# Evidence Search Service Results of your search request

## Patients who are COVID positive and have sustained a pneumothorax.

**ID of request:** 27948  
**Date of request:** 1st March, 2021  
**Date of completion:** 12th March, 2021

If you would like to request any articles or any further help, please contact:  Lucy Sinclair at [lucy.sinclair1@nhs.net](mailto:lucy.sinclair1@nhs.net)

Please acknowledge this work in any resulting paper or presentation as: Evidence search: Patients who are COVID positive and have sustained a pneumothorax.. Lucy Sinclair. (12th March, 2021). BRIGHTON, UK: Brighton and Sussex Library and Knowledge Service.

**Sources searched**  
Cochrane Library (0)  
NICE Evidence Search (0)  
TRIP Database (0)

**Date range used** (5 years, 10 years): 2019-current   
**Limits used** (gender, article/study type, etc.): English language   
**Search terms and notes** (full search strategy for database searches below):

Europe PMC search strategy: (("COVID-19" or COVID19 or 2019nCoV or "Corona Virus" or Coronavirus or "CoV 2" or CoV2 or COVID or nCoV or SARS2 or SARSCoV or "SARS-CoV") AND ((pneumothorax OR "collapsed lung"))) AND (SRC:PPR)

Google Scholar search strategy: (("COVID-19" or COVID 19 or 2019 nCoV or "Corona Virus" or Coronavirus or "CoV 2" or CoV2 or COVID or nCoV or SARS 2 or SARS CoV and "SARS-CoV") AND ((pneumothorax OR "collapsed lung")))

Search terms: COVID-19, Coronavirus, pneumothorax, collapsed lung.

For more information about the resources please go to: <https://www.bsuh.nhs.uk/library/>.

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### [B. Search History](#SearchHistory)

## A. Original Research

1. **'Sono-cardiopulmonary resuscitation' in COVID-19: A proposed algorithm**  
   Brunda R. L. Postgraduate Medical Journal 2021;97:3-4.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=49b6069a94ef291451683401ab3166e1)

1. **A 40-Year-Old Man With Tricuspid Atresia, Status Post-Fontan, With Severe COVID-19 Pneumonia and Pneumothorax**  
   Vaikunth Sumeet S. JACC. Case reports 2021;3:187-191.

We report a case of COVID-19 in an adult single-ventricle patient post-Fontan-to our knowledge, the first report in this population documenting the use of the latest management recommendations for this novel disease. Additionally, this patient had significant pre-existing ventricular dysfunction, valvular disease, and comorbidities including HIV. (Level of Difficulty: Advanced.). Copyright © 2021 The Authors.

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1. **A bird eye view on cystic fibrosis: An underestimated multifaceted chronic disorder**  
   Kotnala S. Life Sciences 2021;268:118959.

Cystic fibrosis (CF) is an autosomal recessive disease which involves the mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene. CF involves in the inflammatory processes and is considered as a multisystem disorder that is not confined to lungs, but it also affects other vital organs that leads to numerous co-morbidities. The respiratory disorder in the CF results in mortality and morbidity which is characterized by series of serious events involving mucus hypersecretion, microbial infections, airways obstruction, inflammation, destruction of epithelium, tissue remodeling and terminal lung diseases. Mucins are the high molecular weight glycoproteins important for the viscoelastic properties of the mucus, play a significant role in the disease mechanisms. Determining the functional association between the CFTR and mucins might help to identify the putative target for specific therapeutic approach. In fact, furin enzyme which helps in the entry of novel COVID-19 virus into the cell, is upregulated in CF and this can also serve as a potential target for CF treatment. Moreover, the use of nano-formulations for CF treatment is an area of research being widely studied as they have also demonstrated promising outcomes. The in-depth knowledge of non-coding RNAs like miRNAs and lncRNAs and their functional association with CFTR gene expression and mutation can provide a different range of opportunity to identify the promising therapeutic approaches for CF.Copyright © 2021 Elsevier Inc.

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1. **A.B.C. approach proposal for POCUS in COVID-19 critically ill patients**  
   Simon Robert Medical ultrasonography 2021;23:94-102.

The rapid spread of SARS-CoV-2 (COVID-19) since December 2019 forced Intensive Care Units to face high numbers of patients admitted simultaneously with limited resources. COVID-19 critically ill patients, especially those on mechanical ventilators, demand special attention as they can develop potential complications with critical hemodynamic and respiratory consequences. Point of Care Ultrasound (POCUS) might have important roles in assessing the critically ill SARS-CoV-2 patient. Mostly, lung ultrasound has been presented as having a role in diagnosis and monitoring, but airway examination and hemodynamic evaluation are of interest also. We propose an A.B.C. POCUS approach focusing on A-airway (orotracheal intubation), B-breathing (interstitial syn-dromes, pneumothorax, atelectasis, pneumonia), and C-circulation (cardiac function, pulmonary embolism, volume status, deep veins thrombosis). This A.B.C. approach has emerged during ICU care for 22 adult COVID-19 critically ill patients, along with the analysis of recent papers describing ultrasound in COVID-19 patients including the use of ultrasound that is currently applied in the management of the general critically ill population. This A.B.C- POCUS algorithm parallels the well-established clinical A.B.C. algorithms. There are few extensive ultrasonographic studies in COVID-19 critically ill patients up to now, but techniques extrapolated from non-COVID studies seem reasonable even though comparative studies are not available yet.

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1. **An anti-CD6 antibody for the treatment of COVID-19 patients with cytokine-release syndrome: Report of three cases**  
   Filgueira L. M. Immunotherapy 2021;13:289-295.

In COVID-19, the inflammatory cytokine-release syndrome is associated with the progression of the disease. Itolizumab is a monoclonal antibody that recognizes human CD6 expressed in activated T cells. The antibody has shown to be safe and efficacious in the treatment of moderate to severe psoriasis. Its effect is associated with the reduction of pro-inflammatory cytokines release, including IFN-gamma, IL-6 and TNF-alpha. Here, we report the outcome of three severe and critically ill COVID-19 patients treated with itolizumab as part of an expanded access protocol. Itolizumab was able to reduce IL-6 concentrations in all the patients. Two of the three patients showed respiratory and radiological improvement and were fully recovered. We hypothesize this anti-inflammatory therapy in addition to antiviral and anticoagulant therapy could reduce COVID-19 associated morbidity and mortality.Copyright © 2021 Future Medicine Ltd.. All rights reserved.

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1. **An Update of Coronavirus Disease 2019 (COVID-19): An Essential Brief for Clinicians**  
   Zare Afshin 2021;:No page numbers.

1. **Anticoagulation Management in Severe Coronavirus Disease 2019 Patients on Extracorporeal Membrane Oxygenation**  
   Guo Z. Journal of Cardiothoracic and Vascular Anesthesia 2021;35:389-397.

Objective: To explore special coagulation characteristics and anticoagulation management in extracorporeal membrane oxygenation (ECMO)-assisted patients with coronavirus disease 2019 (COVID-19). Design(s): Single-center, retrospective observation of a series of patients. Participant(s): Laboratory-confirmed severe COVID-19 patients who received venovenous ECMO support from January 20-May 20, 2020. Intervention(s): This study analyzed the anticoagulation management and monitoring strategies, bleeding complications, and thrombotic events during ECMO support. Measurements and Main Results: Eight of 667 confirmed COVID-19 patients received venovenous ECMO and had an elevated D-dimer level before and during ECMO support. An ECMO circuit pack (oxygenator and tubing) was replaced a total of 13 times in all 8 patients, and coagulation-related complications included oxygenator thrombosis (7/8), tracheal hemorrhage (5/8), oronasal hemorrhage (3/8), thoracic hemorrhage (3/8), bleeding at puncture sites (4/8), and cannulation site hemorrhage (2/8). Conclusion(s): Hypercoagulability and secondary hyperfibrinolysis during ECMO support in COVID-19 patients are common and possibly increase the propensity for thrombotic events and failure of the oxygenator. Currently, there is not enough evidence to support a more aggressive anticoagulation strategy.Copyright © 2020 Elsevier Inc.

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1. **Assessment of final-year medical students' performance in diagnosing critical findings on chest X-ray**  
   Samara O. Emergency Radiology 2021;:No page numbers.

Purpose: Due to the recently emerging shortage in medical staff during the novel corona virus pandemic, several countries have rushed their undergraduate medical students into the emergency department. The accuracy of diagnosing critical findings on X-rays by senior medical students is not well assessed. In this study, we aim to assess the knowledge and accuracy of undergraduate final-year medical students in diagnosing life-threatening emergency conditions on chest x-ray. Method(s): This is a cross-sectional nationwide survey across all medical schools in Jordan. Through an electronic questionnaire, participants were sequentially shown a total of six abnormal X-rays and one normal. For each X-ray, participants were asked to choose the most likely diagnosis, and to grade the degree of self-confidence regarding the accuracy of their answer in a score from 0 (not confident) to 10 (very confident). Result(s): We included a total of 530 participants. All participants answered at least six out of seven questions correctly, out of them, 139 (26.2%) participants answered all questions correctly. Pneumoperitoneum was the highest correct answer (93.8%), whereas flail chest was the least correctly answered case with only 310 (58.5%) correct answers. Regarding self-confidence for each question, 338 participants (63.8%) reported very high overall self-confidence level. Answers related to tension pneumothorax had the highest confidence level. Conclusion(s): Senior Jordanian medical students showed good knowledge with high confidence levels in diagnosing life-threatening conditions on chest x-rays, supporting their incorporation in the emergency department during pandemics and confirming the reliability of information they can extract.Copyright © 2021, American Society of Emergency Radiology.

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1. **Assessment of final-year medical students' performance in diagnosing critical findings on chest X-ray**  
   Samara Osama Emergency radiology 2021;:No page numbers.

PURPOSE: Due to the recently emerging shortage in medical staff during the novel corona virus pandemic, several countries have rushed their undergraduate medical students into the emergency department. The accuracy of diagnosing critical findings on X-rays by senior medical students is not well assessed. In this study, we aim to assess the knowledge and accuracy of undergraduate final-year medical students in diagnosing life-threatening emergency conditions on chest x-ray., METHOD: This is a cross-sectional nationwide survey across all medical schools in Jordan. Through an electronic questionnaire, participants were sequentially shown a total of six abnormal X-rays and one normal. For each X-ray, participants were asked to choose the most likely diagnosis, and to grade the degree of self-confidence regarding the accuracy of their answer in a score from 0 (not confident) to 10 (very confident)., RESULTS: We included a total of 530 participants. All participants answered at least six out of seven questions correctly, out of them, 139 (26.2%) participants answered all questions correctly. Pneumoperitoneum was the highest correct answer (93.8%), whereas flail chest was the least correctly answered case with only 310 (58.5%) correct answers. Regarding self-confidence for each question, 338 participants (63.8%) reported very high overall self-confidence level. Answers related to tension pneumothorax had the highest confidence level., CONCLUSION: Senior Jordanian medical students showed good knowledge with high confidence levels in diagnosing life-threatening conditions on chest x-rays, supporting their incorporation in the emergency department during pandemics and confirming the reliability of information they can extract.

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1. **Bedside Tunneled Hemodialysis Catheter Placement in Patients with COVID-19**  
   Williams Austin D. Annals of vascular surgery 2021;:No page numbers.

BACKGROUND: COVID-19, the syndrome caused by the novel SARS-CoV2, is associated with high rates of acute kidney injury requiring renal replacement therapy (RRT). It is well known that despite the ease of bedside insertion, the use of nontunneled dialysis catheters (NTDCs) is associated with increased complications compared to tunneled dialysis catheters (TDCs). Our objective was to develop a strategy for TDC placement at the bedside to provide effective dialysis access, conserve resources and decrease personnel exposure at our medical center in an epicenter of the COVID-19 pandemic., METHODS: A technique for bedside TDC insertion with ultrasound and plain radiographs in the intensive care unit was developed. Test or clinically COVID-19-positive patients requiring RRT were evaluated for bedside emergent NTDC or nonemergent TDC placement. Patients who underwent NTDC placement were monitored for ongoing RRT needs and were converted to TDC at the bedside after 3-5 days. We prospectively collected patient data focusing on complications and mortality., RESULTS: Of the 36 consultations for dialysis access in COVID-positive patients from March 19 through June 5, 2020, a total of 24 bedside TDCs were placed. Only one patient developed a complication, which was pneumothorax and cardiac tamponade during line placement. In-hospital mortality in the cohort was 63.9%., CONCLUSIONS: Bedside TDC placement has served to conserve resources, prevent complications with transport to and from the operating room, and decrease personnel exposure during the COVID-19 pandemic. This strategy warrants further consideration and could be used in critically ill patients regardless of COVID status. Copyright © 2021 Elsevier Ltd. All rights reserved.

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1. **Bilateral pneumothorax after acupuncture treatment**  
   Nishie Miyuki BMJ case reports 2021;14:No page numbers.

A 31-year-old female physician was diagnosed with bilateral pneumothorax a day after her acupuncture treatment. Her body mass index was 16.9 and she did not have a prior history of respiratory disease or smoking. Acupuncture needles may easily reach the pleura around the end of the suprascapular angle of the levator scapulae muscle where the subcutaneous tissue is anatomically thin. In our patient, the thickness between the epidermis and the visceral pleura in this area was only 22 mm as confirmed by an ultrasound scan. Although she felt chest discomfort 30 min after the procedure, she assumed the symptom to be a reaction to the acupuncture. In light of our case, we advise practitioners to select appropriate acupuncture needles for patients based on the site of insertion and counsel them regarding the appearance of symptoms such as chest pain and dyspnoea immediately after the procedure. Copyright © BMJ Publishing Group Limited 2021. No commercial re-use. See rights and permissions. Published by BMJ.

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1. **Bilateral spontaneous pneumothorax in SARS-CoV-2 infection: A very rare, life-threatening complication**  
   Gonzalez-Pacheco Hector The American journal of emergency medicine 2021;39:258.e1-258.e3.

In the coronavirus disease 2019 (COVID-19) era, the presence of acute respiratory failure is generally associated with acute respiratory distress syndrome; however, it is essential to consider other differential diagnoses that require different, and urgent, therapeutic approaches. Herein we describe a COVID-19 case complicated with bilateral spontaneous pneumothorax. A previously healthy 45-year-old man was admitted to our emergency department with sudden-onset chest pain and progressive shortness of breath 17days after diagnosis with uncomplicated COVID-19 infection. He was tachypneic and presented severe hypoxemia (75% percutaneous oxygen saturation). Breath sounds were diminished bilaterally on auscultation. A chest X-ray revealed the presence of a large bilateral pneumothorax. A thoracic computed tomography (CT) scan confirmed the large bilateral pneumothorax, with findings consistent with severe COVID-19 infection. Chest tubes were inserted, with immediate clinical improvement. Follow-up chest CT scan revealed resolution of bilateral pneumothorax, reduction of parenchymal consolidation, and formation of large bilateral pneumatoceles. The patient remained under observation and was then discharged home. Bilateral spontaneous pneumothorax is a very rare, potentially life-threatening complication in patients with COVID-19. This case highlights the importance of recognizing this complication early to prevent potentially fatal consequences. Copyright © 2020 Elsevier Inc. All rights reserved.

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1. **Bilateral spontaneous pneumothorax in SARS-CoV-2 infection: A very rare, life-threatening complication**  
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1. **Case Report: Massive Spontaneous Pneumothorax-A Rare Form of Presentation for Severe COVID-19 Pneumonia**  
   Marza Adina Maria Medicina (Kaunas, Lithuania) 2021;57:No page numbers.

Background and Objectives: Coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection is a viral disease that is spreading worldwide and became a pandemic. Although most of the time, the symptoms of the infection are flu like, a percentage of patients develop severe forms, along with severe complications. Many of them are known among front-line health workers, but the number of uncommon presentations and complications has increased. This case report aims to alert healthcare workers on less common forms of presentation, and to introduce this differential diagnosis in the evaluation of patients with COVID-19, given the increasing occurrence of pneumothorax in patients who are not mechanical ventilated. Case presentation: A 57-year-old female patient came to the Emergency Department (ED) by ambulance, with acute respiratory failure. She had SpO2 = 43% on room air at home, and 86% on admission in ED after oxygen delivery (on a reservoir mask). SARS-CoV-2 infection was suspected based on symptoms that started three days ago (fever, dry cough, dyspnea, and fatigability). Blood was taken for lab tests, pharyngeal and nasal swabs for the reverse transcription-PCR (RT-PCR) test, and native computed tomography (CT) was scheduled. The thoracic CT scan showed massive right pneumothorax, partially collapsed lung, multiple bilateral lung infiltrates with a ground glass aspect and the RT-PCR test came back positive for SARS-CoV-2 infection. Despite the prompt diagnosis and treatment of pneumothorax (thoracostomy was performed and the drain tube was placed), the patient died after a long hospitalization in the intensive care unit. Conclusion: Secondary spontaneous pneumothorax (SSP), as a complication in severe forms of COVID-19 pneumonia, especially in female patients without risk factors is rare, and early diagnosis and treatment are essential for increasing the survival chances of these patients.

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1. **Cavitary lung lesions and pneumothorax in a healthy patient with active coronavirus-19 (COVID-19) viral pneumonia**  
   Afrazi Amin Interactive cardiovascular and thoracic surgery 2021;32:150-152.

Severe respiratory sequelae drive morbidity-associated with coronavirus 2019 (COVID-19) disease. We report a case of COVID-19 pneumonia complicated by cavitary lesions and pneumothorax in a young healthy male. Pneumothorax management with catheter thoracostomy and rapid resolution of the cavitary lesions are described. An extensive work-up for other causes a cavitation was negative and the temporal correlation of the cavities with COVID-19 infection plus their rapid resolution suggest a direct relationship. We propose a mechanism for cavitation secondary to microangiopathy, a cause of cavitation in the vasculitides and a known feature of COVID-19. Copyright © The Author(s) 2020. Published by Oxford University Press on behalf of the European Association for Cardio-Thoracic Surgery. All rights reserved.

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1. **Challenging cases of renal cell cancers with or without tumor thrombus during the covid-19 pandemic**  
   Ciancio G. Anticancer Research 2021;41:335-340.

Background/Aim: Large or bilateral multiple renal cell carcinoma (RCC) without/with tumor thrombus (TT) in the renal vein (RV) or inferior vena cava (IVC) poses a challenge to the surgeon due to the potential for massive hemorrhage, tumor thromboemboli and dialysis, and the situation is more critical due to Covid-19 pandemic. We report our experience and measures in dealing with challenging cases of large or multiple RCCs without/with TT during the ongoing Covid-19 pandemic. Patients and Methods: Between 4/2020-10/2020, five patients underwent RCC resection with/without TT. Patients 1 and 2 had RCCs/TT in RV; Patient 3 had RCC/TT supradiaphragmatic below right atrium; Patient-4 had a 26 cm RCC; Patient-5 had multiple RCCS as part of Birt-Hogg-Dube syndrome. Result(s): Patients were preoperatively tested negative for Covid-19. Operation times were 105, 85, 255, 200 and 247 minutes for Patients 1-5. Estimated blood loss was: 100, 50, 3,900,100 and 50 ml, respectively. Patient 3 underwent RCC resection en bloc with IVC/TT. Patients 1 and 2 underwent resections of RCC/TT in RV. Patient 4 underwent a 26 cm RCC resection. Patient 5 underwent laparoscopic bilateral radical nephrectomies. No immediate postoperative complications were reported. Conclusion(s): We successfully managed 5 challenging cases of RCCs despite the recommendations imposed by hospitals due to Covid-19 pandemic, with favorable outcomes.Copyright © 2021 International Institute of Anticancer Research. All rights reserved.

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1. **Characteristics of Hospitalized Children with SARS-CoV-2 in the New York City Metropolitan Area**  
   Verma S. Hospital Pediatrics 2021;11:71-78.

OBJECTIVES: To describe the characteristics of hospitalized children with severe acute respiratory syndrome coronavirus 2 in New York City metropolitan area. PATIENTS AND METHODS: This was a multicenter, retrospective cohort study at 4 hospitals comprising 82 hospitalized children (0-21 years) who tested positive for severe acute respiratory syndrome coronavirus 2 after symptoms and risk screening between March 1 and May 10, 2020. We subdivided patients on the basis of their admission to acute or critical care units and by age groups. Further subanalyses were performed between patients requiring respiratory support or no respiratory support. RESULT(S): Twenty-three (28%) patients required critical care. Twenty-nine (35%) patients requiring respiratory support, with 9% needing mechanical ventilation, and 1 required extracorporeal support. All patients survived to discharge. Children with any comorbidity were more likely to require critical care (70% vs 37%, P 5 .008), with obesity as the most common risk factor for critical care (63% vs 28%, P 5 .02). Children with asthma were more likely to receive respiratory support (28% vs 8%, P 5 .02), with no difference in need for critical care (P 5 .26). Children admitted to critical care had higher rates of renal dysfunction at presentation (43% vs 10%, P 5 .002). CONCLUSION(S): Children with comorbidities (obesity and asthma in particular) were at increased risk for critical care admission and/or need for respiratory support. Children with renal dysfunction at presentation were more likely to require critical care.Copyright © 2021 by the American Academy of Pediatrics.

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1. **Chest CT findings of coronavirus disease 2019 (COVID-19): A comprehensive meta-analysis of 9907 confirmed patients**  
   Zarifian A. Clinical Imaging 2021;70:101-110.

Objectives: We performed a systematic review and meta-analysis of the prevalence of chest CT findings in patients with confirmed COVID-19 infection. Method(s): Systematic review of the literature was performed using PubMed, Scopus, Embase, and Google Scholar to retrieve original studies on chest CT findings of patients with confirmed COVID-19, available up to 10 May 2020. Data on frequency and distribution of chest CT findings were extracted from eligible studies, pooled and meta-analyzed using random-effects model to calculate the prevalence of chest CT findings. Result(s): Overall, 103 studies (pooled population: 9907 confirmed COVID-19 patients) were meta-analyzed. The most common CT findings were ground-glass opacities (GGOs) (77.18%, 95%CI = 72.23-81.47), reticulations (46.24%, 95%CI = 38.51-54.14), and air bronchogram (41.61%, 95%CI = 32.78-51.01). Pleural thickening (33.35%, 95%CI = 21.89-47.18) and bronchial wall thickening (15.48%, 95%CI = 8.54-26.43) were major atypical and airway findings. Lesions were predominantly distributed bilaterally (75.72%, 95%CI = 70.79-80.06) and peripherally (65.64%, 95%CI = 58.21-72.36), while 8.20% (95%CI = 6.30-10.61) of patients had no abnormal findings and pre-existing lung diseases were present in 6.01% (95%CI = 4.37-8.23). Conclusion(s): The most common CT findings in COVID-19 are GGOs with/without consolidation, reticulations, and air bronchogram, which often involve both lungs with peripheral distribution. However, COVID-19 might present with atypical manifestations or no abnormal findings in chest CT, which deserve clinicians' notice.Copyright © 2020 Elsevier Inc.

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1. **Chest Tube Drainage in the Age of COVID-19**  
   Dhanasopon Andrew P. Physician assistant clinics 2021;6:261-265.

Patients with COVID-19 are at risk of developing acute respiratory distress syndrome requiring invasive mechanical ventilation. Barotrauma in these patients often leads to clinically significant pneumothorax, which necessitates chest tube thoracostomy. However, given the mode of transmission of the severe acute respiratory syndrome coronavirus 2 virus and the aerosolizing nature of the procedure, special considerations and care must be taken to mitigate the exposure risks to health care personnel. This article discusses the risk mitigation strategies proposed and under review at the authors' institution. Copyright © 2020 Elsevier Inc. All rights reserved.

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1. **Chest X-ray in the emergency department during COVID-19 pandemic descending phase in Italy: correlation with patients' outcome**  
   Moroni Chiara La Radiologia medica 2021;:No page numbers.

PURPOSE: The aims of our study are: (1) to estimate admission chest X-ray (CXR) accuracy during the descending phase of pandemic; (2) to identify specific CXR findings strictly associated with COVID-19 infection; and (3) to correlate lung involvement of admission CXR with patients' outcome., MATERIALS AND METHODS: We prospectively evaluated the admission CXR of 327 patients accessed to our institute during the Italian pandemic descending phase (April 2020). For each CXR were searched ground glass opacification (GGO), consolidation (CO), reticular-nodular opacities (RNO), nodules, excavations, pneumothorax, pleural effusion, vascular congestion and cardiac enlargement. For lung alterations was defined the predominance (upper or basal, focal or diffuse, central or peripheric, etc.). Then radiologists assessed whether CXRs were suggestive or not for COVID-19 infection. For COVID-19 patients, a prognostic score was applied and correlated with the patients' outcome., RESULTS: CXR showed 83% of specificity and 60% of sensitivity. GGO, CO, RNO and a peripheric, diffuse and basal prevalence showed good correlation with COVID-19 diagnosis. A logistic regression analysis pointed out GGO and a basal or diffuse distribution as independent predictors of COVID-19 diagnosis. The prognostic score showed good correlation with the patients' outcome., CONCLUSION: In our study, admission CXR showed a fair specificity and a good correlation with patients' outcome. GGO and others CXR findings showed a good correlation with COVID-19 diagnosis; besides GGO a diffuse or bibasal distribution resulted in independent variables highly suggestive for COVID-19 infection thus enabling radiologists to signal to clinicians radiologically suspect patients during the pandemic descending phase.

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1. **Clinical course of COVID-19 patients treated with ECMO: A multicenter study in Daegu, South Korea**  
   Jang W. S. Heart and Lung 2021;50:21-27.

Background: The COVID-19 pandemic has caused an epidemic of critical patients, some of whom have been treated with extracorporeal membrane oxygenation (ECMO). This purpose of study is to describe the clinical course of COVID-19 patients treated with ECMO. Method(s): A multicentered study of critical patients with COVID-19 treated at six hospitals in Daegu was conducted between January and April 2020. Result(s): Among the 80 patients receiving mechanical ventilation support, 19 (24%) were treated with ECMO included (median age 63.0 years). Eight of the 19 patients (42%) were weaned off ECMO (9.8 days, IQR 7.0-13.7). Among them, four patients were also weaned off mechanical ventilation (33.4 days, IQR 29.3 - 35.7), three were still receiving mechanical ventilation (50.9 days), and one expired after ECMO weaning. According to the univariate analysis, the factor that was associated with successful ECMO weaning was vitamin B12 treatment (p = 0.028). Conclusion(s): During the COVID-19 epidemic, ECMO weaning and mortality rates were 42% and 58%, respectively.Copyright © 2020 Elsevier Inc.

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1. **Clinical outcomes of pleural drainage on pneumothorax and hydrothorax in critically ill patients with COVID-19: A case series with literature review**  
   Xu Y. Heart and Lung 2021;50:213-219.

Background: For patients with COVID-19, pneumothorax and hydrothorax are suggested to be negative prognostic indicators. However, the management of these two conditions has rarely been discussed. We aimed to describe the clinical outcomes of pleural drainage in critically ill patients with COVID-19. Method(s): A total of 17 pleural drainages were performed in 11 critically ill patients with pneumothorax or hydrothorax. Either chest tubes or central venous catheters (CVCs) were used. The clinical outcomes, including respiratory and circulation indicators at 24 h and 1 h before the procedure and 24 h and 48 h after the procedure, were retrospectively recorded. Result(s): (1) Following pleural drainage, there was a 19.1% improvement in the PaO2/FiO2 ratio from 147.4 mmHg (-1 h) to 175.5 mmHg (24 h), while the mean positive end expiratory pressure (PEEP) decreased from 10.7 cmH2O (-1 h) to 8.9 cmH2O (24 h) and 8.1 cmH2O (48 h). The A-a gradients decreased from 313.3 mmHg (-1 h) to 261.3 mmHg (24 h). (2) The dosage of norepinephrine increased from 0.15 mug/kg/min (-1 h) to 0.40 mug/kg/min (24 h). (3) No haemorrhagic or infectious complications were observed. (4) A total of 41.6% of CVCs were partially or fully obstructed, while no chest tubes were obstructed. Conclusion(s): For critically ill patients with COVID-19, pleural drainage leads to a significant improvement in oxygenation and gas exchange, but the deterioration of circulation is not reversed. It is safe to perform pleural drainage even though anticoagulation therapy and glucocorticoids are widely used. Chest tubes rather than CVCs are recommended.Copyright © 2020

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1. **Coronavirus disease 2019 in patients with inborn errors of immunity: An international study**  
   Meyts I. Journal of Allergy and Clinical Immunology 2021;147:520-531.

Background: There is uncertainty about the impact of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in individuals with rare inborn errors of immunity (IEI), a population at risk of developing severe coronavirus disease 2019. This is relevant not only for these patients but also for the general population, because studies of IEIs can unveil key requirements for host defense. Objective(s): We sought to describe the presentation, manifestations, and outcome of SARS-CoV-2 infection in IEI to inform physicians and enhance understanding of host defense against SARS-CoV-2. Method(s): An invitation to participate in a retrospective study was distributed globally to scientific, medical, and patient societies involved in the care and advocacy for patients with IEI. Result(s): We gathered information on 94 patients with IEI with SARS-CoV-2 infection. Their median age was 25 to 34 years. Fifty-three patients (56%) suffered from primary antibody deficiency, 9 (9.6%) had immune dysregulation syndrome, 6 (6.4%) a phagocyte defect, 7 (7.4%) an autoinflammatory disorder, 14 (15%) a combined immunodeficiency, 3 (3%) an innate immune defect, and 2 (2%) bone marrow failure. Ten were asymptomatic, 25 were treated as outpatients, 28 required admission without intensive care or ventilation, 13 required noninvasive ventilation or oxygen administration, 18 were admitted to intensive care units, 12 required invasive ventilation, and 3 required extracorporeal membrane oxygenation. Nine patients (7 adults and 2 children) died. Conclusion(s): This study demonstrates that (1) more than 30% of patients with IEI had mild coronavirus disease 2019 (COVID-19) and (2) risk factors predisposing to severe disease/mortality in the general population also seemed to affect patients with IEI, including more younger patients. Further studies will identify pathways that are associated with increased risk of severe disease and are nonredundant or redundant for protection against SARS-CoV-2.Copyright © 2020 The Authors

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1. **Coronavirus Disease-2019: Modified Underwater Seal Chest Drain System**  
   Kumar Neeraj Journal of cardiothoracic and vascular anesthesia 2021;35:347-348.

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1. **COVID-19 Presenting with Spontaneous Pneumothorax**  
   Ahmed Intisar Journal of the College of Physicians and Surgeons--Pakistan : JCPSP 2021;30:S29-S31.

The coronavirus disease 2019 (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The disease mainly affects respiratory system. Its common clinical findings include fever, cough and shortness of breath. Characteristic radiological features of the disease include peripherally distributed, bilateral ground-glass opacities, predominantly involving the lower lung zones. In this report, we present a case of COVID-19 disease presenting with spontaneous pneumothorax. A 26-year male patient was admitted to the Emergency Department with fever, dry cough, shortness of breath and right-sided chest pain. Radiographic imaging of the patient revealed pneumothorax on the right and peripherally distributed non-homogenous opacification. The patient underwent right lateral tube thoracostomy. COVID-19 was diagnosed on testing of nasopharyngeal swab. In conclusion, spontaneous pneumothorax is one of the rare presentations of COVID-19 pneumonia and should be kept in mind in patients presenting with shortness of breath and chest pain. Key Words: Spontaneous pneumothorax, Corona, pneumonia.

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1. **COVID-19 with spontaneous pneumothorax, pneumomediastinum, and subcutaneous emphysema in the intensive care unit: Two case reports**  
   Alharthy A. Journal of Infection and Public Health 2021;14:290-292.

Real-Time-reverse-transcription-Polymerase-Chain-Reaction from nasopharyngeal swabs and chest computed tomography (CT) depicting typically bilateral ground-glass opacities with a peripheral and/or posterior distribution are mandatory in the diagnosis of COVID-19. COVID-19 pneumonia may present though with atypical features such as pleural and pericardial effusions, lymphadenopathy, cavitations, and CT halo sign. In these two case-reports, COVID-19 presented as pneumothorax, pneumomediastinum and subcutaneous emphysema in critically ill patients. These disorders may require treatment or can be even self-limiting. Clinicians should be aware of their potential effects on the cardiorespiratory status of critically ill COVID-19 patients. Finally, pneumothorax can be promptly diagnosed by means of lung ultrasound. Although operator dependent, lung ultrasound is a useful bedside diagnostic tool that could alleviate the risk of cross-infection related to COVID-19 patient transport.Copyright © 2020 The Author(s)

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1. **COVID-19: looking beyond the peak. Challenges and tips for radiologists in follow-up of a novel patient cohort**  
   McStay R. Clinical Radiology 2021;76:74.

As the coronavirus pandemic evolves, the focus of radiology departments has begun to change. The acute phase of imaging a new disease entity whilst rationalising radiology services in the face of lockdown has passed. Radiologists are now becoming familiar with the complications of COVID-19, particularly the lung parenchymal and pulmonary vascular sequelae and are considering the impact follow-up imaging may have on departments already struggling with a backlog of suspended imaging in the face of reduced capacity. This review from the British Society of Thoracic Imaging explores both the thoracic and extra-thoracic complications of COVID-19, recognising the importance of a holistic approach to patient follow-up. The British Thoracic Society guidelines for respiratory follow-up of COVID-19 will be discussed, together with newly developed reporting templates, which aim to provide consistency for clinicians as well as an opportunity for longer-term data collection.Copyright © 2020 The Royal College of Radiologists

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1. **Critical role of cardiopulmonary point-of-care ultrasound in the era of COVID-19**  
   Choi E. Y. Journal of Cardiovascular Imaging 2021;29:69-70.

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1. **Critically ill patients with COVID-19 in Tokyo, Japan: A single-center case series**  
   Miike S. Journal of Infection and Chemotherapy 2021;27:291-295.

Introduction: We reported, in our previous study, a patient with coronavirus disease 2019 (COVID-19) who was successfully treated with extracorporeal membrane oxygenation. Data on clinical courses and outcomes of critically ill patients with COVID-19 in Japan are limited in the literature. This study aimed to describe the clinical courses and outcomes of critically ill patients with COVID-19 in Tokyo, Japan. Method(s): This is a single-center case series study. Patients with COVID-19 treated with mechanical ventilation (MV) were reviewed retrospectively. Data on baseline characteristics, in-hospital treatment, and outcomes were collected. Result(s): Between February 2, 2020, and June 30, 2020, 14 critically ill patients with COVID-19 were treated with MV. Most patients were male and had comorbidities, especially hypertension or diabetes; 35.7% were overweight and 21.4% were obese. The majority of the patients had dyspnea on admission. The median duration of MV was 10.5 days, and the 28-day mortality rate was 35.7%. In the four patients with COVID-19 who died, the cause of death was respiratory failure. Conclusion(s): As in previous reports from other countries, the mortality rate of patients with COVID-19 requiring intensive care remains high in Tokyo. Further study on the appropriate timing of MV initiation and specific treatments for critically ill patients with COVID-19 is needed.Copyright © 2020 Japanese Society of Chemotherapy and The Japanese Association for Infectious Diseases

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1. **Delayed recurrent spontaneous pneumothorax post-recovery from COVID-19 infection**  
   Kasturi Srikanth Indian journal of thoracic and cardiovascular surgery 2021;:1-3.

Pneumothorax, as a consequence of coronavirus disease 2019 (COVID-19) infection, has become an established entity but the delayed occurrence of pneumothorax, after recovery from the illness, is less commonly reported. We present a case of delayed recurrent spontaneous pneumothorax, presenting 4 weeks after recovery from COVID-19 in a previously healthy middle-aged gentleman, for which uniportal video-assisted thoracoscopic surgery (VATS) pleurectomy was performed, but the cause of pneumothorax could not be ascertained. This report brings to light, the importance of continued surveillance of COVID-19 survivors, the unpredictability of the disease process, and the challenges of thoracic surgery in this unique subset of patients. Copyright © Indian Association of Cardiovascular-Thoracic Surgeons 2021.

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1. **Delayed Spontaneous Bilateral Pneumothorax in a Previously Healthy Nonventilated COVID-19 Patient**  
   Huis In 't Veld Maite A. The Journal of emergency medicine 2021;:No page numbers.

BACKGROUND: The novel coronavirus disease 2019 (COVID-19) is a recent viral outbreak that has rapidly spread to multiple countries worldwide. Little is known about COVID-19 infection-related complications., CASE REPORT: We report a patient who developed spontaneous bilateral pneumothorax after a recent COVID-19 infection. To our knowledge, this is the first reported case of spontaneous bilateral pneumothorax in a patient with recent confirmed severe acute respiratory syndrome coronavirus-2 infection without any risk factors for pneumothorax and who had not received positive pressure ventilation. WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?: There may be a possible correlation between a recent COVID-19 infection and the development of spontaneous pneumothorax. The diagnosis of spontaneous pneumothorax should be considered in any patient with known or suspected recent COVID-19 infection who presents with new acute symptoms consistent with pneumothorax or sudden clinical deterioration. Copyright © 2021 Elsevier Inc. All rights reserved.

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1. **Design, development and evaluation of Artificial Breathing Capability Device (ABCD): A novel innovation for respiratory support**  
   Mathew J. L. BMJ Innovations 2021;7:40-46.

Objective The paucity of mechanical ventilators necessitates development of innovative respiratory support devices. Method(s): We developed the Artificial Breathing Capability Device (ABCD) to automate compression of self-inflating bags (SIB), while controlling peak inspiratory pressure (PIP), ventilation rate (VR) and inspiration to expiration time (I:E) ratio (as in a conventional ventilator). ABCD has additional smart features including self-regulatory checks, auto cut-off during cough, endotracheal tube disconnection and blockage alarms, and SIB disconnection alarm. ABCD was tested non-stop for 60 days with 396 user combinations, using adult-size and paediatric-size SIB. The device was evaluated for robustness, reliability and precision. Result(s): ABCD did not have mechanical, electrical or electronic failures during continuous testing under various ambient conditions, confirming robustness. Reliability and precision evaluated by the proportion of user combinations showing <10% deviation from the set parameters showed: PIP 100%, VR 100% and I:E 84.3% with an adult SIB. The corresponding proportions with a paediatric-size SIB were 85.4%, 100% and 95.5%. With both SIB, the only combinations showing >10% deviation were outside the physiologic range. Conclusion(s): ABCD is a safe, efficacious and cost-effective option, which could be considered for adults and children in the context of ventilator shortages especially during the COVID-19 pandemic.Copyright © 2021 Author(s).

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1. **Detection of severe acute respiratory syndrome coronavirus 2 in the pleural fluid**  
   Baek M. S. Infection and Chemotherapy 2021;53:e51.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) can be detected via a nasopharyngeal swab and in sputum, blood, urine, and feces. However, there is only limited data on the real-time reverse transcriptase polymerase chain reaction (RT-PCR) results of coronavirus disease 2019 (COVID-19) patients with pleural fluid. We report a case of COVID-19 with SARS-CoV-2 detected in both sputum and pleural fluid. A 68-year-old male patient came to the hospital with a chief complaint of dyspnea. He was diagnosed with lung cancer. A biopsy was performed, and a pneumothorax was found. As a result, a chest tube was placed into the right pleural space. During his hospital stay, the patient was confirmed as COVID-19 positive. We identified the presence of SARS-CoV-2 through real-time RTPCR assay from the pleural fluid. Although pleural effusion is an uncommon finding in the COVID-19, care should be taken to avoid exposure when handling the pleural fluid sample. Copyright © 2021 by The Korean Society of Infectious Diseases, Korean Society for Antimicrobial Therapy, and The Korean Society for AIDS.

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1. **Development of a large spontaneous pneumothorax after recovery from mild COVID-19 infection**  
   Nunna Krishidhar BMJ case reports 2021;14:No page numbers.

A previously healthy 37-year-old man presented with fevers and myalgias for a week with a minimal dry cough. Initial SARS-CoV-2 nasopharyngeal testing was negative, but in light of high community prevalence, he was diagnosed with COVID-19, treated with supportive care and self-quarantined at home. Three days after resolution of all symptoms, he developed sudden onset chest pain. Chest imaging revealed a large right-sided pneumothorax and patchy subpleural ground glass opacities. IgM and IgG antibodies for SARS-CoV-2 were positive. His pneumothorax resolved after placement of a small-bore chest tube, which was removed after 2 days. This case demonstrates that patients with COVID-19 can develop a significant pulmonary complication, a large pneumothorax, despite only minimal lower respiratory tract symptoms and after resolution of the original illness. Medical professionals should consider development of a pneumothorax in patients who have recovered from COVID-19 and present with new respiratory symptoms. Copyright © BMJ Publishing Group Limited 2020. No commercial re-use. See rights and permissions. Published by BMJ.

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1. **Diagnosis-wide analysis of COVID-19 complications: an exposure-crossover study**  
   Murk William CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne 2021;193:E10-E18.

BACKGROUND: Many studies reporting coronavirus disease 2019 (COVID-19) complications have involved case series or small cohorts that could not establish a causal association with COVID-19 or provide risk estimates in different care settings. We sought to study all possible complications of COVID-19 to confirm previously reported complications and to identify potential complications not yet known., METHODS: Using United States health claims data, we compared the frequency of all International Classification of Diseases, 10th Revision, Clinical Modification (ICD-10-CM) diagnosis codes occurring before and after the onset of the COVID-19 pandemic in an exposure-crossover design. We included patients who received a diagnosis of COVID-19 between Mar. 1, 2020, and Apr. 30, 2020, and computed risk estimates and odds ratios (ORs) of association with COVID-19 for every ICD-10-CM diagnosis code., RESULTS: Among 70 288 patients with COVID-19, 69 of 1724 analyzed ICD-10-CM diagnosis codes were significantly associated with COVID-19. Disorders showing both strong association with COVID-19 and high absolute risk included viral pneumonia (OR 177.63, 95% confidence interval [CI] 147.19-214.37, absolute risk 27.6%), respiratory failure (OR 11.36, 95% CI 10.74-12.02, absolute risk 22.6%), acute kidney failure (OR 3.50, 95% CI 3.34-3.68, absolute risk 11.8%) and sepsis (OR 4.23, 95% CI 4.01-4.46, absolute risk 10.4%). Disorders showing strong associations with COVID-19 but low absolute risk included myocarditis (OR 8.17, 95% CI 3.58-18.62, absolute risk 0.1%), disseminated intravascular coagulation (OR 11.83, 95% CI 5.26-26.62, absolute risk 0.1%) and pneumothorax (OR 3.38, 95% CI 2.68-4.26, absolute risk 0.4%)., INTERPRETATION: We confirmed and provided risk estimates for numerous complications of COVID-19. These results may guide prognosis, treatment decisions and patient counselling. Copyright © 2021 Joule Inc. or its licensors.

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1. **Diesel siphoner's lung: An unusual cause of hydrocarbon pneumonitis**  
   Shrestha T. M. Clinical Case Reports 2021;9:416-419.

The practice of manual siphoning of diesel from fuel tanks is common among automobile mechanics in Nepal. When an automobile mechanic with a history of diesel siphonage presents with respiratory symptoms, the diesel siphoner's lung diagnosis should be considered. Clinical suspicion confirmed by radiological findings can help in early management and prevention of permanent damage.Copyright © 2020 The Authors. Clinical Case Reports published by John Wiley & Sons Ltd.

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1. **Effect of Recombinant Human Granulocyte Colony-Stimulating Factor for Patients with Coronavirus Disease 2019 (COVID-19) and Lymphopenia: A Randomized Clinical Trial**  
   Cheng L. L. JAMA Internal Medicine 2021;181:71-78.

Importance: Lymphopenia is common and correlates with poor clinical outcomes in patients with coronavirus disease 2019 (COVID-19). Objective(s): To determine whether a therapy that increases peripheral blood leukocyte and lymphocyte cell counts leads to clinical improvement in patients with COVID-19. Design, Setting and Participants: Between February 18 and April 10, 2020, we conducted an open-label, multicenter, randomized clinical trial at 3 participating centers in China. The main eligibility criteria were pneumonia, a blood lymphocyte cell count of 800 per muL (to convert to x109/L, multiply by 0.001) or lower, and no comorbidities. Severe acute respiratory syndrome coronavirus 2 infection was confirmed with reverse-transcription polymerase chain reaction testing. Exposures: Usual care alone, or usual care plus 3 doses of recombinant human granulocyte colony-stimulating factor (rhG-CSF, 5 mug/kg, subcutaneously at days 0-2). Main Outcomes and Measures: The primary end point was the time from randomization to improvement of at least 1 point on a 7-category disease severity score. Result(s): Of 200 participants, 112 (56%) were men and the median (interquartile range [IQR]) age was 45 (40-55) years. There was random assignment of 100 patients (50%) to the rhG-CSF group and 100 (50%) to the usual care group. Time to clinical improvement was similar between groups (rhG-CSF group median of 12 days (IQR, 10-16 days) vs usual care group median of 13 days (IQR, 11-17 days); hazard ratio, 1.28; 95% CI, 0.95-1.71; P =.06). For secondary end points, the proportion of patients progressing to acute respiratory distress syndrome, sepsis, or septic shock was lower in the rhG-CSF group (rhG-CSF group, 2% vs usual care group, 15%; difference, -13%; 95%CI, -21.4% to -5.4%). At 21 days, 2 patients (2%) had died in the rhG-CSF group compared with 10 patients (10%) in the usual care group (hazard ratio, 0.19; 95%CI, 0.04-0.88). At day 5, the lymphocyte cell count was higher in the rhG-CSF group (rhG-CSF group median of 1050/muL vs usual care group median of 620/muL; Hodges-Lehmann estimate of the difference in medians, 440; 95% CI, 380-490). Serious adverse events, such as sepsis or septic shock, respiratory failure, and acute respiratory distress syndrome, occurred in 29 patients (14.5%) in the rhG-CSF group and 42 patients (21%) in the usual care group. Conclusion and Relevance: In preliminary findings from a randomized clinical trial, rhG-CSF treatment for patients with COVID-19 with lymphopenia but no comorbidities did not accelerate clinical improvement, but the number of patients developing critical illness or dying may have been reduced. Larger studies that include a broader range of patients with COVID-19 should be conducted. Trial Registration: Chinese Clinical Trial Registry: ChiCTR2000030007.Copyright © 2021 American Medical Association. All rights reserved.

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1. **Effect of Tocilizumab vs Usual Care in Adults Hospitalized with COVID-19 and Moderate or Severe Pneumonia: A Randomized Clinical Trial**  
   Hermine O. JAMA Internal Medicine 2021;181:32-40.

Importance: Severe pneumonia with hyperinflammation and elevated interleukin-6 is a common presentation of coronavirus disease 2019 (COVID-19). Objective(s): To determine whether tocilizumab (TCZ) improves outcomes of patients hospitalized with moderate-to-severe COVID-19 pneumonia. Design, Setting, and Particpants: This cohort-embedded, investigator-initiated, multicenter, open-label, bayesian randomized clinical trial investigating patients with COVID-19 and moderate or severe pneumonia requiring at least 3 L/min of oxygen but without ventilation or admission to the intensive care unit was conducted between March 31, 2020, to April 18, 2020, with follow-up through 28 days. Patients were recruited from 9 university hospitals in France. Analyses were performed on an intention-to-treat basis with no correction for multiplicity for secondary outcomes. Intervention(s): Patients were randomly assigned to receive TCZ, 8 mg/kg, intravenously plus usual care on day 1 and on day 3 if clinically indicated (TCZ group) or to receive usual care alone (UC group). Usual care included antibiotic agents, antiviral agents, corticosteroids, vasopressor support, and anticoagulants. Main Outcomes and Measures: Primary outcomes were scores higher than 5 on the World Health Organization 10-point Clinical Progression Scale (WHO-CPS) on day 4 and survival without need of ventilation (including noninvasive ventilation) at day 14. Secondary outcomes were clinical status assessed with the WHO-CPS scores at day 7 and day 14, overall survival, time to discharge, time to oxygen supply independency, biological factors such as C-reactive protein level, and adverse events. Result(s): Of 131 patients, 64 patients were randomly assigned to the TCZ group and 67 to UC group; 1 patient in the TCZ group withdrew consent and was not included in the analysis. Of the 130 patients, 42 were women (32%), and median (interquartile range) age was 64 (57.1-74.3) years. In the TCZ group, 12 patients had a WHO-CPS score greater than 5 at day 4 vs 19 in the UC group (median posterior absolute risk difference [ARD] -9.0%; 90% credible interval [CrI], -21.0 to 3.1), with a posterior probability of negative ARD of 89.0% not achieving the 95% predefined efficacy threshold. At day 14, 12% (95% CI -28% to 4%) fewer patients needed noninvasive ventilation (NIV) or mechanical ventilation (MV) or died in the TCZ group than in the UC group (24% vs 36%, median posterior hazard ratio [HR] 0.58; 90% CrI, 0.33-1.00), with a posterior probability of HR less than 1 of 95.0%, achieving the predefined efficacy threshold. The HR for MV or death was 0.58 (90% CrI, 0.30 to 1.09). At day 28, 7 patients had died in the TCZ group and 8 in the UC group (adjusted HR, 0.92; 95% CI 0.33-2.53). Serious adverse events occurred in 20 (32%) patients in the TCZ group and 29 (43%) in the UC group (P =.21). Conclusions and Relevance: In this randomized clinical trial of patients with COVID-19 and pneumonia requiring oxygen support but not admitted to the intensive care unit, TCZ did not reduce WHO-CPS scores lower than 5 at day 4 but might have reduced the risk of NIV, MV, or death by day 14. No difference on day 28 mortality was found. Further studies are necessary for confirming these preliminary results. Trial Registration: ClinicalTrials.gov Identifier: NCT04331808.Copyright © 2021 American Medical Association. All rights reserved.

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1. **Endobronchial valves: a bridge to definitive surgical management in COVID-19 recurrent pneumothorax**  
   Szewczyk Joanne Journal of thoracic disease 2021;13:411-413.

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1. **Evaluation of the Incidence and Potential Mechanisms of Tracheal Complications in Patients With COVID-19**  
   Fiacchini Giacomo JAMA otolaryngology-- head & neck surgery 2021;147:70-76.

Importance: Full-thickness tracheal lesions and tracheoesophageal fistulas are severe complications of invasive mechanical ventilation. The incidence of tracheal complications in ventilated patients with coronavirus disease 2019 (COVID-19) is unknown., Objective: To evaluate whether patients with COVID-19 have a higher incidence of full-thickness tracheal lesions and tracheoesophageal fistulas than matched controls and to investigate potential mechanisms., Design, Setting, and Participants: This is a retrospective cohort study in patients admitted to the intensive care unit in a tertiary referral hospital. Among 98 consecutive patients with COVID-19 with severe respiratory failure, 30 underwent prolonged (>=14 days) invasive mechanical ventilation and were included in the COVID-19 group. The control group included 45 patients without COVID-19. Patients with COVID-19 were selected from March 1 to May 31, 2020, while the control group was selected from March 1 to May 31, 2019., Exposures: Patients with COVID-19 had severe acute respiratory syndrome coronavirus 2 infection diagnosed by nasopharyngeal/oropharyngeal swabs and were treated according to local therapeutic procedures., Main Outcomes and Measures: The primary study outcome was the incidence of full-thickness tracheal lesions or tracheoesophageal fistulas in patients with prolonged invasive mechanical ventilation., Results: The mean (SD) age was 68.8 (9.0) years in the COVID-19 group and 68.5 (14.1) years in the control group (effect size, 0.3; 95% CI, -5.0 to 5.6). Eight (27%) and 15 (33%) women were enrolled in the COVID-19 group and the control group, respectively. Fourteen patients (47%) in the COVID-19 group had full-thickness tracheal lesions (n = 10, 33%) or tracheoesophageal fistulas (n = 4, 13%), while 1 patient (2.2%) in the control group had a full-thickness tracheal lesion (odds ratio, 38.4; 95% CI, 4.7 to 316.9). Clinical and radiological presentations of tracheal lesions were pneumomediastinum (n = 10, 71%), pneumothorax (n = 6, 43%), and/or subcutaneous emphysema (n = 13, 93%)., Conclusions and Relevance: In this cohort study, almost half of patients with COVID-19 developed full-thickness tracheal lesions and/or tracheoesophageal fistulas after prolonged invasive mechanical ventilation. Attempts to prevent these lesions should be made and quickly recognized when they occur to avoid potentially life-threatening complications in ventilated patients with COVID-19.

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1. **Extensive pulmonary LCH treated with ECMOO**  
   Slater L. Pediatric Blood and Cancer 2021;68:No page numbers.

Purpose: Isolated lung LCH is rare amongst paediatric population.We describe an infant with extensive isolated pulmonary LCHwho has survived with prompt placement on ECMO. Patient and Results: 10 months old boy presented to the Paediatric Unit with 6 weeks history of fever and respiratory symptoms culminating in rapid deterioration with pneumothorax requiring intubation, ventilation and bilateral chest drain insertion. The CXR and CT scan of the chest show multiple large cystic structures in both lungs obliterating parenchyma. Two days later he was placed on ECMO due to progressive hypoxemia. Clinical and radiological diagnosis was of Langerhans cell histiocytosis (LCH). Screening and examination of the skin failed to show any other system involvement. Serum did not contain BRAFV600E. The LCH was diagnosed on lung biopsy. He was started on prednisolone and vinblastine 2 days post biopsy. He remained on ECMO for 24 days and developed several further pneumothoraces requiring repeated surgical interventions. After clinical, ventilatory and radiological improvement he was decannulated and started on cPAP and proceeded to be self ventilating after 6 days, initially with supplemental oxygen and then in air. BRAFV600E was negative in the tumour tissue. He was started on MEK inhibitor Trametinib, following approval for compassionate use. He was discharged home after 3 months of inpatient stay. He continues on combined therapy with vinblastine/ prednisolone/Trametinib, tolerating treatment without any significant side effects and continues to be clinically well 8 months after initial presentation. Conclusion(s): Patients with extensive pulmonary cystic disease due to LCH can have a curative outcome. Patients with pulmonary compromise and extensive disease due to LCH should have every opportunity to be placed on ECMO as this procedure allows bridging to lung recovery while appropriate LCH directed treatment is put in place.

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1. **Extra-pulmonary complications of 45 critically ill patients with COVID-19 in Yichang, Hubei province, China: A single-centered, retrospective, observation study**  
   Wang Peng Medicine 2021;100:e24604.

ABSTRACT: Mortality of critically ill patients with coronavirus disease 2019 (COVID-19) was high. Aims to examine whether time from symptoms onset to intensive care unit (ICU) admission affects incidence of extra-pulmonary complications and prognosis in order to provide a new insight for reducing the mortality. A single-centered, retrospective, observational study investigated 45 critically ill patients with COVID-19 hospitalized in ICU of The Third People's Hospital of Yichang from January 17 to March 29, 2020. Patients were divided into 2 groups according to time from symptoms onset to ICU admission (>7 and <=7 days) and into 2 groups according to prognosis (survivors and non-survivors). Epidemiological, clinical, laboratory, radiological characteristics and treatment data were studied. Compared with patients who admitted to the ICU since symptoms onset <=7 days (55.6%), patients who admitted to the ICU since symptoms onset >7 days (44.4%) were more likely to have extra-pulmonary complications (19 [95.0%] vs 16 [64.0%], P = .034), including acute kidney injury, cardiac injury, acute heart failure, liver dysfunction, gastrointestinal hemorrhage, hyperamylasemia, and hypernatremia. The incidence rates of acute respiratory distress syndrome, pneumothorax, and hospital-acquired pneumonia had no difference between the 2 groups. Except activated partial thromboplastin and Na+ concentration, the laboratory findings were worse in group of time from symptoms onset to ICU admission >7 days. There was no difference in mortality between the 2 groups. Of the 45 cases in the ICU, 19 (42.2%) were non-survivors, and 16 (35.6%) were with hospital-acquired pneumonia. Among these non-survivors, hospital-acquired pneumonia was up to 12 (63.2%) besides higher incidence of extra-pulmonary complications. However, hospital-acquired pneumonia occurred in only 4 (15.4%) survivors. Critically ill patients with COVID-19 who admitted to ICU at once might get benefit from intensive care via lower rate of extra-pulmonary complications. Copyright © 2021 the Author(s). Published by Wolters Kluwer Health, Inc.

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1. **Fatal outcome of anti-MDA5 juvenile dermatomyositis in a paediatric COVID-19 patient: a case report**  
   Quintana-Ortega Cristian Modern rheumatology case reports 2021;5:101-107.

Anti-melanoma differentiation-associated gene 5 juvenile dermatomyositis (anti-MDA5 JDM) is associated with high risk of developing rapidly progressive interstitial lung disease (RP-ILD). Here we report an 11-year-old girl with anti-MDA5 JDM and RP-ILD which led to a fatal outcome, further aggravated by SARS-CoV-2 infection. She was referred to our hospital after being diagnosed with anti-MDA5 JDM and respiratory failure due to RP-ILD. On admission, fibrobronchoscopy with bronchoalveolar lavage (BAL) revealed Pneumocystis jirovecii infection so treatment with intravenous trimethoprim-sulfamethoxazole was initiated. Due to RP-ILD worsening, immunosuppressive therapy was intensified using methylprednisolone pulses, cyclophosphamide, tofacitinib and intravenous immunoglobulin without response. She developed severe hypoxemic respiratory failure, pneumomediastinum and pneumothorax, further complicated with severe RP-ILD and cervical subcutaneous emphysema. Three real-time RT-PCR for SARS-CoV-2 were made with a negative result. In addition, she was complicated with a secondary hemophagocytic lymphohistiocytosis and a fourth real-time PCR for SARS-CoV-2 performed in BAS sample was positive. Despite aggressive treatment of RP-ILD due to anti-MDA5 JDM, there was no improvement of respiratory failure in the following days and patient developed refractory septic shock and died. Anti-MDA5 JDM patients with RP-ILD have a poor prognosis with a high mortality rate. For this reason, intensive immunosuppressive therapy is essential including the use of promising drugs such as tofacitinib. COVID-19 in children with underlying health conditions like anti-MDA5 JDM may still be at risk for disease and severe complications.

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1. **Frequency, Risk Factors, Clinical Characteristics, and Outcomes of Spontaneous Pneumothorax in Patients With Coronavirus Disease 2019: A Case-Control, Emergency Medicine-Based Multicenter Study**  
   Miro Oscar Chest 2021;159:1241-1255.

BACKGROUND: Recent reports of patients with coronavirus disease 2019 (COVID-19) developing pneumothorax correspond mainly to case reports describing mechanically ventilated patients. The real incidence, clinical characteristics, and outcome of spontaneous pneumothorax (SP) as a form of COVID-19 presentation remain to be defined., RESEARCH QUESTION: Do the incidence, risk factors, clinical characteristics, and outcomes of SP in patients with COVID-19 attending EDs differ compared with COVID-19 patients without SP and non-COVID-19 patients with SP?, STUDY DESIGN AND METHODS: This case-control study retrospectively reviewed all patients with COVID-19 diagnosed with SP (case group) in 61 Spanish EDs (20% of Spanish EDs) and compared them with two control groups: COVID-19 patients without SP and non-COVID-19 patients with SP. The relative frequencies of SP were estimated in COVID-19 and non-COVID-19 patients in the ED, and annual standardized incidences were estimated for both populations. Comparisons between case subjects and control subjects included 52 clinical, analytical, and radiologic characteristics and four outcomes., RESULTS: We identified 40 occurrences of SP in 71,904 patients with COVID-19 attending EDs (0.56; 95% CI, 0.40-0.76). This relative frequency was higher than that among non-COVID-19 patients (387 of 1,358,134, 0.28; 95% CI, 0.26-0.32; OR, 1.93; 95% CI, 1.41-2.71). The standardized incidence of SP was also higher in patients with COVID-19 (34.2 vs 8.2/100,000/year; OR, 4.19; 95% CI, 3.64-4.81). Compared with COVID-19 patients without SP, COVID-19 patients developing SP more frequently had dyspnea and chest pain, low pulse oximetry readings, tachypnea, and increased leukocyte count. Compared with non-COVID-19 patients with SP, case subjects differed in 19 clinical variables, the most prominent being a higher frequency of dysgeusia/anosmia, headache, diarrhea, fever, and lymphopenia (all with OR > 10). All the outcomes measured, including in-hospital death, were worse in case subjects than in both control groups., INTERPRETATION: SP as a form of COVID-19 presentation at the ED is unusual (< 1 cases) but is more frequent than in the non-COVID-19 population and could be associated with worse outcomes than SP in non-COVID-19 patients and COVID-19 patients without SP. Copyright © 2020 American College of Chest Physicians. Published by Elsevier Inc. All rights reserved.

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1. **Functional Pathophysiology of SARS-CoV-2 Induced Acute Lung Injury and Clinical Implications**  
   Habashi Nader M. Journal of applied physiology (Bethesda, Md. : 1985) 2021;:No page numbers.

The worldwide pandemic caused by the SARS-CoV-2 virus has resulted in over 84,407,000 cases with over 1,800,000 deaths when this paper was submitted, with comorbidities such as gender, race, age, body mass, diabetes, and hypertension greatly exacerbating mortality. This review will analyze the rapidly increasing knowledge of COVID-19 induced lung pathophysiology. Although controversial, the acute respiratory distress syndrome (ARDS) associated with COVID-19 (CARDS) seems to present as two distinct phenotypes: Type-L and Type-H. The 'L' refers to Low elastance, ventilation/perfusion ratio, lung weight, and recruitability, and the 'H' refers to High pulmonary elastance, shunt, edema, and recruitability. However, the LUNG SAFE and ESICM Trials Groups has shown that ~13% of the mechanically ventilated non-COVID-19 ARDS patients have the Type-L phenotype. However, other studies have shown that CARDS and ARDS respiratory mechanics overlap and that standard ventilation strategies apply to these patients. The mechanisms causing alterations in pulmonary perfusion could be caused by some combination of: 1) renin-angiotensin system (RAS) dysregulation, 2) thrombosis caused by loss of endothelial barrier, 3) endothelial dysfunction causing loss of hypoxic pulmonary vasoconstriction (HPV) perfusion control, and 4) hyper-perfusion of collapsed lung tissue that has been directly measured and supported by a computational model. A flow chart has been constructed highlighting the need for personalized and adaptive ventilation strategies, such as the time controlled adaptive ventilation (TCAV) method to set and adjust the airway pressure release ventilation (APRV) mode, which recently was shown effective at improving oxygenation and reducing FiO2, vasopressors, and sedation in COVID-19 patients.

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1. **High flow nasal cannula therapy in children with acute respiratory insufficiency in the pediatric intensive care unit of a resource-limited country: A preliminary experience**  
   Saeed B. Journal of the College of Physicians and Surgeons Pakistan 2021;31:110-112.

A retrospective study was performed in children (aged one month - 16 years) receiving HFNC to determine the frequency, efficacy and adverse effects of high flow nasal cannula (HFNC) therapy in the pediatric intensive care unit (PICU), from January to December 2017. Treatment failure was defined as clinical deterioration on HFNC therapy such that mechanical ventilation (MV) was required. Clinical parameters before and after HFNC were assessed using repeated measures analysis of variance. A total of 120 patients received HFNC therapy (21% of total admissions). Primary diagnosis were respiratory disease (50%), central nervous system diseases (14.2%), sepsis (10.8%), and postoperative care (10%). Mean duration of HFNC was 27.5 +/-19.7 hours and mean PICU length of stay was 6 +/- 6 days. Pneumothorax developed in four patients. MV was required in 28 patients, and subsequently, 15 deaths occurred in that group. HFNC is a frequently used, safe and effective therapy for children requiring respiratory support in PICU.Copyright © 2021 College of Physicians and Surgeons Pakistan. All rights reserved.

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1. **High incidence and mortality of pneumothorax in critically Ill patients with COVID-19**  
   Wang Xiao-Hui Heart & lung : the journal of critical care 2021;50:37-43.

BACKGROUND: The clinical characteristics of the patients with COVID-19 complicated by pneumothorax have not been clarified., OBJECTIVES: To determine the epidemiology and risks of pneumothorax in the critically ill patients with COVID-19., METHODS: Retrospectively collecting and analysing medical records, laboratory findings, chest X-ray and CT images of 5 patients complicated by pneumothorax., RESULTS: The incidence of pneumothorax was 10% (5/49) in patients with ARDS, 24% (5/21) in patients receiving mechanical ventilation, and 56% (5/9) in patients requiring invasive mechanical ventilation, with 80% (4/5) patients died. All the 5 patients were male and aged ranging from 54 to 79 years old. Pneumothorax was most likely to occur 2 weeks after the beginning of dyspnea and associated with reduction of neuromuscular blockers, recruitment maneuver, severe cough, changes of lung structure and function., CONCLUSIONS: Pneumothorax is a frequent and fatal complication of critically ill patients with COVID-19. Copyright © 2020. Published by Elsevier Inc.

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1. **Impact of intravenous lidocaine on clinical outcomes of patients with ARDS during COVID-19 pandemia (LidoCovid): A structured summary of a study protocol for a randomised controlled trial**  
   Muller Marie Trials 2021;22:131.

OBJECTIVES: The main objective of this study is to evaluate the effect of intravenous lidocaine on gas exchange and inflammation in acute respiratory distress syndrome due or not to Covid-19 pneumonia., TRIAL DESIGN: This is a prospective monocentric, randomized, quadruple-blinded and placebo-controlled superiority trial. This phase 3 clinical study is based on two parallel groups received either intravenous lidocaine 2% or intravenous NaCl 0.9%., PARTICIPANTS: This study has been conducted at the University Hospitals of Strasbourg (medical and surgical Intensive Care Units in Hautepierre Hospital) since the 4th November 2020. The participants are 18 years-old and older, hospitalized in ICU for a moderate to severe ARDS according to the Berlin definition; they have to be intubated and sedated for mechanical protective ventilation. All participants are affiliated to the French Social security system and a dosage of beta HCG has to be negative for women of child bearing age . For the Covid-19 subgroup, the SARS-CoV2 infection is proved by RT-PCR <7 days before admission and/or another approved diagnostic technique and/or typical CT appearance pneumonia. The data are prospectively collected in e-Case Report Forms and extracted from clinical files., INTERVENTION AND COMPARATOR: The participants are randomised in two parallel groups with a 1:1 ratio. In the experimental group, patients receive intravenous lidocaine 2% (20mg/mL) (from FRESENIUS KABI France); the infusion protocol provide a bolus of 1 mg/kg (ideal weight), followed by 3 mg/kg/h for the first hour, 1.5 mg/kg/h for the second hour, 0.72 mg/kg/h for the next 22 hours and then 0.6 mg/kg/h for 14 days at most or 24 hours after extubation or ventilator-weaning. The patients in the control group receive intravenous NaCl 0.9% (9 mg/mL) (from Aguettant, France) as placebo comparator; the infusion protocol provide a bolus of 0.05 mL/kg (ideal weight), followed by 0.15 mL/kg/h for the first hour, 0.075 mL/kg/h for the second hour, 0.036 mL/kg/h for the next 22 hours, and the 0.03 mL/kg/h for up to 14 days or 24 hours after extubation or ventilator-weaning. Lidocaine level is assessed at H4, D2, D7 and D14 to prevent local anesthetics systemic toxicity. Clinical data and biological samples are collected to assess disease progression., MAIN OUTCOMES: The primary outcome is the evolution of alveolar-capillary gas exchange measured by the PaO2/FiO2 ratio after two days of treatment. The secondary endpoints of the study include the following: Evolution of PaO2/FiO2 ratio at admission and after 21 days of treatment Number of ventilator-free days Anti-inflammatory effects by dosing inflammatory markers at different timepoints (ferritin, bicarbonate, CRP, PCT, LDH, IL-6, Troponin HS, triglycerides, complete blood count, lymphocytes) Anti-thrombotic effects by dosing platelets, aPTT, fibrinogen, D-dimers, viscoelastic testing and identification of all thromboembolic events up to 4 weeks. Plasmatic concentration of lidocaine and albumin Incidence of adverse events like cardiac rhythm disorders, need of vasopressors, any modification of the QRS, QTc or PR intervals every day Ileus recovery time Consumption of hypnotics, opioids, neuromuscular blockers. Lengths of stay in the ICU, incidence of reintubation and complications due to intensive care unit care (mortality until 90 days, pneumothorax, bacterial pneumopathy, bronchospasm, cardiogenic shock, acute renal failure, need of renal dialysis, delirium, atrial fibrillation, stroke (CAM-ICU score), tetraplegia (MCR score)). Incidence of cough and sore throat at extubation or ventilator-weaning and within 24 hours. All these outcomes will be evaluated according to positivity to Sars-Cov-2., RANDOMISATION: The participants who meet the inclusion criteria and have signed written informed consent will be randomly allocated using a computer-generated random number to either intervention group or control group. The distribution ratio of the two groups will be 1:1, with a stratification according to positivity to Sars-Cov-2., BLINDING MASKING): All participants, care providers, investigator and outcomes assessor are blinded., NUMBERS TO BE RANDOMISED (SAMPLE SIZE): We planned to randomize fifty participants in each group, 100 participants total., TRIAL STATUS: The amended protocol version 2.1 was approved by the Ethics Committee "Comite de Protection des Personnes Sud-Mediterranee II on January 8, 2021 and by the Commission Nationale de l'Informatique et des Libertes (CNIL) on November 10, 2020. The study is currently recruiting participants; the recruitment started in November 2020 and the planned recruitment period is three years., TRIAL REGISTRATION: The trial was registered on clinicaltrials.gov on October 30, 2020 and identified by number NCT04609865 ., FULL PROTOCOL: The full protocol is attached as an additional file, accessible from the Trials website (Additional file 1). In the interest in expediting dissemination of this material, the familiar formatting has been eliminated; this Letter serves as a summary of the key elements of the full protocol.

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The secondary endpoints of the study include the following:Evolution of PaO2/FiO2 ratio at admission and after 21 days of treatmentNumber of ventilator-free daysAnti-inflammatory effects by dosing inflammatory markers at different timepoints (ferritin, bicarbonate, CRP, PCT, LDH, IL-6, Troponin HS, triglycerides, complete blood count, lymphocytes)Anti-thrombotic effects by dosing platelets, aPTT, fibrinogen, D-dimers, viscoelastic testing and identification of all thromboembolic events up to 4 weeks.Plasmatic concentration of lidocaine and albuminIncidence of adverse events like cardiac rhythm disorders, need of vasopressors, any modification of the QRS, QTc or PR intervals every dayIleus recovery timeConsumption of hypnotics, opioids, neuromuscular blockers.Lengths of stay in the ICU, incidence of reintubation and complications due to intensive care unit care (mortality until 90 days, pneumothorax, bacterial pneumopathy, bronchospasm, cardiogenic shock, acute renal failure, need of renal dialysis, delirium, atrial fibrillation, stroke (CAM-ICU score), tetraplegia (MCR score)).Incidence of cough and sore throat at extubation or ventilator-weaning and within 24 hours. 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1. **Incidence of Barotrauma in Patients With COVID-19 Pneumonia During Prolonged Invasive Mechanical Ventilation - A Case-Control Study**  
   Udi Josefina Journal of intensive care medicine 2021;36:477-483.

BACKGROUND: SARS-CoV2 can cause pulmonary failure requiring prolonged invasive mechanical ventilation (MV). Lung protective ventilation strategies are recommended in order to minimize ventilator induced lung injury. Whether patients with COVID-19 have the same risk for complications including barotrauma is still unknown. Therefore, we investigated barotrauma in patients with COVID-19 pneumonia requiring prolonged MV., METHODS: All patients meeting diagnosis criteria for ARDS according to the Berlin Definition, with PCR positive SARS-CoV2 infection and prolonged mechanical ventilation, defined as >=2 days, treated at our ARDS referral center between March and April 2020 were included in a retrospective registry analysis. Complications were detected by manual review of all patient data including respiratory data, imaging studies, and patient files., RESULTS: A total of 20 patients with severe COVID-19 pulmonary failure (Overall characteristics: median age: 61 years, female gender 6, median duration of MV 22 days) were analyzed. Eight patients (40%) developed severe barotrauma during MV (after median 18 days, range: 1-32) including pneumothorax (5/20), pneumomediastinum (5/20), pneumopericard (1/20), and extended subcutaneous emphysema (5/20). Median respirator settings 24 hours before barotrauma were: Peak inspiratory pressure (Ppeak) 29 cm H2O (range: 27-35), positive end-expiratory pressure (PEEP) 14 cm H2O (range: 5-24), tidal volume (VT) 5.4ml/kg predicted body weight (range 0.4-8.6), plateau pressure (Pplateau) 27 cm H2O (range: 19-30). Mechanical ventilation was significantly more invasive on several occasions in patients without barotrauma., CONCLUSION: Barotrauma in COVID-19 induced respiratory failure requiring mechanical ventilation was found in 40% of patients included in this registry. Our data suggest that barotrauma in COVID-19 may occur even when following recommendations for lung protective MV.

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1. **Is Spontaneous Pneumomediastinum a Poor Prognostic Factor in Covid-19?**  
   Ozsoy Ibrahim Ethem Journal of the College of Physicians and Surgeons--Pakistan : JCPSP 2021;31:132-137.

OBJECTIVE: To determine the risk factors for spontaneous pneumomediastinum (SPM), its clinical course and effect on prognosis in patients with Coronavirus disease-19 (COVID-19) pneumonia., STUDY DESIGN: Descriptive study., PLACE AND DURATION OF STUDY: Kayseri City Training and Research Hospital, Turkey, from April to September 2020., METHODOLOGY: All COVID-19 patients' clinical, laboratory, and radiologic characteristics, as well as treatment outcome data, were obtained through medical record extraction. Group A had 50 patients (22 men and 28 women) without SPM, and Group B had 20 patients (10 men and 10 women) with SPM., RESULTS: Considering the accompanying comorbidities, the frequencies of asthma and inhaler-use was significantly higher in Group B than in Group A (p <0.05). In the CT evaluation at presentation, the rate of involvement of all five lobes of the lung in Group B was significantly higher than in Group A. Rates of tube thoracostomy, mechanical ventilator requirement, length of stay in hospital, and exitus were significantly higher in Group B than in Group A (p <0.05)., CONCLUSION: SPM development in a patient with COVID-19 pneumonia is a sign that the prognosis will not be good, and these patients need a more aggressive treatment. Key Words: Spontaneous pneumomediastinum, COVID-19, Pneumothorax, Real-time polymerase chain reaction, Subcutaneous emphysema.

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1. **Life-Saving Procedures Performed While Wearing CBRNe Personal Protective Equipment: A Mannequin Randomized Trial**  
   Mormando Giulia Simulation in healthcare : journal of the Society for Simulation in Healthcare 2021;Publish Ahead of Print:No page numbers.

INTRODUCTION: Chemical-biological-radiological-nuclear-explosive (CBRNe) are complex events. Decontamination is mandatory to avoid harm and contain hazardous materials, but can delay care. Therefore, the stabilization of patients in the warm zone seems reasonable, but research is limited. Moreover, subjects involved in biological events are considered infectious even after decontamination and need to be managed while wearing personal protective equipment (PPE), as seen with Ebola and COVID-19 pandemic. With this simulation mannequin trial, we assessed the impact of CBRNe PPE on cardiopulmonary resuscitation and combat casualty care procedures., METHODS: We compared procedures performed by emergency medicine and anesthesiology senior residents, randomized in 2 groups (CBRNe PPE vs. no PPE). Chest compression (CC) depth was defined as the primary outcome. Time to completion was calculated for the following: tourniquet application; tension pneumothorax needle decompression; peripheral venous access (PVA) and intraosseous access positioning; and drug preparation and administration. A questionnaire was delivered to evaluate participants' perception., RESULTS: Thirty-six residents participated. No significant difference between the groups in CC depth (mean difference = 0.26 cm [95% confidence interval = -0.26 to 0.77 cm, P = 0.318]), as well as for CC rate, CC complete release, and time for drugs preparation and administration was detected. The PPE contributed to significantly higher times for tourniquet application, tension pneumothorax decompression, peripheral venous access, and intraosseous access positioning. The residents found simulation relevant to the residencies' core curriculum., CONCLUSIONS: This study suggests that cardiopulmonary resuscitation can be performed while wearing PPE without impacting quality, whereas other tasks requiring higher dexterity can be significantly impaired by PPE.Trial Registration Number: NCT04367454, April 29, 2020 (retrospectively registered). Copyright © 2021 Society for Simulation in Healthcare.

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1. **Lung biopsy in the diagnosis of pediatric ANCA-associated vasculitis**  
   Sayad Edouard Pediatric pulmonology 2021;56:145-152.

OBJECTIVE: To investigate pulmonary histopathologic features in a cohort of pediatric patients with anti-neutrophil cytoplasmic antibody (ANCA)-associated vasculitis (AAV) who underwent a lung biopsy as part of their evaluation. We report the safety and the findings of lung biopsies in this population., METHODS: After IRB approval, we performed a retrospective chart review of all patients <18 years of age presenting to our institution with a diagnosis of pediatric AAV (pAAV) who underwent lung biopsy. We reviewed histopathologic features, serologies, the timing of biopsy, and complications., RESULTS: Fourteen patients met inclusion criteria, nine patients with microscopic polyangiitis (MPA), and five patients with granulomatosis with polyangiitis (GPA). All patients had positive ANCA serology. 13/14 patients required admission on initial presentation for respiratory symptoms; 11/13 required respiratory support. The indication for biopsy was confirmation of diagnosis before initiating therapy in 11 patients (78%), part of the infectious evaluation in two (14%), and part of interstitial lung disease evaluation in one (7%). 11/14 (78%) biopsies had findings consistent with AAV diagnosis: 6/9 (67%) of the MPA patients compared with 5/5 (100%) of the GPA patients. The most common findings on histopathology were vascular inflammation and signs of alveolar hemorrhage. The only reported complication after lung biopsy was pneumothorax in four patients (28%)., CONCLUSION: Lung biopsy had a higher diagnostic yield in GPA compared with MPA patients. In our cohort, a diagnosis of AAV could be made with clinical features and positive serology but was confirmed by lung histopathology in the majority of cases. Obtaining a lung biopsy for diagnostic purposes in pAAV should be reserved for uncertain cases where the diagnosis cannot be confirmed clinically and with serology. Copyright © 2020 Wiley Periodicals LLC.

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1. **Lung Manifestations of COVID-19 on Chest Radiographs-Indian Experience in a High-Volume Dedicated COVID center**  
   Nagarajan Bhagyam SN comprehensive clinical medicine 2021;:1-6.

Chest imaging, which includes X-ray imaging and CT scan, is the main modality for assessing lung involvement in patients affected with the COVID-19 virus. Although CT is more sensitive, due to ease and affordability issues, X-rays are the preferred first-line study. The aim of this article is to familiarize the treating physician with the imaging spectrum of the coronavirus lung infection on X-ray and to discuss the frequency of these findings. A total of 593 radiographs of admitted COVID-19 patients (RT-PCR proven) were retrospectively assessed in the study. Demographics of admitted patients and COVID manifestations on chest radiographs were assessed. Male to female ratio of patients in our study was 2.1:1. The largest number of patients was in the 50 to 60-year age bracket (29%). Forty percent of the X-rays in our study were negative. No X-ray showed findings exclusively in the upper zones, and 88% showed findings in the mid-lower zones. Ground glass opacification was the commonest finding (75% of cases) in abnormal X-rays. The next most common findings were peripheral lung opacities and confluent consolidation. Confluent consolidation, which indicates more severe disease, was observed in 15% of the abnormal X-rays. The proportion of patients showing confluent consolidation was seen more in the older age groups (> 50 years old) with a peak in the 60-70-year age bracket. Small reticular opacities, pneumothorax, pneumomediastinum, and pleural effusions were uncommon findings in our study. Copyright © Springer Nature Switzerland AG 2021.

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1. **Lung ultrasound assessment of acute respiratory distress syndrome caused by coronavirus disease 2019: An observational study**  
   Li R. Hong Kong Journal of Emergency Medicine 2021;28:8-14.

Background: An outbreak of coronavirus disease 2019 (COVID-19) took place in Wuhan, China, by the end of 2019, and the disease continues to spread all over the world. The number of patients is increasing rapidly, a large number of infected patients is critically ill, and the mortality is high. However, information on COVID-19 patients is limited, and its clinical characteristics have not been fully studied. Objective(s): To compare the performances of point-of-care lung ultrasound (LUS) and bedside chest X-ray in assessing the condition of COVID-19 patients with acute respiratory distress syndrome (ARDS). Method(s): This observational study enrolled 42 COVID-19 patients with ARDS who were admitted to the Department of Critical Care Medicine of the Wuhan Union Hospital from February to April 2020. The point-of-care LUS characteristics of the COVID-19 patients with ARDS were summarized, and the performances of LUS and bedside chest X-ray in assessing the patient's condition were compared. Result(s): Most of the 42 patients were elderly individuals with chronic clinical diseases. The proportion of patients older than 60 years old was 85.7%. All patients were given invasive mechanical ventilation; eight (19.0%) of them received venovenous extracorporeal membrane oxygenation support. LUS has evident advantages in detecting lung consolidation, patchy shadows, and pleural thickening, and pleural line changes in particular. The receiver operating characteristic analysis indicated that the sensitivity, Youden index, and kappa value for detecting COVID-19 patients with ARDS were higher for LUS than the chest X-ray. Conclusion(s): LUS has better diagnostic accuracy and sensitivity in COVID-19 patients with ARDS than the chest X-ray.Copyright © The Author(s) 2020.

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1. **Lung Ultrasound Findings in Patients Hospitalized With COVID-19**  
   Kumar Andre Journal of ultrasound in medicine : official journal of the American Institute of Ultrasound in Medicine 2021;:No page numbers.

OBJECTIVES: Lung ultrasound (LUS) can accurately diagnose several pulmonary diseases, including pneumothorax, effusion, and pneumonia. LUS may be useful in the diagnosis and management of COVID-19., METHODS: This study was conducted at two United States hospitals from 3/21/2020 to 6/01/2020. Our inclusion criteria included hospitalized adults with COVID-19 (based on symptomatology and a confirmatory RT-PCR for SARS-CoV-2) who received a LUS. Providers used a 12-zone LUS scanning protocol. The images were interpreted by the researchers based on a pre-developed consensus document. Patients were stratified by clinical deterioration (defined as either ICU admission, invasive mechanical ventilation, or death within 28 days from the initial symptom onset) and time from symptom onset to their scan., RESULTS: N = 22 patients (N = 36 scans) were included. Eleven (50%) patients experienced clinical deterioration. Among N = 36 scans, only 3 (8%) were classified as normal. The remaining scans demonstrated B-lines (89%), consolidations (56%), pleural thickening (47%), and pleural effusion (11%). Scans from patients with clinical deterioration demonstrated higher percentages of bilateral consolidations (50 versus 15%; P = .033), anterior consolidations (47 versus 11%; P = .047), lateral consolidations (71 versus 29%; P = .030), pleural thickening (69 versus 30%; P = .045), but not B-lines (100 versus 80%; P = .11). Abnormal findings had similar prevalences between scans collected 0-6 days and 14-28 days from symptom onset., DISCUSSION: Certain LUS findings may be common in hospitalized COVID-19 patients, especially for those that experience clinical deterioration. These findings may occur anytime throughout the first 28 days of illness. Future efforts should investigate the predictive utility of these findings on clinical outcomes. Copyright © 2021 American Institute of Ultrasound in Medicine.

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1. **Lung ultrasound in the COVID-19 pandemic**  
   Jackson K. Postgraduate Medical Journal 2021;97:34-39.

Lung ultrasound has been described for over a decade and international protocols exist for its application. It is a controversial area among pulmonologists and has had more uptake with emergency as well as intensive care physicians. We discuss the basics and evidence behind the use of lung ultrasound in respiratory failure, and what role we see it playing in the current 2019 novel coronavirus pandemic.Copyright © Author(s) (or their employer(s)) 2021.

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1. **Neonatal pneumothorax: symptoms, signs and timing of onset in the post-surfactant era**  
   Andersson J. The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians 2021;:1-5.

AIM: The primary objective was to describe the incidence, symptoms, clinical signs, and time of onset of neonatal pneumothorax in Orebro County during 2011-2017. Secondary objectives were to describe risk factors, diagnostic procedures, treatments, and mortality and to compare preterm with term/post-term neonates., MATERIALS AND METHODS: This retrospective population-based descriptive study included all neonates born in Orebro County during 2011-2017 and admitted to the neonatal intensive care unit at Orebro University Hospital at age <28 days with an x-ray verified diagnosis of "Pneumothorax originating in the perinatal period" in their medical record., RESULTS: Seventy-five neonates matched the inclusion criteria. The incidence of neonatal pneumothorax in Orebro County during the study period was 3.1 (95% CI: 2.5-3.8) per 1000 live births. All neonates were <48 h at debut of respiratory symptoms and the most common symptom was tachypnea. Twelve (16%) received invasive treatment. The mortality rate was 2 (3%), none due to pneumothorax., CONCLUSION: The incidence of 3.1 per 1000 live births was relatively high, but the frequency of invasive treatment and mortality was low, indicating a high proportion of mild pneumothoraces. The lack of patients aged >48 h indicates that most neonatal pneumothoraces now occur very early in life.

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1. **Non-invasive ventilation alternating with high-flow nasal oxygen versus high-flow nasal oxygen alone after extubation in COPD patients: a post hoc analysis of a randomized controlled trial**  
   Thille A. W. Annals of Intensive Care 2021;11:30.

Background: Several randomized clinical trials have shown that non-invasive ventilation (NIV) applied immediately after extubation may prevent reintubation in patients at high-risk of extubation failure. However, most of studies included patients with chronic respiratory disorders as well as patients without underlying respiratory disease. To date, no study has shown decreased risk of reintubation with prophylactic NIV after extubation among patients with chronic obstructive pulmonary disease (COPD). We hypothesized that prophylactic NIV after extubation may decrease the risk of reintubation in COPD patients as compared with high-flow nasal oxygen. We performed a post hoc subgroup analysis of COPD patients included in a multicenter, randomized, controlled trial comparing prophylactic use of NIV alternating with high-flow nasal oxygen versus high-flow nasal oxygen alone immediately after extubation. Result(s): Among the 651 patients included in the original study, 150 (23%) had underlying COPD including 86 patients treated with NIV alternating with high-flow nasal oxygen and 64 patients treated with high-flow nasal oxygen alone. The reintubation rate was 13% (11 out of 86 patients) with NIV and 27% (17 out of 64 patients) with high-flow nasal oxygen alone [difference, - 14% (95% CI - 27% to - 1%); p = 0.03]. Whereas reintubation rates were significantly lower with NIV than with high-flow nasal oxygen alone at 72 h and until ICU discharge, mortality in ICU did not differ between groups: 6% (5/86) with NIV vs. 9% (6/64) with high-flow nasal oxygen alone [difference - 4% (95% CI - 14% to 5%); p = 0.40]. Conclusion(s): In COPD patients, prophylactic NIV alternating with high-flow nasal oxygen significantly decreased the risk of reintubation compared with high-flow nasal oxygen alone. Trial registration The study was registered at http://www.clinicaltrials.gov with the trial registration number NCT03121482 (20 April 2017).Copyright © 2021, The Author(s).

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1. **Noninvasive Ventilation in Cystic Fibrosis: Clinical Indications and Outcomes in a Large UK Adult Cystic Fibrosis Center**  
   Spoletini Giulia Respiratory care 2021;66:466-474.

BACKGROUND: Noninvasive ventilation (NIV) is routinely used to treat patients with cystic fibrosis and respiratory failure. However, evidence on its use is limited, with no data on its role in disease progression and outcomes. The aim of this study was to assess the indications of NIV use and to describe the outcomes associated with NIV in adults with cystic fibrosis in a large adult tertiary center., METHODS: A retrospective analysis of data captured prospectively on the unit electronic patient records was performed. All patients with cystic fibrosis who received NIV over a 10-y period were included in the study. A priori, 2 groups were identified based on length of follow-up, with 2 subgroups identified based on duration of NIV treatment., RESULTS: NIV was initiated on 64 occasions. The duration of follow-up was categorized as > 6 months or < 6 months in 31 (48.4%) and 33 (51.6%) occasions, respectively. The most common indications for starting NIV were chronic (48.5%) and acute (32.8%) hypercapnic respiratory failure. Among those with a follow-up > 6 months, subjects who stopped using NIV early showed a steady median (interquartile range) decline in FEV1 (pre-NIV: -0.04 [-0.35 to 0.03] L/y vs post-NIV: -0.07 [-0.35 to 0.01] L/y, P = .51), while among those who continued using it had an improvement in the rate of decline (pre-NIV: -0.25 [-0.52 to -0.02] L/y vs post-NIV: -0.07 [-0.13 to 0.16] L/y, P = .006). No differences in intravenous antibiotic requirement or pulmonary exacerbations were noted with the use of NIV. Pneumothorax and massive hemoptysis occurred independently in 4 cases., CONCLUSIONS: NIV is being used in cystic fibrosis as adjunct therapy for the management of advanced lung disease in a similar fashion to other chronic respiratory conditions. Adherence to NIV treatment can stabilize lung function but does not reduce pulmonary exacerbations or intravenous antibiotic requirement. Copyright © 2021 by Daedalus Enterprises.

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1. **Outcomes of Percutaneous Tracheostomy for Patients with SARS-CoV-2 Respiratory Failure**  
   Arnold Jason medRxiv : the preprint server for health sciences 2021;:No page numbers.

Background: SARS-CoV-2 can cause severe respiratory failure leading to prolonged mechanical ventilation. Data are just emerging about the practice and outcomes of tracheostomy in these patients. We reviewed our experience with tracheostomies for SARS-CoV-2 at our tertiary-care, urban teaching hospital., Methods: We reviewed the demographics, comorbidities, timing of mechanical ventilation, tracheostomy, and ICU and hospital lengths-of-stay (LOS) in SARS-CoV-2 patients who received tracheostomies. Early tracheostomy was considered <14 days of ventilation. Medians with interquartile ranges (IQR) were calculated and compared with Wilcoxon rank sum, Spearman correlation, Kruskal-Wallis, and regression modeling., Results: From March 2020 to January 2021, our center had 370 patients intubated for SARS-CoV-2, and 59 (16%) had percutaneous bedside tracheostomy. Median time from intubation to tracheostomy was 19 (IQR 17 - 24) days. Demographics and comorbidities were similar between early and late tracheostomy, but early tracheostomy was associated with shorter ICU LOS and a trend towards shorter ventilation. To date, 34 (58%) of patients have been decannulated, 17 (29%) before hospital discharge; median time to decannulation was 24 (IQR 19-38) days. Decannulated patients were younger (56 vs 69 years), and in regression analysis, pneumothorax was associated was associated with lower decannulation rates (OR 0.05, 95CI 0.01 - 0.37). No providers developed symptoms or tested positive for SARS-CoV-2., Conclusions: Tracheostomy is a safe and reasonable procedure for patients with prolonged SARS-CoV-2 respiratory failure. We feel that tracheostomy enhances care for SARS-CoV-2 since early tracheostomy appears associated with shorter duration of critical care, and decannulation rates appear high for survivors.

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1. **Outcomes of Percutaneous Tracheostomy for Patients with SARS-CoV-2 Respiratory Failure**  
   Arnold Jason 2021;:No page numbers.

&lt;h4&gt;ABSTRACT&lt;/h4&gt; &lt;h4&gt;Background&lt;/h4&gt; SARS-CoV-2 can cause severe respiratory failure leading to prolonged mechanical ventilation. Data are just emerging about the practice and outcomes of tracheostomy in these patients. We reviewed our experience with tracheostomies for SARS-CoV-2 at our tertiary-care, urban teaching hospital. &lt;h4&gt;Methods&lt;/h4&gt; We reviewed the demographics, comorbidities, timing of mechanical ventilation, tracheostomy, and ICU and hospital lengths-of-stay (LOS) in SARS-CoV-2 patients who received tracheostomies. Early tracheostomy was considered &lt;14 days of ventilation. Medians with interquartile ranges (IQR) were calculated and compared with Wilcoxon rank sum, Spearman correlation, Kruskal-Wallis, and regression modeling. &lt;h4&gt;Results&lt;/h4&gt; From March 2020 to January 2021, our center had 370 patients intubated for SARS-CoV-2, and 59 (16%) had percutaneous bedside tracheostomy. Median time from intubation to tracheostomy was 19 (IQR 17 – 24) days. Demographics and comorbidities were similar between early and late tracheostomy, but early tracheostomy was associated with shorter ICU LOS and a trend towards shorter ventilation. To date, 34 (58%) of patients have been decannulated, 17 (29%) before hospital discharge; median time to decannulation was 24 (IQR 19-38) days. Decannulated patients were younger (56 vs 69 years), and in regression analysis, pneumothorax was associated was associated with lower decannulation rates (OR 0.05, 95CI 0.01 – 0.37). No providers developed symptoms or tested positive for SARS-CoV-2. &lt;h4&gt;Conclusions&lt;/h4&gt; Tracheostomy is a safe and reasonable procedure for patients with prolonged SARS-CoV-2 respiratory failure. We feel that tracheostomy enhances care for SARS-CoV-2 since early tracheostomy appears associated with shorter duration of critical care, and decannulation rates appear high for survivors.

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1. **Percutaneous tracheostomy for long-term ventilated COVID-19-patients: rationale and first clinical-safe for all-experience**  
   Jonckheere W. Anaesthesiology Intensive Therapy 2021;52:366-372.

Background: COVID-19 infection has resulted in thousands of critically ill patients admitted to ICUs and treated with mechanical ventilation. Percutaneous tracheostomy is a well-known technique utilised as a strategy to wean critically ill patients from mechanical ventilation. Worldwide differences exist in terms of methods, operators, and settings, and questions remain regarding timing and indications. If tracheostomy is to be performed in COVID-19 patients, a safe environment is needed for optimal care. Method(s): We present a guidewire dilating forceps tracheostomy procedure in COVID-19 patients that was optimised including apnoea-moments, protective clothing, checklists, and clear protocols. We performed a retrospective analysis of the outcome after tracheostomy in COVID-19 patients between March 2020 and May 2020. Result(s): The follow-up of the first 16 patients, median age 62 years, revealed a median intubation time until tracheostomy of 18 days and median cannulation time of 20 days. The overall perioperative complication rate and complication rate while cannulated was 19%, mainly superficial bleeding. None of the healthcare providers involved in performing the procedure developed any symptoms of the disease. Conclusion(s): This COVID-19-centred strategy based on flexibility, preparation, and cooperation between healthcare providers with different backgrounds facilitated percutaneous tracheostomy in COVID-19 patients without an increase in the overall complication rate or evidence of risk to healthcare providers. Our findings provide initial evidence that tracheostomy can be performed safely as a standard of care for COVID-19 patients requiring prolonged mechanical ventilation as was standard practice in ICU patients prior to the COVID-19 pandemic to promote ventilator weaning and patient recovery.Copyright © 2020 Via Medica. All rights reserved.

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1. **Peripheral and lung resident T cell responses against SARS-CoV-2**  
   Grau-Expósito Judith 2021;:No page numbers.

Considering that SARS-CoV-2 interacts with the host at the respiratory tract mucosal interface, T cells strategically placed within these surfaces, namely resident memory T cells, will be essential to limit viral spread and disease. Importantly, these cells are mostly non-recirculating, which reduces the window of opportunity to examine circulating lymphocytes in blood as they home to the lung parenchyma. Here, we demonstrate that viral specific T cells can migrate and establish in the lung as resident memory T cells remaining detectable up to 10 months after initial infection. Moreover, focusing on the acute phase of the infection, we identified virus-specific T cell responses in blood with functional, migratory and apoptotic patterns modulated by viral proteins and associated with clinical outcome. Our study highlights IL-10 secretion by virus-specific T cells associated to a better outcome and the persistence of resident memory T cells as key players for future protection against SARS-CoV-2 infection.

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1. **Pneumothorax and Pneumatocoele Formation in a Patient with COVID-19: a Case Report**  
   Capleton P. SN comprehensive clinical medicine 2021;:1-4.

Coronavirus disease 2019 (COVID-19) causes significant morbidity and mortality for a proportion of infected patients, and our knowledge and understanding of its clinical, radiological and histopathological features are still evolving. An association between COVID-19 and pneumothorax has been described in an increasing number of case reports and series in the literature, which have largely focused on clinical and imaging features. We report the case of a patient who developed COVID-19 complicated by pneumothorax, requiring surgical intervention. We describe the histopathological features seen in the thorascopically resected bullectomy specimen-this is, to our knowledge, the first reported description of the morphological features of pneumothorax in this important clinical setting. Copyright © The Author(s), under exclusive licence to Springer Nature Switzerland AG part of Springer Nature 2021.

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1. **Pneumothorax and pneumomediastinum in patients hospitalized with coronavirus disease 2019 (COVID-19)**  
   Greenberg Daniel J. Heart & lung : the journal of critical care 2021;50:386-387.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=4d215f3f689488876177f33498518dff)

1. **Pneumothorax and pulmonary air leaks as ventilator-induced injuries in COVID-19**  
   Martelli Gabriele Acute and critical care 2021;:No page numbers.

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1. **Pneumothorax Following COVID-19: Based on Autopsy Findings**  
   Wang Rongshuai 2021;:No page numbers.

&lt;h4&gt;Background: &lt;/h4&gt; More and more studies showed pneumothorax is a complication of the 2019 novel coronavirus disease (COVID-19). But no autopsy findings of pneumothorax in COVID-19 decedent were reported, and direct relations between pneumothorax and lung pathology in these decedents were not discussed so far. &lt;h4&gt;Methods: &lt;/h4&gt; A 62-year-old man with COVID-19 presenting with persistent hypoxemia and suddenly dead, who was treated by mechanical ventilation in the intensive care unit (ICU) for 5 days. A systemic autopsy examination of COVID-19 decedent, including histopathology study, was conducted and the medical record, chest computerized tomography (CT) image were reviewed by forensic pathologists and clinicians. &lt;h4&gt;Results: &lt;/h4&gt; Severe pneumothorax, diffuse alveolar damage and airway obstruction were observed. Pneumothorax should be one of the causes of death. &lt;h4&gt;Conclusion: &lt;/h4&gt; Pneumothorax, due to SARS-CoV-2 infection, is a fatal complication of COVID-19. Regular examination of chest CT or X-ray and airway management are important to clinical treatment.

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1. **Pneumothorax in Mechanically Ventilated Patients with COVID-19 Infection**  
   Akdogan Raziye Ecem Case reports in critical care 2021;2021:6657533.

Data on patient-related factors associated with pneumothorax among critically ill patients with COVID-19 pneumonia is limited. Reports of spontaneous pneumothorax in patients with coronavirus disease 2019 (COVID-19) suggest that the COVID-19 infection could itself cause pneumothorax in addition to the ventilator-induced trauma among mechanically ventilated patients. Here, we report a case series of five mechanically ventilated patients with COVID-19 infection who developed pneumothorax. Consecutive cases of intubated patients in the intensive care unit with the diagnosis of COVID-19 pneumonia and pneumothorax were included. Data on their demographics, preexisting risk factors, laboratory workup, imaging findings, treatment, and survival were collected retrospectively between March and July 2020. Four out of five patients (4/5; 80%) had a bilateral pneumothorax, while one had a unilateral pneumothorax. Of the four patients with bilateral pneumothorax, three (3/4; 75%) had secondary bacterial pneumonia, two had pneumomediastinum and massive subcutaneous emphysema, and one of these two had an additional pneumoperitoneum. A surgical chest tube or pigtail catheter was placed for the management of pneumothorax. Three out of five patients with pneumothorax died (3/5; 60%), and all of them had bilateral involvement. The data from these cases suggest that pneumothorax is a potentially fatal complication of COVID-19 infection. Large prospective studies are needed to study the incidence of pneumothorax and its sequelae in patients with COVID-19 infection. Copyright © 2021 Raziye Ecem Akdogan et al.

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1. **Pneumothorax rate in intubated patients with COVID-19**  
   Capaccione Kathleen M. Acute and critical care 2021;36:81-84.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=d5422fecfbe335fb82bbb61514770d8b)

1. **Point-of-care lung ultrasound in the diagnosis and monitoring of paediatric patients with spontaneous pneumothorax in SARS-CoV-2 infection**  
   Musolino Anna M. Journal of paediatrics and child health 2021;:No page numbers.

Point-of-care lung ultrasound is a widely used tool in the diagnosis and management of patients with pulmonary diseases and now with SARS-CoV-2 infection. We describe two cases of pneumothorax which are, as far as we know, among the first reported in COVID-19 patients younger than 18 years. The diagnostic and monitoring role of point-of-care lung ultrasound has been extremely useful in the management of patients. Copyright © 2021 Paediatrics and Child Health Division (The Royal Australasian College of Physicians).

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1. **Prediction Models for Severe Manifestations and Mortality due to COVID-19: A Rapid Systematic Review**  
   Miller Jamie 2021;:No page numbers.

&lt;h4&gt;ABSTRACT&lt;/h4&gt; &lt;h4&gt;Background&lt;/h4&gt; Throughout 2020, the coronavirus disease 2019 (COVID-19) has become a threat to public health on national and global level. There has been an immediate need for research to understand the clinical signs and symptoms of COVID-19 that can help predict deterioration including mechanical ventilation, organ support, and death. Studies thus far have addressed the epidemiology of the disease, common presentations, and susceptibility to acquisition and transmission of the virus; however, an accurate prognostic model for severe manifestations of COVID-19 is still needed because of the limited healthcare resources available. &lt;h4&gt;Objective&lt;/h4&gt; This systematic review aims to evaluate published reports of prediction models for severe illnesses caused COVID-19. &lt;h4&gt;Methods&lt;/h4&gt; Searches were developed by the primary author and a medical librarian using an iterative process of gathering and evaluating terms. Comprehensive strategies, including both index and keyword methods, were devised for PubMed and EMBASE. The data of confirmed COVID-19 patients from randomized control studies, cohort studies, and case-control studies published between January 2020 and July 2020 were retrieved. Studies were independently assessed for risk of bias and applicability using the Prediction Model Risk Of Bias Assessment Tool (PROBAST). We collected study type, setting, sample size, type of validation, and outcome including intubation, ventilation, any other type of organ support, or death. The combination of the prediction model, scoring system, performance of predictive models, and geographic locations were summarized. &lt;h4&gt;Results&lt;/h4&gt; A primary review found 292 articles relevant based on title and abstract. After further review, 246 were excluded based on the defined inclusion and exclusion criteria. Forty-six articles were included in the qualitative analysis. Inter observer agreement on inclusion was 0.86 (95% confidence interval: 0.79 - 0.93). When the PROBAST tool was applied, 44 of the 46 articles were identified to have high or unclear risk of bias, or high or unclear concern for applicability. Two studied reported prediction models, 4C Mortality Score from hospital data and QCOVID from general public data from UK, and were rated as low risk of bias and low concerns for applicability. &lt;h4&gt;Conclusion&lt;/h4&gt; Several prognostic models are reported in the literature, but many of them had concerning risks of biases and applicability. For most of the studies, caution is needed before use, as many of them will require external validation before dissemination. However, two articles were found to have low risk of bias and low applicability can be useful tools.

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1. **Predictors of Pneumothorax/Pneumomediastinum in Mechanically Ventilated COVID-19 Patients**  
   Belletti Alessandro Journal of cardiothoracic and vascular anesthesia 2021;:No page numbers.

OBJECTIVE: To determine the incidence, predictors, and outcome of pneumothorax (PNX)/pneumomediastinum (PMD) in coronavirus disease 2019 (COVID-19) acute respiratory distress syndrome (ARDS)., DESIGN: Observational study., SETTING: Tertiary-care university hospital., PARTICIPANTS: One hundred sixteen consecutive critically ill, invasively ventilated patients with COVID-19 ARDS., INTERVENTIONS: The authors collected demographic, mechanical ventilation, imaging, laboratory, and outcome data. Primary outcome was the incidence of PNX/PMD. Multiple logistic regression analyses were performed to identify predictors of PNX/PMD., MEASUREMENTS AND MAIN RESULTS: PNX/PMD occurred in a total of 28 patients (24.1%), with 22 patients developing PNX (19.0%) and 13 developing PMD (11.2%). Mean time to development of PNX/PMD was 14 +/- 11 days from intubation. The authors found no significant difference in mechanical ventilation parameters between patients who developed PNX/PMD and those who did not. Mechanical ventilation parameters were within recommended limits for protective ventilation in both groups. Ninety-five percent of patients with PNX/PMD had the Macklin effect (linear collections of air contiguous to the bronchovascular sheaths) on a baseline computed tomography scan, and tended to have a higher lung involvement at intensive care unit (ICU) admission (Radiographic Assessment of Lung Edema score 32.2 +/- 13.4 v 18.7 +/- 9.8 in patients without PNX/PMD, p=0.08). Time from symptom onset to intubation and time from total bilirubin on day two after ICU admission were the only independent predictors of PNX/PMD. Mortality was 60.7% in patients who developed PNX/PMD versus 38.6% in those who did not (p=0.04)., CONCLUSION: PNX/PMD occurs frequently in COVID-19 patients with ARDS requiring mechanical ventilation, and is associated with increased mortality. Development of PNX/PMD seems to occur despite use of protective mechanical ventilation and has a radiologic predictor sign. Copyright © 2021 Elsevier Inc. All rights reserved.

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1. **Prevalence and risk factors of barotrauma in Covid-19 patients admitted to an intensive care unit in Kuwait; a retrospective cohort study**  
   Elsaaran Hussein Annals of medicine and surgery (2012) 2021;63:102141.

Background: The development of barotrauma has been suggested to complicate the management of mechanically ventilated COVID-19 patients admitted to the intensive care unit (ICU). This study aims to identify potential risk factors associated with the development of barotrauma related complications in COVID-19 patients receiving mechanical ventilation., Methods: A retrospective cohort study was carried out in a single COVID-19 designated center in Kuwait. Three hundred and forty-three confirmed COVID-19 patients transferred and/or admitted to our institution between February 26, 2020 and June 20, 2020 were included in the study. All patients were admitted into the ICU with the majority being mechanically ventilated (81.3%)., Results: Fifty-four (15.4%) patients developed barotrauma, of which 49 (90.7%) presented with pneumothorax, and 14.8% and 3.7% due to pneumomediastinum and pneumopericardium respectively. Of those that developed barotrauma, 52 (96.3%) patients were in acute respiratory distress syndrome (ARDS). Biochemically, the white blood cells (p = 0.001), neutrophil percentage (p = 0.012), lymphocyte percentage (p = 0.014), neutrophil: lymphocyte ratio (NLR) (p=<0.001) and lactate dehydrogenase (LDH) (p = 0.002) were found to be significantly different in patients that developed barotrauma. Intubation due to low level of consciousness (p = 0.007), a high admission COVID-GRAM score (p = 0.042), and a positive-end expiratory pressure (PEEP) higher than the control group (p = 0.016) were identified as potential risk factors for the development of barotrauma., Conclusion: Patients infected with COVID-19 have a significant risk of developing barotrauma when receiving invasive mechanical ventilation. This poses a substantial impact on the hospital course of the patients and clinical outcome, correlating to a higher mortality rate in this cohort of patients. Copyright © 2021 The Authors.

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1. **Prevalence of opportunistic invasive aspergillosis in COVID-19 patients with severe pneumonia**  
   Segrelles-Calvo G. Mycoses 2021;64:144-151.

Background: As the global coronavirus pandemic (COVID-19) spreads across the world, new clinical challenges emerge in the hospital landscape. Among these challenges, the increased risk of coinfections is a major threat to the patients. Although still in a low number, due to the short time of the pandemic, studies that identified a significant number of hospitalised patients with COVID-19 who developed secondary fungal infections that led to serious complications and even death have been published. Objective(s): In this scenario, we aim to determine the prevalence of invasive fungal infections (IFIs) and describe possible associated risk factors in patients admitted due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection. Patients/Methods: We designed an open prospective observational study at the Rey Juan Carlos University Hospital (Mostoles, Spain), during the period from February 1 to April 30, 2020. Result(s): In this article, we reported seven patients with COVID-19-associated pulmonary aspergillosis (CAPA) who had a poor prognosis. Severely ill patients represent a high-risk group; therefore, we must actively investigate the possibility of aspergillosis in all of these patients. Larger cohort studies are needed to unravel the role of COVID-19 immunosuppressive therapy as a risk factor for aspergillosis. Conclusion(s): As the pandemic continues to spread across the world, further reports are needed to assess the frequency of emergent and highly resistant reemergent fungal infections during severe COVID-19. These coinfections are leading a significant number of patients with COVID-19 to death due to complications following the primary viral disease.Copyright © 2020 Wiley-VCH GmbH

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1. **Proposed delay for safe surgery after COVID‐19**  
   Kovoor Joshua G. ANZ Journal of Surgery 2021;:No page numbers.

1. **Pulmonary barotrauma in mechanically ventilated coronavirus disease 2019 patients: A case series**  
   Edwards Jodi-Ann Annals of medicine and surgery (2012) 2021;61:24-29.

Background: Coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) may result in hypoxic respiratory failure necessitating mechanical ventilation. Barotrauma is a well-documented complication of mechanical ventilation., Objective: To describe the presentation, characteristics, and management of mechanically ventilated patients with COVID-19 who developed barotrauma., Methods: Retrospective case series study of 13 adult, mechanically ventilated, laboratory-confirmed COVID-19 positive patients admitted between 3/15/2020 and 4/14/2020 to a community hospital in New York City. Patient demographics, clinical course, ventilatory parameters, and radiographic results were obtained from electronic medical records. Barotrauma was defined as pneumomediastinum, subcutaneous emphysema, and or pneumothorax on chest X-ray. Descriptive analyses and Mann-Whitney U test were performed, where appropriate., Results: Of the 574 COVID-19 positive patients, 139 (24.2%) needed mechanical ventilation and 13 (9.4%) of those developed barotrauma. Majority of patients were Black race (92.3%), older than age 65 (56.8%), male (69.2%), and had comorbidities (76.9%). Most common presenting symptoms were cough (84.6%) and dyspnea (76.9%). Barotrauma presentations included 3/13 pneumothoraces and pneumomediastinum, 12/13 pneumomediastinum and subcutaneous emphysema, and 1/13 pneumothorax alone. The average days on ventilator was 3.4, average positive expiratory-end pressure 15.5 cmH2O, dynamic compliance 33.8 mL/cmH2O, and P/F ratio 165. Interventions were 4/13 chest tubes and 2/13 pigtail catheters., Conclusions: Barotrauma is a common complication of mechanical ventilation of COVID-19 patients. Despite high ventilatory pressures, tension pneumothorax is rare and barotrauma could potentially be managed conservatively. Further studies are needed to evaluate the indication and outcome of thoracostomies and conservative management. Copyright © 2020 The Authors.

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1. **Pulmonary barotrauma in mechanically ventilated coronavirus disease 2019 patients: A case series**  
   Edwards J. A. Annals of Medicine and Surgery 2021;61:24-29.

Background: Coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) may result in hypoxic respiratory failure necessitating mechanical ventilation. Barotrauma is a well-documented complication of mechanical ventilation. Objective(s): To describe the presentation, characteristics, and management of mechanically ventilated patients with COVID-19 who developed barotrauma. Method(s): Retrospective case series study of 13 adult, mechanically ventilated, laboratory-confirmed COVID-19 positive patients admitted between 3/15/2020 and 4/14/2020 to a community hospital in New York City. Patient demographics, clinical course, ventilatory parameters, and radiographic results were obtained from electronic medical records. Barotrauma was defined as pneumomediastinum, subcutaneous emphysema, and or pneumothorax on chest X-ray. Descriptive analyses and Mann-Whitney U test were performed, where appropriate. Result(s): Of the 574 COVID-19 positive patients, 139 (24.2%) needed mechanical ventilation and 13 (9.4%) of those developed barotrauma. Majority of patients were Black race (92.3%), older than age 65 (56.8%), male (69.2%), and had comorbidities (76.9%). Most common presenting symptoms were cough (84.6%) and dyspnea (76.9%). Barotrauma presentations included 3/13 pneumothoraces and pneumomediastinum, 12/13 pneumomediastinum and subcutaneous emphysema, and 1/13 pneumothorax alone. The average days on ventilator was 3.4, average positive expiratory-end pressure 15.5 cmH2O, dynamic compliance 33.8 mL/cmH2O, and P/F ratio 165. Interventions were 4/13 chest tubes and 2/13 pigtail catheters. Conclusion(s): Barotrauma is a common complication of mechanical ventilation of COVID-19 patients. Despite high ventilatory pressures, tension pneumothorax is rare and barotrauma could potentially be managed conservatively. Further studies are needed to evaluate the indication and outcome of thoracostomies and conservative management.Copyright © 2020 The Authors

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1. **Pulmonary Barotrauma Resulting from Mechanical Ventilation in 2 Patients with a Diagnosis of COVID-19 Pneumonia**  
   Ezeagu Raphael The American journal of case reports 2021;22:e927954.

BACKGROUND Invasive mechanical ventilation can cause pulmonary barotrauma due to elevated transpulmonary pressure and alveolar rupture. A significant proportion of COVID-19 patients with acute respiratory distress syndrome (ARDS) will require mechanical ventilation. We present 2 interesting cases that demonstrate the possibility of COVID-19-associated ARDS manifesting with pulmonary barotrauma at acceptable ventilatory pressures. CASE REPORT The first patient was a 71-year-old man who was intubated and placed on mechanical ventilation due to hypoxemic respiratory failure from SARS-CoV-2 infection. His partial pressure of O2 to fraction of inspired oxygen ratio (PaO2/FiO2) was 156. He developed subcutaneous emphysema (SE) and pneumomediastinum on day 5 of mechanical ventilation at ventilatory settings of positive end-expiratory pressure (PEEP) <=15 cmH2O, plateau pressure (Pplat) <=25 cmH2O and pulmonary inspiratory pressure (PIP) <=30 cmH2O. He was managed with 'blow-hole' incisions, with subsequent clinical resolution of subcutaneous emphysema. The second patient was a 58-year-old woman who was also mechanically ventilated due to hypoxemic respiratory failure from COVID-19, with PaO2/FiO2 of 81. She developed extensive SE with pneumomediastinum and pneumothorax while on mechanical ventilation settings PEEP 13 cmH2O and PIP 28 cmH2O, Pplat 18 cmH2O, and FiO2 90%. SE was managed with blow-hole incisions and pneumothorax with chest tube. CONCLUSIONS Clinicians should be aware of pulmonary barotrauma as a possible complication of COVID-19 pulmonary disease, even at low ventilatory pressures.

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1. **Pulmonary emphysema, bullae, and pneumothorax in COVID-19 pneumonia**  
   Xu Wenrui Radiology case reports 2021;16:995-998.

In this paper, we described 2 cases with COVID-19 pneumonia, who developed pulmonary emphysema, bullae, and pneumothorax during therapy. In a 48-year-old man with mechanical ventilation, parts of ground glass opacities and consolidations transformed into emphysema and giant bulla, and bilateral pneumothorax were also observed. In a 35-year-old man, localized emphysema and pulmonary bullae were seen in subpleural area in bilateral upper lobes, where no previous lesions were presented. In conclusion, pulmonary emphysema, bullae, and pneumothorax could be complications of COVID-19. On one hand, surgical emphysema in ventilated COVID-19 patients was observed as in SARS patients. On the other hand, more serious destruction of lung parenchyma was found in COVID-19 patients. Copyright © 2021 Published by Elsevier Inc. on behalf of University of Washington.

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1. **Quality of focused thoracic ultrasound performed by emergency medical technicians and paramedics in a prehospital setting: a feasibility study**  
   Pietersen Pia Iben Scandinavian journal of trauma, resuscitation and emergency medicine 2021;29:40.

BACKGROUND: In a prehospital setting, the severity of respiratory symptoms in patients calling for an ambulance differ. The initial evaluation, diagnosing, and thereby management can be challenging because respiratory symptoms can be caused by disease in many organs. Ultrasound examinations can contribute with important information and support the clinical decision-making. However, ultrasound is user-dependent and requires sufficient knowledge and training. The aim of this study was to explore the quality of thoracic ultrasound examinations performed on patients by emergency medical technicians and paramedics in a prehospital, clinical setting., METHODS: From November 2018 - April 2020, Danish emergency medical technicians and paramedics (n = 100) performed thoracic ultrasound examinations on patients with respiratory symptoms using a portable ultrasound device. The ultrasound examinations were stored and retrospectively assessed by a reviewer blinded to the patients' symptoms and history, as well as the emergency medical technicians' and paramedics' findings. The image quality was scored from 1 to 5. The findings determined by the reviewer was then correlated with a questionnaire filled out by the emergency medical technicians and paramedics regarding ultrasonic findings and potential change in treatment or management of the patient. The agreement in percentage and as Cohen's kappa was explored., RESULTS: A total of 590 ultrasound examinations were assessed, resulting in a median image quality score of 3 (IQ1 = 4, IQ3 = 3). The overall agreement in percentage between the emergency medical technicians and paramedics and reviewer was high (87.7% for a normal scan, 89.9% for interstitial syndrome, 97.3% for possible pneumothorax, and 96.3% for pleural effusion). Cohen's kappa varied from 0.01 for possible pneumothorax to 0.69 for pleural effusion. Based on the questionnaires (n = 406), the ultrasound examination entailed a change in treatment or visitation in 48 cases (11.7%) which in this study population encompasses a number-needed-to-scan of 8.5., CONCLUSION: Emergency medical technicians and paramedics perform focused thoracic ultrasound examinations with adequate image quality sufficient to determine if pathology is present or not. The emergency medical technicians' and paramedics' assessment correlates to some extent with an experienced reviewer and their findings are most reliable for the inclusion of a normal scan or inclusion of pleural effusion. Implementation could possibly impact the number of patients receiving correct prehospital treatment and optimal choice of receiving facility.

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1. **Radiologic aspects of COVID-19 pneumonia: outcomes and thoracic complications**  
   Parra Gordo M. L. Aspectos radiologicos de la neumonia COVID-19: evolucion y complicaciones toracicas. 2021;63:74-88.

Outcomes vary widely in patients with COVID-19. Whereas some patients have only mild symptoms of short duration, others develop severe disease that leads to acute respiratory distress syndrome requiring prolonged stays in intensive care units. Radiologically, the initial stage is characterized by viral pneumonia with mild expression. In some patients, however, the onset of the immune response results in acute lung damage with organizing pneumonia and diffuse alveolar damage. Moderate-severe disease is associated with a high incidence of pulmonary embolisms, generally peripherally distributed and associated with endothelial damage, prolonged stays in bed, and coagulopathy. Other relatively common complications are spontaneous pneumothorax and pneumomediastinum due to the rupture of alveolar walls and barotrauma in mechanically ventilated patients. Superinfection, generally bacterial and less commonly fungal, is more common in patients with severe disease. Copyright © 2020 SERAM. Publicado por Elsevier Espana, S.L.U. All rights reserved.

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1. **SARS-CoV-2 diagnosis using medical imaging techniques and artificial intelligence: A review**  
   Benameur Narjes Clinical imaging 2021;76:6-14.

OBJECTIVE: SARS-CoV-2 is a worldwide health emergency with unrecognized clinical features. This paper aims to review the most recent medical imaging techniques used for the diagnosis of SARS-CoV-2 and their potential contributions to attenuate the pandemic. Recent researches, including artificial intelligence tools, will be described., METHODS: We review the main clinical features of SARS-CoV-2 revealed by different medical imaging techniques. First, we present the clinical findings of each technique. Then, we describe several artificial intelligence approaches introduced for the SARS-CoV-2 diagnosis., RESULTS: CT is the most accurate diagnostic modality of SARS-CoV-2. Additionally, ground-glass opacities and consolidation are the most common signs of SARS-CoV-2 in CT images. However, other findings such as reticular pattern, and crazy paving could be observed. We also found that pleural effusion and pneumothorax features are less common in SARS-CoV-2. According to the literature, the B lines artifacts and pleural line irregularities are the common signs of SARS-CoV-2 in ultrasound images. We have also stated the different studies, focusing on artificial intelligence tools, to evaluate the SARS-CoV-2 severity. We found that most of the reported works based on deep learning focused on the detection of SARS-CoV-2 from medical images while the challenge for the radiologists is how to differentiate between SARS-CoV-2 and other viral infections with the same clinical features., CONCLUSION: The identification of SARS-CoV-2 manifestations on medical images is a key step in radiological workflow for the diagnosis of the virus and could be useful for researchers working on computer-aided diagnosis of pulmonary infections. Copyright © 2021 Elsevier Inc. All rights reserved.

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1. **Severe COVID-19 pneumonia and barotrauma: From the frying pan into the fire**  
   Kalpakam Hariprasad 2021;:No page numbers.

&lt;h4&gt;Aim&lt;/h4&gt; COVID-19 pneumonia with ARDS (C-ARDS) has a high mortality. Preliminary reports indicate a higher incidence of barotrauma in patients with C-ARDS[1] both on invasive mechanical ventilation (iMV) and non-invasive ventilation (NIV) This study examines the incidence and risk factors for barotrauma and change in outcomes after barotrauma in patients with severe C-ARDS on positive pressure respiratory support (PPRS). &lt;h4&gt;Methods and materials&lt;/h4&gt; This is a retrospective study of C-ARDS associated barotrauma over 5 months in patients on PPRS in a tertiary COVID care center. The type of barotrauma, intervention, related factors, such as type of respiratory support (iMV vs NIV), airway pressure prior to the occurrence of barotrauma, and post-barotrauma outcomes were analyzed. &lt;h4&gt;Results&lt;/h4&gt; A total of 38/410 (9.3%) C-ARDS patients on PPRS [mean age 57.82 ± 13.3 years, 32 males (84.2%)] developed barotrauma. Of these, 20 patients (52.6%) were on NIV and 18 (47.4%) patients were iMV on standard recommended settings. The median P/F ratio of patients on MV at the time of barotrauma was 116.4 (IQR 72.4, 193.25). The details of barotrauma were as follows: 24 patients had pneumothorax (PTX), 2 had pneumo-mediastinum and 12 had subcutaneous emphysema. Overall, 24/38 (63.2%) patients, including 15/18 (83.3%) on MV succumbed to their illness. The barotrauma happened a median of 6.5 days (IQR 4.75,13) after admission and 15 days (IQR 10.25,18.0) from symptom onset. The median duration from barotrauma to death was 7 days (IQR 2.25, 8.0) and barotrauma to discharge (for survivors) was 12.5 days (IQR 8.0, 21.25). All patients received steroids and 11/38 (28.9%) received additional immunosuppression with tocilizumab. &lt;h4&gt;Conclusion&lt;/h4&gt; A high incidence of barotrauma was seen in this large series of severe C-ARDS patients on PPRS. Barotrauma led to further deterioration in the clinical status leading to a fatal outcome in the majority of the MV patients, despite prompt treatment.

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1. **Severe organising pneumonia following COVID-19**  
   Vadasz I. Thorax 2021;76:201-204.

Various forms of diffuse parenchymal lung disease have been proposed as potential consequences of severe COVIDa '19. We describe the clinical, radiological and histological findings of patients with COVIDa '19-associated acute respiratory distress syndrome who later developed severe organising pneumonia including longitudinal follow-up. Our findings may have important implications for the therapeutic modalities in the late-phase of severe COVIDa '19 and might partially explain why a subgroup of COVIDa '19 patients benefits from systemic corticosteroids.Copyright © Author(s) (or their employer(s)) 2021. No commercial re-use. See rights and permissions. Published by BMJ.

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1. **Spontaneous pneumomediastinum, pneumopericardium, pneumothorax, and subcutaneous emphysema in a patient with COVID-19**  
   Rashedi Sina Radiology case reports 2021;:No page numbers.

In this paper, we describe a case of COVID-19 pneumonia complicated by alveolar air leakage syndrome without prior positive pressure ventilation. Our patient was a 55-year-old non-smoker male with a previous history of marginal B-cell lymphoma diagnosed ten years ago who presented to the emergency department with cough, dyspnea, and respiratory distress. The COVID-19 diagnosis was confirmed based on a polymerase chain reaction (PCR) test for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The unenhanced chest computed tomography (CT) obtained on the first day of admission demonstrated bilateral multifocal ground-glass opacities and consolidation, extensive pneumomediastinum, bilateral pneumothorax, a rim of pneumopericardium, and right-sided subcutaneous emphysema. Despite the initiation of supportive care, antiviral and antibiotic therapy, he passed away due to septic shock. In conclusion, spontaneous alveolar air leakage, characterized by spontaneous pneumomediastinum, pneumopericardium, pneumothorax, and subcutaneous emphysema, is a rare complication of COVID-19, which may be linked with a severe course of the disease. Copyright © 2021 Published by Elsevier Inc. on behalf of University of Washington.

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1. **Spontaneous pneumomediastinum, pneumothorax and subcutaneous emphysema in COVID-19 patients-a case series**  
   Agrawal A. Egyptian Journal of Radiology and Nuclear Medicine 2021;52:27.

Background: Spontaneous pneumomediastinum, pneumothorax and spontaneous subcutaneous emphysema are rare entities. A rising trend in the setting of COVID-19 even in patients who are not put on invasive ventilation can suggest an alternative aetiology. Case presentation: We describe four cases which presented with suspected symptoms of COVID-19 and were diagnosed with pneumomediastinum, pneumothorax, and subcutaneous emphysema which would have been missed if not for computed tomography scan performed at the time of admission. Three of these cases had no prior history of any iatrogenic intervention, and the fourth person developing pneumothorax and subcutaneous emphysema after intubation. Conclusion(s): Pneumomediastinum, pneumothorax and subcutaneous emphysema can be noted as a complication of COVID-19 itself as well as the complication of management of COVID-19.Copyright © 2021, The Author(s).

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1. **Spontaneous pneumothorax and pneumomediastinum as a rare complication of COVID-19 pneumonia: Report of 6 cases**  
   Rafiee Moezedin Javad Radiology case reports 2021;16:687-692.

Spontaneous pneumothorax (SPT) and pneumomediastinum (SPM) have been reported as uncommon complications of coronavirus disease (COVID-19) pneumonia. The exact incidence and risk factors are still unrecognized. We report 6 nonventilated, COVID-19 pneumonia cases with SPT and SPM and their outcomes. The major risk factors for development of SPT and SPM in our patients were male gender, advance age, and pre-existing lung disease. These complications may occur in the absence of mechanical ventilation and associated with increasing morbidity (chest tube insertion, sepsis, hospital admission) and mortality. SPT and SPM should be considered as a potential predictive factor for adverse outcome and probable cause of unexplained deterioration of clinical condition in COVID-19 pneumonia. Copyright © 2021 The Authors.

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1. **Spontaneous Pneumothorax in COVID-19 Patients**  
   Marsico Salvatore Archivos de bronconeumologia 2021;57 Suppl 1:66.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=a89c47bc96f9a1cf1f6019608816d4dc)

1. **Spontaneous Pneumothorax in COVID-19 Patients Treated with High-Flow Nasal Cannula outside the ICU: A Case Series**  
   Nalewajska Magdalena International journal of environmental research and public health 2021;18:No page numbers.

The coronavirus disease 2019 (COVID-19) caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has become a global pandemic and a burden to global health at the turn of 2019 and 2020. No targeted treatment for COVID-19 infection has been identified so far, thus supportive treatment, invasive and non-invasive oxygen support, and corticosteroids remain a common therapy. High-flow nasal cannula (HFNC), a non-invasive oxygen support method, has become a prominent treatment option for respiratory failure during the SARS-CoV-2 pandemic. HFNC reduces the anatomic dead space and increases positive end-expiratory pressure (PEEP), allowing higher concentrations and higher flow of oxygen. Some studies suggest positive effects of HFNC on mortality and avoidance of intubation. Spontaneous pneumothorax has been observed in patients suffering from SARS-CoV-2 pneumonia. Although the viral infection itself contributes to its development, higher PEEP generated by both HFNC and mechanical ventilation is another risk factor for increased alveoli damage and air-leak. Herein, we present three cases of patients with no previous history of lung diseases who were diagnosed with COVID-19 viral pneumonia. All of them were supported with HFNC, and all of them presented spontaneous pneumothorax.

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1. **Spontaneous pneumothorax: An emerging complication of COVID-19 pneumonia**  
   Ekanem Emmanuel Heart & lung : the journal of critical care 2021;50:437-440.

Spontaneous Pneumothorax in the setting of coronavirus disease 19 (COVID-19) has been rarely described and is a potentially lethal complication. We report our institutional experience. Patients with confirmed COVID-19 who were admitted at 5 hospitals within the Inova health system between February 21 and May 2020 were included in the study. We identified 1619 patients, 22 patients (1.4%) developed spontaneous pneumothorax during their hospitalization without evidence of traumatic injury. Copyright © 2021 Elsevier Inc. All rights reserved.

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1. **Spontaneous Tension Pneumothorax as a Complication of COVID-19**  
   Umar Shahzad Muhammad Case reports in medicine 2021;2021:4126861.

Key Clinical Message. Tension pneumothorax is an uncommon presentation in patients with SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) or COVID-19 pneumonia. We present a case of tension pneumothorax in a patient with COVID-19 pneumonia and myocarditis. This was an unlikely diagnosis in a patient with no known underlying lung condition and no other precipitating factors such as barotrauma. In an acute deterioration of patients with SARS-CoV-2, it is important to always consider alternative diagnoses and repeat imaging. Copyright © 2021 Muhammad Umar Shahzad et al.

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1. **Surgical interventions in patients hospitalised with COVID-19. A review of seven months of experience working in a COVID-19 dedicated centre**  
   Rymarowicz J. Journal of Clinical Medicine 2021;10:1-8.

The Coronavirus Disease 2019 (COVID-19) pandemic has made changes to the traditional way of performing surgical consultations. The aim of the present study was to assess the need for surgical care performed by various surgical specialties among patients infected with COVID-19 hospitalized in a COVID-19 dedicated hospital. All surgical consultations performed for patients infected with COVID-19 in a COVID dedicated hospital in a seven month period were evaluated. Data on demographics, surgical specialty, consult reason, procedure performed, and whether it was a standard face to face or teleconsultation were gathered. Out of 2359 COVID-19 patients admitted to the hospital in the seven month period, 229 (9.7%) required surgical care. Out of those 108 consultations that did not lead to surgery, 71% were managed by telemedicine. A total of 36 patients were operated on while suffering from COVID-19. Out of them, only three patients admitted primarily for COVID-19 pneumonia underwent emergency surgery. The overall mortality among those operated on was 16.7%. Conclusion(s): Patients hospitalised with COVID-19 may require surgical care from various surgical specialties, especially during peaks of the pandemic. However, they rarely require a surgical procedure and only occasionally require major surgery. A significant portion of potentially surgical problems could be managed by teleconsultations.Copyright © 2021 by the authors. Licensee MDPI, Basel, Switzerland.

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1. **Surgical tracheotomy in COVID-19 patients: an Italian single centre experience**  
   Briatore Roberto European archives of oto-rhino-laryngology : official journal of the European Federation of Oto-Rhino-Laryngological Societies (EUFOS) : affiliated with the German Society for Oto-Rhino-Laryngology - Head and Neck Surgery 2021;:No page numbers.

PURPOSE: Coronavirus infection disease 2019 (COVID-19) causes in 10% of patients a severe respiratory distress syndrome managed with invasive mechanical ventilation (IMV), sometimes difficult to wean. The role of tracheotomy is debated for the possible risks for patients and staff. We are going to describe here our experience with surgical tracheotomy in COVID-19 positive patients., METHODS: We enrolled all intensive care unit (ICU) patients requiring longer than 10 days of IMV. Demographic, clinical, respiratory, complications, and outcomes data were collected, in a particular length of weaning from sedation and IMV, in-ICU and in-hospital mortality rate. All healthcare operators involved were tested for SARS-CoV2 by pharyngeal swab and blood test (antibody test)., RESULTS: 13 out of 68 ICU patients (19.1%) underwent surgical tracheotomy after a median intubation period of 14 days. The mean age was 60 (56-65) years. 85% were male patients. Postoperative mild bleeding was seen in 30.7%, pneumothorax in 7.7%. Mean weaning from sedation required 3 days, 19 days from IMV. In-ICU and in-hospital COVID-infection-related mortality was 23.1% and 30.7%, respectively. None of the healthcare operators was found SARS-CoV2 positive during the period of the study., CONCLUSIONS: In COVID-19 pandemic surgical tracheotomy enables to wean from sedation and subsequently from IMV in a safe way for both patients and personnel.

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1. **Tension Pneumothorax complicating COVID19 Pneumonia**  
   Mohamed Amr 2021;:No page numbers.

Acute decompensation in patient with COVID19 is usually a consequence of worsening ARDS , however acute pulmonary embolism and acute pneumothorax are frequently recognized causes of acute decompensation , the later causes are treatable and having high index of suspicion is very important in order not to miss them.

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1. **Tension pneumothorax in patient with COVID-19 infection**  
   Vahidirad Ali Radiology case reports 2021;16:358-360.

Corona-virus infection that arose from China is now a global pandemic. It presents with a variety of pulmonary manifestations, most commonly in the form of ground glass pulmonary lesions and opacities. Less common manifestation such as pnuemothorax has been reported by some authors. In this study we report a 56-year-old man with Corona-virus disease presenting with tension pneumothorax, a rare and life-threatening complication of Corona-virus infection that has not been reported previously. In our case, after insertion of thoracostomy tube, the patient's symptoms improved. After about 1 year of Corona-virus pandemic, it still presents with some rare pulmonary and extrapulmonary manifestations, so, familiarity with these manifestations is important for a correct diagnosis and treatment. Copyright © 2020 Published by Elsevier Inc. on behalf of University of Washington.

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1. **The effects of novel coronavirus (SARS-CoV-2) infection on cardiovascular diseases and cardiopulmonary injuries**  
   Li Ni Stem cell research 2021;:102168.

1. **The importance of imaging - Perspectives from redeployment**  
   Atallah J. Clinical Imaging 2021;69:380-383.

As the coronavirus disease 2019 (COVID-19) pandemic strains the healthcare system, radiology residents across the United States have become a vital part of the redeployed workforce. Through a series of four cases of COVID-19 patients encountered on the wards, we highlight the insight and unique set of skills redeployed radiology residents possess that are essential to patient care during this crisis. By increasing visibility through active participation on the clinical team, we demonstrate the fundamental role radiology has in the greater field of medicine.Copyright © 2020 Elsevier Inc.

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1. **The management of women with thoracic endometriosis: a national survey of British gynaecological endoscopists**  
   Hirsch M. Facts, views & vision in ObGyn 2021;12:291-298.

Objectives: This study evaluates current national opinions on screening, diagnosis, and management of thoracic endometriosis., Background: Thoracic endometriosis is a rare but serious condition with four main clinical presentations: pneumothorax, haemoptysis, haemothorax, and pulmonary nodules. There are no specialist centres in the United Kingdom despite growing patient desire for recognition, investigation, and treatment., Methods: We distributed a multiple-choice email survey to senior members of the British Society for Gynaecological Endoscopy. Descriptive statistics were used to present the results. Results: We received 67 responses from experienced clinicians having provided over 800 combined years of endometriosis patient care. The majority of respondents managed over 100 endometriosis patients annually, for more than five years. Over one third had never managed a patient with symptomatic thoracic endometriosis; just 9% had managed more than 30 cases over the course of their career. Screening varied by modality with only 4% of clinicians always taking a history of respiratory symptoms while 69% would always screen for diaphragmatic endometriosis during laparoscopy. The management of symptomatic thoracic endometriosis varied widely with the commonest treatment being surgery followed by hormonal therapies. Regarding management, 71% of respondents felt the team should comprise of four or more different specialists, and 56% believed care should be centralised either regionally or nationally., Conclusions: Thoracic endometriosis is poorly screened for amongst clinicians with varied management lacking a common diagnostic or therapeutic pathway in the United Kingdom. Specialists expressed a preference for women to be managed in a large multidisciplinary team setting at a regional or national level. Copyright © 2020 Facts, Views & Vision.

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1. **The repurposed use of anesthesia machines to ventilate critically ill patients with Coronavirus Disease 2019 (COVID-19)**  
   Bottiroli Maurizio 2021;:No page numbers.

&lt;h4&gt;Background: &lt;/h4&gt; The surge of critically ill patients due to the coronavirus disease-2019 (COVID-19) overwhelmed critical care capacity in areas of northern Italy. Anesthesia machines have been used as alternatives to traditional ICU mechanical ventilators. However, the outcomes for patients with COVID-19 respiratory failure cared for with Anesthesia Machines is currently unknow. We hypothesized that COVID-19 patients receiving care with Anesthesia Machines would have worse outcomes compared to standard practice.MethodsWe designed a retrospective study of patients admitted with a confirmed COVID-19 diagnosis at a large tertiary urban hospital in northern Italy. Two care units were included: a 27-bed standard ICU and a 15-bed temporary unit emergently opened in an operating room setting. Intubated patients assigned to Anesthesia Machines (AM group) were compared to a control cohort treated with standard mechanical ventilators (ICU-VENT group). Outcomes were assessed at 60-day follow-up. A multivariable Cox regression analysis of risk factors between survivors and non-survivors was conducted to determine the adjusted risk of death for patients assigned to AM group.ResultsComplete daily data from 89 mechanically ventilated patients consecutively admitted to the two units were analyzed. Seventeen patients were included in the AM group, whereas 72 were in the ICU-VENT group. Disease severity and intensity of treatment were comparable between the two groups. The 60-day mortality was significantly higher in the AM group compared to the ICU-vent group (12/17 vs. 27/72, 70.6% vs. 37.5%, respectively, p = 0.016). Allocation to AM group was associated with a significantly increased risk of death after adjusting for covariates (HR 4.05, 95% CI: 1.75–9.33, p = 0.001). Several incidents and complications were reported with Anesthesia Machine care, raising safety concerns.ConclusionsOur results support the hypothesis that care associated with the use of Anesthesia Machines is inadequate to provide long-term critical care to patients with COVID-19. Added safety risks must be considered if no other option is available to treat severely ill patients during the ongoing pandemic.Clinical Trial NumberNot applicable

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1. **Thoracic surgery outcomes for patients with Coronavirus Disease 2019**  
   Chang Stephanie H. The Journal of thoracic and cardiovascular surgery 2021;:No page numbers.

OBJECTIVE: As the Coronavirus Disease 2019 pandemic continues, appropriate management of thoracic complications from Coronavirus Disease 2019 needs to be determined. Our objective is to evaluate which complications occurring in patients with Coronavirus Disease 2019 require thoracic surgery and to report the early outcomes., METHODS: This study is a single-institution retrospective case series at New York University Langone Health Manhattan campus evaluating patients with confirmed Coronavirus Disease 2019 infection who were hospitalized and required thoracic surgery from March 13 to July 18, 2020., RESULTS: From March 13 to August 8, 2020, 1954 patients were admitted to New York University Langone Health for Coronavirus Disease 2019. Of these patients, 13 (0.7%) required thoracic surgery. Two patients (15%) required surgery for complicated pneumothoraces, 5 patients (38%) underwent pneumatocele resection, 1 patient (8%) had an empyema requiring decortication, and 5 patients (38%) developed a hemothorax that required surgery. Three patients (23%) died after surgery, 9 patients (69%) were discharged, and 1 patient (8%) remains in the hospital. No healthcare providers were positive for Coronavirus Disease 2019 after the surgeries., CONCLUSIONS: Given the 77% survival, with a majority of patients already discharged from the hospital, thoracic surgery is feasible for the small percent of patients hospitalized with Coronavirus Disease 2019 who underwent surgery for complex pneumothorax, pneumatocele, empyema, or hemothorax. Our experience also supports the safety of surgical intervention for healthcare providers who operate on patients with Coronavirus Disease 2019. Copyright © 2021 The American Association for Thoracic Surgery. Published by Elsevier Inc. All rights reserved.

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1. **Thoracostomy with placement of the thoracic tube in prone decubit during COVID-19 pandemic**  
   Navarro-Zambrano G. Cirugia Cardiovascular 2021;:No page numbers.

The severe acute respiratory syndrome caused by the SARS-CoV-2 coronavirus, leads to respiratory failure and severe hypoxemia, and requires the implementation of invasive mechanical ventilation in addition to strategies such as prone position to improve arterial oxygenation. Extrapulmonary complications such as spontaneous pneumothorax, pneumomediastinum, pleural effusion complicate its management, especially in the prone position. Chest tube thoracostomy is the first treatment line. This procedure leads to a high risk of contagion by the generation of aerosols, in addition to the risk of lung injury during insertion of the pleural drain due to the prone position. We report a case of SARS-CoV-2 infection with mechanical ventilatory assistance complicated by spontaneous pneumothorax that required placement of pleural drainage when the patient was in the prone position. We describe the technique that is not described in the literature.Copyright © 2021 Sociedad Espanola de Cirugia Cardiovascular y Endovascular

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1. **Tocilizumab-induced cytomegalovirus colitis in a patient with COVID-19**  
   Khatib M. Y. Clinical Case Reports 2021;9:148-152.

The authors urge clinicians to observe for early signs of CMV reactivation in patients presenting with gastrointestinal bleeding and intestinal perforation after receiving tocilizumab or other immunosuppressive therapy as a treatment for COVID 19. Early recognition of CMV infection and treatment will prevent life-threatening bleeding and mortality.Copyright © 2020 The Authors. Clinical Case Reports published by John Wiley & Sons Ltd.

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1. **Use of venovenous extracorporeal membrane oxygenation for perioperative management of acute respiratory distress syndrome caused by fat embolism syndrome: A case report and literature review**  
   Momii Kenta Medicine 2021;100:e24929.

INTRODUCTION: Fat embolism syndrome (FES) is a known complication of long bone fracture and can affect multiple organs. The organ most commonly affected with FES is the lung. Severe cases of FES from long bone fracture can cause acute respiratory distress syndrome (ARDS). Although the treatment of ARDS remains challenging, it is reported that a lung protection strategy and prone positioning are effective. In addition, early fixation is reported to be beneficial in respiratory failure due to FES, though it may exacerbate respiratory failure during the perioperative period. We report the use of venovenous extracorporeal membrane oxygenation (VV-ECMO) for the successful perioperative management of a patient diagnosed with ARDS due to FES., PATIENT CONCERNS: A 24-year-old man injured in a traffic accident was brought to our emergency department due to shock and consciousness disorder., DIAGNOSIS: After examining the patient, we noted bilateral pneumothorax, liver and spleen injuries, and multiple long bone fractures. Four days after admission, he was diagnosed with FES due to a prolonged consciousness disorder, progressive hypoxia with diffuse lung damage, and cutaneous and mucosal petechiae., INTERVENTION: As respiratory failure progressed, VV-ECMO was initiated on the 6th day. To improve the respiratory failure caused by ARDS, prone position therapy was necessary. Thus, we performed osteosynthesis on the 9th day under ECMO. Prone position therapy was started after surgery., OUTCOMES: Subsequently, his respiratory condition and chest radiographs improved steadily. VV-ECMO was discontinued on the 17th day and the ventilator was removed on the 28th day. His consciousness levels improved without residual central nervous system complications., CONCLUSION: Our study reveals the successful improvement of FES-induced ARDS by osteosynthesis and prone positioning under VV-ECMO. This strategy prioritizes supportive treatment over pharmacologic interventions. Copyright © 2021 the Author(s). Published by Wolters Kluwer Health, Inc.

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1. **Ventilator associated lung injury in severe COVID-19 pneumonia patients - Case Reports: Ventilator associated lung injury in COVID-19**  
   Gupta Vikash Kumar European journal of radiology open 2021;8:100310.

Management of severe coronavirus disease 2019 requires advanced respiratory support modalities including invasive mechanical ventilation (IMV), continuous positive airway pressure (C-PAP), and non-invasive ventilation ((NIV). IMV leads to either subtle forms of lung injury (pulmonary edema, lung cysts) or more severe form of lung injury manifested as subcutaneous emphysema, pneumomediastinum, and pneumothorax (herein collectively termed barotrauma). We have described two cases showing the two end of spectrum of ventilator associated lung injury (VALI). Copyright © 2020 The Authors.

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1. **"Floating egg" appearance of para-pneumonic effusion in a COVID-19 patient**  
   Haynes S. Indian Journal of Anaesthesia 2020;64:902-903.

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1. **2019 novel coronavirus (COVID-19) pneumonia complications: the importance of lung ultrasound**  
   Consoli L. Journal of Ultrasound 2020;:No page numbers.

In December 2019, a novel coronavirus (SARS-Cov-2) was first reported in Wuhan, China, and rapidly spread around the world, leading to an international emerging public health emergency. As reported from Chinese experiences, approximately 20% of patients had a severe course, requiring intensive care, with an overall case fatality rate of 2.3%. In diagnosis, chest computed tomography most commonly showed ground-glass opacity with or without consolidative patterns. Herein, we report a case of a patient affected by COVID-19 pneumonia referred in the emergency department of our institution on April 4, 2020, with peculiar lung ultrasound findings.Copyright © 2020, Societa Italiana di Ultrasonologia in Medicina e Biologia (SIUMB).

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1. **A 29-Year-Old Male with a Fatal Case of COVID-19 Acute Respiratory Distress Syndrome (CARDS) and Ventilator-Induced Lung Injury (VILI)**  
   Deliwala Smit S. The American journal of case reports 2020;21:e926136.

BACKGROUND COVID-19 patients that develop acute respiratory distress syndrome (ARDS) "CARDS" behave differently compared to patients with classic forms of ARDS. Recently 2 CARDS phenotypes have been described, Type L and Type H. Most patients stabilize at the milder form, Type L, while an unknown subset progress to Type H, resembling full-blown ARDS. If uncorrected, phenotypic conversion can induce a rapid downward spiral towards progressive lung injury, vasoplegia, and pulmonary shrinkage, risking ventilator-induced lung injury (VILI) known as the "VILI vortex". No cases of in-hospital phenotypic conversion have been reported, while ventilation strategies in these patients differ from the lung-protective approaches seen in classic ARDS. CASE REPORT A 29-year old male was admitted with COVID-19 pneumonia complicated by severe ARDS, multi-organ failure, cytokine release syndrome, and coagulopathy during his admission. He initially resembled CARDS Type L case, although refractory hypoxemia, fevers, and a high viral burden prompted conversion to Type H within 8 days. Despite ventilation strategies, neuromuscular blockade, inhalation therapy, and vitamin C, he remained asynchronous to the ventilator with volumes and pressures beyond accepted thresholds, eventually developing a fatal tension pneumothorax. CONCLUSIONS Patients that convert to Type H can quickly enter a spiral of hypoxemia, shunting, and dead-space ventilation towards full-blown ARDS. Understanding its nuances is vital to interrupting phenotypic conversion and entry into VILI vortex. Tension pneumothorax represents a poor outcome in patients with CARDS. Further research into monitoring lung dynamics, modifying ventilation strategies, and understanding response to various modes of ventilation in CARDS are required to mitigate these adverse outcomes.

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1. **A case of chylothorax**  
   Ismail A. Journal of Investigative Medicine 2020;68:600.

Introduction Chylothorax is an uncommon cause of pleural effusion characterized by extravasation of chyle into the pleural space. It is caused by injury or obstruction of the thoracic duct or subdiaphragmatic flow from the peritoneal cavity. The fluid is usually milky in appearance with elevated triglycerides (>110 mg/dL) or chylomicrons. It can be asymptomatic or present with non-specific respiratory symptoms. Case A 79-year-old patient with history of hypertension presented to the emergency room complaining of diffuse abdominal pain and dyspnea. His dyspnea worsened over the last 2 months. A chest X-ray showed bilateral pleural effusions and a CT chest showed large right hydropneumothorax and moderate left pleural effusion. He had a right thoracentesis with chest tube placement as well as left thoracentesis. The fluid analysis was consistent with a chylothorax. His chest tube output remained high (1-2L daily). His nutrition was optimized and octreotide 50 mg every 8 hours was tried with modest reduction in the chest tube output. The etiology of the chylothorax was unknown. He reported a stab wound to his right chest 20 years ago. Imaging of his head, chest, abdomen, and pelvis showed no masses. The fluid analysis of the effusions was negative for malignant cells and cultures were negative. A nuclear medicine lymphangiogram showed no extravasation of radiotracer into the thoracic cavity. The pneumothorax resolved and the chest tube was removed with rapid reaccumulation of his pleural effusion. After discussion with the patient about the benefits and harms of an indwelling pleural catheter, he decided against it. The patient was discharged home with hospice care. Discussion Chylothorax is a rare cause of pleural effusions and present a challenge in management. Trauma causes about 50% of the cases. Esophagectomy and corrective surgeries for congenital heart diseases are the most common reported causes. Malignancy and lymphatic anomalies are the most common non-traumatic causes of chylothorax (39%-72%). Diagnosis needs an extensive history and physical exam. Fluid analysis and imaging can help identify the cause. Lymphangiogram is needed when lymphatic anomaly is suspected. Medical management usually involves a high-protein, low-fat diet and somatostatin analogues; definitive treatment is usually surgical, when no contraindications exist.

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1. **A case of Marfan syndrome with massive haemoptysis from collaterals of the lateral thoracic artery**  
   Yabuuchi Y. BMC Pulmonary Medicine 2020;20:4.

Background: Marfan Syndrome (MFS) is a heritable connective tissue disorder with a high degree of clinical variability including respiratory diseases; a rare case of MFS with massive intrathoracic bleeding has been reported recently. Case presentation: A 32-year-old man who had been diagnosed with MFS underwent a Bentall operation with artificial valve replacement for aortic dissection and regurgitation of an aortic valve in 2012. Warfarin was started postoperatively, and the dosage was gradually increased until 2017, when the patient was transported to our hospital due to sudden massive haemoptysis. Computed tomography (CT) with a maximum intensity projection (MIP) revealed several giant pulmonary cysts with fluid levels in the apex of the right lung with an abnormal vessel from the right subclavian artery. Transcatheter arterial embolization was performed with angiography and haemostasis was achieved, which suggested that the bleeding vessel was the lateral thoracic artery (LTA) branch. CT taken before the incident indicated thickening of the cystic wall adjacent to the thorax; therefore, it was postulated that the bleeding originated from fragile anastomoses between the LTA and pulmonary or bronchial arteries. It appears that the vessels exhibited inflammation that began postoperatively, which extended to the cysts. Conclusion(s): We experienced a case of MFS with massive haemoptysis from the right LTA. We have to be aware of the possibility that massive haemoptysis could be induced in MFS with inflamed pulmonary cysts.Copyright © 2020 The Author(s).

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1. **A case of secondary tension pneumothorax in COVID-19 pneumonia in a patient with no prior history of lung disease**  
   Amoah Kwesi SAGE open medical case reports 2020;8:2050313X20967504.

Complications that arise in patients with severe COVID-19 pneumonia are acute respiratory distress syndrome, often leading to mechanical ventilation, shock requiring vasopressors, acute kidney injury, stroke, thromboembolic phenomena, and myocardial injury. To date, there are four cases of tension pneumothorax in patients with COVID-19, published in literature. We present a 33-year-old man with no prior history of lung disease who was admitted to our hospital on account of hypoxic respiratory failure secondary to COVID-19 pneumonia. During his hospitalization, he developed sudden onset of chest pain which worsened with coughing. A chest X-ray showed a right-sided pneumothorax with left-sided mediastinal shift. He required placement of chest tubes with eventual resolution of the pneumothorax several days later. This case highlights the need for clinical recognition, consideration of differential diagnoses, prompt evaluation, appropriate imaging, and management of this severe life-threatening unusual complication of COVID-19 pneumonia. Copyright © The Author(s) 2020.

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1. **A case of spontaneous pneumothorax 21 days after diagnosis of coronavirus disease 2019 (COVID-19) pneumonia**  
   Abushahin A. American Journal of Case Reports 2020;21:e925787.

Patient: Male, 47-year-old Final Diagnosis: COVID-19 \* pneumothorax Symptoms: Chest discomfort \* dry cough \* shortness of breath Medication: - Clinical Procedure: - Specialty: Infectious Diseases Objective: Diagnostic/therapeutic accidents Background: At the end of 2019, coronavirus (SARS-CoV-2) was recognized as the cause of a cluster of pneumonia cases in Wuhan, a city in China. There are numerous complications associated with COVID-19 infection, such as acute respiratory distress syndrome, renal failure, circulatory shock, and multi-organ failure. Spontaneous pneumo-thorax following COVID-19 pneumonia is an extremely rare complication. Case Report: We report the case of a 49-year-old man with a past medical history of type 2 diabetes mellitus with an initial presentation of cough, shortness of breath, and fever. He was diagnosed with COVID-19 pneumonia and rap-idly deteriorated on the day of admission, requiring initiation of mechanical ventilation. The patient recovered clinically and was discharged home. He returned 21 days after discharge with a spontaneous pneumothorax. Conclusion(s): Spontaneous pneumothorax is a rare complication after apparent recovery from COVID-19 pneumonia. It is imperative that treating physicians are aware of this complication in order to recognize it early and treat it promptly.Copyright © Am J Case Rep, 2020;.

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1. **A Case of Spontaneous Pneumothorax 21 Days After Diagnosis of Coronavirus Disease 2019 (COVID-19) Pneumonia**  
   Abushahin Ashraf The American journal of case reports 2020;21:e925787.

BACKGROUND At the end of 2019, coronavirus (SARS-CoV-2) was recognized as the cause of a cluster of pneumonia cases in Wuhan, a city in China. There are numerous complications associated with COVID-19 infection, such as acute respiratory distress syndrome, renal failure, circulatory shock, and multi-organ failure. Spontaneous pneumothorax following COVID-19 pneumonia is an extremely rare complication. CASE REPORT We report the case of a 49-year-old man with a past medical history of type 2 diabetes mellitus with an initial presentation of cough, shortness of breath, and fever. He was diagnosed with COVID-19 pneumonia and rapidly deteriorated on the day of admission, requiring initiation of mechanical ventilation. The patient recovered clinically and was discharged home. He returned 21 days after discharge with a spontaneous pneumothorax. CONCLUSIONS Spontaneous pneumothorax is a rare complication after apparent recovery from COVID-19 pneumonia. It is imperative that treating physicians are aware of this complication in order to recognize it early and treat it promptly.

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1. **A Case Report of Spontaneous Pneumothorax in the 2019 Novel Coronavirus–Infected Pneumonia**  
   Pan Yunhu 2020;:No page numbers.

&lt;h4&gt;Background: &lt;/h4&gt; COVID-19,which pathogen virus officially named SARS-CoV-2, started in China Wuhan city and so far rapidly spread to a global outbreak. Since the lung is the main lesion organ for virus invasion, Chest CT is strongly recommended in COVID-19 on either initial diagnosis and follow-up.Multiple patchy shadows and ground glass opacity of bilateral lung are typical features of CT scan,and spontaneous pneumothorax appeared in the early onset of COVID-19 is rare. Case Presentation: We reported one case of spontaneous pneumothorax in the early onset of COVID-19, chest CT showed only a small amount of pneumothorax were seen in the right lobe.After receiving 4 days of treatment, re-examination chest CT shows right pneumothorax disappeared, but the patient was clinically worse, and progressive multiple diffuse consolidation. Although treatment with extracorporeal membrane oxygenator,the patient died 15 days after admission. &lt;h4&gt;Conclusion: &lt;/h4&gt; Spontaneous pneumothorax in the early stages of COVID-19 is rare,which imaging features differ from other lung diseases complicated with pneumothorax,such as COPD.More than we usually know,the improvement of pneumothorax and the outcome of COVID-19 may be inconsistent.

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1. **A Complication of Pneumothorax and Pneumomediastinum in a Non-Intubated Patient With COVID-19: A Case Report**  
   Sonia Fnu Cureus 2020;12:e10044.

COVID-19 disease can lead to multiple complications such as severe acute respiratory distress syndrome (ARDS), coagulopathy, renal failure, cardiac and neurological complications. We describe a case of a patient who developed pneumothorax and pneumomediastinum in the setting of COVID-19 without having ARDS or requiring mechanical ventilation. Our patient developed sudden onset of shortness of breath and desaturation. Chest X-ray and CT chest revealed pneumothorax and pneumomediastinum. Though pneumothorax in pulmonary infection is most likely associated with increased airway pressure in acute respiratory distress syndrome and positive pressure mechanical ventilation. Pneumothorax is a life-threatening complication and if diagnosed early it can reduce mortality. In patients with COVID-19 infection, sudden clinical worsening with shortness of breath and desaturation should prompt the clinician to look for potentially treatable causes such as pneumothorax. Copyright © 2020, Sonia et al.

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1. **A patient with severe polytrauma with massive pulmonary contusion and hemorrhage successfully treated with multiple treatment modalities: a case report**  
   Nagashima Futoshi Journal of medical case reports 2020;14:69.

BACKGROUND: The mortality rate is very high for patients with severe multiple trauma with massive pulmonary contusion containing intrapulmonary hemorrhage. Multiple treatment modalities are needed not only for a prevention of cardiac arrest and quick hemostasis against multiple injuries, but also for recovery of oxygenation to save the patient's life., CASE PRESENTATION: A 48-year-old Japanese woman fell down stairs that had a height of approximately 4 m. An X-ray showed pneumothorax, pulmonary contusion in her right lung, and an unstable pelvic fracture. A chest drain was inserted and preperitoneal pelvic packing was performed to control bleeding, performing resuscitative endovascular balloon occlusion of the aorta. A computed tomography scan revealed massive lung contusion in the lower lobe of her right lung, pelvic fractures, and multiple fractures and hematoma in other areas. An emergency thoracotomy was performed, and then we performed wide wedge resection of the injured lung, clamping proximal to suture lines with two Satinsky blood vessel clamps. The vessel clamps were left in the right thoracic cavity. The other hemorrhagic areas were embolized by transcatheter arterial embolization. However, since her respiratory functions deteriorated in the intensive care unit, veno-venous extracorporeal membrane oxygenation was used for lung assist. Planned reoperation under veno-venous extracorporeal membrane oxygenation was performed on day 2. Since her respiratory condition improved gradually, the veno-venous extracorporeal membrane oxygenation circuit was withdrawn on day 7. She was transferred to the psychiatric ward of our hospital on day 75., CONCLUSION: Utilizing multiple treatment modalities such as resuscitative endovascular balloon occlusion of the aorta, damage control surgery, transcatheter arterial embolization, and veno-venous extracorporeal membrane oxygenation with appropriate timing saves a patient with severe polytrauma with massive pulmonary contusion including intrapulmonary hemorrhage.

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1. **A Prospective Outcome Assessment After Bronchoscopic Interventions for Malignant Central Airway Obstruction**  
   Mohan Anant Journal of bronchology & interventional pulmonology 2020;27:95-105.

BACKGROUND: A systematic assessment of comprehensive clinical outcomes after various therapeutic procedures for malignant central airway obstruction (CAO) is lacking., METHODS: Patients with symptomatic malignant CAO undergoing various therapeutic bronchoscopy procedures were assessed for symptomatic and functional improvement using the Speiser Score, spirometry, 6-minute walk distance (6MWD), and St. George Respiratory Questionnaire (SGRQ) up to 3 months after the procedures., RESULTS: A total of 83 intervention procedures were performed in 65 patients, comprising 43 (66.2%) male individuals [overall mean age, 52.4; SD, 15.4 y]. The majority of these (92.3%) was done using rigid bronchoscope under general anesthesia. Airway stenting was the most common intervention performed (56.6%), followed by mechanical debulking (26.5%), cryodebulking (6%), electrosurgical removal (4.8%), balloon dilatation (3.6%), and laser ablation (2.4%). A total of 15 complications (18.1%) were noted. Of these, 8 (53.3%) were early complications and 7 (46.7%) were late complications. Early complications included airway bleeding, hypoxia, vocal cord injury, laryngeal injury, and pneumothorax. Late complications included significant granulation tissue formation in metallic stents and lung collapse because of mucus plug. The survival rates at 4, 8, and 12 weeks were 83%, 70.7%, and 66.1%, respectively. Significant improvement was observed in dyspnea, cough, Speiser Score, 6MWD, forced expiratory volume in 1 s, forced vital capacity, and SGRQ scores at 48 hours, 4 weeks, and at 12 weeks after the procedures and no procedure-related mortality occurred., CONCLUSION: Various therapeutic bronchoscopic interventions, including combined modalities, provide rapid and sustained improvements in symptoms, respiratory status, exercise capacity, and quality of life in malignant CAO and have a good safety profile.

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1. **A rare case of Pneumopericardium secondary to COVID-19**  
   Sahu Kamal Kant Heart & lung : the journal of critical care 2020;49:679-680.

Coronavirus disease 2019 (COVID-19) has posed an unparalleled challenge to the medical communities and patients worldwide. This is the third coronavirus pandemic of the decade and worst so far in terms of the number of patients affected and related deaths. Although COVID-19 is a systemic illness, the respiratory system is obvious to be involved first, and takes most of the brunt of SARS-CoV-2 infection. Common upper and lower respiratory presentations could be sore throat, consolidation, ground glass opacities, and acute respiratory distress syndrome in severe cases. Pneumothorax, pneumomediastinum are uncommon clinical findings in association with COVID-19. We hereby report a rare case of spontaneous pneumomediastinum with a synchronous pneumopericardium. Copyright © 2020 Elsevier Inc. All rights reserved.

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1. **A single centre retrospective observational study: Clinical characteristics and outcomes of 57intensive care patients with Covid-19 in South London**  
   Shurovi B. Intensive Care Medicine Experimental 2020;8:No page numbers.

Introduction: Novel Coronavirus (SARS-Coronavirus-2: SARS-CoV-2) or Coronavirus Disease 19 (COVID-19) emerged in Wuhan, China in December 2019 and it was declared a global pandemic in March 2020. Objective(s): To describe the epidemiological characteristics and clinical manifestations of patients with COVID-19 in South-East London Region. Method(s): A single centre retrospective observational study was completed comprising patients with laboratory confirmed diagnosis of Covid-19 in a period between 12th March and 3rd April. Data was collected on patient characteristics, clinical manifestations, laboratory results, radiology findings and management in Intensive Care Unit (ICU). Moreover, described some of the complications that were noted in the COVID-19 cohort. Result(s): 57 patients (68% male) were followed up for 23 days. The most common co-morbidities were hypertension (54%), obesity (53%) and type2diabetes (32%). The most common clinical manifestations were shortness of breath (88%), fever (%88) and cough (84%), which was initially noted 8 days prior to ICU admission. The typical radiology findings seen in COVID-19 patients were bilateral infiltrates on chest X-ray. Laboratory findings that were common in majority of patients were lymphopenia with raised white cell count, raised C-reactive protein and raised ferritin. 21% of the patients required renal replacement therapy due to acute kidney injury. Invasive mechanical ventilation (IMV) was required by 93% of the cohort; however, initially the unit did not try non-invasive ventilation for COVID-19 patients. PaO2/FiO2 ratio illustrated appropriately the biochemical picture of acute respiratory distress syndrome. At the end of the follow-up period for this study, 35% had died, 28% had been discharged from hospital, 9% was stepped down to the ward from ICU and 28% remained in ICU. The average ICU stays in this cohort was 15 days. Mortality was correlated with age, PaO2/FiO2 ratio, ventilator settings, peak ferritin and neutrophil count over the first 72hours of IMV. Some of the complications that were seen in this cohort: eight patients developed pneumomediastinum, surgical emphysema and pneumothoraces, one patient had a ST-elevation myocardial infarction requiring PCI and one had a micro-haemorrhage/subarachnoid haemorrhage (8 mm) and one patient developed posterior reversible encephalopathy syndrome (PRES). Conclusion(s): This retrospective observational study described the clinical characteristics and outcomes of a South-East London cohort. It described few of the complications that were seen in this cohort, which could be co-related to COVID-19. Moreover, it reports factors that are correlated with mortality for patients with COVID-19.

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1. **A successful case of extracorporeal membrane oxygenation treatment for intractable pneumothorax in a patient with COVID-19**  
   Nakatsutsumi Keita Acute medicine & surgery 2020;7:e612.

Background: Some patients with coronavirus disease 2019 (COVID-19) develop pneumothorax. Tube thoracotomy and bulla resection could generate aerosols and cause virus transmission; the optimal treatment strategy remains unclear., Case Presentation: A 57-year-old male was transferred as a severe COVID-19 pneumonia case. On the 16th day after admission, the patient's respiratory condition deteriorated, and the chest X-ray revealed the presence of severe right-sided pneumothorax. A chest drain was immediately inserted; however, a significant air leak continued, and severe ventilator settings were required. Thus, veno-venous extracorporeal membrane oxygenation (VV-ECMO) treatment was initiated to allow the lungs to rest. After 10 days of lung-protective ventilation, the patient was weaned from ECMO and the chest drain was removed on the following day with no major comorbidities., Conclusion: The combination of ECMO with lung rest strategy could be a treatment option for intractable pneumothorax with COVID-19 to avoid unnecessary surgical procedures and aerosol generation. Copyright © 2020 The Authors. Acute Medicine & Surgery published by John Wiley & Sons Australia, Ltd on behalf of Japanese Association for Acute Medicine.

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1. **A tentative guide for thoracic surgeons during COVID-19 pandemic**  
   Ghoniem A. Cardiothoracic Surgeon 2020;28:16.

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1. **A trial of lopinavir-ritonavir in adults hospitalized with severe covid-19**  
   Cao B. New England Journal of Medicine 2020;382:1787-1799.

BACKGROUND: No therapeutics have yet been proven effective for the treatment of severe illness caused by SARS-CoV-2. METHOD(S): We conducted a randomized, controlled, open-label trial involving hospitalized adult patients with confirmed SARS-CoV-2 infection, which causes the respiratory illness Covid-19, and an oxygen saturation (Sao2) of 94% or less while they were breathing ambient air or a ratio of the partial pressure of oxygen (Pao2) to the fraction of inspired oxygen (Fio2) of less than 300 mm Hg. Patients were randomly assigned in a 1:1 ratio to receive either lopinavir-ritonavir (400 mg and 100 mg, respectively) twice a day for 14 days, in addition to standard care, or standard care alone. The primary end point was the time to clinical improvement, defined as the time from randomization to either an improvement of two points on a seven-category ordinal scale or discharge from the hospital, whichever came first. RESULT(S): A total of 199 patients with laboratory-confirmed SARS-CoV-2 infection underwent randomization; 99 were assigned to the lopinavir-ritonavir group, and 100 to the standard-care group. Treatment with lopinavir-ritonavir was not associated with a difference from standard care in the time to clinical improvement (hazard ratio for clinical improvement, 1.31; 95% confidence interval [CI], 0.95 to 1.80). Mortality at 28 days was similar in the lopinavir-ritonavir group and the standard-care group (19.2% vs. 25.0%; difference, -5.8 percentage points; 95% CI, -17.3 to 5.7). The percentages of patients with detectable viral RNA at various time points were similar. In a modified intention-to-treat analysis, lopinavir-ritonavir led to a median time to clinical improvement that was shorter by 1 day than that observed with standard care (hazard ratio, 1.39; 95% CI, 1.00 to 1.91). Gastrointestinal adverse events were more common in the lopinavir-ritonavir group, but serious adverse events were more common in the standard-care group. Lopinavir-ritonavir treatment was stopped early in 13 patients (13.8%) because of adverse events. CONCLUSION(S): In hospitalized adult patients with severe Covid-19, no benefit was observed with lopinavir-ritonavir treatment beyond standard care. Future trials in patients with severe illness may help to confirm or exclude the possibility of a treatment benefit.Copyright © 2020 Massachusetts Medical Society.

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1. **A unique presentation of cryptococcusneoformans and pneumocystis jirovecii(PJP) co-infection in a newly diagnosed HIV patient**  
   Zia S. American Journal of Clinical Pathology 2020;154:S20.

One week prior to demise, a 30 years old smoker male with a pastmedical history significant for intermittent asthma presented toemergency with shortness of breath, wheezing, productive cough, and generalized fatigue for 1 week. He was afebrile, normotensive, tachycardic and had O2 saturation of 96% on room air. Physicalexamination showed cachexia, audible wheezes and oropharyngeal erythema. Labs showed WBC 3600/uL with lymphocyte count of 700/uL and mild thrombocytopenia. Chest Xray was clear. Serology was reactive for HIV, pending viral load.Working diagnosis was asthma exacerbation in the setting of apossible viral infection for which he was discharged home tocomplete a 5-day course of high dose prednisone, with follow up with infectious diseases as an outpatient. Subsequent, HIV viralload after discharge was 194,643 copies/mL. One week later, he presented to the ED with worsening respiratorysymptoms, new onset chest pain and vomiting. He washypotensive, tachycardic, tachypneic, and afebrile. He hadleukocytosis of 12,700/uL with neutrophilia, lactate of 6.6, BNP841. Influenza A, B and RSV, and urine histoplasma antigen were negative. EKG showed abnormal ST segment elevation with concerns for STEMI. Chest CT revealed multifocal, bilateral groundglass and nodular opacities with cystic cavities. Mediastinal and hilar lymphadenopathy was also noted. Pulmonary embolism and pneumothorax were ruled out. Blood gases reflected acutehypoxemic respiratory failure. Vancomycin and Piperacillin/tazobactam were started. A bed side ultrasound showed significantly dilated right ventricle with severely reducedfunction and hence concerns for cardiogenic component of shock.He was intubated and shortly after developed asystole and expiredafter prolonged cardiopulmonary resuscitation with in twelvehours of admission. At autopsy, gross exam showed bilateral pulmonary congestion, bilateral hilar adenopathy and matted lymph nodes in the mediastinum. Microscopy revealed cryptococcus (mucicarminepositive encapsulated yeast forms) involving intraalveolar and alveolar septal parts of all lobes of the lungs, effacing lymphnodes, and involving microscopic foci in bilateral myocardialventricles. Modified GMS-positive cup shaped Pneumocystisorganisms involved the alveolar spaces of all lung lobes. The lungparenchyma showed minimal inflammatory response. Our case is of an HIV patient with respiratory symptoms found tohave pulmonary co-infection with PJP and Cryptococcusneoformans, confirmed on pathology report. This is uncommon inliterature. Additionally, this case is unique in reporting the presentation of Cryptococcus neoformans as involving the mediastinal lymph nodes and myocardium.

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1. **A.B.C. approach proposal for POCUS in COVID-19 critically ill patients**  
   Simon R. Medical ultrasonography 2020;:No page numbers.

The rapid spread of SARS-CoV-2 (COVID-19) since December 2019 forced Intensive Care Units to face high numbers of patients admitted simultaneously with limited resources. COVID-19 critically ill patients, especially those on mechanical ventilators, demand special attention as they can develop potential complications with critical hemodynamic and respiratory consequences. Point of Care Ultrasound (POCUS) might have important roles in assessing the critically ill SARS-CoV-2 patient. Mostly, lung ultrasound has been presented as having a role in diagnosis and monitoring, but airway examination and hemodynamic evaluation are of interest also. We propose an A.B.C. POCUS approach focusing on A-airway (orotracheal intubation), B-breathing (interstitial syn-dromes, pneumothorax, atelectasis, pneumonia), and C-circulation (cardiac function, pulmonary embolism, volume status, deep veins thrombosis). This A.B.C. approach has emerged during ICU care for 22 adult COVID-19 critically ill patients, along with the analysis of recent papers describing ultrasound in COVID-19 patients including the use of ultrasound that is currently applied in the management of the general critically ill population. This A.B.C- POCUS algorithm parallels the well-established clinical A.B.C. algorithms. There are few extensive ultrasonographic studies in COVID-19 critically ill patients up to now, but techniques extrapolated from non-COVID studies seem reasonable even though comparative studies are not available yet.

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1. **Adverse events in coronavirus disease patients management: A pictorial essay**  
   Angileri S. A. Journal of Clinical Imaging Science 2020;10:42.

Clinical manifestation of coronavirus disease (COVID-19) varies from asymptomatic to severe clinical forms that can result in acute respiratory distress syndrome or in multiple organ dysfunction syndromes. There are no guidelines, based on randomized controlled trials, for the treatment of COVID-19 patients. The treatment is based on antiviral drugs, invasive and non-invasive ventilation supports, and anticoagulant therapy. This is a pictorial essay covering the multiple adverse events encountered during the treatment of COVID-19 patients in an area with a high pandemic incidence. Adverse events are defined as unexpected events following treatment for the infection. The cases described would be useful in aiding early diagnosis, limiting and improving the management of serious complications for patients, and allowing rapid and appropriate treatment.Copyright © 2020 Published by Scientific Scholar on behalf of Journal of Clinical Imaging Science

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1. **Air Leak**  
   Adeyinka Adebayo 2020;:No page numbers.

Air leak (AL) is a clinical phenomenon that is associated with the leakage or escape of air from cavity which contains air into spaces that usually under normal circumstances do not have air. The terminology Air Leak Syndrome (ALS) is the presence of air leak with associated symptoms of respiratory distress.[1][2][3] Air containing cavities include Upper Airway: Tracheobronchial tree. Sinuses Ethmoid Sinus. Frontal Sinus. Maxillary sinus. Gastrointestinal tract: Esophagus. Stomach. Small Intestine. Large Intestine Colon. The escape of air from air containing cavity to non-air containing cavity can create a condition where some vital organs in the non-air containing cavity can be compressed creating life-threatening conditions. These life-threatening conditions can be created as a result of compression of the lung or major blood vessels. When the lung or major blood vessels are flattening by the presence of air, gas exchange or blood flow can be severely compromised. Presence of air in spaces that it not "supposed" to be is prefixed with the word "Pneumo" Pneumothorax - Presence of air in the pleural cavity. Pneumopericardium Presence of air in the pericardial sac. Pneumoperitoneum - Presence of air in the peritoneal cavity. Subcutaneous Emphysema - Presence of air in the subcutaneous tissue. The presence of air in the pleural cavity that is associated with the collapse of the lung (Pneumothorax) has clinical significance because of the risk of airway collapse. If the major blood vessels are compressed with the presence of air in the pleural cavity, a clinical condition call tension pneumothorax can ensue. This is a medical emergency that requires immediate medical attention. Pneumothoraxes Classifications Spontaneous pneumothorax These occur without any precipitating event and is divided into two following groups: 1. Primary spontaneous pneumothorax occurs on healthy, non-diseased lungs. 2. Secondary spontaneous pneumothorax develops from lungs that are diseased with changes in the parenchymal structures. Traumatic pneumothorax These pneumothoraxes occur from traumatic injury to the lung and pleura space. The traumatic injury may be direct or indirect. Iatrogenic In critically ill patients, an iatrogenic pneumothorax causing an air leak can occur from the following conditions: Barotrauma and volutrauma - Aggressive use of high pressure or volume on patients placed on mechanical ventilation or high-frequency oscillatory ventilation especially for patients with acute respiratory distress syndrome; respiratory distress syndrome can lead to the development of air leak or ALS. The placement of a subclavian central line - This can lead to the introduction of air into the pleural cavity creating pneumothoraxes and air leak. Surgical interventions - When on the lung, heart, and mediastinal structures, these can create air leak syndrome. Determination of the Presence of an Air Leak To quantify the amount of air leak in a patient connected to a chest tube, the patient is asked to cough, and the water column and the water seal column in the chest tube drainage system is observed. If there are no air bubbles, the pleural cavity is devoid of air. The presence of air bubbles signifies the presence of air leak. If the amount of air bubbles is the same in quantity, this might signify the presence of a significant leak or an active leak. On the contrary, a gradual reduction in the amount of the bubble is indicative of a small leak or a passive leak. After thoracic surgery, especially resection of the lung, warm sterile saline is instilled into the thoracic cavity. The resected lung is usually insufflated with air to a peak pressure of around 30 mmHg, and the resected section of the lung is then checked for the presence of air leak. Macchiarini et al. suggested a way to classify the air leak: 1. Grade 0 - No leak. 2. Grade I - Countable bubbles. 3. Grade II - Streams of bubbles. 4. Grade III - Coalesced bubbles. After lung resection, air leak that persists for more than five days postoperatively is defined as prolonged air leak (PAL). [4][5] Copyright © 2020, StatPearls Publishing LLC.

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1. **Airway and Ventilation Management for 4 Year Old with Massive Intrathoracic Mass**  
   Ekeoduru R. Trends in Anaesthesia and Critical Care 2020;30:e71.

Introduction: Pleuropulmonary blastomas are aggressive, primary intrathoracic tumors that present in childhood1. Children have non-specific upper respiratory symptoms causing delay in diagnosis and significant tumor burden. Presentation includes coughing, fever, wheezing, dyspnea, vomiting, abdominal pain, backache, choking, chest pain and incidental discovery. Anesthetic management is challenged by airway obstruction, pleural effusions, pneumothorax, and reduced lung volumes. Case:4 yo female with no significant PMH presented with 4- week history of fever and malaise with new finding of right pleural effusion and multiple bilateral pulmonary nodules. Patient had intermittent fevers and was initially diagnosed with mononucleosis via blood test. She also exhibited cough, shortness of breath, decreased appetite and weight loss. Weeks later she presented with low, right-sided chest pain. She was evaluated for appendicitis. Radiograph exhibited right lung white out. CT chest/abdomen/pelvis showed 14x 7cm right chest mass causing sub-carinal compression. A smaller mass was visualized in the left lung base, as well as pleural effusions and pneumothorax, as visible in the image below. The child was taken to OR for port placement and mass biopsy under general anesthesia. The anesthetic was extremely challenging because of airway deviation and decreased pulmonary reserve. The goal was to maintain spontaneous ventilation and secure the airway, but avoid complete airway collapse. Discussion(s): Pleuropulmonary blastoma has a poor prognosis because of low prevalence and high rate of misdiagnosis. Long-term survival opportunities for children rely on tumor resection, chemotherapy and radiation. Intra-operative management is challenging for the anesthesiologist. We are tasked with managing tortuous, friable airways in the face of reduced pulmonary compliance, pleural effusions, and the risk of pneumothorax expansion. In addition, chronic tumor burden causing airway obstruction can lead to chronic infection of the lower lobes that may require lung isolation during resection. Careful planning, preparation and communication are key to successful management of these vulnerable children. Learning Points: Airway management and ventilation strategies for obstructing intra-thoracic tumors in pediatric patients. Consent for publication for educational purposes was given by the parents. References [1] Zhang N, Zeng Q, Ma X, et al., Diagnosis and Treatment of Pleuropulmonary Blastoma in Children: A Single-Center Report of 41 Cases, J Pediatr Surg 2019; 0: 1-5. [Formula presented]Copyright © 2020

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1. **Airway Diagnostics: Bronchoalveolar Lavage, Tracheal Wash, and Pleural Fluid**  
   Couetil L. L. Veterinary Clinics of North America - Equine Practice 2020;36:87-103.

Indications for bronchoalveolar lavage, tracheal wash, and thoracocentesis for the diagnosis of respiratory diseases are discussed. Each technique is described in detail and illustrated by videos. Sample handling, preparation and evaluation are reviewed. The advantages and limitations of bronchoalveolar lavage and tracheal wash procedures as well as a critical comparison between the 2 techniques for equine asthma diagnosis are presented. Finally, validated cut-off values for equine asthma diagnosis are reviewed.Copyright © 2019 Elsevier Inc.

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1. **Alveolar air leakage in COVID-19 patients: Pneumomediastinum and/or pneumopericardium**  
   Hamad A. M. M. Heart and Lung 2020;49:881-882.

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1. **An adjudication algorithm for respiratory-related hospitalization in idiopathic pulmonary fibrosis**  
   Maher T. M. American Journal of Respiratory and Critical Care Medicine 2020;201:No page numbers.

Rationale: Respiratory-related hospitalization is strongly associated with increased short-term mortality in idiopathic pulmonary fibrosis (IPF) and is a common endpoint in IPF clinical trials. External adjudication is sometimes employed for standardization, however, there is no universally accepted definition. Consequently, comparing data across trials is challenging. The objective of the current work was to develop an algorithm for the adjudication of respiratory-related hospitalization in IPF clinical trials. The algorithm is currently being used to adjudicate events in ISABELA 1 and 2 (ClinicalTrials.gov identifiers: NCT03711162 and NCT03733444), two ongoing multinational phase 3 trials assessing GLPG1690 in ~1500 patients with IPF for >=52 weeks (an open-label extension is also planned). Method(s): Nine experts developed the algorithm by consensus, using multiple rounds of algorithm review. A literature review of phase 2/3 IPF trials that included respiratory-related hospitalization as an endpoint informed the design. Result(s): The literature review identified 18 relevant trials that included respiratory-related hospitalization as an endpoint (NCT00075998, NCT00131274, NCT00287729/NCT00287716, NCT00650091, NCT00768300, NCT00957242, NCT01629667, NCT01766817, NCT01769196, NCT01872689, NCT01890265, NCT01979952, NCT01982968, NCT02550873, NCT02951429, NCT03573505, NCT03725852, NCT03832946). Details regarding the adjudication of respiratory-related hospitalization in IPF trials were generally lacking, adjudication was often performed post-hoc, or events were not adjudicated but were instead investigator-defined. The algorithm developed (Figure) classifies respiratoryrelated hospitalization by the following causes: extra-parenchymal (worsening respiratory symptoms due to left heart failure, volume overload, pulmonary embolism, pneumothorax, or trauma); other (respiratory tract infection, right heart failure, or exacerbation of chronic obstructive pulmonary disease); 'definite' acute exacerbation of IPF (AEIPF; worsening respiratory symptoms within 1 month, with new ground glass opacities present and no evidence of left heart failure, volume overload, pulmonary embolism, pneumothorax, or infection); or 'suspected' AEIPF (as for 'definite' AEIPF, but insufficient data to exclude infection or other causes of opacification). Extraparenchymal causes, other respiratory causes, and 'definite' or 'suspected' AEIPF are all defined as respiratory-related hospitalization. Implementing the algorithm in the ISABELA trials will enable respiratory-related hospitalization to be assessed and adjudicated in the largest IPF clinical trial population studied to date and, given the broad eligibility criteria of the program, in subjects reflective of those seen in real-world settings. Conclusion(s): A standardized algorithm for the adjudication of respiratory-related hospitalization in IPF trials will improve consistency and allow for cross-trial comparisons, increasing the reliability and utility of the endpoint. The algorithm is currently being used in the largescale ISABELA trials. A validation analysis is planned.

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1. **An Updated Primer on SARS-CoV-2 and the Evolving Covid-19 Pandemic**  
   Mani Subramani 2020;:No page numbers.

1. **Analysis of 92 deceased patients with COVID-19**  
   Yang Fan Journal of medical virology 2020;92:2511-2515.

This retrospective study aimed to analyze the clinical characteristics and complications in death cases with novel coronavirus disease-19 (COVID-19). We collected the medical records of 92 patients with COVID-19, who died in the time period ranging from 6 January 2020 to 25 February 2020, in Renmin Hospital of Wuhan University and summarized the clinical characteristics of complications. There were 91 death cases in which different complications were developed, including acute respiratory distress syndrome (ARDS) (73/91), myocardial injury (31/91), liver injury (15/91), renal insufficiency (14/91), multiple organ dysfunction syndrome (MODS) (14/91), and pneumothorax (1/91). Among these patients, 83 patients had at least one complication. However, one patient who died of recurrent gastrointestinal bleeding was not directly linked to COVID-19. The main complications of deceased patients with COVID-19 were ARDS, myocardial injury, liver injury, renal insufficiency, and MODS. Copyright © 2020 Wiley Periodicals LLC.

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1. **Apoptosis and pericyte loss in alveolar capillaries in COVID-19 infection: choice of markers matters. Author's reply**  
   Burel-Vandenbos F. Intensive Care Medicine 2020;46:1967-1968.

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1. **Application of lung ultrasonography in critically ill patients with COVID-19**  
   Li Shuo Echocardiography (Mount Kisco, N.Y.) 2020;37:1838-1843.

PURPOSE: Lung ultrasonography (LU) is useful to assess lung lesions and variations at bedside. To investigate the results of LU in severe and critical patients with coronavirus disease 2019 (COVID-19), we performed a single-institution study to evaluate the related lung lesions and variations, and prophylactic strategies, in a large referral and treatment center., METHODS: We included 91 adult patients with severe and critical COVID-19, namely 62 males and 29 females, with an average age of 59 +/- 11 years, who underwent LU. We collected the following patient information: sex, age, days in hospital, and days in ICU. In the ultrasound examinations, we recorded the presence of discrete B lines, confluent B lines, consolidation, pleural thickening, pleural effusion, and pneumothorax (PTX)., RESULTS: Among the 91 severe and critical patients, 59 cases had scattered B lines, 56 cases had confluent B lines, 58 cases had alveolar-interstitial syndrome (AIS), 48 cases had lung consolidation, six cases had pleural thickening, 39 cases had pleural effusion (average depth of the pleural effusion: 1.0 +/- 1.5 cm), and 20 patients developed PTX. In the Cox multivariate analysis, there were significant differences in age, hospitalization days, ICU days, and lung consolidation., CONCLUSION: Lung ultrasonography performed at the bedside can detect lung diseases, such as B lines, PTX, pulmonary edema, lung consolidation, pleural effusion, and variations of these findings. Our findings support the use of LU and measurements for estimating factors, and monitoring response to therapy in severe and critical COVID-19 patients. Copyright © 2020 The Authors. Echocardiography published by Wiley Periodicals LLC.

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1. **Application of lung ultrasonography in critically ill patients with COVID-19**  
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1. **Are Chest Radiographs Routinely Indicated After Chest Tubes Placed for Non-Surgical Reasons Are Removed?**  
   Diaz Raiko Cureus 2020;12:e7339.

Background The insertion and subsequent removal of chest tubes are frequently performed procedures for the management of pneumothoraces, pleural effusions, and cardio-thoracic surgical interventions. A chest radiograph is commonly obtained after the removal of a chest tube to rule out the interval development of a pneumothorax. This practice has been questioned in various retrospective and prospective studies conducted on surgical patient populations, showing little to no benefits in performing routine chest X-rays (CXRs) after chest tube removal unless clinical symptoms such as worsening respiratory status and hemodynamic compromise are present. Material and Methods A four-year retrospective study was conducted using the Cleveland Clinic Foundation database. A chart review was performed, and 1,032 patients were screened, with 200 patients meeting inclusion criteria. The inclusion criteria included patients who underwent chest tube insertion for non-surgical reasons. The primary outcome was the percentage of clinically significant pneumothoraces detected by routine CXR after chest tube removal. Results Out of the 200 patients included in the study, 53 had a CXR after chest tube removal showing a residual pneumothorax. Out of the 53 patients, 50 ended up not needing chest tube re-insertion, as the patients were asymptomatic and hemodynamically stable. Only three patients required chest tube re-insertion due to respiratory symptoms and significant hemodynamic changes after the chest tubes were removed. In all three cases, the symptoms manifested prior to the CXRs being obtained; therefore, the decision to reinsert each chest tubes was made based on clinical signs rather than imaging. As expected, the practice of repeating CXRs after removal of the chest tubes resulted in delayed discharges despite patients reporting no symptoms and being hemodynamically stable. Conclusions Our study findings correlate with prior smaller studies on surgical patients. Symptoms and hemodynamic data seem to be a better predictor of whether a patient will require chest tube re-insertion or not. Routine CXR after chest tube removal also leads to prolonged hospital stay. Copyright © 2020, Diaz et al.

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1. **Association of underlying diseases and clinical characteristics with mortality in patients with 2019 novel coronavirus in Iran**  
   Zamanian M. Archives of Clinical Infectious Diseases 2020;15:1-9.

Objectives: The first case of 2019 novel coronavirus disease (COVID-19) was reported in Iran in February 2020. Here, we report the epidemiological and clinical characteristics of patients with COVID-19 and factors associated with mortality in these patients. Method(s): A retrospective cohort study was conducted from February 22, 2020, to March 24, 2020, in Golestan Hospital in Kerman-shah, Iran. Demographic data including underlying diseases and clinical data including the presenting symptoms, chest computed tomography (CT) scan, reverse transcription polymerase chain reaction (RT-PCR) test results, and outcomes were extracted from electronic medical records. Simple and multiple logistic regression methods were used to explore the factors associated with mor-tality. Result(s): Of 245 patients admitted with COVID-19, 155 (63.30%) were male. The mean age of the subjects was 54.68 +/- 19.21. Forty-five (18.48%) patients had underlying diseases. Common symptoms were dyspnea (n = 137; 55.9%), cough (n = 93; 38.0%), and fever (n = 78; 31.8%). All patients had pneumonia with abnormal findings on chest CT scan (100%), and RT-PCR test results were positive in 87 (35.50%) patients. Of the total admitted cases, 38 (15.5%) patients died during hospitalization. An old age (OR = 1.09; 95% CI: 1.02 to 1.06), history of heart disease (OR = 5.07; 95% CI: 1.46 to 17.58), hypertension (OR = 5.82; 95% CI: 1.13 to 30.04), smoking (OR = 11.44; 95% CI: 1.01 to 29.53), history of at least one underlying disease (OR = 3.31; 95%CI: 1.54 to 7.09), and symptoms of decreased consciousness at the time of admission (OR = 24.23; 95% CI: 2.62 to 223.39) were associated with mortality. Also, the symptoms of cough (OR = 0.383; 95% CI: 0.17 to 0.88) and fever (OR = 0.278; 95% CI: 0.10 to 0.74) had a negative association with mortality. Conclusion(s): In the current study, factors including old age, smoking, symptoms of decreased consciousness, and underlying diseases such as heart disease, hypertension, and history of at least one underlying disease were associated with mortality. Factors associated with mortality should be considered so that we can better manage patients with COVID-19.Copyright © 2020, Author(s).

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1. **Asthma phenotypes and associated comorbidities in a large cohort of adolescents in Israel**  
   Machluf Y. Journal of Asthma 2020;57:722-735.

Objectives: Asthma is a multifactorial, heterogeneous, complex and common chronic respiratory disease driven by diverse mechanisms. Although asthma presents various clinical forms with different levels of severity, it is unclear whether asthma severities are a consequence of disease management or varied etiologies. We sought to investigate this question. Method(s): This article presents a cross-sectional study of 113,671 Israeli adolescents. Univariate and multivariable logistic regression models were performed to analyze the independent associations between mild asthma and moderate-to-severe asthma phenotypes and coexistent medical conditions within each gender separately. Hierarchical clustering of the odds ratios of the diverse statistically significant medical conditions associated with asthma severity-gender groups was also performed. We focused on the allergic and neurological-cognitive-mental disorders. Result(s): Among males, two associations were common to both asthma groups (atopic dermatitis and allergic rhinitis), five unique to mild asthma (urticaria/angioedema, Hymenoptera/bee allergies, allergic conjunctivitis, epilepsy and migraine) and two unique to moderate-to-severe asthma (learning disabilities and ADD/ADHD (Attention-deficit disorder/Attention-deficit/hyperactivity disorder)). Among females, two associations were common to both clinical asthma groups (allergic rhinitis and urticaria/angioedema), and five unique to moderate-to-severe asthma (atopic dermatitis, learning disabilities, ADD/ADHD, anxiety/mood disorders and migraine). Allergic rhinitis was the only condition to be associated with all four groups. Learning disabilities and ADD/ADHD were only associated with moderate-to-severe asthma (but not with mild asthma), in both males and females. Hierarchical clustering analysis uncovered two prominent clusters, separating mild from moderate-to-severe asthma. Conclusion(s): The differences between mild and moderate-to-severe asthma enhance asthma phenotype characterization, with respect to comorbidities, and indicate varied etiologies.Copyright © 2019, © 2019 Taylor & Francis Group, LLC.

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1. **Bedside Postpyloric Placement under Direct Visualization: The Next Generation**  
   Isaacson M. American Journal of Gastroenterology 2020;115:S292-S293.

INTRODUCTION: Roughly 1.2M feeding tubes are placed annually in the US, most of which are placed without direct visualization. The current state within our Network is blind bedside placement with x-ray confirmation. The cost of blind placement is $1.46M annually, with potential additional cost due to complications (airway placement, pneumothorax, death), delayed nutrition/administration of medications, and cost of x-ray. We identified 3 adverse events which occurred over a 3-year time period with blind placement, resulting in 2 deaths and 1 lung placement. Sub-specialty departments have expressed frustration for lack of a "tubes service" in an effort to provide more timely nutrition in a safe manner as well as avoid need for x-rays. METHOD(S): In an effort to improve quality of care to patients, optimize time to tube placement, and ensure accurate placement eliminating need for x-rays, an enteral nutrition platform was implemented with GI fellow training and placement of NG and post-pyloric tubes under direct visualization without the use of endoscopy. The inpatient service received consults for failed bedside NG placements via a specific EPIC order set. Each fellow was required to participate in a demo on proper device use and per form 2 live placements with industry and lead physician providing atelbow assistance. The Program Director developed an instruction sheet which was made a part of the curriculum, Figure 1. with the first 50 placements to be confirmed by x-ray. RESULT(S): The service began in February 2020 and 10 consults had been received thus far. The GI fellows achieved a 100% success using tube with direct visualization. X-ray confirmed proper placement with no adverse events. Average time from consult to placement was 10 hours and time from consult to use was less than 24 hours, Figure 2. Xinying et al reported time from consult to blind placement was an average of ;21 hours. Given the COVID-19 pandemic, fellow training was halted and 2 competent fellows continued to place tubes eliminating the need for transport and x-ray during that critical time. CONCLUSION(S): The tube service was well accepted in our hospital. An initial cost/benefit analysis shows a potential $840.20 in savings per patient (Table 1) with decreased need for x-rays, elimination of adverse events as direct visual capability, earlier time to feeding and decreased length of stay. Further cost/benefit will be analyzed as we expand throughout our very large health system.

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1. **BILATERAL PNEUMOTHORACES IN A PATIENT WITH COVID PNEUMONIA**  
   Ul Haq I. Chest 2020;158:A414.

SESSION TITLE: Global Case Report Posters SESSION TYPE: Global Case Reports PRESENTED ON: October 18-21, 2020 INTRODUCTION: The ongoing outbreak of corona virus disease has affected more than 6 million people in the world. COVID 19 affects people in dramatically different ways. Pneumothorax is an uncommon complication of COVID 19. We present a case of COVID pneumonia complicated with bilateral pneumothoraces CASE PRESENTATION: A 49 years old non smoker patient with no chronic illnesses presented to the emergency department with a dry cough and low-grade fever. His physical examination and initial chest radiograph were normal. He tested positive for COVID 19 and was advised home isolation. One week later he re-presented with a high grade fever, worsening cough and dyspnea. He was found to have hypoxemia with oxygen saturations of 85% on room air. Chest radiograph revealed multiple bilateral lower zone infiltrates consistent with a diagnosis of COVID pneumonia. Lab investigations showed a lymphocyte count of 0.5 x103 /uL, D- dimer of 1.27, CRP of 133 and a ferritin of 8352 mcg/L. He required 15 liters of oxygen and was treated with Hydroxychloroquine, Azithromycin and cefuroxime. In view of risk of rapid deterioration, he received IV tocilizumab, convalescent plasma and IV methylprednisolone. He didn't require mechanical ventilation and his clinical condition gradually improved. He was weaned off from oxygen over a period of 12 days. Two days later he complained of right sided chest pain and increasing shortness of breath. Chest x-ray identified a large right sided pneumothorax with mediastinal shift towards the left. A right sided chest drain was placed, and patient's symptoms improved. The chest drain continued to have an air leak for the next four days. On the fifth day the patient complained of left sided chest pain and a chest radiograph this time confirmed a large left sided pneumothorax. Subsequently a left sided chest tube was inserted. The patient is currently undergoing the above treatment for the pneumothoraces. DISCUSSION: A wide variety of radiological findings in Covid 19 have been reported in different studies. Sana S et al. reviewed imaging findings in 919 Covid-19 positive patients and concluded that predominantly radiological findings in COVID pneumonia include bilateral multilobar ground-glass opacification (GGO) with a peripheral or posterior distribution, mainly in the lower lobes and less frequently within the right middle lobe. None of the patients encountered pneumothorax.1 In a retrospective single center study of 99 patients conducted at Wuhan Jinyintan Hospital only 1 % had pneumothorax.2 We present the first case of bilateral pneumothoraces secondary to COVID 19. CONCLUSION(S): Patients with COVID pneumonia may develop pneumothorax and suspicious cases with any new or worsening dyspnea need to be evaluated promptly for it. Reference #1: 1.Sana Salehi, Aidin Abedi, Sudheer Balakrishnan. Coronavirus Disease 2019 (COVID-19): A Systematic Review of Imaging Findings in 919 Patients. American Journal of Roentgenology (2019): 1-7 Reference #2: 2.Nanshan Chen, Min Zhou, Xuan Dong,et al.Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study. Lancet, 2020, 395(10223) : 507-513 DISCLOSURES: No relevant relationships by Mushtaq Ahmad, source=Web Response No relevant relationships by Shakeel Ahmed, source=Web Response No relevant relationships by Mansoor Hameed, source=Web Response No relevant relationships by Irfan Ul Haq, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Bilateral pneumothorax as possible atypical presentation of coronavirus disease 2019 (COVID-19)**  
   Ahluwalia Amrit S. Respiratory medicine case reports 2020;31:101217.

Coronavirus disease 2019 (COVID-19) is most frequently associated with a mild presentation of fever, cough, and shortness of breath. Typical radiographic findings of COVID-19 are bilateral ground-glass opacities on computed tomography (CT) scans. However, there have been instances of pneumothorax, giant bulla, and pneumomediastinum, mainly in elderly COVID-19 patients and predominately occurring at least one week after symptom onset. Here, we report a case where a healthy, young Hispanic man presented with three days of fever, cough, and dyspnea. On admission to the emergency department, he was found to have bilateral pneumothoraces, pneumomediastinum, and pneumopericardium requiring bilateral chest tubes. The patient had no predisposing risk factors for pneumothorax, such as a history of trauma, smoking, past intubations, asthma, high pressure oxygen delivery, or a history of prior pneumothorax. The only positive diagnostic test was a SARS-CoV-2 test by real-time reverse transcriptase-polymerase chain reaction assay. This case highlights the potential atypical presentation of a COVID-19 infection and is the first reported case, to our knowledge, that features bilateral spontaneous pneumothoraces, pneumomediastinum, and pneumopericardium as a probable rare presentation of COVID-19. Copyright © 2020 The Authors.

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1. **Bronchopleural fistula development in the setting of novel therapies for acute respiratory distress syndrome in SARS-CoV-2 pneumonia**  
   Placik Daniel A. Radiology case reports 2020;15:2378-2381.

COVID-19 pneumonia has demonstrated a wide spectrum of clinical presentations that has yet to be completely uncovered. We discuss the case of a 49-year-old male who presented to the emergency department with fever, cough, and shortness of breath. Initial chest X-ray suggested viral pneumonia that was confirmed to be due to COVID-19. He was treated with empiric antibiotics, antiviral therapy, high-dose glucocorticoids, and interleukin antagonists. Two weeks into the patient's hospital course, he rapidly decompensated with subsequent chest X-ray and CT chest confirming tension pneumothorax with bronchopleural fistula. Intraoperative samples of the necrotic empyema identified mucormycosis invading the lung parenchyma with follow-up microbiology results confirming Rhizopus species. In this case report, we explore the possibility that the patient's immunocompromised state may have contributed to the patient's development of mucormycosis and subsequent development of bronchopleural fistula. Copyright Published by Elsevier Inc. on behalf of University of Washington.

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1. **Bulla Formation and Tension Pneumothorax in a Patient with COVID-19**  
   Yasukawa Kosuke The American journal of tropical medicine and hygiene 2020;103:943-944.

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1. **Burden and spectrum of paediatric respiratory diseases at a referral hospital in North-Central Nigeria - A five year review**  
   Ibraheem R. M. African Journal of Emergency Medicine 2020;10:3-7.

Introduction: Globally respiratory diseases, comprising a broad range of disease conditions due to infectious and non-infectious causes, are a major cause of childhood morbidity and mortality. Thus, identification of the burden of respiratory illness will ensure appropriate interventions towards reducing its attendant morbidity and mortality. The study was conducted to identify the burden, spectrum and outcome of respiratory diseases in hospitalized children at University of Ilorin Teaching Hospital, North-Central Nigeria. Method(s): A retrospective descriptive cross-sectional study involving children admitted through the emergency paediatric unit over five years (January 2013-December 2017) was conducted. Data on demography, diagnosis, co-morbidities and complications, duration of admission, and outcome were collected and analyzed using SPSS 20. Result(s): Of the total 7012 children admitted, 1939(27.7%) were due to respiratory diseases with a median age of 16 (interquartile range {IQR} 7-36) months. Males were 994(51.3%) and 945(48.7%) females. Infectious diseases were the most common cause of admission. Pneumonia (50.1%) and aspiration pneumonitis (5.1%) accounted for the highest admissions due to infective and non-infective respiratory diseases respectively. Overall, respiratory diseases accounted for 20.7% (119/574) of the overall mortality among all admissions while the all-respiratory disease mortality was 6.1% (119/1939). The major contributors to mortality were pneumonia, aspiration pneumonitis and tuberculosis accounting for 81(68.1%), 12(10.1%) and nine (7.6%) deaths respectively. The median duration of hospital stay was four days [IQR: 2 to 6 days]. A significantly higher proportion of the deaths occurred with four days of admission and 82.4% of the deaths occurred among those aged less than five years. A higher number of females (70, 58.8%) died compared to males (49, 41.2%), p=0.05. Conclusion(s): Pneumonia and aspiration pneumonitis are major contributors to morbidity and mortality due to respiratory diseases for which interventions towards improving childhood health indices should be prioritized.Copyright © 2020 African Federation for Emergency Medicine

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1. **Case report of sequential bilateral spontaneous pneumothorax in a never-ventilated, lung-healthy COVID-19-patient**  
   Caviezel Claudio International journal of surgery case reports 2020;75:441-445.

INTRODUCTION: Patients with COVID-19 infection and severe lung parenchyma alterations may need mechanical ventilation with subsequent pneumothorax and eventually persistent air leak in case of pre-existing lung disease., PRESENTATION OF CASE: This report presents the case of a never-ventilated 58 years old male patient without pre-existing, underlying lung disease demonstrating severe lung parenchyma changes due to COVID-19-pneumonia. He suffered from recurrent bilateral spontaneous pneumothoraces, which were successfully treated with bilateral thoracoscopy and resections of the destroyed lung areas. Notably, he has already been under treatment with anticoagulation due to portal thrombosis 8 years ago., DISCUSSION: Although especially know from patients under mechanical ventilation, this patient suffered from spontaneous pneumothorax without ever been ventilated. Probably due to the severe vascular inflammatory changes and focal endothelitis like also seen in other organs of COVID-19 patients, the pneumothorax may lead to a prolonged air leak, which needs surgical therapy. The patients pre-existing anticoagulation therapy may prevented him from a mere severe course., CONCLUSION: Early surgical therapy may be considered in COVID-19 patients with persistent air leak, even if not mechanically ventilated. Simultaneously, the role of early anticoagulation needs further investigation. Copyright © 2020 The Authors. Published by Elsevier Ltd.. All rights reserved.

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1. **Case Report: COVID-19-Associated Bilateral Spontaneous Pneumothorax-A Literature Review**  
   Alhakeem A. American Journal of Tropical Medicine and Hygiene 2020;103:1162-1165.

COVID-19 is a pandemic caused by SARS-CoV-2, primarily affecting the respiratory tract. Pulmonary complications of COVID-19 may include acute respiratory distress syndrome and pulmonary embolism. Pneumothorax has been recently reported in association with COVID-19. We report a case of COVID-19 pneumonia with bilateral spontaneous pneumothorax with no known underlying lung disease or risk factors.Copyright © 2020 by The American Society of Tropical Medicine and Hygiene

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1. **Case Report: COVID-19-Associated Bilateral Spontaneous Pneumothorax-A Literature Review**  
   Alhakeem Ayat The American journal of tropical medicine and hygiene 2020;103:1162-1165.

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1. **Case Report: COVID-19-Related Pneumothorax-Case Series Highlighting a Significant Complication**  
   Al-Shokri Shaikha D. The American journal of tropical medicine and hygiene 2020;103:1166-1169.

COVID-19 is a recent outbreak in China and rapidly spread worldwide. Lung consolidation is the most common radiologic finding of COVID-19 pneumonia. Pneumothorax has been rarely reported as a complication of severe COVID-19 pneumonia. Early recognition and management are detrimental to the outcome. We here report three cases of SARS-CoV-2 infection complicated by pneumothorax. In addition, we present a brief literature review.

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1. **Case Report: Pneumothorax and Pneumomediastinum as Uncommon Complications of COVID-19 Pneumonia-Literature Review**  
   Quincho-Lopez Alvaro The American journal of tropical medicine and hygiene 2020;103:1170-1176.

As the COVID-19 pandemic progresses, awareness of uncommon presentations of the disease increases. Such is the case with pneumothorax and pneumomediastinum. Recent evidence suggested that these can occur in the context of COVID-19 pneumonia, even in the absence of mechanical ventilation-related barotrauma. We present two patients with COVID-19 pneumonia complicated by pneumomediastinum. The first patient was a 55-year-old woman who developed COVID-19 pneumonia. Her clinical course was complicated by pneumothorax and pneumomediastinum, and, unfortunately, she died 2 days following the admission. The second patient was a 31-year-old man who developed a small pneumomediastinum and was managed conservatively. He had a spontaneous resolution of the pneumomediastinum and was discharged 19 days later. None of our patients required invasive or noninvasive positive pressure ventilation. We performed a literature review of COVID-19 pneumonia cases that developed pneumothorax, pneumomediastinum, or both. The analysis showed that the latter had high mortality (60%). Thus, it is necessary to pay attention to these complications as early identification and management can reduce the associated morbidity and mortality.

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1. **Case report: Spontaneous pneumothorax in resolved, uncomplicated COVID-19 Pneumonia-A literature review**  
   Dennison Jennifer Respiratory medicine case reports 2020;31:101291.

As the global COVID-19 pandemic has progressed, awareness of uncommon presentations and complications has increased. The actual incidence of spontaneous pneumothorax was found to be 0.66%, or six patients out of 902 who tested positive in recently published literature of 3368 patients (Zantah M, Dominguez Castillo E, Townsend R, Dikengil F, Criner GJ. Pneumothorax in COVID-19 disease-incidence and clinical characteristics. Respir Res. 2020 Sep 16; 21 (1):236.). Of those six patients, only two (0.22%) were not associated with mechanical ventilation barotrauma or comorbid lung disease such as COPD. Here, we present a spontaneous pneumothorax and pneumomediastinum in a patient four days after he had been discharged from hospitalization due to uncomplicated COVID-19 pneumonia. Copyright © 2020 The Authors.

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1. **Challenges and opportunities for lung ultrasound in novel Coronavirus disease (COVID-19)**  
   Schultz M. J. American Journal of Tropical Medicine and Hygiene 2020;102:1162-1163.

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1. **Chest Computed Tomography Findings in COVID-19 and Influenza: A Narrative Review**  
   Onigbinde Stephen O. BioMed research international 2020;2020:6928368.

Objective: The COVID-19 pandemic and annual influenza epidemic are responsible for thousands of deaths globally. With a similarity in clinical as well as laboratory findings, there is a need to differentiate these two conditions on chest CT scan. This paper attempts to use existing literature to draw out differences in chest CT findings in COVID-19 and influenza., Methods: A search was conducted using PubMed. 17 original studies on chest CT findings in COVID-19 and influenza were identified for full-text review and data analysis. Findings. COVID-19 and influenza share similar chest CT findings. The differences found show that COVID-19 ground-glass opacities are usually peripherally located with the lower lobes being commonly involved, while influenza has a central, peripheral, or random distribution usually affecting the five lobes. Vascular engorgement, pleural thickening, and subpleural lines were reported in COVID-19 patients. In contrast, pneumomediastinum and pneumothorax were reported only in studies on influenza. Conclusion and Relevance. COVID-19 and influenza have overlapping chest CT features with few differences which can assist in telling apart the two pathologies. Additional studies are needed to further define the differences and degree between COVID-19 and influenza. Copyright © 2020 Stephen O. Onigbinde et al.

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1. **Chest CT findings of COVID-19 pneumonia by duration of symptoms**  
   Ding X. European Journal of Radiology 2020;127:109009.

Purpose: To evaluate lung abnormalities on thin-section computed tomographic (CT) scans in patients with COVID-19 and correlate findings to duration of symptoms. Method(s): In total, 348 CT scans in 112 patients were classified according to the time after the onset of the initial symptoms, namely stage-1 (0-4 days); stage-2 (5-9 days); stage-3 (10-14 days); stage-4 (15-21 days); stage-5 (22-28 days); and stage-6 (28 days). Each lung lobe was evaluated for extent affected by ground-glass opacities (GGO), crazy-paving pattern and consolidation, in five categories of percentual severity. Summation of scores from all five lung lobes provided the total CT score (maximal CT score, 25). Result(s): The predominant patterns of lung abnormalities were GGOs, crazy-paving pattern, consolidation and linear opacities. The frequency of crazy-paving pattern, consolidation and linear opacities peaked at stage-3 (62.7 %), stage-4 (75.0 %) and stage-5 (83.1 %), respectively, and decreased thereafter. Total CT scores increased from stage-1 to stage-2 (2.8 +/- 3.1, vs. 6.5 +/- 4.6, respectively, P < 0.01), and thereafter remained high. The lower lobes were more inclined to be involved with higher CT scores except for stage-1. At stage-6 98.1 % of CT scans still showed abnormalities (CT score 7.5 +/- 4.1). Conclusion(s): Thin-section CT could provide semi-quantitative analysis of pulmonary damage severity. This disease changed rapidly at the early stage, then tended to be stable and lasted for a long time.Copyright © 2020 Elsevier B.V.

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1. **Chest drain insertion following pneumothorax due to CPR in a COVID - 19 patient**  
   Kaisy Maythem Abdulhassan Al Visual journal of emergency medicine 2020;21:100862.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=47712fa5f0e3aabdb29c823fda0c3771)

1. **Chest Imaging in Patients Hospitalized With COVID-19 Infection - A Case Series**  
   Bhat R. Current Problems in Diagnostic Radiology 2020;49:294-301.

COVID-19 (Corona Virus Disease-19) is a zoonotic illness first reported in the city of Wuhan, China in December 2019, and is now officially a global pandemic as declared by the World Health Organization. The infection is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19 infected patients can be asymptomatic carriers or present with mild-to-severe respiratory symptoms. Imaging, including computed tomography is not recommended to screen/diagnose COVID-19 infections, but plays an important role in management of these patients, and to rule out alternative diagnoses or coexistent diseases. In our multicenter case series, we outline the clinical presentations and illustrate the most common imaging manifestations in patients hospitalized with COVID-19.Copyright © 2020 Elsevier Inc.

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1. **Chest radiographic spectrum of covid-19 among pediatric patients: Experience in tertiary care hospital**  
   Tariq A. Pakistan Paediatric Journal 2020;44:4-5.

Objective: The aim of this study was to evaluate the chest radiograph findings in children with PCR proven SARS-Cov-2 (COVID-19) infection admitted in Children hospital Lahore. Study Design: A Cross-sectional observational study. Place and Duration of Study: The study was conducted in Children's Hospital and The Institute of Child Health, Lahore from May 01, 2020 to July 31, 2020 after approval from the Institutional review board. Material(s) and Method(s): A total of 51 pediatric patients between 0 and 16 years of age were included in the study. Chest radiographs at the time of presentation were evaluated regarding the type of abnormality and distribution. Result(s): 25 (49%) patients had normal chest radiographs. Positive findings were detected in radiographs of 26 (50.9%) patients. Among the patients who had positive findings, Bilateral symmetrical changes were observed in 12 (46%) patients. Bilateral and asymmetric involvement was detected in 14 (53.8%) patients. Parenchymal haze was observed in 13 (50%) patients, parenchymal consolidation was seen in 13 (50%). Atelectasis in 05 (19.2%), pleural effusion in 05 (19.2%), parenchymal infiltrates in 02 (7.7%) and pneumothorax in 01 (3.8%) patient. The involvement of the middle and lower lobes was predominant finding in pediatric population however peripheral / sub-pleural involvement was not a typical pattern. Conclusion(s): COVID-19 Chest Radiography findings differ in the pediatric population from adults. Findings are nonspecific and are overlapping with other viral pneumonias. Therefore, Chest radiograph cannot be used as a screening or diagnostic tool. .

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1. **Chest X-ray findings monitoring COVID-19 disease course and severity**  
   Yasin R. Egyptian Journal of Radiology and Nuclear Medicine 2020;51:193.

Background: Coronavirus related respiratory illness usually manifests clinically as pneumonia with predominant imaging findings of an atypical or organizing pneumonia. Plain radiography is very helpful for COVID-19 disease assessment and follow-up. It gives an accurate insight into the disease course. We aimed to determine the COVID-19 disease course and severity using chest X-ray (CXR) scoring system and correlate these with patients' age, sex, and outcome. Result(s): In our study, there were 350 patients proven with positive COVID-19 disease; 220 patients (62.9%) had abnormal baseline CXR and 130 patients (37.1%) had normal baseline CXR. During follow-up chest X-ray studies, 48 patients (13.7%) of the normal baseline CXR showed CXR abnormalities. In abnormal chest X-ray, consolidation opacities were the most common finding seen in 218 patients (81.3%), followed by reticular interstitial thickening seen in 107 patients (39.9%) and GGO seen in 87 patients (32.5%). Pulmonary nodules were found 25 patients (9.3%) and pleural effusion was seen in 20 patients (7.5%). Most of the patients showed bilateral lung affection (181 patients, 67.5%) with peripheral distribution (156 patients, 58.2%) and lower zone affection (196 patients, 73.1%). The total severity score was estimated in the baseline and follow-up CXR and it was ranged from 0 to 8. The outcome of COVID-19 disease was significantly related to the age, sex, and TSS of the patients. Male patients showed significantly higher mortality rate as compared to the female patients (P value 0.025). Also, the mortality rate was higher in patients older than 40 years especially with higher TSS. Conclusion(s): Radiographic findings are very good predictors for assessing the course of COVID-19 disease and it could be used as long-term consequences monitoring.Copyright © 2020, The Author(s).

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1. **Chest x-rays findings in covid 19 patients at a university teaching hospital-a descriptive study**  
   Durrani M. Pakistan Journal of Medical Sciences 2020;36:S22-S26.

Objective: To analyze Chest X-ray findings in COVID 19 positive patients, presented at corona filtration center, Benazir Bhutto Hospital Rawalpindi, based on CXR classification of British Society of Thoracic Imaging (BSTI). Method(s): In this study, all RT-PCR COVID-19 positive patients screened at corona filtration center, Benazir Bhutto hospital Rawalpindi from 20th March 2020 to 10th April 2020 were included. Mean age of the cohort with age range was calculated. Presenting complaints & Co-morbid were analyzed and tabulated in frequencies and percentages. Portable CXR findings were classified according to BSTI classification and documented in frequencies and percentages. Result(s): Mean age of the patients was 44 years. Presenting complaints were cough 20 (67%), fever 18 (60%), shortness of breath 11 (37%), sore throat six (20%), loss of sense of taste and smell four(13%). Main co-morbid was hypertension six (20%). Two (7%) patients had normal and seven (23%) had classical COVID CXRs. 21 (70%) patients were in indeterminate group with only one (3%) having unilateral lung disease. Three (10%) patients had diffuse lung involvement and 18(60%) had peripheral lung involvement. Majority of patients 19 (63%), had bilateral middle and lower zonal involvement. Conclusion(s): In this study, COVID-19 CXRs generally manifested a spectrum of pure ground glass, mixed ground glass opacities to consolidation in bilateral peripheral middle and lower lung zones. BSTI CXR reporting classification of COVID-19 is valid in our patients with addition of middle zonal involvement in classical COVID-19 criteria as opposed to just lower zone involvement.Copyright © 2020, Professional Medical Publications. All rights reserved.

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1. **Chest-X-ray is a mainstay for follow-up in critically ill patients with covid-19 induced pneumonia**  
   de Barry O. European Journal of Radiology 2020;129:109075.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=ab61720a2c683fdac2511067bcab18d4)

1. **Chinese Society of Anesthesiology Expert Consensus on Anesthetic Management of Cardiac Surgical Patients With Suspected or Confirmed Coronavirus Disease 2019**  
   He Y. Journal of Cardiothoracic and Vascular Anesthesia 2020;34:1397-1401.

The outbreak of a new coronavirus (severe acute respiratory syndrome coronavirus 2 [SARS-CoV-2]) in China in December 2019 has brought serious challenges to disease prevention and public health. Patients with severe coronavirus disease 2019 (COVID-19) who undergo cardiovascular surgery necessitate extremely high demands from anesthesia personnel, and face high risks of mortality and morbidity. Based on the current understanding of COVID-19 and the clinical characteristics of cardiovascular surgical patients, the authors provide anesthesia management guidelines for cardiovascular surgery along with the prevention and control of COVID-19.Copyright © 2020 Elsevier Inc.

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1. **Chronic pulmonary diseases and COVID-19**  
   Cakir Edis E. Turkish Thoracic Journal 2020;21:345-349.

Over the past few months, coronavirus disease 2019 (COVID-19) has assumed the character of a pandemic, leading to significant global mortality mostly because of COVID-19-related pneumonia. Pneumonia is likely to progress more severely in patients with underlying chronic lung disease. The purpose of this review is to discuss the management strategies in patients with chronic lung disease such as chronic obstructive pulmonary disease, asthma, pleural diseases, and obstructive sleep apnea during the COVID-19 pandemic, with current literatures and international guidelines.Copyright © 2020 by Turkish Thoracic Society.

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1. **Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia**  
   Zhu Huaping Translational pediatrics 2020;9:51-60.

Background: The newly identified 2019-nCoV, which appears to have originated in Wuhan, the capital city of Hubei province in central China, is spreading rapidly nationwide. A number of cases of neonates born to mothers with 2019-nCoV pneumonia have been recorded. However, the clinical features of these cases have not been reported, and there is no sufficient evidence for the proper prevention and control of 2019-nCoV infections in neonates., Methods: The clinical features and outcomes of 10 neonates (including 2 twins) born to 9 mothers with confirmed 2019-nCoV infection in 5 hospitals from January 20 to February 5, 2020 were retrospectively analyzed., Results: Among these 9 pregnant women with confirmed 2019-nCoV infection, onset of clinical symptoms occurred before delivery in 4 cases, on the day of delivery in 2 cases, and after delivery in 3 cases. In most cases, fever and a cough were the first symptoms experienced, and 1 patient also had diarrhea. Of the newborns born to these mothers, 8 were male and 2 were female; 4 were full-term infants and 6 were born premature; 2 were small-for-gestational-age (SGA) infants and 1 was a large-for-gestational-age (LGA) infant; there were 8 singletons and 2 twins. Of the neonates, 6 had a Pediatric Critical Illness Score (PCIS) score of less than 90. Clinically, the first symptom in the neonates was shortness of breath (n=6), but other initial symptoms such as fever (n=2), thrombocytopenia accompanied by abnormal liver function (n=2), rapid heart rate (n=1), vomiting (n=1), and pneumothorax (n=1) were observed. Up to now, 5 neonates have been cured and discharged, 1 has died, and 4 neonates remain in hospital in a stable condition. Pharyngeal swab specimens were collected from 9 of the 10 neonates 1 to 9 days after birth for nucleic acid amplification tests for 2019-nCoV, all of which showed negative results., Conclusions: Perinatal 2019-nCoV infection may have adverse effects on newborns, causing problems such as fetal distress, premature labor, respiratory distress, thrombocytopenia accompanied by abnormal liver function, and even death. However, vertical transmission of 2019-nCoV is yet to be confirmed. Copyright 2020 Translational Pediatrics. All rights reserved.

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1. **Clinical Characteristics and Outcome of Pneumomediastinum in Patients with COVID-19 Pneumonia**  
   Kangas-Dick A. Journal of laparoendoscopic & advanced surgical techniques. Part A 2020;:No page numbers.

Introduction: Pneumomediastinum (PM) is characterized by the presence of air within the mediastinum. The association between PM and coronavirus 2019 (COVID-19) has not been well established in the current literature. We sought to summarize the limited body of literature regarding PM in patients with COVID-19 and characterize the presentation and clinical outcomes of PM in patients with severe acute respiratory syndrome (SARS)-COV-2 pneumonia at our institution to better define the incidence, prognosis, and available treatment for this condition. Material(s) and Method(s): All patients with a proven diagnosis of COVID-19 and PM between March 18, 2020 and May 5, 2020 were identified through hospital records. Retrospective analysis of radiology records and chart review were conducted. Clinical characteristics and outcomes were collected and descriptive statistics was analyzed. Result(s): Thirty-six patients met inclusion criteria. Out of the 346 intubated COVID-19 patients, 34 (10%) had PM. The incidence of PM increased for the first 4 weeks of the pandemic, and then began to decrease by week 5. At the endpoint of the study, 12 (33.33%) patients were alive and 24 patients (66.67%) had died. Conclusion(s): PM, although a rare phenomenon, was more prevalent in COVID-19 patients compared with historical patients with adult respiratory distress syndrome. The etiology of this condition may be attributed to higher susceptibility of patients infected with SARS-CoV-2 to a combination of barotrauma and airway injury.

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1. **CLINICAL CHARACTERISTICS AND OUTCOME OF PNEUMOTHORAX IN PATIENTS WITH COVID-19 PNEUMONIA**  
   Kangas-Dick A. Chest 2020;158:A2648.

SESSION TITLE: Cardiothoracic Surgery Posters SESSION TYPE: Original Investigation Posters PRESENTED ON: October 18-21, 2020 PURPOSE: Pneumothorax (PTX) is characterized by the presence of air within the pleural space. The association between PTX and COVID-19 has not been well established in the current literature. We sought to better characterize the presentation and clinical outcomes of PTX in patients with confirmed SARS-COV-2 pneumonia at our institution to better define the incidence, cause, outcomes and available treatment for this condition. METHOD(S): All patients with a proven diagnosis of COVID19 and concomitant PTX between March 17, 2020 and May 5, 2020 were identified through hospital records. Retrospective analysis of radiology records and chart review was conducted. Clinical characteristics and outcomes were collected and descriptive statistics were analyzed. RESULT(S): 63 patients met inclusion criteria. Median age was 65.5 years (IQR 54-74.75). The most prevalent medical comorbidities were hypertension (53%, n=33), diabetes mellitus (47.6%, n=30), and hyperlipidemia (31.7%, n=20). 55 patients (87.3%) required mechanical ventilation. Of these PTX was diagnosed after intubation in 54 (98.2%). This reflected 20.83% of the total 264 intubated patients at our institution during the study period. Median positive end -expiratory pressure on the day of PTX diagnosis was 10 (IQR10-15).An invasive procedure with potential to cause iatrogenic PTX had been performed in only 15.6% (n=10) of the 63 patients on the day of or the day prior to the PTX. Chest tubes were placed in 57 (90.4%) patients. 51 patients were admitted to the ICU (81.0%) patients and of those 40 (78.4%) died. Median ICU and Hospital Lengths of stay were 16.5 (5-24.5) and 17 (5-26) days, respectively. At the end of data collection (6/1/2020), 8 (12.6%) patients remained admitted to the hospital, 8 patients (12.6%) were discharged, and 47 patients (74.6%) had died. Risk factors associated with mortality were Age >65 years (OR 16.0 (1.5-170.22) p=0.022) and concurrent renal failure (OR 11.11 (2.5-49.13) p-0.002). CONCLUSION(S): Compared to historical series in acutely ill patients with ARDS, PTX was found in higher incidence among patients with COVID-19. Older age and concurrent renal failure were found as significant contributors to mortality. Compared to all intubated patients with COVID-19 at our institution, the ICU mortality associated with this condition is elevated (59% vs 78.4%, p=0.0099). CLINICAL IMPLICATIONS: With the looming possibility of a second wave of COVID-19, we feel that this information is vitally important to share with the scientific community as Pneumothorax may be associated with worse clinical outcomes. DISCLOSURES: No relevant relationships by Victor Gazivoda, source=Web Response No relevant relationships by MUDATHIR IBRAHIM, source=Web Response No relevant relationships by Aaron Kangas-Dick, source=Web RCopyright © 2020 American College of Chest Physicians

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1. **Clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia in Wuhan, China: a single-centered, retrospective, observational study**  
   Yang Xiaobo The Lancet. Respiratory medicine 2020;8:475-481.

BACKGROUND: An ongoing outbreak of pneumonia associated with the severe acute respiratory coronavirus 2 (SARS-CoV-2) started in December, 2019, in Wuhan, China. Information about critically ill patients with SARS-CoV-2 infection is scarce. We aimed to describe the clinical course and outcomes of critically ill patients with SARS-CoV-2 pneumonia., METHODS: In this single-centered, retrospective, observational study, we enrolled 52 critically ill adult patients with SARS-CoV-2 pneumonia who were admitted to the intensive care unit (ICU) of Wuhan Jin Yin-tan hospital (Wuhan, China) between late December, 2019, and Jan 26, 2020. Demographic data, symptoms, laboratory values, comorbidities, treatments, and clinical outcomes were all collected. Data were compared between survivors and non-survivors. The primary outcome was 28-day mortality, as of Feb 9, 2020. Secondary outcomes included incidence of SARS-CoV-2-related acute respiratory distress syndrome (ARDS) and the proportion of patients requiring mechanical ventilation., FINDINGS: Of 710 patients with SARS-CoV-2 pneumonia, 52 critically ill adult patients were included. The mean age of the 52 patients was 59.7 (SD 13.3) years, 35 (67%) were men, 21 (40%) had chronic illness, 51 (98%) had fever. 32 (61.5%) patients had died at 28 days, and the median duration from admission to the intensive care unit (ICU) to death was 7 (IQR 3-11) days for non-survivors. Compared with survivors, non-survivors were older (64.6 years [11.2] vs 51.9 years [12.9]), more likely to develop ARDS (26 [81%] patients vs 9 [45%] patients), and more likely to receive mechanical ventilation (30 [94%] patients vs 7 [35%] patients), either invasively or non-invasively. Most patients had organ function damage, including 35 (67%) with ARDS, 15 (29%) with acute kidney injury, 12 (23%) with cardiac injury, 15 (29%) with liver dysfunction, and one (2%) with pneumothorax. 37 (71%) patients required mechanical ventilation. Hospital-acquired infection occurred in seven (13.5%) patients., INTERPRETATION: The mortality of critically ill patients with SARS-CoV-2 pneumonia is considerable. The survival time of the non-survivors is likely to be within 1-2 weeks after ICU admission. Older patients (>65 years) with comorbidities and ARDS are at increased risk of death. The severity of SARS-CoV-2 pneumonia poses great strain on critical care resources in hospitals, especially if they are not adequately staffed or resourced., FUNDING: None. Copyright © 2020 Elsevier Ltd. All rights reserved.

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1. **Clinical course of coronavirus disease 2019 in 11 patients after thoracic surgery and challenges in diagnosis**  
   Peng S. Journal of Thoracic and Cardiovascular Surgery 2020;160:585.

Objectives: To illustrate the clinical course and difficulties in early diagnosis of coronavirus disease 2019 (COVID-19) in patients after thoracic surgery. Method(s): We retrospectively analyzed the clinical course of the first 11 patients diagnosed with COVID-19 after thoracic surgery in early January 2020. Postoperative clinical, laboratory, and radiologic records and the time line of clinical course were summarized. Potential prognostic factors were evaluated. Result(s): In the 11 confirmed cases (3 female, 8 male), median days from symptom onset to case detection was 8. Insidious symptom onset and misinterpreted postoperative changes on chest computed tomography (CT) resulted in delay in diagnosis. There were 3 fatalities due to respiratory failure, whereas 4 severe and 4 mild cases recovered and were discharged. All patients had once experienced leukocytosis and eosinopenia. Remittent fever and resected lung segments >=5 were associated with fatality. Conclusion(s): The case fatality rate of postsurgical patients subsequently diagnosed with COVID-19 was 27.3%. Insidious symptom onset, postoperative leukocytosis with lymphopenia, and postsurgical CT changes overshadowed the early signs of viral pneumonia. Dynamic symptom monitoring, serial chest CTs, and tests for viral RNA and serum antibody improve the chance for prompt detection of COVID-19. Consideration should be given to preadmission and preoperative screening and strict contact isolation during the postoperative period.Copyright © 2020 The American Association for Thoracic Surgery

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1. **Clinical features, diagnosis and treatment of COVID-19**  
   Ali J. Biol Clin Sci Res J 2020;2020:e032.

1. **Clinical outcomes of pleural drainage on pneumothorax and hydrothorax in critically ill patients with COVID-19: A case series with literature review**  
   Xu Yuan Heart & lung : the journal of critical care 2020;50:213-219.

BACKGROUND: For patients with COVID-19, pneumothorax and hydrothorax are suggested to be negative prognostic indicators. However, the management of these two conditions has rarely been discussed. We aimed to describe the clinical outcomes of pleural drainage in critically ill patients with COVID-19., METHODS: A total of 17 pleural drainages were performed in 11 critically ill patients with pneumothorax or hydrothorax. Either chest tubes or central venous catheters (CVCs) were used. The clinical outcomes, including respiratory and circulation indicators at 24 h and 1 h before the procedure and 24 h and 48 h after the procedure, were retrospectively recorded., RESULTS: (1) Following pleural drainage, there was a 19.1% improvement in the PaO2/FiO2 ratio from 147.4 mmHg (-1 h) to 175.5 mmHg (24 h), while the mean positive end expiratory pressure (PEEP) decreased from 10.7 cmH2O (-1 h) to 8.9 cmH2O (24 h) and 8.1 cmH2O (48 h). The A-a gradients decreased from 313.3 mmHg (-1 h) to 261.3 mmHg (24 h). (2) The dosage of norepinephrine increased from 0.15 mug/kg/min (-1 h) to 0.40 mug/kg/min (24 h). (3) No haemorrhagic or infectious complications were observed. (4) A total of 41.6% of CVCs were partially or fully obstructed, while no chest tubes were obstructed., CONCLUSION: For critically ill patients with COVID-19, pleural drainage leads to a significant improvement in oxygenation and gas exchange, but the deterioration of circulation is not reversed. It is safe to perform pleural drainage even though anticoagulation therapy and glucocorticoids are widely used. Chest tubes rather than CVCs are recommended. Copyright © 2020. Published by Elsevier Inc.

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1. **Clinical presentation and prognostic analysis of adult patients with Langerhans cell histiocytosis with pulmonary involvement**  
   Miao Hui-Lei BMC cancer 2020;20:911.

BACKGROUND: The study aimed to investigate the clinical features and prognosis factors of adult patients with Langerhans cell histiocytosis (LCH) with pulmonary involvement, especially multisystem (MS) LCH with pulmonary involvement., METHODS: We retrospectively analyzed the demographic materials, clinical features and treatment outcomes of 119 adult LCH patients with pulmonary involvement at our center from January 1990 to November 2019., RESULTS: Among 119 patients, 13 (10.9%) had single-system (SS) LCH, and 106 (89.1%) had MS-LCH with pulmonary involvement. SS-LCH patients had higher smoking rate (84.6% vs 52.8%, P = 0.026) and smoking index (300 vs 200, P = 0.019) than MS-LCH patients. The percentage of respiratory symptoms of SS-LCH patients was higher than MS-LCH patients (84.6% vs 53.8%, P = 0.034). Pulmonary function was impaired in 83.8% of the patients, and DLCO was the parameter most frequently impaired, accounting for 81.1%. The median DLCO was 65.1% predicted. Patients with pneumothorax had significantly worse DLCO (P = 0.022), FEV1 (P = 0.000) and FEV1/FVC (P = 0.000) than those without pneumothorax. During the follow-up, 72.4% of the patients had stable pulmonary function, and 13.8% showed improvements after chemotherapy. The estimated 3-year OS and EFS were 89.7 and 58.3%, respectively. Patients with a baseline FEV1 <= 55% predicted had worse OS. A history of pneumothorax indicated worse EFS and cytarabine based therapy predicted better EFS., CONCLUSIONS: An FEV1 <= 55% predicted and a history of pneumothorax at diagnosis indicated a poor prognosis. Cytarabine based regimen may arrest the decline in pulmonary function in LCH patients with pulmonary involvement and improve EFS.

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1. **Clinical Use and Barriers of Thoracic Ultrasound: A Survey of Italian Pulmonologists**  
   Zanforlin Alessandro Respiration; international review of thoracic diseases 2020;99:171-176.

INTRODUCTION: Thoracic ultrasound is accurate in the diagnosis of a wide range of respiratory diseases. Yet the extent of its use is unknown. Through a national survey, we aimed to explore the clinical use of thoracic ultrasound and the barriers to the diffusion of the technique in Italy., METHODS: Accademia di Ecografia Toracica (AdET) developed a self-administered survey which was sent by email to Italian pulmonologists via national scientific societies and networks., RESULTS: Of the 2010 physicians invited, 514 completed the survey (26% response rate). According to 99% of responders, thoracic ultrasound had a relevant clinical role. Seventy-nine percent of the responders used thoracic ultrasound at least once a month. The main settings were: 53% pulmonology ward, 15% outpatient clinic, 15% interventional pulmonology room, 10% internal medicine ward, 4% respiratory intensive care units, and 9% other. Thoracic ultrasound was primarily used: (1) with both diagnostic and interventional aims (72%), (2) as diagnostic imaging (17%), and (3) as guidance for interventional procedures (11%). The main clinical applications were: (1) diagnosis and management of pleural effusion, (2) pneumothorax, (3) pneumonia, (4) cardiac failure, and (5) acute dyspnea. Twenty-one percent of the responders do not use thoracic ultrasound. The main reported bar-riers were: (1) availability of an ultrasound system (52%), (2) lack of protected time and training (22%), and (3) use of the technique by other specialists (15%)., CONCLUSION: Thoracic ultrasound is widely used by Italian pulmonologists and considered a clinically relevant tool. The availability of dedicated ultrasound systems seems to be a major limit of the use of the technique. Copyright © 2020 S. Karger AG, Basel.

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Introduction: Thoracic ultrasound is accurate in the diagnosis of a wide range of respiratory diseases. Yet the extent of its use is unknown. Through a national survey, we aimed to explore the clinical use of thoracic ultrasound and the barriers to the diffusion of the technique in Italy. Method(s): Accademia di Ecografia Toracica (AdET) developed a self-administered survey which was sent by email to Italian pulmonologists via national scientific societies and networks. Result(s): Of the 2010 physicians invited, 514 completed the survey (26% response rate). According to 99% of responders, thoracic ultrasound had a relevant clinical role. Seventy-nine percent of the responders used thoracic ultrasound at least once a month. The main settings were: 53% pulmonology ward, 15% outpatient clinic, 15% interventional pulmonology room, 10% internal medicine ward, 4% respiratory intensive care units, and 9% other. Thoracic ultrasound was primarily used: (1) with both diagnostic and interventional aims (72%), (2) as diagnostic imaging (17%), and (3) as guidance for interventional procedures (11%). The main clinical applications were: (1) diagnosis and management of pleural effusion, (2) pneumothorax, (3) pneumonia, (4) cardiac failure, and (5) acute dyspnea. Twenty-one percent of the responders do not use thoracic ultrasound. The main reported bar-riers were: (1) availability of an ultrasound system (52%), (2) lack of protected time and training (22%), and (3) use of the technique by other specialists (15%). Conclusion(s): Thoracic ultrasound is widely used by Italian pulmonologists and considered a clinically relevant tool. The availability of dedicated ultrasound systems seems to be a major limit of the use of the technique.Copyright © 2020 S. Karger AG, Basel.

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1. **CLINICOEPIDEMIOLOGICAL CHARACTERISTICS of PATIENTS WHO DIED from COVID-19 at A NATIONAL HOSPITAL of LIMA, Peru**  
   Escobar G. Revista de la Facultad de Medicina Humana 2020;20:180-185.

Introduction: The COVID-19 pandemic has caused more than 70 thousand deaths worldwide. Objective(s): To describe the characteristics of COVID-19 patients who died in a tertiary hospital. Method(s): A descriptive study was carried out in the emergency service of the Hospital Rebagliati in Lima, Peru, which includes deceased patients with a positive result for SARS-CoV-2 infection diagnosed by RT-PCR until April 4, 2020. The medical history was reviewed. and hospital records looking for sociodemographic variables, clinical characteristics, radiological manifestations, treatment and evolution. Result(s): 14 cases were identified, 78.6% were male, average age 73.4 years (range 26 to 97). 21.4% of cases acquired the infection out of Peru. Risk factors were found in 92.9% of patients (more frequent elderly, hypertension and obesity). The most frequent symptoms were dyspnea, fever and cough, with illness time 8 days (+/- 3); signs of polypnea and respiratory rales. The most frequent laboratory findings were elevated C-reactive protein (average 22 mg / dL) and hypoxemia. The predominant radiological presentation was bilateral interstitial pulmonary infiltration in ground glass. 78.6% (11 of 14 cases) entered mechanical ventilation; 71.4% of the cases received azithromycin, 64.3% hydroxychloroquine and 57.1% broad-spectrum antibiotics; with a 4.7 day hospital stay (+/- 2.4). Conclusion(s): Those who died from COVID-19 presented bilateral severe pneumonia, more frequent in men, with risk factors (elderly, hypertension and obesity), with a high need for ventilatory assistance.Copyright © 2020 Iranian Journal of Breast Diseases.

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1. **Clinicopathological Features and Outcomes of Acute Kidney Injury in Critically Ill COVID-19 with Prolonged Disease Course: A Retrospective Cohort**  
   Xia P. Journal of the American Society of Nephrology 2020;31:2205-2221.

Background The incidence, severity, and outcomes of AKI in COVID-19 varied in different reports. In patients critically ill with COVID-19, the clinicopathologic characteristics of AKI have not been described in detail. Methods This is a retrospective cohort study of 81 patients critically ill with COVID-19 in an intensive care unit. The incidence, etiologies, and outcomes of AKI were analyzed. Pathologic studies were performed in kidney tissues from ten deceased patients with AKI. Results A total of 41 (50.6%) patients experienced AKI in this study. The median time from illness to AKI was 21.0 (IQR, 9.5-26.0) days. The proportion of Kidney Disease Improving Global Outcomes (KDIGO) stage 1, stage 2, and stage 3 AKI were 26.8%, 31.7%, and 41.5%, respectively. The leading causes of AKI included septic shock (25 of 41, 61.0%), volume insufficiency (eight of 41, 19.5%), and adverse drug effects (five of 41, 12.2%). The risk factors for AKI included age (per 10 years) (HR, 1.83; 95% CI, 1.24 to 2.69; P50.002) and serum IL-6 level (HR, 1.83; 95% CI, 1.23 to 2.73; P50.003). KDIGO stage 3 AKI predicted death. Other potential risk factors for death included male sex, elevated D-dimer, serum IL-6 level, and higher Sequential Organ Failure Assessment score. The predominant pathologic finding was acute tubular injury. Nucleic acid tests and immunohistochemistry failed to detect the virus in kidney tissues. Conclusions AKI was a common and multifactorial complication in patients critically ill with COVID-19 at the late stage of the disease course. The predominant pathologic finding was acute tubular injury. Older age and higher serum IL-6 level were risk factors of AKI, and KDIGO stage 3 AKI independently predicted death.Copyright © 2020 by the American Society of Nephrology

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1. **Co-reactivation of the human herpesvirus alpha subfamily (herpes simplex virus-1 and varicella zoster virus) in a critically ill patient with COVID-19**  
   Xu R. British Journal of Dermatology 2020;183:1145-1147.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=92f8403a39b62e2d2b4768562fb826d0)

1. **Comparative analysis of laboratory indexes of severe and non-severe patients infected with COVID-19**  
   Bao Jinfeng Clinica chimica acta 2020;509:180-194.

1. **Comparative study of deep learning methods for the automatic segmentation of lung, lesion and lesion type in CT scans of COVID-19 patients**  
   Tilborghs Sofie 2020;:No page numbers.

Recent research on COVID-19 suggests that CT imaging provides useful information to assess disease progression and assist diagnosis, in addition to help understanding the disease. There is an increasing number of studies that propose to use deep learning to provide fast and accurate quantification of COVID-19 using chest CT scans. The main tasks of interest are the automatic segmentation of lung and lung lesions in chest CT scans of confirmed or suspected COVID-19 patients. In this study, we compare twelve deep learning algorithms using a multi-center dataset, including both open-source and in-house developed algorithms. Results show that ensembling different methods can boost the overall test set performance for lung segmentation, binary lesion segmentation and multiclass lesion segmentation, resulting in mean Dice scores of 0.982, 0.724 and 0.469, respectively. The resulting binary lesions were segmented with a mean absolute volume error of 91.3 ml. In general, the task of distinguishing different lesion types was more difficult, with a mean absolute volume difference of 152 ml and mean Dice scores of 0.369 and 0.523 for consolidation and ground glass opacity, respectively. All methods perform binary lesion segmentation with an average volume error that is better than visual assessment by human raters, suggesting these methods are mature enough for a large-scale evaluation for use in clinical practice.

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1. **Comparison of chest CT findings between COVID-19 pneumonia and other types of viral pneumonia: a two-center retrospective study**  
   Li Xiao European radiology 2020;30:5470-5478.

1. **Comparison of efficacy of dexamethasone and methylprednisolone in moderate to severe covid 19 disease**  
   Fatima S. A. Annals of Medicine and Surgery 2020;60:413-416.

Background: The first case of Infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) were diagnosed in Wuhan, China in 2019. In the first half of 2020 this disease has already converted into a global pandemic. Various treatment options were being tried all over the world. Some studies showed beneficial effects of corticosteroids in covid 19. Hence, we designed this study to compare the effect of two steroids in moderate to severe covid 19 disease. Objective(s): To compare the efficacy and safety of dexamethasone and methylprednisolone in moderate to severe covid 19 disease. Study Settings: Fatima Memorial Hospital, Lahore and Ganga Ram hospital, Lahore. Study Design: Quasi experimental, interventional study. Duration of Study: From 1st June 2020 to 30th June 2020. Methodology: Sample size and technique: there were total 100 patients; 35 patients received dexamethasone and 65 were kept in methylprednisolone receiving group. Result(s): The mean age of patients was 57.91 years in dexamethasone group and 54.86 years in methylprednisolone group. In dexamethasone group, there were 15 (42.8%) critically ill patients who were shifted to Intensive care unit (ICU) and seven (20%) of them needed ventilatory support, whereas in methylprednisolone group 22 (33.8%) had to be admitted in ICU with eight (12.3%) patient needing ventilator. As outcome measure, patients in both the groups showed marked improvement in temperature, oxygen requirement and C-reactive protein (CRP) on day 5. Only six (17.1%) patient died who received dexamethasone while 10 (15.3%) patients died among those receiving methylprednisolone. Conclusion(s): Dexamethasone and methylprednisolone both are equally effective in treating moderate to severe covid 19 disease.Copyright © 2020

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1. **Compassionate Use of Tocilizumab for Treatment of SARS-CoV-2 Pneumonia**  
   Jordan S. C. Clinical Infectious Diseases 2020;71:3168-3173.

Background: Preliminary data from severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pneumonia patients indicate that a cytokine storm may increase morbidity and mortality. Tocilizumab (anti-IL-6R) is approved by the Food and Drug Administration for treatment of cytokine storm associated with chimeric antigen receptor T-cell therapy. Here we examined compassionate use of tocilizumab in patients with SARS-CoV-2 pneumonia. Method(s): We report on a single-center study of tocilizumab in hospitalized patients with SARS-CoV-2 pneumonia. All patients had confirmed SARS-CoV-2 pneumonia and oxygen saturations <90% on oxygen support with most intubated. We examined clinical and laboratory parameters including oxygen and vasopressor requirements, cytokine profiles, and C-reactive protein (CRP) levels pre-and post-tocilizumab treatment. Result(s): Twenty-seven SARS-CoV-2 pneumonia patients received one 400 mg dose of tocilizumab. Interleukin (IL)-6 was the predominant cytokine detected at tocilizumab treatment. Significant reductions in temperature and CRP were seen post-tocilizumab. However, 4 patients did not show rapid CRP declines, of whom 3 had poorer outcomes. Oxygen and vasopressor requirements diminished over the first week post-tocilizumab. Twenty-two patients required mechanical ventilation; at last follow-up, 16 were extubated. Adverse events and serious adverse events were minimal, but 2 deaths (7.4%) occurred that were felt unrelated to tocilizumab. Conclusion(s): Compared to published reports on the morbidity and mortality associated with SARS-CoV-2, tocilizumab appears to offer benefits in reducing inflammation, oxygen requirements, vasopressor support, and mortality. The rationale for tocilizumab treatment is supported by detection of IL-6 in pathogenic levels in all patients. Additional doses of tocilizumab may be needed for those showing slow declines in CRP. Proof of efficacy awaits randomized, placebo-controlled clinical trials.Copyright © 2020 The Author(s) 2020. Published by Oxford University Press for the Infectious Diseases Society of America. All rights reserved. For permissions, e-mail: journals.permissions@oup.com.

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1. **Complement Inhibition in Severe COVID-19 Acute Respiratory Distress Syndrome**  
   Raghunandan S. Frontiers in Pediatrics 2020;8:616731.

Most children with COVID-19 have asymptomatic or mild illness. Those who become critically ill suffer from acute respiratory distress syndrome (ARDS) and acute kidney injury (AKI). The rapid deterioration of lung function has been linked to microangiopathic and immune-mediated processes seen in the lungs of adult patients with COVID-19. The role of complement-mediated acute lung injury is supported by animal models of SARS-CoV, evaluation of lung tissue in those who died from COVID-19 and response of COVID-19 ARDS to complement inhibition. We present a summary of a child with COVID-19 disease treated with convalescent plasma and eculizumab and provide a detailed evaluation of the inflammatory pathways.© Copyright © 2020 Raghunandan, Josephson, Verkerke, Linam, Ingram, Zerra, Arthur, Stowell, Briones and Chonat.

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1. **Concurrent COVID-19 and Pneumocystis jirovecii pneumonia in a severely immunocompromised 25-year-old patient**  
   Bhat P. International Journal of Infectious Diseases 2020;99:119-121.

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1. **Corona virus-herbal approach for boosting immunity and influencing viral activity**  
   Iqbal A. International Journal of Pharmaceutical Research 2020;12:722-733.

COVID-19 is a highly contagious disease caused by severe acute respiratory SARS CoV-2. The common symptoms include cough usually dry in nature, fever, tiredness, shortness of breath and anosmia. World Health Organization has declared it 'pandemic' with a higher mortality rate especially among elderly having weaker immune system. There is no specific treatment for this dreadful infection until now and prevention is the only way to curb the disease. Antiviral drugs like remdesvir, oseltamivir, lopinavir and ritonavir along with antimalarial drugs like chloroquine and hydroxychloroquine are found to be effective against the novel coronavirus but are still under trial. In any disease outbreak, those who are fit with strong immune system persist otherwise will face grave results. Nature has created a treasury of medicinal herbs which boost the immune system besides having other benefits. In this paper we have proposed a polyherbal formulation, along with a thorough review of its ingredients, with the aim to highlight its potential in prevention and cure of COVID-19.Copyright © 2020, Advanced Scientific Research. All rights reserved.

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1. **Coronavirus disease 2019 (COVID-19) complicated by Spontaneous Pneumomediastinum and Pneumothorax**  
   Gillespie Megan Respiratory medicine case reports 2020;31:101232.

The first reports of severe acute respiratory symptoms from a novel coronavirus called coronavirus disease 2019 (COVID-19) occurred in Wuhan, Hubei Province, China in December 2019.1 The World Health Organization declared COVID-19 a global pandemic by March 2020.1 The COVID-19 outbreak has resulted in a current global health emergency. Clinical information about the findings of COVID-19 and its associated complications are constantly evolving and becoming more widely available. Providers should be familiar with both typical symptoms and image study results for COVID-19 as well as less commonly reported complications of progressive COVID-19, such as spontaneous pneumomediastinum and spontaneous pneumothorax as highlighted in this case. Copyright © 2020 Published by Elsevier Ltd.

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1. **Coronavirus Disease 2019 (COVID-19): A Systematic Review of Imaging Findings in 919 Patients**  
   Salehi Sana AJR. American journal of roentgenology 2020;215:87-93.

OBJECTIVE. Available information on CT features of the 2019 novel coronavirus disease (COVID-19) is scattered in different publications, and a cohesive literature review has yet to be compiled. MATERIALS AND METHODS. This article includes a systematic literature search of PubMed, Embase (Elsevier), Google Scholar, and the World Health Organization database. RESULTS. Known features of COVID-19 on initial CT include bilateral multilobar ground-glass opacification (GGO) with a peripheral or posterior distribution, mainly in the lower lobes and less frequently within the right middle lobe. Atypical initial imaging presentation of consolidative opacities superimposed on GGO may be found in a smaller number of cases, mainly in the elderly population. Septal thickening, bronchiectasis, pleural thickening, and subpleural involvement are some of the less common findings, mainly in the later stages of the disease. Pleural effusion, pericardial effusion, lymphadenopathy, cavitation, CT halo sign, and pneumothorax are uncommon but may be seen with disease progression. Follow-up CT in the intermediate stage of disease shows an increase in the number and size of GGOs and progressive transformation of GGO into multifocal consolidative opacities, septal thickening, and development of a crazy paving pattern, with the greatest severity of CT findings visible around day 10 after the symptom onset. Acute respiratory distress syndrome is the most common indication for transferring patients with COVID-19 to the ICU and the major cause of death in this patient population. Imaging patterns corresponding to clinical improvement usually occur after week 2 of the disease and include gradual resolution of consolidative opacities and decrease in the number of lesions and involved lobes. CONCLUSION. This systematic review of current literature on COVID-19 provides insight into the initial and follow-up CT characteristics of the disease.

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1. **Coronavirus disease 2019 in a 2-month-old male infant: A case report from Iran**  
   Heydari H. Korean Journal of Pediatrics 2020;63:499-502.

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1. **Coronavirus disease 2019 with spontaneous pneumothorax, pneumomediastinum and subcutaneous emphysema, France**  
   Zayet S. New microbes and new infections 2020;38:100785.

To our knowledge, Complications such as pneumomediastinum and/or pneumothorax during the course of COVID-19 remain rare and their mechanism is poorly described. We present a case of COVID-19 pneumonia associated with spontaneous pneumothorax, pneumomediastinum and subcutaneous emphysema in an immunocompetent patient with no past history of smoking or chronic obstructive pulmonary disease (COPD). The only risk factor of this patient was prolonged cough. We hypothesize the mechanism underlying the pneumomediastinum is the aggressive disease pathophysiology in COVID-19 with an incresead risk of alveolar damage. Copyright © 2020 The Author(s).

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1. **COVID-19 (SARS-CoV-2) Infection in Pregnancy: A Systematic Review**  
   Akhtar H. Gynecologic and Obstetric Investigation 2020;85:295-306.

Introduction: To review published studies related to the association of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections with pregnancy, foetal, and neonatal outcomes during coronavirus disease 2019 (COVID-19) pandemic in a systematic manner. Method(s): A comprehensive electronic search was done through PubMed, Scopus, Medline, Cochrane database, and Google Scholar from December 01, 2019, to May 22, 2020, along with the reference list of all included studies. All cohort studies that reported on outcomes of COVID-19 during pregnancy were included. Qualitative assessment of included studies was performed using the Newcastle-Ottawa scale. Result(s): Upon admission, most pregnant women underwent a low-dose radiation CT scan; the reports of which included unilateral/bilateral pneumonia in most patients. A marked lymphopenia was also noted in many patients with COVID-19. 513 titles were screened, and 22 studies were included, which identified 156 pregnant women with COVID-19 and 108 neonatal outcomes. The most common maternal/foetal complications included intrauterine/foetal distress (14%) and premature rupture of membranes (8%). The neonatal clinical manifestations of COVID-19 commonly included shortness of breath (6%), gastrointestinal symptoms (4%), and fever (3%). Conclusion(s): COVID-19 infection in pregnancy leads to increased risk in pregnancy complications such as preterm birth, PPROM, and may possibly lead to maternal death in rare cases. There is no evidence to support vertical transmission of SARS-CoV-2 infection to the unborn child. Due to a paucity of inconsistent data regarding the impact of COVID-19 on the newborn, caution should be undertaken to further investigate and monitor possible infection in the neonates born to COVID-19-infected mothers.Copyright © 2020 The Author(s). Published by S. Karger AG, Basel.

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1. **COVID-19 and ART: the view of the Italian Society of Fertility and Sterility and Reproductive Medicine**  
   Vaiarelli Alberto Reproductive biomedicine online 2020;40:755-759.

1. **COVID-19 and pneumothorax: a multicentre retrospective case series**  
   Martinelli Anthony W. The European respiratory journal 2020;56:No page numbers.

INTRODUCTION: Pneumothorax and pneumomediastinum have both been noted to complicate cases of coronavirus disease 2019 (COVID-19) requiring hospital admission. We report the largest case series yet described of patients with both these pathologies (including nonventilated patients)., METHODS: Cases were collected retrospectively from UK hospitals with inclusion criteria limited to a diagnosis of COVID-19 and the presence of either pneumothorax or pneumomediastinum. Patients included in the study presented between March and June 2020. Details obtained from the medical record included demographics, radiology, laboratory investigations, clinical management and survival., RESULTS: 71 patients from 16 centres were included in the study, of whom 60 had pneumothoraces (six with pneumomediastinum in addition) and 11 had pneumomediastinum alone. Two of these patients had two distinct episodes of pneumothorax, occurring bilaterally in sequential fashion, bringing the total number of pneumothoraces included to 62. Clinical scenarios included patients who had presented to hospital with pneumothorax, patients who had developed pneumothorax or pneumomediastinum during their inpatient admission with COVID-19 and patients who developed their complication while intubated and ventilated, either with or without concurrent extracorporeal membrane oxygenation. Survival at 28 days was not significantly different following pneumothorax (63.1+/-6.5%) or isolated pneumomediastinum (53.0+/-18.7%; p=0.854). The incidence of pneumothorax was higher in males. 28-day survival was not different between the sexes (males 62.5+/-7.7% versus females 68.4+/-10.7%; p=0.619). Patients aged >=70 years had a significantly lower 28-day survival than younger individuals (>=70 years 41.7+/-13.5% survival versus <70 years 70.9+/-6.8% survival; p=0.018 log-rank)., CONCLUSION: These cases suggest that pneumothorax is a complication of COVID-19. Pneumothorax does not seem to be an independent marker of poor prognosis and we encourage continuation of active treatment where clinically possible. Copyright ©ERS 2020.

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1. **COVID-19 Complicated by Spontaneous Pneumothorax**  
   Mallick Taha Cureus 2020;12:e9104.

Over the last few months, the coronavirus disease 2019 (COVID-19) pandemic has created overwhelming challenges for physicians across the world. While much has been described in the literature about lung infiltrates and respiratory failure associated with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), pneumothorax remains a relatively rare presentation with current literature indicating a rate of one percent. We describe a case series of three patients each of whom tested positive for SARS-CoV-2 on reverse-transcriptase polymerase chain reaction testing of nasopharyngeal swab specimens and presented with pneumothorax. These patients were treated at the New York City Health and Hospitals (NYC H+H) system, a network of eleven hospitals in four different boroughs of New York City. None of these patients had a history of lung disease and one patient was a previous smoker. One out of three patients died. Inflammatory markers were noted to be elevated in each of these patients to levels that have been associated with severe COVID-19 infection. CT scans in these patients showed bilateral air space disease consistent with COVID-19 pneumonia and pneumothorax with other features including pneumomediastinum, subcutaneous emphysema, and pneumatoceles. This may indicate the underlying pathogenesis of pneumothorax in these patients to involve inflammation-induced pulmonary parenchymal injury and necrosis with subsequent development of air leaks into the pleural cavity, a mechanism similar to that noted in patients during the severe acute respiratory syndrome (SARS) outbreak in 2003. Conservative management with chest tube drainage or observation was adequate for two of three patients while one patient developed multi-organ system dysfunction and eventual death. Copyright © 2020, Mallick et al.

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1. **Covid-19 factsheet**  
   Anonymous Breathe 2020;16:1-13.

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1. **COVID-19 in a 26-week preterm neonate**  
   Piersigilli F. The Lancet Child and Adolescent Health 2020;4:476-478.

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1. **COVID-19 in pregnancy: The foetal perspective- A systematic review**  
   Dube R. BMJ Paediatrics Open 2020;4:e000859.

Objective We aimed to conduct a systematic review of the available literature to determine the effects of confirmed cases of COVID-19 in pregnant women from the foetal perspective by estimation of mother to child transmission, perinatal outcome and possible teratogenicity. Methods Data sources: Eligible studies between 1 November 2019 and 10 August 2020 were retrieved from PubMed, Embase, LitCovid, Google Scholar, EBSCO MEDLINE, CENTRAL, CINAHL, MedRXiv, BioRXiv and Scopus collection databases. English language case reports, case series and cohort studies of SARS-CoV-2 confirmed pregnant women with data on perinatal outcome, congenital anomalies and mother to child transmission were analysed. Results 38 case reports, 34 cohort and case series describing 1408 neonates were included for evidence acquisition of mother to child transmission. 29 case reports and 31 case series and cohort studies describing 1318 foetuses were included for the evaluation of perinatal outcome and congenital anomalies. A pooled proportion of 3.67% neonates had positive SARS-CoV-2 viral RNA nasopharyngeal swab results and 7.1% had positive cord blood samples. 11.7% of the placenta, 6.8% of amniotic fluid, 9.6% of faecal and rectal swabs and none of the urine samples were positive. The rate of preterm labour was 26.4% (OR=1.45, 95% CI 1.03 to 2.03 with p=0.03) and caesarean delivery (CS) was 59.9% (OR=1.54, 95% CI 1.17 to 2.03 with p=0.002). The most common neonatal symptom was breathing difficulty (1.79%). Stillbirth rate was 9.9 per 1000 total births in babies born to COVID-19 mothers. Conclusion Chances of mother to child transmission of the SARS-CoV-2 virus is low. The perinatal outcome for the foetus is favourable. There is increased chances of CS but not preterm delivery.The stillbirth and neonatal death rates are low. There are no reported congenital anomalies in babies born to SARS CoV-2 positive mothers.Copyright © 2020 Author(s). Published by BMJ.

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1. **COVID-19 or Pulmonary Contusion? A Diagnostic Dilemma**  
   Rouhezamin M. R. Academic Radiology 2020;27:894-895.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=95a4aa5050b771ae62830a2d85d42699)

1. **COVID-19 pneumonia and pneumothorax: case series**  
   Talan Leyla COVID-19 pnomonisi ve pnomotoraks: olgu serisi. 2020;68:437-443.

Barotrauma is a commonly reported complication in critically ill patients with ARDS caused by different etiologies, it's rate is reported to be around %10. Pneumothorax/pneumomediastinum in COVID-19 patients seem to be more common and have different clinical characteristics. Here we report 9 patients who had pneumothorax and/or pneumomediastinum during their stay in the ICU. Patients who were admitted to ICU between March 2020 and December 2020, were reviewed for presence of pneumothorax, pneumomediastinum and subcutaneous emphysema during their ICU stay. Demographic characteristics, mechanical ventilation settings, documented ventilation parameters, outcomes were studied. A total of 161 patients were admitted to ICU during the study period, 96 were invasively ventilated. Nine patients had developed pneumothorax, pneumomediastinum and/or subcutaneous emphysema during their admission. Five of them were men and median age was 66.6 years. All patients were intubated and mechanically ventilated. All patients were managed conservatively. One patient was discharged from ICU, the others were lost due to other complications related to COVID-19. Upon detection of pneumothorax and/or mediastinum all patients were managed conservatively by limiting their PEEP and maximum inspiratory pressures and were followed by daily chest X-rays (CXR) for detection of any progress. None of the patients showed increase in size of their pneumothorax and/or pneumomediastinum. Hemodynamically instability due to pneumothorax and/or pneumomediastinum was not observed in any of the patients. Tension pneumothorax was not observed in any of the patients. Most common reason for death was sepsis due to secondary bacterial infections. Acute deterioration with rapid oxygen desaturation or palpation of crepitation over thorax and neck in a COVID-19 patient should prompt a search for pneumothorax or pneumomediastinum. Conservative management may be an option as long as the patients are stable.

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1. **COVID-19 pneumonia complicated by bilateral pneumothorax: A case report**  
   Shirai Tsuyoshi Respiratory medicine case reports 2020;31:101230.

Background: Pneumothorax is a rare but life-threatening complication associated with pneumonia caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)., Case presentation: Informed consent was obtained from the patient himself.A 50-year-old man presented with a 9-day history of fever, cough, and dyspnoea. He was diagnosed with coronavirus disease 2019 (COVID-19) pneumonia and was admitted to the Medical Hospital, Tokyo Medical and Dental University. Chest CT showed diffuse patchy ground-glass opacities (GGOs). His state of oxygenation deteriorated, and mechanical ventilation was initiated on day 4 after admission (12th day from onset). He improved gradually and was weaned from ventilation on day 15. Sudden onset of bilateral pneumothorax occurred on day 21 with severe respiratory failure, and chest CT revealed pneumatocele formation on both lower lobes., Conclusions: Pneumothorax is a notable complication in cases of severe COVID-19 pneumonia, especially in those who require positive-pressure ventilation. Copyright © 2020 The Author(s).

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1. **COVID-19 Pneumonia: Three Thoracic Complications in the Same Patient**  
   Borghesi Andrea Diagnostics (Basel, Switzerland) 2020;10:No page numbers.

The most dreaded thoracic complications in patients with coronavirus disease 2019 (COVID-19) are acute pulmonary embolism and pulmonary fibrosis. Both the complications are associated with an increased risk of morbidity and mortality. While acute pulmonary embolism is not a rare finding in patients with COVID-19 pneumonia, the prevalence of pulmonary fibrosis remains unclear. Spontaneous pneumothorax is another possible complication in COVID-19 pneumonia, although its observation is rather uncommon. Herein, we present interesting computed tomography images of the first case of COVID-19 pneumonia that initially developed acute pulmonary embolism and subsequently showed progression toward pulmonary fibrosis and spontaneous pneumothorax.

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1. **COVID-19 pnomonisi ve pnomotoraks: olgu serisi, COVID-19 pneumonia and pneumothorax: case series**  
   Talan L. Tuberkuloz ve toraks 2020;68:437-443.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=990bb0eb7ed864256ab73a207cb1177c)

1. **COVID-19 Pulmonary Infection with Pneumothorax in a Young Patient**  
   Gurkan Okan Journal of the College of Physicians and Surgeons--Pakistan : JCPSP 2020;30:43-45.

Coronavirus disease (COVID-19), first reported in December 2019 in Wuhan, China, has spread all over the world in a short time and was declared as a pandemic by the World Health Organization (WHO). During COVID-19 pandemic, chest computed tomography (CT) imaging has become an important tool with high sensitivity for diagnosis due to the low positive rate of the real-time reverse-transcriptase polymerase chain reaction (RT-PCR). Furthermore, the chest CT has played an important role in the diagnosis of underlying pulmonary lesions. In this case report, we present a patient who was admitted to the emergency department with fever, cough and left shoulder pain, and was subsequently diagnosed with both COVID-19 and pneumothorax following chest CT and RT-PCR test. Key Words: COVID-19, Coronavirus, Pneumothorax, Tomography.

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1. **COVID-19 ventilator barotrauma management: less is more**  
   Housman Brian Annals of translational medicine 2020;8:1575.

Background: COVID-19 patients requiring mechanical ventilation may develop significant pneumomediastinum and sub-cutaneous emphysema without associated pneumothorax (SWAP). Prophylactic chest tube placement or sub-fascial "blowholes" are usually recommended to prevent tension pneumothorax and clinical decline. Risk of iatrogenic lung injury and release of virus into the environment is high. Incidence and conservative management data of such barotraumatic complications during the COVID-19 pandemic are lacking., Methods: All patients with mediastinal air and SWAP evaluated by the department of Thoracic Surgery at the Mount Sinai Hospital between March 30 and April 10, 2020 were identified. All patients without pneumothorax were treated conservatively with daily chest x-ray and observation. Three patients had prophylactic chest tube placement prior to the study period without thoracic surgery consultation., Results: There were 29 cases of mediastinal air with SWAP out of 171 COVID positive intubated patients (17.0%) who were treated conservatively. Patients were intubated for an average of 2.4 days before SWAP was identified. 12 patients (41%) had improvement or resolution without intervention. Two patients progressed to pneumothorax 3 and 8 days following initial presentation. Both had chest tubes placed without incident before there were any changes in oxygenation, hemodynamics, supportive medications, or ventilator settings. There were 3 patients who had percutaneous tubes placed before the study period all of whom had significant worsening of their sub-cutaneous air and air leak., Conclusions: Conservative management of massive sub-cutaneous emphysema without pneumothorax in COVID-19 patients is safe and limits viral exposure to healthcare workers. Placement of chest tubes is discouraged unless a definite sizable pneumothorax develops. Copyright 2020 Annals of Translational Medicine. All rights reserved.

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1. **COVID-19 with bilateral pneumothoraces- case report**  
   Muhammad Ambreen Iqbal Respiratory medicine case reports 2020;31:101254.

To the best of our knowledge, there is no case report or data published regarding COVID pneumonitis presenting initially as pneumothorax. There are 3 case reports published to-date (May 30, 2020) reporting secondary pneumothorax as complication in later stages of Acute respiratory distress syndrome (ARDS) secondary to COVID-19 in non-ventilated patients. We present a case of COVID-19 disease presenting as tension pneumothorax after a week of symptoms and developing a second pneumothorax on the contralateral side post mechanical ventilation. Copyright © 2020 The Author(s).

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1. **COVID-19 with cystic features on computed tomography: A case report**  
   Liu Kefu Medicine 2020;99:e20175.

RATIONALE: The cystic features of the novel coronavirus disease 2019 (COVID-19) found on computed tomography (CT) have not yet been reported in the published literature. We report the cystic chest CT findings of 2 patients confirmed to have COVID-19-related pneumonia., PATIENT CONCERNS: A 38-year-old man and a 35-year-old man diagnosed with severe COVID-19 pneumonia were admitted to the intensive care unit., DIAGNOSES: Chest CT findings showed multiple cysts in ground-glass opacities (bilaterally) with/without pneumothorax. The cysts had a smooth inner wall., INTERVENTIONS: The patients continued to be given oxygen by mask and received antitussive, phlegm-dispelling treatment., OUTCOMES: At follow up, there was a reduction in the number of multiple cystic lesions on CT. To date, 1 patient was discharged from hospital, while the other had been transferred to the rehabilitation department., LESSONS: COVID-19 may independently result in pulmonary cyst formation and pneumothorax; the application of a ventilator may be another causative factor.

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1. **COVID-19 with spontaneous pneumothorax, pneumomediastinum and subcutaneous emphysema**  
   Wang Weiyi Journal of travel medicine 2020;27:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=fca3e40af13895fa4045ba712e1aebea)

1. **COVID-19 with spontaneous pneumothorax, pneumomediastinum, and subcutaneous emphysema in the intensive care unit: Two case reports**  
   Alharthy Abdulrahman Journal of infection and public health 2020;14:290-292.

Real-Time-reverse-transcription-Polymerase-Chain-Reaction from nasopharyngeal swabs and chest computed tomography (CT) depicting typically bilateral ground-glass opacities with a peripheral and/or posterior distribution are mandatory in the diagnosis of COVID-19. COVID-19 pneumonia may present though with atypical features such as pleural and pericardial effusions, lymphadenopathy, cavitations, and CT halo sign. In these two case-reports, COVID-19 presented as pneumothorax, pneumomediastinum and subcutaneous emphysema in critically ill patients. These disorders may require treatment or can be even self-limiting. Clinicians should be aware of their potential effects on the cardiorespiratory status of critically ill COVID-19 patients. Finally, pneumothorax can be promptly diagnosed by means of lung ultrasound. Although operator dependent, lung ultrasound is a useful bedside diagnostic tool that could alleviate the risk of cross-infection related to COVID-19 patient transport. Copyright © 2020 The Author(s). Published by Elsevier Ltd.. All rights reserved.

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1. **COVID-19, Chronic Obstructive Pulmonary Disease and Pneumothorax: A Frightening Triad**  
   Poggiali Erika European journal of case reports in internal medicine 2020;7:001742.

We describe the case of a male patient admitted to our emergency department during the Italian COVID-19 epidemic, for progressive worsening dyspnoea. A diagnosis of pneumothorax and diffuse interstitial lung involvement was promptly made by lung ultrasound and confirmed by an HRCT scan. A chest CT scan also showed diffuse emphysema, as observed in chronic obstructive pulmonary disease (COPD), and small consolidations in the lower lobes, suggestive for COVID-19 pneumonia. A chest tube was immediately inserted in the emergency room with complete resolution of the dyspnoea. A nasopharyngeal swab for 2019-nCoV was positive. Unfortunately, the patient died from COVID-19-related acute respiratory distress syndrome after 48 days of hospitalization., LEARNING POINTS: Coronavirus disease (COVID-19) can cause death from severe acute respiratory distress syndrome (ARDS). Pneumothorax is a common complication of chronic obstructive pulmonary disease (COPD). The combination of COVID-19, COPD and pneumothorax can prove fatal. Copyright © EFIM 2020.

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1. **COVID-19-Associated Hyperactive Intensive Care Unit Delirium With Proposed Pathophysiology and Treatment: A Case Report**  
   Sher Y. Psychosomatics 2020;61:544-550.

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1. **COVID-19: How the radiology department should combat this global pandemic**  
   Modi T. Journal of Clinical and Diagnostic Research 2020;14:TE01-TE06.

The impact of the global pandemic due to novel Coronavirus Disease (nCOVID-19) has been braced by all medical subspecialties, including the radiology department. As Computerised Tomography (CT) of the chest as well as radiographs gain more and more importance in diagnosing, following up and prognosticating this respiratory infection, it becomes essential to have set protocols in place regarding imaging, disinfection and departmental workflow to ensure smooth functioning and protection of patients and health care workers. We have formulated the "AMMO" protocol as a guide to smooth functioning of the radiology department, which enumerates the steps to be taken for organisation of patient workload, organising equipment, disinfection protocols, maintaining the health and safety of radiology healthcare workers along with timely and accurate reporting. By combining the established guidelines and the knowledge gained from our experience at a dedicated COVID-19 hospital, this article aims to provide a reference in the management of radiology departments during this pandemic.Copyright © 2020 Journal of Clinical and Diagnostic Research. All rights reserved.

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1. **Critical Care Management for Novel 2019 SARS-CoV-2 and HCoV-NL63 Coinfection in a Young Immunocompromised Patient: A Chicago Experience**  
   Sanchez-Nadales Alejandro Case reports in critical care 2020;2020:8877641.

Background: SARS-CoV-2 is a newly emerged virus that has spread rapidly, exhibiting tremendous morbidity and mortality. Some potential pharmaceutical targets have been identified but are still lacking proper validation. Case Presentation. We describe the case of a young, immunosuppressed and critically ill patient with previous Influenza B infection, requiring extracorporeal membrane oxygenation, which was then followed, in the succeeding months, by SARS-CoV-2 infection complicated by severe adult respiratory distress syndrome. Her clinical course exhibited complications, including pulmonary embolism, acute kidney injury, pneumothorax, pneumomediastinum, multiple cardiac arrests, and eventually death., Conclusion: Coinfection with other respiratory pathogens and opportunistic infections are possible. Copyright © 2020 Alejandro Sanchez-Nadales et al.

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1. **Critical Illness Due to Covid-19: A Description of the Surge in a Single Center in Sioux Falls**  
   Jamous Fady South Dakota medicine : the journal of the South Dakota State Medical Association 2020;73:312-317.

BACKGROUND: We aim to describe the basic demographics, clinical course and outcomes of critically ill patients with Covid-19 admitted to Avera McKennan Hospital and University Health Center Intensive Care Unit (ICU) between March 20 and May 4, 2020., METHODS: In this single centered, retrospective, observational study, we enrolled 37 critically ill adults with COVID-19 pneumonia admitted to the (ICU) between March 20 and May 4, 2020. Demographic data, admitting symptoms, laboratory values, co-morbidities, treatments and clinical outcomes were collected. Data was compared between survivors and non-survivors. We aim to describe our data and report the 28-day mortality as of June 1, 2020., RESULTS: Of 154 patients admitted with COVID-19 pneumonia during our study period, 37 (24 percent) were critically ill and required an ICU stay. The mean age was 58 years and 76 percent were men. Of these 37 patients, 28 (78 percent) had a chronic illness (diabetes in 43 percent, hypertension in 47 percent). In addition, 54 percent were associated with a local meat packing plant. Most common presenting symptoms were dyspnea (92 percent), cough (70 percent) and fever (68 percent). The mean PaO2/ FiO2 ratio was 143 (67-362). Significant lab findings include the following: 54 percent of patients had lymphocytopenia, the mean ferritin was 850 ng/mL (10-3528), the mean D-Dimer was 4.09 FEU ug/mL and the mean IL-6 was 96.5 pg/mL. At 28 days, 24 percent (nine) had died. Twenty-five (68 percent) patients required mechanical ventilation, with 10 (27 percent) of those patients requiring initiation of neuromuscular blocking agents for ventilator compliance. Of those four (40 percent) did not survive. In addition, 20 patients (54 percent) were proned. Pneumomediastinum or pneumothorax occurred in five of the 37 (14 percent). Renal replacement therapy was required in 6 of the 37 patients, 4 of whom (66 percent) died. Steroids were used in 70 percent of patients, tocilizumab in 59 percent, and hydroxychloroquine in 27 percent. All patients received antibiotics. Convalescent plasma became available for our 5th patient. A total of 29 (78 percent) received convalescent plasma, (86 percent of survivors and 56 percent non-survivors). Median ICU length of stay was 11 days for both survivors (1-49) and non-survivors (1-21). There were no differences in age, body mass index (BMI), or initial PaO2/FiO2 (P/F) among those two groups. Non-survivors (nine) included the two immune compromised patients in our cohort, two patients with pre-existing DNR/DNI status, and one death within two hours of admit. Compared with survivors, more of the non-survivors received vasopressors (78 percent vs 46 percent), dialysis (44 percent vs 7 percent) and hydroxychloroquine (44 percent vs 21 percent). The first 5 patients treated in the ICU did not survive. One month after the initial case was reported in South Dakota, our ICU experienced a six-week surge. At its highest, COVID-19-related census reached 63 percent of the ICU capacity (15/24)., CONCLUSION: Mortality of critically ill patients with COVID-19 is high. Multi-organ, advanced and prolonged critical care resources are needed. Interpretation of our data is limited by a higher mortality of the earlier members of the cohort, a change in therapeutic practice over time and institution of social distancing. Copyright© South Dakota State Medical Association.

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1. **Critically ILL patients with coronavirus disease 2019 in a designated ICU: Clinical features and predictors for mortality**  
   Wang Z. H. Risk Management and Healthcare Policy 2020;13:833-845.

Background: Coronavirus disease 2019 (COVID-19) is a worldwide pandemic outbreak with a high mortality. Prognostic factors of critically ill patients with COVID-19 have not been fully elucidated yet. Method(s): In the present study, 59 patients with COVID-19 from the intensive care unit of the Caidian Branch of Tongji Hospital were enrolled. Epidemiological, demographic, clin-ical, laboratory, radiological, treatment data, and clinical outcomes were collected. Prognostic factors were statistically defined. Result(s): Of the 59 patients studied (67.4+/-11.3 years), 38 patients were male, 51 had underlying diseases, and 41 patients died during admission. Compared with the survivors, the deceased patients were of older age, had more smoking history, severer fatigue, and diarrhea, a higher incidence of multiple organ injuries, more deteriorative lymphopenia and thrombocytopenia, remarkably impaired cellular immune response, and strengthened cyto-kine release. Age higher than 70 (OR=2.76, 95% CI=1.45-5.23), arrhythmia (OR=4.76, 95% CI=1.59-14.25), and a Sequential Organ Failure Assessment (SOFA) score above 4 (OR=5.16, 95% CI=1.29-20.55) were identified as risk factors for mortality of patients. Conclusion(s): Critically ill COVID-19 patients aged higher than 70, arrhythmia, or a SOFA score above 4 have a high risk of mortality, and need prior medical intervention.Copyright © 2020 Wang et al.

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1. **CT imaging features of COVID-19 pneumonia: initial experience from Turkey**  
   Cinkooglu Akin Diagnostic and interventional radiology (Ankara, Turkey) 2020;26:308-314.

PURPOSE: We aimed to demonstrate the computed tomography (CT) findings observed at the initial presentation of coronavirus disease 2019 (COVID-19) pneumonia and reveal the most frequent infiltration and distribution patterns of the disease., METHODS: One hundred and eighty-five patients (87 men, 98 women; mean age, 48.7 years), who underwent RT-PCR sampling and high-resolution CT examination in our hospital between March 15, 2020, and April 15, 2020, and got a definitive diagnosis of COVID-19 disease via initial or follow-up RT-PCR test, were included in the study. We comprehensively analyzed the most common and relatively rare CT imaging features (e.g., distribution pattern, density of the lesions, additional CT signs) in patients diagnosed with COVID-19 pneumonia., RESULTS: Thirty-eight patients (20.6%) had no evidence of pneumonia on their initial high-resolution CT images. Among 147 patients (79.4%) who had parenchymal infiltration consistent with pneumonia, 10 (6.8%) had a negative baseline RT-PCR test, and positivity was detected as a result of repeated tests. Most of the patients had multifocal (89.1%) and bilateral (86.4%) lesions. The most common location, right lower lobe, was affected in 87.8% of the patients. Lesions were distributed predominantly at peripheral (87.1%) and posterior (46.3%) areas of lung parenchyma. Most of the patients had pure ground glass opacity (GGO) (82.3%) followed by GGO with consolidation (32.7%) and crazy paving pattern (21.8%). Pure consolidation, solid nodules, halo sign, reverse halo sign, vascular enlargement, subpleural line, air-bronchogram, and bronchiectasis were the other findings observed in at least 15% of the cases. Halo sign, acinar nodules, air-bubble sign, pleural thickening and effusion, mediastinal and/or hilar lymphadenopathy were seen rarely (2%-12.9%). Pericardial effusion, pneumothorax, cavitation, and tree-in-bud pattern were not detected in our study group., CONCLUSION: Multifocal and bilateral GGO infiltration predominantly distributed in peripheral, posterior, and lower lung areas was the most common infiltration pattern.

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1. **Cystic fibrosis lung disease: An overview**  
   Turcios N. L. Respiratory Care 2020;65:233-251.

Although better insights into the natural course of cystic fibrosis (CF) have led to treatment approaches that have improved pulmonary health and increased the life expectancy of individuals with this disorder, lung disease remains the main cause of morbidity and mortality in patients with CF. Evidence suggests that airway epithelial defects in ions-water transport lead to dehydrated mucus, impaired mucus clearance, and mucus adhesion to airway surfaces. An increase in mucin secretion is also suggested by the formation of endobronchial mucus plaques and plugs, which become the main sites of air flow obstruction, infection, and inflammation conducing to early small airways disease followed by the development of bronchiectasis. The lung involvement is usually progressive with intermittent exacerbations. Aggressive management and advances in treatment delay, but, do not prevent progression of lung disease. Respiratory failure ensues and is the major cause of death. The lung parenchyma is virtually untouched for much of the course of the disease. This review focuses on the lung involvement in cystic fibrosis and summarizes new developments on the diagnostic approach of CF and pathogenesis of related lung disease. Current therapeutic modalities, novel therapies targeting the basic genetic defect, and lung transplantation are also re viewed.Copyright © 2020 Daedalus Enterprises.

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1. **Delayed recurrent spontaneous pneumothorax in a patient recovering from COVID-19 pneumonia**  
   Shah Viraj M. Korean journal of anesthesiology 2020;:No page numbers.

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1. **Descriptive analysis of critically ill patients admitted to a third-level hospital in covid-19 pandemic**  
   Garcia Olivares P. Intensive Care Medicine Experimental 2020;8:No page numbers.

Introduction: COVID-19 is a potentially fatal disease, with high contagiousness, that has become a global public health problem. Objective(s): The aim of this study was to describe the characteristics of patients admitted to the critical care units of a third level hospital during the COVID-19 pandemic. Method(s): Prospective, observational study performed in critically ill Covid-19 patients admitted to H.G.U Gregorio Maranon during March-April 2020. We collected epidemiological data, comorbidities, presentation symptoms, relevant clinical data, organic support measures used, complications during stay, administered treatments and outcome. Descriptive analysis was express as means (SD) for normally distributed quantitative variables, medians (IQR) for non-normally distributed variables, and as percentages for categorical data. Result(s): One hundred and fifty patients were included, 70% were male, mean age was 61 years (49-70). Charlson Comorbidity Index 1 pts (0-3) and the most frequent comorbidities observed were: Obesity (MCI >= 30) 53%, hypertension 53%, diabetes 18%, dyslipidemia 47%, cardiovascular disease 56%, chronic respiratory disease 26% and immunodeficiency 10%. The elapsed time from the onset of the clinical picture to hospital admission was 6 +/- 4 days, being the most common symptoms: fever 90%, cough 70%, shortness of breath 60%, myalgia 46% and headache 7%. The delay until ICU admission was 2 +/- 1 days and the main clinical characteristics at admission were: APACHE II 17 +/- 5, SOFA 6 +/- 3, PaO2/FiO2 ratio 102 +/- 45, mechanical ventilation 70%, High-flow oxygen therapy 27% and requiring immediate prone-position ventilation 57% of patients. During ICU stay, 88% of patients needed mechanical ventilation, with an average time of 15 days (8-25), 74% prone-position ventilation, with a median of 2 sessions (0-5), 64% neuromuscular blockers and 37% of patients underwent tracheostomy for respiratory support removal. Vasopressor therapy was required by 63% of patients, 30% developed acute renal failure and 10% needed renal replacement therapy. During ICU stay, infectious complications (ventilator-related pneumonia 28% and catheter-related bacteraemia 24%) were the most frequent, followed by delirium 30%, pneumothorax 10% and clinical thromboembolism 7%. Regarding the treatment administered: 99% of patients received antibiotics, 99% Ritonavir/Lopinavir, 97% Hidroxichloroquine, 76% Tocilizumab, 60% Beta-Interferon and 22% Remdesivir. Of all the patients, 76% received corticosteroids at some time during hospital stay. The ICU mortality was 38%, with mean stay of 24 days (10-32). In-hospital mortality was 40%, with mean stay of 36 days (17-53). The main causes of mortality were multiple organ dysfunction syndrome 47%, and refractory hypoxemia 40%. Conclusion(s): There was a significant mortality and a large number of complications in critically ill Covid-19 patients. A high percentage of patients needed respiratory support and prone-position ventilation. Prolonged ICU and hospital stay was required.

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1. **Detection of Severe Acute Respiratory Syndrome Coronavirus 2 in the Pleural Fluid**  
   Baek Moon Seong Infection & chemotherapy 2020;:No page numbers.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) can be detected via a nasopharyngeal swab and in sputum, blood, urine, and feces. However, there is only limited data on the real-time reverse transcriptase polymerase chain reaction (RT-PCR) results of coronavirus disease 2019 (COVID-19) patients with pleural fluid. We report a case of COVID-19 with SARS-CoV-2 detected in both sputum and pleural fluid. A 68-year-old male patient came to the hospital with a chief complaint of dyspnea. He was diagnosed with lung cancer. A biopsy was performed, and a pneumothorax was found. As a result, a chest tube was placed into the right pleural space. During his hospital stay, the patient was confirmed as COVID-19 positive. We identified the presence of SARS-CoV-2 through real-time RT-PCR assay from the pleural fluid. Although pleural effusion is an uncommon finding in the COVID-19, care should be taken to avoid exposure when handling the pleural fluid sample. Copyright © 2020 by The Korean Society of Infectious Diseases, Korean Society for Antimicrobial Therapy, and The Korean Society for AIDS.

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1. **Development of a multi-institutional registry for children with operative congenital lung malformations**  
   Kunisaki S. M. Journal of Pediatric Surgery 2020;55:1313-1318.

Introduction: The purpose of this study was to develop a multi-institutional registry to characterize the demographics, management, and outcomes of a contemporary cohort of children undergoing congenital lung malformation (CLM) resection. Method(s): After central reliance IRB approval, a web-based, secure database was created to capture retrospective cohort data on pathologically-confirmed CLMs performed between 2009 and 2015 within a multi-institutional research collaborative. Result(s): Eleven children's hospitals contributed 506 patients. Among 344 prenatally diagnosed lesions, the congenital pulmonary airway malformation volume ratio was measured in 49.1%, and fetal MRI was performed in 34.3%. One hundred thirty-four (26.7%) children had respiratory symptoms at birth. Fifty-eight (11.6%) underwent neonatal resection, 322 (64.1%) had surgery at 1-12 months, and 122 (24.3%) had operations after 12 months. The median age at resection was 6.7 months (interquartile range, 3.6-11.4). Among 230 elective lobectomies performed in asymptomatic patients, thoracoscopy was successfully utilized in 102 (44.3%), but there was substantial variation across centers. The most common lesions were congenital pulmonary airway malformation (n = 234, 47.3%) and intralobar bronchopulmonary sequestration (n = 106, 21.4%). Conclusion(s): This multicenter cohort study on operative CLMs highlights marked disease heterogeneity and substantial practice variation in preoperative evaluation and operative management. Future registry studies are planned to help establish evidence-based guidelines to optimize the care of these patients. Level of Evidence: Level II.Copyright © 2019 Elsevier Inc.

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1. **Development of bullous lung disease in a patient with severe COVID-19 pneumonitis**  
   Berhane Samuel BMJ case reports 2020;13:No page numbers.

A 60-year-old man presented with sudden onset right-sided chest pain and gradually worsening shortness of breath on exertion. Eleven days earlier, he had an admission with COVID-19 pneumonitis requiring 8 days of continuous positive airway pressure. He was tachypnoeic with a respiratory rate of 24 breaths/min, oxygen saturations on room air of 91%. Examination revealed reduced air entry and a resonant percussion note over the right hemithorax. Chest radiograph suggested a complex right pneumothorax; however, a CT chest was notable for widespread right-sided bullous lung disease. After a day of observation on a COVID-19 ward (and a repeat radiograph with a stable appearance), he was discharged with a 2-week follow-up with the respiratory team, safety netting advice and ambulatory oxygen. This case suggests that bullous lung disease may be a complication of severe COVID-19 pneumonitis. Copyright © BMJ Publishing Group Limited 2020. No commercial re-use. See rights and permissions. Published by BMJ.

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1. **Diagnosis of coronavirus disease 2019 pneumonia in pregnant women: can we rely on lung ultrasound?**  
   Sperandeo M. American Journal of Obstetrics and Gynecology 2020;223:615.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=af329054cebc20dffb4396c153c97018)

1. **Diaphragm dysfunction prior to intubation in a patient with Covid-19 pneumonia; assessment by point of care ultrasound and potential implications for patient monitoring**  
   van Steveninck A. L. Respiratory Medicine Case Reports 2020;31:101284.

The clinical research described in this case report was initiated because of the recognized need for early identification of Covid-19 patients at risk of respiratory failure. We used point of care ultrasound to identify diaphragm dysfunction in a spontaneously breathing Covid-19 patient. Measurements of diaphragm thickness and thickening fraction indicated diaphragm dysfunction prior to intubation while respiratory failure was not yet evident from arterial blood gas analysis. Recovery of diaphragm contractility was demonstrated within two days of controlled mechanical ventilation when the patient was switched to a pressure support mode. With recovery of the diaphragm very large fractional shortening was seen after discontinuation of rocuronium, which was associated with a reduced dynamic compliance. In conclusion, this case report illustrates the need to be aware of potential diaphragm dysfunction in spontaneously breathing Covid-19 patients. With recovery, point of care ultrasound allows repeated evaluation of diaphragm function which appears to be responsive to changes in pulmonary compliance.Copyright © 2020 The Authors

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1. **Different presentation of pulmonary parenchymal disruption in COVID-19 pneumonia. Case series of Sub-Intensive Care Unit in Naples, Italy**  
   Polistina Giorgio E. Monaldi archives for chest disease = Archivio Monaldi per le malattie del torace 2020;90:No page numbers.

The coronavirus disease 2019 (COVID-19) is a recent pandemic that affected more than 5 million people worldwide. Chest high resolution computed tomography (HRCT) is an essential tool in diagnosis and management of the disease. Pulmonary parenchymal opacity is a typical sign of the disease, but not the only one. Pneumothorax, pneumomediastinum, bronchiectasis and cysts are probably underrated complications of COVID-19 that can worsen prognosis, in terms of prolonged hospitalization and need of oxygen therapy. In our single center case series, we outline four different manifestations of pneumothorax, pneumomediastinum and cysts in hospitalized patients with COVID-19 pneumonia.

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1. **Disparate effects of methicillin-resistant Staphylococcus aureus infection on renal function in IgA-dominant infection-associated glomerulonephritis and menstrual toxic shock syndrome: a case report and literature review**  
   Zhang Yan The Journal of international medical research 2020;48:300060520933810.

The sudden outbreak of severe acute respiratory syndrome coronavirus 2 pneumonia posed a significant challenge to medical professionals because treatment of critically ill patients requires the efforts of a multidisciplinary team. To highlight this principle, we examined acute kidney injury (AKI) in IgA-dominant infection-associated glomerulonephritis (GN) and menstrual toxic shock syndrome (mTSS). Both GN and mTSS are rare diseases caused by staphylococcal infection, and renal function is frequently impaired. The resulting AKIs are disparate pathological entities driven by distinct immune mechanisms. We begin by describing the case of a diabetic man with pyopneumothorax following methicillin-resistant Staphylococcus aureus (MRSA). He had endocapillary proliferative GN with in situ IgA-dominant immune-complex formation in the mesangium accompanied by complement C3 deposition in the glomerular capillary wall. By contrast, acute tubular necrosis was observed in a case of mTSS; the patient's immune response was stimulated differently by MRSA enterotoxin and exotoxin resulting in aberrant IgA deposition, complement activation, and insufficient antibody production. As a multidisciplinary communication covering the fields of nephrology, immunology, and pathology, this report may help clinicians to understand these distinct renal lesions and make optimal therapeutic decisions expeditiously.

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1. **Disparate effects of methicillin-resistant Staphylococcus aureus infection on renal function in IgA-dominant infection-associated glomerulonephritis and menstrual toxic shock syndrome: a case report and literature review**  
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1. **Does COVID-19 Increase the Risk for Spontaneous Pneumothorax?**  
   do Lago Vanessa Carvalho The American journal of the medical sciences 2020;360:735-737.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=88eb0df8f778d217254fc50676a357ed)

1. **Does Making a Diagnosis of ARDS in Patients With Coronavirus Disease 2019 Matter?**  
   Tobin M. J. Chest 2020;158:2275-2277.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=76e94e815cd081b89368056b52319dd1)

1. **E. COLI PNEUMONIA WITH PNEUMATOCELE, EMPYEMA NECESSITANS, AND BRONCHOPLEURAL FISTULA IN A PATIENT WITH SEVERE COVID-19**  
   Kahn M. Chest 2020;158:A509.

SESSION TITLE: Medical Student/Resident Chest Infections Posters SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: Tocilizumab, an interleukin-6 inhibitor used in rheumatologic disease and cytokine release syndrome, is one of many investigational drugs used for coronavirus disease-19 pneumonia (COVID). While the safety profile has been well studied, there is little known about its effect on opportunistic infections (OI) risk in patients with COVID. We present a 43-year-old man with COVID who received tocilizumab and subsequently developed cavitating lung lesions suspicious for invasive aspergillosis. CASE PRESENTATION: A 43-year-old man with diabetes mellitus was admitted for hypoxemic respiratory failure (HRF). Nasopharyngeal swab polymerase chain reaction was positive for COVID. He was placed on high-flow nasal cannula (HFNC), and on day 10 he was intubated for worsening HRF. He was treated with ceftriaxone, azithromycin, methylprednisolone, convalescent plasma, and tocilizumab. Antibiotics later included ertapenem due to E. coli with extended-spectrum beta lactamase (ESBL) found in sputum culture. He was extubated on day 15 and oxygen requirements were weaned to HFNC. However, bronchial aspirate cultures from day 14 grew mold and subsequent serologies were positive for Aspergillus. Chest computerized tomography (CT) was notable for the development of multiple new cavitary lesions concerning for invasive pulmonary aspergillosis. The patient was initially treated with voriconazole and later with amphotericin B due to liver enzyme elevation. The patient's oxygen requirements initially decreased, however on day 30 the patient suffered an aspiration event and was reintubated. Subsequent CT was concerning for worsening of cavitary lung disease. Bronchoalveolar lavage was collected, which tested positive for Aspergillus galactomannan. On hospital day 31, the patient suffered a left-sided tension pneumothorax requiring tube thoracostomy. At the time of submission the patient remains critically ill. DISCUSSION: Influenza-associated pulmonary aspergillosis (IAPA) is a known complication of severe influenza.1,2 Similarly, COVID-associated pulmonary aspergillosis (CAPA) may become an emerging problem given the overwhelming inflammation and use of experimental immunosuppressive therapies in COVID.1,2 While tocilizumab has not been shown to increase risk of Aspergillus infection in rheumatologic disease, it has not been studied in COVID and the risk of OI in an already-susceptible group may outweigh the benefits of using this drug in patients with COVID.3 If CAPA is similar to IAPA, BAL galactomannan is the gold standard for diagnosis.2 CONCLUSION(S): As the medical community searches for COVID treatments, these patients' potentially inherent vulnerability to OI may be under-appreciated. When using immunosuppressive agents to curtail the inflammatory cascade, the risk of OI must be considered and agents like tocilizumab must be further studied in this context. Reference #1: Koehler P, Cornely OA, Bottiger BW, et al. COVID-19 associated pulmonary aspergillosis. Mycoses. 2020;63(6):528-534. Reference #2: van Arkel ALE, Rijpstra TA, Belderbos HNA, van Wijngaarden P, Verweij PE, Bentvelsen RG. COVID-19 associated pulmonary aspergillosis. Am J Respir Crit Care Med. 2020;online May 2020. Reference #3: Kourbeti IS, Ziakas PD, Mylonakis E. Biologic therapies in rheumatoid arthritis and the risk of opportunistic infections: a meta-analysis. Clin Infect Dis. 2014;58(12):1649-57. DISCLOSURES: No relevant relationships by Michael Kahn, source=Web Response No relevant relationships by Nader Kamangar, source=Web Response No relevant relationships by Jay Thetford, source=Web Response No relevant relationships by Richard Watson, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **EARLY DISCHARGE AFTER ROBOTIC LOBECTOMY UTILIZING AN ENHANCED RECOVERY AFTER SURGERY-BASED PROTOCOL**  
   Perez N. Chest 2020;158:A2641.

SESSION TITLE: Cardiothoracic Surgery Posters SESSION TYPE: Original Investigation Posters PRESENTED ON: October 18-21, 2020 PURPOSE: Robotic lobectomy has been associated with a median length of stay of 4 days. We hypothesized that with a standard Enhanced Recovery After Surgery (ERAS) protocol, robotic lobectomies could be discharged as early as post-operative day 1. METHOD(S): Between March 2017 and March 2020, a total of 239 robotic-assisted lobectomies were performed by a single surgeon. All operations included additional procedures, such as mediastinal and hilar lymph node dissections, bronchoscopies, en bloc resections, intercostal nerve blocks and lysis of adhesions. RESULT(S): 20 patients were discharged home on post-operative day 1. Of these, 13 were female and 7 were male. The average age was 65 years. 8 patients had cardiovascular disease, 2 had chronic kidney disease and 7 had a history of other cancer. The average body mass index was 28.9 kg/m2. The average pack years smoked was 24.3. The average FEV1 was 2.3L which was 87% predicted (median 2.0L, 91% predicted). The average diffusion capacity was 82% predicted (median 79% predicted). 6 patients underwent left lower lobectomy, 5 left upper lobectomy, 4 right upper lobectomy, 3 right middle lobectomy and 2 right lower lobectomy. The most common pathology was adenocarcinoma (7 patients) followed by squamous cell carcinoma (5 patients), and other pathologies in 8 patients. There were 3 post-discharge complications within 30 days requiring intervention; thoracentesis (1 patient), atrial fibrillation with rapid ventricular response (1 patient), and acute kidney injury in a patient with chronic kidney disease (1 patient). There were no readmissions for pleural effusion or pneumothorax. There were no mortalities. CONCLUSION(S): An underemphasized, but very important, additional benefit of robotic lobectomy is shortened length of stay. Our study demonstrates that post-operative day 1 discharge after lobectomy is possible, and is associated with low risk for complication and readmission. Additionally, the application of an ERAS-based care path improves patient outcomes and strengthens team-based collaboration by streamlining post-operative care practices and expectations. This decreased length of hospitalization reduces risks for nosocomial infections (including COVID-19) and improves resource utilization. CLINICAL IMPLICATIONS: Early discharge was the goal of our ERAS protocol applied to all lobectomy patients. Important features include:-Pre-operative education and counseling (including the possibility of day 1 discharge)-Multimodal pain relief regimen-Early out of bed mobilization and ambulation -Atrial fibrillation prophylaxis (usually low dose beta blocker)-Repletion of potassium and magnesium-Water seal of chest tubes post-operative day 1-Early and frequent air leak checks with forced cough and Valsalva maneuver-Chest tube removal when air leak resolved -Discharge same day of tube removal if subsequent chest x-ray without pneumothorax DISCLOSURES: No relevant relationships by Nicole Perez, source=Web Response No relevant relationships by R Thomas Temes, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Early research on COVID-19: a bibliometric analysis**  
   Gong Yue The Innovation 2020;1:100027.

1. **Early use of tocilizumab in respiratory failure associated with acute COVID -19 pneumonia in recipients with solid organ transplantation**  
   Antony S. J. IDCases 2020;21:e00888.

As of May 14, 2020, the World Health Organization has reported approximately 4.3 million cases of the novel Coronavirus Disease (COVID-19) with approximately 294,046 deaths worldwide [1]. Solid organ transplant recipients who are on chronic immunosuppressants fall within a special population of COVID-19 patients since they are more susceptible to complications secondary to COVID-19. Currently, we do not have data on treating COVID-19 patients with solid organ transplants with tocilizumab, an interleukin-6 (IL-6) inhibitor. We report a case of COVID-19 in a patient with a kidney and liver transplant and discuss the early use of tocilizumab to prevent the cytokine storm and attempt to reduce the likelihood of progression to Acute Respiratory Distress Syndrome (ARDS). In addition, we present other COVID-19 related transplant cases reported in the literature outlining the presenting clinical signs and outcomes.Copyright © 2020 The Authors

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1. **Echocardiographic characteristics of subjects with COVID-19: A case series**  
   Vera-Pineda R. Cardiology Research 2020;11:260-265.

Although coronavirus disease 2019 (COVID-19) manifests in most cases with respiratory symptoms, other presentations can occur. Direct damage to the cardiovascular system has been reported and recently, acute myocardial injury has been identified as a risk factor for mortality. Transthoracic echocardiography is a non-invasive tool that allows the detection of myocardial damage with validated markers (left ventricular ejection fraction and global longitudinal strain). Herein, we present the echocardiographic findings in four patients with COVID-19. All cases had acute respiratory distress syndrome (100%). Three out of four had elevated levels of creatine kinase and creatine kinase myocardial band. One case had ventricular concentric remodeling (25%). All cases (100%) had altered ventricular function: two had a reduced ejection fraction (50%) and, of those available for global longitudinal strain analysis, all had abnormal global longitudinal strain (100%). One case was found to have a tricuspid vegetation of 12 x 10 mm with no other manifestation of endocarditis. All of our cases had left ventricular dysfunction as assessed by echocardiography. One of our patients had a vegetation in the tricuspid valve. Two of our cases had a reduced ejection fraction. The importance of acute cardiac injury in COVID-19 has recently been established. A recent study found it to be an independent risk factor for mortality in patients with this disease. Information regarding echocardiographic characteristics of this population is scarce. Further research to elucidate the impact of these characteristics on morbidity and mortality is urgently needed.Copyright © 2020 The authors.

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1. **Effect of Hydroxychloroquine on Clinical Status at 14 Days in Hospitalized Patients with COVID-19: A Randomized Clinical Trial**  
   Self W. H. JAMA - Journal of the American Medical Association 2020;324:2165-2176.

Importance: Data on the efficacy of hydroxychloroquine for the treatment of coronavirus disease 2019 (COVID-19) are needed. Objective(s): To determine whether hydroxychloroquine is an efficacious treatment for adults hospitalized with COVID-19. Design, Setting, and Participant(s): This was a multicenter, blinded, placebo-controlled randomized trial conducted at 34 hospitals in the US. Adults hospitalized with respiratory symptoms from severe acute respiratory syndrome coronavirus 2 infection were enrolled between April 2 and June 19, 2020, with the last outcome assessment on July 17, 2020. The planned sample size was 510 patients, with interim analyses planned after every 102 patients were enrolled. The trial was stopped at the fourth interim analysis for futility with a sample size of 479 patients. Intervention(s): Patients were randomly assigned to hydroxychloroquine (400 mg twice daily for 2 doses, then 200 mg twice daily for 8 doses) (n = 242) or placebo (n = 237). Main Outcomes and Measures: The primary outcome was clinical status 14 days after randomization as assessed with a 7-category ordinal scale ranging from 1 (death) to 7 (discharged from the hospital and able to perform normal activities). The primary outcome was analyzed with a multivariable proportional odds model, with an adjusted odds ratio (aOR) greater than 1.0 indicating more favorable outcomes with hydroxychloroquine than placebo. The trial included 12 secondary outcomes, including 28-day mortality. Result(s): Among 479 patients who were randomized (median age, 57 years; 44.3% female; 37.2% Hispanic/Latinx; 23.4% Black; 20.1% in the intensive care unit; 46.8% receiving supplemental oxygen without positive pressure; 11.5% receiving noninvasive ventilation or nasal high-flow oxygen; and 6.7% receiving invasive mechanical ventilation or extracorporeal membrane oxygenation), 433 (90.4%) completed the primary outcome assessment at 14 days and the remainder had clinical status imputed. The median duration of symptoms prior to randomization was 5 days (interquartile range [IQR], 3 to 7 days). Clinical status on the ordinal outcome scale at 14 days did not significantly differ between the hydroxychloroquine and placebo groups (median [IQR] score, 6 [4-7] vs 6 [4-7]; aOR, 1.02 [95% CI, 0.73 to 1.42]). None of the 12 secondary outcomes were significantly different between groups. At 28 days after randomization, 25 of 241 patients (10.4%) in the hydroxychloroquine group and 25 of 236 (10.6%) in the placebo group had died (absolute difference, -0.2% [95% CI, -5.7% to 5.3%]; aOR, 1.07 [95% CI, 0.54 to 2.09]). Conclusions and Relevance: Among adults hospitalized with respiratory illness from COVID-19, treatment with hydroxychloroquine, compared with placebo, did not significantly improve clinical status at day 14. These findings do not support the use of hydroxychloroquine for treatment of COVID-19 among hospitalized adults. Trial Registration: ClinicalTrials.gov: NCT04332991.Copyright © 2020 American Medical Association. All rights reserved.

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1. **Efficacy and safety of tocilizumab in severe COVID-19 patients: a single-centre retrospective cohort study**  
   Campochiaro C. European Journal of Internal Medicine 2020;76:43-49.

Background: Tocilizumab (TCZ), a humanized monoclonal antibody targeting the interleukin-6 (IL-6) receptor, has been proposed for the treatment of COVID-19 patients; however, limited data are available on the safety and efficacy. Method(s): We performed a retrospective study on severe COVID-19 patients with hyper-inflammatory features admitted outside intensive care units (ICUs). Patients treated with intravenous TCZ in addition to standard of care were compared to patients treated with standard of care alone. Safety and efficacy were assessed over a 28-day follow-up. Result(s): 65 patients were included. Among them, 32 were treated with TCZ. At baseline, all patients were on high-flow supplemental oxygen and most (78% of TCZ patients and 61% of standard treatment patients) were on non-invasive ventilation. During the 28-day follow-up, 69% of TCZ patients experienced a clinical improvement compared to 61% of standard treatment patients (p = 0.61). Mortality was 15% in the tocilizumab group and 33% in standard treatment group (p = 0.15). In TCZ group, at multivariate analysis, older age was a predictor of death, whereas higher baseline PaO2:FiO2 was a predictor of clinical improvement at day 28. The rate of infection and pulmonary thrombosis was similar between the two groups. Conclusion(s): At day 28, clinical improvement and mortality were not statistically different between tocilizumab and standard treatment patients in our cohort. Bacterial or fungal infections were recorded in 13% of tocilizumab patients and in 12% of standard treatment patients. Confirmation of efficacy and safety will require ongoing controlled trials.Copyright © 2020 European Federation of Internal Medicine

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1. **Emergency tracheal intubation in 202 patients with COVID-19 in Wuhan, China: lessons learnt and international expert recommendations**  
   Yao Wenlong British journal of anaesthesia 2020;125:e28-e37.

Tracheal intubation in coronavirus disease 2019 (COVID-19) patients creates a risk to physiologically compromised patients and to attending healthcare providers. Clinical information on airway management and expert recommendations in these patients are urgently needed. By analysing a two-centre retrospective observational case series from Wuhan, China, a panel of international airway management experts discussed the results and formulated consensus recommendations for the management of tracheal intubation in COVID-19 patients. Of 202 COVID-19 patients undergoing emergency tracheal intubation, most were males (n=136; 67.3%) and aged 65 yr or more (n=128; 63.4%). Most patients (n=152; 75.2%) were hypoxaemic (Sao2 <90%) before intubation. Personal protective equipment was worn by all intubating healthcare workers. Rapid sequence induction (RSI) or modified RSI was used with an intubation success rate of 89.1% on the first attempt and 100% overall. Hypoxaemia (Sao2 <90%) was common during intubation (n=148; 73.3%). Hypotension (arterial pressure <90/60 mm Hg) occurred in 36 (17.8%) patients during and 45 (22.3%) after intubation with cardiac arrest in four (2.0%). Pneumothorax occurred in 12 (5.9%) patients and death within 24 h in 21 (10.4%). Up to 14 days post-procedure, there was no evidence of cross infection in the anaesthesiologists who intubated the COVID-19 patients. Based on clinical information and expert recommendation, we propose detailed planning, strategy, and methods for tracheal intubation in COVID-19 patients. Copyright © 2020 The Author(s). Published by Elsevier Ltd.. All rights reserved.

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1. **Emergency tracheal intubation in 202 patients with COVID-19 in Wuhan, China: lessons learnt and international expert recommendations**  
   Yao Wenlong British journal of anaesthesia 2020;125:e28-e37.

1. **Emergency Tracheal Intubation in Patients with COVID-19: Experience from a UK Centre**  
   Gandhi A. Anesthesiology Research and Practice 2020;2020:8816729.

This retrospective observational case series describes a single centre's preparations and experience of 53 emergency tracheal intubations in patients with COVID-19 respiratory failure. The findings of a contemporaneous online survey exploring technical and nontechnical aspects of airway management, completed by intubation team members, are also presented. Preparations included developing a COVID-19 intubation standard operating procedure and checklist, dedicated airway trolleys, a consultant-led mobile intubation team, and an airway education programme. Tracheal intubation was successful in all patients. Intubation first-pass success rate was 85%, first-line videolaryngoscopy use 79%, oxygen desaturation 49%, and hypotension 21%. Performance was consistent across all clinical areas. The main factor impeding first-pass success was larger diameter tracheal tubes. The majority of intubations was performed by consultant anaesthetists. Nonconsultant intubations demonstrated higher oxygen desaturation rates (75% vs. 45%, p=0.610) and lower first-pass success (0% vs. 92%, p<0.001). Survey respondents (n = 29) reported increased anxiety at the start of the pandemic, with statistically significant reduction as the pandemic progressed (median: 4/5 very high vs. 2/5 low anxiety, p<0.001). Reported procedural/environmental challenges included performing tasks in personal protective equipment (62%), remote-site working (48%), and modification of normal practices (41%)-specifically, the use of larger diameter tracheal tubes (21%). Hypoxaemia was identified by 90% of respondents as the most challenging patient-related factor during intubations. Our findings demonstrate that a consultant-led mobile intubation team can safely perform tracheal intubation in critically ill COVID-19 patients across all clinical areas, aided by thorough preparation and training, despite heightened anxiety levels.Copyright © 2020 Ajay Gandhi et al.

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1. **Encephalopathy in COVID-19 patients; viral, parainfectious, or both?**  
   Umapathi T. eNeurologicalSci 2020;21:100275.

We describe the clinical, laboratory and radiological features of 3 critically ill patients with COVID-19 who developed severe encephalopathy. The first patient did not regain consciousness when sedation was removed at the end of 2 weeks of intensive care. He had received treatment with convalescent plasma. His clinical examination was remarkable for intact brainstem reflexes, roving eye movements, later transient ocular flutter; and then what appeared to be slow ocular dipping. He had no coherent volitional response to the environment. The second patient recovered with measurable cognitive deficits after a prolonged period of encephalopathy. He had received combination treatment with interferon beta 1b and lopinavir/ritonavir. The third patient remained in persistent, severe agitated delirium and died 3 months into his illness. The MRI of the 3 patients showed multifocal abnormalities predominantly in the cerebral white matter, with varying involvement of the grey matter, brainstem and spinal cord. Case 1's MRI changes were consistent with acute disseminated encephalomyelitis. The patients also displayed blood markers, to varying degree, of autoimmunity and hypercoagulability. We were not able to convincingly show, from microbiological as well as immunological evaluation, if the effects of COVID-19 on these patients' nervous system were a direct consequence of the virus, proinflammatory-thrombotic state or a combination. Patient 1 responded partially to empirical, albeit delayed, therapy with intravenous immunoglobulins. Patient 2 recovered with no specific treatment. These cases illustrate the need to understand the full spectrum of encephalopathy associated with COVID-19 so as to better guide its management.Copyright © 2020 The Author(s)

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1. **Endotracheal tube obstruction in COVID-19 critical ill patients: Complications**  
   De Miguel Martin S. H. Intensive Care Medicine Experimental 2020;8:No page numbers.

Introduction: SARS-CoV 2 (COVID-19) critical ill patients with pneumonia requiring mechanical ventilation (MV) frequently present endotracheal tube (ET) obstruction episodes. ET obstruction and ET emergent change procedure may increase the risk of Intensive Care Unit (ICU) complications with prognostic implications. Method(s): Retrospective observational trial. Patients with confirmed SARS-CoV-2 (COVID-19) pneumonia requiring mechanical ventilation longer than 48 hours between March 6th and May 6th 2020 were included. In patients with ET obstruction and ET emergent change, the following events were recorded: new onset ventilator associated pneumonia (VAP), pneumothorax and mortality related to ET change. Intubation days, ICU-stay and mortality were compared between both groups (patients with ET obstruction vs patients without ET obstruction). Result(s): 49 COVID-19 patients with pneumonia required MV. Two patients died in the next 48 hours and were excluded. 47 patients were included. Mean age was 61,7 (+/-1,6) years old, 35 (74,4%) male. Mean APACHE 2 was 14,4 (+/-0,8), mean SAPS 2 34,1 (+/-1,3). Global mortality was 29,7%. Mean ICU-stay was 29 (+/-2,6) days and mean intubation days 24 (+/-2,4). In 28 patients (59,5%) ET was changed at least once. Mean ET change day was 11,1 (+/-1,3) . Among ET change group, 14,3% had pneumothorax; 60,7% developed VAP in the follow 72 hours, 58,8% of which had new germ isolation. After comparing both groups, patients who needed ET change stayed longer intubated (28,4 vs 17,7, p < 0,05) and admitted in ICU (34,5 vs 21 days, p < 0,05). There were not significant differences in mortality. One patient died (3,6%) secondary to a ET change. Conclusion(s): More than half SARS-CoV 2 intubated critical ill patients presented ET obstructions. These episodes may increase the risk of developing complications such as VAP and pneumothorax, which determine longer intubation period and ICU-stay. Strategies headed for limiting and preventing ET obstruction episodes may decrease morbidity during MV, having an impact in ICU-stay.

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1. **Epidemiological and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China: a descriptive study**  
   Chen Nanshan Lancet (London, England) 2020;395:507-513.

BACKGROUND: In December, 2019, a pneumonia associated with the 2019 novel coronavirus (2019-nCoV) emerged in Wuhan, China. We aimed to further clarify the epidemiological and clinical characteristics of 2019-nCoV pneumonia., METHODS: In this retrospective, single-centre study, we included all confirmed cases of 2019-nCoV in Wuhan Jinyintan Hospital from Jan 1 to Jan 20, 2020. Cases were confirmed by real-time RT-PCR and were analysed for epidemiological, demographic, clinical, and radiological features and laboratory data. Outcomes were followed up until Jan 25, 2020., FINDINGS: Of the 99 patients with 2019-nCoV pneumonia, 49 (49%) had a history of exposure to the Huanan seafood market. The average age of the patients was 55.5 years (SD 13.1), including 67 men and 32 women. 2019-nCoV was detected in all patients by real-time RT-PCR. 50 (51%) patients had chronic diseases. Patients had clinical manifestations of fever (82 [83%] patients), cough (81 [82%] patients), shortness of breath (31 [31%] patients), muscle ache (11 [11%] patients), confusion (nine [9%] patients), headache (eight [8%] patients), sore throat (five [5%] patients), rhinorrhoea (four [4%] patients), chest pain (two [2%] patients), diarrhoea (two [2%] patients), and nausea and vomiting (one [1%] patient). According to imaging examination, 74 (75%) patients showed bilateral pneumonia, 14 (14%) patients showed multiple mottling and ground-glass opacity, and one (1%) patient had pneumothorax. 17 (17%) patients developed acute respiratory distress syndrome and, among them, 11 (11%) patients worsened in a short period of time and died of multiple organ failure., INTERPRETATION: The 2019-nCoV infection was of clustering onset, is more likely to affect older males with comorbidities, and can result in severe and even fatal respiratory diseases such as acute respiratory distress syndrome. In general, characteristics of patients who died were in line with the MuLBSTA score, an early warning model for predicting mortality in viral pneumonia. Further investigation is needed to explore the applicability of the MuLBSTA score in predicting the risk of mortality in 2019-nCoV infection., FUNDING: National Key R&D Program of China. Copyright © 2020 Elsevier Ltd. All rights reserved.

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1. **Epidemiology of influenza in hospitalized children with respiratory tract infection in Suzhou area from 2016 to 2019**  
   Rao X. Journal of Medical Virology 2020;92:3038-3046.

Influenza is a contagious respiratory disease and risks public health in China, and it has caused wide public concern in recent years. Immunocompromised patients, such as children and elderly people, suffer more severe influenza complication and some extreme cases are even life threatening. To identify the influenza characteristics and its correlation with various climatic and environmental pollution factors, we collected the reported influenza epidemic of hospitalized children in Children's Hospital of Soochow University from 2016 to 2019. Our results show that the main influenza virus subtypes are A/H1N1, A/H3N2, B/BV, and B/BY. We also identified the characteristics of the prevalent influenza virus subtypes in different months, seasons, years, and patients' age. Of all the influenza infected patients, the most susceptible groups are children over 3 to 5 years of age, and more cases are reported in winter than other seasons. We also found that influenza is also highly correlated with climatic and environmental pollution factors, and the autoregressive integrated moving average model is employed for the short-term influenza prediction in Suzhou city, which can provide scientific basis for the prevention and control of influenza and public health decision-making.Copyright © 2020 Wiley Periodicals LLC

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1. **Expectant management of pneumothorax in intubated COVID 19 positive patients: A case series**  
   Elder Colby 2020;:No page numbers.

&lt;h4&gt;Background: &lt;/h4&gt; There is an increasing amount of literature describing the pathogenesis of coronavirus disease 2019 (COVID-19) pneumonia and its associated complications. Historically, a small pneumothorax has been shown to be successfully treated without chest tube insertion, but this management has yet to be proven in COVID-19 pneumonia patients. In addition, pneumothorax in an intubated patient with high positive end-expiratory pressure (PEEP) provides additional uncertainty with pursuing non-operative management. Case Presentation: In this series we report four cases of patients with respiratory distress who tested positive for COVID-19 via nasopharyngeal swab and developed ventilator-induced pneumothoraces which were successfully managed with observation alone. &lt;h4&gt;Conclusions: &lt;/h4&gt; Management of patients with COVID-19 pneumonia on positive pressure ventilation who develop small stable pneumothoraces can be safely observed without chest tube insertion.

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   Elder Colby Journal of cardiothoracic surgery 2020;15:263.

BACKGROUND: There is an increasing amount of literature describing the pathogenesis of coronavirus disease 2019 (COVID-19) pneumonia and its associated complications. Historically, a small pneumothorax has been shown to be successfully treated without chest tube insertion, but this management has yet to be proven in COVID-19 pneumonia patients. In addition, pneumothorax in an intubated patient with high positive end-expiratory pressure (PEEP) provides additional uncertainty with pursuing non-operative management., CASE PRESENTATION: In this series we report four cases of patients with respiratory distress who tested positive for COVID-19 via nasopharyngeal swab and developed ventilator-induced pneumothoraces which were successfully managed with observation alone., CONCLUSIONS: Management of patients with COVID-19 pneumonia on positive pressure ventilation who develop small stable pneumothoraces can be safely observed without chest tube insertion.

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1. **Experience of N-acetylcysteine airway management in the successful treatment of one case of critical condition with COVID-19: A case report**  
   Liu Yan Medicine 2020;99:e22577.

RATIONALE: The new coronavirus pneumonia Corona Virus Disease 2019 (COVID-19) has become a global pandemic. Patients with critically COVID-19 usually require invasive respiratory support, and the airway management is particularly important and the prognosis is poor., PATIENT CONCERNS: A 64-year-old man with an anastomotic fistula after radical treatment of esophageal cancer and right-side encapsulated pyopneumothorax was admitted with cough and dyspnea., DIAGNOSIS: The patient was diagnosed with novel coronavirus pneumonia and right-side encapsulated pyopneumothorax by pharyngeal swab nucleic acid test in combination with chest computed tomography (CT)., INTERVENTIONS: The patient was treated with antibiotics, antiviral and antibacterial medications, respiratory support, expectorant nebulization, and nutritional support. But he expressed progressive deterioration. Endotracheal intubation and mechanical ventilation were performed since the onset of the type - respiratory failure on the 13th day of admission. The patient had persistent refractory hypercapnia after mechanical ventilation. Based on the treatment mentioned above, combined with repeated bronchoalveolar lavage by using N-acetylcysteine (NAC) inhalation solution, the patients refractory hypercapnia was gradually improved., OUTCOMES: The patient was cured and discharged after being given the mechanical ventilation for 26 days as well as 46 days of hospitalization, currently is surviving well., LESSONS: Patients with severe conditions of novel coronavirus pneumonia often encounter bacterial infection in their later illness-stages. They may suffer respiratory failure and refractory hypercapnia that is difficult to improve due to excessive mucus secretion leading to small airway obstruction. This study provided a new insight on the proper treatment severe COVID-19 patients. The use of reasonable antibiotics and symptomatic respiratory support and other treatment, timely artificial airway and repeated bronchoalveolar NAC inhalation solution lavage, expectorant and other airway management are essential for such patients.

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1. **Extensive Surgical Emphysema in a Child after Primary Closure of Tracheocutaneous Fistula**  
   Gurung R. Case reports in anesthesiology 2020;2020:3714718.

A 4-year-old child had closure of tracheocutaneous fistula under general anaesthesia. He developed extensive surgical emphysema over the face, chest, and upper abdomen immediately in the recovery room. We gave him oxygen supplementation, removed surgical stitch, and inserted a 4 mm tracheostomy tube to secure airway. Chest X-ray ruled out pneumothorax or pneumomediastinum. After a week, a tight bandage was applied which approximated the tissue and helped in the closure of stoma; no suture was applied. The patient was discharged home on the fourth postoperative day. The patient needs close observation in the postoperative period with likely complication in mind. Recognizing early signs and symptoms of respiratory distress with quick intervention is lifesaving during the complication of tracheocutaneous fistula surgery. In absence of pneumothorax or pneumomediastinum, extensive surgical emphysema occurring during primary closure of tracheocutaneous fistula can be treated without inserting any drainage tube. Copyright © 2020 R. Gurung et al.

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1. **EXTRAPULMONARY PRESENTATION OF ASYMPTOMATIC MALE IN LYMPHANGIOLEIOMYOMATOSIS**  
   Quiles C. Chest 2020;158:A1128.

SESSION TITLE: Medical Student/Resident Diffuse Lung Disease SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: Lymphangioleiomyomatosis (LAM) is a rare multisystem disease that affects almost exclusively women in the reproductive age that can occur sporadically or in association with tuberous sclerosis (TB). LAM is characterized by invasion of the lungs and axial lymphatics by smooth muscle like cells termed LAM cells which have mutations in TSC1 or more commonly TSC2 resulting in activation of mTOR, abnormal cellular growth and migration. LAM commonly presents with dyspnea, recurrent pneumothorax and in some cases respiratory failure. Diagnosis is made by a combination of clinical features and the finding of thin walled cysts on CT scanning. In case of doubt, lung biopsy can be made for diagnosis with smooth muscle actin and HMB45 positive cells. Forty percent of patients have renal angiomyolipoma. Treatment is predominantly supportive with oxygen, bronchodilators and sometimes lung transplantation. CASE PRESENTATION: 41 y/o male patient with PMHx of epilepsy presents with abdominal pain that started 4 days ago. Pain was localized on left lower quadrant and left flank, non-radiating, pulsatile with 10/10 intensity and was associated with diarrhea and fever. Physical examination was remarkable for nasal angiofibromas, palpable mass on left lower quadrant and ash leaf spots on lower limbs. Abdominal-Pelvic CT Angiogram was remarkable for multiple bilateral renal angiomyolipomas, largest in the left kidney measuring 20 cm in size with an area of 15 cm of acute hemorrhage. Patient underwent endovascular embolization of renal arteries with no further complications. Due to findings on Abdominal-Pelvic CT Scan consistent with Tuberous Sclerosis, Chest CT Scan was ordered and remarkable for cystic changes in lungs and sclerotic bone lesions. These findings were pathognomonic of LAM and tissue biopsy was not necessary for diagnosis. DISCUSSION: Our patient represents a rare presentation of LAM in male patients; LAM is historically considered uncommon and fatal disease of women of childbearing age. The prevalence of LAM is thought to be 1 to 2.6 patients in 1,000,000 in the general female population. Our case presents a male with a rare disease diagnosed incidentally due to abdominal pain. Patient never presented with respiratory symptoms. Renal angiomyiolipoma could be an incidental finding on most patients. Our case demonstrates an atypical gender presentation with extra pulmonary symptoms that are unusual in LAM. CONCLUSION(S): The fact that this rare and uncommon disease presents in women is not exclusive to this gender. When exploring LAM as a differential diagnosis, males should be included. Reference #1: Johnson, S. R. (2006). Lymphangioleiomyomatosis. European Respiratory Journal. doi:10.1183/09031936.06.00113303 Reference #2: Rhee, J. A., Adial, A., Gumpeni, R., & Iftikhar, A. (2019). Lymphangioleiomyomatosis: A Case Report and Review of Literature. Cureus, 11(1), e3938. https://doi.org/10.7759/cureus.3938 Reference #3: Kristof AS, Moss J. Lymphangioleiomyomatosis. In: NORD Guide to Rare Disorders. Lippincott Williams & Wilkins. Philadelphia, PA. 2003:395-6. DISCLOSURES: No relevant relationships by Sandra Galarza-Vargas, source=Web Response No relevant relationships by Claudia Quiles, source=Web Response No relevant relationships by Jose Torres, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Fatal outcome in a liver transplant recipient with COVID-19**  
   Huang J. F. American Journal of Transplantation 2020;20:1907-1910.

Liver injury is common in patients with COVID-19, but little is known about its clinical presentation and severity in the context of liver transplant. We describe a case of COVID-19 in a patient who underwent transplant 3 years ago for hepatocellular carcinoma. The patient came to clinic with symptoms of respiratory disease; pharyngeal swabs for severe acute respiratory syndrome coronavirus 2 were positive. His disease progressed rapidly from mild to critical illness and was complicated by several nosocomial infections and multiorgan failure. Despite multiple invasive procedures and rescue therapies, he died from the disease. The management of COVID-19 in the posttransplant setting presents complex challenges, emphasizing the importance of strict prevention strategies.Copyright © 2020 The American Society of Transplantation and the American Society of Transplant Surgeons

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1. **First case of drug-induced liver injury associated with the use of tocilizumab in a patient with COVID-19**  
   Muhovic D. Liver International 2020;40:1901-1905.

Background and Aims: Tocilizumab (TCZ; interleukine-6 receptor antagonist) has been proposed to treat severe forms of Coronavirus disease-19 (COVID-19) because interleukine-6 plays an important role in COVID-19-induced cytokine storm. Several clinical studies have shown very good effects of TCZ in patients with COVID-19, with a few minor side effects reported. Only eight serious liver injuries caused by TCZ were reported before being used in the treatment of patients with COVID-19. Considering the significantly increased use of TCZ for the treatment of COVID-19, we would like to warn of its rare but possible serious hepatotoxicity, especially when used together with other hepatotoxic drugs. Method(s): We describe a patient with COVID-19-induced cytokine storm who developed drug-induced liver injury associated with the use of TCZ. Result(s): One day after TCZ administration, serum transaminase levels increased 40-fold. Nevertheless, TCZ had a positive effect on clinical and laboratory parameters in cytokine storm, with transaminases values normalizing in 10 days. Conclusion(s): This is the first reported case of DILI caused by TCZ in a COVID-19 patient. Intensive liver function monitoring is imperative in COVID-19 patients, because of frequent polypharmacy with potentially hepatotoxic drugs.Copyright © 2020 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd

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1. **First use of NxStage portable intermittent haemodialysis in ICU patients with AKI requiring RRT during COVID-19 pandemic in UK**  
   Isralls S. Intensive Care Medicine Experimental 2020;8:No page numbers.

Introduction: The Coronavirus disease (COVID-19) pandemic brought extraordinary demands on many Intensive Care Units (ICU) in the UK. Our ICU faced an unprecedent rate of admissions [ref1], with 32.7% of patients requiring Renal Replacement Therapy (RRT) for Acute Kidney Injury (AKI) [ref2]. Pre-pandemic, our conventional RRT was Continuous Veno Venous Haemofiltration (CVVHF), favoured over other modalities in view of more stable haemodynamic profile [ref3]. With a shortage of RRT machines, consumables, and trained workforce, we explored NxStage Pure Flow System and Cycler (NxS) as an alternative to provide portable intermittent haemodialysis (iHD) as RRT in ICU. Method(s): This study was designed as a service evaluation to review NxS safety and efficacy, including all patients with COVID-19 and AKI Stage 3 by KDIGO criteria treated with NxS between 24/04 and 24/06/2020. Exclusion criteria were liver failure or haemodynamic instability requiring vasopressors. Study approval SE20/015 (28/05/2020). Result(s): Ten consecutive patients were included, 9/10 male, all of Black, Asian and Minority Ethnicity; mean age 54.9 years (SD 11.7). 7/10 had diabetes, 6/10 had hypertension, one had chronic kidney disease. All patients had radiological features typical for COVID-19 and 7 had positive nasopharyngeal swab. In the first 24 hours in ICU, mean APACHE II score was 19.8 (SD 5.7) and PaO2/ FiO2 ratio 137mmHg (SD 69). All patients were intubated and ventilated during admission. 45 NxS treatments were delivered over two months, with a median of 3.5 days of NxS per patient (IQR 1.5-8), versus 14 days of CVVHDF (IQR 8-22.5). 5 of 45 treatments were aborted: 3 secondary to vascular access mechanical issues, one for change in therapeutic priority, and one for hypotension requiring metaraminol. Adverse events per patient are detailed in the table below. 7/10 patients developed hypokalaemia during NxS, requiring replacement in 24 of 45 treatments, without any arrhythmia. 36 treatments were delivered through standard vascath, and 9 through TesioCath. We report one bleeding episode from TesioCath site, but no episodes of catheter-associated thrombosis, nor any pneumothorax secondary to dialysis catheter insertion. We report 3 episodes of dialysis catheter associated sepsis, versus 26 septic episodes from other sources. The pH variation over NxS treatment remained stable and no patient was acidotic at the end of NxS treatment. Serum lactate level increased during all treatments, by virtue of the lactate buffer used, and decreased to the normal reference range within five hours of NxS completion in 31 of 45 cases, without clinical sequelae in the remaining cases. Efficacy was described by achieving the target fluid balance in 40/45 treatments, and reducing blood urea nitrogen (BUN) post-NxS compared to pre-NxS in 37/45 treatments (on average 5.1 mmol/l less than pre-NxS BUN samples, p < 0.01 on paired t test). 8/10 patients survived to ICU discharge or last follow up; 3 have been discharged home, 2 remain in hospital and 3 in ICU. Mean ICU length of stay was 38.7 days (SD 16.8). At ICU discharge, median eGFR was 73 mL/min/1.73 m2 (IQR 14 - 84) with no dialysis dependence. Conclusion(s): This pilot project was developed and delivered through necessity, and it was not designed to compare or displace the use of CVVHF by iHD in ICU [ref4], but proved that NxS is safe and effective in selected patients in order to preserve the use of CVVHF for patients who are haemodynamically unstable or with liver failure. (Table Presented).

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1. **Frequency of five unusual presentations in patients with COVID-19: results of the UMC-19-S1**  
   Miro Oscar Epidemiology and infection 2020;148:e189.

Despite SARS-CoV-19 infection has a stereotypical clinical picture, isolated cases with unusual manifestations have been reported, some of them being well-known to be triggered by viral infections. However, the real frequency in COVID-19 is unknown. Analysing data of 63 822 COVID patients attending 50 Spanish emergency department (ED) during the COVID outbreak, before hospitalisation, we report frequencies of (myo)pericarditis (0.71), meningoencephalitis (0.25), Guillain-Barre syndrome (0.13), acute pancreatitis (0.71) and spontaneous pneumothorax (0.57). Compared with general ED population, COVID patients developed more frequently Guillain-Barre syndrome (odds ratio (OR) 4.55, 95% confidence interval (CI) 2.09-9.90), spontaneous pneumothorax (OR 1.98, 95% CI 1.40-2.79) and (myo)pericarditis (OR 1.45, 95% CI 1.07-1.97), but less frequently pancreatitis (OR 0.44, 95% CI 0.33-0.60).

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1. **From radiological manifestations to pulmonary pathogenesis of CoviD-19: A bench to bedside review**  
   Saburi A. Radiology Research and Practice 2020;2020:8825761.

In this review, we aim to assess previous radiologic studies in COVID-19 and suggest a pulmonary pathogenesis based on radiologic findings. Although radiologic features are not specific and there is heterogeneity in symptoms and radiologic and clinical manifestation, we suggest that the dominant pattern of computed tomography is consistent with limited pneumonia, followed by interstitial pneumonitis and organizing pneumonia.Copyright © 2020 Amin Saburi et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

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1. **Goni Moreno progressive preoperative pneumoperitoneum for giant hernias: a monocentric retrospective study of 162 patients**  
   Mancini A. Hernia 2020;24:545-550.

Introduction: Goni Moreno's procedure was described 60 years ago as a solution for giant hernias repair through the creation of a progressive preoperative pneumoperitoneum (PPP). The main objective of the present study is to assess its effectiveness in terms of primary fascial closures. The secondary objectives of this study are to explore the morbidity and mortality associated with Moreno's procedure using 40 years of data from a large cohort of patients. Material(s) and Method(s): This is a retrospective study of all patients who underwent PPP procedures between October 1974 and January 2019 at the digestive surgery unit at Grenoble University Hospital, France. Data were reviewed to assess the preoperative demographic characteristics of the patients, procedure, postoperative course, complication following Clavien-Dindo classification and 30-day outcomes. Result(s): 162 procedures were attempted. The mean age of patients was 57.8 years. 83 patients had a history of chronic respiratory disease (51.2%). The mean BMI was 33.2 kg/m2, and 52 patients were obese (32.1%) Half of the patients were classified as ASA score III. Success rate of fascial closures was 95.7%. The global rate of complication during the insufflation period and after surgical repair of the hernia was 51.8% (n = 84). Among these, only 16.7% (n = 27) were major according to the Clavien-Dindo classification. The global mortality rate was 3.1%. Conclusion(s): Goni Moreno PPP is an effective procedure that allows a high rate of fascial closure. The population of patients requiring such procedures presents a high-risk profile for complications regarding demographics and associated diseases.Copyright © 2020, Springer-Verlag France SAS, part of Springer Nature.

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1. **Guideline for the management of COVID-19 patients during hospital admission in a non-intensive care setting**  
   Nielsen Jeschke K. European Clinical Respiratory Journal 2020;7:1761677.

Introduction: Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) has presented health-care systems worldwide with novel challenges and experiences and evidence is emerging during the pandemic. Patients requiring hospitalization frequently suffer from respiratory failure of different severities. Aim(s): The aim of this guideline is the treatment of patients with SARS CoV-2 (COVID-19) in hospital; in particular, it addresses the treatment of respiratory failure treated in general Internal Medical- and Pulmonary Medical wards. Result(s): Elderly patients and patients with chronic disease are particularly vulnerable to COVID-19. Target oxygen saturation should be between 92% and 96% in patients without chronic lung diseases. Treatment with >5 L oxygen/min should be in close collaboration with intensive care colleagues and >15 l/min preferably in intensive care units. High-flow nasal canula (HFNC) and long-term Continuous Positive Airway Pressure (CPAP) are recommended for patients not responding to conventional oxygen therapy. Non-invasive ventilation (NIV) is only recommended for selected patients, such as those with a ceiling of treatment or patients presenting with hypercapnic failure. With the use of humidification protective equipment as FFP2-3 masks should be used. Nebulized medication should be avoided, and spacers should be used instead. Conclusion(s): Respiratory failure is frequently the cause of hospitalization in patients with COVID-19 and should be monitored closely.Copyright © 2020, © 2020 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

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1. **Heart transplant recipient with features of COVID-19 infection: First case report from India**  
   Sharma D. Indian Journal of Transplantation 2020;14:335-337.

A 16-year-old boy has been reported 3 months postcardiac transplantation with chief complaints of nausea, vomiting, pain in abdomen, and fever. The patient had remarkably increased serum lactate dehydrogenase levels, triglycerides, serum amylase, and serum lipase. The B-type natriuretic peptide level more than 35,000 ng/mL and troponin T was increased (0.57 mug/ml). Last known concentration of tacrolimus was 9 ng/ml. Supraventricular tachycardia was remarkable on electrocardiogram. His computed tomographic findings revealed bilateral pneumothorax with bilateral pleural effusion with an opacity seen in the right upper lobe. Bedside echo revealed dilated right atrium and right ventricle with left ventricular ejection fraction of 60%. He was kept on immunosuppression of mycophenolate mofetil 360 mg (2 tablets twice a day) and tacrolimus (2.5 mg twice a day). His reverse transcriptase-polymerase chain reaction throat swabs of the patient were sent for testing 2019-nCoV and were found to be negative. The patient could not be revived in spite of all medical management.Copyright © 2020 Indian Journal of Transplantation Published by Wolters Kluwer - Medknow.

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1. **Helmet CPAP treatment in patients with COVID-19 pneumonia: a multicentre cohort study**  
   Anonymous European Respiratory Journal 2020;56:2001935.

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1. **Hemoglobin Sunshine Seth: A Case Report of Low-Oxygen-Affinity Hemoglobinopathy**  
   Heidenreich Leah S. Case reports in pediatrics 2020;2020:2853531.

Pulse oximetry is routinely used in the newborn nursery for clinical monitoring and to detect critical congenital heart disease. The differential diagnoses for reduced peripheral oxygen saturation in an infant include congenital heart disease, respiratory distress syndrome, transient tachypnea of the newborn, persistent pulmonary hypertension of the newborn, meconium aspiration syndrome, pneumonia, pneumothorax, and sepsis. The diagnostic evaluation for neonatal hypoxemia can be invasive and expensive. When this evaluation is unrevealing, other interventions may be tried without clear benefit to the patient, including, but not limited to, supplemental oxygen. Therefore, it is important to consider alternative, albeit rare, diagnoses, including hemoglobinopathies with abnormal oxygen binding properties. Mutations in the structure of alpha- and beta-globin chains can alter the affinity of hemoglobin for oxygen, and changes in oxygen affinity may result in changes in the oxygen saturation detected by pulse oximetry. These changes may or may not be of clinical significance. This case report describes Hemoglobin Sunshine Seth, a rare low-oxygen-affinity hemoglobin variant presenting as reduced peripheral oxygen saturation in an otherwise well-appearing infant male. Copyright © 2020 Leah S. Heidenreich et al.

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1. **High incidence of barotrauma in patients with COVID-19 pneumonia during invasive mechanical ventilation**  
   Udi J. Critical Care 2020;24:No page numbers.

Introduction: COVID-19 can cause pulmonary failure and even acute respiratory distress syndrome (ARDS) requiring prolonged mechanical ventilation (MV). It is known that MV by itself comes with complications like superinfections and barotrauma. Since it has been proposed by Gattinoni et al that COVID-19 pneumonia may have two phenotypes [1], an early one presenting with low elastance and recruitability and the later one with features of ARDS, we evaluated all COVID-19 patients on MV for barotrauma. Method(s): All patients with COVID-19 pneumonia on MV treated at our intensive care unit (university hospital, ARDS and ECMO reference center) between March and April 2020 were included. Characteristics of MV during the last 24 hours (h) before any complication were recorded. This retrospective registry is covered by an ethics approval (file 234-20). Result(s): A total of 20 patients with COVID-19 pneumonia were included (median age: 61 years, 6 female, duration of MV 22 days, 55% on venovenous extracorporeal membrane oxygenation (vv-ECMO). Of these, 8 patients (median age: 62 years, 3 female, 4 on vv-ECMO) developed barotrauma (40%) including pneumothorax (n=5), pneumomediastinum (n=5) and subcutaneous emphysema (n=2) under MV (Figure 1). Only 1 patient had a predisposing lung disease (chronic obstructive lung disease). Median MV duration before complication occurs was 18 days (range: 1-32). Median MV parameters from all 8 patients during the last 24 h before barotrauma, were: inspiratory oxygen fraction (FiO2) 55% (range: 45-70) peak inspiratory pressure 27 mbar (range: 20-29), positive end-expiratory pressure (PEEP) 12 mbar (range: 5-16), tidal volume (VT) 453 ml (range: 41-775), and respiratory frequency (RF) 22/min (range: 15-30), 63% spontaneous breathing, 50% prone positioning. Conclusion(s): In our experience, barotrauma is a frequent complication in the late phase of COVID-19 induced ARDS. Preliminary data suggest that barotrauma in COVID-19 may occur even when following recommendations for lung protective MV in ARDS.

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1. **HIGH INCIDENCE OF SPONTANEOUS PNEUMOTHORAX IN CRITICALLY ILL PATIENTS WITH SARS-COV-2**  
   Reddy R. Chest 2020;158:A1191.

SESSION TITLE: Disorders of the Pleura Posters SESSION TYPE: Original Investigation Posters PRESENTED ON: October 18-21, 2020 PURPOSE: Spontaneous pneumothorax is a relatively common complication in critically ill patients with severe acute respiratory distress syndrome (ARDS). Limited data exists regarding pneumothorax in severe acute respiratory coronavirus 2 (SARS-CoV-2) patients. This study depicts cases of spontaneous pneumothorax in critically ill SARS-CoV-2 patients and explores the potential underlying mechanisms. METHOD(S): This is a retrospective cohort study of SARS-CoV-2 patients with severe ARDS admitted to a tertiary care center between March 9, 2020 to April 5, 2020. SARS-CoV-2 was diagnosed via polymerase chain reaction. Only patients on mechanical ventilation were analyzed. RESULT(S): A total of 22 patients with confirmed SARS-CoV-2 infection on mechanical ventilation were identified and analyzed. Out of these, 7 patients developed a spontaneous pneumothorax. The patients were predominantly male (86%) with an age range between 67 and 82 years old. Cough (100%) and shortness of breath (71%) were the most common presenting symptoms. Chronic obstructive pulmonary disease was not present in any of the patients. Pneumothoraxes were diagnosed 6 to 33 days after hospital admission. All 7 patients had subclavian central lines that were placed by 4 different providers with more than 15 years of critical care experience. All 7 patients had right sided pneumothoraxes of varying sizes but only 42% had right-sided lines. Remarkably, the mean peak inspiratory pressure (Ppeak) for these patients was 25 cm H2O and the mean positive end expiratory pressure (PEEP) was 11 cm H2O. Prone positioning was utilized in 57% of patients and 42% of patients received convalescent plasma. The mortality rate was 71% and the 2 patients who survived were discharged to long term acute care hospitals. CONCLUSION(S): Traditionally, ventilator associated pneumothorax is associated with a Ppeak greater than 40 cm H2O, which contrasts with the mean Ppeak of 25 cm H2O observed in this study. While iatrogenic pneumothoraces are common following subclavian central line placement, the majority of the pneumothoraces in this study occurred on the opposite side of the procedure. ARDS secondary to SARS-CoV-2 infection appears to have a completely different pathophysiology than that of traditional ARDS, which is typically managed with low PEEP and Ppeak. Utilizing the ARDSnet protocol in patients with ARDS secondary to SARS-CoV-2 may be deleterious. Further investigation is needed to evaluate this hypothesis. CLINICAL IMPLICATIONS: ARDS secondary to SARS-CoV-2 appears to be distinct from ARDS caused by other disease processes and may have a different risk of pneumothorax development. As elderly, critically ill SARS-CoV-2 patients with ARDS have been found to have increased risk of death, identifying modifiable risks associated with the development of a spontaneous pneumothorax could help mitigate morbidity and mortality in this population. DISCLOSURES: No relevant relationships by Andres Chacon Martinez, source=Web Response No relevant relationships by robert chait, source=Web Response No relevant relationships by Kai Chen, source=Web Response No relevant relationships by Nakeya Dewaswala, source=Web Response No relevant relationships by Katherine Hodgin, source=Web Response no disclosure on file for Jesus Pino; No relevant relationships by Fergie Ramos Tuarez, source=Web Response No relevant relationships by Renuka Reddy, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **High versus low PEEP in non-recruitable collapsed lung tissue: possible implications for patients with COVID-19**  
   Schultz Marcus J. The Lancet. Respiratory medicine 2020;8:e44.

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1. **High-flow nasal cannula is superior to standard face-mask oxygen therapy in viral bronchiolitis**  
   Ture E. Signa Vitae 2020;16:47-53.

Objectives: High-flow nasal cannula (HFNC) has arisen as a novel treatment method for providing high-flow oxygen support. It can be used for patients of all age groups, provides respiratory support in respiratory tract diseases, and its use is rapidly increasing. The aim of the study was to compare the effectiveness of oxygen therapies with HFNC and a non-rebreathing face mask (NFM) with a reservoir bag through changes in vital signs before and after treatment. Method(s): Patients aged under two years who were diagnosed as having acute bronchiolitis were included in study. Of the randomly selected patients, one-half was given HFNC oxygen therapy and the other half was given standard oxygen support via an NFM. Result(s): There was a significant reduction in respiration rates (RR) at the 3rd hour and in heart rate (HR) at the 6th hour of treatment compared with NFM. Time to normalization of HR and RR according to age and length of hospital stay were shorter and need for intensive care support was less in those receiving HFNC oxygen support. Conclusion(s): HFNC significantly shortens length of hospital stay and duration of oxygen therapy compared with standard oxygen. The authors believe that the effectiveness of treatment or response to treatment could be evaluated using HR and RR monitoring. A flow rate up to 25 L/min could be used for patients aged under two years.Copyright © 2020 The Authors. Published by MRE Press.

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1. **Hydroxychloroquine with or without azithromycin in mild-to-moderate Covid-19**  
   Cavalcanti A. B. New England Journal of Medicine 2020;383:2041-2052.

BACKGROUND Hydroxychloroquine and azithromycin have been used to treat patients with coronavirus disease 2019 (Covid-19). However, evidence on the safety and efficacy of these therapies is limited. METHODS We conducted a multicenter, randomized, open-label, three-group, controlled trial involving hospitalized patients with suspected or confirmed Covid-19 who werereceiving either no supplemental oxygen or a maximum of 4 liters per minute of supplemental oxygen. Patients were randomly assigned in a 1:1:1 ratio to receive standard care, standard care plus hydroxychloroquine at a dose of 400 mg twice daily, or standard care plus hydroxychloroquine at a dose of 400 mg twice daily plus azithromycin at a dose of 500 mg once daily for 7 days. The primary outcome was clinical status at 15 days as assessed with the use of a seven-level ordinal scale (with levels ranging from one to seven and higher scores indicating a worse condition) in the modified intention-to-treat population (patients with a confirmed diagnosis of Covid-19). Safety was also assessed. RESULTS A total of 667 patients underwent randomization; 504 patients had confirmed Covid-19 and were included in the modified intention-to-treat analysis. As compared with standard care, the proportional odds of having a higher score on the seven-point ordinal scale at 15 days was not affected by either hydroxychloroquine alone (odds ratio, 1.21; 95% confidence interval [CI], 0.69 to 2.11; P = 1.00) or hydroxychloroquine plus azithromycin (odds ratio, 0.99; 95% CI, 0.57 to 1.73; P = 1.00). Prolongation of the corrected QT interval and elevation of liver-enzyme levels were more frequent in patients receiving hydroxychloroquine, alone or with azithromycin, than in those who were not receiving either agent. CONCLUSIONS Among patients hospitalized with mild-to-moderate Covid-19, the use of hydroxychloroquine, alone or with azithromycin, did not improve clinical status at 15 days as compared with standard care.Copyright © 2020 Massachusetts Medical Society.

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1. **Hyperbaric oxygen therapy may be effective to improve hypoxemia in patients with severe COVID-2019 pneumonia: two case reports**  
   Guo Dazhi Undersea & hyperbaric medicine : journal of the Undersea and Hyperbaric Medical Society, Inc 2020;47:181-187.

Objectives: To determine whether hyperbaric oxygen (HBO2) therapy be effective to improve hypoxemia for severe COVID-19 pneumonia patients., Methods: Two male patients ages 57 and 64 years old were treated. Each met at least one of the following criteria: shortness of breath; respiratory rate (RR) >=30 breaths/minute; finger pulse oxygen saturation (SpO2) <=93% at rest; and oxygen index (P/F ratio: PaO2/FiO2 <=300 mmHg). Each case excluded any combination with pneumothorax, pulmonary bullae or other absolute contraindications to HBO2. Patients were treated with 1.5 atmospheres absolute HBO2 with an oxygen concentration of more than 95% for 60 minutes per treatment, once a day for one week. Patients' self-reported symptoms, daily mean SpO2 (SO2), arterial blood gas analysis, D-dimer, lymphocyte, cholinesterase (che) and chest CT were conducted and measured., Results: For both patients, dyspnea and shortness of breath were immediately alleviated after the first HBO2 treatment and remarkably relieved after seven days of HBO2 therapy. The RR also decreased daily. Neither patient became critically ill. The decreasing trend of SO2 and P/F ratio was immediately reversed and increased day by day. The lymphocyte count and ratio corresponding to immune function gradually recovered. D-dimer corresponding to peripheral circulation disorders and serum cholinesterase, reflecting liver function had improved. Follow-up chest CT showed that the pulmonary inflammation had clearly subsided., Conclusion: Our preliminary uncontrolled case reports suggest that HBO2 therapy may promptly improve the progressive hypoxemia of patients with COVID-2019 pneumonia. However, the limited sample size and study design preclude a definitive statement about the potential effectiveness of HBO2 therapy to COVID-2019 pneumonia. It requires evaluation in randomized clinical trials in future. Copyright© Undersea and Hyperbaric Medical Society.

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1. **Iatrogenic Pneumothorax and Pneumomediastinum in a Patient with COVID-19**  
   Selvaraj Vijairam Rhode Island medical journal (2013) 2020;103:32-33.

Co-occurrence of pneumothorax and pneumomediastinum is rare in COVID-19 patients. Positive airway pressure therapy used to improve oxygenation may sometimes worsen clinical outcomes in some patients with severe COVID-19 pneumonia. In this case report, we describe an individual who was diagnosed with COVID-19 and developed bilateral pneumothorax and pneumomediastinum after initiating non-invasive positive airway pressure therapy.

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1. **Images in clinical tropical medicine bulla formation and tension pneumothorax in a patient with COVID-19**  
   Yasukawa K. American Journal of Tropical Medicine and Hygiene 2020;103:943-944.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=84c83dcb103d0f869bf59a186720b1eb)

1. **Imaging differences between coronavirus disease 2019, severe acute respiratory syndrome, and Middle East respiratory syndrome**  
   Kheiralla O. A. M. European Journal of Radiology Open 2020;7:100277.

Since the outbreak of Coronavirus Disease-19 (COVID-19) infection in December 2019 in Wuhan, the capital Hubei province, central of China, more than 4 million people have contracted the virus worldwide. Despite the imposed precautions, coronavirus disease-19 is rapidly spreading with human-to-human transmission resulting in more than 290,000 death as of May 13, 2020 according to World Health Organization (WHO). The aim of this study was to revise the characteristic imaging features of Sever Acute Respiratory Syndrome (SARS) and Middle East Respiratory Syndrome (MERS) during their outbreak, and to compare them with that of COVID-19, to familiarize radiologists with the imaging spectrum of corona-virus syndromes. This study will help in more understanding and characterisation of COVID-19 to support the global efforts in combating its worldwide outbreak.Copyright © 2020 The Authors

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1. **Imaging features of the initial chest thin-section CT scans from 110 patients after admission with suspected or confirmed diagnosis of COVID-19**  
   Long Cheng-Juan BMC medical imaging 2020;20:64.

BACKGROUND: In December 2019, an outbreak of a novel coronavirus pneumonia, now called COVID-19, occurred in Wuhan, Hubei Province, China. COVID-19, which is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has spread quickly across China and the rest of the world. This study aims to evaluate initial chest thin-section CT findings of COVID-19 patients after their admission at our hospital., METHODS: Retrospective study in a tertiary referral hospital in Anhui, China. From January 22, 2020 to February 16, 2020, 110 suspected or confirmed COVID-19 patients were examined using chest thin-section CT. Patients in group 1 (n = 51) presented with symptoms of COVID-19 according to the diagnostic criteria. Group 2 (n = 29) patients were identified as a high degree of clinical suspicion. Patients in group 3 (n = 30) presented with mild symptoms and normal chest radiographs. The characteristics, positions, and distribution of intrapulmonary lesions were analyzed. Moreover, interstitial lesions, pleural thickening and effusion, lymph node enlargement, and other CT abnormalities were reviewed., RESULTS: CT abnormalities were found only in groups 1 and 2. The segments involved were mainly distributed in the lower lobes (58.3%) and the peripheral zone (73.8%). The peripheral lesions, adjacent subpleural lesions, accounted for 51.8%. Commonly observed CT patterns were ground-glass opacification (GGO) (with or without consolidation), interlobular septal thickening, and intralobular interstitial thickening. Compared with group 1, patients in group 2 presented with smaller lesions, and all lesions were distributed in fewer lung segments. Localized pleural thickening was observed in 51.0% of group 1 patients and 48.2% of group 2 patients. The prevalence of lymph node enlargement in groups 1 and 2 combined was extremely low (1 of 80 patients), and no significant pleural effusion or pneumothorax was observed (0 of 80 patients)., CONCLUSION: The common features of chest thin-section CT of COVID-19 are multiple areas of GGO, sometimes accompanied by consolidation. The lesions are mainly distributed in the lower lobes and peripheral zone, and a large proportion of peripheral lesions are accompanied by localized pleural thickening adjacent to the subpleural region.

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1. **Imaging findings in COVID-19 pneumonia**  
   Farias L. P. G. Clinics (Sao Paulo, Brazil) 2020;75:e2027.

The coronavirus disease (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), emerged in Wuhan city and was declared a pandemic in March 2020. Although the virus is not restricted to the lung parenchyma, the use of chest imaging in COVID-19 can be especially useful for patients with moderate to severe symptoms or comorbidities. This article aimed to demonstrate the chest imaging findings of COVID-19 on different modalities: chest radiography, computed tomography, and ultrasonography. In addition, it intended to review recommendations on imaging assessment of COVID-19 and to discuss the use of a structured chest computed tomography report. Chest radiography, despite being a low-cost and easily available method, has low sensitivity for screening patients. It can be useful in monitoring hospitalized patients, especially for the evaluation of complications such as pneumothorax and pleural effusion. Chest computed tomography, despite being highly sensitive, has a low specificity, and hence cannot replace the reference diagnostic test (reverse transcription polymerase chain reaction). To facilitate the confection and reduce the variability of radiological reports, some standardizations with structured reports have been proposed. Among the available classifications, it is possible to divide the radiological findings into typical, indeterminate, atypical, and negative findings. The structured report can also contain an estimate of the extent of lung involvement (e.g., more or less than 50% of the lung parenchyma). Pulmonary ultrasonography can also be an auxiliary method, especially for monitoring hospitalized patients in intensive care units, where transfer to a tomography scanner is difficult.

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1. **Imaging findings of SARS-CoV-2 infection in pediatrics: A systematic review of coronavirus disease 2019 (COVID-19) in 850 patients**  
   Katal Sanaz Academic Radiology 2020;:No page numbers.

1. **Imaging spectrum in coronavirus disease-2019: What every nuclear medicine physician must know?**  
   Dsouza M. Indian Journal of Nuclear Medicine 2020;35:274-275.

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1. **Implementation of a deep learning-based computeraided detection system for the interpretation of chest radiographs in patients suspected for covid-19**  
   Hwang E. J. Korean Journal of Radiology 2020;21:1150-1160.

Objective: To describe the experience of implementing a deep learning-based computer-aided detection (CAD) system for the interpretation of chest X-ray radiographs (CXR) of suspected coronavirus disease (COVID-19) patients and investigate the diagnostic performance of CXR interpretation with CAD assistance. Material(s) and Method(s): In this single-center retrospective study, initial CXR of patients with suspected or confirmed COVID-19 were investigated. A commercialized deep learning-based CAD system that can identify various abnormalities on CXR was implemented for the interpretation of CXR in daily practice. The diagnostic performance of radiologists with CAD assistance were evaluated based on two different reference standards: 1) real-time reverse transcriptase-polymerase chain reaction (rRT-PCR) results for COVID-19 and 2) pulmonary abnormality suggesting pneumonia on chest CT. The turnaround times (TATs) of radiology reports for CXR and rRT-PCR results were also evaluated. Result(s): Among 332 patients (male:female, 173:159; mean age, 57 years) with available rRT-PCR results, 16 patients (4.8%) were diagnosed with COVID-19. Using CXR, radiologists with CAD assistance identified rRT-PCR positive COVID-19 patients with sensitivity and specificity of 68.8% and 66.7%, respectively. Among 119 patients (male:female, 75:44; mean age, 69 years) with available chest CTs, radiologists assisted by CAD reported pneumonia on CXR with a sensitivity of 81.5% and a specificity of 72.3%. The TATs of CXR reports were significantly shorter than those of rRT-PCR results (median 51 vs. 507 minutes; p < 0.001). Conclusion(s): Radiologists with CAD assistance could identify patients with rRT-PCR-positive COVID-19 or pneumonia on CXR with a reasonably acceptable performance. In patients suspected with COVID-19, CXR had much faster TATs than rRT-PCRs.Copyright © 2020 The Korean Society of Radiology.

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1. **In Silico Modeling of Coronavirus Disease 2019 Acute Respiratory Distress Syndrome: Pathophysiologic Insights and Potential Management Implications**  
   Das Anup Critical care explorations 2020;2:e0202.

Objectives: Patients with coronavirus disease 2019 acute respiratory distress syndrome appear to present with at least two distinct phenotypes: severe hypoxemia with relatively well-preserved lung compliance and lung gas volumes (type 1) and a more conventional acute respiratory distress syndrome phenotype, displaying the typical characteristics of the "baby lung" (type 2). We aimed to test plausible hypotheses regarding the pathophysiologic mechanisms underlying coronavirus disease 2019 acute respiratory distress syndrome and to evaluate the resulting implications for ventilatory management., Design: We adapted a high-fidelity computational simulator, previously validated in several studies of acute respiratory distress syndrome, to: 1) develop quantitative insights into the key pathophysiologic differences between the coronavirus disease 2019 acute respiratory distress syndrome and the conventional acute respiratory distress syndrome and 2) assess the impact of different positive end-expiratory pressure, Fio2, and tidal volume settings., Setting: Interdisciplinary Collaboration in Systems Medicine Research Network., Subjects: The simulator was calibrated to represent coronavirus disease 2019 acute respiratory distress syndrome patients with both normal and elevated body mass indices undergoing invasive mechanical ventilation., Interventions: None., Measurements and Main Results: An acute respiratory distress syndrome model implementing disruption of hypoxic pulmonary vasoconstriction and vasodilation leading to hyperperfusion of collapsed lung regions failed to replicate clinical data on type 1 coronavirus disease 2019 acute respiratory distress syndrome patients. Adding mechanisms to reflect disruption of alveolar gas-exchange due to the effects of pneumonitis and heightened vascular resistance due to the emergence of microthrombi produced levels of ventilation perfusion mismatch and hypoxemia consistent with data from type 1 coronavirus disease 2019 acute respiratory distress syndrome patients, while preserving close-to-normal lung compliance and gas volumes. Atypical responses to positive end-expiratory pressure increments between 5 and 15 cm H2O were observed for this type 1 coronavirus disease 2019 acute respiratory distress syndrome model across a range of measures: increasing positive end-expiratory pressure resulted in reduced lung compliance and no improvement in oxygenation, whereas mechanical power, driving pressure, and plateau pressure all increased. Fio2 settings based on acute respiratory distress syndrome network protocols at different positive end-expiratory pressure levels were insufficient to achieve adequate oxygenation. Incrementing tidal volumes from 5 to 10 mL/kg produced similar increases in multiple indicators of ventilator-induced lung injury in the type 1 coronavirus disease 2019 acute respiratory distress syndrome model to those seen in a conventional acute respiratory distress syndrome model., Conclusions: Our model suggests that use of standard positive end-expiratory pressure/Fio2 tables, higher positive end-expiratory pressure strategies, and higher tidal volumes may all be potentially deleterious in type 1 coronavirus disease 2019 acute respiratory distress syndrome patients, and that a highly personalized approach to treatment is advisable. Copyright © 2020 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of the Society of Critical Care Medicine.

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1. **Incidence of Barotrauma in Patients With COVID-19 Pneumonia During Prolonged Invasive Mechanical Ventilation - A Case-Control Study**  
   Udi J. Journal of Intensive Care Medicine 2020;:No page numbers.

Background: SARS-CoV2 can cause pulmonary failure requiring prolonged invasive mechanical ventilation (MV). Lung protective ventilation strategies are recommended in order to minimize ventilator induced lung injury. Whether patients with COVID-19 have the same risk for complications including barotrauma is still unknown. Therefore, we investigated barotrauma in patients with COVID-19 pneumonia requiring prolonged MV. Method(s): All patients meeting diagnosis criteria for ARDS according to the Berlin Definition, with PCR positive SARS-CoV2 infection and prolonged mechanical ventilation, defined as >=2 days, treated at our ARDS referral center between March and April 2020 were included in a retrospective registry analysis. Complications were detected by manual review of all patient data including respiratory data, imaging studies, and patient files. Result(s): A total of 20 patients with severe COVID-19 pulmonary failure (Overall characteristics: median age: 61 years, female gender 6, median duration of MV 22 days) were analyzed. Eight patients (40%) developed severe barotrauma during MV (after median 18 days, range: 1-32) including pneumothorax (5/20), pneumomediastinum (5/20), pneumopericard (1/20), and extended subcutaneous emphysema (5/20). Median respirator settings 24 hours before barotrauma were: Peak inspiratory pressure (Ppeak) 29 cm H2O (range: 27-35), positive end-expiratory pressure (PEEP) 14 cm H2O (range: 5-24), tidal volume (VT) 5.4ml/kg predicted body weight (range 0.4-8.6), plateau pressure (Pplateau) 27 cm H2O (range: 19-30). Mechanical ventilation was significantly more invasive on several occasions in patients without barotrauma. Conclusion(s): Barotrauma in COVID-19 induced respiratory failure requiring mechanical ventilation was found in 40% of patients included in this registry. Our data suggest that barotrauma in COVID-19 may occur even when following recommendations for lung protective MV.Copyright © The Author(s) 2020.

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1. **Incidence of barotrauma in patients with severe COVID-19 acute respiratory failure: A descriptive study**  
   Nespoli S. Intensive Care Medicine Experimental 2020;8:No page numbers.

Introduction: Barotrauma is a well-known complication of invasive mechanical ventilation and it has been anecdotally reported in critically ill patients with COVID-19. Objective(s): To analyse the incidence and factors associated with development of barotrauma in a cohort of COVID-19 patients. Method(s): Retrospective case series of consecutive patients with laboratory-confirmed COVID-19 admitted from March 1st to April 30th 2020 to the general ICU of a tertiary care hospital. Data regarding the use of CPAP before ICU admission, as well as the parameters of mechanical ventilation during the ICU stay were collected. Barotrauma was defined as pneumothorax, pneumomediastinum or subcutaneous emphysema by means of clinical examination, lung ultrasound, chest XR or CT scan. Result(s): 81 patients were enrolled in the study; age was 60 +/- 10 years, 69 (85%) were male. 16 patients (20%) developed barotrauma. Table 1 shows the comparison of patients who did vs. those who did not develop barotrauma. 3 patients already had barotrauma at ICU admission; in the remaining cases, barotrauma was diagnosed after 14 [10; 22] days of mechanical ventilation. At the diagnosis, 3 patients (19%) were spontaneously breathing, 5 (31%) were receiving pressure support ventilation and 8 (50%) controlled ventilation; in patients undergoing mechanical ventilation PEEP was 11.6 +/- 2.6 cmH2O and Plateau airway pressure was 28 +/- 5 cmH2O. Conclusion(s): Barotrauma is a frequent, severe, late complication in mechanically ventilated COVID-19 patients. An older age and a longer course of controlled mechanical ventilation seem associated with the development of barotrauma. (Table Presented).

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1. **Incidence of pneumothorax and pneumomediastinum in Covid-19 critically ill patients**  
   Gandini L. Intensive Care Medicine Experimental 2020;8:No page numbers.

Introduction: Barotrauma, including both pneumothorax and pneumomediastinum, is a well-known complication of prolonged non-invasive ventilation (NIV) [1]. Vigorous respiratory efforts lead to increased transpulmonary pressure and to patient self induced lung injury [2]. In Coronavirus Disease 2019 (Covid-19), correct timing to declare failure of NIV and proceed to intubation and invasive ventilation is unknown. We tested the hypothesis that in Covid-19 prolonged NIV is associated with barotrauma. Objective(s): To describe incidence of barotrauma in Covid-19 and its onset time from hospital admission. To evaluate association between barotrauma and duration of NIV in Covid-19. Method(s): We retrospectively enrolled 104 consecutive Covid-19 patients, admitted to our ICU from February 22nd to March 22nd, requiring intubation after failure of NIV. Age, sex and SOFA score were collected at ICU admission. Diagnosis of barotrauma was confirmed by radiological evidence (ultrasound/chest x-ray, chest CT) during the first 2 weeks from ICU admission. Different time intervals (from hospital admission to intubation (T1) and from beginning of NIV to intubation (T2)) were compared between patients with barotrauma and controls, using the Mann-Withney test. We then identified a subgroup of barotrauma patients, defined "early", characterized by occurrence of barotrauma before or within the first 24 hours after intubation. We compared this group with controls with the Mann-Whitney test. Result(s): Mean age was 61+/-10, 84 (80.7%) were male and median SOFA score was 6 (range 4-8). Barotrauma occurred in 15 patients (14%), at a median time of 8 days (IQR 6-12) from hospital admission. No differences were found either in T1 (median days 3, IQR 2-5.5 vs 5, IQR 2-9, p ns), or in T2 (median days 2, IQR 1-4 vs 3, IQR 2-6, p ns) between controls and patients with barotrauma. However 6 patients had an early barotrauma; in this subgroup, T2 was longer in patients who developed early barotrauma compared to controls (Table). Conclusion(s): In Covid-19 barotrauma had an incidence similar to other forms of acute respiratory failure. However, early barotrauma was associated with prolonged use of NIV. (Table Presented).

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1. **Increased physiological dead space in mechanically ventilated COVID-19 patients recovering from severe acute respiratory distress syndrome: A case report**  
   Xia J. BMC Infectious Diseases 2020;20:637.

Background: An ongoing outbreak of coronavirus disease 2019 (COVID-19) is spreading globally. Recently, several articles have mentioned that the early acute respiratory distress syndrome (ARDS) caused by COVID-19 significantly differ from those of ARDS due to other causes. Actually, we newly observed that some mechanically ventilated COVID-19 patients recovering from severe ARDS (more than 14 days after invasive ventilation) often experienced evidently gradual increases in CO2 retention and minute ventilation. However, the underlying mechanics remain unclear. Case presentation: To explain these pathophysiological features and discuss the ventilatory strategy during the late phase of severe ARDS in COVID-19 patients, we first used a metabolic module on a General Electric R860 ventilator (Engstrom Carestation; GE Healthcare, USA) to monitor parameters related to gas metabolism, lung mechanics and physiological dead space in two COVID-19 patients. We found that remarkably decreased ventilatory efficiency (e.g., the ratio of dead space to tidal volume 70-80%, arterial to end-tidal CO2 difference 18-23 mmHg and ventilatory ratio 3-4) and hypermetabolism (oxygen consumption 300-400 ml/min, CO2 elimination 200-300 ml/min) may explain why these patients experienced more severe respiratory distress and CO2 retention in the late phase of ARDS caused by COVID-19. Conclusion(s): During the recovery period of ARDS among mechanically-ventilated COVID-19 patients, attention should be paid to the monitoring of physiological dead space and metabolism. Tidal volume (8-9 ml/kg) could be increased appropriately under the limited plateau pressure; however, barotrauma should still be kept in mind.Copyright © 2020 The Author(s).

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1. **Late histological findings in symptomatic COVID-19 patients: A case report**  
   Aiolfi Alberto Medicine 2020;99:e21046.

RATIONALE: Although there have been several studies describing clinical and radiographic features about the novel coronavirus (COVID-19) infection, there is a lack of pathologic data conducted on biopsies or autopsies., PATIENT CONCERNS: A 56-year-old and a 70-year-old men with fever, cough, and respiratory fatigue were admitted to the intensive care unit and intubated for respiratory distress., DIAGNOSIS: The nasopharyngeal swab was positive for COVID-19 and the chest Computed Tomography (CT) scan showed the presence of peripheral and bilateral ground-glass opacities., INTERVENTIONS: Both patients developed pneumothoraces after intubation and was managed with chest tube. Due to persistent air leak, thoracoscopies with blebs resection and pleurectomies were performed on 23rd and 16th days from symptoms onset., OUTCOMES: The procedures were successful with no evidence of postoperative air-leak, with respiratory improvement. Pathological specimens were analyzed with evidence of diffuse alveolar septum disruption, interstitium thickness, and infiltration of inflammatory cells with diffuse endothelial dysfunction and hemorrhagic thrombosis., LESSONS: Despite well-known pulmonary damages induced by the COVID-19, the late-phase histological changes include diffused peripheral vessels endothelial hyperplasia, in toto muscular wall thickening, and intravascular hemorrhagic thrombosis.

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1. **Late-onset neonatal sepsis in a patient with covid-19**  
   Munoz A. C. New England Journal of Medicine 2020;382:A10.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=4ddb92461fcb8132147adb4a75ed79da)

1. **Late-Onset Neonatal Sepsis in a Patient with Covid-19**  
   Coronado Munoz Alvaro The New England journal of medicine 2020;382:e49.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=f1cb69ee07517fbf42fabe82a9d1facb)

1. **Late-onset pneumothorax in a COVID-19 patient treated with ventilation and ECMO: A case report and literature review**  
   Horii Toshihiro Radiology case reports 2020;15:2560-2564.

Coronavirus disease 2019 (COVID-19) has become a major threat to public health since the outbreak in Wuhan in 2019. Chest computed tomography is recommended for COVID-19 cases for evaluation and follow up of pneumonia and related complication. We report the case of a 66-year-old man with underlying hypertension and a history of smoking 76 packs a year; he was frequently monitored by computed tomography for pulmonary changes during the period from early symptom onset to death. Furthermore, he developed a pneumothorax during the course. The occurrence of pneumothorax in COVID-19 patients is not common, and there have been only a few previous reports. This is a valuable case of pneumothorax in a patient with COVID-19 treated with a ventilator and extracorporeal membrane oxygenation. This case and previous reports suggest that pneumothorax occurs in COVID-19 with a relatively late onset (3-8 weeks). Long-term pneumonia morbidity, steroid therapy, positive pressure ventilation, and extracorporeal membrane oxygenation can cause pneumothorax, leading to capillary and alveolar damage. Copyright © 2020 The Authors. Published by Elsevier Inc. on behalf of University of Washington.

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1. **Level of serum IL-33 and emphysema paraseptal in clove cigarette smoker with spontaneous pneumothorax: A case report**  
   Koesoemoprodjo Winariani Respiratory medicine case reports 2020;30:101133.

A young male clove cigarette smoker experienced spontaneous pneumothorax and later paraseptal emphysema was detected on high-resolution computed tomography (HRCT) scan without respiratory symptoms. Smoking is a known risk factor for emphysema. Paraseptal emphysema is a type of emphysema that rarely causes respiratory symptoms, nevertheless, usually accompanied by spontaneous pneumothorax. Interleukin 33 (IL-33) is an alarmin cytokine that belongs to the IL-1 family. The effects of IL-33 depend on its structure. In its mature form, it is a cytokine alarmin that binds to ST2 (suppression of tumorigenicity) receptors on the surface of macrophages and innate immune cells to drive Th1/Th2 immune responses, causing oxidative stress, and increased IL-33 production causes polarization of alveolar macrophages to an M2 phenotype. In this study, long-term exposure to clove cigarette smoke caused an increased serum level of IL-33 (43.72 pg/mL) and paucigranulocytic airway inflammation. In paucigranulocytic inflammation, IL-33 is involved in lung parenchymal damage presumably through oxidative stress, activation of alveolar macrophage and increased MMP12 secretion, resulting in alveolar destruction and airspace enlargement. Copyright © 2020 The Authors.

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1. **Long-term maintenance of nutritional status with ninjinyoueito in terminal patients with chronic respiratory disease: Two case reports**  
   Sasatani Y. Biomedical Reports 2020;12:121-124.

Ninjinyoeito, is a traditional herbal (Kampo) medicine which is administered to patients with debilitating diseases in North-East Asia. Ninjinyoeito has been reported to be effective against loss of physical strength, fatigue and loss of appetite in patients with wasting diseases. The present study described long-term maintenance of body weight with ninjinyoueito in 2 terminal patients with chronic respiratory diseases. The first patient was a 75-year-old with chronic obstructive pulmonary disease (COPD) who took ninjinyoueito for >=5 years and the second patient was a 72-year-old man with metastatic lung cancer with combined pulmonary fibrosis and emphysema (CPFE) who took ninjinyoueito for >=1 year. Both of them maintained their physique and nutritional status during the terminal stages of disease and there were no adverse effects observed in these 2 patients which could be attributed to ninjinyoueito. The results suggest that ninjinyoueito may be a supplementary treatment for the maintenance of nutritional status in patients with a chronic respiratory disease accompanied by wasting, such as COPD.Copyright © 2020, Spandidos Publications. All rights reserved.

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1. **Lung cavitation due to COVID-19 pneumonia**  
   Selvaraj Vijairam BMJ case reports 2020;13:No page numbers.

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1. **LUNG ULTRASOUND B-LINES CORRELATE WITH STATIC COMPLIANCE IN MECHANICALLY VENTILATED PATIENTS**  
   Lehr A. Chest 2020;158:A584.

SESSION TITLE: Insights into the Care of Patients with Respiratory Failure SESSION TYPE: Original Investigations PRESENTED ON: October 18-21, 2020 PURPOSE: Lung ultrasound is a quick, non-invasive, and widely available tool used to assess for a multitude of disease processes. Recently, a quick point assessment of B-lines (B-line score) has been shown to be an accurate marker of extra-vascular lung water. In mechanically ventilated patients, static lung compliance is calculated as Cstat = VT/(Pplat-PEEP), with VT meaning tidal volume, Pplat plateau pressure, and PEEP positive end expiratory pressure. A limitation of this technique is that patients need to be passive on the ventilator to accurately measure PPlat, something which is difficult given efforts to reduce sedation. Other techniques, such as esophageal manometry, have been used to estimate transpulmonary pressures, but is limited by being invasive and subject to error. Our study sought to determine if the B-line score correlates with lung compliance in mechanically ventilated patients. We hypothesized that the B-line score would inversely correlate with static lung compliance. METHOD(S): This was a prospective observational study performed in the medical intensive care units of NYU Langone Health and Bellevue Hospital Center. Inclusion criteria included all adult patients requiring mechanical ventilation. Exclusion criteria included reasons to have reduced respiratory system compliance from an extrapulmonary etiology: BMI > 35, abdominal hypertension, significant pleural effusions, or pneumothorax. Lung ultrasound was performed at 4 points over the anterior chest. Each image was independently scored by two intensivists. The number of B-lines seen in each window were counted and added together to create the B-line score. Static lung compliance was determined using the formula above; inspiratory hold maneuvers were used to obtain plateau pressures. RESULT(S): A total of 99 observations were performed. The mean B-line score was 4.73 +/- 0.60 with a range score from 0 to 25.5. Ultrasound B-line score inversely correlated with static lung compliance (Spearman's r = -0.60, p<0.001), net fluid balance in the 24 hours prior to the scan (Spearman's r = -0.26, p=0.02), and P/F ratio (Spearman's r = -0.37, p<0.001). CONCLUSION(S): Ultrasound B-line score correlates with for static lung compliance in mechanically ventilated patients. CLINICAL IMPLICATIONS: Our study demonstrates that an assessment of B-lines on lung ultrasound is an effective marker of important clinical characteristics in mechanically ventilated patients. In patients where assessments of these factors are limited, use of this quick and simple B-line score may be clinically useful. This is especially true in the recent COVID-19 pandemic, where imaging tests and monitoring may be limited given isolation precautions. Whether serial B-line scores in the same patient correlate with clinical improvement in the above-mentioned markers is yet to be determined. DISCLOSURES: No relevant relationships by Andrew Lehr, source=Web Response No relevant relationships by Vikramjit Mukherjee, source=Web Response, value=Consulting fee Removed 04/27/2020 by Vikramjit Mukherjee, source=Web Response No relevant relationships by Deepak Pradhan, source=Web Response No relevant relationships by Bishoy Zakhary, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Lung ultrasound in a COVID pandemic - Choosing wisely**  
   Baker K. Australasian Journal of Ultrasound in Medicine 2020;23:159-166.

This is an opinion piece on the role of POCUS in COVID-19, with a focus on lung ultrasound. It is not an instructional essay. Crisis management in medicine has often been likened to crisis management in the aviation industry. The important difference between pilots and clinicians is that the clinician's life was not in imminent danger, should one fail. The clinician did not have the same emotional urgency as the pilot. The COVID-19 pandemic has changed this, and clinicians are now faced with the need to make urgent decisions whilst exposed to some personal risk. Whether to embrace POCUS and lung ultrasound during this pandemic is an important decision. Whilst there are clear advantages, poorly considered overzealous uptake is not without hazard, opportunity cost and potential risk to patient and clinician.Copyright © 2020 Australasian Society for Ultrasound in Medicine

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1. **Lung ultrasound in a respiratory pandemic**  
   Lokuge A. EMA - Emergency Medicine Australasia 2020;32:883-889.

Australian hospitals have prepared for a major surge in patients due to the infectious respiratory pandemic COVID-19. In other nations, patient presentations have overwhelmed resources. Ultrasound has been shown to be an effective tool to exclude significant life-threats in resource poor settings. In this article, we will describe three lung ultrasound algorithms for the emergency diagnosis of patients presenting with respiratory symptoms during a COVID-19 pandemic: (i) LUSC19: lung ultrasound to assess the severity of COVID-19; (ii) LUSAC: lung ultrasound to exclude alternative causes of respiratory distress; and (iii) LUSI: lung ultrasound following intubation. We anticipate that emergency physicians will use these algorithms during the upcoming respiratory pandemic to rapidly determine the severity of COVID-19 infection, to seek and treat significant alternative diagnoses and ensure endotracheal intubation.Copyright © 2020 Australasian College for Emergency Medicine

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1. **Lung Ultrasound in COVID-19 Pneumonia: Prospects and Limitations**  
   khalili N. Academic Radiology 2020;27:1044-1045.

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1. **Lung Ultrasound in Patients with Acute Respiratory Failure Reduces Conventional Imaging and Health Care Provider Exposure to COVID-19**  
   Mongodi Silvia Ultrasound in medicine & biology 2020;46:2090-2093.

Lung ultrasound gained a leading position in the last year as an imaging technique for the assessment and management of patients with acute respiratory failure. In coronavirus disease 2019 (COVID-19), its role may be of further importance because it is performed bedside and may limit chest X-ray and the need for transport to radiology for computed tomography (CT) scan. Since February 21, we progressively turned into a coronavirus-dedicated intensive care unit and applied an ultrasound-based approach to avoid traditional imaging and limit contamination as much as possible. We performed a complete daily examination with lung ultrasound score computation and systematic search of complications (pneumothorax, ventilator-associated pneumonia); on-duty physicians were free to perform CT or chest X-ray when deemed indicated. We compared conventional imaging exams performed in the first 4 wk of the COVID-19 epidemic with those in the same time frame in 2019: there were 84 patients in 2020 and 112 in 2019; 64 and 22 (76.2% vs. 19.6%, p < 0.001) had acute respiratory failure, respectively, of which 55 (85.9%) were COVID-19 in 2020. When COVID-19 patients in 2020 were compared with acute respiratory failure patients in 2019, the median number of chest X-rays was 1.0 (1.0-2.0) versus 3.0 (1.0-4.0) (p=0.0098); 2 patients 2 (3.6%) versus 7 patients (31.8%) had undergone at least one thoracic CT scan (p=0.001). A self-imposed ultrasound-based approach reduces the number of chest X-rays and thoracic CT scans in COVID-19 patients compared with patients with standard acute respiratory failure, thus reducing the number of health care providers exposed to possible contamination and sparing personal protective equipment. Copyright © 2020 World Federation for Ultrasound in Medicine & Biology. Published by Elsevier Inc. All rights reserved.

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1. **Management of Persistent Pneumothorax With Thoracoscopy and Bleb Resection in COVID-19 Patients**  
   Aiolfi Alberto The Annals of thoracic surgery 2020;110:e413-e415.

Several studies have been published describing the clinical and radiographic findings of coronavirus disease 2019-related pneumonia. Therefore, there is currently a lack of pathologic data on its effects in intubated patients. Pneumothorax may occur rarely and results from a combination of fibrotic parenchyma and prolonged high-pressure ventilation. Chest drainage represents first-line treatment. However, in cases of persistent pneumothorax, thoracoscopy and bleb resection may be feasible options to reduce air leak and improve ventilation. This report describes the cases of 2 patients with coronavirus disease 2019 who were successfully treated with thoracoscopy, bleb resection, and pleurectomy for persistent pneumothorax. Copyright © 2020 by The Society of Thoracic Surgeons Published by Elsevier.

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1. **Management of pneumothorax in mechanically ventilated COVID-19 patients: early experience**  
   Hussain Azhar Interactive cardiovascular and thoracic surgery 2020;31:540-543.

A significant proportion of patients infected with the novel coronavirus, now termed severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), require intensive care admission and subsequent mechanical ventilation. Pneumothorax, a potential fatal complication of mechanical ventilation, can further complicate the management of COVID-19 patients, whilst chest drain insertion may increase the risk of transmission of attending staff. We present a case series and a suggested best-practice protocol for how to manage and treat pneumothoraces in COVID-19 patients in an intensive care unit setting. Copyright © The Author(s) 2020. Published by Oxford University Press on behalf of the European Association for Cardio-Thoracic Surgery. All rights reserved.

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1. **Massive tension pyopneumothorax and pneumoperitoneum in a COVID-19 patient**  
   Paramythiotou E. Pneumon 2020;33:1.

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1. **Maternal and perinatal outcomes with COVID-19: A systematic review of 108 pregnancies**  
   Zaigham M. Acta Obstetricia et Gynecologica Scandinavica 2020;99:823-829.

Introduction: The pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has exposed vulnerable populations to an unprecedented global health crisis. The knowledge gained from previous human coronavirus outbreaks suggests that pregnant women and their fetuses are particularly susceptible to poor outcomes. The objective of this study was to summarize the clinical manifestations and maternal and perinatal outcomes of COVID-19 during pregnancy. Material(s) and Method(s): We searched databases for all case reports and series from 12 February to 4 April 2020. Multiple terms and combinations were used including COVID-19, pregnancy, maternal mortality, maternal morbidity, complications, clinical manifestations, neonatal morbidity, intrauterine fetal death, neonatal mortality and SARS-CoV-2. Eligibility criteria included peer-reviewed publications written in English or Chinese and quantitative real-time polymerase chain reaction (PCR) or dual fluorescence PCR-confirmed SARS-CoV-2 infection. Unpublished reports, unspecified date and location of the study or suspicion of duplicate reporting, cases with suspected COVID-19 that were not confirmed by a laboratory test, and unreported maternal or perinatal outcomes were excluded. Data on clinical manifestations, maternal and perinatal outcomes including vertical transmission were extracted and analyzed. Result(s): Eighteen articles reporting data from 108 pregnancies between 8 December 2019 and 1 April 2020 were included in the current study. Most reports described women presenting in the third trimester with fever (68%) and coughing (34%). Lymphocytopenia (59%) with elevated C-reactive protein (70%) was observed and 91% of the women were delivered by cesarean section. Three maternal intensive care unit admissions were noted but no maternal deaths. One neonatal death and one intrauterine death were also reported. Conclusion(s): Although the majority of mothers were discharged without any major complications, severe maternal morbidity as a result of COVID-19 and perinatal deaths were reported. Vertical transmission of the COVID-19 could not be ruled out. Careful monitoring of pregnancies with COVID-19 and measures to prevent neonatal infection are warranted.Copyright © 2020 The Authors. Acta Obstetricia et Gynecologica Scandinavica published by John Wiley & Sons Ltd on behalf of Nordic Federation of Societies of Obstetrics and Gynecology (NFOG)

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1. **Mediastinal Emphysema, Giant Bulla, and Pneumothorax Developed during the Course of COVID-19 Pneumonia**  
   Sun Ruihong Korean journal of radiology 2020;21:541-544.

The coronavirus disease 2019 (COVID-19) pneumonia is a recent outbreak in mainland China and has rapidly spread to multiple countries worldwide. Pulmonary parenchymal opacities are often observed during chest radiography. Currently, few cases have reported the complications of severe COVID-19 pneumonia. We report a case where serial follow-up chest computed tomography revealed progression of pulmonary lesions into confluent bilateral consolidation with lower lung predominance, thereby confirming COVID-19 pneumonia. Furthermore, complications such as mediastinal emphysema, giant bulla, and pneumothorax were also observed during the course of the disease. Copyright © 2020 The Korean Society of Radiology.

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1. **Mobile chest X-ray manifestations of 54 deceased patients with coronavirus disease 2019: Retrospective study**  
   Xiang Chunlin Medicine 2020;99:e23167.

To describe the mobile chest X-ray manifestations of deceased patients with coronavirus disease 2019 (COVID-19). In this retrospective study, we analyzed in patients with COVID-19 from Tongji Hospital (Wuhan, China), who had been died between February 18 and March 25, 2020. Two radiologists analyzed the radiologic characteristics of mobile chest X-ray, and analyzed the serial X-ray changes.Fifty-four deceased patients with COVID-19 were included in the study. We found that 50 (93%) patients with lesions occurred in the bilateral lung, 4 (7%) patients occurred in the right lung, 54 (100%) patients were multifocal involvement. The number of lung fields involved was 42 (78%) patients in 6 fields, 3 (6%) patients in 5 lung fields, 4 (7%) patients in 4 lung fields, and 5 (9%) patients in 3 lung fields. Fifty-three (98%) patients had patchy opacities, 3 (6%) patients had round or oval solid nodules, 9 (17%) patients had fibrous stripes, 13 (24%) patients had pleural effusion, 8 (15%) patients had pleural thickening, 6 (11%) patients had pneumothorax, 3 (6%) patients had subcutaneous emphysema. Among the 24 patients who had serial mobile chest X-rays, 16 (67%) patients had the progression of the lesions, 8 (33%) patients had no significant change of the lesions, and there was no case of reduction of the lesions. The mobile chest X-ray manifestations of deceased patients with COVID-19 were mostly bilateral lung, multifocal involvement, and extensive lung field, and pleural effusion, pleural thickening, and pneumothorax probably could be observed. The serial mobile chest X-ray showed that the chest lesions were progressive with a high probability.

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1. **Mount Sinai NY Surgeon on the Front Lines of the COVID-19 Pandemic in Brooklyn, NY, USA**  
   Vine A. J. American Surgeon 2020;86:567-571.

A surgeon was among the teams caring for critically-ill patients with COVID-19 infection during the height of the pandemic in March and April 2020 in Brooklyn. He recorded his experiences and thoughts as events unfolded, a chronicle of the landmark public health event of the century. Working to exhaustion alongside his colleagues from Mount Sinai Hospital, he encountered tragedy and inspiration.Copyright © The Author(s) 2020.

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1. **Multimodality imaging of COVID-19 pneumonia: from diagnosis to follow-up. Acomprehensive review**  
   Larici A. R. European Journal of Radiology 2020;131:109217.

Due to its pandemic diffusion, SARS- CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2) infection represents a global threat. Despite a multiorgan involvement has been described, pneumonia is the most common manifestation of COVID-19 (Coronavirus disease 2019) and it is associated with a high morbidity and a considerable mortality. Especially in the areas with high disease burden, chest imaging plays a crucial role to speed up the diagnostic process and to aid the patient management. The purpose of this comprehensive review is to understand the diagnostic capabilities and limitations of chest X-ray (CXR) and high-resolution computed tomography (HRCT) in defining the common imaging features of COVID-19 pneumonia and correlating them with the underlying pathogenic mechanisms. The evolution of lung abnormalities over time, the uncommon findings, the possible complications, and the main differential diagnosis occurring in the pandemic phase of SARS-CoV-2 infection are also discussed.Copyright © 2020 Elsevier B.V.

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1. **Multisystem manifestations of COVID-19 in a patient presenting to a heart attack centre**  
   Malaweera Anura European heart journal cardiovascular Imaging 2020;21:1304.

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1. **Nebulised surfactant for the treatment of severe COVID-19 in adults (COV-Surf): A structured summary of a study protocol for a randomized controlled trial**  
   Dushianthan Ahilanandan Trials 2020;21:1014.

OBJECTIVES: SARS-Cov-2 virus preferentially binds to the Angiotensin Converting Enzyme 2 (ACE2) on alveolar epithelial type II cells, initiating an inflammatory response and tissue damage which may impair surfactant synthesis contributing to alveolar collapse, worsening hypoxia and leading to respiratory failure. The objective of this study is to evaluate the feasibility, safety and efficacy of nebulised surfactant in COVID-19 adult patients requiring mechanical ventilation for respiratory failure., TRIAL DESIGN: This study is a dose-escalating randomized open-label clinical trial of 20 COVID-19 patients., PARTICIPANTS: This study is conducted in two centres: University Hospital Southampton and University College London Hospitals. Eligible participants are aged >=18, hospitalised with COVID-19 (confirmed by PCR), who require endotracheal intubation and are enrolled within 24 hours of mechanical ventilation. For patients unable to consent, assent is obtained from a personal legal representative (PerLR) or professional legal representative (ProfLR) prior to enrolment. The following are exclusion criteria: imminent expected death within 24 hours; specific contraindications to surfactant administration (e.g. known allergy, pneumothorax, pulmonary hemorrhage); known or suspected pregnancy; stage 4 chronic kidney disease or requiring dialysis (i.e., eGFR < 30); liver failure (Child-Pugh Class C); anticipated transfer to another hospital, which is not a study site, within 72 hours; current or recent (within 1 month) participation in another study that, in the opinion of the investigator, would prevent enrollment for safety reasons; and declined consent or assent., INTERVENTION AND COMPARATOR: Intervention: The study is based on an investigational drug/device combination product. The surfactant product is Bovactant (Alveofact R), a natural animal derived (bovine) lung surfactant formulated as a lyophilized powder in 108 mg vials and reconstituted to 45 mg/mL in buffer supplied in a prefilled syringe. It is isolated by lung lavage and, by weight, is a mixture of: phospholipid (75% phosphatidylcholine, 13% phosphatidylglycerol, 3% phosphatidylethanolamine, 1% phosphatidylinositol and 1% sphingomyelin), 5% cholesterol, 1% lipid-soluble surfactant-associated proteins (SP-B and SP-C), very low levels of free fatty acid, lyso-phosphatidylcholine, water and 0.3% calcium. The Drug Delivery Device is the AeroFact-COVID TM nebulizer, an investigational device based on the Aerogen R Solo vibrating mesh nebulizer. The timing and escalation dosing plans for the surfactant are as follows. Cohort 1: Three patients will receive 10 vials (1080 mg) each of surfactant at dosing times of 0 hours, 8 hours and 24 hours. 2 controls with no placebo intervention. Cohort 2: Three patients will receive 10 vials (1080 mg) of surfactant at dosing times of 0 hours and 8 hours, and 30 vials (3240 mg) at a dosing time of 24 hours. 2 controls with no placebo intervention. Cohort 3: Three patients will receive 10 vials (1080 mg) of surfactant at a dosing time of 0 hours, and 30 vials (3240 mg) at dosing times of 8 hours and 24 hours. 2 controls with no placebo intervention. Cohort 4: Three patients will receive 30 (3240 mg) vials each of surfactant at dosing times of 0 hours, 8 hours and 24 hours. 2 controls. 2 controls with no placebo intervention. The trial steering committee, advised by the data monitoring committee, will review trial progression and dose escalation/maintenance/reduction after each cohort is completed (48-hour primary outcome timepoint reached) based on available feasibility, adverse event, safety and efficacy data. The trial will not be discontinued on the basis of lack of efficacy. The trial may be stopped early on the basis of safety or feasibility concerns. Comparator: No placebo intervention. All participants will receive usual standard of care in accordance with the local policies for mechanically ventilated patients and all other treatments will be left to the discretion of the attending physician., MAIN OUTCOMES: The co-primary utcome is the improvement in oxygenation (PaO2/FiO2 ratio) and pulmonary ventilation (Ventilation Index (VI), where VI = [RR x (PIP - PEEP) x PaCO2]/1000) at 48 hours after study initiation. The secondary outcomes include frequency and severity of adverse events (AEs), Adverse Device Effects (ADEs), Serious Adverse Events (SAEs) and Serious Adverse Device Events (SADEs), change in pulmonary compliance, change in positive end-expiratory pressure (PEEP) requirement of ventilatory support at 24 and 48 hours after study initiation, clinical improvement defined by time to one improvement point on the ordinal scale described in the WHO master protocol (2020) recorded while hospitalised, days of mechanical ventilation, mechanical ventilator free days (VFD) at day 21, length of intensive care unit stay, number of days hospitalised and mortality at day 28. Exploratory end points will include quantification of SARS-CoV-2 viral load from tracheal aspirates using PCR, surfactant dynamics (synthesis and turnover) and function (surface tension reduction) from deep tracheal aspirate samples (DTAS), surfactant phospholipid concentrations in plasma and DTAS, inflammatory markers (cellular and cytokine) in plasma and DTAS, and blood oxidative stress markers., RANDOMISATION: After informed assent, patients fulfilling inclusion criteria will be randomised to 3:2 for the treatment and control arms using an internet-based block randomization service (ALEA tool for clinical trials, FormsVision BV) in combination with electronic data collection. Randomisation will be done by the recruiting centre with a unique subject identifier specific to that centre., BLINDING (MASKING): This is an open-labelled unblinded study., NUMBERS TO BE RANDOMISED (SAMPLE SIZE): The total sample size is 20 COVID-19 mechanically ventilated patients (12 intervention; 8 control)., TRIAL STATUS: Current protocol version is V2 dated 5th of June 2020. The recruitment is currently ongoing and started on the 14th of October 2020. The anticipated study completion date is November 2021., TRIAL REGISTRATION: ClinicalTrials.gov: NCT04362059 (Registered 24 April 2020), EUDAMED number: CIV-GB-20-06-033328, EudraCT number: 2020-001886-35 (Registered 11 May 2020) FULL PROTOCOL: The full protocol is attached as an additional file, accessible from the Trials website (Additional file 1). In the interest in expediting dissemination of this material, the familiar formatting has been eliminated; this Letter serves as a summary of the key elements of the full protocol. The study protocol has been reported in accordance with the Standard Protocol Items: Recommendations for Clinical Interventional Trials (SPIRIT) guidelines (Additional file 2).

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1. **Need for Objective Assessment of Volume Status in Critically Ill Patients with COVID-19: The Tri-POCUS Approach**  
   Koratala A. CardioRenal Medicine 2020;10:209-216.

As the coronavirus disease 2019 (COVID-19) continues to spread across the globe, the knowledge of its epidemiology, clinical features, and management is rapidly evolving. Nevertheless, the data on optimal fluid management strategies for those who develop critical illness remain sparse. Adding to the challenge, the fluid volume status of these patients has been found to be dynamic. Some present with several days of malaise, gastrointestinal symptoms, and consequent hypovolemia requiring aggressive fluid resuscitation, while a subset develop acute respiratory distress syndrome with renal dysfunction and lingering congestion necessitating restrictive fluid management. Accurate objective assessment of volume status allows physicians to tailor the fluid management goals throughout this wide spectrum of critical illness. Conventional point-of-care ultrasonography (POCUS) enables the reliable assessment of fluid status and reducing the staff exposure. However, due to specific characteristics of COVID-19 (e.g., rapidly expanding lung lesions), a single imaging method such as lung POCUS will have significant limitations. Herein, we suggest a Tri-POCUS approach that represents concurrent bedside assessment of the lungs, heart, and the venous system. This combinational approach is likely to overcome the limitations of the individual methods and provide a more precise evaluation of the volume status in critically ill patients with COVID-19.Copyright © 2020

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1. **Neurofibromatosis-Associated Diffuse Lung Disease: A Case Report and Review of the Literature**  
   Dehal Navdeep Cureus 2020;12:e8916.

Neurofibromatosis-1 or von Recklinghausen's disease is an autosomal dominant disorder. Cafe au lait macules are generally the initial presenting feature of the disease, and there can be varying degrees of involvement of the skeletal, neurological, and pulmonary organ systems as the disease progresses. The existence of neurofibromatosis-associated diffuse lung disease (NF-DLD) as a separate entity has always been questioned and, is often attributed to cigarette smoking, rather than a manifestation of NF-1. A 59-year-old male with a history of neurofibromatosis presented with shortness of breath and ataxia for 10 days. Exam findings were pertinent for tachycardia, tachypnea, and diffuse cutaneous neurofibromas. Workup showed white blood count (WBC) of 15.9 k/ul, electrocardiogram with biatrial enlargement and right axis deviation, and a chest X-ray showed left lower lobe infiltrate concerning for pneumonia. Computed tomography (CT) scan of the chest revealed left basilar consolidation with surrounding ground-glass opacities and innumerable bilateral thin-walled cysts. The latter finding raised suspicion for NF-DLD. The patient was evaluated by pulmonology with recommendations to continue treatment for pneumonia and follow-up with high-resolution CT of the chest and complete pulmonary function testing in 12 weeks. He was discharged in a stable condition after five days of hospitalization. NF-DLD is a pulmonary manifestation of NF-1 with non-specific respiratory symptoms and a characteristic pattern of upper lobe cystic and basilar interstitial lung disease. It usually presents in the 4th or 5th decade, earlier in tobacco users, but a few pediatric cases have also been reported. The presentation of NF-DLD can be variable, ranging from dyspnea, chest pain, chronic cough, hemoptysis, or an incidental finding on CT. Multiple complications, including spontaneous pneumothorax due to the rupture of subpleural blebs, pulmonary hypertension, and chronic respiratory failure, are associated with NF-DLD. NF-DLD can be prevented by smoking cessation but, there are no known modalities for treatment; however, complications can be managed symptomatically. This case illustrates the diagnostic challenge that NF-DLD represents to clinicians. The patient's CT from two years ago showed emphysematous changes along with scattered fibrosis and scarring, and no cystic changes were mentioned, unlike his latest CT, which showed innumerable cysts. This patient had a history of smoking, which likely put him at a higher risk for the development of cysts. However, he quit smoking 10 years prior, which suggests that his lung changes are not secondary to cigarette smoke, further confirming our suspicion for NF-DLD. Although routine screening is not implemented due to the rarity of the disease, NF-DLD should not be ruled out in patients with NF-1 presenting with pulmonary symptoms until a high-resolution computed tomography (HRCT) is obtained. Copyright © 2020, Dehal et al.

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1. **NEUROFIBROMATOSIS-ASSOCIATED DIFFUSE LUNG DISEASE: MYTH OR REALITY**  
   Dehal N. Chest 2020;158:A2554.

SESSION TITLE: Medical Student/Resident Diffuse Lung Disease SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: Neurofibromatosis-1(NF-1) or von Recklinghausen's disease is an autosomal dominant disorder with an incidence of one in 2600 to 3000 people.[1] Cafe au lait macules are generally the initial presenting feature of the disease, and there can be varying degrees of skeletal, neurological, and pulmonary involvement as the disease progresses. The existence of Neurofibromatosis associated diffuse lung disease (NF-DLD) as a separate entity has been questioned since it was first reported in 1963 and, is often attributed to cigarette smoking, than a manifestation of NF-1. CASE PRESENTATION: A 59-year-old male with a history of NF-1 and former tobacco abuse presented to the hospital for evaluation of shortness of breath for eight days. On evaluation, he was tachycardic, tachypneic, and had scattered cutaneous neurofibromas. Work up was pertinent for a white count of 15.9, electrocardiogram with biatrial enlargement and right axis deviation, and chest x-ray showing left lower infiltrate concerning for pneumonia. Computed Tomography (CT) scan of the chest illustrated left basilar consolidation with surrounding ground-glass opacities and innumerable bilateral thin-walled cysts. The latter finding raised suspicion for NF-DLD. The patient was evaluated by pulmonary medicine with recommendations to continue treatment for pneumonia and follow up with high-resolution CT of the chest and complete pulmonary function test in twelve weeks. He was discharged in a stable condition after five days of hospitalization. DISCUSSION: NF-DLD is a pulmonary manifestation of NF-1 with non-specific respiratory symptoms and a characteristic pattern of upper lobe cystic and basilar interstitial lung disease on CT. It usually presents in the 4th or 5th decade but can present earlier in tobacco users. The presentation of NF-DLD can be variable, ranging from dyspnea, chest pain, chronic cough, hemoptysis, or an incidental finding on CT. Multiple complications, including spontaneous pneumothorax[2], pulmonary hypertension, and chronic respiratory failure, are associated with NF-DLD.[3] It can be prevented by smoking cessation, but there are no known modalities for the treatment of NF-DLD. However, the complications can be managed symptomatically. CONCLUSION(S): This case illustrates the diagnostic challenge that NF-DLD represents to clinicians. This patient has a history of smoking, which likely puts him at a higher risk for the development of cysts. However, he quit ten years prior, which suggests that his lung changes are not secondary to cigarette smoke, further confirming our suspicion for NF-DLD. Although routine screening is not implemented due to the rarity of the disease, NF-DLD should not be ruled out in patients with NF-1 presenting with pulmonary symptoms until a CT chest is obtained. Reference #1: Neurofibromatosis. Conference statement. National Institutes of Health Consensus Development Conference. Arch Neurol. 1988;45(5):575-578. Reference #2: Shin SY, Lee YK, Moon AL, Sung DW. Neurofibromatosis Type I presenting with Spontaneous Pneumothorax: A Case Report. J Korean Soc Radiol. 2010 Oct;63(4):379-382. Reference #3: Nguyen KA, Elnaggar M, Gallant NM, Tanios M. Neurofibromatosis type 1: a case highlighting pulmonary and other rare clinical manifestations. BMJ Case Rep. 2018;2018:bcr2017222614. Published 2018 Jan 31. DISCLOSURES: No relevant relationships by Alheli Arce Gastelum, source=Web Response No relevant relationships by Navdeep Dehal, source=Web Response No relevant relationships by Paul Millner, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Neurological manifestations of pediatric multi-system inflammatory syndrome potentially associated with COVID-19**  
   Schupper A. J. Child's Nervous System 2020;36:1579-1580.

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1. **New clinical experiences and evaluation of clinical and paraclinical features of deceased patients with COVID-19 infection referred to Shahid Mostafa Khomeini Hospital of Ilam**  
   Ghaysouri A. Travel Medicine and Infectious Disease 2020;37:101657.

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1. **Noninvasive Ventilation in Cystic Fibrosis: Clinical Indications and Outcomes in a Large UK Adult Cystic Fibrosis Center**  
   Spoletini G. Respiratory care 2020;:No page numbers.

BACKGROUND: Noninvasive ventilation (NIV) is routinely used to treat patients with cystic fibrosis and respiratory failure. However, evidence on its use is limited, with no data on its role in disease progression and outcomes. The aim of this study was to assess the indications of NIV use and to describe the outcomes associated with NIV in adults with cystic fibrosis in a large adult tertiary center. METHOD(S): A retrospective analysis of data captured prospectively on the unit electronic patient records was performed. All patients with cystic fibrosis who received NIV over a 10-y period were included in the study. A priori, 2 groups were identified based on length of follow-up, with 2 subgroups identified based on duration of NIV treatment. RESULT(S): NIV was initiated on 64 occasions. The duration of follow-up was categorized as > 6 months or < 6 months in 31 (48.4%) and 33 (51.6%) occasions, respectively. The most common indications for starting NIV were chronic (48.5%) and acute (32.8%) hypercapnic respiratory failure. Among those with a follow-up > 6 months, subjects who stopped using NIV early showed a steady median (interquartile range) decline in FEV1 (pre-NIV: -0.04 [-0.35 to 0.03] L/y vs post-NIV: -0.07 [-0.35 to 0.01] L/y, P = .51), while among those who continued using it had an improvement in the rate of decline (pre-NIV: -0.25 [-0.52 to -0.02] L/y vs post-NIV: -0.07 [-0.13 to 0.16] L/y, P = .006). No differences in intravenous antibiotic requirement or pulmonary exacerbations were noted with the use of NIV. Pneumothorax and massive hemoptysis occurred independently in 4 cases. CONCLUSION(S): NIV is being used in cystic fibrosis as adjunct therapy for the management of advanced lung disease in a similar fashion to other chronic respiratory conditions. Adherence to NIV treatment can stabilize lung function but does not reduce pulmonary exacerbations or intravenous antibiotic requirement.Copyright © 2020 by Daedalus Enterprises.

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1. **Normative data across the age range for Multiple Breath Nitrogen Washout**  
   O'Neill K. European Respiratory Journal 2020;56:No page numbers.

Background: Multiple breath nitrogen washout (MBW) to measure lung clearance index (LCI) is reliable and sensitive (1,2). It is increasingly being used in respiratory research as an outcome measure in clinical trials to assess treatment effectiveness and/or monitor disease progression. Spirometry declines with age in healthy individuals (3). Normative MBW data across the age range is limited; more study is needed to quantify the degree of change associated with healthy aging. Aim(s): To assess the impact of ageing on MBW in heathy adults Methods: Healthy adults aged 18-80 years were recruited (sponsor Queen's University Belfast; reference18.26v3). Exclusion criteria included history of respiratory conditions, on long term oxygen therapy, recent pneumothorax, recent surgery, unstable cardiovascular status, tuberculosis, aneurysms, or use of antibiotics in the previous 4 weeks. Student's t test was used to compare subgroups. Result(s): Eighty-five healthy adults have been recruited (study ongoing) (mean (SD) age: 50.1 (17.2) years). Mean (SD) FEV1%pred 98.9 (15.1), FVC%pred 104.1 (17.6), FEF%pred 86.3 (34.1) and LCI2.5 was 7.6 (1.2). LCI2.5 was increased in 61-80 year olds (8.7 (1.2)) compared to 18-40 year olds (7.0 (0.6)) and 41-60 year olds (7.2 (0.8)), p<0.001. Conclusion(s): On achieving the recruitment target (n=240), MBW data will be assessed per age decile to understand the impact of ageing on MBW in heathy adults across the age range and will provide normative data to facilitate the interpretation of MBW in clinical trials. Rowan, S. A. et al. Am. J. Respir. Crit. Care Med. 189, 586-592 (2014). Subbarao, P. et al.Ann. Am. Thorac. Soc. 12, 932-939 (2015). Thomas, E. T et al. BMJ Open 9, e028150 (2019).

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1. **Occurrence of Pneumothorax and Pneumomediastinum in Covid-19 patients during non-invasive ventilation with Continuous Positive Airway Pressure**  
   Antonio Gidaro 2020;:No page numbers.

&lt;h4&gt;ABSTRACT&lt;/h4&gt; &lt;h4&gt;Background&lt;/h4&gt; Acute Hypoxemic Respiratory Failure (AHRF) is a common complication of Covid-19 related pneumonia, for which non-invasive ventilation (NIV) with Helmet Continuous Positive Airway Pressure (CPAP) is widely used. During past epidemics of SARS and MERS pneumomediastinum (PNM) and pneumothorax (PNX) were common complications (respectively 1.7-12% and 16,4%) either spontaneous or associated to ventilation. &lt;h4&gt;Methods&lt;/h4&gt; Aim of our retrospective study was to investigate the incidence of PNX/PNM in COVID-19 pneumonia patients treated with CPAP. Moreover, we examined the correlation between PNX/PNM and Positive end-expiratory pressure (PEEP) values. We collected data from patients admitted to “Luigi Sacco” University Hospital of Milan from 21/02/2020 to 06/05/2020 with COVID-19 pneumonia requiring CPAP. &lt;h4&gt;Results&lt;/h4&gt; One-hundred-fifty-four patients were enrolled. During hospitalization 3 PNX and 2 PNM occurred (3.2%). Out of these five patients 2 needed invasive ventilation after PNX, two died. In the overall population, 42 patients (27%) were treated with High-PEEP (&gt;10 cmH2O), and 112 with Low-PEEP (≤10 cmH2O). All the PNX/PNM occurred in the High-PEEP group (5/37 vs 0/112, p&lt;0,001). &lt;h4&gt;Conclusion&lt;/h4&gt; The incidence of PNX appears to be lower in COVID-19 than SARS and MERS, but their occurrence is accompanied by high mortality and worsening of clinical conditions. Considering the association of PNX/PNM with high PEEP we suggest using the lower PEEP as possible to prevent these complications. &lt;h4&gt;“Key messages” box&lt;/h4&gt; &lt;h4&gt;Section 1: What is already known on this subject&lt;/h4&gt; Elevated incidence of pneumomediastinum (PNM) and pneumothorax (PNX) occurring during SARS and MERS pneumonia (respectively 1.7-12% 9,10 and 16,4% 11 ), either spontaneous or associated to ventilation.Conversely, these complications have not been reported when NIV was used for the treatment of common pneumonia patients 6,7 . Some cases of PNX and PNM have been recently reported in patients with COVID-19 pneumonia, most of them spontaneous 12-14 , in some cases related to NIV 15,16 or endotracheal intubation (ETI) 17,18 . &lt;h4&gt;Section 2: What this study adds&lt;/h4&gt; Incidence of PNX/PNM is lower in COVID19 pneumonia patients during CPAP (3,2%) than SARS and MERS. Considering mortality rate and need of ETI, occurrence of PNX/PNM worsens prognosis. All the PNX/PNM occurred in the High-PEEP (&gt;10 cmH2O) group (5/37 vs 0/112, p&lt;0,001). Considering the association of high PEEP (&gt;10 cmH2O) with PNX/PNM, the use of low PEEP values has to be taken into consideration.

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1. **One disease, many faces-typical and atypical presentations of SARS-CoV-2 infection-related COVID-19 disease**  
   Philips Cyriac Abby World Journal of Clinical Cases 2020;8:3956.

1. **Outbreak of COVID-19 infection in children: fear and serenity**  
   Pavone P. Eur Rev Med Pharmacol Sci 2020;24:4572-4575.

1. **Outcomes of an intermediate respiratory care unit in the COVID-19 pandemic**  
   Hernandez-Rubio J. C. PLoS ONE 2020;15:e0243968.

Background 15% of COVID-19 patients develop severe pneumonia. Non-invasive mechanical ventilation and high-flow nasal cannula can reduce the rate of endotracheal intubation in adult respiratory distress syndrome, although failure rate is high. Objective To describe the rate of endotracheal intubation, the effectiveness of treatment, complications and mortality in patients with severe respiratory failure due to COVID-19. Methods Prospective cohort study in a first-level hospital in Madrid. Patients with a positive polymerase chain reaction for SARS-CoV-2 and admitted to the Intermediate Respiratory Care Unit with tachypnea, use of accessory musculature or SpO2 <92% despite FiO2> 0.5 were included. Intubation rate, medical complications, and 28-day mortality were recorded. Statistical analysis through association studies, logistic and Cox regression models and survival analysis was performed. Results Seventy patients were included. 37.1% required endotracheal intubation, 58.6% suffered medical complications and 24.3% died. Prone positioning was independently associated with lower need for endotracheal intubation (OR 0.05; 95% CI 0.005 to 0.54, p = 0.001). The adjusted HR for death at 28 days in the group of patients requiring endotracheal intubation was 5.4 (95% CI 1.51 to 19.5; p = 0.009). Conclusions The rate of endotracheal intubation in patients with severe respiratory failure from COVID- 19 was 37.1%. Complications and mortality were lower in patients in whom endotracheal intubation could be avoided. Prone positioning could reduce the need for endotracheal intubation.Copyright © 2020 Carrillo Hernandez-Rubio et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

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1. **Paediatric cohort studies on lower respiratory diseases and their reporting quality: Systematic review of the year 2018**  
   Ardura-Garcia C. European Respiratory Journal 2020;56:2000168.

The paediatric respiratory research community uses cohort studies extensively. However, the landscape of these studies and their quality of reporting has not been assessed. We performed a systematic review of publications on cohort studies reporting on paediatric lower respiratory problems published in 2018. We searched MEDLINE and Embase and extracted data on study and journal characteristics. We assessed the number of items of the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) checklist that a random sample (100 papers) reported. We analysed factors associated with the STROBE score and with the most poorly reported items, using Poisson and logistic regression. Of the 21319 records identified, 369 full-text articles met our inclusion criteria. Most papers studied asthma aetiology through birth cohorts and were based in Europe or North America. The reporting quality was insufficient: 15% reported the 22 STROBE items; median (interquartile range) score 18 (16-21). The most poorly reported items were sources of bias, sample size, statistical methods, descriptive results and generalisability. None of the study or journal factors were associated with the STROBE score. We need a joint effort of editors, reviewers and authors to improve the reporting quality of paediatric cohort studies on respiratory problems.Copyright © ERS 2020

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1. **Pattern of respiratory diseases, morbidities and outcome in patients admitted in respiratory ward of a tertiary care hospital: A descriptive cross-sectional study**  
   Pant P. Journal of the Nepal Medical Association 2020;58:1061-1064.

Introduction: Respiratory diseases are leading cause of morbidity and mortality worldwide imposing significant global health burden. The admission rate of patients is the indication of the overall workload in the ward. The aim of this study was to find the prevalence of admission of patients in the pulmonology ward among patients visiting pulmonology department of a tertiary care hospital. Method(s): A descriptive cross-sectional study was conducted at Tribhuvan University Teaching Hospital. Medical records of all patients visiting pulmonology department and admitted in pulmonology ward from May 2018 to April 2020 were retrospectively reviewed. Data entry and analysis was done in SPSS version 20.0. Descriptive statistics were performed. Result(s): A total of 30,480 patients visited the pulmonology department in the two-year study period. Out of them, 1296 (4.25%) patients were admitted in the pulmonology ward. Eleven respiratory diseases were identified as primary causes for admission. Acute exacerbation of chronic obstructive pulmonary disease (44.5%), pneumonia (26.3%), tuberculosis (11%), lung cancer (5%) and bronchiectasis (3.9%) ranked top five causes for admission. Conclusion(s): Respiratory diseases impose tremendous burden in health care setting. Acute exacerbation of chronic obstructive pulmonary disease, pneumonia and tuberculosis remain an important cause of respiratory admissions in our study.Copyright © The Author(s) 2018.

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1. **Pediatric Characteristics of 2019 Novel Coronavirus: Review of Available Published Literature**  
   Yagnik P. J. Clinical Pediatrics 2020;59:849-852.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=2b885e3256046033da4ac220a1b25b22)

1. **Pediatric SARS, H1N1, MERS, EVALI, and now coronavirus disease (COVID-19) Pneumonia: What radiologists need to know**  
   Foust A. M. American Journal of Roentgenology 2020;215:736-744.

OBJECTIVE. The purpose of this article is to review new pediatric lung disorders-including disorders that have occurred in recent years years such as severe acute respiratory syndrome (SARS), swine-origin influenza A (H1N1), Middle East respiratory syndrome (MERS), e-cigarette or vaping product use-associated lung injury (EVALI), and coronavirus disease (COVID-19) pneumonia-to enhance understanding of the characteristic imaging findings. CONCLUSION. Although the clinical symptoms of SARS, H1N1, MERS, EVALI, and COVID-19 pneumonia in pediatric patients may be nonspecific, some characteristic imaging findings have emerged or are currently emerging. It is essential for radiologists to have a clear understanding of the characteristic imaging appearances of these lung disorders in pediatric patients to ensure optimal patient care.Copyright © American Roentgen Ray Society

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1. **Percutaneous dilatational tracheostomy for saturating influx of COVID-19 patients: Experience of military ENT physicians deployed in Mulhouse, France**  
   Morvan J. B. European Annals of Otorhinolaryngology, Head and Neck Diseases 2020;137:263-268.

Objectives: The main objective was to demonstrate the feasibility of percutaneous tracheostomy performed under difficult conditions by military ENT physicians during their deployment in the military intensive care field hospital of the French Military Medical Service in Mulhouse to confront the exceptional COVID-19 pandemic. The secondary objective was to assess reliability and safety for patient and caregivers, with a risk of iatrogenic viral contamination. Material(s) and Method(s): A single-center retrospective study was conducted between March 25 and April 25, 2020, in 47 COVID-19 patients requiring prolonged mechanical ventilation. The inclusion criterion was having undergone percutaneous tracheostomy. Result(s): Eighteen consecutively included patients had successfully undergone percutaneous tracheostomy despite unfavorable anatomical conditions (short neck: 83.3%, overweight or obese: 88.9%). Median time to completion was 11 days after intubation, with an average duration of 7 minutes. The procedure was technically compliant in 83.3% of cases, and considered easy (on self-assessment) in 72.2%, with 2 minor per-procedural complications. No crossover to surgery was required. There was only 1 major post-procedural complication (late hemorrhage). Conclusion(s): This study showed the feasibility of percutaneous tracheostomy by an ENT physician under COVID-19 biohazard conditions. The technique was fast, easy and safe and met safety requirements for patient and staff.Copyright © 2020

[http://www.sciencedirect.com/science/journal/18797296 this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=1ee2f6c757e235470652f467713fa0dd)

1. **Pericardial affections in patients with covid-19: A possible cause of hemodynamic deterioration**  
   Fernandes F. Arquivos Brasileiros de Cardiologia 2020;115:569-573.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=6ca39a17064af20db3c54decf5da96a1)

1. **Perioperative preparation in thoracic day surgery: Battle against COVID-19**  
   Shen C. Thoracic Cancer 2020;11:2376-2379.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=fdd3b0ed2a73945b15f77516fdb66d60)

1. **Personalizing Invasive Mechanical Ventilation Strategies in Coronavirus Disease 2019 (COVID-19)-Associated Lung Injury: The Utility of Lung Ultrasound**  
   Conway H. Journal of Cardiothoracic and Vascular Anesthesia 2020;34:2571-2574.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=6dae0ef85e46a12252d51b4f45325bb8)

1. **Pleural disease in respiratory medicine**  
   Welch H. Medicine (United Kingdom) 2020;48:279-287.

Pleural disease encompasses a wide range of pathological processes, many of which are common and increasing in incidence. Patients with pleural disease are encountered by both respiratory specialists and general physicians, and a systematic approach to their management helps in targeting investigation and optimizing patient care. Research has led to recent advances in diagnostic strategies and therapeutic techniques in these patients. This review focuses on the clinical assessment, diagnosis and management of patients with pleural effusions, malignant pleural disease, pleural infection and pneumothorax. It provides practical suggestions regarding investigation and management.Copyright © 2020

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1. **Pleural diseases and COVID-19: ubi fumus, ibi ignis**  
   Porcel Jose M. The European respiratory journal 2020;56:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=498231e77d278d71aed1531436aa7579)

1. **PNEUMOMEDIASTINUM AND PNEUMOTHORAX DUE TO NONINVASIVE POSITIVE PRESSURE VENTILATION IN COVID-19 PNEUMONIA**  
   Thetford J. Chest 2020;158:A1284.

SESSION TITLE: Medical Student/Resident Disorders of the Pleura Posters SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: Barotrauma as a consequence of high alveolar pressures is well described in invasive mechanically ventilated (IMV) patients with pneumonia or pneumonitis. Limited data exists on the incidence of barotrauma in patients with Coronavirus Disease 19 pneumonia (COVID-19). We present a case of barotrauma occurring in a non-intubated patient with COVID-19 receiving noninvasive positive pressure ventilation (NPPV). CASE PRESENTATION: A 43-year-old male with obesity presented with 2 days of cough and dyspnea. Polymerase chain reaction (PCR) testing confirmed COVID-19. He initially required 5L of oxygen (O2) per minute by nasal cannula. Due to worsening hypoxemic respiratory failure (HRF) on day 3, the patient was placed on high-flow nasal cannula (HFNC) at 90% FiO2 at a flow rate of 30 L/min. By day 7, the patient had worsening HRF and increased work of breathing. He was transitioned to continuous positive airway pressure (CPAP) at 100% FiO2 with continuous pressure set at 12 cm H2O. On day 13, he developed tachycardia and desaturation. Chest CT found gas dissecting along the axial interstitium resulting in pneumomediastinum, bilateral pneumothoraces, and extensive subcutaneous emphysema. The lung parenchyma exhibited coarse ground glass opacities and early evidence of fibrotic changes. Chest tubes were placed in each hemithorax with resolution of his pnemothoraces after 5 days. His O2 requirements decreased, and he was transferred to a rehabilitation hospital on 10 L/min O2 by facemask on day 25. DISCUSSION: Barotrauma leading to pneumomediastinum and pneumothoraces are a well-documented complication of mechanical ventilation.1 In an effort to mitigate the morbidity and mortality associated with mechanical ventilation, many clinicians have shifted toward using NPPV in HRF in COVID-19, however NPPV may not necessarily protect patients against a complication more commonly associated with IMV.2,3 Progressive and cumulative alveolar injury may predispose COVID-19 patients to barotrauma regardless of mode of ventilation.3 CONCLUSION(S): Due to the mortality associated with IMV in COVID-19, many clinicians have shifted toward using NPPV to manage HRF. However, patients receiving NPPV may still be subject to complications such as barotrauma. Additionally, given our evolving understanding of COVID-19 and the pulmonary parenchymal distortion seen in many patients, a deterioration in respiratory status should prompt clinicians to search for evidence of barotrauma, even in patients receiving NPPV. Reference #1: Mentzer SJ, Tsuda A, Loring SH. Pleural mechanics and the pathophysiology of air leaks. J Thorac Cardiovasc Surg. 2018;155(5):2182-2189. Reference #2: Xu XP, Zhang XC, Hu SL, et al. Noninvasive Ventilation in Acute Hypoxemic Nonhypercapnic Respiratory Failure: A Systematic Review and Meta-Analysis. Crit Care Med. 2017;45(7):e727-e733. Reference #3: Sun R, Liu H, Wang X. Mediastinal Emphysema, Giant Bulla, and Pneumothorax Developed during the Course of COVID-19 Pneumonia. Korean J Radiol. 2020;21(5):541-544. DISCLOSURES: no disclosure on file for Nikhil Barot; No relevant relationships by Michael Kahn, source=Web Response No relevant relationships by Nader Kamangar, source=Web Response No relevant relationships by Jay Thetford, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Pneumomediastinum and spontaneous pneumothorax as an extrapulmonary complication of COVID-19 disease**  
   Lopez Vega Jesse Mauricio Emergency radiology 2020;27:727-730.

The new disease outbreak that causes atypical pneumonia named COVID-19, which started in China's Wuhan province, has quickly spread to a pandemic. Although the imaging test of choice for the initial study is plain chest radiograph, CT has proven useful in characterizing better the complications associated with this new infection. We describe the evolution of 3 patients presenting pneumomediastinum and spontaneous pneumothorax as a very rare complication of COVID-19 and their particular interest as a probable prognostic factor.

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1. **PNEUMOMEDIASTINUM AS A COMPLICATION OF COVID-19: MAY NOT NEED INTERVENTION**  
   Miyakawa L. Chest 2020;158:A2455-A2456.

SESSION TITLE: Late-breaking Abstract Posters SESSION TYPE: Original Investigation Posters PRESENTED ON: October 18-21, 2020 PURPOSE: Evaluate patients with pneumomediastinum (PTM) as a complication of coronavirus 2019 (Covid-19) infection and their outcomes. METHOD(S): Data was obtained by retrospective analysis of a database of Covid-19 patients, admitted to two New York hospitals from March 25th to April 26th, 2020. Identified 13 patients with PTM as a complication of Covid-19. RESULT(S): Median age of patients was 67 years, 7 (54%) were men, and 1 patient had pre-existing emphysema. Presenting symptoms included dyspnea (13/13, 100%), fever (10/13, 77%), and cough (9/13, 69%); none had chest pain. Median presenting SaO2/FiO2 ratio was 359. Pneumomediastinum was diagnosed on presentation in 2 patients (15%), during hospitalization but prior to invasive mechanical ventilation in 4 patients (31%), and after invasive mechanical ventilation in 7 patients (54%). Six patients had CT scans confirming the diagnosis of PTM. Twelve of the 13 patients were initiated on mechanical ventilation at median 5.5 days. Four patients (31%) developed pneumothoraces and 1 patient required bilateral chest tube drainage. Tension pneumothorax, tension pneumopericardium, and chest wall compartment syndrome were not observed in our cohort. Pneumomediastinum self-resolved in 5 patients (38%) while on mechanical ventilation. (Fig. 1) Seven out of 12 intubated patients (58%) underwent prone ventilation without worsening of PTM. One patient was discharged home, 10 patients expired, and 2 patients remain hospitalized. CONCLUSION(S): Pneumomediastinum is a known sequelae of noncompliant lungs in severe acute respiratory distress syndrome (ARDS), typically in the setting of positive pressure delivered with invasive mechanical ventilation. Our cohort had a low prevalence of predisposing risk factors such as emphysema, and a high mortality. Pneumomediastinum was not strongly associated with mechanical ventilation, as nearly half (6/13) of the patients developed PTM prior to intubation. CLINICAL IMPLICATIONS: In our cohort, findings of PTM may be attributed to two main etiologies converging: damage from Covid-19 and self-inflicted increases in transpulmonary pressures. We postulate that impaired surfactant production from type II pneumocytes may predispose to atelectrauma leading to diffuse alveolar injury and risk of rupture, unlike in typical ARDS where barotrauma occurs in the context of poorly compliant lungs. Moreover, the increased work of breathing and pronounced cough seen in Covid-19 pneumonia may lead to increased transpulmonary pressures resulting in PTM. Reductions in transpulmonary pressures after intubation with initiation of sedation and neuromuscular blockade may explain the resolution of PTM in spite of invasive ventilation. Given the high mortality we observed, early identification and initiation of methods to reduce transpulmonary pressures is imperative to reduce risk of further complications. DISCLOSURES: No relevant relationships by Young Im Lee, source=Web Response No relevant relationships by Nan Li, source=Web Response No relevant relationships by Joseph Mathew, source=Web Response No relevant relationships by Lina Miyakawa, source=Web Response No relevant relationships by Paru Patrawalla, source=Web Response No relevant relationships by Paru Patrawalla, source=Web Response No relevant relationships by Adam Rothman, source=Web Response No relevant relationships by Vishad Sheth, source=Web Response No relevant relationships by David Steiger, source=Web Response No relevant relationships by Jigna Zatakia, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Pneumomediastinum following intubation in COVID-19 patients: a case series**  
   Wali A. Anaesthesia 2020;75:1076-1081.

The number of patients requiring tracheal intubation rose dramatically in March and April 2020 with the COVID-19 outbreak. Our thoracic surgery department has seen an increased incidence of severe pneumomediastinum referred for surgical opinion in intubated patients with COVID-19 pneumonitis. Here we present a series of five patients with severe pneumomediastinum requiring decompression therapy over a 7-day period in the current COVID-19 outbreak. We hypothesise that the mechanism for this is the aggressive disease pathophysiology with an increased risk of alveolar damage and tracheobronchial injury, along with the use of larger-bore tracheal tubes and higher ventilation pressures. We present this case series in order to highlight the increased risk of this potentially life-threatening complication among the COVID-19 patient cohort and offer guidance for its management to critical care physicians.Copyright © 2020 Association of Anaesthetists

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1. **PNEUMOMEDIASTINUM IN A CRITICALLY ILL CORONAVIRUS DISEASE 2019 (COVID-19) PATIENT**  
   Hayrabedian M. Chest 2020;158:A765.

SESSION TITLE: Fellows Critical Care Posters SESSION TYPE: Fellow Case Report Posters PRESENTED ON: October 18-21, 2020 INTRODUCTION: The Coronavirus Disease 2019 (COVID-19) pandemic has displayed heterogeneity in disease manifestations and complications; cardiac, renal, neurological complications and coagulopathy are reported. We present a case of COVID-19 with pneumomediastinum. CASE PRESENTATION: A 59-year-old male was admitted after a reverse transcriptase polymerase chain reaction (RT-PCR) test- confirmed COVID19. He was confused and was intubated for hypoxia. Laboratory investigation showed white blood cells of 2.8x1000/mm3 (normal: 3.4-9.4x1000/ mm3) [differential: 59%(normal: 47-67%) neutrophils and 39% ( normal: 25-45%) lymphocytes], aspartate aminotransferase 1174 IU/l(normal:13-39IU/l), alanine aminotransferase 598 IU/l(normal:7-52IU/l), ferritin > 7500 ng/ml (normal: 20-200 ng/ml), C reactive protein 306.1 mg/l (normal: 0-5 mg/l) and D-dimer 10 mcg/ml (normal: 0-0.50 mcg/ml). Arterial blood gases showed pH 7.14 (normal: 7.35-7.45), PCO2 59 mmHg (normal: 34-46 mmHg) and PO2 54 mmHg (normal: 80-97 mmHg) on 100% oxygen. Computed tomography of the chest (CT chest) showed diffuse groundglass opacities. Diagnosis of acute respiratory distress syndrome (ARDS) was made. On day 5, given low lung compliance (static compliance 13.5 ml/CmH2O), mode was switched to airway pressure release ventilation(APRV). On day 8, subcutaneous emphysema was noted with worsening hemodynamics. CT chest showed pneumomediastinum, pneumopericardium and subcutaneous air without pneumothorax. APRV was changed to conventional mode and infraclavicular incisions completed. Patient's status continued to decline; he died on the 13th day of admission. DISCUSSION: COVID-19 causes pulmonary involvement ranging from atypical pneumonia to ARDS. Few cases of COVID-19-associated pneumomediastinum are reported in the literature. Barotrauma from mechanical ventilation accounts for one third cases of pneumomediastinum. Although, large tidal volumes are thought to predispose to barotrauma, these associations are related to the severity of lung disease. ARDS is most associated and is the only independent risk factor for barotrauma[1]. APRV does not demonstrate any difference regarding the onset of barotrauma when compared to conventional modes used in ARDS[2]. Different pathological patterns ranging from interstitial lymphocytic infiltrates to organizing pneumonia to diffuse alveolar damage are reported in COVID-19[3]. These possibly define the spectrum of COVID-19 and hence the increasing rate of severe complications with worsening injury. CONCLUSION(S): COVID-19 patients display diverse complications; pneumomediastinum is an emerging one. Further research is needed to study COVID-19 and barotrauma within the clinical and pathological phenotypes of the disease. Reference #1: Airway pressures and early barotrauma in patients with acute lung injury and acute respiratory distress. Eisner MD, Thompson BT, Schoenfeld D, et al. Am J Respir Crit Care Med. 165:978-982 2002. Reference #2: Airway pressure release ventilation during acute hypoxemic respiratory failure: a systematic review and meta-analysis of randomized controlled trials. Carsetti et al. Ann. Intensive Care (2019) 9:44. Reference #3: Time to consider histologic pattern of lung injury to treat critically ill patients with COVID-19 infection. Marie-Christine Copin, Erika Parmentier, [...], and The Lille COVID-19 ICU and Anatomopathology Group. Intensive Care Med. 2020 Apr 23 :1-3. DISCLOSURES: No relevant relationships by Moses Hayrabedian, source=Web Response No relevant relationships by Faraaz Nayeemuddin, source=Web Response No relevant relationships by Rajagopal Sreedhar, source=Admin inputCopyright © 2020 American College of Chest Physicians

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1. **Pneumomediastinum in COVID-19 patients: a case series of a rare complication**  
   Volpi Sara European journal of cardio-thoracic surgery : official journal of the European Association for Cardio-thoracic Surgery 2020;58:646-647.

Pneumomediastinum is a rare clinical finding, but one which can be the source of significant concern for clinicians. By presenting 3 such cases, we highlight that pneumomediastinum can complicate the course of a severe coronavirus disease 2019 infection but emphasize that conservative management is the first-line method of treatment, with gradual resorption of the air from the tissues. It is important to be alert to the development of pneumothorax, which will require drainage. Copyright © The Author(s) 2020. Published by Oxford University Press on behalf of the European Association for Cardio-Thoracic Surgery. All rights reserved.

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1. **Pneumothorax and Pneumomediastinum Secondary to COVID-19 Disease Unrelated to Mechanical Ventilation**  
   Tucker Lara Case reports in critical care 2020;2020:6655428.

In the recent worldwide coronavirus 2019 pandemic, a notable rise in pneumomediastinum and pneumothorax complications has been witnessed in numerous mechanically ventilated patients infected with severe acute respiratory syndrome coronavirus 2. Most cases have reported these complications as barotrauma from mechanical ventilation with COVID-19 disease. We aim to report three polymerase chain reaction-confirmed COVID-19 patients who developed pneumomediastinum and pneumothorax unrelated to mechanical ventilation. We originally analyzed 800 patients with COVID-19 disease at Orlando Regional Medical Center from March 1, 2020, to July 31, 2020, of which 12 patients developed pneumomediastinum and pneumothorax in their hospital course. Interestingly, three patients developed pneumomediastinum on chest imaging prior to intubation. We present these three patients, one female and two males, ages of 42, 64, and 65, respectively, who were diagnosed with COVID-19 disease through nasopharyngeal sampling tests with acute respiratory distress syndrome. Spontaneous pneumomediastinum and pneumothorax are potential complications of COVID-19 disease in the lungs unrelated to mechanical ventilation. This is similar to previous outbreaks of severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS) diseases. Further investigation is needed to define the causality of pneumomediastinum in nonintubated COVID-19 patients to define the incidence of disease. Copyright © 2020 Lara Tucker et al.

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1. **Pneumothorax as a late complication of COVID-19**  
   Ferreira Joao Guimaraes Revista do Instituto de Medicina Tropical de Sao Paulo 2020;62:e61.

In late 2019, a novel coronavirus initially related to a cluster of severe pneumonia cases in China was identified. COVID-19 cases have rapidly spread to multiple countries worldwide. We present a typical laboratory confirmed case of COVID-19 pneumonia, that was hospitalized due to hypoxemia but did not require mechanical ventilation. Although initially the patient was evaluated with a favorable outcome, in the third week of the disease, the symptomatology deteriorated due to a massive hypertensive pneumothorax with no known previous risk factor. Since the first cases of COVID-19 have been described, pneumothorax was characterized as a potential, though uncommon, complication. It has been reported that diffuse alveolar injury caused by SARS-CoV-2 can cause alveolar rupture, produce air leakage and interstitial emphysema. Although uncommon, pneumothorax should be listed as a differential diagnosis for COVID-19 patients with sudden respiratory decompensation. As a life-threatening event, it requires prompt recognition and expeditious treatment.

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1. **Pneumothorax as an ominous side effect in COVID-19 patients under mechanical ventilation: Report of seven patients**  
   Tofigh A. M. Journal of Cellular and Molecular Anesthesia 2020;5:202-205.

Today, due to the pandemic of novel coronavirus 2019 (COVID-19), extensive information over all parts of the world is spreading rapidly. We present seven cases of COVID-19 patients with pneumothorax as one of the ominous side effects of the disease and a strong predictor of death which is a new challenge in controlling the transmission and distribution of the disease.Copyright © Shahid Beheshti University of Medical Sciences, Anesthesiology Research Center.

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1. **Pneumothorax as the presenting manifestation of COVID-19**  
   Ayazi Shahin Journal of thoracic disease 2020;12:7488-7493.

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1. **Pneumothorax in 2019 novel coronavirus pneumonia needs to be recognized**  
   Li Wenya Infection 2020;:No page numbers.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=793845cd7daf8005de471656b6592aff)

1. **Pneumothorax in a COVID-19 Pneumonia Patient without Underlying Risk Factors**  
   Yamaya Takafumi Internal medicine (Tokyo, Japan) 2020;59:2921-2925.

Coronavirus disease 2019 (COVID-19) has been recognized as a worldwide pandemic. However, the clinical course of COVID-19 remains poorly characterized. Although some cases of pneumothorax have been reported, they all had pulmonary complications or were managed with mechanical ventilation. We herein report a case of pneumothorax that developed even though the patient had no pulmonary underlying diseases and had never been managed with mechanical ventilation. In the present case, a lung bulla was found on chest computed tomography during treatment for COVID-19. We concluded that COVID-19 affected the formation of the lung bulla and induced the complication of pneumothorax.

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1. **Pneumothorax in COVID-19 Acute Respiratory Distress Syndrome: Case Series**  
   Wong Kelvin Cureus 2020;12:e11749.

Objective The study aims to describe the clinical characteristics and outcomes of patients with COVID-19 related acute respiratory distress syndrome (ARDS) who developed pneumothorax. Design and setting A retrospective chart review was performed of the electronic medical record. Patients were included if they were identified as having confirmed COVID-19 as well as pneumothorax from March 16, 2020 to May 31, 2020. Patients' demographic and clinical characteristics, mechanical ventilator parameters, lung compliance measurements and outcomes during hospitalization were collected. This case series was conducted in intensive care units at two large tertiary care centers within the Northwell Health System, located in New York State. Patients A total of 75 patients were identified who were predominantly male (73.3%) with an average age of 62.8 years. Thirty (40%) were Hispanic, 20 (26.7%) were White, 16 (21.3%) were Asian, and nine (12%) were Black. Common comorbid conditions were hypertension (52%), diabetes mellitus (26.7%), hyperlipidemia (32.0%), and chronic pulmonary disease (8, 10.7%). Measurements and main results Most of the patients were diagnosed with pneumothorax while on mechanical ventilation (92%) despite overall adherence with lung-protective ventilation strategies. Average tidal volume was 6.66 mL/kg) of ideal body weight. The average positive end-expiratory pressure (PEEP) was 10.83 (cm) H2O. Lung compliance was poor, with average peak and plateau pressures of 41.9 cm H2O and 35.2 cm H2O, respectively. Inpatient mortality was high in these patients (76%). Conservative management with initial observation had a success rate (73.3%) with similar mortality and shorter length of stay (LOS) on average. Significant factors in the conservatively managed group included lack of tension physiology, the smaller size of pneumothorax, lack of underlying diabetes, presence of pneumomediastinum, and not being on mechanical ventilation during diagnosis. Conclusion Despite overall adherence to best practice ventilator management in ARDS, we observed a large number of pneumothoraces during the COVID-19 pandemic. Conservative management may be appropriate if there are no clinical signs or symptoms of tension physiology and pneumothorax size is small. Copyright © 2020, Wong et al.

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1. **Pneumothorax in COVID-19 disease- incidence and clinical characteristics**  
   Zantah Massa Respiratory research 2020;21:236.

BACKGROUND: Spontaneous pneumothorax is an uncommon complication of COVID-19 viral pneumonia. The exact incidence and risk factors are still unknown. Herein we review the incidence and outcomes of pneumothorax in over 3000 patients admitted to our institution for suspected COVID-19 pneumonia., METHODS: We performed a retrospective review of COVID-19 cases admitted to our hospital. Patients who were diagnosed with a spontaneous pneumothorax were identified to calculate the incidence of this event. Their clinical characteristics were thoroughly documented. Data regarding their clinical outcomes were gathered. Each case was presented as a brief synopsis., RESULTS: Three thousand three hundred sixty-eight patients were admitted to our institution between March 1st, 2020 and June 8th, 2020 for suspected COVID 19 pneumonia, 902 patients were nasopharyngeal swab positive. Six cases of COVID-19 patients who developed spontaneous pneumothorax were identified (0.66%). Their baseline imaging showed diffuse bilateral ground-glass opacities and consolidations, mostly in the posterior and peripheral lung regions. 4/6 cases were associated with mechanical ventilation. All patients required placement of a chest tube. In all cases, mortality (66.6%) was not directly related to the pneumothorax., CONCLUSION: Spontaneous pneumothorax is a rare complication of COVID-19 viral pneumonia and may occur in the absence of mechanical ventilation. Clinicians should be vigilant about the diagnosis and treatment of this complication.

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1. **Pneumothorax In Covid-19 Pneumonia: A case series**  
   Hameed Mansoor Respiratory medicine case reports 2020;31:101265.

Background: Coronavirus disease 2019 (Covid-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It mainly affects the lungs and common symptoms are fever, cough and shortness of breath. Pneumothorax has been noted to complicate Covid-19 cases requiring hospital admission, however the exact incidence and risk factors are still unknown., Discussion: We present a series of 3 cases of primary spontaneous pneumothorax with Covid-19 pneumonia. All cases in our series did not require positive pressure ventilation and none had any pre-existing lung disease. All were never smokers and had favourable outcomes despite having severe Covid-19 with a pneumothorax during the course of the disease. In our literature review we discuss several plausible mechanisms and risk factors resulting in a pneumothorax with Covid-19., Conclusion: Our cases are a reminder that an acute deterioration with hypoxia in a Covid-19 patient could indicate a pneumothorax. Pneumothorax is one of the reported complications in Covid-19 and clinician vigilance is required during assessment of patients, as both share the common symptom of breathlessness and therefore can mimic each other. Copyright © 2020 The Author(s).

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1. **Pneumothorax in patients with coronavirus disease 2019 pneumonia with invasive mechanical ventilation**  
   Ozdemir Servet Interactive cardiovascular and thoracic surgery 2020;:No page numbers.

OBJECTIVES: Our goal was to evaluate the prevalence of and risk factors for pneumothorax in patients with invasive mechanical ventilation in the intensive care unit (ICU) diagnosed with coronavirus disease 2019 pneumonia., METHODS: The prevalence of pneumothorax was retrospectively reviewed in 107 patients diagnosed with coronavirus disease 2019 pneumonia and treated in an ICU in Turkey between 11 March 2020 and 30 April 2020., RESULTS: The patients were aged 19-92 years; 37 (34.6%) were women. Pneumothorax developed in 8 (7.5%) of the intubated patients. Four (50%) of the patients with pneumothorax and 68 (68.7%) of those without it died. In the univariable logistic regression analysis of the presence of comorbid diseases (P = 0.91), positive end-expiratory pressure (P = 0.18), compliance (P = 0.93), peak pressure (P = 0.41) and the Horowitz index (P = 0.13) did not show statistically significant effects in increasing the risk of pneumothorax., CONCLUSIONS: There was no significant increase or decrease in the risk of pneumothorax in patients treated with invasive mechanical ventilation after the diagnosis of coronavirus disease 2019-related pneumonia/acute respiratory distress syndrome. However, consideration of the risk of pneumothorax in these individuals may have the potential to improve the prognoses in such settings. Copyright © The Author(s) 2020. Published by Oxford University Press on behalf of the European Association for Cardio-Thoracic Surgery. All rights reserved.

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1. **Pneumothorax in patients with prior or current COVID-19 pneumonia**  
   Janssen M. L. Respiratory Medicine Case Reports 2020;31:101187.

As the number of COVID-19 cases emerge, new complications associated with the disease are recognized. We present three cases of spontaneous pneumothorax in patients with COVID-19. They show that a pneumothorax can occur during different phases of disease, in patients without a pulmonary disease history and is not necessarily associated to positive pressure ventilation or severity of COVID-19. Although the exact causative mechanisms remain unknown, this observation might imply that extensive alveolar destruction due to COVID-19 may lead to bulla formation resulting in subsequent pneumothorax.Copyright © 2020

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1. **Pneumothorax in patients with prior or current COVID-19 pneumonia**  
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1. **PNEUMOTHORAX IN SEVERE ILL PATIENTS ADMITTED DUE TO SARS-COV-2**  
   Uribe J. P. Chest 2020;158:A324.

SESSION TITLE: Chest Infections Posters SESSION TYPE: Original Investigation Posters PRESENTED ON: October 18-21, 2020 PURPOSE: Approximately 1% of patients admitted for SARS-CoV-2 may develop pneumothorax (PTX) during the hospitalization. Currently there is no literature available regarding the development of pneumothorax during SARS-CoV-2 infection neither the characteristics nor clinical outcomes of these patients. We present a single center review of 11 subjects who developed PTX during the course of hospitalization for SARS-CoV-2. METHOD(S): Retrospective medical records review of patients diagnosed with PTX and SARS-CoV-2 between January 1, 2020 and May 8, 2020 at Beth Israel Deaconess Medical Center in Boston, MA. Patients were identified from our institutional database (Clinical Query 2). Demographics, baseline comorbidities, hospital stay, ICU stay, interventions and crude mortality are presented. RESULT(S): A total of 11 inpatients with SARS-CoV-2 and PTX were included (mean age 66.45 years [SD 13.28]; 81.82% [n=9] males; 72.73% PTX on the right side). The mean hospital stay until discharge or death was 25.91 days (SD 11.61), with a mean time from admission to PTX of 13.81 days (SD 12.27). Nine (81.82%) of PTX were secondary spontaneous and 2 (18.18%) iatrogenic. The most common comorbid conditions found were hypertension (54.55%) followed by hyperlipidemia (45.45%), malignancy (27.27%) and congestive heart failure (27.27%). Nine (81.81%) subjects were on the ICU when the event occurred with a mean ICU stay of 15.11 days (SD 8.89). Seven (63.64%) patients were under mechanical ventilation with a mean intubation time of 19.86 days (SD 10.17). Ten (90.91%) subjects required chest tube insertion with 54.54% (n=6) requiring chest tube size > 14 Fr. Two (18.18%) patients ended up having tracheostomy and 5 (45.45%) died before discharge. CONCLUSION(S): We found that secondary and iatrogenic PTX may be an infrequent complication of patients admitted for the treatment of SARS-CoV-2. This entity may be implicated in acute clinical deterioration with rapid oxygen desaturation in critically ill patients. CLINICAL IMPLICATIONS: Pneumothorax may be may be implicated in acute clinical deterioration with rapid oxygen desaturation in critically ill patients SARS-CoV-2. DISCLOSURES: No relevant relationships by Alvaro Ayala, source=Web Response No relevant relationships by Alex Chee, source=Web Response No relevant relationships by Fayez Kheir, source=Web Response Consultant relationship with Boston Scientific Please note: $1001 - $5000 by Adnan Majid, source=Web Response, value=Consulting fee Consultant relationship with olympus Please note: $5001 - $20000 by Adnan Majid, source=Web Response, value=Consulting fee Consultant relationship with pinacle biologics Please note: $1001 - $5000 by Adnan Majid, source=Web Response, value=Consulting fee Consultant relationship with cook medical Please note: $1001 - $5000 by Adnan Majid, source=Web Response, value=Consulting fee No relevant relationships by Mihir Parikh, source=Web Response No relevant relationships by Juan Pablo Uribe, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Pneumothorax rate in intubated patients with COVID-19**  
   Capaccione Kathleen M. Acute and critical care 2020;:No page numbers.

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1. **Pneumothorax: How to predict, prevent and cure**  
   Hallifax R. J. ERS Monograph 2020;2020:193-210.

Pneumothorax is a common clinical problem. Spontaneous pneumothorax is divided into PSP and SSP. This chapter will discuss the underlying causes of pneumothorax: underlying recognised chronic respiratory conditions, and familial and genetic conditions. Recurrence rates are high after a single episode, and vary by sex, age and comorbidity, but the case for recurrence prevention surgery has yet to be made. Prevention would appear to be best undertaken by VATS including chemical pleurodesis. Management remains predominantly that of admission and chest drain insertion. However, the results are eagerly awaited of trials of conservative and ambulatory management of pneumothorax, which could change the current treatment paradigm. Prediction models are required to predict those failing initial management and those at increased risk of recurrence. The underlying cause of PSP may be better understood by an improved understanding of the genetic predisposition and analysis of the inflammatory processes occurring in the lung parenchyma.Copyright © ERS 2020.

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1. **Point of care and intensive care lung ultrasound: A reference guide for practitioners during COVID-19**  
   Moore S. Radiography 2020;26:e297-e302.

Objectives: Current events with the recent COVID-19 outbreak are necessitating steep learning curves for the NHS workforce. Ultrasound, although not used in the diagnosis of COVID-19 may be utilised by practitioners at the point of care (POC) or on the intensive care units (ITUs) where rapid assessment of the lung condition may be required. The aim of this article was to review current literature surrounding the use of lung ultrasound in relation to COVID-19 and provide Sonographers with a quick and digestible reference guide for lung pathologies. Key Findings: Ultrasound is being used in Italy and China to help review lung condition during the COVID-19 outbreak however not strictly as a diagnostic tool as Computed Tomography (CT) of the chest and chest radiographs are currently gold standard. Ultrasound is highly sensitive in the detection of multiple lung pathologies which can be demonstrated in conjunction with COVID-19 however to date there are no specific, nor pathognomonic findings which relate to COVID-19 on ultrasound. Conclusion(s): Lung ultrasound is highly sensitive and can quickly and accurately review lung condition creating potential to assess for changes or resolution over time, especially in the ITU and POC setting. However it should not be used as a diagnostic tool for COVID-19 due to low specificity in relation to the virus. Implications for practice: The adoption of lung ultrasound to monitor lung condition during the COVID-19 outbreak may reduce the need for serial exposure to ionising radiation on the wards and in turn reduce the number of radiographers required to attend infected wards and bays, protecting both patients and the workforce.Copyright © 2020 The College of Radiographers

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1. **Point-of-care lung ultrasound in the assessment of patients with COVID-19: A tutorial**  
   Cid X. Australasian Journal of Ultrasound in Medicine 2020;23:271-281.

The adoption of point-of-care lung ultrasound for both suspected and confirmed COVID-19 patients highlights the issues of accessibility to ultrasound training and equipment. Lung ultrasound is more sensitive than chest radiography in detecting viral pneumonitis and preferred over computed tomography for reasons including its portability, reduced healthcare worker exposure and repeatability. The main lung ultrasound findings in COVID-19 patients are interstitial syndrome, irregular pleural line and subpleural consolidations. Consolidations are most likely found in critical patients in need of ventilatory support. Hence, lung ultrasound may be used to timely triage patients who may have evolving pneumonitis. Other respiratory pathology that may be detected by lung ultrasound includes pulmonary oedema, pneumothorax, consolidation and large effusion. A key barrier to incorporate lung ultrasound in the assessment of COVID-19 patients is adequate decontamination of ultrasound equipment to avoid viral spread. This tutorial provides a practical method to learn lung ultrasound and a cost-effective method of preventing contamination of ultrasound equipment and a practical method for performing and interpreting lung ultrasound.Copyright © 2020 Australasian Society for Ultrasound in Medicine

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1. **Point-of-care lung ultrasound in three neonates with COVID-19**  
   Gregorio-Hernandez R. European journal of pediatrics 2020;179:1279-1285.

Since March 2020, the world is involved in the COVID-19 pandemic, a disease caused by a novel virus called SARS-CoV-2. Some authors have described the ultrasonographic findings of COVID-19 pneumonia in adults and children, but data on neonates are lacking. Our objective was to describe the ultrasonographic lung pattern on newborns with SARS-CoV-2 infection during the COVID-19 pandemic. Newborns who tested positive for SARS-CoV-2 PCR in respiratory samples and were evaluated with point-of-care lung ultrasound (LU) from March to April 2020 were included. LU was performed bedside by a single investigator at the time of diagnosis and every 48 h during the first week following diagnosis. Six areas were studied. Three neonates were included. Infants' comorbidities included meconium aspiration syndrome, bronchopulmonary dysplasia, and Hirschsprung's disease. One required mechanical ventilation. No deaths occurred. LU showed B-lines, consolidation, and spared areas. No pneumothorax or pleural effusion was observedConclusions: LU could be of value when managing COVID-19 neonates. We describe the findings of lung ultrasound monitoring during the first week following diagnosis in three neonates with SARS-CoV-2 infection. What is known: \* Lung ultrasound (LU) is a useful tool in COVID-19 management in adults. To date, no report on LU and neonates with SARS-CoV-2 infection has been published. What is new: \* This study adds evidence about LU findings in neonates with SARS-CoV-2 infection.

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1. **Point-Of-Care Ultrasound for Lung Assessment in Patients With Severe Scoliosis and Chest Deformities: An Emergency Department Case Series**  
   Paes de Castro Giorno Eliana The Journal of emergency medicine 2020;58:775-780.

BACKGROUND: Diagnosing pneumonia and other lung conditions can be challenging in patients with severe intellectual or physical disabilities or severe chest deformities. Physical examination is sometimes difficult to perform and the frequently requested chest x-ray (CXR) study is often of little value in the diagnostic approach to this population. Point-of-care lung ultrasound (US) is an emerging diagnostic tool with particularly high level of accuracy in detecting pneumonia, pleural effusion, and pneumothorax., CASE REPORT: This case series describes four cases demonstrating the usefulness of point-of-care US in a pediatric emergency department for lung assessment in patients for differentiation and diagnosis of acute causes of acute respiratory symptoms, in whom clinical features or CXR failed to confirm or exclude pulmonary complications. WHY SHOULD AN EMERGENCY PHYSICIAN BE AWARE OF THIS?: In patients with chest deformities, pulmonary complications can be disproportionately frequent. Lung US should be recognized as an important adjunctive tool in this subset of patients to detect pneumonia, pleural effusions, and pneumothorax. When used proactively, it can reduce unnecessary radiation exposure, provide more certainty in determining the diagnosis, and, most importantly, inform correct and timely management. Copyright © 2020 Elsevier Inc. All rights reserved.

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1. **Position statement: Cardiopulmonary resuscitation of patients with confirmed or suspected COVID-19 - 2020**  
   Guimaraes H. P. Arquivos Brasileiros de Cardiologia 2020;114:1078-1087.

Care for patients with cardiac arrest in the context of the coronavirus disease 2019 (COVID-19) pandemic has several unique aspects that warrant particular attention. This joint position statement by the Brazilian Association of Emergency Medicine (ABRAMEDE), Brazilian Society of Cardiology (SBC), Brazilian Association of Intensive Care Medicine (AMIB), and Brazilian Society of Anesthesiology (SBA), all official societies representing the corresponding medical specialties affiliated with the Brazilian Medical Association (AMB), provides recommendations to guide health care workers in the current context of limited robust evidence, aiming to maximize the protection of staff and patients alike. It is essential that full aerosol precautions, which include wearing appropriate personal protective equipment, be followed during resuscitation. It is also imperative that potential causes of cardiac arrest of particular interest in this patient population, especially hypoxia, cardiac arrhythmias associated with QT prolongation, and myocarditis, be considered and addressed. An advanced invasive airway device should be placed early. Use of HEPA filters at the bag-valve interface is mandatory. Management of cardiac arrest occurring during mechanical ventilation or during prone positioning demands particular ventilator settings and rescuer positioning for chest compressions which deviate from standard cardiopulmonary resuscitation techniques. Apart from these logistical issues, care should otherwise follow national and international protocols and guidelines, namely the 2015 International Liaison Committee on Resuscitation (ILCOR) and 2019 American Heart Association (AHA) guidelines and the 2019 Update to the Brazilian Society of Cardiology Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Guideline.Copyright © 2020, Arquivos Brasileiros de Cardiologia. All rights reserved.

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1. **Positive airway pressure ventilation and complications in pediatric tracheocutaneous fistula repair**  
   Smith Joshua D. The Laryngoscope 2020;130:E30-E34.

OBJECTIVES: Surgical repair of persistent tracheocutaneous fistula in children may be complicated by tracheal air leak with resultant subcutaneous emphysema, pneumomediastinum, and/or pneumothorax. We first sought to identify clinical risk factors for postoperative complications after primary repair of persistent tracheocutaneous fistula in children. Second, the type and frequency of complications in patients administered positive airway pressure ventilation (e.g., bag-valve mask ventilation, continuous positive airway pressure [CPAP], or bilevel positive airway pressure [BiPAP]) postoperatively was determined and compared to a control population., METHODS: This was a retrospective investigation of all pediatric patients (n = 108) undergoing surgical repair of persistent tracheocutaneous fistula from January 2000 and April 2016 at a tertiary, academic referral center. Type and frequency of postoperative complications were compared among patients who were administered positive airway pressure ventilation postoperatively versus those who were not., RESULTS: Of 108 pediatric patients, complications after tracheocutaneous fistula repair occurred in 22 (20.4%) patients. These included symptoms of respiratory distress requiring intervention (e.g., supplemental O2 , racemic epinephrine, intubation), subcutaneous emphysema, pneumomediastinum and/or pneumothorax, bleeding, wound infection, and readmission. Frequency of all postoperative complications was significantly higher in patients administered positive airway pressure ventilation versus those who were not (50.0% vs. 16.7%, P = 0.015), as were rates of subcutaneous emphysema, pneumomediastinum, and/or pneumothorax (33.3% vs. 4.2%, P = 0.005)., CONCLUSION: Positive airway pressure ventilation after primary repair of persistent tracheocutaneous fistula in children may increase risk of serious respiratory complications. In practice, we advocate for avoidance of bag-valve mask ventilation and caution when utilizing CPAP or BiPAP postoperatively in these patients., LEVEL OF EVIDENCE: 4 Laryngoscope, 130:E30-E34, 2020. Copyright © 2019 The American Laryngological, Rhinological and Otological Society, Inc.

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1. **Potential effect of blood purification therapy in reducing cytokine storm as a late complication of critically ill COVID-19**  
   Ma J. Clinical Immunology 2020;214:108408.

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1. **Predicting COVID-19 Pneumonia Severity on Chest X-ray with Deep Learning**  
   Cohen Joseph Paul 2020;:No page numbers.

Purpose: The need to streamline patient management for COVID-19 has become more pressing than ever. Chest X-rays provide a non-invasive (potentially bedside) tool to monitor the progression of the disease. In this study, we present a severity score prediction model for COVID-19 pneumonia for frontal chest X-ray images. Such a tool can gauge severity of COVID-19 lung infections (and pneumonia in general) that can be used for escalation or de-escalation of care as well as monitoring treatment efficacy, especially in the ICU. Methods: Images from a public COVID-19 database were scored retrospectively by three blinded experts in terms of the extent of lung involvement as well as the degree of opacity. A neural network model that was pre-trained on large (non-COVID-19) chest X-ray datasets is used to construct features for COVID-19 images which are predictive for our task. Results: This study finds that training a regression model on a subset of the outputs from an this pre-trained chest X-ray model predicts our geographic extent score (range 0-8) with 1.14 mean absolute error (MAE) and our lung opacity score (range 0-6) with 0.78 MAE. Conclusions: These results indicate that our model's ability to gauge severity of COVID-19 lung infections could be used for escalation or de-escalation of care as well as monitoring treatment efficacy, especially in the intensive care unit (ICU). A proper clinical trial is needed to evaluate efficacy. To enable this we make our code, labels, and data available online at https://github.com/mlmed/torchxrayvision/tree/master/scripts/covid-severity and https://github.com/ieee8023/covid-chestxray-dataset

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1. **Predictors of CPAP outcome in hospitalised COVID-19 patients**  
   Noeman-Ahmed Y. 2020;:No page numbers.

&lt;h4&gt;Introduction&lt;/h4&gt; Throughout March – April 2020, many patients with COVID-19 presented to Southend University Hospital with Acute Hypoxaemic Respiratory Failure (AHRF). Patients were managed in a Specialist Respiratory High Dependency Unit. We present our experience on the usage of continuous positive airway pressure (CPAP) therapy and possible indicators of its success in this patient group. &lt;h4&gt;Methods&lt;/h4&gt; Data from patients (n=89) requiring mechanical ventilation during the months of March-April 2020, were retrospectively collected and analysed. 37 patients received IMV (Invasive Mechanical Ventilation) without a CPAP trial beforehand. 52 patients underwent a CPAP trial, of which 21 patients successfully avoided intubation and ITU admission. &lt;h4&gt;Results&lt;/h4&gt; The 52 patients, prior to receiving CPAP had significant respiratory failure as evidenced by a low PaO2: FiO2 (PFR) (mean± SD 123 ± 60 mmHg) and mean SpO2:FiO2 (SFR) (mean ± SD: 140 ± 50). The main indicators of CPAP success were: higher SFR before and after CPAP, lower respiratory rate (RR), lower Neutrophil to Lymphocyte ratio (NLR) and higher PFR prior to CPAP. &lt;h4&gt;Discussion&lt;/h4&gt; CPAP proved successful in 40% of COVID-19 patients presenting with AHRF. SFR, PFR, RR and NLR are predictors of such success. SFR can be used for effective real time monitoring of patients before and after CPAP to identify likelihood of success. Based on our results, we have suggested a modified CPAP management protocol in COVID-19. These findings can guide future studies and will allow improved triage of patients to either CPAP or IMV, in the event of a future COVID peak.

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1. **Predictors of mortality in patients with COVID-19-a systematic review**  
   Mehraeen E. European Journal of Integrative Medicine 2020;40:101226.

Introduction: In the current COVID-19 pandemic, disease diagnosis is essential for optimal management and timely isolation of infected cases in order to prevent further spread. The aim of this study was to systematically review the assessment of risk and model the predictors of mortality in COVID-19 patients. Method(s): A systematic search was conducted of PubMed, Scopus, Embase, Google Scholar, and Web of Science databases. Variables associated with hospital mortality using bivariate analysis were included as potential independent predictors associated with mortality at the p < 0.05 levels. Result(s): We included 114 studies accounting for 310,494 patients from various parts of the world. For the purpose of this analysis, we set a cutoff point of 10% for the mortality percentages. High mortality rates were defined as higher than 10% of confirmed positive cases and were given a score of two, while low mortality (<10%) was assigned the score of one. We then analyzed the associations between 72 variables and the observed mortality rates. These variables included a large range of related variables such as demographics, signs and symptoms and related morbidities, vital signs, laboratory findings, imaging studies, underlying diseases, and the status of countries' income, based on the United Nation's classifications. Conclusion(s): Findings suggest that older age, hypertension, and diabetes mellitus conferred a significant increased risk of mortality among patients with COVID-19. In the multivariate analysis, only diabetes mellitus demonstrated an independent relationship with increased mortality. Further studies are needed to ascertain the relationship between possible risk factors with COVID-19 mortality.Copyright © 2020 Elsevier GmbH

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1. **Primary ciliary dyskinesia as a cause of repeating atelectasis in the neonatal period**  
   Primo A. E. L. American Journal of Case Reports 2020;21:1-3.

Objective: Congenital defects/diseases Background: Primary ciliary dyskinesia (PCD) is a disease characterized by motor ciliary dysfunction, which leads to the accumulation of secretions in the lower airways and, consequently, to atelectasis and repeated infections. During the neonatal period, diagnosis can be difficult because the symptoms are frequently associated with other respiratory diseases common in neonates. The laterality defects should warn the clinician of the need for further investigation using clinical criteria, but the confirmation depends on a genetic test. Case Report: The objective of this report is to present a case of PCD manifesting in the neonatal period that was diagnosed due to respiratory failure associated with recurrent atelectasis and situs inversus totalis. Conclusion(s): This disease is not well known by neonatologists, but early diagnosis decreases morbidity and improves patient quality of life.Copyright © Am J Case Rep.

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1. **Prone positioning in non-intubated patients with COVID-19 associated acute respiratory failure, the PRO-CARF trial: A structured summary of a study protocol for a randomised controlled trial**  
   Ibarra-Estrada Miguel A. Trials 2020;21:940.

OBJECTIVES: To assess the effect of prone positioning therapy on intubation rate in awake patients with COVID-19 and acute respiratory failure., TRIAL DESIGN: This is a two-center parallel group, superiority, randomized (1:1 allocation ratio) controlled trial., PARTICIPANTS: All patients admitted to the Hospital Civil de Guadalajara and Hospital General de Occidente in Mexico for COVID-19 associated acute respiratory failure and in need of supplementary oxygen through high-flow nasal cannula are screened for eligibility., INCLUSION CRITERIA: all adult patients admitted to the COVID-19 unit who test positive for COVID-19 by PCR-test and in need for oxygen are eligible for inclusion. Randomization starts upon identification of requirement of a fraction of inspired oxygen >=30% for an oxygen capillary saturation of >=90% Exclusion criteria: less than 18 years-old, pregnancy, patients with immediate need of invasive mechanical ventilation (altered mental status, fatigue), vasopressor requirement to maintain median arterial pressure >65 mmHg, contraindications for prone positioning therapy (recent abdominal or thoracic surgery or trauma, facial, pelvic or spine fracture, untreated pneumothorax, do-not-resuscitate or do-not-intubate order, refusal or inability of the patient to enroll in the study., INTERVENTION AND COMPARATOR: Patients of the intervention group will be asked to remain in a prone position throughout the day as long as possible, with breaks according to tolerance. Pillows will be offered for maximizing comfort at chest, pelvis and knees. Monitoring of vital signs will not be suspended. Inspired fraction of oxygen will be titrated to maintain a capillary saturation of 92%-95%. For patients in the control group, prone positioning will be allowed as a rescue therapy. Staff intensivists will monitor the patient's status in both groups on a 24/7 basis. All other treatment will be unchanged and left to the attending physicians., MAIN OUTCOMES: Endotracheal intubation rate for mechanical ventilation at 28 days., RANDOMISATION: Patients will be randomly allocated to either prone positioning or control group at 1:1 ratio. Such randomization will be computer generated and stratified by center with permuted blocks and length of 4., BLINDING (MASKING): Due to logistical reasons, only principal investigators and the data analyst will be blinded to group assignment., NUMBERS TO BE RANDOMISED (SAMPLE SIZE): With an intubation rate of 60% according to recent reports from some American centers, and assuming a decrease to 40% to be clinically relevant, we calculated a total of 96 patients per group, for a beta error of 0.2, and alpha of 0.5. Therefore, we plan to recruit 200 patients, accounting for minimal losses to follow up, with 100 non-intubated patients in the prone position group and a 100 in the control group., TRIAL STATUS: The local registration number is 048-20, with the protocol version number 2.0. The date of approval is 3rd May 2020. Recruitment started on 3rd May and is expected to end in December 2020., TRIAL REGISTRATION: The protocol was retrospectively registered under the title: "Prone Positioning in Non-intubated Patients With COVID-19 Associated Acute Respiratory Failure. The PRO-CARF trial" in ClinicalTrials.gov with the registration number: NCT04477655. Registered on 20 July 2020., FULL PROTOCOL: The full protocol is attached as an additional file, accessible from the Trials website (Additional file 1). In the interest in expediting dissemination of this material, the familiar formatting has been eliminated; this Letter serves as a summary of the key elements of the full protocol. The study protocol has been reported in accordance with the Standard Protocol Items: Recommendations for Clinical Interventional Trials (SPIRIT) guidelines (Additional file 2).

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1. **Prospective multicentre study on the safety and utility of transbronchial lung cryobiopsy with endobronchial balloon**  
   Inomata Minoru ERJ open research 2020;6:No page numbers.

Transbronchial lung cryobiopsy (TBLC) has been increasingly utilised to diagnose diffuse parenchymal lung diseases (DPLDs) and lung cancers; however, TBLC protocols have not yet been standardised and the rate of complications associated with this procedure vary widely. Therefore, this prospective multicentre observational study investigated the safety and utility of the TBLC technique in patients with diffuse and localised respiratory diseases. This study was conducted at multiple medical centres in Japan between July 2018 and April 2019. The study's primary end-point was the rate of severe or serious adverse events associated with TBLC. Adverse events included bronchial bleeding, pneumothorax, pneumonia, respiratory failure, and an acute exacerbation of interstitial pneumonia. Adverse events were graded according to severity. During the TBLC procedure, an endobronchial balloon catheter for bronchial blockade was used in all patients. Pathological confidence and quality of specimens were categorised into three groups. A total of 112 patients were included. Neither severe nor serious adverse events were identified; therefore, the primary end-point was met. Nineteen patients (17%) experienced no bronchial bleeding. Mild or moderate bronchial bleeding was identified in 67% and 16% of patients, respectively. Mild pneumothoraces were identified in four patients (3.6%). The safety profile in patients aged >=75 years was not significantly different from younger patients. Definite or probable pathological diagnoses were made in 84.9% of patients. This TBLC protocol with routine use of an endobronchial balloon had an acceptable safety profile and diagnostic yield in patients, including elderly ones, with diffuse and localised respiratory diseases. Copyright ©ERS 2020.

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1. **Protective measures undertaken during chest tube thoracostomy in COVID-19 outbreak**  
   Gedik Ismail Ertugrul Indian journal of thoracic and cardiovascular surgery 2020;:1-4.

Background: Coronavirus disease 2019 (COVID-19) is a newly emerging infectious disease that was first reported in China and has become a worldwide pandemic. Many surgical procedures are continuing to be performed during this state of pandemic as is thoracic surgery. We present six cases of tube thoracostomy in COVID-19 patients and the modifications to the routine surgical technique., Methods: We serially attached two closed underwater drainage systems (CUDS) together and added a high-efficiency particulate air (HEPA) filter to the port of the second CUDS, because the intrapleural air, which passes through the CUDS into the air in intensive care unit (ICU), may contain high concentrations of 2019 novel coronavirus (2019-nCoV). Second, we attached the chest drain to the first CUDS in order to prevent the spread of virus during the placement of drain into the pleural cavity. Third, just before opening the parietal pleura, ventilation was put on standby mode and the endotracheal tube was clamped to prevent viral dissemination to the environment. Fourth, we covered the incision with a gauze sponge soaked with sterile saline solution during pleural entry, to prevent viral dissemination into the environment., Results: There were a total of six patients enrolled in our study. All these patients were diagnosed with COVID-19. The surgical indication for the chest tube thoracostomy was tension pneumothorax in all six patents. All patients had lung expansion defects and subcutaneous emphysema after intervention. Unfortunately, all of them succumbed to COVID-19, despite best available treatment. There was no COVID-19 infection reported in the healthcare professionals during this study., Conclusions: Thoracic surgical procedures may cause dissemination of high amounts of 2019-nCoV in the environment and thus are perhaps the most dangerous surgeries to perform. Variations in the thoracic surgical techniques are necessary in order to protect the healthcare providers from COVID-19. Copyright © Indian Association of Cardiovascular-Thoracic Surgeons 2020.

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1. **PULMONARY BAROTRAUMA DURING NONINVASIVE VENTILATION IN PATIENTS WITH COVID-19**  
   Pattupara A. Chest 2020;158:A337.

SESSION TITLE: Chest Infections Posters SESSION TYPE: Original Investigation Posters PRESENTED ON: October 18-21, 2020 PURPOSE: The pathophysiology of respiratory distress in hospitalized patients with COVID-19 is not yet fully understood. Spontaneous pulmonary barotrauma (PBT) is a pulmonary complication typically seen in intubated patients. However, in the related viral epidemic of SARS in 2002, 6.6% to 15% of patients on non-invasive ventilation (NIV) were described to have developed PBT, with severe alveolar destruction as the suggested mechanism. Within the COVID-19 pandemic, isolated case studies have described bulla and PBT, and a systematic review of imaging has suggested PBT to be a sign of disease progression. METHOD(S): In this single center retrospective case series, two patients with confirmed COVID-19 infection who developed PBT on NIV were identified in a New York City hospital from March 2020 to April 2020 and were included in this study. RESULT(S): Both the patients were non-smokers with no pre-existing lung disease. The first patient was a 58-year-old woman with a history of pemphigus vulgaris, and the second patient was a 69-year-old man with a history of hypertension and type 2 diabetes mellitus. Both patients received treatment with hydroxychloroquine, azithromycin, therapeutic anticoagulation, high dose steroids, and were enrolled in the hospital's remdesivir trial. Both patients required oxygen therapy which included escalation from nasal cannula to continuous positive airway pressure (CPAP), and both were encouraged to self-prone. The first patient was found to have a large left pneumothorax (PTX), pneumomediastinum (PM), and extensive subcutaneous emphysema (SE) on day 18 of hospitalization while on CPAP of 12 cm H2O, requiring surgical chest tube placement. The second patient developed a small left apical PTX, PM, and SE on day eight of hospitalization while on CPAP of 14 cm H2O, which was conservatively managed. Both patients eventually required intubation for worsening hypoxemia and later succumbed to their illness. CONCLUSION(S): In this study we identified two patients who developed PBT without being subjected to invasive ventilation or very high levels of PEEP. Both patients had poor outcomes, suggesting that COVID-19 may be associated with alveolar destruction, especially in the setting of steroid use. Glucocorticoid use may interfere with lung healing which could further increase the risk of alveolar rupture. CLINICAL IMPLICATIONS: This study encourages clinicians to have low threshold to suspect PBT in COVID-19 patients even while on NIV. Prospective studies are needed further to determine the utility of steroid use, given this potential risk for PBT and the clinical significance of our observations in COVID-19 patients. DISCLOSURES: No relevant relationships by Kirtipal Bhatia, source=Web Response No relevant relationships by Joseph Ghassibi, source=Web Response No relevant relationships by Julia Goldberg, source=Web Response No relevant relationships by Yasmin Herrera, source=Web Response No relevant relationships by Kam Sing Ho, source=Web Response No relevant relationships by Vivek Modi, source=Web Response No relevant relationships by Archana Pattupara, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Pulmonary cavitation – an under-recognized late complication of severe COVID-19 lung disease**  
   Zoumot Zaid 2020;:No page numbers.

&lt;h4&gt;Background: &lt;/h4&gt; Pulmonary radiological findings of the novel coronavirus disease 2019 (COVID-19) have been well documented and range from scattered ground-glass infiltrates in milder cases to confluent ground-glass change, dense consolidation, and crazy paving in the critically ill. However, lung cavitation has not been commonly described in these patients. The objective of this study was to assess the incidence of pulmonary cavitation in patients with COVID-19 and describe its characteristics and evolution. &lt;h4&gt;Methods: &lt;/h4&gt; We conducted a retrospective review of all patients admitted to our institution with COVID-19 and reviewed electronic medical records and imaging to identify patients who developed pulmonary cavitation. &lt;h4&gt;Results: &lt;/h4&gt;: Twelve out of 689 (1.7%) patients admitted to our institution with COVID-19 developed pulmonary cavitation, comprising 3.3% (n=12/359) of patients who developed COVID-19 pneumonia, and 11% (n=12/110) of those admitted to the intensive care unit. We describe the imaging characteristics of the cavitation and present the clinical, pharmacological, laboratory, and microbiological parameters for these patients. In this cohort six patients have died, and six discharged home. &lt;h4&gt;Conclusion: &lt;/h4&gt; Cavitary lung disease in patients with severe COVID-19 disease is not uncommon, and is associated with a high level of morbidity and mortality.

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1. **Pulmonary contusion during the COVID-19 pandemic: challenges in diagnosis and treatment**  
   Wang Y. Surgery Today 2020;50:1113-1116.

Managing patients with pulmonary contusion safely and effectively during the coronavirus disease 2019 (COVID-19) pandemic is challenging. This retrospective study analyzes the clinical data of 29 consecutive patients with pulmonary contusion, including two with COVID-19, at Tongji Hospital, Wuhan, China, in January and February, 2020. We analyzed the clinical manifestations, laboratory test results, computed tomography (CT) images, treatment, and clinical outcomes. The two patients with pulmonary contusion and COVID-19 had increased leukocyte and neutrophil counts, similar to the patients with pulmonary contusion alone. Interestingly, both these patients had subpleural ground glass opacity on CT images as a typical manifestation of COVID-19. All 29 patients were treated conservatively, including with closed thoracic drainage, instead of with thoracotomy. Six patients died of ARDS or craniocerebral injury, but the others stabilized. During the COVID-19 pandemic, patients with pulmonary contusion should be tested for SARS-CoV-2 and unless critical, thoracotomy should be avoided.Copyright © 2020, Springer Nature Singapore Pte Ltd.

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1. **Pulmonary function testing in blast-exposed veterans from operation enduring freedom and operation Iraqi freedom (OEF/OIF): An interim analysis**  
   Chin K. American Journal of Respiratory and Critical Care Medicine 2020;201:No page numbers.

Rationale: Exposure to improvised explosive devices (IEDs) with resultant injury is considered the signature injury in US military veterans of OEF/OIF. Blast exposure results in barotrauma injury to multiple organs, including shearing of the small airways epithelium shown in animal models. Prior epidemiologic studies demonstrated high prevalence of respiratory symptoms in OEF/OIF deployers, however, there is comparatively little known regarding pulmonary function in blast-exposed populations specifically. Method(s): A subset of veterans enrolled in the Veterans' Affairs (VA) Toxic Embedded Fragment (TEF) registry were invited to complete a clinical evaluation at 5 VA sites in the United States. The TEF registry includes over 19,000 veterans reporting injuries from embedded metal fragments based on responses to standard screening questions asked upon entry into the VA healthcare system. Participants completed a clinical questionnaire regarding demographics, military-related injuries, occupational exposures, and symptoms related to renal and pulmonary disease. Self-reported blast exposure was assessed based on responses to the VA's TEF exposure questionnaire. Participants completed pulmonary function tests (PFTs), including spirometry, lung volumes, and diffusing capacity. Comparisons were made between veterans reporting blast exposure compared to those without blast exposure. Veterans without blast exposure were included in the TEF registry because they had sustained a bullet-only exposure. Statistical analysis was performed with Student t test, chi-square test, and regression analysis. Result(s): Data from 242 veterans were evaluated in this interim analysis, out of planned recruitment of 421 subjects. Participants were predominantly male (n=234, 96.7%) with mean age 42 years, height 177 cm, and weight 97.6 kg. Mean time since injury was 12.7 years. Forty-four veterans (18%) with retained fragments reported injuries potentially attributable to barotrauma (pneumothorax, lung contusion, eardrum rupture). Blast exposure data were unavailable for four veterans. Mean values for spirometry, lung volumes, and diffusing capacity were similar between the blast-exposed and blastunexposed groups (Table). Nineteen veterans (7.8%) had obstructive spirometry (FEV1/FVC<0.7). Conclusion(s): Mean pulmonary function test values do not differ between the blast-exposed and blast-unexposed groups in this interim analysis. The low number of blast-unexposed veterans in the interim analysis limits statistical power to detect differences. Future analyses will include comparison of PFT data to population-based normal values and limits of normal, stratification of PFT data by clinical patterns of abnormalities, adjustment of data for BMI, and measures of severity of blast exposure. Time since blast exposure may represent an important parameter in development of PFT abnormality and respiratory symptoms in the post-deployment population.(Table Presented).

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1. **Pulmonary illness related to e-cigarette use in Illinois and Wisconsin - Final report**  
   Layden J. E. New England Journal of Medicine 2020;382:903-916.

BACKGROUND E-cigarettes are battery-operated devices that heat a liquid and deliver an aerosolized product to the user. Pulmonary illnesses related to e-cigarette use have been reported, but no large series has been described. In July 2019, the Wisconsin Department of Health Services and the Illinois Department of Public Health received reports of lung injury associated with the use of e-cigarettes (also called vaping) and launched a coordinated public health investigation. METHODS We defined case patients as persons who reported use of e-cigarette devices and related products in the 90 days before symptom onset and had pulmonary infiltrates on imaging and whose illnesses were not attributed to other causes. Medical record abstraction and case patient interviews were conducted with the use of standardized tools. RESULTS There were 98 case patients, 79% of whom were male; the median age of the patients was 21 years. The majority of patients presented with respiratory symptoms (97%), gastrointestinal symptoms (77%), and constitutional symptoms (100%). All case patients had bilateral infiltrates on chest imaging. A total of 95% of the patients were hospitalized, 26% underwent intubation and mechanical ventilation, and two deaths were reported. A total of 89% of the patients reported having used tetrahydrocannabinol products in e-cigarette devices, although a wide variety of products and devices was reported. Syndromic surveillance data from Illinois showed that the mean monthly rate of visits related to severe respiratory illness in June through August of 2019 was twice the rate that was observed in the same months in 2018. CONCLUSIONS Case patients presented with similar clinical characteristics. Although the definitive substance or substances contributing to injury have not been determined, this initial cluster of illnesses represents an emerging clinical syndrome or syndromes. Additional work is needed to characterize the pathophysiology and to identify the definitive causes.Copyright © 2019 Massachusetts Medical Society.

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1. **Radiology of COVID-19 - Imaging the pulmonary damage**  
   Sohail Saba JPMA. The Journal of the Pakistan Medical Association 2020;70(Suppl 3):S60-S63.

A large part of the world is presently in the grip of the coronavirus disease (COVID-19) by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2 virus), declared a pandemic in March 2020. This document is a brief commentary of the imaging modalities used in the screening, diagnosis and management of COVID-19 pneumonia. Chest x-rays, especially portable, still form a part of majority of official guidelines, with reports of the suggestive radiologic features. The potential of CT scan and ultrasound is also realised, with earlier detection rate. Typical radiologic findings of bilateral, asymmetrical, crazy-paved ground glass opacification, consolidation, reverse halo sign, opacities, progressing to fibrosis are well described for both the X-ray and CT scan. Atypical findings include airway changes, pleural effusion, pulmonary nodules and acute pulmonary embolism. Absence of lymphadenopathy, pleural effusion and pneumothorax is notable. The role of portable lung ultrasound, reported to be useful in emergency, is yet to be established in the guidelines. Disinfection of the equipment is a major concern. Governmental guidelines still advocate X-ray despite professional societies increasingly recommending CT scan.

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1. **Ralstonia insidiosa Neonatal Sepsis: A Case Report and Review of the Literature**  
   Alasehir E. A. Journal of Pediatric Infectious Diseases 2020;15:148-151.

Introduction Ralstonia spp. are nonfermenting gram-negative bacteria that have recently emerged as opportunistic pathogens. Previously, two case series of infection associated with Ralstonia insidiosa have been published. In this case report, R. insidiosa infection of a neonate in the neonatal intensive care unit (NICU) is presented. Case Presentation A term male infant developed respiratory distress 2 hours after birth and was admitted to the NICU with the presumptive diagnosis of transient tachypnea of the newborn. A left apical pneumothorax was detected, requiring chest tube insertion. An umbilical catheter was placed due to poor peripheral vascular access. On the second day, blood cultures were sent from the umbilical artery and umbilical venous catheters, which showed growth of R. insidiosa. The antibiotics were changed from ampicillin and gentamicin to ampicillin-sulbactam and cefotaxime according to the antibiotic susceptibility test results. Respiratory distress symptoms resolved and the patient was extubated. The infant's clinical condition improved steadily and was discharged with breast feeding and stable vital findings, negative follow-up cultures, and C-reactive protein. Conclusion Ralstonia insidiosa is an emerging pathogen in hospital infections due to its ability to survive in water supplies and sterilized water-based solutions. There is need for vigilance of R. insidiosa, especially in intensive care units. Awareness of rare pathogens, early detection of the bacteria, and antibiotic susceptibility test results are important in the success of treatment.Copyright © 2020 by Georg Thieme Verlag KG, Stuttgart New York.

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1. **Rapidly developing large pneumatocele and spontaneous pneumothorax in SARS-CoV-2 infection**  
   Sanivarapu Raghavendra R. Respiratory medicine case reports 2020;31:101303.

Coronavirus disease 2019 (COVID-19) has spread to more than 70 countries around the world since its discovery in 2019. More than 2.5 million cases and more than 130,000 deaths have been reported in the United States alone. The common radiological presentation in this disease is noted to be the presence of ground glass opacities and/or consolidations. We report a case of 40-year-old male admitted for COVID-19 and rapidly deteriorated into severe acute respiratory distress syndrome requiring intubation and mechanical ventilation with no prior history of smoking or lung disease. The patient had normal imaging 3 days prior to admission to the hospital and rapidly developed a large pneumatocele with pneumothorax requiring chest tube placement that later on resolved. This is a unique radiologic finding in COVID-19 and likely related to severe inflammation secondary to SARS-CoV-2 infection. Copyright © 2020 The Author(s).

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1. **RARE HEPATOPULMONARY FISTULA DUE TO LIVER ABSCESS RUPTURE**  
   Singh J. Chest 2020;158:A1280.

SESSION TITLE: Medical Student/Resident Disorders of the Pleura Posters SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: Hepatopulmonary fistulas are quite rare, a complication which can be due to primary etiologies such as hydatid or pyogenic cysts (1). These insults cause transdiaphragmatic infiltration leading to rupture at the lower lung leading to the formation of a fistula. Secondary causes are congenital abnormalities, surgical or penetrating trauma. Our patient developed an extremely rare complication of fistulization with the right lung pleura due to a suppurative hepatic collection leading to a complicated clinical presentation. There are known septic embolic or constitutional symptoms associated with the diagnosis which were not present in our case, rather acute hypoxic respiratory failure and septic shock due to rupture of the hepatic abscess. CASE PRESENTATION: A 59-year-old female with a recent history of a benign liver tumor presented for shortness of breath and dry cough for two days. On physical exam, she was tachypneic and increased work of breathing. Vital signs were significant for oxygen desaturation to 86% on room air, required mechanical ventilation. She was admitted to the intensive care unit for acute respiratory failure due to possible multifocal pneumonia and rule out COVID-19 Upon admission evaluation, laboratory results significant for transaminitis (Alk Phos 353, AST 197 and ALT 60) Chest X-ray (Figure 1) raised right hemidiaphragm, right lower lobe atelectasis and bilateral alveolar infiltrates. CT AP with IV contrast revealed a large right sub diaphragmatic abscess with a right-sided empyema (Figure 2) Upon review of daily CXR, day 6 of the admission, new loculated pneumothoraces in the upper and middle right lung. Chest tube was placed for the pnuemothoraces. The pleural fluid was exudative and neutrophil predominant. Followed by an IR drainage of the liver abscess yielding 60 cc of brown purulent fluid. The spontaneous pneumothorax was likely in the setting of a cystopleural fistula resulting from ruptured hepatic abscess given similar microbiology with anaerobic gram positive rod growth from the IR guided liver abscess drainage and the chest tube drainage. DISCUSSION: Hepatopulmonary fistulas may have benign courses but there is a significant mortality rate due to septic shock and florid infection. A pyogenic abscess causes obstruction of the biliary tree allowing for bacterial overgrowth complicated by rupture leading to peritonitis or sepsis. CONCLUSION(S): Our case is a rare presentation showing the severe progression of a pyogenic liver abscess allowing for this communication between the lung and liver. This case emphasizes the importance of early recognition of infectious liver abscesses and early intervention. Reference #1: Gulamhussein, Patrini, Pararajasingham, Adams, Shukla, Velissaris, Lawrence, Panagiotopoulous "Hepatopulmonary Fistula: a life threatening complication of hydatid cyst" J Cardiothorac Surg 2015 Reference #2: Abbas M, Khan F, Muhsin S, Al-Dehwe "Epidemiology, Clinical features and outcome of Liver Abcsess: A single Reference Center Experience in Qatar" Oman Med J 2014 DISCLOSURES: No relevant relationships by Kinjal Patel, source=Web Response No relevant relationships by Jean Singh, source=Web Response No relevant relationships by Ivan Wong, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **RARE PHENOMENA OF SPONTANEOUS PNEUMOMEDIASTINUM WITH UNDERLYING AND UNDIAGNOSED DERMATOMYOSITIS AND ILD**  
   Jaggi K. K. Chest 2020;158:A1980.

SESSION TITLE: Medical Student/Resident Pulmonary Manifestations of Systemic Disease Posters SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: The clinical manifestations of amyopathic dermatomyositis (ADM) have been long studied due to its rare complications. Pulmonary involvement is noted in nearly 50% of the population with ADM, however, spontaneous pneumomediastinum (SPM) is rare. Here we present a case of a woman who was subsequently diagnosed with ADM, only after lung involvement was noted. CASE PRESENTATION: 58-year-old woman presented with shortness of breath, cough, pain and erythema of her hands for four months. She was unsucessfully treated with antibiotics and steroids from different ER and urgent care visits, with radiographic imaging showing pneumonia and ILD. She was evaluated by pulmonology and initial PFT's showed a moderate restrictive pattern with normal FEV1/FVC (76%) and mildly reduced FEV1 at 62%. During a hospital admission for dyspnea, a CT chest showed bilateral pneumomediastinum and gas within the supraclavicular regions on a CT, which also confirmed ILD (specifically NSIP). Diagnosis was confirmed as ADM and she was started on mycophenolate mofetil and steroids. Labs at that time were largely unremarkable, and rheumatological and infectious workup was negative. However, her pneumomediastinum worsened and caused significant neck swelling and crepitus as seen in figures 1-3. Her respiratory status, however, remained stable. As such, she was started on a higher dose of mycophenolate, hydroxychloroquine, and tofacitinib. Despite having improvement in her pneumomediastinum and respiratory symptoms with this regimen, her FEV1 declined by 12% and required supplemental oxygen. Since then, she has been receiving rituximab infusions, with a good response. DISCUSSION: Spontaneous pneumomediastinum is a rare phenomenon seen in ADM. The most common pulmonary complication of ADM is ILD, and nearly 80% of these patients have NSIP. While the literature mainly consists of case reports, its review shows that patients with ILD were more prone to spontaneous pneumomediastinum, subcutaneous emphysema, or pneumothoraces. Exact pathophysiology is unknown, suggested theories include inflammatory processes causing alveolar rupture leading to pneumothorax or pneumomediastinum. These inflammatory processes are seen in small vessel vasculitis or connective tissue diseases. Multiple case reports have shown improvement in the pneumomediastinum with treatment of the underlying disease. Steroid remains the first-line agent, however, in cases of subpar response, immunosuppressants including cyclosporine, methotrexate, azathioprine, mycophenolate mofetil have shown tremendous response. When cases are refractory to the above therapies, rituximab has a good, as was seen in our case. CONCLUSION(S): Pulmonary involvement in patients with DM is associated with higher mortality. Prompt diagnosis of the underlying disease and treatment with steroids and/or immunosuppressants is vital in order to prevent worsening of the pulmonary manifestations. Reference #1: Kono H, Inokuma S, Nakayama H, Suzuki M. Pneumomediastinum in dermatomyositis: association with cutaneous vasculopathy. Ann Rheum Dis. 2000;59(5):372-376. doi:10.1136/ard.59.5.372 Reference #2: Tang R, Millett CR, Green JJ. Amyopathic dermatomyositis complicated by pneumomediastinum. J Clin Aesthet Dermatol. 2013;6(3):40-43. Reference #3: Okogbaa J, Batiste L. Dermatomyositis: An Acute Flare and Current Treatments. Clin Med Insights Case Rep. 2019;12:1179547619855370. Published 2019 Jun 18. doi:10.1177/1179547619855370 DISCLOSURES: My spouse/partner as a Own stock relationship with United Medical Systems Please note: $5001 - $20000 Added 05/18/2020 by Bruno DiGiovine, source=Web Response, value=Dividends No relevant relationships by Karan Kevin Jaggi, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Recommendations for interventional pulmonology during COVID-19 outbreak: a consensus statement from the Portuguese Pulmonology Society**  
   Guedes F. Pulmonology 2020;26:386-397.

Coronavirus disease 2019 (COVID-19) is an emerging infectious disease caused by a novel SARS-CoV-2 pathogen. Its capacity for human-to-human transmission through respiratory droplets, coupled with a high-level of population mobility, has resulted in a rapid dissemination worldwide. Healthcare workers have been particularly exposed to the risk of infection and represent a significant proportion of COVID-19 cases in the worst affected regions of Europe. Like other open airway procedures or aerosol-generating procedures, bronchoscopy poses a significant risk of spreading contaminated droplets, and medical workers must adapt the procedures to ensure safety of both patients and staff. Several recommendation documents were published at the beginning of the pandemic, but as the situation evolves, our thoughts should not only focus on the present, but should also reflect on how we are going to deal with the presence of the virus in the community until there is a vaccine or specific treatment available. It is in this sense that this document aims to guide interventional pulmonology throughout this period, providing a set of recommendations on how to perform bronchoscopy or pleural procedures safely and efficiently.Copyright © 2020 Sociedade Portuguesa de Pneumologia

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1. **Recurrent pneumothorax in a COVID-19 patient: A case report**  
   Sardenberg Rodrigo A. S. Respiratory medicine case reports 2020;31:101201.

An 88-year-old woman diagnosed with COVID-19 in Brazil presented with recurrent pneumothorax. She was under mechanical ventilation for 20 days because of acute respiratory distress syndrome (ARDS). Chest x-ray revealed right lung pneumothorax, which was treated with a pigtail chest tube leading to successful lung reexpansion. After 48 hours the patient developed an ipsilateral pneumothorax and a new tube thoracostomy under conventional chest tube under suction was performed and kept in place for 14 days. This brief report highlights that the conventional chest tube under suction procedures might be a good choice in Covid-19 patients. Copyright © 2020 The Author(s).

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1. **Recurrent Pneumothorax in a Critically Ill Ventilated COVID-19 Patient**  
   Rehnberg Lucas Case reports in critical care 2020;2020:8896923.

We present this case of a young woman with SARS-CoV-2 viral infection resulting in coronavirus 2019 (COVID-19) lung disease complicated by a complex hydropneumothorax, recurrent pneumothorax, and pneumatoceles. A 33-year-old woman presented to the hospital with a one-week history of cough, shortness of breath, and myalgia, with no other significant past medical history. She tested positive for COVID-19 and subsequently, her respiratory function rapidly deteriorated, necessitating endotracheal intubation and mechanical ventilation. She had severe hypoxic respiratory failure requiring a protracted period on the mechanical ventilator with different ventilation strategies and multiple cycles of prone positioning. During her proning, after two weeks on the intensive care unit, she developed tension pneumothorax that required bilateral intercostal chest drains (ICD) to stabilise her. After 24 days, she had a percutaneous tracheostomy and began her respiratory wean; however, this was limited due to the ongoing infection. Thorax CT demonstrated a left-sided pneumothorax, with bilateral pneumatoceles and a sizeable, complex hydropneumothorax. Despite the insertion of ICDs, the hydropneumothorax persisted over months and initially progressed in size on serial scans needing multiple ICDs. She was too ill for surgical interventions initially, opting for conservative management. After 60 days, she successfully underwent a video-assisted thoracoscopic surgery (VATS) for a washout and placement of further ICDs. She was successfully decannulated after 109 days on the intensive care unit and was discharged to a rehabilitation unit after 116 days of being an inpatient, with her last thorax CT showing some residual pneumatoceles but significant improvement. Late changes may mean patients recovering from the COVID-19 infection are at increased risk of pneumothoracies. Clinicians need to be alert to this, especially as bullous rupture may not present as a classical pneumothorax. Copyright © 2020 Lucas Rehnberg et al.

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1. **Reducing patient harm following inadvertent endobronchial placecement of nasogastric tubes in patients with SARS-COV-2**  
   Mandalia R. Journal of Cardiothoracic and Vascular Anesthesia 2020;34:S56-S57.

Introduction: Nasogastric tube (NGT) insertion is essential for enteral feeding but can potentially cause significant injury to the lungs (1). Following a critical incident, we audited our practice of NGT insertion and the consequences of injury in patients with Severe Acute Respiratory Syndrome COVID-19 caused by the (SARS-CoV-2) virus. Method(s): NGT insertion followed a local standard safety protocol and were inserted by consultants or senior registrars in anaesthesia and critical care medicine, or advanced critical care practitioners. Individual practitioners were able to choose their technique of insertion. All patients had their post-NGT insertion chest x-ray reviewed and those with misplaced NGTs had their case notes reviewed. Early in the outbreak, blind insertion was recommended in our institution to reduce aerosolisation, this was rapidly changed to direct visualisation with laryngoscopy as our experience managing SARS-CoV-2 patients increased. Result(s): During the SARS-CoV-2 pandemic, a total of 135 NGTs were inserted into ventilated and/or extracorporeal membrane oxygenation (ECMO) patients. All of NGTs positioned were confirmed by a chest radiograph. Eleven (8.1%) were inadvertently endobronchial, of which four developed pneumothoraces (figure 1). Three patients (including both who had received ECMO) died and a fourth is currently undergoing a prolonged respiratory wean. No patients were fed or received drugs via a misplaced NGT. Chest radiograph of patient with inadvertent NGT placement in right lower lobe. Note the path of the tube suggests breech of the bronchial tree and direct injury to the lung parenchyma (arrowhead). A CT the following day showed a large pneumothorax (arrowhead), some haemothorax (black arrow) and severe ground glass changes consistent with SARS-CoV-2 (white arrow). Discussion(s): Our inadvertent endobronchial NGT rate is relatively high, compared to our previous clinical experience, which we believe may be related to the challenges of working with cumbersome personal protective equipment and/or changed practice to attempt to reduce transmission of SARS-CoV-2 (2). We suspect the lung parenchyma is particularly fragile in acute respiratory distress syndrome caused by SARS-CoV-2, which contributes to the high rate of pleural breech and subsequent poor outcome (3). We recommend experienced operators place NGTs and do so using direct or videolaryngoscopy to minimise the risk of incorrect placement. We would like to thank the families of our patients for their permission to share the images in this work.Copyright © 2020

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1. **Remdesivir for 5 or 10 days in patients with severe covid-19**  
   Goldman J. D. New England Journal of Medicine 2020;383:1827-1837.

BACKGROUND Remdesivir is an RNA polymerase inhibitor with potent antiviral activity in vitro and efficacy in animal models of coronavirus disease 2019 (Covid-19). METHODS We conducted a randomized, open-label, phase 3 trial involving hospitalized patients with confirmed SARS-CoV-2 infection, oxygen saturation of 94% or less while they were breathing ambient air, and radiologic evidence of pneumonia. Patients were randomly assigned in a 1:1 ratio to receive intravenous remdesivir for either 5 days or 10 days. All patients received 200 mg of remdesivir on day 1 and 100 mg once daily on subsequent days. The primary end point was clinical status on day 14, assessed on a 7-point ordinal scale. RESULTS In total, 397 patients underwent randomization and began treatment (200 patients for 5 days and 197 for 10 days). The median duration of treatment was 5 days (interquartile range, 5 to 5) in the 5-day group and 9 days (interquartile range, 5 to 10) in the 10-day group. At baseline, patients randomly assigned to the 10-day group had significantly worse clinical status than those assigned to the 5-day group (P=0.02). By day 14, a clinical improvement of 2 points or more on the ordinal scale occurred in 64% of patients in the 5-day group and in 54% in the 10-day group. After adjustment for baseline clinical status, patients in the 10-day group had a distribution in clinical status at day 14 that was similar to that among patients in the 5-day group (P=0.14). The most common adverse events were nausea (9% of patients), worsening respiratory failure (8%), elevated alanine aminotransferase level (7%), and constipation (7%). CONCLUSIONS In patients with severe Covid-19 not requiring mechanical ventilation, our trial did not show a significant difference between a 5-day course and a 10-day course of remdesivir. With no placebo control, however, the magnitude of benefit cannot be determined.Copyright © 2020 Massachusetts Medical Society.

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1. **Reprint of: Pulmonary complications in cocaine users**  
   Underner M. Journal Europeen des Urgences et de Reanimation 2020;32:127-141.

Cocaine can be responsible for many psychiatric and/or somatic disorders. The aim of this systematic literature review of data was to expose relations between cocaine use and pulmonary complications. Cocaine can be responsible for acute respiratory symptoms (cough, black sputum, hemoptysis, dyspnea, wheezing, chest pain) and for various pulmonary disorders including barotrauma (pneumothorax, pneumomediastinum, subcutaneous emphysema, pneumopericardium), airway damage, asthma, bronchiolitis obliterans with organizing pneumonia, acute pulmonary edema, alveolar hemorrhage, alveolar pneumonia with carbonaceous material, bullous emphysema, acute eosinophilic pneumonia, pulmonary granulomatosis caused by talc or cellulose, interstitial pneumonitis and pulmonary fibrosis, vasculitis, pulmonary hypertension, pulmonary embolism and pulmonary infarction, mycotic pulmonary arterial aneurysms, septic emboli, aspiration pneumonia, community-acquired pneumonia, HIV-related opportunistic infections, latent tuberculosis infection, pulmonary tuberculosis, lung cancer and crack lung. Some of these complications are serious and may have a fatal outcome. Pulmonary function tests, thoracic tomodensitometry, bronchial fibroscopy with bronchoalveolar lavage and lung scintigraphy may be an aid to the diagnosis of these pulmonary compications. Cocaine use must be sought in case of respiratory symptoms in young persons.Copyright © 2019 Elsevier Masson SAS

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1. **Repurposing a Small Community Hospital Surgical Residency Program in an Epicenter of the COVID-19 Pandemic**  
   Meghpara Melissa K. The American surgeon 2020;86:1623-1628.

BACKGROUND: COVID-19 put a stop to the operative experience of surgical residents, leaving reassignment of the team, to the frontlines. Each program has adapted uniquely; we discuss how our surgical education changed in our hospital., STUDY DESIGN: A retrospective review of changes in general surgery cases, bedside procedures, and utilization of residents before and during the pandemic. Procedures were retrieved from electronic medical records. Operating room (OR) cases 1 month before and 5 weeks after the executive order were collected. Triple lumen catheter (TLC), temporary hemodialysis catheter (HDC), and pneumothorax catheter (PC) insertions by surgical residents were recorded for 5 weeks., RESULTS: Before the pandemic, an average of 27.9 cases were done in the OR, with an average of 10.1 general surgery cases. From March 23 to April 30, 2020, the average number of cases decreased to 5.1, and general surgery cases decreased to 2.2. Elective, urgent, and emergent cases represented 83%, 14.6%, and 2.4% prior to the order and 66.7%, 15.1%, and 18.2%, respectively, after the order. Bedside procedures over 5 weeks totaled to 153, 93 TLCs, 39 HDCs, and 21 PCs., CONCLUSION: Repurposing the surgical department for the concerns of the pandemic has involved all surgical staff. We worked with other departments to allocate our team to areas of need and re-evaluated daily. The strengths of our team to deliver care and perform many bedside procedures allowed us to meet the demands posed by this disease while remaining as a cohesive unit.

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1. **Research Progress of Genetic Structure, Pathogenic Mechanism, Clinical Characteristics, and Potential Treatments of Coronavirus Disease 2019**  
   Zhu Chunsheng Frontiers in pharmacology 2020;11:No page numbers.

1. **Respiratory Failure and Death in Vulnerable Premature Children With Lower Respiratory Tract Illness**  
   Ofman Gaston The Journal of infectious diseases 2020;222:1129-1137.

BACKGROUND: Efforts to better understand the risk factors associated with respiratory failure (RF) and fatal lower respiratory tract infection (LRTI) in premature children in developing countries are necessary to elaborate evidenced-based preventive interventions. We aim to characterize the burden of respiratory syncytial virus (RSV) and human metapneumovirus (hMPV) LRTI in premature children and determine risk factors for RF and fatal illness in a vulnerable population., METHODS: This is a prospective, population-based, cross-sectional study. Subjects with severe LRTI were enrolled during respiratory season. Risk factors for RF and death in premature infants were investigated., RESULTS: A total of 664 premature children participated. Infant's hospitalization rate due to LRTI was 82.6/1000 (95% confidence interval [CI], 68.6-96.7/1000). Infant's RSV and hMPV rates were 40.9/1000 (95% CI, 36.3-45.6/1000) and 6.6/1000 (95% CI, 3.9-9.2/1000), respectively. The RF rate was 8.2/1000 (95% CI, 4.9-11.5/1000). The LRTI mortality was 2.2/1000 (95% CI, 0.7-3.7/1000); for RSV, the rate was 0.8/1000 (95% CI, 0-1.7/1000) with a case-fatality ratio of 1.8%. Never breastfeeding, malnutrition, younger than 6 months, congenital heart disease, and lower hematocrit were risk factors for RF. Experiencing pneumonia, pneumothorax, sepsis, or apnea were clinical determinants of poor outcomes., CONCLUSIONS: Premature children under 2 years old in vulnerable environments experience RF and death more often than term counterparts. Modifiable risk factors associated with poor outcomes should prompt evidence-based interventions. Copyright © The Author(s) 2020. Published by Oxford University Press for the Infectious Diseases Society of America.

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1. **Respiratory symptoms and signs**  
   Singh S. Medicine (United Kingdom) 2020;48:225-233.

Laennec's invention of the stethoscope in 1816, and description of auscultatory sounds for clinical diagnosis remain important today. History and examination are pivotal to accurate diagnosis, helped by confirmatory investigations. The key symptoms of respiratory disease are breathlessness, chest pain, cough with associated sputum production, and wheeze. Non-respiratory conditions also produce such symptoms. A systematic approach to history-taking should include all primary symptoms, their time course, characteristics, severity and trajectory. A review of non-respiratory and pharmaceutical associations, and historical aspects of respiratory symptoms, should precede a thorough review of clinical signs. Hence, a checklist of 'pulmonary risk factors' completes a thorough evaluation. After clinical evaluation, assimilation of information, and synthesis with clinicopathophysiological knowledge of respiratory diseases, allows formulation of a differential diagnosis. Classical patterns of the most important focal abnormalities, if present, include consolidation, collapse, pneumothorax, pleural effusion, or interstitial lung patterns. Clinical signs can change during the time course of the illness. The pre-test likelihood ratio of a diagnosis may then inform the post-test likelihood following investigations. This article reviews the key features of respiratory symptoms and signs, outlines tips on how best to elicit these, and discusses patterns of clinical features in the context of differential diagnosis.Copyright © 2020

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1. **Risks of novel coronavirus disease (COVID-19) in pregnancy; a narrative review**  
   Panahi Latif Archives of academic emergency medicine 2020;8:No page numbers.

1. **ROLE OF BRONCHOSCOPY IN THE DIAGNOSIS OF SARS-COV-2: CASE REPORT**  
   Lamboy I. Chest 2020;158:A411-A412.

SESSION TITLE: Global Case Report Posters SESSION TYPE: Global Case Reports PRESENTED ON: October 18-21, 2020 INTRODUCTION: On December 2019 in Wuhan China there were a cluster of cases of an unknown etiology pneumonia, that we later discovered it was caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) [1]. In May 2020, in Puerto Rico there were approximately 1806 positive cases reported, with a mortality rate ranging among 5% [2]. But, is this number even real? At the moment, we are using the Reverse Transcription-PCR for diagnosis; but is this study completely reliable? CASE PRESENTATION: We present a 69-year-old man with multiple chronic comorbidities such as: hypertension, dyslipidemia, diabetes mellitus, chronic kidney disease, bronchial asthma and sleep apnea. Patient complained of three days of cough, anorexia, generalized malaise, fever and chills prior to a sudden loss of consciousness episode in which he had a right side 8th rib fracture developing a small apical right sided pneumothorax. Laboratory markers such as Ferritin, LDH, sed rate, CRP, D-dimer, lactic acid and procalcitonin, all of which have been associated with COVID-19, were elevated upon admission. Chest CT scan demonstrated evidence of the small right apical pneumothorax and a focal consolidation of a left lung base. In light of patient's signs and symptoms, he was considered a person under investigation (PUI) for COVID-19. A nasopharyngeal (NP) RT-PCR was done, yielding a negative test. Patient continued developing fever episodes and worsening hypoxemia and his inflammatory markers continued on an increasing trend. Chest CT scan was repeated and there was evidence of worsening, bilateral and bibasilar patchy ground glass opacities. Another 2 NP RT-PCRs were done in light of high suspicion for COVID-19 pneumonia; both of them came back negative. Was there any other etiology that we were missing? Patient was taken to bronchoscopy and the RT-PCR testing for SARS-CoV-2 in BAL came back positive, despite 3 previous negative NP tests results. DISCUSSION: RT-PCR is the most useful diagnostic test currently used for the detection of COVID-19. Mostly the nasopharyngeal test is done, mainly due to its simplicity. There are multiple existing RT-PCR assays in the market along with several manufacturers [1,3]. Among the different assays there are: RT-PCR assays targeting the RNA-dependent RNA polymerase (RdRp), envelope (E), and nucleocapsid (N) genes of SARS-CoV-2; being the most sensitive the RdRp (3). Yi Wei Tang et al recently published a study in which they developed three different RT-PCR assays and compared them to the currently existing and mostly used assay (RdRp). They discovered that the COVID-19-RdRp/Hel assay was the most sensitive and specific of them and the one with less cross-reactivity with other human coronaviruses. CONCLUSION(S): This case brings a very important question, how reliable are the currently used RT-PCR tests regarding our Novel Coronavirus? Reference #1: Chan JF-W, et al. 2020. Improved molecular diagnosis of COVID- 19 by the novel, highly sensitive and specific COVID-19- RdRp/Hel real-time reverse transcription-PCR assay validated in vitro and with clinical specimens. J Clin Microbiol 58:e00310-20. https://doi.org/10.1128/JCM.00310-20. Reference #2: https://www.nytimes.com/interactive/2020/us/puerto-rico-coronavirus-cases.html Reference #3: Yi-Wei Tang, et al. 2020. The Laboratory Diagnosis of COVID-19 Infection: Current Issues and Challenges. J. Clin. Microbiol. Online Edition. doi:10.1128/JCM.00512-20 DISCLOSURES: No relevant relationships by Edgardo Adorno, source=Web Response No relevant relationships by Christian Castillo Latorre, source=Web Response No relevant relationships by Francisco Del Olmo-Arroyo, source=Web Response No relevant relationships by Ilean Lamboy, source=Web Response No relevant relationships by Mariana Mercader-Perez, source=Web Response No relevant relationships by William Rodriguez-Cintron, source=Web Response No relevant relationships by Mark Vergara-Gomez, sourc =Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Role of chest radiograph (Cxr) in covid-19 diagnosis and management**  
   Raj V. Journal of the Indian Medical Association 2020;118:14-19.

Coronavirus disease-2019 (COVID-19) is a highly contagious disease and has been declared as a pandemic by the World Health Organization. COVID-19 presents with lower respiratory tract infectionrelated symptoms and many patients might be asymptomatic carriers. Reverse transcriptasepolymerase chain reaction (RT-PCR) test used for diagnosis is not robust and has limited availability. Chest radiograph (CXR) is an easily available test and universally used for assessment of patients with respiratory symptoms. In this review, we discuss the various imaging appearances of COVID-19 on a CXR. We also look at the role of CXR in the diagnosis/screening of COVID-19, the utility of artificial intelligence and highlight various guidelines on imaging in COVID-19. Practical aspects relating to infection control and quality control are also discussed.Copyright © 2020, Indian Medical Association. All rights reserved.

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1. **Role of point of care ultrasound in COVID-19 pandemic: what lies beyond the horizon?**  
   Galluccio F. Medical Ultrasonography 2020;22:461-468.

The pandemic of COVID-19 requires rapid and easy access to reliable imaging modalities for diagnosis and follow up. Considering the cost-effectiveness of the imaging used, ultrasound is a non-ionizing, portable and bedside imaging modality with a high diagnostic impact in emergencies and intensive care units in pandemics, but it is operator dependent. In our article, we provide a comprehensive review of the role of point-of-care ultrasound in the diagnosis of COVID-19 infection and its impact on the lungs, cardiovascular system, eyes and abdominal organs. Moreover, ultrasound can provide real-time diagnostic and therapeutic interventions, such as the placement of a central catheter and aspiration of pericardial effusion. Awareness of health care professionals in the front-line fighting COVID-19 infection in emergency rooms, clinics, and in intensive care units is important and will help rapid and targeted management decisions.Copyright © 2020 Societatea Romana de Ultrasonografie in Medicina si Biologie. All rights reserved.

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1. **SARS-CoV-2 Associated With Pneumothorax: A Case Report and Literature Review**  
   Younes Islam Cureus 2020;12:e12191.

SARS-CoV-2 has created universal disarray since its outbreak in 2019. Emergent measures were taken worldwide to mitigate the morbid outcomes of the pandemic. Multiple organ systems have been shown to be negatively impacted secondary to the heightened inflammatory response to the novel virus. In this report, we focus on the respiratory system. The novel virus impact on the respiratory system has been well documented, leading to acute respiratory distress syndrome. Here, we present a case of a patient with no risk factors for pneumothorax (smoking, underlying lung disease, prior history of pneumothorax, age, family history) who was found to be SARS-CoV-2 positive and developed a significant pneumothorax requiring transfer to the intensive care unit. Copyright © 2020, Younes et al.

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1. **SARS-CoV-2 infection associated with spontaneous pneumothorax**  
   Rohailla Sagar CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne 2020;192:E510.

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1. **SARS-CoV-2 jumping the species barrier: zoonotic lessons from SARS, MERS and recent advances to combat this pandemic virus**  
   Dhama Kuldeep Travel medicine and infectious disease 2020;:101830.

1. **SARS-CoV-2 pneumonia with subcutaneous emphysema, mediastinal emphysema, and pneumothorax: A case report**  
   Xiang C. Medicine (United States) 2020;99:e20208.

Introduction:Since the end of 2019, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection has affected more than 1,000,000 population in the world. Subcutaneous emphysema and pneumothorax are uncommon complications of SARS-CoV-2 pneumonia. Herein, we describe a fatal case of SARS-CoV-2 pneumonia with subcutaneous emphysema and pneumothorax.Patient concerns:Subcutaneous emphysema was found in neck, bilateral chest walls, abdomen wall, groin area, and scrotum of a 67-year-old man. Extensive air-space opacities, subcutaneous emphysema and a small amount of pneumothorax were found in his chest X-ray scan. Echocardiography showed left ventricular enlargement with ejection fraction 20%.Diagnosis:This resident of Wuhan with laboratory-confirmed SARS-CoV-2 infection had chronic pulmonary and cardiac diseases. Liver dysfunction, myocardial injury, and coagulation disorder were suggested by laboratory findings. Pneumonia, subcutaneous emphysema, and pneumothorax were confirmed with chest X-ray. Heart failure was revealed by echocardiography. Intervention(s):He was transferred to intensive care unit, where invasive ventilation was used for him during the whole hospitalization. Prone position ventilation, vasoconstrictor, antibacteria, and antiviral therapy were given. Outcome(s):He died on the twelfth day after admission. Conclusion(s):Subcutaneous emphysema and pneumothorax may occur in patients with SARS-CoV-2 pneumonia and chronic pulmonary disease. Chronic cardiac disease might be aggravated by SARS-CoV-2 infection, and develop heart failure.Copyright © 2020 Lippincott Williams and Wilkins. All rights reserved.

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1. **SARS-CoV-2 pneumonia with subcutaneous emphysema, mediastinal emphysema, and pneumothorax: A case report**  
   Xiang Chunlin Medicine 2020;99:e20208.

INTRODUCTION: Since the end of 2019, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection has affected more than 1,000,000 population in the world. Subcutaneous emphysema and pneumothorax are uncommon complications of SARS-CoV-2 pneumonia. Herein, we describe a fatal case of SARS-CoV-2 pneumonia with subcutaneous emphysema and pneumothorax., PATIENT CONCERNS: Subcutaneous emphysema was found in neck, bilateral chest walls, abdomen wall, groin area, and scrotum of a 67-year-old man. Extensive air-space opacities, subcutaneous emphysema and a small amount of pneumothorax were found in his chest X-ray scan. Echocardiography showed left ventricular enlargement with ejection fraction 20%., DIAGNOSIS: This resident of Wuhan with laboratory-confirmed SARS-CoV-2 infection had chronic pulmonary and cardiac diseases. Liver dysfunction, myocardial injury, and coagulation disorder were suggested by laboratory findings. Pneumonia, subcutaneous emphysema, and pneumothorax were confirmed with chest X-ray. Heart failure was revealed by echocardiography., INTERVENTIONS: He was transferred to intensive care unit, where invasive ventilation was used for him during the whole hospitalization. Prone position ventilation, vasoconstrictor, antibacteria, and antiviral therapy were given., OUTCOMES: He died on the twelfth day after admission., CONCLUSIONS: Subcutaneous emphysema and pneumothorax may occur in patients with SARS-CoV-2 pneumonia and chronic pulmonary disease. Chronic cardiac disease might be aggravated by SARS-CoV-2 infection, and develop heart failure.

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1. **SARS-CoV-2, more than a respiratory virus: Its potential role in neuropathogenesis**  
   Singal Chitra Mohinder Singh ACS chemical neuroscience 2020;11:1887-1899.

1. **SARS-CoV-2: Jumping the species barrier, lessons from SARS and MERS, its zoonotic spillover, transmission to humans, preventive and control measures and recent developments to counter this pandemic virus**  
   Dhama Kuldeep 2020;:No page numbers.

1. **SARS-CoV2 induced pulmonary embolism and complications from anticoagulation**  
   Turshudzhyan A. Respiratory Medicine Case Reports 2020;31:101176.

Coronavirus disease (COVID-19) pandemic has rapidly spread around the world. As new complications associated with the virus become more apparent, concerns in the medical community continue to grow. One of the more commonly encountered and more troubling complications in critically ill patients has been hypercoagulable state and subsequent thrombotic events. Within the spectrum of observed thrombotic events, pulmonary embolism seems to prevail. These trends are concerning and reinforce current recommendations on anticoagulation in critically ill with the virus. To illustrate the variety of possible presentations of pulmonary emboli in COVID-19 population, two cases of patients in their sixties are described, one without any predisposing risk factors and one with history of asthma and obesity. These patients developed pulmonary emboli at different points during their hospital course, were treated differently, and had different outcomes. Important observations are made that may shed some light on possible etiology of pulmonary emboli. One of the patients presented still developed pulmonary embolism despite being on full dose anticoagulation. Literature review suggests that pulmonary clot burden in COVID-19 patients could be due to pulmonary thrombus rather than pulmonary embolism and is triggered by profuse vascular damage and severe inflammatory response. Literature review also proposes changes to the diagnostic work up in COVID-19 patients, such as earlier screening for pulmonary embolism in critically ill. In addition, rare and severe complications of current anticoagulation therapy is illustrated and discussed through one of the cases presented.Copyright © 2020

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1. **SARS‐CoV‐2 in the context of past coronaviruses epidemics: Consideration for prenatal care**  
   Lambelet Valentine Prenatal diagnosis 2020;40:1641-1654.

1. **Secondary spontaneous pneumothorax and bullous lung disease in cannabis and tobacco smokers: A case-control study**  
   Stefani Alessandro PloS one 2020;15:e0230419.

BACKGROUND: The notion that smoking cannabis may damage the respiratory tract has been introduced in recent years but there is still a paucity of studies on this subject. The aim of this study was to investigate the relationship between cannabis smoking, pneumothorax and bullous lung disease in a population of operated patients., METHODS AND FINDINGS: We performed a retrospective study on patients operated on for spontaneous pneumothorax. Patients were divided into three groups according to their smoking habit: cannabis smokers, only-tobacco smokers and nonsmokers. Cannabis lifetime exposure was expressed in dose-years (1d/y = 1 gram of cannabis/week for one year). Clinical, radiological and perioperative variables were collected. The variables were analyzed to find associations with smoking habit. The impact of the amount of cannabis consumption was also investigated by ROC curves analysis. Of 112 patients, 39 smoked cannabis, 23 smoked only tobacco and 50 were nonsmokers. Median cannabis consumption was 28 dose/years, median tobacco consumption was 6 pack/years. Cannabis smokers presented with more severe chronic respiratory symptoms and bullous lung disease and with a higher incidence of tension pneumothorax than both tobacco smokers and nonsmokers. Cannabis smokers also developed a larger pneumothorax, experienced prolonged postoperative stay and demonstrated a higher incidence of pneumothorax recurrence after the operation than nonsmokers did. The risk of occurrence of chronic respiratory symptoms and bullous lung disease in cannabis smokers was dose-related., CONCLUSIONS: Cannabis smoking seems to increase the risk of suffering from respiratory complaints and can have detrimental effects on lung parenchyma, in a dose-dependent manner. Cannabis smoking also negatively affected the outcome of patients operated for spontaneous pneumothorax. A history of cannabis abuse should always be taken in patients with pneumothorax. There may be need for a specific treatment for pneumothorax in cannabis smokers.

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1. **Secondary tension pneumothorax in a COVID-19 pneumonia patient: a case report**  
   Spiro Judith E. Infection 2020;48:941-944.

PURPOSE: Especially in elderly and multimorbid patients, Coronavirus Disease 2019 (COVID-19) may result in severe pneumonia and secondary complications. Recent studies showed pneumothorax in rare cases, but tension pneumothorax has only been reported once., CASE PRESENTATION: A 47-year-old male was admitted to the emergency department with fever, dry cough and sore throat for the last 14 days as well as acute stenocardia and shortage of breath. Sputum testing (polymerase chain reaction, PCR) confirmed SARS-CoV-2 infection. Initial computed tomography (CT) showed bipulmonary groundglass opacities and consolidations with peripheral distribution. Hospitalization with supportive therapy (azithromycin) as well as non-invasive oxygenation led to a stabilization of the patient. After 5 days, sputum testing was negative and IgA/IgG antibody titres were positive for SARS-CoV-2. The patient was discharged after 7 days. On the 11th day, the patient realized pronounced dyspnoea after coughing and presented to the emergency department again. CT showed a right-sided tension pneumothorax, which was relieved by a chest drain (Buelau) via mini open thoracotomy. Negative pressure therapy resulted in regression of the pneumothorax and the patient was discharged after 9 days of treatment., CONCLUSION: Treating physicians should be aware that COVID-19 patients might develop severe secondary pulmonary complications such as acute tension pneumothorax., LEVEL OF EVIDENCE: V.

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1. **Seizures in patients with respiratory disease - A retrospective single center study**  
   Aydin S. Arquivos de Neuro-Psiquiatria 2020;78:247-254.

Objective: Seizures are a neurological condition commonly experienced during the follow-up period after systemic or metabolic disorders. The aim of the present study was to determine the etiological factors of seizures in patients at a tertiary care chest clinic. Method(s): We reviewed all neurology consultations that were requested due to seizures in inpatient clinics in a tertiary care hospital specializing in respiratory disorders between January 2011 and January 2018 were retrospectively reviewed. Result(s): The present study included 705 of 2793 (25.2%) patients who requested consultations for seizures during the study period. The mean age of the sample was 64.05+/-17.19 years. Of the 705 patients, 307 (43.5%) had a previous history of epilepsy (Group I) and 398 (56.5%) had a first-time seizure and were considered to have symptomatic seizures (Group II). Multiple factors played roles in the development of seizures in 54.8% of the patients. In most patients, metabolic causes, systemic infections, and drug use were identified and an intracranial metastatic mass lesion was the major cause in patients with lung cancer. Rates of hypoxemia and respiratory acidosis were significantly higher in patients with symptomatic seizures (Group II) than in patients with primary epilepsy (Group I). Conclusion(s): Blood gas changes such as hypoxemia and respiratory acidosis were among the factors statistically associated with the development of symptomatic seizures in patients with respiratory diseases. Additionally, hypoxemia, hypercapnia, and respiratory acidosis were correlated with mortality in patients hospitalized for respiratory system diseases who requested consultations for seizures.Copyright © 2020 Associacao Arquivos de Neuro-Psiquiatria. All rights reserved.

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1. **Severe E-cigarette, or vaping, product use associated lung injury (EVALI) requiring veno-venous extracorporeal membrane oxygenation (VV-ECMO)**  
   Aldy K. N. Journal of Medical Toxicology 2020;16:149.

Background: In July 2019, an investigation of cases of acute pulmonary disease of unknown etiology led to a possible association with vaping. EVALI has affected over 2000 otherwise healthy adolescents and adults residing over 49 states and is associated with over 42 deaths to date. We report a severe case of EVALI that was treated aggressively with steroids and required a prolonged course of VV-ECMO. Method(s): A 16-year-old girl presenting with gastrointestinal and respiratory symptoms was admitted to our pediatric intensive care unit (PICU) with progressive respiratory failure and bilateral pulmonary ground-glass opacities on chest computed tomography. After extensive infectious workup was unrevealing, she reported a history of vaping e-cigarettes containing either nicotine or THC oil prior to symptom onset. The PICU team in consultation with pulmonology and medical toxicology started high-dose intravenous (IV) methylprednisolone 1 mg/kg twice daily for presumed EVALI. Despite initial improvements, she continued to require positive pressure ventilation, developed pneumomediastinum and progressed to tension pneumothoraces with a persistent air leak. Unable to maintain her oxygenation, she was placed on VV-ECMO for a prolonged course. Ultimately, she received a tracheostomy and was discharged with continued vent dependence. Discussion(s): The clinical course, severity, and range of interventions in affected patients around the country have varied widely. Respiratory symptoms have been the most severe, but the constellation of symptoms in EVALI include constitutional and gastrointestinal symptoms. In many cases, steroid use led to rapid clinical improvements. However, other cases with severe illness, like our patient, necessitated high-dose IV steroids, intubation, and VV-ECMO. The underlying etiology is likely vitamin E acetate, but the pathophysiology remains unclear. Conclusion(s): Clinicians need to be aware of EVALI and ask about vaping in patients presenting with respiratory and gastrointestinal symptoms. Management strategies are anecdotal and necessitate a multidisciplinary approach.

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1. **Severe respiratory failure in the course of coronavirus disease 2019 treated with extracorporeal membrane oxygenation**  
   Suwalski P. Kardiologia Polska 2020;78:913-915.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=79ac6c1c50bbde32d21494dd06f7b203)

1. **Similarities and Differences of Early Pulmonary CT Features of Pneumonia Caused by SARS-CoV-2, SARS-CoV and MERS-CoV: Comparison Based on a Systemic Review**  
   Chen Xu Chinese medical sciences journal = Chung-kuo i hsueh k'o hsueh tsa chih 2020;35:254-261.

Objective To compare the similarities and differences of early CT manifestations of three types of viral pneumonia induced by SARS-CoV-2 (COVID-19), SARS-CoV (SARS) and MERS-CoV (MERS) using a systemic review. Methods Electronic database were searched to identify all original articles and case reports presenting chest CT features for adult patients with COVID-19, SARS and MERS pneumonia respectively. Quality of literature and completeness of presented data were evaluated by consensus reached by three radiologists. Vote-counting method was employed to include cases of each group. Data of patients' manifestations in early chest CT including lesion patterns, distribution of lesions and specific imaging signs for the three groups were extracted and recorded. Data were compared and analyzed using SPSS 22.0. Results A total of 24 studies were included, composing of 10 studies of COVID-19, 5 studies of MERS and 9 studies of SARS. The included CT exams were 147, 40, and 122 respectively. For the early CT features of the 3 pneumonias, the basic lesion pattern with respect to "mixed ground glass opacity (GGO) and consolidation, GGO mainly, or consolidation mainly" was similar among the 3 groups (chi2=7.966, P>0.05). There were no significant differences on the lesion distribution (chi2=13.053, P>0.05) and predominate involvement of the subpleural area of bilateral lower lobes (chi 2=4.809, P>0.05) among the 3 groups. The lesions appeared more focal in COVID-19 pneumonia at early phase (chi 2=23.509, P<0.05). The proportions of crazy-paving pattern (chi 2=23.037, P<0.001), organizing pneumonia pattern (P<0.05) and pleural effusions (P<0.001) in COVID-19 pneumonia were significantly lower than the other two. Although rarely shown in the early CT findings of all three viral pneumonias, the fibrotic changes were more frequent in SARS than COVID-19 and MERS (chi 2=6.275, P<0.05). For other imaging signs, only the MERS pneumonia demonstrated tree-in-buds, cavitation, and its incidence rate of interlobular or intralobular septal thickening presented significantly increased as compared to the other two pneumonia (chi 2=22.412, P<0.05). No pneumothorax, pneumomediastinum and lymphadenopathy was present for each group. Conclusions Imaging findings on early stage of these three coronavirus pneumonias showed similar basic lesion patterns, including GGO and consolidation, bilateral distribution, and predominant involvement of the subpleural area and the lower lobes. Early signs of COVID-19 pneumonia showed less severity of inflammation. Early fibrotic changes appeared in SARS only. MERS had more severe inflammatory changes including cavitation and pleural effusion. The differences may indicate the specific pathophysiological processes for each coronavirus pneumonia.

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1. **Similarities and Differences of Early Pulmonary CT Features of Pneumonia Caused by SARS-CoV-2, SARS-CoV and MERS-CoV: Comparison Based on a Systemic Review**  
   Chen X. Chinese Medical Sciences Journal 2020;35:254-261.

To compare the similarities and differences of early CT manifestations of three types of viral pneumonia induced by SARS-CoV-2 (COVED-19), SARS-CoV (SARS) and MERS-CoV (MERS) using a systemic review. Method(s): Electronic database were searched to identify all original articles and case reports presenting chest CT features for adult patients with COVID-19, SARS and MERS pneumonia respectively. Quality of literature and completeness of presented data were evaluated by consensus reached by three radiologists. Vote-counting method was employed to include cases of each group. Data of patients' manifestations in early chest CT including lesion patterns, distribution of lesions and specific imaging signs for the three groups were extracted and recorded. Data were compared and analyzed using SPSS 22.0. Result(s): A total of 24 studies were included, composing of 10 studies of COVED-19, 5 studies of MERS and 9 studies of SARS. The included CT exams were 147, 40, and 122 respectively. For the early CT features of the 3 pneumonias, the basic lesion pattern with respect to "mixed ground glass opacity (GGO) and consolidation, GGO mainly, or consolidation mainly" was similar among the 3 groups (chi2 = 7.966, p > 0.05). There were no significant differences on the lesion distribution (chi2 = 13.053, p > 0.05) and predominate involvement of the subpleural area of bilateral lower lobes (chi2 = 4.809, p > 0.05) among the 3 groups. The lesions appeared more focal in COVID-19 pneumonia at early phase (chi2 = 23.509, p < 0.05). The proportions of crazy-paving pattern (chi2 = 23.037, p < 0.001), organizing pneumonia pattern (p < 0.05) and pleural effusions (p < 0.001) in COVID-19 pneumonia were significantly lower than the other two. Although rarely shown in the early CT findings of all three viral pneumonias, the fibrotic changes were more frequent in SAKS than COVID-19 and MERS (chi2 = 6.275, P<0.05). For other imaging signs, only the MERS pneumonia demonstrated tree-in-buds, cavitation, and its incidence rate of interlobular or intralobular septal thickening presented significantly increased as compared to the other two pneumonia (chi2 = 22.412, p < 0.05). No pneumothorax, pneumomediastinum and lymphadenopathy was present for each group. Conclusion(s): Imaging findings on early stage of these three coronavirus pneumonias showed similar basic lesion patterns, including GGO and consolidation, bilateral distribution, and predominant involvement of the subpleural area and the lower lobes. Early signs of COVID-19 pneumonia showed less severity of inflammation. Early fibrotic changes appeared in SAKS only, MERS had more severe inflammatory changes including cavitation and pleural effusion. The differences may indicate the specific pathophysiological processes for each coronavirus pneumonia.Copyright © 2020 Chinese Academy Medical Sciences

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1. **Simulation role in preparing for COVID-19**  
   Aldekhyl S. S. Annals of Thoracic Medicine 2020;15:134-137.

During the current COVID-19 global pandemic, the major efforts are channeled toward containing and minimizing the spread and maintaining the healthcare providers' safety. One of the major aspects of effective infection control and prevention is healthcare team training and system troubleshooting. Simulation-based education appears to be a practical and flexible instructional design to achieve variable levels of knowledge, skills, and attitude training. In this paper, we aim is to provide a brief scheme on how simulation-based training can be employed in COVID-19 pandemic preparedness efforts. In addition, we will be sharing our multidisciplinary simulation experience in critical care at the National Guard Health Affairs, Saudi Arabia.Copyright © 2020 Annals of Thoracic Medicine.

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1. **Skin and gastrointestinal symptoms in COVID-19**  
   Ciechanowicz P. Przeglad Gastroenterologiczny 2020;15:301-308.

Introduction: The first cases of coronavirus disease 2019 (COVID-19) were noted in December 2019 in Wuhan province, China. The World Health Organisation (WHO) announced the pandemic status on March 11, 2020. The manifestations of the disease are as follows: fever, cough, fatigue, anosmia and ageusia, dyspnoea, chest pain, muscle soreness, chills, sore throat, rhinitis, headache, gastrointestinal (GI) symptoms, and dermal lesions. Aim(s): To evaluate the relationship between dermal lesions and GI symptoms in a group of COVID-19 patients. Material(s) and Method(s): A group of 441 COVID-19 patients admitted to the Central Clinical Hospital of the Ministry of the Interior and Administration in Warsaw between March 15th and June 15th, 2020. Result(s): Of 441 patients with confirmed SARS-CoV-2 infection, 255 (58.5%) experienced gastrointestinal (GI) symptoms: lack of appetite was reported in 124 (48.6%) cases, diarrhoea was noted in 109 (42.7%), abdominal pain in 95 (37.3%), vomiting in 37 (14.5%), and nausea in 32 (12.5%) cases. Eight (1.81%) patients had dermal lesions: erythematous macular lesions (2 patients - 25%), erythematous infiltrated lesions (2; 25%), erythematous infiltrated and exfoliative lesions (3; 37.5%), erythematous papular lesions (3; 37.5%), and erythematous oedematous lesions (2; 25%). All of those patients reported gastrointestinal symptoms during the hospitalisation. Conclusion(s): The following study analyses possible causes of dermal lesions and their coexistence with GI symptoms. Several possible theories were taken into account, including the microbiota alterations and issue of drug-related complications.Copyright © 2020 Termedia Publishing House Ltd.. All rights reserved.

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1. **Spectrum of HRCT findings among asymptomatic and recovered COVID-19 patients: how did they impact the clinical decision?**  
   Samir A. Egyptian Journal of Radiology and Nuclear Medicine 2020;51:245.

Background: Decisions about asymptomatic COVID-19 patients are always critical, either during initial screening or during recovery. Spread of infection will be inevitable if those patients were left non-isolated. This study aimed not only to survey spectrum of HRCT findings of COVID-19 among asymptomatic and recovered patients but also to record unexpected results and document their impact upon the clinical decision. Result(s): The study was retrospectively conducted, during June and July 2020, on 120 patients proved with COVID-19, during initial HRCT screening or delayed following announcement of recovery. All patients were completely asymptomatic. They included 72 males and 48 females (60%:40%). Their age ranged from 10 to 58 years (mean 35.95 +/- 12.25 SD). HRCT was analyzed by three expert consultant radiologists in consensus. Among asymptomatic initially screened COVID-19 patients, additional to GGOs, bilateral consolidative changes were unexpectedly found together with secondary fibrosis (23.3% and 10%). HRCT results significantly impacted the clinical decision (P < 0.0001); PCR had to be repeated with home isolation (43.3%). Infected health care providers had to stop their duty immediately (20%). Isolated hospitalization replaced routine ward admission (25%). Cautious surgical interference was performed using full personal protective equipment (PPE) (8.3%). Among asymptomatic recovered COVID-19 patients, unexpected large lesions (> 3 cm) were found (70%). Near 50% of lung volume was persistently affected (10%). Secondary fibrosis was striking (33%). Encysted hydro-pneumothorax persisted for a whole month (1.7%). "No-isolation" decision remained unchanged because of clinical and laboratory stability; however, steroids were prescribed to speed lung recovery. Conclusion(s): HRCT findings among asymptomatic and recovered COVID-19 patients can be unexpected and can definitely impact the clinical decision.Copyright © 2020, The Author(s).

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1. **Spontaneous Pneumomediastinum in a Patient with Coronavirus Disease 2019 Pneumonia and the Possible Underlying Mechanism**  
   Lei Pinggui Korean journal of radiology 2020;21:929-930.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=f50eb6ec9ff85fce6fac0f4214a8a649)

1. **Spontaneous pneumomediastinum in mixed connective tissue disease**  
   Hasan F. Rheumatology (United Kingdom) 2020;59:No page numbers.

Background: Spontaneous pneumomediastinum refers to dissection of free air from the airways on lung parenchyma into the mediastinal structures without any antecedent thoracic trauma or surgical intervention. Pneumomediastinum has been described as a rare complication of connective tissue disease, most commonly in dermatomyositis and polymyositis. Here we report 2 cases of mixed connective tissue disease (MCTD) who developed pneumomediastinum. Method(s): The first case was a 76 year old male undergoing assessment for MCTD. During assessment, he was found to have bibasal crepitations without any obvious respiratory symptom. He was on steroids for last 4 weeks for proteinuria. His High- resolution CT scan (HRCT) showed pneumomediastinum with evidence of Interstitial lung disease (ILD) without any complication. He was monitored closely and his pneumomediastinum resolved without any intervention. The second case was a 49 year old female with known MCTD & was on steroids for 5 months. She was admitted to the hospital with weight loss and dysphagia. This was a long hospital stay during which she developed pneumomediastinum with pneumothorax and surgical emphysema around the neck. She required ICU admission and was transferred to cardiothoracic centre where she underwent bronchoscopy, VATS inspection and required chest drains. Result(s): In both cases there were similarities where both patients with MCTD were on variable duration of steroids & had ILD. They then developed pneumomediastinum with surgical emphysema, however their course was quite contrasting where the first case was relatively benign & resolved without any intervention while the second one required long ITU stay with multiple complications and interventions. Conclusion(s): Spontaneous pneumomediastinum is an uncommon manifestation of CTD and only few cases have been reported with MCTD. Although spontaneous mediastinum seems to be associated with a relatively benign short-term course, one should be wary of complications and have low threshold for investigating for any new lung symptoms in context of CTD. It is uncertain whether severity of MCTD or duration of steroids use impacts the progress of spontaneous pneumomediastinum as there are very limited number of cases.

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1. **Spontaneous pneumomediastinum, pneumopericardium, pneumothorax and subcutaneous emphysema in patients with COVID-19 pneumonia, a case report**  
   Hazariwala Vikisha Journal of cardiothoracic surgery 2020;15:301.

BACKGROUND: Spontaneous pneumomediastinum unrelated to mechanical ventilation is a newly described complication of COVID-19 pneumonia. The objective of this case presentation is to highlight an important complication and to explore potential predisposing risk factors and possible underlying pathophysiology of this phenomenon., CASE PRESENTATION: We present two patients with COVID-19 pneumonia complicated by spontaneous pneumomediastinum, pneumopericardium, pneumothorax and subcutaneous emphysema without positive pressure ventilation. Both patients had multiple comorbidities, received a combination of antibiotics, steroids and supportive oxygen therapy, and underwent routine laboratory workup. Both patients then developed spontaneous pneumomediastinum and ultimately required intubation and mechanical ventilation, which proved to be challenging to manage., CONCLUSIONS: Spontaneous pneumomediastinum is a serious complication of COVID-19 pneumonia, of which clinicians should be aware. Further studies are needed to determine risk factors and laboratory data predictive of development of spontaneous pneumomediastinum in COVID-19 pneumonia.

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1. **Spontaneous pneumomediastinum, pneumothorax and subcutaneous emphysema in COVID-19 pneumonia: a rare case and literature review**  
   Elhakim Tarig Sami BMJ case reports 2020;13:No page numbers.

Spontaneous pneumomediastinum (SPM) and pneumothorax (PNX) unrelated to positive pressure ventilation has been recently reported as an unusual complication in cases of severe COVID-19 pneumonia. The presumed pathophysiological mechanism is diffuse alveolar injury leading to alveolar rupture and air leak. We present a case of COVID-19 pneumonia complicated on day 13 post admission by SPM, PNX and subcutaneous emphysema in a patient with no identifiable risk factors for such complication. The patient received medical treatment for his COVID-19 infection without the use of an invasive or non-invasive ventilator. Moreover, he is a non-smoker with no lung comorbidities and never reported a cough. He was eventually discharged home in stable condition. A comprehensive literature review revealed 15 cases of SPM developing in patients with COVID-19 pneumonia. Copyright © BMJ Publishing Group Limited 2020. No commercial re-use. See rights and permissions. Published by BMJ.

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1. **Spontaneous pneumomediastinum, pneumothorax and subcutaneous emphysema in COVID-19: case report and literature review**  
   Shan Shi Revista do Instituto de Medicina Tropical de Sao Paulo 2020;62:e76.

Coronavirus Disease 2019 (COVID-19) has rapidly spread worldwide. Numerous studies have shown its typical and atypical CT findings. We report one COVID-19 patient who presented with a transient pneumothorax, spontaneous pneumomediastinum (SP), as well as subcutaneous emphysema during hospitalization. Chest CT andclinical findings were discussed, and a literature review is presented. The probable cause of SP in COVID-19 was alveolar damage. Once pneumothorax and SP were present, the patient should be carefully monitored to prevent respiratory deterioration, especially when lung lesions are severe.

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1. **Spontaneous Pneumomediastinum/Pneumothorax in Patients With COVID-19**  
   Eperjesiova Bianka Cureus 2020;12:e8996.

No spontaneous air leak case series have been described in the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) patient population thus far. We described seven spontaneous air leak cases we found in our coronavirus disease 2019 (COVID-19) positive 976-patient cohort. Five out of seven patients eventually required mechanical ventilation, and one of these patients died. All of our patients who demonstrated radiological air leaks after intubation died. No other precipitating factors offered in the literature thus far played a role in our patient population. We presume that acute lung injury leading to SARS-CoV-2 with associated acute respiratory distress syndrome (ARDS) predisposes patients to this rare complication. Copyright © 2020, Eperjesiova et al.

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1. **Spontaneous Pneumomediastinum: A Probable Unusual Complication of Coronavirus Disease 2019 (COVID-19) Pneumonia**  
   Wang Jing Korean journal of radiology 2020;21:627-628.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=804a5557915c16f1989fb8ce43825b4e)

1. **Spontaneous pneumothorax and pneumomediastinum: An unusual presentation of COVID-19**  
   Polistina G. E. Minerva Pneumologica 2020;59:41-43.

The coronavirus disease 2019 (COVID-19) pneumonia was a recent worldwide outbreak. During chest computed tomography (CT) we may observe pulmonary parenchymal opacity, as sign of COVID-19. Very few have reported pneumothorax and pneumomediastinum as complications of severe COVID-19 pneumonia. We describe a 44-year-old male admitted to our department after the onset of sudden chest pain and high fever and evidence on computed tomography of spontaneous pneumothorax and pneumomediastinum, subsequently confirming COVID-19 pneumonia.Copyright © 2020 eDiZioNi MiNerVa MeDica

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1. **SPONTANEOUS PNEUMOTHORAX AND SPONTANEOUS PNEUMOMEDIASTINUM IN NON-INTUBATED PATIENTS IN THE SETTING OF SEVERE ACUTE RESPIRATORY SYNDROME CORONAVIRUS 2**  
   George B. Chest 2020;158:A1653-A1654.

SESSION TITLE: Medical Student/Resident Lung Pathology SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: As of May 2020, only a limited number of cases of spontaneous pneumomediastinum (PMS) and spontaneous pneumothorax (PTX) have been reported in non-intubated patients with hypoxemic respiratory failure due to severe acute respiratory syndrome coronavirus-2(SARS CoV-2) pneumonia. Presented are 5 cases of non-intubated patients with PTX/PMS in the setting of SARS CoV2 from March to May 2020 in a community hospital-based in Long Island, New York. CASE PRESENTATION: From March to May 2020, 5 cases of spontaneous PTX/PMS in SARS CoV-2 patients were identified. Gender division was 3 males and 2 females. Observed across all 5 cases: a history of hypertension, hypoxia/dyspnea/cough on presentation, treatment with IV corticosteroids/full dose anticoagulation/tocilizumab, and presence of pulmonary fibrosis as either an early or late complication. Cardiac disease was present in 4/5 cases. 3 patients were non-smokers while 1 had asthma. All three patients who had their PTX/PMS managed conservatively survived. One of the two patients requiring intervention passed. IL-6, D-Dimer, and C-Reactive protein levels varied. Further details can be seen in Table 1. DISCUSSION: Inflammation-induced obstruction of small airways increases alveolar pressure resulting in rupture with air leaks into the lung interstitium. Air travels along the bronchovascular sheaths to the hilum and collects in the mediastinum causing pneumomediastinum. Rupture of the mediastinal parietal pleura causes a pneumothorax. Additionally, inflammatory cells produced during the SARS-CoV-2-related cytokine release storm, partially driven by interleukin -6, (1) may cause the destruction of elastic fibers in the lung with the formation of bulla. Patient 5 supports this theory with IL-6 levels >3000 and the only patient to succumb to the virus. The development of pulmonary fibrosis in all five patients is likely due to diffuse alveolar damage with cellular fibromyxoid exudates, desquamation of pneumocytes, and hyaline membrane formation typical of ARDS(2)(3). This is similar to findings seen in pathology reports of post-mortem lung biopsies of SARS and Middle Eastern Respiratory Syndrome coronavirus'. CT findings of these cases showed areas of advanced fibrosis with bullae formation. Peak D-Dimer and CRP levels did not show any association with the outcome despite all receiving anticoagulation. Studies have shown that SARS-CoV-2 may induce an initial profound vascular insult resulting in ventilation-perfusion mismatch with resulting hypoxemia. CONCLUSION(S): PTX/PMS and pulmonary fibrosis can occur as early or late complications of the SARS CoV2 Pneumonia. These observations should be studied to direct evidenced-based management of SARS CoV2 in the setting of impending 'second wave' of infections. Diligent follow up after SARS CoV2 pneumonia with imaging modalities may be essential to ensure long-term survival and prevention of functional impairment. Reference #1: Zhang, C., Wu, Z., Li, J. W., Zhao, H., & Wang, G. Q. (2020). Cytokine release syndrome in severe COVID-19: interleukin-6 receptor antagonist tocilizumab may be the key to reduce mortality. International journal of antimicrobial agents, 55(5), 105954. https://doi.org/10.1016/j.ijantimicag.2020.105954 Reference #2: Zhang, C., Wu, Z., Li, J. W., Zhao, H., & Wang, G. Q. (2020). Cytokine release syndrome in severe COVID-19: interleukin-6 receptor antagonist tocilizumab may be the key to reduce mortality. International journal of antimicrobial agents, 55(5), 105954. https://doi.org/10.1016/j.ijantimicag.2020.105954 Reference #3: Marini JJ, Gattinoni L. Management of COVID-19 Respiratory Distress. JAMA. Published online April 24, 2020. doi:10.1001/jama.2020.6825 DISCLOSURES: No relevant relationships by Blessen George, source=Web Response No relevant relationships by Michael Megally, source=Web Response No relevant relationships by Karen Mrejen-Shakin, source=Web ResponseC pyright © 2020 American College of Chest Physicians

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=06066ae9175990e41fdf270e701feac7)

1. **Spontaneous pneumothorax and subcutaneous emphysema in COVID-19 patient: Case report**  
   Ucpinar Burcin Agridag Journal of infection and public health 2020;13:887-889.

Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome virus coronavirus 2 (SARS-CoV-2). As known, COVID-19 has become a global pandemic and serious health problem. Disease mainly affects lungs and common findings are fever cough and shortness of breath. Computerized tomography (CT) has an important role in initial evaluation and follow up of COVID-19. Main (CT) finding of the disease is bilateral extensive ground-glass opacification (GGO) with a peripheral or posterior distribution, mainly involving the lower lobes. In this case report, we present a pneumothorax and subcutaneous emphysema case in a patient with COVID-19. To the best of authors' knowledge, it is the first illustrated case of pneumothorax accompanying COVID-19 pneumonia. Copyright © 2020. Published by Elsevier Ltd.

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1. **Spontaneous pneumothorax and subpleural bullae in a patient with COVID-19: a 92-day observation**  
   Fan Qianqian European journal of cardio-thoracic surgery : official journal of the European Association for Cardio-thoracic Surgery 2020;58:858-860.

This report describes a patient with COVID-19 who developed spontaneous pneumothorax and subpleural bullae during the course of the infection. Consecutive chest computed tomography images indicated that COVID-19-associated pneumonia had damaged the subpleural alveoli and distal bronchus. Coughing might have induced a sudden increase in intra-alveolar pressure, leading to the rupture of the subpleural alveoli and distal bronchus and resulting in spontaneous pneumothorax and subpleural bullae. At the 92-day follow-up, the pneumothorax and subpleural bullae had completely resolved, which indicated that these complications had self-limiting features. Copyright © The Author(s) 2020. Published by Oxford University Press on behalf of the European Association for Cardio-Thoracic Surgery. All rights reserved.

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1. **Spontaneous pneumothorax as a complication in COVID-19 male patient: A case report**  
   Fahad Ahmed Muhi Clinical case reports 2020;:No page numbers.

Coronavirus disease 2019 infection may be later complicated with pneumothorax after primarily symptoms. We must be aware about pneumothorax, which may be increased in cases of COVID-19. Copyright © 2020 The Authors. Clinical Case Reports published by John Wiley & Sons Ltd.

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1. **Spontaneous Pneumothorax as a Complication of COVID-19 Pneumonia: A Case Report**  
   Perice Leland Clinical practice and cases in emergency medicine 2020;4:521-523.

INTRODUCTION: Coronavirus disease 2019 (COVID-19) is caused by the severe acute respiratory syndrome coronavirus 2. It typically presents with respiratory symptoms such as fevers, cough, and shortness of breath. As the number of cases increases, however, COVID-19 is being increasingly recognized as being associated with a variety of other respiratory pathologies., CASE REPORT: We present the case of a 59-year-old man with COVID-19 pneumonia who acutely decompensated after having been on the medicine floor for two weeks. He was found to have a tension pneumothorax. This was treated with a needle decompression followed by a chest tube insertion. The patient subsequently recovered and was discharged., CONCLUSION: This case highlights the importance of considering tension pneumothorax as a possible cause of shortness of breath in patients with COVID-19 pneumonia.

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1. **Spontaneous Pneumothorax as Unusual Presenting Symptom of Covid-19 Pneumonia: Surgical Management and Pathological Findings**  
   Bellini Roberto 2020;:No page numbers.

Spontaneous pneumothorax has been reported as a possibile complication of novel coronavirus associated pneumonia (COVID-19). We report two cases of COVID-19 patients who developed spontaeous and recurrent pneumothorax as a presenting symptom, treated with surgical procedure. Intraoperative findings of COVID-19 pneumonia were parenchymal atelectasis and vascular congestion. Lung tissue was very frail and prone to bleeding. Histological examination showed interstitial infiltration of lymphocytes and plasma cells, as seen in non specific interstitial pneumonia, together with myo-intimal thicknening of vessels with blood extravasation and microthrombi. Lung surgery for pneumothorax in COVID-19 patients can be safely and effectively performed when necessary.

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1. **Spontaneous pneumothorax as unusual presenting symptom of COVID-19 pneumonia: surgical management and pathological findings**  
   Bellini Roberto Journal of cardiothoracic surgery 2020;15:310.

BACKGROUND: Spontaneous pneumothorax has been reported as a possibile complication of novel coronavirus associated pneumonia (COVID-19). We report two cases of COVID-19 patients who developed spontaeous and recurrent pneumothorax as a presenting symptom, treated with surgical procedure. An insight on pathological finding is given., CASE PRESENTATION: Two patients presented to our hospital with spontaneous pneumothorax associated with Sars-Cov2 infection onset. After initial conservative treatment with chest drain, both patients had a recurrence of pneumothorax during COVI-19 disease, contralateral (patient 1) or ipsilateral (patient 2) and therefore underwent lung surgery with thoracoscopy and bullectomy. Intraoperative findings of COVID-19 pneumonia were parenchymal atelectasis and vascular congestion. Lung tissue was very frail and prone to bleeding. Histological examination showed interstitial infiltration of lymphocytes and plasma cells, as seen in non specific interstitial pneumonia, together with myo-intimal thicknening of vessels with blood extravasation and microthrombi., CONCLUSIONS: Although rarely, COVID-19 may present with spontaneous pneumothorax. Lung surgery for pneumothorax in COVID-19 patients can be safely and effectively performed when necessary.

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1. **Spontaneous Pneumothorax Following COVID-19 Pneumonia**  
   Hollingshead Caitlyn IDCases 2020;21:e00868.

Patient presents with dyspnea after recovering from COVID-19 pneumonia and is found to have pneumothorax. This represents an under-reported sequelae of COVID-19. Copyright © 2020 The Author(s).

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1. **Spontaneous Pneumothorax in an Elderly Patient With Coronavirus Disease (COVID-19) Pneumonia**  
   Rehman Tyler The Ochsner journal 2020;20:343-345.

Background: The relationship between the 2019 novel coronavirus (COVID-19) and pneumothorax is not yet established. As of June 2020, few cases of nonintubated patients developing pneumothorax had been documented. Case Report: We present the case of an elderly patient with COVID-19 pneumonia that resulted in a prolonged hospital course because of pneumothorax complication. The patient did not develop severe symptoms and did not require intubation. Conclusion: This case report should aid clinicians assessing patients with COVID-19 pneumonia. Copyright ©2020 by the author(s); Creative Commons Attribution License (CC BY).

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1. **SPONTANEOUS PNEUMOTHORAX OCCURRING IN CORONAVIRUS DISEASE 2019 (COVID-19)**  
   Leys L. Chest 2020;158:A1279.

SESSION TITLE: Medical Student/Resident Disorders of the Pleura Posters SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: A spontaneous pneumothorax is an abnormal atraumatic accumulation of air within the pleural space. It is classified as primary or secondary pneumothorax with multiple associated precipitants or risk factors(1). Here we present a case of spontaneous pneumothorax following COVID-19 pneumonia. CASE PRESENTATION: A 58-year-old Hispanic male, known to have hypertension, presented to the emergency room for dyspnea for one day. This was associated with a non-productive cough, fever and pleuritic left-sided chest pain. He denied any smoking history, recent travel, trauma or ill-contacts. There was no known history of lung disease, autoimmune illnesses or family history of pneumothorax. He reported only taking hydrochlorothiazide and amlodipine. Initial vitals were normal, except a respiratory rate of 25 breaths per minute. Pertinent examination findings were, he was of normal height with tachypnea and diminished air entry over the left hemithorax. Laboratory results were positive for COVID-19 by nasopharyngeal swab, with mild leukocytosis, normal procalcitonin and lactic acid. The interleukin-6 level (45.13 pg/mL), ferritin, CPK, LDH and ESR were elevated. Initial chest x-ray and computer tomography (CT) chest showed 30-40% left pneumothorax with patchy bilateral and peripheral coalescing infiltrates, typical of COVID-19 of mild to moderate severity, with a CT severity score (CT-SS) of 12 out of 40. He subsequently had left pigtail placement and was admitted for COVID-19 pneumonia complicated by spontaneous pneumothorax. He was started on antibiotics, hydroxychloroquine and placed on contact and droplet isolation. Ultimately, influenza oropharyngeal swab, urine antigens for mycoplasma and legionella, HIV, collagen vascular screen and blood cultures were otherwise unremarkable. After 8 days, he clinically improved with complete resolution of the pneumothorax post pigtail removal. DISCUSSION: In the United States, the incidence of adult males with primary or secondary spontaneous pneumothorax is 7.4-18/100,000 or 6.3/100,000, respectively(2). There are several known risk factors for pneumothorax such as smoking, tall stature, family history and certain genetic disorders. Our index case, with the exception of male gender, exhibited none of these precipitants and had no known history of lung disease or any other risk factors for spontaneous pneumothorax. Sun et al,(3) proposed that diffuse alveolar injury due to COVID-19 may increase the risk of alveolar rupture resulting in pneumothoraces. Another theory included a prolonged cough that is associated with COVID-19 pneumonia. CONCLUSION(S): Healthcare providers should consider patients with COVID-19 pneumonia to be, directly or indirectly, predisposed to spontaneous pneumothoraces. To the best of our knowledge this is the first reported local presentation of spontaneous pneumothorax in a patient with COVID-19 pneumonia. Reference #1: McKnight CL, Burns B. Pneumothorax. [Updated 2020 Mar 25]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK441885/ Reference #2: Costumbrado J, Ghassemzadeh S. Pneumothorax, Spontaneous. [Updated 2019 Dec 16]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK459302 Reference #3: Sun R, Liu H, Wang X. Mediastinal Emphysema, Giant Bulla, and Pneumothorax Developed during the Course of COVID-19 Pneumonia. Korean J Radiol. 2020;21(5):541-544. doi:10.3348/kjr.2020.0180 DISCLOSURES: No relevant relationships by Sahai Donaldson, source=Web Response No relevant relationships by Lorenzo Leys, source=Web Response No relevant relationships by Alicia Thomas, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Spontaneous Pneumothorax: A Complication of Coronavirus Disease 2019 (COVID-19) Patients**  
   Guo Qiannan The Thoracic and cardiovascular surgeon 2020;:No page numbers.

BACKGROUND: At present, the coronavirus disease 2019 (COVID-19) is spreading all over the world. The occurrence of spontaneous pneumothorax in these patients might be higher than the fact, and we should pay high clinical attention to them., METHOD: Data regarding clinical investigation, laboratory investigation, diagnosis, and treatment measures of 21 COVID-19 patients with spontaneous pneumothorax from January to March of 2020 were collected and analyzed in this study., RESULTS: Seven patients had a history of basic lung diseases. All patients used different methods of oxygen therapy before the occurrence of spontaneous pneumothorax according to the severity of the COVID-19, including 18 patients with ventilator-assisted breathing, 2 patients with bilevel positive airway pressure assisted breathing, and 1 patient with mask oxygen inhalation. All patients were confirmed cases of COVID-19 by chest CT (computed tomography) and virus nucleic acid detection and were found to have spontaneous pneumothorax through physical examination, bedside X-ray, and/or bedside ultrasound. 13 of 21 patients combined with pleural effusion at the same time. All the patients underwent closed thoracic drainage for spontaneous pneumothorax and the pleural effusion, if any. Nine patients died, and 12 patients recovered smoothly., CONCLUSION: Spontaneous pneumothorax might be an overlooked complication of COVID-19 patients and may be associated with poor prognosis. Copyright Thieme. All rights reserved.

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1. **Spontaneous Pneumothorax: A Complication of Coronavirus Disease 2019 (COVID-19) Patients**  
   Guo Q. Thoracic and Cardiovascular Surgeon 2020;:No page numbers.

Background At present, the coronavirus disease 2019 (COVID-19) is spreading all over the world. The occurrence of spontaneous pneumothorax in these patients might be higher than the fact, and we should pay high clinical attention to them. Method Data regarding clinical investigation, laboratory investigation, diagnosis, and treatment measures of 21 COVID-19 patients with spontaneous pneumothorax from January to March of 2020 were collected and analyzed in this study. Results Seven patients had a history of basic lung diseases. All patients used different methods of oxygen therapy before the occurrence of spontaneous pneumothorax according to the severity of the COVID-19, including 18 patients with ventilator-assisted breathing, 2 patients with bilevel positive airway pressure assisted breathing, and 1 patient with mask oxygen inhalation. All patients were confirmed cases of COVID-19 by chest CT (computed tomography) and virus nucleic acid detection and were found to have spontaneous pneumothorax through physical examination, bedside X-ray, and/or bedside ultrasound. 13 of 21 patients combined with pleural effusion at the same time. All the patients underwent closed thoracic drainage for spontaneous pneumothorax and the pleural effusion, if any. Nine patients died, and 12 patients recovered smoothly. Conclusion Spontaneous pneumothorax might be an overlooked complication of COVID-19 patients and may be associated with poor prognosis.Copyright © 2020 American Medical Association. All rights reserved.

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1. **Spontaneous subcutaneous emphysema and pneumomediastinum in COVID-19 patients: An indicator of poor prognosis?**  
   Al-Azzawi M. American Journal of Case Reports 2020;21:1-6.

Case series Patients: Male, 36-year-old \* Male, 47-year-old \* Male, 78-year-old Final Diagnosis: COVID-19 \* pneumomediastinum \* subcutaneous emphysema Symptoms: Respiratory distress \* shortness of breath Medication: - Clinical Procedure: - Specialty: Critical Care Medicine \* Pulmonology Objective: Rare co-existance of disease or pathology Background: Novel Coronavirus 2019 (COVID-19) has been in the spotlight since the first cases were reported in December 2019. COVID-19 has been found to cause severe acute respiratory distress syndrome and, more uncommonly, subcutaneous emphysema and pneumomediastinum. We present a case series of 3 patients with COVID-19 infection managed in the Intensive Care Unit and found to have subcutaneous emphysema and pneumome-diastinum on chest imaging. Case Reports: We present a case series of 3 men, ages 36, 47, and 78 years, diagnosed with COVID-19 via RT-PCR, found to have severe acute respiratory distress syndrome, and managed in the Intensive Care Unit. Two patients described in this case series were mechanically ventilated on low positive end-expiratory pressures and developed subcutaneous emphysema and pneumomediastinum on chest imaging, and 1 patient developed subcutaneous emphysema prior to intubation. Each of these patients had a more eventful hospital course and worse outcomes than most COVID-19 infected patients. Conclusion(s): Subcutaneous emphysema and pneumomediastinum in COVID-19 patients have been rarely reported and is poorly understood. In our institution, we have found the diagnosis of subcutaneous emphysema and pneumo-mediastinum in COVID-19 patients is associated with unfavorable outcomes and worse prognosis.Copyright © Am J Case Rep, 2020;.

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1. **Spontaneous subcutaneous emphysema and pneumomediastinum in non-intubated patients with COVID-19**  
   Manna Sayan Clinical imaging 2020;67:207-213.

PURPOSE: We describe the presenting characteristics and hospital course of 11 novel coronavirus (COVID-19) patients who developed spontaneous subcutaneous emphysema (SE) with or without pneumomediastinum (SPM) in the absence of prior mechanical ventilation., MATERIALS AND METHODS: A total of 11 non-intubated COVID-19 patients (8 male and 3 female, median age 61 years) developed SE and SPM between March 15 and April 30, 2020 at a multi-center urban health system in New York City. Demographics (age, gender, smoking status, comorbid conditions, and body-mass index), clinical variables (temperature, oxygen saturation, and symptoms), and laboratory values (white blood cell count, C-reactive protein, D-dimer, and peak interleukin-6) were collected. Chest radiography (CXR) and computed tomography (CT) were analyzed for SE, SPM, and pneumothorax by a board-certified cardiothoracic-fellowship trained radiologist., RESULTS: Eleven non-intubated patients developed SE, 36% (4/11) of whom had SE on their initial CXR. Concomitant SPM was apparent in 91% (10/11) of patients, and 45% (5/11) also developed pneumothorax. Patients developed SE on average 13.3 days (SD: 6.3) following symptom onset. No patients reported a history of smoking. The most common comorbidities included hypertension (6/11), diabetes mellitus (5/11), asthma (3/11), dyslipidemia (3/11), and renal disease (2/11). Four (36%) patients expired during hospitalization., CONCLUSION: SE and SPM were observed in a cohort of 11 non-intubated COVID-19 patients without any known cause or history of invasive ventilation. Further investigation is required to elucidate the underlying mechanism in this patient population. Copyright © 2020 Elsevier Inc. All rights reserved.

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1. **Spontaneous tension pneumothorax and acute pulmonary emboli in a patient with COVID-19 infection**  
   Khurram Ruhaid BMJ case reports 2020;13:No page numbers.

The COVID-19 pandemic has had a significant impact on the structure and operation of healthcare services worldwide. We highlight a case of a 64-year-old man who presented to the emergency department with acute dyspnoea on a background of a 2-week history of fever, dry cough and shortness of breath. On initial assessment the patient was hypoxic (arterial oxygen saturation (SaO2) of 86% on room air), requiring 10 L/min of oxygen to maintain 98% SaO2 Examination demonstrated left-sided tracheal deviation and absent breath sounds in the right lung field on auscultation. A chest radiograph revealed a large right-sided tension pneumothorax which was treated with needle thoracocentesis and a definitive chest drain. A CT pulmonary angiogram demonstrated segmental left lower lobe acute pulmonary emboli, significant generalised COVID-19 parenchymal features, surgical emphysema and an iatrogenic pneumatocoele. This case emphasises the importance of considering coexisting alternative diagnoses in patients who present with suspected COVID-19. Copyright © BMJ Publishing Group Limited 2020. No commercial re-use. See rights and permissions. Published by BMJ.

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1. **Status epilepticus and other EEG findings in patients with COVID-19: A case series**  
   Chen W. Seizure 2020;81:198-200.

Purpose: Neurological manifestations of COVID-19 infection include impaired consciousness, strokes, and seizures. Limited reports describing EEG abnormalities in patients with COVID-19 have been published. These articles reported nonspecific encephalopathic patterns, epileptiform discharges, and rarely seizures. Our primary aim was to assess EEG abnormalities in patients with COVID-19 and evaluate for epileptiform activity or seizures. Method(s): We identified five critically ill adult patients with COVID-19 who underwent EEG monitoring. All patients had CeribellTM rapid response EEG initially and two continued with conventional long-term video EEG. Result(s): All 5 patients had encephalopathy and 3 also had seizure-like movements, thus prompting EEG monitoring. EEGs all showed nonspecific markers of encephalopathy including diffuse slowing and generalized rhythmic delta activity. Two also had epileptiform discharges reaching 2-3 Hz at times, with one patient in nonconvulsive status epilepticus and the other developing clinical status epilepticus with myoclonic movements. EEG and clinical symptoms improved with anti-seizure medications. Conclusion(s): Status epilepticus was present in 2 out of our cohort of 5 critically ill patients who underwent EEG monitoring. These findings highlight the importance of EEG monitoring in high-risk patients with COVID-19 and encephalopathy. EEG recordings in such patients can identify pathological patterns that will benefit from treatment with anti-seizure medications.Copyright © 2020 British Epilepsy Association

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1. **Subcutaneous Emphysema in Patients With COVID-19 Infection: A Report of Three Cases**  
   Toquica Gahona Christian C. Cureus 2020;12:e10559.

Subcutaneous emphysema is a rare complication of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pneumonia that should prompt immediate attention to find its cause. Herein, we describe three patients with SARS-CoV-2 pneumonia who were admitted to the ICU and developed subcutaneous emphysema and one with a concomitant pneumothorax. Three patients with diagnosis of SARS-CoV-2 pneumonia admitted to the ICU developed subcutaneous emphysema during the hospital admission. One of them who had concomitant pneumothorax required thoracostomy tube for treatment and the other two were monitored clinically without additional interventions. Two patients died during the first two to three weeks of their hospital course. One patient survived and was discharged after 63 days in the hospital. Subcutaneous emphysema is considered a non-life-threatening condition and is usually self-limited requiring supportive treatment in mild cases. For such cases, observation is appropriate. Patients with newly discovered SE life-threatening pathology, such as pneumothorax, esophageal rupture, and necrotizing infections, should be investigated depending on the clinical setting. This is one of the first paper that shows the development of subcutaneous emphysema in patients with SARS-CoV-2 pneumonia. This may represent a rare complication of the infection as well as may be attributable to other factors such as increased cough and mechanical ventilation. There is a need for studies on the clinical characteristics of a disease with still many unknown features and a wide clinical spectrum that is still being defined. Copyright © 2020, Toquica Gahona et al.

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1. **Subcutaneous Emphysema, Pneumomediastinum, and Pneumothorax in Critically Ill Patients With Coronavirus Disease 2019: A Retrospective Cohort Study**  
   Jones Eben Critical care explorations 2020;2:e0210.

Importance: Management of severe coronavirus disease 2019 relies on advanced respiratory support modalities including invasive mechanical ventilation, continuous positive airway pressure, and noninvasive ventilation, all of which are associated with the development of subcutaneous emphysema, pneumomediastinum, and pneumothorax (herein collectively termed barotrauma)., Objectives: To assess the occurrence rate of barotrauma in severe coronavirus disease 2019 and to explore possible associated factors., Design Setting and Participants: A retrospective, single-center cohort study with nested case series, conducted at University Hospital Lewisham: a 450-bed general hospital in London, United Kingdom. All patients with confirmed coronavirus disease 2019 admitted to the critical care department from March 12, to April 12, 2020, were included., Main Outcomes and Measures: Patients were retrospectively screened for radiological evidence of barotrauma. Admission characteristics, modalities of respiratory support, and outcomes were compared between barotrauma and nonbarotrauma groups. Respiratory parameters in the period preceding barotrauma identification were recorded., Results: Of 83 admissions with coronavirus disease 2019, eight suffered barotrauma (occurrence rate 9.6%; 95% CI 4.3%-18.1%). Barotrauma cases had longer illness duration prior to critical care admission (10 vs 7 d; interquartile range, 8-14 and 6-10, respectively; p = 0.073) and were more often treated with continuous positive airway pressure or noninvasive ventilation as the initial modality of advanced respiratory support (87.5% vs 36.0%; p = 0.007). Patients managed with continuous positive airway pressure or noninvasive ventilation prior to the development of barotrauma had median minute ventilation of 16.2-19.9 and 21.3-22.7 L/min, respectively. Compared with the nonbarotrauma group, a higher proportion of patients with barotrauma had died (62.5% vs 43.2%), and a lower proportion of patients had been discharged (25.0% vs 53.3%) at 3-month follow-up., Conclusions and Relevance: Barotrauma appears to be a common complication of severe coronavirus disease 2019. Determining whether high minute ventilation while using continuous positive airway pressure or noninvasive ventilation predisposes patients to barotrauma requires further investigation. Copyright © 2020 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of the Society of Critical Care Medicine.

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1. **SUDDEN CARDIAC DEATH AND THE PECULIAR COVID-19 CASE**  
   Abkouh D. T. Chest 2020;158:A271.

SESSION TITLE: Medical Student/Resident Cardiovascular Disease Posters SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: The COVID-19 pandemic has left the medical community floundering for answers as patients present with a variety of symptoms, at different stages of the infection. As the outbreak spread, the public was made aware of the range of symptoms associated with SARS-COV-2. Respiratory symptoms of dry cough and shortness of breath, Gastrointestinal symptoms such as nausea, vomiting, and even more vague signs such as Anosmia have been observed. Our case further highlights the devastating outcomes and the multi systemic involvement, the difficulty of false-negative testing on these patients, the associated hyper-coagulability causing multi-organ dysfunction. CASE PRESENTATION: Healthy 32-year-old gentleman presented with nausea, non-bloody emesis, epigastric pain, and poor oral intake of 6 days duration. Patient also reported shortness of breath and cough productive of yellow sputum for the past 2 day. He denied any sick contacts and initial real-time PCR COVID testing in ED was negative. On admission, patient was comfortable on room air, with tachycardia. lab findings significant for elevated lactate, Procalcitonin, and LFTs. CT abdomen w/o contrast revealed bilateral pleural effusions and ground glass opacities. Upon transfer to medical floors, rapid response was called for hypotension. Initially, patient was alert, oriented, and in no acute distress. Shortly thereafter, he began to gasp for air and complain of chest pain. pulse-oximetry decreased to 75% and patient became unresponsive, without a pulse. Cardiopulmonary resuscitation was initiated promptly per ACLS protocol. reversible causes including tension pneumothorax, cardiac tamponade, and electrolyte/metabolic disturbances were ruled out. The course of illness and clinical features were highly suggestive of acute massive pulmonary embolism, and intravenous TPA was administered. Thrombectomy was considered, however it was determined that it would not change the outcome. After 64 minutes of resuscitation and 21 doses of epinephrine, the efforts came to a halt and patient was pronounced dead. A repeat swab for COVID-19 was taken and later reported as positive. DISCUSSION: This puzzling case displays a rapid deterioration of a COVID-19 related complication. The infection creates a diagnostic dilemma due to the myriad of associated symptoms and multi-system involvement as well as the False-negative testing which may alter the course of management and admission criteria. Hypercoagulability triad is seen with lack of mobility, systemic inflammatory response, and endothelial invasion by SARS-CoV-2 causing endothelial damage. This phenomena may be the underlying cause of the systemic involvement. CONCLUSION(S): Although COVID-19 infection is widely viewed as a respiratory infection, it's crucial to recognize the multi-systemic involvement and array of symptoms. Reliable testing may possibly alter medical management, improve outcome, and reduce exposure. Reference #1: Magro C. Complement associated microvascular injury and thrombosis in the pathogenesis of severe COVID-19 infection: A report of five cases. Translational research : the journal of laboratory and clinical medicine. 04/2020. Doi 10.1016/j.trsl.2020.04.007. Reference #2: Panigada M. Hypercoagulability of COVID-19 patients in intensive care unit. A report of thromboelastography findings and other parameters of hemostasis. Journal of thrombosis and haemostasis. 04/2020. doi: 10.1111/jth.14850. DISCLOSURES: No relevant relationships by Padmini Giri, source=Web Response No relevant relationships by Verisha Khanam, source=Web Response No relevant relationships by Sarwan Kumar, source=Web Response No relevant relationships by DANYAL TAHERI ABKOUH, source=Web Response No relevant relationships by Jurgena Tusha, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Taking care of vascular access in patients with cancer following the prevalence of covid-19**  
   Karimian M. International Journal of Cancer Management 2020;13:1-2.

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1. **Tension gastrothorax-the lessons learnt**  
   Jennings R. Journal of the Intensive Care Society 2020;21:85.

We present a case of tension gastrothorax and the lessons learnt. 30-week primip, 38 years old admitted following an emergency LSCS for severe pre-eclampsia having been admitted to hospital with difficulty in breathing and severe chest and abdominal pain. Suspected to be preeclampsia related symptoms. PMH - Laparoscopic Nissen fundoplication and re-do, mesh repair in December 2018. Severe respiratory distress at induction with evidence of LUL diversion and LLL collapse on CXR. Significant VQ mismatch intra-operatively with high airway pressures, PaO2 15kpa on 70% FiO2 & 7 PEEP. CT scan demonstrated large diaphragmatic defect with entire, grossly distended stomach and a loop of transverse colon located within the right hemithorax with possible narrowing or outlet obstruction. Bilateral plural effusions noted, and a left sided intercostal drain was inserted. Patient was extubated and was stable for a period before developing increasing pain and nausea. Urgent surgical opinion was sort, NGT reinserted and a follow up CT scan done. During the scan the patient deteriorated with respiratory distress and hypoxia - treated with high flow O2. Blood pressure became compromised as previously required 50 mg/h (10ml/h) labetalol infusion to maintain SBP 170mmHg was hypotensive. Labetalol was weaned off and SBP was 100. Fluid resuscitation was given and the alert to Critical Care to expect return of a deteriorating patient with the potential for intubation. Following verbal CT report of large tension gastrothorax, the NGT was advanced and large volume of air aspirated. With on-going fluid replacement and decompression, the patient stabilised. Respiratory function improved with FiO2 requirements reduced and SBP maintained with low dose vasopressors. Patient was placed on the emergency surgical list. Surgical intervention included OGD, laparoscopy converted to laparotomy with thoracostomy and open abdomen before a re-look laparotomy for inspection of stomach and closure of wound with NJ insertion the following day. Furthermore, adequate analgesia and management of blood pressure ensued before successful extubation onto high flow O2. A severely distended stomach misplaced into the thoracic cavity is a rare event caused by previous or existing hiatus hernia and simulates a tension pneumothorax with haemodynamic compromise and symptoms of respiratory distress.1 Often mistaken for a pneumothorax, diagnosis can occur when emergency treatment is deployed with little improvement and respiratory compromise not resolved. The tension gastrothorax is only relieved with the correct placement and decompression with an NG tube.2 The incidence of these hernias becoming necrotic and risk of vascular compromise is 5% with significant increased mortality, prompt treatment is imperative.3 Incidence of such hernias are low but run a high risk of becoming life threatening due to frequent miss-diagnosis and poor recognition.4 This diagnosis is often further complicated in the third trimester of pregnancy due to altered physiology secondary to increasing abdominal pressure exerted by the growing uterus. These patients commonly present in respiratory distress, with haemodynamic compromise and mediastinal shift.

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1. **TENSION PNEUMOMEDIASTINUM IN A PATIENT WITH COVID-19 PNEUMONIA**  
   Desai A. Chest 2020;158:A1028.

SESSION TITLE: Medical Student/Resident Critical Care Posters SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: Mechanical ventilation can commonly cause mediastinal emphysema which in rare cases can convert to tension pneumomediastinum. This complication can result in cardiopulmonary compromise and decompression may be lifesaving. CASE PRESENTATION: A 53 year old woman with a history of ulcerative colitis, obstructive sleep apnea, chronic kidney disease and diabetes developed renal failure requiring dialysis and severe ARDS due to COVID 19. She was ventilated with 6cc/kg tidal volumes and a PEEP of 12cm/H2O to maintain a plateau pressure less than 30cm/H2O and a driving pressure under 15cm/H2O. She developed extensive subcutaneous emphysema and bilateral subcutaneous angiocatheters were placed. After initial clinical improvement sedation was decreased but with any awakening our patient became dyssynchronous and unstable. CT scan of the head and chest showed large volume pneumomediastinum with minimal pneumoperitoneum and pneumocephalus and no pneumothorax. Tension pneumomediastinum was assumed to be contributing to her hemodynamic instability and decompression of her mediastinum was pursued. A 10F pigtail catheter was inserted into the anterior mediastinum under CT guidance. Approximately 100 cc of air was drained during the procedure with immediate improvement in heart rate, oxygen saturation and ventilator pressures. The pigtail was attached to a pleurovac at 20 cc/H2O suction. Ventilator settings were reduced and subsequent reduction in sedation was accompanied by ventilator synchrony and she was able to follow commands. Unfortunately, despite this improvement, this patient eventually succumbed to COVID related illness. DISCUSSION: Pneumomediastinum may be spontaneous or secondary. Symptoms may include dyspnea, chest pain, and cough. Clinical signs are nonspecific and include tachycardia, ECG changes, and rarely tension physiology from direct cardiac and lung compression. This impedes venous return and increases ventilator pressures(1,3). Chest radiograph is a common diagnostic tool for pneumomediastinum but is limited(2). CT chest is important(2) particularly in cases with no improvement. Several techniques have been indicated in the relief of the tension physiology(1,2,3). We placed a pigtail catheter in the most common site: the anterior mediastinum. Rarely, mediastinotomy and sternotomy(1) may be done in resistant cases. If missed, more severe complications like pneumopericardium may result causing tamponade. Early diagnosis is key. CONCLUSION(S): Tension Pneumomediastinum is a life-threatening and early diagnosis and intervention is key. Reference #1: Clancy DJ, Lane AS, Flynn PW, Seppelt IM. Tension pneumomediastinum: A literal form of chest tightness. J Intensive Care Soc. 2017;18(1):52-56. doi:10.1177/1751143716662665 Reference #2: Beckett A, Tien H, Engels P, Paton-Gay JD, Rizoli S. Tension pneumomediastinum. J Trauma. 2011;71(4):1089. doi:10.1097/TA.0b013e31820edd2a Reference #3: Wolfe MW, Meltzer JS. Delayed Tension Pneumomediastinum after Cardiac Surgery. Anesthesiology. 2018;129(4):809. doi:10.1097/ALN.0000000000002257 DISCLOSURES: No relevant relationships by Corrielle Caldwell, source=Web Response No relevant relationships by Aditi Desai, source=Web Response No relevant relationships by David Hirschl, source=Web Response no disclosure on file for Seth Koenig;Copyright © 2020 American College of Chest Physicians

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1. **Tension pneumothorax in a patient with COVID-19**  
   Flower Luke BMJ case reports 2020;13:No page numbers.

A 36-year-old man was brought to the emergency department with suspected COVID-19, following a 3-week history of cough, fevers and shortness of breath, worsening suddenly in the preceding 4 hours. On presentation he was hypoxaemic, with an SpO2 of 88% on 15 L/min oxygen, tachycardic and had no audible breath sounds on auscultation of the left hemithorax. Local guidelines recommended that the patient should be initiated on continuous positive airway pressure while investigations were awaited, however given the examination findings an emergency portable chest radiograph was performed. The chest radiograph demonstrated a left-sided tension pneumothorax. This was treated with emergency needle decompression, with good effect, followed by chest drain insertion. A repeat chest radiograph demonstrated lung re-expansion, and the patient was admitted to a COVID-19 specific ward for further observation. This case demonstrates tension pneumothorax as a possible complication of suspected COVID-19 and emphasises the importance of thorough history-taking and clinical examination. Copyright © BMJ Publishing Group Limited 2020. No commercial re-use. See rights and permissions. Published by BMJ.

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1. **Tension pneumothorax in a patient with COVID-19**  
   Flower L. BMJ Case Reports 2020;13:e235861.

A 36-year-old man was brought to the emergency department with suspected COVID-19, following a 3-week history of cough, fevers and shortness of breath, worsening suddenly in the preceding 4 hours. On presentation he was hypoxaemic, with an SpO 2 of 88% on 15 L/min oxygen, tachycardic and had no audible breath sounds on auscultation of the left hemithorax. Local guidelines recommended that the patient should be initiated on continuous positive airway pressure while investigations were awaited, however given the examination findings an emergency portable chest radiograph was performed. The chest radiograph demonstrated a left-sided tension pneumothorax. This was treated with emergency needle decompression, with good effect, followed by chest drain insertion. A repeat chest radiograph demonstrated lung re-expansion, and the patient was admitted to a COVID-19 specific ward for further observation. This case demonstrates tension pneumothorax as a possible complication of suspected COVID-19 and emphasises the importance of thorough history-taking and clinical examination.Copyright © BMJ Publishing Group Limited 2020. No commercial re-use. See rights and permissions. Published by BMJ.

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1. **The Boston Medical Center Coronavirus Disease 2019 (COVID-19) Procedure Team: Optimizing the surgeon's role in pandemic care at a safety-net hospital**  
   Aly Sherif Surgery 2020;168:404-407.

BACKGROUND: The coronavirus disease 2019 pandemic has claimed many lives and strained the US health care system. At Boston Medical Center, a regional safety-net hospital, the Department of Surgery created a dedicated coronavirus disease 2019 Procedure Team to ease the burden on other providers coping with the surge of infected patients. As restrictions on social distancing are lifted, health systems are bracing for additional surges in coronavirus disease 2019 cases. Our objective is to quantify the volume and types of procedures performed, review outcomes, and highlight lessons for other institutions that may need to establish similar teams., METHODS: Procedures were tracked prospectively along with patient demographics, immediate complications, and time from donning to doffing of the personal protective equipment. Retrospective chart review was conducted to obtain patient outcomes and delayed adverse events. We hypothesized that a dedicated surgeon-led team would perform invasive bedside procedures expeditiously and with few complications., RESULTS: From March 30, 2020 to April 30, 2020, there were 1,196 coronavirus disease 2019 admissions. The Procedure Team performed 272 procedures on 125 patients, including placement of 135 arterial catheters, 107 central venous catheters, 25 hemodialysis catheters, and 4 thoracostomy tubes. Specific to central venous access, the average procedural time was 47 minutes, and the rate of immediate complications was 1.5%, including 1 arterial cannulation and 1 pneumothorax., CONCLUSION: Procedural complication rate was less than rates reported in the literature. The team saved approximately 192 hours of work that could be redirected to other patient care needs. In times of crisis, redeployment of surgeons (who arguably have the most procedural experience) into procedural teams is a practical approach to optimize outcomes and preserve resources. Copyright © 2020 Elsevier Inc. All rights reserved.

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1. **The clinical safety and efficacy of flexible bronchoscopy in a neonatal intensive care unit**  
   Yan Chongbing Experimental and therapeutic medicine 2020;20:95.

Flexible bronchoscopy (FB), developed in the 1960s, is widely used in the clinical practice of pediatrics and has demonstrated fundamental value in clinical diagnoses and treatment. However, as an invasive procedure, the use of FB is limited due to concerns regarding the tolerance of the procedure and the possible complications in neonatal units. Thus, the present study aimed to investigate the clinical safety and efficacy of flexible bronchoscopy (FB) in a neonatal intensive care unit (NICU). Neonates (n=54) who received FB in the NICU of Shanghai Children's Hospital between January 2012 and December 2016 were enrolled as the experimental group and another 54 neonates who required nebulization and tracheal secretion suction treatments were the control group. Indicators including blood gas, complete blood count, C-reactive protein (CRP), X-ray, patient breathing rate, temperature and blood pressure were monitored prior to and following the procedure. No significant differences in sex, gestational age, birth weight or postnatal age were observed between the experimental group and the control group (P>0.05). Among the 54 FB patients, several cases with side effect were identified, including 18 (33.3%) with respiratory tract stenosis, nine (16.7%) with malacia and stenosis and six (11.1%) with esophagotracheal fistula. Among the 54 members of the control group, 44 neonates (81.4%) were discharged with improved condition, five (9.3%) succumbed and five patients (9.3%) abandoned the treatment and left the hospital. Bronchoalveolar lavage demonstrated consistent results with respiratory secretion culture or tracheal tube culture. In comparison between the experimental and the control groups, no significant difference in pH, partial pressure of carbon dioxide (PCO2), partial pressure of oxygen (PO2) and HCO3 - was observed, while there were no statistical differences in the values of pH, PCO2 and HCO3 - (P>0.05). However, PO2 was significantly increased, and CRP was significantly reduced, following FB procedure compared with prior to FB (P<0.05). No pneumothorax, shock, other severe complications, fever or diffused pneumonia were observed during or after FB. The data from the present study demonstrated that FB is a safe and effective strategy for the diagnosis and differentiation of neonatal respiratory diseases in NICU. Copyright © 2020, Spandidos Publications.

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1. **The coronavirus diseases 2019 (COVID-19) pneumonia with spontaneous pneumothorax: a case report**  
   Chen Xiaoxing BMC infectious diseases 2020;20:662.

BACKGROUND: The outbreak of the novel coronavirus (COVID-19) that was firstly reported in Wuhan, China, with cases now confirmed in more than 100 countries. However, COVID-19 pneumonia with spontaneous pneumothorax is unknown., CASE PRESENTATION: We reported a case of 66-year-old man infected with COVID-19, presenting with fever, cough and myalgia; The patient received supportive and empirical treatment including antiviral treatment, anti-inflammatory treatment, oxygen supply and inhalation therapy; The symptoms, CT images, laboratory results got improved after the treatments, and a throat swab was negative for COVID-19 PCR test; However, on the hospital day 30, the patient presented with a sudden chest pain and dyspnea. CT showed a 30-40% left-sided pneumothorax. Immediate thoracic closed drainage was performed and his dyspnea was rapidly improved. With five more times negative PCR tests for SARS-CoV-2 virus, the patient was discharged and home quarantine., CONCLUSION: This case highlights the importance for clinicians to pay attention to the appearance of spontaneous pneumothorax, especially patients with severe pulmonary damage for a long course, as well as the need for early image diagnose CT and effective treatment once pneumothorax occurs.

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1. **The COVID-19 intubation experience in Wuhan**  
   Aziz M. F. British Journal of Anaesthesia 2020;125:e25-e27.

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1. **The COVID-19 pandemic: A systematic review of the current evidence**  
   Ghomi R. Russian Journal of Infection and Immunity 2020;10:655-663.

Introduction. An epidemic of Coronavirus Disease 2019 (COVID-19) begun in December 2019 in China, causing primary concern. One of the important issues is its rapid spread around the world. Among the questions raised, disease epidemiology, clinical, laboratory symptoms and radiological findings and treatment of COVID-19 disease have been identified in some studies. But no systematic review on current evidences about COVID-19 has been published. Objective. The aim of this study was to determine the COVID-19 epidemiology, clinical features, diagnosis and treatment. Data sources. We performed a systematic review of the literature, using the keywords: "coronavirus" and "2020", "COVID-19" in databases: Science Direct, PubMed, Springer and Scopus during January 1, 2020 to February 23, 2020. Study Selection. All observational studies, as well as case reports and editorial that published in English were include. Data Extraction. Data on the disease control methods of COVID-19 were extracted by multiple observers. Results. 131 articles were retrieved. After screening by abstract and title, 58 articles were selected for full-text assessment. Of them, 43 were finally included for review. The COVID-19 has spread rapidly and can be transmitted via close human-to-human contact via nasopharyngeal or oropharyngeal droplets. The COVID-19, causing considerable problems, especially in patients with comorbidities and old patients. Fever, cough, sore throat and diarrhea are the main clinical features of this emerging disease. The most common radiological finding is bilateral ground-glass view and Lopinavir and Ritonavir are among the antiviral drugs used. Conclusion. COVID-19 is a new clinical infectious disease and can be a serious problem for health systems. Additional research is needed to elucidate factors that may mediate the pathogenesis of the severe and fatal associated disease.Copyright © 2020 Saint Petersburg Pasteur Institute. All rights reserved.

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1. **The diagnostic accuracy of lung auscultation in adult patients with acute pulmonary pathologies: a meta-analysis**  
   Arts Luca Scientific reports 2020;10:7347.

The stethoscope is used as first line diagnostic tool in assessment of patients with pulmonary symptoms. However, there is much debate about the diagnostic accuracy of this instrument. This meta-analysis aims to evaluate the diagnostic accuracy of lung auscultation for the most common respiratory pathologies. Studies concerning adult patients with respiratory symptoms are included. Main outcomes are pooled estimates of sensitivity and specificity with 95% confidence intervals, likelihood ratios (LRs), area under the curve (AUC) of lung auscultation for different pulmonary pathologies and breath sounds. A meta-regression analysis is performed to reduce observed heterogeneity. For 34 studies the overall pooled sensitivity for lung auscultation is 37% and specificity 89%. LRs and AUC of auscultation for congestive heart failure, pneumonia and obstructive lung diseases are low, LR- and specificity are acceptable. Abnormal breath sounds are highly specific for (hemato)pneumothorax in patients with trauma. Results are limited by significant heterogeneity. Lung auscultation has a low sensitivity in different clinical settings and patient populations, thereby hampering its clinical utility. When better diagnostic modalities are available, they should replace lung auscultation. Only in resource limited settings, with a high prevalence of disease and in experienced hands, lung auscultation has still a role.

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1. **The effect of prone positioning in SARS-CoV-2: A case series**  
   Manesso L. Intensive Care Medicine Experimental 2020;8:No page numbers.

Introduction: Patients suffering from Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) disease develop an atypical form of ARDS characterized by severe hypoxemia and preserved lung mechanics1. Prone positioning (PP) is successfully used as a rescue therapy for severe hypoxemia in classic ARDS. Its effects are not yet clear in SARS-CoV-2. Objective(s): To describe the effects of PP on gas exchange and respiratory mechanics in a group of severely hypoxic patients with SARS-CoV-2. Method(s): From February 22th to March 22th, consecutive SARS-CoV-2 patients admitted to the ICUs of Papa Giovanni XXIII Hospital in Bergamo, were studied. PROSEVA study group criteria were used to identify modalities and clinical indications to PP2. Data about ventilation (positive end-expiratory pressure (PEEP), driving pressure (DP), compliance of respiratory system (Crs)) and gas exchange ( PaO2/FiO2 (P/F ratio) and PCO2) were collected at three time points: before (supine- pre), at the end (prone) and after 6 hours (supine-post) of each session. Data were analyzed using repeated measurements ANOVA followed by Dunnet post-hoc analysis. Result(s): Among 115 SARS-CoV-2 patients admitted to the ICU receiving mechanical ventilation, 71 were pronated. 80%patients were male, mean age and BMI were 60 +/- 10 and 30 +/- 5, similarly to the rest of the population. At the beginning of mechanical ventilation P/F ratio and Crs were 123 +/- 63 and 40 +/- 11 ml/cmH2O. Median time to the first prone session was 1 (0;3) day. 25 patients (35%) were pronated once while the remaining 46 needed more than a session. Table shows the results of the PP. Major complications occurred in 16 cycles (11%): severe hypoxemia in 7, pneumothorax in 1, airway-related complications in 4, pulmonary embolism in 2 and cardiovascular instability in 2 cycles. Conclusion(s): PP resulted in a significant increase in P/F ratio despite no effect on respiratory mechanics. These data suggest that PP could be used as rescue therapy for severe hypoxemia in SARS-CoV-2. (Table Presented).

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1. **The future is here: Integrating genetics into the pediatric pulmonary clinic**  
   Hawley M. H. Pediatric Pulmonology 2020;55:1810-1818.

Recognition of underlying genetic etiologies of disease is increasing at an exponential rate, likely due to greater access to and lower cost of genetic testing. Monogenic causes of disease, or conditions resulting from a mutation or mutations in a single gene, are now well recognized in every subspecialty, including pediatric pulmonary medicine; thus, it is important to consider genetic conditions when evaluating children with respiratory disease. In the pediatric pulmonary clinic, genetic testing should be considered when multiple family members present with similar or related clinical features and when individuals have unusual clinical presentations, such as early-onset disease or complex, syndromic features. This review provides a practical guide for genetic diagnosis in the pediatric pulmonary setting, including a review of genetic concepts, considerations for test selection and results in interpretation, as well as an overview of genetic differential diagnoses for common pediatric pulmonary phenotypes. Genetic conditions that commonly present to the pediatric pulmonary clinic are reviewed in a companion article by Yonker et al.Copyright © 2020 Wiley Periodicals, Inc.

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1. **The Geriatric Patient: The Ideal One for Chest Ultrasonography? A Review From the Chest Ultrasound in the Elderly Study Group (GRETA) of the Italian Society of Gerontology and Geriatrics (SIGG)**  
   Ticinesi Andrea Journal of the American Medical Directors Association 2020;21:447-454.e6.

OBJECTIVES: To investigate the current evidence on the use of point-of-care chest ultrasonography in older patients and geriatric settings and present the current state of the art of chest ultrasound applications., DESIGN: Special article based on a literature review with narrative analyses and expert clinical knowledge., SETTING AND PARTICIPANTS: All studies performed in a geriatric setting were included. Observational and intervention studies and meta-analyses including participants aged >=70 years were also considered, even if not specifically focused on a geriatric setting., MEASURES: Data on participant characteristics, diagnostic accuracy of chest ultrasonography, and outcomes were collected for each considered study. Data were analyzed and discussed with a particular focus on the possible applications and advantages of chest ultrasonography in geriatric medicine, underlining the possible areas of future research., RESULTS: We found only 5 studies on the diagnostic accuracy and prognostic relevance of chest ultrasonography in geriatrics. However, several studies performed in emergency departments, intensive care units, and internal medicine wards included a large number of participants >=70 years old; they suggest that chest ultrasonography may represent a valid aid to the diagnostics of acute dyspnea, pneumonia, acute heart failure, pneumothorax, and pleural diseases, with an accuracy in some cases superior to standard x-rays, especially when mobility limitation is present. Diaphragm ultrasonography may also represent a valid tool to guide mechanical ventilation weaning in older patients with acute respiratory failure., CONCLUSIONS AND IMPLICATIONS: Chest ultrasonography may represent a valid bedside diagnostic aid to the management of acute respiratory diseases in older patients. However, specific evidence is lacking for geriatric patients. Future research will need to focus on defining the reference standards and the diagnostic accuracy for older patients with frailty and multimorbidity, cost-efficacy and cost-effectiveness of the technique, its impact for clinical outcomes, and role for follow-up in the post-acute care. Copyright © 2019 AMDA - The Society for Post-Acute and Long-Term Care Medicine. Published by Elsevier Inc. All rights reserved.

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Objectives: To investigate the current evidence on the use of point-of-care chest ultrasonography in older patients and geriatric settings and present the current state of the art of chest ultrasound applications. Design(s): Special article based on a literature review with narrative analyses and expert clinical knowledge. Setting and participants: All studies performed in a geriatric setting were included. Observational and intervention studies and meta-analyses including participants aged >=70 years were also considered, even if not specifically focused on a geriatric setting. Measures: Data on participant characteristics, diagnostic accuracy of chest ultrasonography, and outcomes were collected for each considered study. Data were analyzed and discussed with a particular focus on the possible applications and advantages of chest ultrasonography in geriatric medicine, underlining the possible areas of future research. Result(s): We found only 5 studies on the diagnostic accuracy and prognostic relevance of chest ultrasonography in geriatrics. However, several studies performed in emergency departments, intensive care units, and internal medicine wards included a large number of participants >=70 years old; they suggest that chest ultrasonography may represent a valid aid to the diagnostics of acute dyspnea, pneumonia, acute heart failure, pneumothorax, and pleural diseases, with an accuracy in some cases superior to standard x-rays, especially when mobility limitation is present. Diaphragm ultrasonography may also represent a valid tool to guide mechanical ventilation weaning in older patients with acute respiratory failure. Conclusions and implications: Chest ultrasonography may represent a valid bedside diagnostic aid to the management of acute respiratory diseases in older patients. However, specific evidence is lacking for geriatric patients. Future research will need to focus on defining the reference standards and the diagnostic accuracy for older patients with frailty and multimorbidity, cost-efficacy and cost-effectiveness of the technique, its impact for clinical outcomes, and role for follow-up in the post-acute care.Copyright © 2019 AMDA - The Society for Post-Acute and Long-Term Care Medicine

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1. **The Importance of Genetic Factors in the Management of Spontaneous Pneumothorax**  
   Matsumoto K. Current Pulmonology Reports 2020;9:47-55.

Purpose of Review: Spontaneous pneumothoraces can be the presenting phenotype in a variety of different syndromic genetic conditions. Respiratory physicians therefore have the opportunity to diagnose and manage these patients early to prevent serious complications associated with these syndromes. Recent Findings: The genetic syndromes that present with pneumothoraces can be split broadly between those resulting from defective extracellular matrix formation and those caused by defective tumour-suppressor pathways. When connective tissues are weakened, lifelong surveillance for arterial dilatation can be life-saving as surgical intervention is effective. Long-term aggressive treatment of blood pressure can also commence, although some controversy surrounds which drugs are most effective and precisely how these drugs modify disease progression. Rational treatments of syndromes in which tumour suppressor function is lost are being developed and, in some instances, can already be offered. Summary: Careful clinical assessment of spontaneous pneumothorax may identify an underlying causal condition and facilitate life-saving intervention. Respiratory physicians must therefore be aware of these diseases and their diagnostic criteria.Copyright © 2020, The Author(s).

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1. **The Influence of High Flow Nasal Cannulae on the Outcomes of Severe Respiratory Disease in Children Admitted to a Regional Hospital in South Africa**  
   Richards M. Journal of Tropical Pediatrics 2020;66:612-620.

In settings where access to paediatric intensive care unit (PICU) facilities is constrained and transfer capacity is limited, High Flow Nasal Cannulae (HFNC) might fill an important service gap. The aim of this study was to document the effect of HFNC on the outcomes of children admitted with severe respiratory disease at a regional hospital without a PICU in Cape Town, South Africa. It is a 4-year retrospective analysis documenting two periods of 2 years each, one before (2013-15) and one after (2016-18) the initiation of HFNC use. Patients were between the ages of 2 months and 13 years and had been admitted to a paediatric ward. Outcomes were defined by the need for transfer to a tertiary hospital, the need for invasive ventilation and death. There were 90 instances of HFNC use with a significant reduction in the number of children who were transferred (59 vs. 31), invasively ventilated (20 vs. 6, p <= 0.01) and who died (3 vs. 0, p = 0.02). Before HFNC implementation, there was also a significantly greater proportion of transferred children who remained on low flow nasal cannulae (15 vs. 2, p <= 0.001) at the tertiary hospital. Children who failed HFNC use tended to do this within a day of initiation (Median 11 vs. 60 h for success, p <= 0.001). There were no complications related to its use. We believe that in our setting the utilization of HFNC has helped to timeously and accurately identify children needing to be transferred and may mitigate against severe respiratory disease progression.Copyright © 2020 The Author(s) [2020]. Published by Oxford University Press. All rights reserved. For permissions, please email: journals.permissions@oup.com.

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1. **THE NATURAL HISTORY OF PNEUMOTHORAX ASSOCIATED WITH CARDIAC IMPLANTABLE ELECTRONIC DEVICES - A 10-YEAR SINGLE CENTRE EXPERIENCE**  
   Thomas G. Canadian Journal of Cardiology 2020;36:S54-S55.

Background: Iatrogenic pneumothorax (PTX) is a major complication of cardiac implantable electronic device (CIED) procedures. While the incidence and risk factors of CIED-associated PTX has been well established, little is known about the natural history of this complication. Methods and Results: This is a retrospective study of all CIED-associated PTX at a single adult quaternary care academic center between March 2010 and March 2020. All patients with an ipsilateral PTX identified on the immediate post procedure chest x-ray (CXR) were included. PTX severity was assessed using the American College of Chest Physicians (ACCP) criteria (Severe: Apical height > 3 cm) for the first and second patient CXR and clinical management was ascertained. Eighty-six PTX were identified during the study period (Figure 1), of which 42 patients (48.8%) ultimately received a chest tube. Thirty-five (40.7%) of PTX were deemed severe on the initial CXR with a median apical height of 4.2 cm (IQR 3.5 - 5.5 cm). Fifteen (65.2%) had an increase in PTX size between CXRs (Median (IQR): 0.7 cm (0.4-2.0 cm)), while 3 (13.0%) became reclassified as non-severe. Of the 51 patients with an initial non-severe PTX, 32 (71.1%) had increase in the apical height on the second CXR (median (IQR): 1.5 cm 0.3 - 3.2 cm)), of which 16 (35.6%) became reclassified as severe. Of the total 36 patients who had a second CXR showing a severe PTX, 25 (69.4%) received a chest tube. Patients who received a chest tube were more likely to have already been an inpatient (58.1% vs. 36.4%, p=0.003), admitted if implanted as an outpatient (100% vs. 46.4%, p<0.001), and had a longer LOS if admitted (Median (IQR): 1 day (1 - 2 days) vs. 5 day (4 - 7.8 days), p=0.0012). No statistical differences were seen between cohorts with respect to baseline characteristics (age at implant, sex, comorbidities including pre-existing respiratory disease), medications (antiplatelet/anticoagulant), or CIED type implanted. No long-term untoward consequences were noted in the conservatively managed group. Conclusion(s): An initial strategy of conservative treatment of CIED-associated PTX based on serial CXRs may be reasonable. [Formula presented]Copyright © 2020

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1. **The predictors of hospital-death among children in western iran**  
   Siabani S. Acta Medica Iranica 2020;58:599-604.

Analyzing child mortality, an important indicator of health and development of countries, can help policymakers to develop health programs that resulted in improving Childs's health. Recognizing the causes of in-hospital deaths also assists health caregivers to revise their medical services. The aim of this study was to explore the causes of death in the largest hospital in western Iran. This retrospective descriptive-analytical study was conducted in Imam Reza Hospital (IRH) in Kermanshah, data including demographic characteristics (e.g., age), medical information, and causes of death of patients aged <=18 years, from April 2012 to March 2017 were collected using a checklist. The causes of mortalities were categorized based on the International Coding of Diseases (ICD, Version 10). Using logistic regression, Chi-square, and Cramer's V test in SPSS, the relationships between the outcome and predicting variables were assessed. The results showed 1113 deaths among 21,247 people<=, 18 years people admitted to IRH for five years. About 55% were female and 74% neonate, with a dropping trend from 2011 (4.62%) to 2016 (4.00%). Medical records, mostly, used a variety of usual medical terms for the causes of death, rather than using ICD10 categories. Data were analyzed after alternating medical terms and re-coding data using ICD10. Respiratory system diseases by 34% (dominancy of hyaline membrane diseases), infectious diseases by 28% (leading by sepsis), and diseases of the blood by 13% (mostly disseminated intravascular coagulation (DIC)), respectively, were the most common causes of death. Age was the most important associated factor for all-cause mortality associated with infectious diseases and respiratory system diseases (P=0.01). Having a significant number of neonatal mortality, paying more attention to the neonatal, prenatal, and antenatal care is recommended. In addition, the fatality of infectious diseases is concerning and needs paying serious attention to the health care system.Copyright © 2020 Tehran University of Medical Sciences. All rights reserved.

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1. **The role of chest radiography in confirming covid-19 pneumonia**  
   Cleverley J. The BMJ 2020;370:m2426.

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1. **The role of locoregional anesthesia in the COVID-19 pandemic**  
   Mendes A. B. Acta Medica Portuguesa 2020;33:522-527.

Coronavirus disease 2019 (COVID-19) refers to the respiratory tract infection caused by the newly emergent coronavirus SARS-CoV-2. The present pandemic, declared on the 11th of March 2020, was first recognized in Wuhan city, and rapidly spread throughout China and other countries, including Portugal. Regional anesthesia should be considered whenever surgery is planned for a patient with suspected or confirmed COVID-19, as it minimizes not only airway management, the intervention with the highest risk of aerosolization, but also potential personnel contamination and patient recovery time, while maximizing operation room efficiency. Anesthesia techniques should be aimed at preventing airway manipulation such as endotracheal intubation, which is associated with a higher risk of pulmonary complications in infected patients. These recommendations are structured in pre-, intra-, and post-operative management in suspected or confirmed infected patients with SARS-CoV-2, based in local hospital infection committee recommendations and the most recent literature available regarding regional anaesthesia. They are aimed at anesthesiology personnel, with the main goals being both team and patient safety. The SARS-CoV-2 virus will be not the last novel virus to trigger global pandemics, so having a well-structured regional anesthesia plan to manage this kind of cases will ensure the best outcome possible to both patients and the perioperative team. Keywords: Anesthesia, Conduction; Anesthesia, Local; Coronavirus; COVID-19; Pandemics.Copyright © Ordem dos Medicos 2020

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1. **The Role of Lung Biopsy in Pediatric ANCA-associated Vasculitis**  
   Sayad E. Arthritis and Rheumatology 2020;72:2895-2896.

Background/Purpose: Anca-associated vasculitis (AAV) is characterized by vascular inflammation in multiple organs. The diagnosis can be made clinically using a number of different criteria. The lungs are commonly affected, with a broad range of manifestations described including cough, dyspnea, respiratory failure, and pulmonary hemorrhage. Multiple pulmonary histopathologic patterns have been described in AAV, which requires invasive tissue sampling through lung biopsy and is not without risk. Here, we have reviewed the histopathologic findings in a series of pediatric AAV, and discuss procedural outcomes and yield of lung biopsies in this population. Method(s): After IRB approval, we performed a retrospective chart review of all patients < 18 years of age presenting to our institution with a diagnosis of AAV who underwent lung biopsy. We reviewed histopathologic features, serologies, timing of biopsy, and complications. Result(s): 14 patients met inclusion criteria, 9 patients with a diagnosis of microscopic polyangiitis (MPA), and 5 patients with granulomatosis with polyangiitis (GPA). 10/14 (71%) of the biopsies were performed between 2009 and 2013, and only 4 (29%) from 2015 to present. 13/14 patients required initial admission on presentation for respiratory symptoms. 11/14 required respiratory support. All patients had abnormal chest imaging at presentation. 11/14 had concerns for pulmonary hemorrhage. All 5 patients with GPA had an elevated serine protease-3 (PR3). Mean PR3 level was 703 AU/mL (range 49-1353 AU/mL). Myeloperoxidase (MPO) was elevated in all MPA patients. Mean MPO level was 109 AU/mL (range 24-186 AU/mL). The indication for biopsy was to confirm the diagnosis prior to initiating therapy in 11 patients (78%), as part of an infectious work-up in 2 (14%), and as part of an interstitial lung disease work-up in 1 (7%). 9/14 (64%) biopsies had findings consistent with a diagnosis of AAV, 4/9 (44%) of the MPA patients compared to 5/5 (100%) of the GPA patients. The most common findings on histopathology in GPA patients were vasculitis (100%), granulomatous changes (20%), and alveolar hemorrhage (60%). Only 44% of MPA patients had signs of vasculitis, but 100% showed signs of alveolar hemorrhage. The main post-procedure complication was pneumothorax, in 28% of patients. Conclusion(s): We found that lung biopsy had a higher diagnostic yield in GPA compared to MPA. On histology, confirmation of vasculitis and pulmonary hemorrhage were the most common findings. In our cohort, the diagnosis of AAV was able to be made with clinical features and a positive serology in all cases. Therefore, considering the risks associated with obtaining a lung biopsy, they should not be routine and reserved for uncertain cases.

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1. **The Role of Lung Ultrasound in the Assessment of Novel Coronavirus Pneumonia**  
   Zhang Z. Journal of Cardiothoracic and Vascular Anesthesia 2020;34:2851-2854.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=6dae0ef85e46a12252d51b4f45325bb8)

1. **THE SCARS OF WAR: A CASE OF COVID-19-INDUCED PULMONARY FIBROSIS**  
   Natarajan V. Chest 2020;158:A995.

SESSION TITLE: Medical Student/Resident Critical Care Posters SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: October 18-21, 2020 INTRODUCTION: Approximately 6 million people have been diagnosed with severe acute respiratory syndrome coronavirus-2 (SARSCoV-2) and close to 400,000 people have died from this deadly disease worldwide (COVID-19, 2020). Almost all of the complications include pneumonia. The pulmonary symptoms associated with SARSCoV-2 vary from mild respiratory symptoms to severe respiratory failure. Of those infected with SARSCoV-2, 40% will progress to acute respiratory distress syndrome (ARDS) and of those, 20% will go on to develop pulmonary fibrosis (Spagnolo, 2020). We present a case of a middle-aged female with SARSCoV-2 with unusually rapid progressing pulmonary fibrosis. CASE PRESENTATION: 53 year old female with history of hypertension and obesity, found to be SARSCoV-2 positive. The patient was treated with hydroxychloroquine, azithromycin, intravenous corticosteroids, tocilizumab, and convalescent plasma. She was successfully extubated after a prolonged course and discharged to rehabilitation facility after a length of stay of 15 days. Five days post-discharge the patient presented with sudden-onset shortness of breath secondary to large right-sided tension pneumothorax requiring pigtail and large bore chest tube insertion. Despite this, due to severe hypoxemia, the patient required immediate intubation. Repeat SARSCoV-2 testing was positive. Computed tomography (CT) of chest was significant for diffuse ground glass opacification with no fibrosis. Repeat CT chest just four days later showed severe diffuse bilateral fibrotic changes. DISCUSSION: A large study of SARSCoV-2 patients based in Wuhan, China featured 138 hospitalized patients wherein 61% of patients developed ARDS. Pulmonary fibrosis is a known consequence of ARDS. It is characterized by epithelial cell damage and activation, fibroproliferation, and abnormal accumulation of extracellular matrix (ECM) in lung parenchyma. The pathogenesis of how this disease causes lung damage is still speculative. Diffuse alveolar damage occurs with cellular fibromyxoid exudates, desquamation of pneumocytes, and hyaline membrane formation typical of ARDS. This is similar to findings seen in pathology reports of post-mortem lung biopsies of SARS and Middle Eastern Respiratory Syndrome coronavirus' and is likely similar to what is occurring in SARSCoV-2 patients (Spagnolo, 2020). CT findings of these cases showed areas of advanced fibrosis with bullae formation. Multiple factors that may contribute are virus-induced cytokine release syndrome, drug effects and increased airway pressure with hyperoxia-related lung injury secondary to mechanical ventilation. CONCLUSION(S): Statistics reveal 2-3 million people recovered from SARSCoV-2 worldwide (COVID-19, 2020). This recovery is not always without consequences such as pulmonary fibrosis seen in this patient. Therefore, it is necessary to evaluate long-term ramifications and treatment options in surviving SARSCoV-2 patients. Reference #1: COVID-19 dashboard by the center for systems science and engineering at Johns Hopkins University. Retrieved from https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6 Reference #2: King TE Jr, Pardo A, Selman M. Idiopathic pulmonary fibrosis. Lancet. 2011;378(9807):1949-1961. doi:10.1016/S0140-6736(11)60052-4 Reference #3: Spagnolo et al., Pulmonary fibrosis secondary to COVID-19: a call to arms? Lancet Respiratory Medicine. 2020; doi: https://doi.org/10.1016/S2213-2600(20)30222-8 DISCLOSURES: No relevant relationships by Blessen George, source=Web Response No relevant relationships by Michael Megally, source=Web Response No relevant relationships by Visala Natarajan, source=Web Response no disclosure on file for Benhoor Shamian;Copyright © 2020 American College of Chest Physicians

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1. **The Use of POCUS to Manage ICU Patients With COVID-19**  
   Schrift David Journal of ultrasound in medicine : official journal of the American Institute of Ultrasound in Medicine 2020;:No page numbers.

Since the advent of SARS-CoV-2, the virus that causes COVID-19, clinicians have had to modify how they provide high-value care while mitigating the risk of viral spread. Routine imaging studies have been discouraged due to elevated transmission risk. Patients who have been diagnosed with COVID-19 often have a protracted hospital course with progression of disease. Given the need for close follow-up of patients, we recommend the use of ultrasonography, particularly point-of-care ultrasound (POCUS), to manage patients with COVID-19 through their entire ICU course. POCUS will allow a clinician to evaluate and monitor cardiac and pulmonary function, as well as evaluate for thromboembolic disease, place an endotracheal tube, confirm central venous catheter placement, and rule out a pneumothorax. If a patient improves sufficiently to perform weaning trials, POCUS can also help evaluate readiness for ventilator liberation. Copyright © 2020 American Institute of Ultrasound in Medicine.

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1. **The Utility of Ultrasound Extends Beyond Interstitial Pneumonia Assessment in COVID-19 Patients**  
   Mohamed M. F. H. Academic Radiology 2020;27:1332-1333.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=95a4aa5050b771ae62830a2d85d42699)

1. **Therapeutic challenges in colorectal surgery practice during COVID-19 outbreak: A case series**  
   Alemrajabi M. Colorectal Cancer 2020;9:0014.

After the outbreak of COVID-19, several issues in the field of general surgery have remained unknown. Here we present two consecutive patients operated on in a coronavirus center in February 2020, during the outbreak in Tehran, Iran. Moreover, we highlight some challenges surgeons face in the management of these patients during the outbreak. We suggest surgeons to perform the safest technique with the least risk. In borderline conditions, it is suggested to prefer stoma over anastomosis. This lessens the course of hospitalization and probable complication rates. We suggest establishing clean centers and prepare guidelines for the general surgery team members to lessen the risk for patients and healthcare providers.Copyright © 2020 Mohammad Moradi.

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1. **Thoracic imaging of coronavirus disease 2019 (COVID-19) in children: a series of 91 cases**  
   Caro-Dominguez P. Pediatric Radiology 2020;50:1354-1368.

Background: Pulmonary infection with SARS-CoV-2 virus (severe acute respiratory syndrome coronavirus 2; COVID-19) has rapidly spread worldwide to become a global pandemic. Objective(s): To collect paediatric COVID-19 cases worldwide and to summarize both clinical and imaging findings in children who tested positive on polymerase chain reaction testing for SARS-CoV-2. Material(s) and Method(s): Data were collected by completion of a standardised case report form submitted to the office of the European Society of Paediatric Radiology from March 12 to April 8, 2020. Chest imaging findings in children younger than 18 years old who tested positive on polymerase chain reaction testing for SARS-CoV-2 were included. Representative imaging studies were evaluated by multiple senior paediatric radiologists from this group with expertise in paediatric chest imaging. Result(s): Ninety-one children were included (49 males; median age: 6.1 years, interquartile range: 1.0 to 13.0 years, range: 9 days-17 years). Most had mild symptoms, mostly fever and cough, and one-third had coexisting medical conditions. Eleven percent of children presented with severe symptoms and required intensive unit care. Chest radiographs were available in 89% of patients and 10% of them were normal. Abnormal chest radiographs showed mainly perihilar bronchial wall thickening (58%) and/or airspace consolidation (35%). Computed tomography (CT) scans were available in 26% of cases, with the most common abnormality being ground glass opacities (88%) and/or airspace consolidation (58%). Tree in bud opacities were seen in 6 of 24 CTs (25%). Lung ultrasound and chest magnetic resonance imaging were rarely utilized. Conclusion(s): It seems unnecessary to perform chest imaging in children to diagnose COVID-19. Chest radiography can be used in symptomatic children to assess airway infection or pneumonia. CT should be reserved for when there is clinical concern to assess for possible complications, especially in children with coexisting medical conditions.Copyright © 2020, Springer-Verlag GmbH Germany, part of Springer Nature.

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1. **Thoracoscopic Bullectomy for Persistent Air Leak in a 14-Year-Old Child with COVID-19 Bilateral Pulmonary Disease**  
   Gine Carlos Journal of laparoendoscopic & advanced surgical techniques. Part A 2020;30:935-938.

Introduction: Thoracic surgery in children with coronavirus disease-19 (COVID-19) pulmonary disease is rare, as very limited virus-related lung lesions require intervention. However, some patients may suffer from other pulmonary abnormalities that can be worsened by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and they may consequently require lung surgery. COVID-19 affects the indications, surgical procedure, and postsurgical care of these patients. Background: We present a case of a 14-year-old girl with COVID-19 pulmonary disease and persistent air leak due to right apical bullae that required resection. Clinical, surgical, and safety implications are discussed. The role of thoracic minimally invasive surgery under COVID-19 conditions is also analyzed. Materials and Methods: The thoracoscopic procedure was scheduled earlier than normally expected. The surgery was performed in a COVID-19 reserved theatre with neutral pressure and only the necessary personnel was allowed inside. The use of the required personal protective equipment was supervised by an expert nurse before and after the intervention. Results: The surgeons used a three-port technique to resect the bullae with an endostapler and no mechanical pleural abrasion was added to the procedure. Electrocautery and CO2 insufflation were avoided, and a chest drain with a closed-circuit aspiration system was installed before removing the ports. The child was discharged home 3 days later after the removal of the chest drain. Conclusions: COVID-19 has an impact on the standard indications, surgical strategies and postoperative care of some conditions requiring intervention. Extra safety measures are needed in the operating room to limit the chance of transmission. Minimally invasive surgery for thoracic surgery remains safe if the current safety guidelines are followed closely.

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1. **Time to embrace POCUS as part of the bedside diagnosis of respiratory diseases**  
   Porcel J. M. Respirology 2020;25:466-467.

See related Article.Copyright © 2019 Asian Pacific Society of Respirology

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1. **Tracheal introducers and airway trauma COVID-19. Comment on Br J Anaesth 2020; 125: e168-e170**  
   Sorbello M. British Journal of Anaesthesia 2020;125:e305-e307.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=629839327743e5c4e4d80fa4d72b4b06)

1. **Tracheal trauma after difficult airway management in morbidly obese patients with COVID-19**  
   Abou-Arab O. British Journal of Anaesthesia 2020;125:e168-e170.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=629839327743e5c4e4d80fa4d72b4b06)

1. **Two cases of spontaneous pneumomediastinum with pneumothorax in patients with COVID-19 associated pneumonia**  
   Oye Monique Respiratory medicine case reports 2020;31:101308.

Coronavirus 2019 (COVID-19) is an infectious viral illness caused by severe acute respiratory syndrome virus coronavirus 2 (SARS-CoV-2). This disease mainly affects the lungs manifesting as acute lung injury, pneumonia, and acute respiratory distress syndrome. We describe two patients who developed concomitant spontaneous pneumothorax and pneumomediastinum in the setting of SARS-CoV-2 leading to acute hypoxic respiratory failure. This report adds to the increasing number of cases describing pulmonary complications of COVID-19 infection. Further studies are needed to ascertain the prognostic significance of these pulmonary complications in patients with SARS-CoV-2 infection. Copyright © 2020 The Author(s).

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1. **Ultrasonography and SARS-CoV 2 infection: a review of what we know and do not yet know**  
   Dudea Sorin M. Medical ultrasonography 2020;22:129-132.

1. **Ultrasound on the Frontlines of COVID-19: Report From an International Webinar**  
   Liu R. B. Academic Emergency Medicine 2020;27:523-526.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=16cab0ce32040aa47572040880d059d8)

1. **UNIQUE PRESENTATION OF ENDOBRONCHIAL FOREIGN BODY AS SUBCUTANEOUS EMPHYSEMA**  
   Appusamy N. Chest 2020;158:A2514.

SESSION TITLE: Global Case Report Posters SESSION TYPE: Global Case Reports PRESENTED ON: October 18-21, 2020 INTRODUCTION: Foreign body aspiration is an important cause of emergency hospital admissions in young children less than 3 years of age. It may manifest as acute respiratory difficulty, choking and wheeze or may be asymptomatic. Subcutaneous emphysema is an unusual presentation of bronchial foreign body aspiration in young children. A 3-year-old female child was admitted with swelling of the left side of neck, incidentally noticed by the mother. Initially evaluated at local hospital and x ray chest done showed unilateral hyper lucency on left side with subcutaneous emphysema on left neck.Diagnostic rigid bronchoscopy was done under general anaesthesia and a vegetable foreign body(peanut) was detected in the left main bronchus and retrieved,. CASE PRESENTATION: A 3-year-old female child was brought to the hospital with complaints of swelling of the left side of the neck of 2 days duration. She had no history of any similar episode in the past. Physical examination revealed that the child was conscious,active with no evidence of respiratory distress. Subcutaneous emphysema was noted over her left neck. Auscultation revealed diminished air entry with fine crepitations on the left side of the chest.Her X-ray chest(figure1) depicted hyper lucency on the left hemithorax with subcutaneous emphysema on the left side of neck.CT chest (figure 2)showed left lung hyperinflation with pneumomediastinum and subcutaneous emphysema.Emergency bronchoscopy using rigid bronchoscope revealed a vegetable foreign body (peanut) in the left main bronchus which was removed. The patient showed good recovery and repeat x ray (figure 3)showed resolution of the subcutaneous emphysema and hyper inflation. DISCUSSION: Foreign body aspiration into tracheobronchial tree is commonly seen in young children less than three years due to incomplete laryngeal closure and inadequate swallowing reflex in this age. Definitive history of FB aspiration, a sudden appearance of respiratory symptoms and radiological investigations play an important role in making diagnosis of FB in the airway. In some cases, there is no history of FB aspiration but with the sudden onset of respiratory symptoms, the treating physician must suspect FB in the airway. Chest X-ray findings may not confirm the diagnosis as radio-opaque foreign bodies are rare, but associated findings such as hyperinflation, mediastinal shift and pneumonitis, secondary to FB may contribute to the diagnosis. Pneumomediastinum and subcutaneous emphysema without pneumothorax are uncommon presentation of FB in the airway.Only few such cases of foreign body aspiration have been reported in literature.(123) CONCLUSION(S): Foreign body aspiration should be considered as a differential diagnosis in a child with acute onset of unexplained subcutaneous emphysema.Bronchoscopy should be considered for diagnostic as well as therapeutic purposes. Reference #1: Narasimhan KL, Chowdhary SK, Suri S, Mahajan JK, Samujh R, Rao KL. Foreign body airway obstruction in children: Lessons learnt from a prospective audit. J Indian Assoc Pediatr Surg 2002;7:184-9. Reference #2: Mehta AK, Sarin D. Subcutaneus emphysema: An unusual presentation of foreign body bronchus. Med J Armed Forces India 2007;63:71-2. Reference #3: Ramadan HH, Bu-Saba N, Baraka A, Mroueh S. Management of an unusual presentation of foreign body aspiration. J Laryngol Otol 1992;106:751-2. DISCLOSURES: No relevant relationships by Nagarajan Appusamy, source=Web ResponseCopyright © 2020 American College of Chest Physicians

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1. **Unusual presentations of COVID-19 pneumonia on CT scans with spontaneous pneumomediastinum and loculated pneumothorax: A report of two cases and a review of the literature**  
   Brogna Barbara Heart & lung : the journal of critical care 2020;49:864-868.

Spontaneous pneumomediastinum (SPM) and Loculated pneumothorax (LPNX) are both generally rare clinical and radiological conditions associated with Coronavirus Disease 2019 (COVID-19). We report for the first time clinical data and radiological chest CT imaging of two patients affected by COVID-pneumonia associated with early radiological findings of SPM and LPNX. Copyright © 2020 Elsevier Inc. All rights reserved.

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1. **Use of an antiviral filter attached to a pleural drain bottle to prevent aerosol contamination with SARS-CoV-2**  
   Akhtar Mohammed R. Clinical medicine (London, England) 2020;20:e60-e61.

Pneumothoraces (1%) and pleural effusions (5%) are two of the less common complications of infection with COVID-19. Following a referral for a pleural drain insertion for a pneumothorax in a patient with COVID-19, we reassessed the infection risks involved in this procedure and its aftercare. Pleural drainage tubes attached to an underwater seal drain allow expulsion of aerosol and larger droplets via the vent from the bottle into the surrounding environment, potentially leading to infection of other patients and staff.Consequently, we chose to attach an antiviral filter to the venting port of an underwater seal drain bottle to mitigate this risk. A fluorescein dye experiment was used to demonstrate the reduction in aerosol emission output from the bottle with our described technique, allowing an antiviral filter to be attached to a pleural underwater seal drainage bottle for added protection of patients and staff in the local environment. Copyright © Royal College of Physicians 2020. All rights reserved.

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1. **Use of an antiviral filter attached to a pleural drain bottle to prevent aerosol contamination with SARS-CoV-2**  
   Akhtar M. R. Clinical Medicine, Journal of the Royal College of Physicians of London 2020;20:No page numbers.

Pneumothoraces (1%) and pleural effusions (5%) are two of the less common complications of infection with COVID-19. Following a referral for a pleural drain insertion for a pneumothorax in a patient with COVID-19, we reassessed the infection risks involved in this procedure and its aftercare. Pleural drainage tubes attached to an underwater seal drain allow expulsion of aerosol and larger droplets via the vent from the bottle into the surrounding environment, potentially leading to infection of other patients and staff. Consequently, we chose to attach an antiviral filter to the venting port of an underwater seal drain bottle to mitigate this risk. A fluorescein dye experiment was used to demonstrate the reduction in aerosol emission output from the bottle with our described technique, allowing an antiviral filter to be attached to a pleural underwater seal drainage bottle for added protection of patients and staff in the local environment.Copyright © Royal College of Physicians 2020. All rights reserved.

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1. **Vascular changes detected with thoracic CT in coronavirus disease (COVID-19) might be significant determinants for accurate diagnosis and optimal patient management**  
   Qanadli S. D. American Journal of Roentgenology 2020;215:W15.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=8bcdc02991107842a6a65cf7fb6d4376)

1. **Veno-venous extracorporeal membrane oxygenation for COVID-19-associated pediatric acute respiratory distress syndrome**  
   Lewis D. Perfusion (United Kingdom) 2020;35:550-553.

Background: The SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2) coronavirus has emerged as a highly contagious respiratory pathogen causing severe acute lung injury. Extracorporeal membrane oxygenation is a standard tool for the management of life-threatening acute respiratory distress syndrome, but the use of this resource-intensive therapy has come into question due to strained medical systems and limited proven treatments for COVID-19. Case summary: A 16-year-old female with obesity presented with fever, myalgias, cough, and tachypnea and was diagnosed with COVID-19. She progressed to severe pediatric acute respiratory distress syndrome requiring intubation on hospital day 4 and cannulation to veno-venous extracorporeal membrane oxygenation on hospital day 6. The patient received remdesivir, steroids, and anakinra. The patient was successfully decannulated on hospital day 12 and was discharged home on hospital day 21. Conclusion(s): We report the use of veno-venous extracorporeal membrane oxygenation as a bridge to lung recovery in a pediatric patient with severe pediatric acute respiratory distress syndrome due to COVID-19.Copyright © The Author(s) 2020.

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1. **Vocal Fremitus**  
   Modi Pranav 2020;:No page numbers.

Chest inspection, palpation, and auscultation are key components of the physical examination of patients with respiratory disease. Palpation ascertains the signs suggested by inspecting and assessing the state of the pleura and lung parenchyma by studying the vocal fremitus. Vocal (tactile) fremitus is palpation of the chest wall to detect changes in the intensity of vibrations created with certain spoken words in a constant tone and voice indicating underlying lung pathology.[1][2][3] Pathophysiology Sound vibrations produced in the larynx during phonation are transmitted to the bronchi and lungs and then communicated to the chest wall. Transmission of spoken tones depends on the state of the underlying lung parenchyma in the pleural space. Normal lung parenchyma is a mixture of air-filled spaces and solid lung parenchyma. Air is a poor conductor of low sound frequencies whereas a solid or dense medium increases the transmission of low sound frequencies. Vocal fremitus may be decreased in conditions affecting the lung parenchyma, pleura, or chest wall.[4] Vocal fremitus is decreased in bronchial asthma, emphysema, or bronchial obstruction due to air trapping and decreased density of lung parenchyma. In case of pleural effusion and pneumothorax, air/fluid accumulates in the potential space between the chest wall and lung parenchyma, decreasing the transmission of lower frequency sound vibrations. Vocal fremitus also may be decreased in individuals with obesity. On the other hand, inflammation and consolidation create a dense medium which increases the transmission of lower frequency sounds and vocal fremitus. Vocal resonance is the auscultatory counterpart of vocal fremitus. The following changes in vocal resonance are seen.[5][6] Bronchophony: A louder sound heard over an area of consolidation. Whispering pectoriloquy: While the examiner auscultates over the lung fields, the patient is asked to whisper "one, two, three." Whispered words are heard clearly in the presence of consolidation. Whispered pectoriloquy has the same significance as increased fremitus and adds no new information to those approaches. Egophony or an "E to A" change: A qualitative change in the voice that resembles the bleating of a goat. Select sound frequencies are able to pass through consolidation and tend to distort the sound of the vowel "E" so that it is perceived by the examiner as "A" or "AAAH." Other types of fremitus: Ronchial fremitus - palpable ronchi. Pleural fremitus - palpable pleural rub. Copyright © 2020, StatPearls Publishing LLC.

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1. **[Spontaneous pneumothorax and pneumomediastinum in bilateral pneumonia due to COVID-19]**  
   Vela Colmenero R. M. Neumomediastino y neumotorax espontaneo en neumonia bilateral por COVID-19. 2020;44:591-592.

[Available online at this link](https://www.knowledgeshare.nhs.uk/index.php?PageID=link_resolver&link=cc2ea1247a7ded07f9b3daf524db68ef)

1. **A case of Bullous lung disease**  
   Devu B. K. Indian Journal of Public Health Research and Development 2019;10:868-870.

Bullous Lung disease is the formation of bullae in the lung due to multiple factors. The risk factors of COPD are adjunct with the risk of bullous lung disease. The affected patients commonly exhibit the respiratory symptoms similar to that of COPD cases. Usually chest imaging reveals the condition. Men are more likely to get affected. In this article we report a case of Bullous Lung Disease in a 57 year old male patient.Copyright © 2019, Indian Journal of Public Health Research and Development. All rights reserved.

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1. **A case of subcutaneous emphysema/mediastinal emphysema during the use of humidified high-flow nasal cannula**  
   Sonobe Shota JA clinical reports 2019;5:85.

BACKGROUND: Heated, humidified, high-flow nasal cannula (HHFNC) oxygen therapy allows optimal humidification of inspired gas at high flows and creates a distending pressure similar to nasal continuous positive airway pressure [1]. It has been safely used in adults with moderate hypoxemia with few complications [2, 3]. Hereby, we report serious complications occurred during HHFNC oxygen therapy., CASE PRESENTATION: A 53-year-old female with hemophagocytic lymphohistiocytosis (HLH) was admitted to the intensive care unit because of respiratory failure. After weaning from mechanical ventilation which lasted for 2 weeks, HHFNC therapy at 40 L/min with an FiO2 of 0.5 was started for hypoxemia. Four days later, dyspnea and hypoxemia occurred and chest X-ray and CT scan revealed localized pneumothorax, subcutaneous emphysema, and massive pneumomediastinum. After cessation of HHFNC, respiratory condition improved., CONCLUSION: Subcutaneous emphysema, pneumothorax, and pneumomediastinum should be notified as a serious complication during HHFNC therapy.

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1. **A rare case of tuberous sclerosis associated lymphangioleimyomatosis**  
   Debella Y. T. American Journal of Respiratory and Critical Care Medicine 2019;199:No page numbers.

Introduction: Pulmonary lymphangioleiomyomatosis (LAM) belongs to a rarer group of interstitial lung disease commonly seen in females of child bearing age characterized by diffuse cystic lung changes. It can occur as a sporadic disease or in association with tuberous sclerosis(TS) , an autosomal dominant disorder characterized by seizures, mental retardation, skin lesions and various hamartomatous lesions including renal angiomyolipoma (AML) .Herein we present a case of LAM associated with TS. Case report A 31-year-old female, never smoker with TS diagnosed at 7 months of age after presenting with seizure and later diagnosed to have central nervous system tumors, refractory seizure, bilateral AML of kidneys with bleeding requiring embolization presented to our clinic for evaluation of abnormal chest scan. She has no family history of TS or other known chronic lung disease. She has no respiratory symptoms. Physical examination was notable for angiofibromas on the face and trunk. Chest CT showed numerous, cystic lesions and micronodules bilaterally. Pulmonary function test showed a normal spirometry and lung volumes, mildly reduced DLCO. With the clinical suspicion of LAM, VEGF- D level was checked and came back 4996pg/ml which was consistent with the diagnosis of LAM.Patient was offered treatment with sirolimus considering recurrent bleeding AML and very high VEGF-D level. However she declined treatment and opted for observation. Discussion TS associated LAM (TSC-LAM) is the most common pulmonary manifestation of TS(30%) commonly seen in TSC2 mutations. Respiratory manifestations of sporadic LAM and TSC-LAM are similar. Common symptoms include fatigue, dyspnea, spontaneous pneumothorax and pleural effusion. Other symptoms include chest pain, hemoptysis, and chylothorax. Characteristic chest CT findings include cysts which are thin-walled, diffuse, round, well-defined, bilateral, and without lobar predominance. Diagnosis can be established by characteristic cysts in patients who have tuberous sclerosis complex (TSC), renal angiomyolipomas (AMLs), and elevated levels of vascular endothelial growth factor-D (VEGF-D; >=800 pg/mL).Definitive pathologic diagnosis is made by lung biopsy showing proliferation of atypical smooth muscle-like cells (LAM cells) and positive HMB-45 immunostaining. Patients with LAM who are asymptomatic or mild abnormal lung function can be followed with supportive measures. Sirolimus is indicated for symptomatic patients with abnormal lung function (FEV1 <70 %), evidence of rapidly progressive disease, or problematic chylous accumulations. Conclusion LAM should be considered in all women of child bearing age with the diagnosis of TSC. Diagnosing LAM can be prognostically important, for early intervention with treatments which has been proven to stabilize pulmonary function. (Figure Preseted).

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1. **Analysis of a-line patterns seen on lung ultrasound scans in healthy volunteers following spontaneous breathing and high flow nasal cannula therapy**  
   Kwan J. Y. Journal of the Intensive Care Society 2019;20:12.

A-lines are a type of ultrasonographic artefact seen as horizontal lines arising at regular intervals from the pleural line. The presence of A-lines can either be a variant of normality or pathological conditions like pneumothorax.1 Currently, there is a lack of guidelines and recommendation about the usage of A-lines analysis in the diagnosis and monitoring of respiratory conditions. 2 This study is designed to determine whether hyperinflation of the lungs results in a difference in the number and echogenicity of A-line artefacts on lung ultrasound scans. We performed a prospective before-and-after trial on 37 healthy volunteers. Lung ultrasound scans were performed before and right after 15 minutes of high-flow nasal cannula (HFNC) air therapy, which was used to increase the endexpiratory volume of the lungs to create a state of hyperinflation. Two variables were analysed: the number and echogenicity of A-line artefacts. Changes in the number of A-line artefacts before and after HFNC were analysed using a paired t-test. Out of 37 healthy participants, 28 showed a significant increase in the number of A-lines [1.27, 95% CI 0.82 to 1.72, P<0.0001] after 15 minutes of HFNC. Conversely, a majority 51.4% of participants (19 participants) showed no changes in echogenicity. However, a two-sided P value of P=0.0127 (P<0.05) obtained using a sign test indicates that if there is any change, it is more likely to be an increase in echogenicity. Since hyperinflation of the lungs results in a significant increase in the number of A-lines, lung ultrasonography has the potential to be used as a point of care tool for the monitoring of the degree of inflation of the lungs, and thus the severity of Chronic Obstructive Pulmonary Disease (COPD) and asthma attacks. It can also be used in the monitoring of mechanical ventilation and prevention of ventilator-induced lung injury (VILI).

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1. **Analysis of A-line patterns seen on lung ultrasound scans in healthy volunteers following spontaneous breathing and high-flow nasal cannula therapy**  
   Kwan J. Y. Ultrasound 2019;27:NP33-NP34.

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1. **ARDS ASSOCIATED WITH HUMAN METAPNEUMOVIRUS INFECTION COMPLICATED BY TENSION PNEUMOTHORACES**  
   Iwuji K. Chest 2019;156:A498-A499.

SESSION TITLE: Monday Fellow Case Report Posters SESSION TYPE: Fellow Case Report Posters PRESENTED ON: 10/21/2019 02:30 PM - 03:15 PM INTRODUCTION: Human metapneumovirus (hMPV), discovered in 2001, causes respiratory tract infections in children and adults. It is an enveloped, negative-sense RNA virus and a member of the family Pneumoviridae. Infection with hMPV is associated with significant airway inflammation, mucus hyperproduction, and hyperplasia of the airway [1]. CASE PRESENTATION: A 38-year-old woman presented to the hospital with two days of progressive dyspnea and non-productive cough. She was seen recently at an urgent care clinic and started on azithromycin for community acquired pneumonia. Her clinical condition quickly deteriorated. Within hours of her hospital admission, she went into septic shock and acute hypoxic respiratory failure with bilateral infiltrates on chest x-ray (CXR) suggestive of acute respiratory distress syndrome (ARDS). She was subsequently intubated and managed with airway pressure release ventilation mode due to refractory hypoxemia. Her initial laboratory results showed white blood cell count of 13K/muL, creatinine of 1.9 mg/dL, and mild transaminitis. Her respiratory molecular diagnosis panel was positive for human metapneumovirus (hMPV). On hospital day 1, the patient developed iatrogenic bilateral tension pneumothoraces due to elevated peak airway pressures (>40 cm of water)and decreased lung compliance (<10 mL/cm of water) despite protective lung ventilation strategy. CXR was remarkable for a left-sided deep sulcus sign (Figure 1). Emergent bilateral chest tubes were placed. She was chemically paralyzed and placed on prone position to manage her ARDS and hypoxemia. By hospital day 12, she was extubated and transferred out of the intensive care unit. DISCUSSION: Discovered in Netherlands, hMPV causes upper and lower respiratory tract infection in children and adults. It has a seasonal variation and tends to present more during the winter and early spring season in United States.[1] With an incubation period of 5 to 9 days, hMPV generally causes mild, self-limited upper and lower respiratory symptoms. Among patients that require hospitalization, clinical manifestations range from bronchiolitis or asthma exacerbation to severe pneumonia or ARDS as seen in our patient[2]. The most sensitive and preferred method of diagnosing hMPV is by reverse-transcriptase polymerase chain reaction (PCR) testing. Direct fluorescent antibody and viral culture are other methods that may be used if PCR is not readily available.[3] Treatment is generally supportive and may vary based on clinical manifestation. There is no approved antiviral medication for hMPV. The use of antibiotics is usually not recommended as the rate of secondary bacterial infection in patients with hMPV is generally very low [1,2,3]. CONCLUSION(S): Infections with hMPV can range from mild respiratory symptoms to life threatening pneumonia causing ARDS. Diagnosis can quickly be achieved by respiratory PCR panel. Treatment is generally supportive. Reference #1: Kumar P, Srivastava M. Prophylactic and therapeutic approaches for human metapneumovirus. Virusdisease. 2018 Dec;29(4):434-444. Reference #2: Haas LE, Thijsen SF, van Elden L, Heemstra KA. Human metapneumovirus in adults. Viruses. 2013 Jan 8;5(1):87-110. Reference #3: Panda S, Mohakud NK, Pena L, Kumar S. Human metapneumovirus: review of an important respiratory pathogen. Int J Infect Dis. 2014 Aug;25:45-52. DISCLOSURES: No relevant relationships by Amr Ismail, source=Web Response No relevant relationships by Kenneth Iwuji, source=Web Response No relevant relationships by Kenneth Nugent, source=Web Response No relevant relationships by David Sotello Aviles, source=Web Response No relevant relationships by Andres Yepes, source=Web ResponseCopyright © 2019 American College of Chest Physicians

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1. **Association between vitamin D level at birth and respiratory morbidities in very-low-birth-weight infants**  
   Kim I. Korean Journal of Pediatrics 2019;62:166-172.

Purpose: This study aimed to evaluate vitamin D status at birth in very-low-birth-weight infants (VLBWIs: <1,500 g) and to determine the association between vitamin D level and respiratory morbidity. Method(s): A retrospective study was conducted at Soonchunhyang University Bucheon Hospital between November 2013 and November 2017. We collected blood samples and data on respiratory morbidity from 230 VLBWIs on the first day of life. Patients who were transferred to other hospitals (n=19), died before 36 weeks of gestational age (n=18), or whose blood samples were not collected immediately after birth (n=5) were excluded. Finally, 188 patients were enrolled. VLBWIs with different vitamin D levels were compared with respect to demographic features, maternal diseases, respiratory morbidities, and other neonatal diseases. Result(s): The mean serum vitamin D level, as measured by 25-hydroxyvitamin D (25(OH)D), was 13.4+/- 9.3 ng/mL. The incidence of vitamin D deficiency (<20 ng/mL) was 79.8%, and 44.1% of preterm infants had severe vitamin D deficiency (<10 ng/mL). Logistic analysis shows that a low serum 25(OH)D level (<20 ng/mL) was a risk factor for respiratory distress syndrome (odds ratio [OR], 4.32; P=0.010) and bronchopulmonary dysplasia (OR, 4.11; P=0.035). Conclusion(s): The results showed that 79.8% of preterm infants in this study had vitamin D deficiency at birth. Low vitamin D status was associated with respiratory morbidity, but the exact mechanism was unknown. Additional studies on the association between vitamin D level and neonatal morbidity are required.Copyright © 2019 by The Korean Pediatric Society.

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1. **Avoiding term admissions into neonatal units: How do we best identify areas for improvement**  
   Firth C. Archives of Disease in Childhood 2019;104:A91.

Aims ATAIN (Avoiding Term Admissions Into Neonatal units) is an NHS England Quality Improvement initiative to reduce admission of full-term babies to neonatal care. All term admissions are collaboratively reviewed by neonatal and maternity teams to identify avoidable admissions and areas to focus quality improvement. We aimed to review our term admissions using the guidance for clinical review team questions (GCRTQs) published in NHS Improvement's 'Reducing harm leading to avoidable admission of full-term babies into neonatal units: findings and resources for improvement.' Methods All term (>37 weeks) admissions to the neonatal unit between April and June 2018 were identified. Badger and notes documentation was collaboratively reviewed and compared to the GCRTQs for respiratory symptoms, jaundice and hypoglycaemia. Results 50 babies were identified. 31/50 (62%) had respiratory symptoms. One baby was born by elective c-section before 39 weeks (with appropriate medical indication). 11/31 did not require respiratory intervention to warrant separation. However, 6 of these had evidence of infection, 1 had a moderate pneumothorax, 1 had recurrent dusky episodes, and 1 had a cleft palate. 2 were subsequently noted to have other problems (early jaundice and hypoglycaemia). None were deemed appropriate for transitional care (TC) at admission. Length of stay ranged from 1 to 11 days. No admissions were for default concerns, and intrapartum antibiotics were given appropriately. 3/50 (6%) were jaundiced. Two were less than 24 hours old and all required high-intensity phototherapy. One Mum had refused anti-D. 2/50 (4%) were hypoglycaemic. Both had risk factors, other associated clinical signs and required IV dextrose. Neither was hypothermic. The GCRTQs did not identify other issues for babies with jaundice or hypoglycaemia. 13/50 (26%) were admitted for other reasons (of whom 6 had bilious vomiting, and 3 required observation for neonatal abstinence with associated social issues). Conclusion The GCRTQs did not identify specific clinical insights in our tertiary neonatal unit, which has relatively low term admission rates and well-established transitional care facilities. We suggest in such settings, rather than review of all term admission using GCRTQs, areas for quality improvement are more likely to be identified through collaborative review of clinical incidents related to term admissions, near-misses and unexpected term TC admissions.

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1. **Cardiac injury due to the rapid progress of the dislocation of rib fractures: A rare case that required urgent open reduction and internal rib fixation**  
   Okamoto K. Respiratory Medicine Case Reports 2019;27:100840.

Background: Most rib fractures are treated conservatively, but patients with severe trauma may require surgical treatment. We report a rare case of delayed pericardial injury due to a fractured rib stump. Case presentation: A 61-year-old man fell while riding a bicycle and was transferred to our hospital. A computed tomography (CT) scan showed mild rib fractures on the 4th-6th ribs, and he was hospitalized because of acute pain. A few days later, his respiratory condition had worsened. CT showed that the rib fractures progressed significantly, and the stump was in contact with the heart, so we performed an urgent surgical rib fixation. Operative findings revealed intrathoracic hemorrhage by the pericardial laceration because of the rib stump. The 4th-7th ribs were internally fixed using a screwless titanium metal plate, and he was discharged without complications on the 20th postoperative day. Conclusion(s): We experienced a rare case of pericardial injury caused by a rapid dislocation of rib fractures. Urgent surgical treatment was able to prevent a serious complication.Copyright © 2019 The Authors

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1. **Clinical presentation and outcome in congenital pulmonary malformation: 25 year retrospective study in Thailand**  
   Maneenil G. Pediatrics International 2019;61:812-816.

Background: Congenital pulmonary malformations (CPM) are a group of rare abnormal lung development lesions that can have various presentations. The aim of this study was to define the differences in the clinical presentations of CPM in neonates, infants, and children, and to review the outcomes. Method(s): A retrospective study was conducted at a tertiary care hospital in southern Thailand between 1992 and 2016. Result(s): Fifty-four patients were diagnosed with CPM, and the median age at onset was 1.7 months (IQR, 0.03-10 months). There were 33 cases (61.1%) of congenital pulmonary airway malformations, two (3.7%) of bronchogenic cyst, eight of (14.8%) congenital lobar emphysema, seven of (13.0%) pulmonary sequestrations, and four of (7.4%) congenital lung cysts. Twenty patients under 1 month old and 16 patients who were 1-12 months old had symptoms of respiratory distress. In contrast, 13 patients >1 year old had symptoms of pulmonary infection. There were significant differences in the numbers of patients who had cyanosis (P = 0.006), cough (P < 0.001), and fever (P < 0.001) between the three age groups. Thirty-eight patients (70%) required surgical treatment involving lobectomy (78.9%). Median follow-up duration was 28.1 months (IQR, 3.7-9.4 months). Nine of 10 patients had abnormal lung function tests, and 80.6% of patients had no subsequent limitations in physical activities. Conclusion(s): Respiratory distress is the important clinical feature in neonates and infants, whereas the signs of pulmonary infection usually occur in children >1 year old. Good outcomes usually occur after surgery but need long-term follow up including lung function assessment.Copyright © 2019 Japan Pediatric Society

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1. **Common Pulmonary Conditions in Sport**  
   Gonzalez Armando Clinics in sports medicine 2019;38:563-575.

Respiratory symptoms and infections are common among athletes. Viral upper respiratory infection symptoms may precede dyspneic symptoms seen in asthmatics or worsen symptoms of exercise-induced bronchoconstriction Knowing how to instruct an athlete on use of inhalers and having an asthma action plan are critical in management of these athletes. Other life-threatening conditions that may be seen are pneumothorax and laryngeal/pharyngeal perforation. Prompt recognition and treatment are crucial if an athlete is suspected to have pulmonary compromise. Laryngeal/pharyngeal perforations are a rare cause of issues within the training room but require a high degree of suspicion to be diagnosed and managed properly. Copyright © 2019 Elsevier Inc. All rights reserved.

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1. **CONGENITAL PULMONARY AIRWAY MALFORMATION: A RARE CAUSE OF HEMOPTYSIS IN ADULTHOOD**  
   Rosales B. Chest 2019;156:A1236.

SESSION TITLE: Tuesday Fellows Case Report Posters SESSION TYPE: Fellow Case Report Posters PRESENTED ON: 10/22/2019 01:00 PM - 02:00 PM INTRODUCTION: Congenital pulmonary airway malformation (CPAM) is a rare cystic parenchymal disease. While typically diagnosed in utero or infancy, CPAM has been identified in previously undiagnosed adults presenting with hemoptysis or recurrent pulmonary infection (1,2). CASE PRESENTATION: A 33 year old female with a history of CPAM status post right lower lobectomy and tobacco dependence presented to the emergency center for evaluation of recurrent hemoptysis. Several days prior to presentation, the patient experienced an upper respiratory infection (URI) and was treated with antibiotics. Toward the end of the antibiotic course, the patient developed progressive hemoptysis. She had one similar episode in her 20s that ultimately lead to CPAM diagnosis. On evaluation, the patient was well nourished, anxious and with normal vital signs. Exam was remarkable only for diminished sounds in the right lower lobe. The patient reported fatigue, nasal congestion and hemoptysis. Lab results were unremarkable. Due to a history of CPAM and complaints of recent URI, the patient underwent a chest computed tomography (CT) scan which showed diffuse cystic disease of the right lung with air-fluid levels within several cysts. The left lung demonstrated mild mosaic attenuation. Compared to a chest CT scan from 2008, the right lung parenchyma displayed progressive tissue deterioration. To evaluate the hemoptysis further, the patient underwent a bronchoscopy which revealed a brisk bleed from the right upper lobe. An endobronchial blocker was placed, and an embolization of the right bronchial artery performed. Following recovery, the patient was referred to thoracic surgery to evaluate for pneumonectomy. DISCUSSION: CPAMs are harmatomatous lesions that develop within the lower respiratory tract during embryogenesis. They are divided into 5 histologic groups with varying risk of malignancy (1,3). All affected individuals are at risk for infection, hemoptysis and pneumothorax. While rare, CPAM is the most common cause of congenital parenchymal disease occurring in 1-4/100,000 births (1). Diagnosis is typically made in utero or infancy but can be delayed due to mild disease or lack of symptoms. Like the patient in this case, adults may be diagnosed with CPAM after developing new respiratory symptoms (2). Recommended management for symptomatic patients is lobectomy or pneumonectomy (4). Surgical management of asymptomatic patients is an open question. CONCLUSION(S): Being aware of this disease may help facilitate earlier diagnosis and management of previously undiagnosed adult patients. Reference #1: Wong KKY, et al. Congenital pulmonary airway malformation: advances and controversies. Lancet Child Adolesc Health. 2018;2(4):290-297. Reference #2: Herrero Y, et al. Cystic Adenomatoid Malformation of the Lung Presenting in Adulthood. Ann Thorac Surg. 2005;79(1):326-329. Reference #3: Pogoriler J, et al. Congenital Cystic Lung Lesions. Am J Surg Pathol. 2019;43(1):47-55. DISCLOSURES: No relevant relationships by Austin Meyer, source=Web Response No relevant relationships by Brittany Rosales, source=Web Response No relevant relationships by Michael Wert, source=Web ResponseCopyright © 2019 American College of Chest Physicians

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1. **Conversion From Venovenous to Venoarterial Extracorporeal Membrane Oxygenation Is Associated With Increased Mortality in Children**  
   Kovler M. L. Journal of Surgical Research 2019;244:389-394.

Background: There is an increasing national trend toward initial venovenous (VV) extracorporeal membrane oxygenation (ECMO) for infants and children with respiratory disease; however, some proportion of patients initiated on VV ECMO will ultimately require conversion to venoarterial (VA) support for circulatory augmentation. The purpose of this work is to describe patients who required conversion from VV to VA ECMO and to highlight the increased mortality in this population. Material(s) and Method(s): Demographic and disease-specific data on children who underwent VV-to-VA ECMO conversion were extracted from the Extracorporeal Life Support Organization registry. Survival comparisons to age-matched patients undergoing unconverted ECMO runs were made using the 2016 Extracorporeal Life Support Organization International Summary report. The relative risk (RR) of death associated with VV-to-VA conversion was calculated, and statistical analysis of survival was performed using a chi-squared test with P < 0.05 for significance. Result(s): This study cohort consisted of 1382 patients who required VV-to-VA conversion. The overall hospital survival rate for neonates requiring conversion was 60%, compared with 83% for unconverted VV runs and 64% for unconverted VA runs (RR 1.23; 95% confidence interval, 1.14-1.34). Similarly, the survival of older children requiring conversion was 46% compared with 66% and 51%, respectively (RR 1.16; 95% confidence interval, 1.06-1.27). Conclusion(s): VV-to-VA conversion does occur and is associated with increased mortality. The need for conversion from VV to VA ECMO may represent an early failure to recognize physiologic parameters or disease severity that would be better managed with initial VA support. Further research is needed to pinpoint the cause of increased mortality and to identify predictors of VV failure to optimize initial mode selection.Copyright © 2019 Elsevier Inc.

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1. **Current operative management of congenital lobar emphysema in children: A report from the Midwest Pediatric Surgery Consortium**  
   Kunisaki S. M. Journal of Pediatric Surgery 2019;54:1138-1142.

Purpose: The purpose of this study was to evaluate the clinical presentation and operative outcomes of patients with congenital lobar emphysema (CLE)within a large multicenter research consortium. Method(s): After central reliance IRB-approval, a retrospective cohort study was performed on all operatively managed lung malformations at eleven participating children's hospitals (2009-2015). Result(s): Fifty-three (10.5%)children with pathology-confirmed CLE were identified among 506 lung malformations. A lung mass was detected prenatally in 13 (24.5%)compared to 331 (73.1%)in non-CLE cases (p < 0.0001). Thirty-two (60.4%)CLE patients presented with respiratory symptoms at birth compared to 102 (22.7%)in non-CLE (p < 0.0001). The most common locations for CLE were the left upper (n = 24, 45.3%), right middle (n = 16, 30.2%), and right upper (n = 10, 18.9%)lobes. Eighteen (34.0%)had resection as neonates, 30 (56.6%)had surgery at 1-12 months of age, and five (9.4%)had resections after 12 months. Six (11.3%)underwent thoracoscopic excision. Median hospital length of stay was 5.0 days (interquartile range, 4.0-13.0). Conclusion(s): Among lung malformations, CLE is associated with several unique features, including a low prenatal detection rate, a predilection for the upper/middle lobes, and infrequent utilization of thoracoscopy. Although respiratory distress at birth is common, CLE often presents clinically in a delayed and more insidious fashion. Level of Evidence: Level III.Copyright © 2019 Elsevier Inc.

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1. **Delivering the 100,000 genomes project to establish the functional role of DNA sequence variants in respiratory rare diseases**  
   Shovlin C. L. Thorax 2019;74:A44-A45.

Background and aims Between July 2016 and September 2018, NHS Genomic Medicine Centres (GMCs) recruited families with specified rare diseases to the 100,000 Genomes Project for whole genome sequencing (WGS), and linkage to pheno-typic information from NHS Health Records. Methods Genomics England protocols were followed for disease nominations, data model generation based on human phenotype ontology (HPO) terms,1 and development/review of PanelApp gene panels.2 Genomics England performed all WGS, data alignments, and initial variant tiering. This incorporated appropriate familial segregation patterns for variants in genes known to cause the patient's disease (Tier 1: clear loss of function variants, Tier2: other variants), and clear loss of function or de novo variants in other genes (Tier 3). The Respiratory GeCIP (Clinical Interpretation Partnership) was established to analyse full WGS/phenotypic datasets. Results Six respiratory diseases were nominated and passed through 100K pipelines: primary ciliary dyskinesia (PCD), familial pulmonary fibrosis (FPF), aggressive non-CF bron-chiectasis, pulmonary arteriovenous malformations (PAVMs), hereditary haemorrhagic telangiectasia (HHT) and familial pneumothorax. National and international networks were established for each, including a focus on patient/public engagement. Patient results were returned to UK GMCs from August 2017. Recruited participants with recessive and dominant diseases each had 0-2 Tier 1 variants, 0-2 Tier 2 variants and up to 536 Tier 3 variants. Genomic diagnoses have been fed back to 57 respiratory families for 15 different genes in PCD, FPF, non-CF bronchiectasis, and PAVMs/HHT, already modifying PanelApp, with validations in two potentially new ciliopathy genes in progress. Full WGS results have been released quarterly to the Research Data Embassy at steadily increasing numbers. HPO term capture identifies further patients; for example, there are data on 269 families recruited with bronchiectasis plus another 27 with relevant HPO terms. Respiratory GeCIP Data Embassy access and Projects were secured through 2018-2019. New analytic resources available through the Data Embassy (particularly LabKey and IVA 2.0) enable >90 Domain members to identify annotated variants through indexed systems. Custom scripts are being used to access variant information from the whole genome. Conclusions The Respiratory GeCIP has established a collaborative resource for the advancement of NHS Respiratory Genomics.

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1. **Diagnostic challenges in late-presenting congenital diaphragmatic hernia: a 16-year experience from tertiary care centre in North India**  
   Rattan K. N. Tropical Doctor 2019;49:138-141.

With increasing use of ultrasound screening, the prenatal diagnosis of congenital diaphragmatic hernia (CDH) in better resourced areas has become the norm. However, early diagnosis is still not universal in resource-poor settings and late presentations of CDH continue. We retrospectively analysed the medical records of children operated for late-presenting CDH from 2001 to 2016 at our tertiary care centre in North India. A total of 32 patients were operated during the period with a male-to-female ratio of 3:1. Of these, 78% presented with respiratory symptoms, 37% with recurrent vomiting and 18% with an acute abdomen. Nine (28%) had been treated erroneously for gastroenteritis and another six (18%) had received anti-tubercular therapy for variable periods. A plain chest radiograph with a Ryle's tube in situ was confirmatory in 75% (24/32). In conclusion, initial misdiagnosis and subsequent unnecessary therapeutic interventions were the leading cause of morbidity.Copyright © The Author(s) 2019.

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1. **Does air pollution really impact the onset of spontaneous pneumothorax" A french case-crossover study**  
   Marx T. American Journal of Respiratory and Critical Care Medicine 2019;199:No page numbers.

Rationale: A link is established between air pollution and respiratory diseases. Very few studies evaluated this link with primary spontaneous pneumothorax (PSP). Contrasted results, low statistical power and methodological limits of these studies brought us to evaluate in a more thorough way this link. The objectives are: (1) to estimate the relation between PSP and air pollutants namely nitrogen dioxide (NO2), ozone (O3) and particulate matter with a diameter <= 10mum (PM10); (2) to investigate a time lag effect between these pollutants and occurrence of PSP. Method(s): This study has a case-crossover design. Subjects aged >= 18 years admitted from 1st June 2009 to 31st May 2013, in 14 Emergency Departments centers on the French territory. Were excluded: patients with traumatic, secondary, recurrent or history of previous pneumothorax. NO2, O3 and PM10 data were collected hourly in monitoring stations. Three exposure assessments were retained: quantitative values, fast increase concentration of air pollutants and peak of pollution. These assessments were calculated for the entire exposure period and for each of the four days of all case and control periods: from date D-1 (Lag1) to date D-4 (Lag4). A fast increase was retained if a positive difference of concentration occurring in a 3- hour interval exceeded: 40mug/m3 for NO2 and O3, 20mug/m3 for PM10. Peaks of pollution were defined using the following norms as the cut-off: NO2 hourly average = 200mug/m3, PM10 daily average = 50mug/m3, O3 8-hour average = 120mug/m3. Result(s): In this study, 948 subjects are included. Mean age was 30.8 (standard deviation 13.2) years. Current smoker accounted for 71.5%. Only 6.4% declared a history of asthma. The percent of PSP observed was the same whatever the season considered. The mean hourly concentration of NO2, O3 and PM10 showed regular and daily variation (Figure 1). Whatever the pollutant considered, no differences were observed between case and control periods, regardless of whether the quantitative values of air pollutants exposure (p>0.09), fast increase concentration (p>0.46) and peak of pollution (p>0.20). Sensitivity analyses performed on different patient subgroups (age, sex, smoking status, history of asthma and center) yielded similar results. Conclusion(s): In this large sample of patient, our results are in favour of a lack of connection between PSP and short-term air pollution exposure and low to moderate level of NO2, O3 and PM10 concentration. An impact at higher exposure level, and/or a potentiating effect of different meteorological factors remain to be demonstrated.

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1. **Does air pollution really impact the onset of spontaneous pneumothorax? A French case-crossover study**  
   Marx Tania Environment international 2019;127:317-323.

RATIONALE: A link is established between air pollution and respiratory diseases. Very few studies evaluated this link with primary spontaneous pneumothorax (PSP). Contrasted results, low statistical power and methodological limits of these studies brought us to evaluate in a more thorough way this link., OBJECTIVES: (1) to estimate the relation between PSP and air pollutants namely nitrogen dioxide (NO2), ozone (O3) and particulate matter with a diameter<=10mum (PM10); (2) to investigate a time lag effect between these pollutants and occurrence of PSP., METHODS: This study has a case-crossover design. Subjects aged >=18years admitted from 1st June 2009 to 31st May 2013, in 14 Emergency Departments centers on the French territory. Were excluded: patients with traumatic, secondary, recurrent or history of previous pneumothorax. NO2, O3 and PM10 data were collected hourly in monitoring stations. Three exposure assessments were retained: quantitative values, fast increase concentration of air pollutants and peak of pollution. These assessments were calculated for the entire exposure period and for each of the four days of all case and control periods., RESULTS: 948 subjects included. Whatever the pollutant considered, no differences were observed between case and control periods, regardless of whether the quantitative values of air pollutants exposure (p>0.09), fast increase concentration (p>0.46) and peak of pollution (p>0.20)., CONCLUSIONS: We failed to show a relation between PSP and short-term air pollution exposure to low levels of NO2 and PM10. An association between O3 exposure and PSP cannot be ruled out. An impact at higher exposure level, and/or a potentiating effect of different meteorological factors remain to be demonstrated. Copyright © 2019 Elsevier Ltd. All rights reserved.

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1. **Effect of rewarming in oxygenation and respiratory condition after neonatal exposure to moderate therapeutic hypothermia**  
   Nitzan I. Pediatrics and Neonatology 2019;60:423-427.

Background: To assess changes in clinical condition and oxygenation in neonates after rewarming following moderate therapeutic hypothermia (MTH) for neonatal encephalopathy. Method(s): Retrospective study of 28 neonates receiving MTH in a tertiary neonatal intensive care unit in Israel. We compared pre-and 24 h post-rewarming arterial oxygen saturation (SaO2) as measured by the blood gases analyzer, pulse-oximetry saturation (SpO2), and cardio-respiratory condition. Result(s): The SpO2 declined from 96.9% (+/-2.9) before rewarming to 95.2% (+/-2.6) after rewarming (p < 0.001). Twelve neonates (42.9%) had clinical respiratory impairment (needing higher respiratory support or had new onset desaturations). In 16 neonates (57.1%) with no change in respiratory support after rewarming, SpO2 decreased from 98.3 +/- 1.9% to 95.6 +/- 3.0% (p < 0.001) and SaO2 decreased from 97.1 +/- 1.7% to 96.0 +/- 2.3% (p = 0.002). The mean SpO2 decrease was greater than mean SaO2 decrease (2.63 +/- 1.8 and 1.1 +/- 1.3 respectively, p = 0.021). Conclusion(s): Neonates who underwent MTH showed reduction in oxygenation after rewarming either by decreasing SpO2 or increasing FiO2 requirements. The SpO2 decline was larger than the SaO2 decline. We suggest careful monitoring of neonates after rewarming.Copyright © 2018

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1. **Eosinophilic pneumonia in a pediatric lung transplant patient**  
   Perkins R. American Journal of Respiratory and Critical Care Medicine 2019;199:No page numbers.

Introduction: Eosinophils are implicated in the pathogenesis of respiratory diseases, in particular, eosinophilic pneumonia. Eosinophilic pneumonia in lung transplant patients has been reported in adults, with bronchoalveolar lavage (BAL) eosinophilia being associated with lower overall survival and chronic lung allograft dysfunction (CLAD)-free survival. However, little is known about its effects in the pediatric lung transplant population. Here we report a case of recurrent eosinophilic pneumonia in a pediatric lung transplantation patient. Case Report: NS is a 13-yearold black female with history of post infectious bronchiolitis obliterans who underwent bilateral lung transplantation 3 months prior to presentation and was admitted with persistent but now progressive right apical pneumothorax. Her pneumothorax resolved with tube thoracoscopy. Four days after chest tube placement, she was noted to have an elevated white blood cell count, elevated ESR, and the interval development of bilateral lower lobe opacities on chest radiography prompting initiation of ciprofloxacin. She developed progressive increase in serum eosinophils and bronchoscopy was performed revealing 15% eosinophils in BAL and 7 eosinophils per high powered field on transbronchial biopsy. She was started on prednisone 40 mg daily with improvement in symptoms and recovery of pulmonary function. Her steroids were tapered without complication. Four months later she represented with dyspnea, chest pain and 50% reduction in FEV1. CT chest demonstrated worsening ground-glass and airspace opacities with diffuse tree in bud pattern bilaterally. Her admission labs revealed peripheral eosinophilia and elevated inflammatory markers. Flexible bronchoscopy was significant for 25% eosinophils in BAL and increased interstitial eosinophils on transbronchical biopsy. She was started on prednisone 60 mg daily with symptomatic improvement. One month later, she failed to recover her FEV1and underwent three days of pulse steroids. Subsequent serial spirometry continued to reveal severe obstruction with air trapping suggesting the development of bronchiolitis obliterans syndrome. Over the next four months she was admitted twice with respiratory distress and required corticosteroids for symptomatic improvement. During her second admission she developed progressive hypercapnic respiratory failure leading to death. Discussion(s): Eosinophilic pneumonia is observed following lung transplantation. Its etiology and clinical importance in pediatric transplantation remain unclear. Our patient developed recurrent eosinophilic pneumonia complicated by the development of CLAD and ultimately leading to death. Although only one case, this is consistent with the associations noted in adult literature. Additional studies are needed to further characterize the implications of eosinophilic pneumonia in lung transplant patients.

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1. **Gastrointestinal Dysmotility and the Implications for Respiratory Disease**  
   Ambartsumyan L. Current Treatment Options in Pediatrics 2019;5:197-214.

Purpose of the review: Gastroesophageal reflux disease (GERD) is frequently implicated as a cause for respiratory disease. However, there is growing evidence that upper gastrointestinal dysmotility may play a significantly larger role in genesis of respiratory symptoms and development of underlying pulmonary pathology. This paper will discuss the differential diagnosis for esophageal and gastric dysmotility in aerodigestive patients and will review the key diagnostic and therapeutic interventions for this dysmotility. Recent findings: Previous studies have shown an association between GERD and pulmonary pathology in children with aerodigestive disorders. Recent publications have demonstrated the presence of esophageal and gastric dysfunction, using fluoroscopic and nuclear medicine studies, in aerodigestive patients who commonly present to pulmonary and otolaryngology clinics. High-resolution impedance manometry (HRIM) has revolutionized our understanding of esophageal dysmotility and its role in pathogenesis of aspiration and esophageal dysfunction and subsequent respiratory compromise. Summary: Esophageal and gastric dysmotility have a profound effect on development of respiratory symptoms and pulmonary sequalae in aerodigestive patients. However, our understanding of the pathophysiology is in its infancy. Prospective studies are needed to address key clinical questions such as: What degree of dysmotility initiates respiratory compromise? What diagnostic tests and therapeutic options best predict aerodigestive outcomes?Copyright © 2019, Springer Nature Switzerland AG.

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1. **Identification of clinical endotypes in lymphangioleiomyomatosis to improve personalised care**  
   Johnson S. American Journal of Respiratory and Critical Care Medicine 2019;199:No page numbers.

Background. Lymphangioleiomyomatosis (LAM) is a multisystem disease with a variable clinical phenotype which makes personalising management and predicting prognosis difficult. We used a machine learning strategy based upon clinical variables in two national cohorts of patients to identify clinical endotypes with the aim of improving personalised care for LAM. Methods. Using unsupervised machine learning techniques, multiple imputation based on chained equations and principal component analysis we analysed 25, demographic, clinical and physiological variables in 173 women with LAM from the UK and 188 replication subjects from the NHLBI LAM registry. Time to death or lung transplant for the NHLBI cohort and was obtained from the US National Death Index and United Network for Organ Sharing databases. Results. Two and three cluster models were identified using principal component transformed data and dissimilarity matrix on four clustering algorithms. 16 variables identified through Recursive Feature Elimination defined two clusters comprising 51% and 49% of the cohort. Strongest discriminators between clusters were age at first symptom (23% of difference, p=2.4x10-11), age at assessment (14%, p=3.9x10-7), %TLCO (11%, p=3.8x10-6), %FEV1/%TLCO (8%, p=1.4x10-4), exertional hypoxaemia (4%, p=4.2x10-3) and VEGF-D (3%, p=2.9x10-2). Those in cluster one had earlier onset disease, airflow obstruction (low % FEV1/%TLCO), presentation was predominantly with pneumothorax or angiomyolipoma often requiring intervention. Those in cluster two were on average, 10 years older, most often presented with dyspnoea, and had more lymphatic complications, elevated VEGF-D, lower gas transfer and exertional hypoxaemia. Pneumothorax and angiomyolipomas were infrequent. Using the 13 top factors in a model reproduced these clusters in NIH LAM registry subjects. Using 21 factors to divide the cohort into 3 clusters identified an additional group of younger women with few respiratory symptoms, preserved lung function and high prevalence of angiomyolipoma and tuberous sclerosis. To determine if clusters predicted outcome we examined severity markers, not used in the model design. Oxygen use was twice as common in cluster two p=0.02. Over the first 14 years of follow-up in the NHLBI cohort, median time to death or transplant was 95, 113 and 168 months for clusters one, two and three respectively (p=0.027) although there was no overall difference over 30 years. Conclusions. We have identified reproducible, clinically relevant LAM endotypes, which may aid clinical management. Further analysis and markers may improve their prognostic value.

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1. **Importance of lung ultrasound in pediatrics**  
   Hasani S. Archives of Disease in Childhood 2019;104:A375-A376.

Acute respiratory conditions are frequent conditions in children which cause sudden respiratory function deterioration also known as dyspnea. The exact determining of etiology is still a main diagnostic challenge. Standard methods include: taking a history, clinical examination, auscultation and radiological procedures. But for many reasons, such as exposure to ionizing radiation and the inability to apply at bedside the chest radiography is not any more 'Gold standard' to acute respiratory insufficiency. Lung ultrasound (LUS) has been shown to have great sensitivity and specificity in the differential diagnosis of the most common respiratory conditions. This method can be applied bedside, it can be used even outside of hospitals, follow - up is easy and does not expose the patient to harmful ionizing radiation. According to a diagnostic algorithm called 'BLUE protocol' established by Daniel Lichtenstein lung ultrasound has been proven to be accurate in finding the true cause of respiratory insufficiency in a large number of cases. Major acute respiratory disorders are pulmonary edema, pulmonary inflammation, acute respiratory distress syndrome (ARDS), pulmonary embolism, asthma exacerbation and chronic obstructive pulmonary disease (COPD), pleural effusion and pneumothorax. Aim(s): To demonstrate the role of lung ultrasound (LUS) as the first line of pulmonary condition diagnosis, to define the role of LUS during folow-up visits in order to prevent complications, to increase awareness of LUS importance in relation to the most frequent pulmonary disease in pediatric patients. Materials-methods: We have described the LUS examination technique as normal LUS images and LUS findings in the most frequent pulmonary pediatric diseases. Result(s) and Conclusion(s): LUS has been proven to be a very important diagnostic tool in almost all lung disease in pediatric disease described but obviously still need continuous research to explore its potential.

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1. **Indications and complications of NIV in patients with cystic fibrosis: 10-year experience in a large UK adult CF centre**  
   Spoletini G. Journal of Cystic Fibrosis 2019;18:S42-S43.

Objectives: NIV is often used to treat respiratory failure in patients with CF, despite limited evidence on its indications, contraindications and complications. We report our 10-year experience in the use of NIV focusing on reasons for NIV initiation and complications. Method(s): A retrospective analysis of all cases of NIV started between 2008 and 2018 was conducted. Post lung transplant patients, those on NIV for physiotherapy, OSA or <12 hours were excluded. Demographics, comorbidities, initial ABG, NIV settings and complications were recorded. Result(s): 56 patients were started on NIV on 64 occasions (age 29 (17-52) yrs; FEV1 in the 12mo prior NIV: best 30 (14-66)% and lowest 17 (9-33)%]. Nine and seven subjects had a past history of pneumothorax (PTX) and moderate/massive haemoptysis respectively. NIV was started due to compensated type 2 respiratory failure (T2RF) with or without increased work of breathing (WOB) in 30 cases (46.9%) [median pH 7.39, pCO2 8.5 and HCO3 39] and for decompensated T2RF in 21 (32.8%) [median pH 7.31 pCO2 9.5 and HCO3 30]. Other reasons included symptomatic nocturnal hypoventilation (n = 4, 6.25%), hypoxia (n = 5, 7.8%) and increased WOB with metabolic alkalosis (n = 4, 6.25%). Pneumothorax occurred in four subjects, one with prior history of PTX. Similarly, four cases of haemoptysis occurred, two in patients with known history. No complications related to sinus disease were observed, likely because NIV was delivered mostly with humidification (79.7%) and full-face masks. Conclusion(s): Our data confirms that NIV is being used to treat patients with CF in a similar fashion to other respiratory conditions (i.e. mostly for T2RF). Despite NIV not being routinely recommended for hypoxia or increased WOB, it is used in CF for these scenarios, especially when intubation is deemed inappropriate. Finally, comorbidities including PTX and haemoptysis, often considered contraindications to NIV, should not limit the use of this technique.Copyright © 2019 European Cystic Fibrosis Society. All rights reserved

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1. **Invasive cavitary aspergillus infection complicated by abpa**  
   Yu Y. American Journal of Respiratory and Critical Care Medicine 2019;199:No page numbers.

Introduction: Aspergillus is a spore forming fungi that can cause a variety of respiratory diseases ranging from invasive infection with cavitary lesions to saprophytic or allergic manifestations. Here, we report a case of Aspergillus infection with cavitary lesions complicated by allergic bronchopulmonary apergillosis (ABPA). Case Report: A 9 year-old male with a past medical history significant for intermittent asthma presented with a 2-3 month history of persistent cough, 5-pound weight loss, and recent fever. His initial laboratory studies revealed peripheral eosinophilia (21%), and initial chest radiography showed a large cavitary lesion in the right upper lobe, with multiple smaller lesions observed on chest CT. He was admitted and started on IV antibiotics, with empiric antifungals added on hospital day #2. Immune evaluation revealed normal IgM, IgG, and IgA, but significantly elevated IgE (13,203). Bronchoscopy demonstrated severe bronchitis with elevated eosinophils (26%) and cultures positive for influenza B and Aspergillus fumigatus, and he was skin test positive for Aspergillus antigen. The following studies were negative/normal: sweat chloride test, HIV, PPD, AFB smears, echinococcus antibodies, toxocara antibodies, ACE, ANA, and ANCA. His hospital course was complicated by an increase in the size of his cavitary lesion, though he clinically improved on micafungin and voriconazole. His immediate post hospitalization course was complicated by a right pneumothorax that required readmission and chest tube placement, with prednisone started to treat ABPA. The pneumothorax ultimately resolved, and over the subsequent 8 years he has been maintained on intermittent courses of prednisone or omalizumab with posaconazole as an antifungal, and he has had stable lung function and IgE generally <1000. The initial cystic lesion has decreased in size, though other lesions have grown. Based on the history of retained primary teeth, elevated IgE level, eosinophilia, and pneumatocele, the patient scored a 33 on the NIH scoring system for hyper-IgE syndrome (HIES). However, his STAT3 genetic testing was negative for mutations associated with classic HIES. Further investigation also did not reveal a specific immunodeficiency. Discussion(s): Aspergillus lung disease has many manifestations, including invasive disease with cavitary lesions and ABPA, which is characterized by hypersensitivity to allergens of Aspergillus and elevated IgE. This patient's course was most consistent with a combination of invasive disease and ABPA, and he responded to treatment including corticosteroids, antifungals, and more recently omalizumab. Although invasive Aspergillus is typically associated with immunodeficiency, and HIES was suspected, no immune defect was identified.

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1. **Investigation of silicosis caused by agglomerated quartz stone processing dust**  
   Mao L. Respirology 2019;24:16-17.

Objective: To improve the understanding of the severity of silicosis in that industry by analysis of clinical characteristics of silicosis caused by agglomerated quartz. Method(s): Dust protective measures, air dust concentration, silica content in industry and dust exposure times, symptoms, radiological images, lung functions were retrospectively analyzed in agglomerated quartz associated silicosis patients from Jan 2015 to Dec 2018 in Shanghai Pulmonary Hospital. Result(s): All subjects were migrant workers. 87.8% of them worked in unregistered workshop without any of dust protective equipment. Average dust concentrations in workshops and countertop installation sites were 351.0mg/m3 and 127.6mg/m3, respectively. a-quartz content in dust were ranged from 70% to 99%. Respiratory symptoms, cough and exertional dyspnoea were the main complaining in 80.6% patients. 56.5% patients were upstaged in 23 patients who reexamined chest X-ray 2 months to 2 years after the first chest radiograph. The manifestations of computer tomography (CT) scans in all subjects were mainly extensively nodules, ground glass opacities, massive fibrosis, patchy shadows, nodule coalescence, emphysema and bullae. 22.4% of them were complicated with pneumothorax and 8.2% with cavity in lung. 89.6% patients CT scans were progressed in 67 who reexamined chest CT scan 2 months to 2 years after the first chest CT scan. Conclusion(s): Accelerated silicosis caused by agglomerated quartz plate processing dust is a serious disease of frequent complications, rapid progress and poor prognosis. It is urgent to strengthen legal supervision in the stone materials industry.

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1. **Lung ultrasound and the role of lung aeration score in patients with acute respiratory distress syndrome on extracorporeal membrane oxygenation: A prospective observational study**  
   Curry S. Journal of the Intensive Care Society 2019;20:29-30.

Acute respiratory distress syndrome (ARDS) is a respiratory condition characterised by progressive loss of lung aeration and impaired gas exchange. In its most severe form, ARDS may require veno-venous extracorporeal membrane oxygenation (VV-ECMO) to maintain adequate physiological parameters of ventilation. Strict imaging protocols play an important role in clinical management of patients receiving VV-ECMO. Lung ultrasound (LUS) represents an emerging bedside imaging technique, allowing for quantification of daily aeration scores based on the observed pathological aspects of lung injury in ARDS. The potential use of LUS as a tool to monitor ARDS pathology represents a significant opportunity to enhance patient care and optimise treatment delivery. The aim of this study is to determine if lung aeration scores calculated using LUS correlate with the severity of lung injury identified on bedside chest radiography (CXR) in patients with ARDS receiving VV-ECMO, using computed tomography (CT) as the reference standard. This single-centre prospective, observational study investigated consecutive adult patients diagnosed with ARDS receiving VV-ECMO admitted to Royal Papworth Hospital between October 2017-February 2018. LUS assessments were conducted to examine 12-lung regions within 24-hours of patient admission and daily thereafter until liberated from VV-ECMO. Daily lung aeration scores were calculated according to appearance of four defined ultrasound patterns. CT and CXR were conducted as per hospital protocol and an independent consultant radiologist calculated aeration scores retrospectively. Correlations between LUS aeration scores and those of CXR and CT were tested using Spearman correlation rank analysis and assessed for bias and level of agreement using the Bland-Altman method. Inter and intra-observer agreements were assessed using kappa coefficient tests. Statistical significance was fixed at 0.05. Consecutive adult patients (n=30) were prospectively screened for inclusion and data were collected from 18 patients (42yrs +/-16.07). Correlations in aeration scores indicated statistically significant results for LUS vs CT (rho=.868, p=.002) and for LUS vs CXR (rho=.498, p=.018) with good agreement and no evidence of proportional bias (B=.059; p=.664; B=.085; p=.683). Highly statistically significant correlations were found for identification of pleural effusion (rho=.601; p<.010) and pneumothorax (rho=792; p<.001). Inter-observer reliability indicated good reliability between all operators (K=.726, 95% CI:.602-.830, p<0.005; K=.699, 95% CI:.577-.810, p<0.005; K=.640, 95% CI:.489-.766, p<0.005) and good intraobserver reliability for individual operators (K=.700, 95% CI:.569 -.807, p<0.005; K=.642, 95% CI:.517 -.750, p<0.005). Lung ultrasound was demonstrated to correlate with CT for quantifying lung aeration with a good level of agreement and no evidence of proportional bias. Correlations of aeration scores between LUS and bedside CXR were also demonstrated. For identification of pleural effusions and pneumothorax, LUS was shown to be accurate with a good level of sensitivity and specificity. These results quantify a statistically significant relationship between the contemporary lung imaging techniques and LUS. In clinical practice, LUS offers clinicians a reliable and reproducible bedside imaging technique for realtime evaluation of lung pathology. In conjunction with traditional imaging techniques, routine use of LUS should be considered for assessment and monitoring in this patient group.

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1. **METASTATIC PANCREATIC CANCER MASQUERADING AS INTERSTITIAL LUNG DISEASE**  
   Patel N. Chest 2019;156:A519.

SESSION TITLE: Monday Fellow Case Report Posters SESSION TYPE: Fellow Case Report Posters PRESENTED ON: 10/21/2019 02:30 PM - 03:15 PM INTRODUCTION: Pancreatic cancer is often metastatic at presentation and occasionally presents with predominantly respiratory symptoms that can lead to further delays in diagnosis. CASE PRESENTATION: A 78 year old female with a history of breast cancer in remission presented with persistent cough for 3 months. She was found to have bilateral basilar ground glass opacities on CT chest [Image 1]. She had bronchoscopy with bronchoalveolar lavage and transbronchial biopsy that showed a neutrophil and macrophage predominant lavage with negative bacterial, fungal and acid fast cultures and benign bronchial cells and chronic inflammation on biopsy. She was treated for a presumed bacterial pneumonia. A myositis and autoimmune panel were normal. A repeat CT chest in 1 month showed worsening bilateral opacities and she was started on prednisone for presumed cryptogenic organizing pneumonia [Image 2]. She unfortunately had worsening dyspnea, worsening hypoxia requiring supplemental oxygen and again worsening bilateral opacities on a repeat CT scan 2 months later [Image 3]. She underwent surgical lung biopsy which was concerning for adenocarcinoma with mucinous and lepidic features. Staining was concerning for malignancy of gastrointestinal origin. A PET-CT scan revealed a pancreatic tail mass and a CA 19-9 was markedly elevated concerning for metastatic pancreatic adenocarcinoma. She unfortunately developed a post-surgical pneumothorax requiring a prolonged hospitalization and further deconditioning. She was not a candidate for aggressive treatment options due to decreased pulmonary reserve and poor performance status. DISCUSSION: In rare circumstances, metastatic cancers, particularly pancreatic adenocarcinomas, can present with acinar and lepidic spread of tumor which can mimic interstitial lung disease, rather than a nodular or lymphangitic presentation [1]. This can confound the diagnosis and lead to a diagnostic delay. Early consideration of surgical lung biopsy may need to be considered in cases where a clear etiology of interstitial lung disease is not evident in order to prevent further delays in diagnosis which may limit treatment options [2]. CONCLUSION(S): We present a case of metastatic pancreatic cancer presenting initially with dyspnea and chest imaging suggestive of interstitial lung disease. Surgical lung biopsy was able to confirm the diagnosis, but unfortunately not until the patient experienced a significant decline in her performance status which limited her treatment options. Early diagnosis is imperative for effective treatment of pancreatic cancer, and acinar and lepidic spread of tumors should remain in the differential for persistent ground glass opacities on radiography. Reference #1: Ozkan E, Balachandran A, Bhosale PR, Tamm EP, Marcal LP, Szklaruk J. Pictorial essay: multimodality imaging of metastases from pancreatic ductal adenocarcinoma. Clin Imaging. 2010; 34(4):277-87 Reference #2: Heraudeau A, Ricordel C, Sale A, et al. Interstitial lung disease and pancreatic cancer: Series of two cases. Rev Mal Respir. 2018 Jan;35(1):78-82 DISCLOSURES: No relevant relationships by Nihal Patel, source=Web Response No relevant relationships by Michael Wert, source=Web ResponseCopyright © 2019 American College of Chest Physicians

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1. **Neonatal factors predictive for respiratory and gastro-intestinal morbidity after esophageal atresia repair**  
   Rayyan M. Pediatrics and Neonatology 2019;60:261-269.

Background: Esophageal atresia is a major congenital foregut anomaly. Affected patients often suffer from respiratory and gastro-intestinal morbidity. The objective of this study is to identify possible neonatal predictive factors contributing to a long-term complicated clinical course in patients after repair of esophageal atresia. Method(s): A total of 93 patients born between 1993 and 2013, with esophageal atresia and surviving the neonatal period were included in this retrospective study. A complicated clinical course was defined as the occurrence of >=1 of these complications: severe gastro-esophageal reflux, esophageal stricture requiring dilatations, need for tube feeding for >100 days, severe tracheomalacia, severe chronic respiratory disease and death. We used linear models with a binomial distribution to determine risk factors for gastro-intestinal or respiratory complicated evolution and a backward stepwise elimination procedure to reduce models until only significant variables remained in the model. Multinomial logistic regression was used to assess risk factors for different evolutions of complication. Model parameter estimates were used to calculate odds ratios for significant risk factors. Result(s): Fifty-seven patients (61%) had a complicated clinical course in the first year of life and 47 (51%) had a complicated evolution during years 1-6. In the first year, prematurity was a significant factor for complicated gastro-intestinal (OR 2.84) and respiratory evolution (OR 2.93). After 1 year, gastro-intestinal morbidity in childhood was associated with VACTERL association (OR 12.2) and a complicated first year (OR 36.1). Respiratory morbidity was associated with congenital heart disease (OR 12.9) and a complicated first year (OR 86.9). Multinomial logistic regression showed that prematurity (p = 0.018) and VACTERL association (p = 0.003) were significant factors of complications. Conclusion(s): Prematurity is an important predictive factor for a complicated clinical course in early life. A complicated first year often predicts a complicated clinical course in childhood. These risk factors may be helpful in counseling of parents in the neonatal period.Copyright © 2018

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1. **Osimertinib as treatment for egfr exon 20 insertion-positive lung adenocarcinoma**  
   Murano C. EXCLI Journal 2019;18:893-898.

A 20-year-old woman was diagnosed with stage 4 lung adenocarcinoma with an epidermal growth factor receptor (EGFR) exon 20 insertion gene mutation. Although the patient underwent chemotherapy, her lesions progressed. Liquid biopsy for EGFR T790M mutation showed negative results. After administering osimertinib, reduction of the lesions at the primary site was observed, and the patient's respiratory condition improved. Previous reports showing successful treatment of EGFR exon 20 insertion-positive lung adenocarcinoma with the standard osimertinib dose of 80 mg are limited. The present case demonstrated that osimertinib could be a possible treatment option for EGFR exon 20 insertion-positive lung adenocarcinomaCopyright © 2019, Leibniz Research Centre for Working Environment and Human Factors. All rights reserved.

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1. **Outcomes of newborns and infants associated with use of an innovative, ultra-low-cost, bubble continuous positive airway pressure (CPAP) package, with a novel blender and pulse oximeter, in Mahaarashtra, India**  
   Ravi R. Pediatrics 2019;144:No page numbers.

Purpose: Acute respiratory failure is a critical feature of the most common causes of death and disability of newborns worldwide, the majority of which occurs in low resource settings. Bubble Continuous Positive Airway Pressure (bCPAP) is highly effective in addressing newborn respiratory failure, however high cost and the need for electricity and compressed air are barriers to access and scale. This study examines the outcomes of a novel ultra-low-cost bCPAP package with an innovative blender, called Every Second Matters-Newborn and Infant Respiratory Bundle (ESM-NIRB), to overcome these barriers. Method(s): The authors designed, and in May of 2017, deployed across four hospitals in Maharashtra, India, the ESMNIRB package: an ultra-low-cost and electricity independent bCPAP device with innovative oxygen blender, novel device-patient interface, hospital grade pulse oximeter, didactic and field training, clinical pathway wall chart and safety checklist. Hourly respiratory severity scores (RSS), vitals, mortality, length of time on bCPAP, patient demographics, outcomes, cointerventions, adverse events and severe adverse events were reported with each use. Result(s): From May 26, 2017 to March 22, 2018, 78 newborns were placed on the ESM-NIRB bCPAP device for impending respiratory failure. 41 (43.6%) of the 78 were premature and 63 (80.8%) survived to discharge. Diagnoses included hyaline membrane disease (32%), respiratory distress (30.8%), transient tachypnea of the newborn (12.8%), neonatal sepsis (9.0%), birth asphyxia (6.4%), congenital heart disease (2.6%), meconium aspiration syndrome (2.6%), pneumonia (2.6%) and hypoglycemia (1.3%). Among newborns with initial RSS between 4 and 8, the RSS decreased on average by 1.31 [95% CI 0.88, 1.75; p-value 0.000139] after 6 hours of treatment with the ESM-NIRB bCPAP device. One newborn with meconium aspiration syndrome incurred a pneumothorax while on the device and was successfully treated and weaned to room air without further escalation of care. No severe adverse events have occurred from the ESM-NIRB bCPAP device. Conclusion(s): Implementation of an ultra-low cost ESM-NIRB package that does not require electricity or pressurized air was possible across all four hospitals in India. The authors are conducting a qualitative study on provider experiences with the package to enhance its feasibility in these settings, with possible future implementation in primary health centers and rural areas of India.

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1. **Pathophysiology of respiratory disease and its significance to anaesthesia**  
   Craig S. K. Anaesthesia and Intensive Care Medicine 2019;20:693-699.

Significant changes occur in the respiratory physiology of healthy patients during anaesthesia. In patients with underlying respiratory pathology, the changes in respiratory physiology may lead to additional clinical problems during the conduct of anaesthesia and in the perioperative period. An understanding of the disease processes that can affect the lungs and pleura allows the anaesthetist to account for the potential complications of these conditions and manage the anaesthetic accordingly.Copyright © 2019 Elsevier Ltd

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1. **Patient characteristics and outcomes of a home mechanical ventilation program in a developing country**  
   Saiphoklang N. Lung India 2019;36:207-211.

There are limited data on home mechanical ventilation (HMV) in developing countries. This study aimed to describe the patient characteristics, feasibility, and outcomes of an HMV program at a university hospital in Thailand. Material(s) and Method(s): Data were collected on all patients who were discharged with HMV between October 2014 and August 2015 at Thammasat University Hospital. Result(s): Twelve patients (eight men and four women) underwent HMV. They were aged 71.5 +/- 17.6 years; mean +/- standard deviation. Indications for HMV were 6 neurologic diseases (4 amyotrophic lateral sclerosis, 1 multiple system atrophy, and 1 stroke), 2 chronic obstructive pulmonary disease (COPD), 1 tracheomalacia, and 3 combined neurologic diseases and respiratory diseases (2 stroke and COPD, 1 stroke and tracheomalacia). The duration of follow-up was 799.5 +/- 780.5 days. The ratio of family income to cost of HMV usage was 77.2:1 +/- 5.5:1. All patients had tracheostomies. Modes of HMV were biphasic positive airway pressure (66.7%), pressure-controlled ventilation (16.7%), pressure-support ventilation (8.3%), and volume-controlled ventilation (8.3%). Complications occurred in ten patients (83.3%), including tracheobronchitis (20 events) and ventilator-associated pneumonia (12 events). Overall mortality was 41.7% (5/12 patients), including two patients who died due to ventilator-associated pneumonia. There were no instances of ventilator malfunction. Conclusion(s): HMV is feasible for patients with neurological diseases and COPD in a developing country. The relatively high rate of complications indicates the need for more comprehensive clinical services for chronic ventilator-dependent patients in this setting.Copyright © 2019 Medknow Publications. All rights reserved.

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1. **Point of care ultrasound in the emergency department**  
   Musolino A. M. Italian Journal of Pediatrics 2019;45:No page numbers.

Point-of-care ultrasonography (POCUS) is a safe, non-invasive and effective diagnostic or procedural guidance ultrasound [1] performed by a clinician to help guide the evaluation and management of the patient, complementary to a medical examination, introduced by the American College of Emergency Medicine (ACEP) in the 90s. [2]. It can be used in hospital and non-hospital settings to exclude severe pathological findings, to increase clinical diagnostic suspicions and to monitor therapy, using a portable ultrasound system at the "point of care" of the patients and reducing at the same time the risks associated with ionizing radiations [3]. Applications. POCUS is largely applied for evaluating pediatric respiratory symptoms identifying pneumonias (sensitivity of 96% and a specificity of 93%) [4], pleural effusions and distinguishing between parapneumonic pleural effusion and empyema. It can be used in the management of children with bronchiolitis [5] [6] It has also demonstrated 100% accuracy in diagnosing pneumothoraces and useful to guide needle aspiration [7,8]. Focused cardiac ultrasound should be considered for assessing patients with hemodynamic failure; it enables physicians to diagnose pericardial effusions, assess cardiac contractility and left ventricular enlargement with 91% accuracy. [9] It is useful even during pulse checks during cardiac arrest resuscitation [10] and for categorization of shock state and initial management strategy [11]. Several protocols have been created to a global approach to a critical patient. Rapid Ultrasound for Shock and Hypotension (RUSH) exam includes standardized views of the heart, inferior vena cava, lungs and abdomen in order to categorize the type of shock. [3] Focused Assessment with Sonography in Trauma (FAST) [12] is applied to assess identification of free fluid at the initial evaluation of the patient with thoracic or abdominal trauma. It allows to check hemothorax, pericardial effusion and tamponade, and to identify an intra-abdominal source of bleeding [11] The E-FAST (Extended FAST) allows to check for pneumothorax. Training. Physician must be trained and assessed for competency (understanding the clinical indications, having the technical skill for image acquisition, the ability to interpret the images and to integrate the findings clinically) in order to be credentialed (through local criteria required to utilize POCUS in their clinical practice) and thus granted privileges by an institution to perform POCUS [13]. Pathways for obtaining basic POCUS competency are training based and practice-based [14]. It's mandatory maintaining competency participating in CME (Continuing Medical Education) as well as perform a minimum number of POCUS examinations annually [13].

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1. **Pre-Hospital Needle Decompression Improves Clinical Outcomes in Multisystem Trauma: A Multicenter Study**  
   Strumwasser A. M. Journal of the American College of Surgeons 2019;229:e62-e63.

Introduction: Advanced Trauma Life Support guidelines support thoracic needle decompression (ND) for tension pneumothorax. Pre-hospital ND remains controversial as few studies have documented benefit. We sought to determine technical success rates and clinical outcomes after pre-hospital ND. Method(s): Pre-hospital ND data was acquired from 79 trauma centers (n = 143 patients, 193 NDs), retrospectively reviewed for demographics and outcomes. Patients were stratified by indication for ND: cardiopulmonary arrest, hemodynamic compromise with respiratory symptoms, acute hypoxia/decreased SaO2, and examination findings consistent with tension physiology. Outcomes included improvements in vital signs/recovery from traumatic arrest, clinical symptoms, and physical examination. Result(s): Demographics included: average age 44 +/- 19 y, 74% male, 97% traumatic arrest, 89% blunt trauma, with 25% of needles placed prior to intubation. Pre-hospital ND improved vital signs 72% of the time (104/143 patients, p < 0.01), physical examination 50% of the time (72/143 patients, p < 0.01), and clinical symptoms 27% of the time (38/143 patients, p < 0.01). Success was lowest for traumatic arrest (11%) and hemodynamic compromise with respiratory symptoms (13%). Best indications for pre-hospital ND were acute hypoxia/decreased SaO2 (73% success) and physical examination findings (51% success). Pre-hospital ND did not differ whether done by nurse, paramedic (p = 0.2), diameter (p > 0.1), or length (p = 0.1) of the catheter. Conclusion(s): Pre-hospital ND outcomes are more reliable if performed for indications other than cardiopulmonary arrest and hypotension with respiratory symptoms. Pre-hospital ND is more successful at attaining improvement in oxygen saturations and improving clinical examination than affecting hemodynamic parameters. Success does not depend on provider or equipment.Copyright © 2019

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1. **Risk and benefits of Bubble Continuous Positive Airway Pressure for neonatal and childhood respiratory diseases in Low- and Middle-Income countries**  
   Ekhaguere O. A. Paediatric Respiratory Reviews 2019;29:31-36.

Over 80% of the global burden of childhood deaths occur in Low- and Middle-Income Countries (LMIC). Of the leading causes of death, respiratory failure is common to the top three. Bubble Continuous Positive Airway Pressure (bCPAP) is a standard therapy considered safe and cost effective in high resource settings. Although high-quality trials from LMIC are few, pooled available trial data considered alongside studies from high-income countries suggest that bCPAP: (i) reduces mortality; (ii) reduces the need for mechanical ventilation; and (iii) prevents extubation failure. Wider availability and optimal use at all levels of the health care system in LMIC are important steps to improve childhood survival. Studies aimed at effectively implementing, and sustaining safe use of bCPAP in the resource limited setting of LMIC are required.Copyright © 2018 Elsevier Ltd

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1. **Risk Factors and Outcome of Neonatal Pneumothorax in Tuzla Canton**  
   Hadzic Devleta Materia socio-medica 2019;31:66-70.

Aim: The aim of this study was to analyze risk factors and outcome of neonatal pneumothorax in Tuzla Canton., Methods: Neonates with chest X-ray confirmed pneumothorax in University Clinical Center of Tuzla, within a three-year period, from January 2015 to December 2017, were retrospectively studied. Participants were evaluated for baseline characteristics, predisposing factors of neonatal pneumothorax, accompanying disorders and mortality., Results: During the observed three-year period 11425 neonates were born in Tuzla Canton, with 7.33 % of preterm births, and 604 neonates were treated in NICU, with 265 neonates who required mechanical ventilation. Neonatal pneumothorax (NP) was diagnosed in 22 patients (9 term, 13 preterm), 12 (54.5%) were male. The incidence was 0.20% of total births, respectively 3.64% of those treated in NICU. The mean gestational age were 35.1 +/- 3.0 weeks and birth weight 2 506.8 +/- 727.7 grams. NP was mostly unilateral (72.7%) and right-sided. The most commonly associated diseases were: respiratory distress syndrome, intracranial haemorrhage, pneumonia, transient tachypnea and sepsis. In 8 (36.4%) neonates, the underlying cause of NP could be mechanical ventilation (secondary), whereas in 14 (63.6%) NP was spontaneous, without previous mechanical ventilation, although 11 of them required mechanical ventilation after pneumothorax., Conclusion: All perinatal risk factors were investigate, and significant differences in two observed groups related to mechanical ventilation were found for birth weight, gestational age, Caesarean section, length of mechanical ventilation, surfactant replacement therapy and outcome. Three (13.64%) neonates with NP died, and among risk factors with poor outcome, significant was only Apgar score in the first minute <= 5.

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1. **Risk factors for postoperative pulmonary complications in the treatment of non-degenerative scoliosis by posterior instrumentation and fusion**  
   Wang Yunsheng European spine journal : official publication of the European Spine Society, the European Spinal Deformity Society, and the European Section of the Cervical Spine Research Society 2019;28:1356-1362.

PURPOSE: The aim of this study was to evaluate the prevalence and risk factors for postoperative pulmonary complications (PPC) after posterior instrumentation and fusion (PIF) in patients with non-degenerative scoliosis., METHODS: We retrospectively evaluated 703 patients (224 males, 479 females) diagnosed with non-degenerative scoliosis who underwent PIF in our center from January 2010 to January 2018. Preoperative, perioperative, demographic data, surgical methods and radiographic parameters were extracted and analyzed to identify risk factors for PPC., RESULTS: The mean age of the patients was 20.8 +/- 9.0 years with the following diagnoses: congenital scoliosis (287/703, 40.8%), idiopathic scoliosis (281/703, 40.0%), neuromuscular scoliosis (103/703, 14.7%) and syndromic scoliosis (32/703, 4.5%). PPC manifested in 82 patients (11.7%) including pleural effusion (39/82, 47.6%), pneumonia (33/82, 40.2%), pneumothorax (3/82, 3.7%), respiratory failure (3/82, 3.7%), hemothorax (2/82, 2.4%), pulmonary edema (1/82, 1.2%) and pulmonary embolism (1/82, 1.2%). Multifactorial regression analysis confirmed that revision surgery [odds ratio (OR) = 2.320, P = 0.030], preoperative respiratory disease (OR = 14.286, P < 0.001), preoperative Cobb angle of main curve > 75degree (OR = 1.701, P = 0.046) and thoracoplasty (OR = 4.098 P < 0.001) were risk factors for PPC after PIF in patients with non-degenerative scoliosis., CONCLUSIONS: A prevalence of 11.7% PPC was observed after PIF. Risk factors were preoperative Cobb angle of main curve > 75degree, preoperative respiratory disease, revision surgery and thoracoplasty. Surgeons should recognize and pay attention to these risk factors and take appropriate preventive measures to prevent severe pulmonary complications. These slides can be retrieved under Electronic Supplementary Material.

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1. **Risks and benefits of bronchoscopy during the first 100 days following allogeneic hematopoietic cell transplantation**  
   Hefazi M. Blood 2019;134:No page numbers.

BACKGROUND Pulmonary infiltrates are common after allogeneic hematopoietic cell transplantation (HCT) and can have infectious or non-infectious etiologies. Fiberoptic Bronchoscopy (FOB) with bronchoalveolar lavage (BAL) is frequently used to evaluate these patients. However, the diagnostic yield can be highly variable according to patient populations, and the impact on management is not well defined, especially in the era of modern antimicrobial therapies. The aim of this study was to investigate the diagnostic and therapeutic yield of FOB-BAL in adult patients with pulmonary infiltrates during the first 100 days following HCT. METHODS We retrospectively reviewed the medical records of adult HCT patients who underwent FOB-BAL during the first 100 days post HCT between January 2005 and December 2015 at Mayo Clinic, Rochester, MN. The interval from HCT to FOB was stratified into early (days 1-30) vs. late (days 31- 100). The finding of progressively more hemorrhagic effluent and/or >= 20% hemosiderin-laden macrophages in BAL were considered diagnostic for diffuse alveolar hemorrhage (DAH). Univariate and multivariate logistic regression models were fit to identify clinical and transplant characteristics that may impact the diagnostic yield of FOB-BAL. RESULTS A total of 114 patients (median age 55 years), representing 12% of all HCT patients underwent FOBBAL. Underlying diagnoses were AML in 36%, MDS in 16%, ALL in 16%, MPN in 12% CLL in 7%, and other in 13%. Transplants were from matched related donor in 43%, matched unrelated donor in 40%, and other donor/matching status in 17%. FOB-BAL was performed during the early period in 61% and during the late period in 39% of patients. In the early period, FOB-BAL provided a specific diagnosis in 49% of patients (30% DAH and 19% infection). In the late period, FOB-BAL had a diagnostic yield of 55% (14% DAH and 36% infection) (Figure 1). The distribution of bacterial and viral infections identified via BAL were similar during the early period (39% and 38%, respectively), whereas more bacterial than viral infections were identified in the later period (56% vs. 19%, respectively) (Figure 2). Non-invasive testing for respiratory tract infection was performed in 34% of patients. These included nasopharyngeal swab for RSV/Influenza PCR in 16% (all negative), multiplex respiratory pathogen PCR in 5% (1 positive for coronavirus), and sputum culture in 21% (positive in 8 patients). This compares with the identification of an infectious pathogen via BAL in 36% of patients; bacterial in 16%, viral in 11%, and fungal in 10%. Transbronchoscopic lung biopsy biopsies were performed in 8 patients and provided diagnostic information in 3 patients (eosinophilic pneumonia, organizing pneumonia and diffuse alveolar damage each in 1 patient). Procedural complications occurred in 3 patients; 2 after transbronchoscopic lung biopsy (1 bleeding and 1 pneumothorax) and 1 during FOB-BAL (atrial fibrillation with rapid ventricular rate). In a multivariable logistic regression model, the underlying diagnosis, presence of acute respiratory failure, and early vs. later time period after HCT were independently affecting the diagnostic yield of FOB-BAL, with higher likelihood of DAH being diagnosed in patients with AML/MDS and during the early post-HCT period, and higher likelihood of DAH being diagnosed in patients with acute respiratory failure (Table 1). In 40% of patients, FOB-BAL findings lead to treatment changes. These included addition of antimicrobials in 24% and addition of corticosteroids in 22% (17% DAH, 2% idiopathic pneumonia syndrome, and 1% organizing pneumonia) (Figure 3). FOB findings lead to more antimicrobial modifications in the early than in the later period (32% vs. 18%, respectively). Overall survival was poor in all the three groups, although significantly better in patients with nondiagnostic FOB findings (median of 2, 3, and 11 months in patients with DAH, infection, or nondiagnostic FOB finings, respectively) (p = 0.03) (Figure 4). CONCLUSION FOB-BAL provides clinically useful i formation in the post-transplant period. BAL findings were diagnostic in 51% of patients, and led to management changes in 40% of patients. Transbronchoscopic lung biopsy is associated with higher rates of procedural complications. Further characterization of the underlying diagnosis in patients with non-diagnostic FOB-BAL findings remains an unmet clinical goal.

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1. **Routine chest X-rays after the removal of chest tubes are not necessary following esophagectomy**  
   Kingma B. F. Journal of Thoracic Disease 2019;11:S799-S804.

Background: Chest X-rays (CXRs) are commonly performed after removing chest tubes following surgery. However, the value of this practice is unclear for patients who underwent esophagectomy. Therefore, the aim of this study was to investigate the clinical relevance of routinely performing a CXR after chest tube removal during the postoperative course of esophagectomy. Method(s): A single-center prospective database was used to select all patients who underwent esophagectomy with gastric conduit reconstruction between 2015 and 2017. Patients who received a CXR within 4 hours after removal of at least one chest tube were included. The radiological reports of these CXRs were evaluated for intrapleural air and fluid. Cases requiring re-insertion of a chest tube on the day of CXR or the day afterwards were identified and the clinical situation of these patients was reviewed. Result(s): Some 117 patients were included and a total of 231 chest tube removals were followed by a CXR within 4 hours. Re-insertion of a chest tube was performed in a total of 6 cases (3%) on the day or the day after this CXR. All these 6 patients had clinical signs or symptoms indicating respiratory problems. In total, new intrapleural air was found on the ipsilateral side of previous chest tube removal in 33 cases (14%) and new intrapleural fluid occurred on the ipsilateral side of previous chest tube removal in 24 cases (10%). Conclusion(s): In conclusion, a CXR after chest tube removal may safely be reserved for patients who develop clinical signs or symptoms that indicate respiratory problems.Copyright © Journal of Thoracic Disease. All rights reserved.

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1. **Safety and efficacy of high flow nasal cannula use on pediatric wards**  
   Feldman J. D. Pediatrics 2019;144:No page numbers.

High flow nasal cannula (HFNC) is increasingly used to provide non-invasive respiratory support to children with bronchiolitis and other causes of respiratory distress. Many institutions require that all children treated with HFNC be admitted to the Pediatric Intensive Care Unit (PICU), while others allow HFNC use on pediatric wards. There are little data on outcomes or complication rates for children treated with HFNC on pediatric wards. Our main study objectives were to evaluate the effcacy and safety of HFNC use on pediatric wards. A retrospective cohort study was conducted of all (N= 309) children < 2 years of age treated with HFNC on pediatric wards for bronchiolitis and other respiratory distress causes between 11/1/2010 and 4/30/2015 at 9 hospitals within a large integrated health care system. Three of these hospitals had both a pediatric ward and an onsite PICU, 6 had no PICU. Descriptive statistics (frequencies, means, medians and proportions) and chisquare tests were used to describe and compare demographic (age, race, gender) and clinical characteristics (weight, onsite PICU status, history of prematurity, cardiac or chronic lung disease, respiratory syncytial virus, baseline heart and respiratory rates) of subjects with successful HFNC use on the ward versus failure, defined as transfer to a PICU. We used multivariable logistic regression models to assess factors associated with HFNC success on the ward, controlling for other demographic and clinical factors. After meeting inclusions and exclusions, there were 208 patients in the final analytic cohort. In the overall cohort, 68% (N=141) and 78% (N=110) of those admitted to hospitals with no onsite PICU succeeded with HFNC on the ward regardless of other demographic or clinical characteristics (Appendix A). Controlling for all other factors, the logistic regression model demonstrated that children admitted to hospitals without onsite PICU were 4 times more likely to succeed on the ward, compared to those admitted to hospitals with an onsite PICU (aOR: 4.0 (CI: 2.1- 7.9, p<0.01) (Appendix B). Patients weighing > 5kg were 2.6 times more likely to succeed on the ward compared with those weighing < 5kg (aOR: 2.6 (CI 1.3-5.2, p<0.01). However, patients with higher than normal respiratory rates were less likely to succeed on the ward (aOR: 0.4, (CI 0.2-1.0, p=0.05). The rate of intubation following a trial of HFNC on the wards was 3.8%, with only 1 patient requiring intubation prior to PICU transfer. There were no reports of pneumothorax. These data suggest HFNC may successfully and safely be used on pediatric wards for many young patients with respiratory distress. Further research might focus on development and validation of models with characteristics predicting success or failure of HFNC on the ward, aiding earlier recognition of those likely to succeed or require transfer to a PICU. (Table Presented).

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1. **Serious adverse events in patients with idiopathic pulmonary fibrosis in the placebo arms of 6 clinical trials**  
   Wuyts W. Respiratory Medicine 2019;150:120-125.

Background: Idiopathic pulmonary fibrosis (IPF) is a fatal interstitial lung disease characterized by irreversible loss of lung function and an unpredictable course of disease progression. Method(s): The safety data for patients with IPF who received placebo in 6 clinical trials were pooled to examine the categories and frequencies of serious adverse events (SAEs) in this population. Result(s): In 1082 patients with IPF who received placebo, 673 SAEs were reported. Of these, 93 SAEs resulted in death (8.6% of patients). Respiratory-related conditions were the most frequently reported SAE (225 events, 16.33 per 100 patient-exposure years [PEY]), followed by infections and infestations (136 events, 9.87 per 100 PEY) and cardiac disorders (79 events, 5.73 per 100 PEY); these categories also had the most fatal outcomes (60, 10, and 10 deaths, respectively). The most frequently reported fatal respiratory-related SAEs were IPF and respiratory failure (38 and 11 patients, respectively), and the most frequently reported fatal infections and infestations and cardiac disorders were pneumonia (5 patients) and myocardial infarction (3 patients), respectively. Conclusion(s): This pooled analysis has value as a comparator for safety in future studies of IPF and provides insights in the natural evolution of both IPF and common comorbidities.Copyright © 2019 The Author(s)

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1. **Severe cystic lung disease and a renal mass in a 35-year-old man: Diagnostic and management challenges**  
   Patel P. American Journal of Respiratory and Critical Care Medicine 2019;199:No page numbers.

Introduction: The co-presence of cystic lung disease and renal mass is suggestive of Birt-Hogg- Dube (BHD) syndrome, a rare autosomal dominant disorder. We describe a case of BHD in a young man and the challenges associated with its diagnosis and management. Case Description: A 35 year-old Indian man without significant past medical history presented with a 3 year history of progressive dyspnea since emigrating from India. He had a normal physical exam, mild sinus tachycardia on electrocardiogram, and large right lung bullae on chest X-ray. He works as a computer analyst. He denied family history of respiratory disease, but his mother died from unknown causes. He smoked 1/2 pack-per-day for 3 years. He denied childhood respiratory illnesses, history of tuberculosis, or exposures to dust, chemicals, or pets. His ambulatory oxygen saturation was 85% on room air. Chest computed tomography demonstrated severe bilateral thinwalled cysts (Fig 1) with minimal normal lung parenchyma and a 1.5cm right renal mass. Pulmonary function tests showed no obstruction, severely reduced vital capacity (39%), and normal diffusion capacity adjusted for alveolar volume (165%). Alpha-1-antitrypsin level was normal and Folliculin Gene testing identified an exon 1 mutation. The patient was referred for lung transplant evaluation and underwent work-up of his renal mass. The severity of his lung disease posed significant challenges due to the risks of potentially fatal pneumothoraces associated with intubation and positive pressure ventilation under general anesthesia. He eventually underwent a percutaneous biopsy and ablation of his renal mass by interventional radiology under conscious sedation, which showed a low-grade oncotic neoplasm, supporting the diagnosis of BHD. He is currently doing well and repeat MRI at 3 months post-ablation shows no evidence of recurrence. Discussion(s): BHD is an autosomal dominant disorder caused by mutations in the folliculin gene. It is characterized by pulmonary cysts, benign skin hamartomas, and a seven-fold increased risk of renal cancer. Treatment is symptom-targeted and prognosis depends on the degree of lung and renal tumor involvement. To our knowledge, there have not been any cases of lung transplantation related to BHD. However, because of its slow-growing nature, the presence of renal cancer, if found early and successfully treated without recurrence, should not preclude such patients from being considered for lung transplantation. Furthermore, thoughtful steps must also be undertaken to minimize the risk of developing potentially fatal pneumothoraces when considering surgical options to diagnose and treat renal cancer in BHD. (Figure Preseted).

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1. **Severe langerhans cell histiocytosis with pulmonary involvement**  
   Cimen O. European Respiratory Journal 2019;54:No page numbers.

Background and Aim: Lung involvement in LCH is the most characteristic finding for adults, in whom smoking is a key etiological factor. In pediatric cases, it is seen less frequently. Here we present two cases with LCH and severe lung involvement Cases: Case 1 is 4-year-old boy admitted with submandibular lymphadenopathy, chest pain and chest X-ray showed bilateral pneumothorax. Chest CT revealed out cystic lesions. Salivary gland excisional biopsy was performed. Pathological findings were diagnostic for LCH. Chemotherapy regimen (prednisolone, vinblastine) were started. Skull X-ray showed osteolytic lesions. The patient's respiratory condition did not improve and considering the recurrence of bilateral pneumothorax, it's decided to perform thoracoscopic pleurodesis. The patient didn't benefit from this procedure. In addition to pneumothorax, pneumomediastinum, ARDS were developed. Veno-venous ECMO procedure is used, but the patient didn't respond to treatment and died 20 days later. Case 2 is 3-month-old female admitted to our hospital due to respiratory distress. She had erythematous papules and vesicular lesions beginning after 2 month-old. Ten days ago she developed poor feeding, irritability, increased respiratory rate. Emphysematous appearance was seen on chest X-ray and referred to our hospital. LCH was diagnosed based on pleural biopsy and positive BRAF mutation was resulted. Chemotherapy regimen was started Conclusion(s): The most prominent feature of these two patients was severe respiratory involvement at the time of diagnosis. It should be kept in mind that lung involvement may be the first finding in patients with LCH and can appear in very young ages. BRAF mutation should be investigated in severe cases with LCH.

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1. **SIMULTANEOUS BILATERAL SPONTANEOUS PNEUMOTHORAX (SBSP) AS THE FIRST PRESENTATION OF COPD**  
   Sharayah A. Chest 2019;156:A2179.

SESSION TITLE: Wednesday Medical Student/Resident Case Report Posters SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: 10/23/2019 09:45 AM - 10:45 AM INTRODUCTION: A secondary spontaneous pneumothorax is defined as pneumothorax secondary to underlying lung disease that occurs without a trauma or iatrogenic cause [1,2]. Simultaneous bilateral spontaneous pneumothorax (SBSP) forms a total of 1.3% of all spontaneous pneumothorax cases [3]. CASE PRESENTATION: A 66-year-old male with significant smoking history who presented to the Emergency Department (ED) for exertional shortness of breath of 3 weeks duration associated with mild chest pain and persistent dry cough. The patient initially went to a secondary hospital where he was diagnosed with bilateral pneumothoraces and was treated with bilateral pigtail chest tubes and oxygen therapy. However, he was in moderate respiratory distress; hence he was referred to a tertiary hospital. In ED, his vital signs were normal except for low oxygen saturation. Physical examination was remarkable for moderate distress, decreased breath sounds bilaterally and bilateral pigtail chest tubes attached. Laboratory studies including metabolic panel and complete blood counts were normal except for leukocytosis of 19.7 K/CMM. Computed tomography scan showed 60-70% bilateral pneumothoraxes, 2 chest tubes, and bilateral patchy consolidation (Figure 1). Patient was followed by repeated physical examinations and CXRs. His right pneumothorax improved and the chest tube was removed. However, the left chest tube showed persistent air leak necessitating pleurodesis with Doxycycline initially and Talc later as the patient wanted to be treated conservatively. Later, he became hemodynamically unstable, CXR showed right tension pneumothorax and an urgent right chest tube was inserted which normalized his vital signs. However, shortly after, he became unstable again, repeated CXR showed recurrent right tension pneumothorax, another chest tube was inserted complicated by right hemothorax; hence he was taken emergently for Video-Assisted Thoracoscopic Surgery (VATS) for hemothorax evacuation. Biopsy from VATS showed dense fibrosis and honeycombing emphysematous changes. Right-sided talc pleurodesis was done, and both chest tubes were removed. Repeated CXR demonstrated small left pneumothorax. Patient was discharged home, pulmonary rehabilitation and smoking cessation were strongly recommended. DISCUSSION: SBSP is a rare life-threatening emergency that requires immediate recognition and treatment. The presentation may vary from mild respiratory distress to cardiopulmonary failure. Diagnosis is confirmed on radiological findings and bilateral chest tubes are the initial appropriate treatment which in 82% of cases can stop air leak in 48 hours. However, the persistent air leak is an indication for surgery with VATS being most common. CONCLUSION(S): Presentation of SBSP can vary from mild respiratory symptoms to respiratory failure, diagnosis can be confirmed on chest radiography and the treatment is emergent chest tube placement. Reference #1: [1]Sahn SA, Heffner JE. Spontaneous pneumothorax. N Engl J Med. 2000 Mar 23;342(12):868-74. Review. PubMed PMID: 10727592. [2] Noppen M, De Keukeleire T. Pneumothorax. Respiration. 2008;76(2):121-7. Epub 2008 Jun 26. Review. PubMed PMID: 18708734 [3] Esther Graf-Deuel, Andreas Knoblauch: Simultaneous bilateral spontaneous pneumothorax. Chest. 1994;105:1142-6. DISCLOSURES: No relevant relationships by Noor Hajjaj, source=Web Response no disclosure on file for Chandler Patton; no disclosure on file for Julio Pernia; No relevant relationships by Ahmad Sharayah, source=Web ResponseCopyright © 2019 American College of Chest Physicians

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1. **Spontaneous Pneumomediastinum - a Rare Asthma Complication**  
   Covantev Serghei Folia medica 2019;61:472-477.

Asthma is the most common chronic respiratory disease worldwide and its prevalence is increasing. Acute asthma complications are often the reason for admission to emergency healthcare service. In our article we present a case of a rare asthma complication - spontaneous pneumomediastinum with a short review of its incidence, etiology, diagnosis and management. Spontaneus pneumothorax is important to differentiate with secondary pneumomediastinum as well as other conditions as cardiac diseases (acute coronary syndrome, pericarditis, cardiac tamponade, pneumopericardium), lung diseases (pneumothorax, pulmonary embolism, tracheobronchial tree rupture), musculoskeletal disorders, and diseases of the esophagus (rupture and perforation o the esophagus). A chest X-ray is often reliable for diagnosis of spontaneous pneumomediastinum and when inconclusive, can be followed by CT. The management is usually conservative with oxygen and analgesia. Surgery is required only in cases of tracheobronchial compression.

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1. **SPONTANEOUS PNEUMOTHORACES DURING PREGNANCY IN PATIENTS WITH LYMPHANGIOLEIOMYOMATOSIS**  
   Hyslop A. Chest 2019;156:A444.

SESSION TITLE: Monday Electronic Posters 3 SESSION TYPE: Original Inv Poster Discussion PRESENTED ON: 10/21/2019 02:30 PM - 03:15 PM PURPOSE: Pregnancy has been associated with accelerated disease progression in women with lymphangioleiomyomatosis (LAM). The aim of our study was to better characterize the risk and burden of spontaneous pneumothoraces (SPs) during pregnancy in patients with LAM. METHOD(S): Details regarding pregnancy and SPs were obtained from self-identified adult women with LAM registered with The LAM Foundation using Research Electronic Data Capture (REDCap) tools hosted at the University of Cincinnati. RESULT(S): There were 50 respondents to our survey. Mean age at time of survey completion was 44 (range: 26-74) years and mean age at time of diagnosis of LAM was 35 (range: 17-67) years. Majority of participants (83%) were Caucasian. The most common symptoms attributed to LAM were: dyspnea (40/48, 83%), fatigue (31/48, 65%), and chest pain (20/48, 42%). 8 patients (16%) also had a concomitant diagnosis of asthma. 70% of patients (35/50) had at least one SP in their lifetime, with the majority (29/35, 83%) experiencing recurrent SPs. 12 patients (24%) had never been pregnant. Perception of the possibility of disease worsening, either personal or physician guided, was a partial explanation for the decision not to pursue pregnancy in all 12 of these patients. 38 patients (76%) were pregnant at least once in their lifetime, amounting to 80 total pregnancies (median number of pregnancies per patient: 2, range: 1-4). Respiratory symptoms during pregnancy led to the diagnosis of LAM in 13 patients (13/38, 34%). Diagnosis of LAM impacted future decisions to become pregnant in 2/3rd of patients (25/38, 66%). 11 patients experienced at least one SP during pregnancy for a total of 21 episodes of SP (median 2 episodes per patient, range 1-3). The per-patient prevalence of pregnancy related SP was 29% (11/38), and per-pregnancy prevalence was 26% (21/80). Management of SPs during pregnancy were: observation (2/21, 10%), chest tube (12/21, 57%), surgical pleurodesis (6/21, 29%), and chemical pleurodesis (1/21, 5%). Details on timing of SPs were available for 17 of 21 SPs; majority of SPs occurred during the 2nd trimester (10/17, 59%), followed by 1st trimester (2/17, 12%), 3rd trimester (2/17, 12%), 6 weeks post-partum (2/17, 12%), and labor (1/17, 6%). CONCLUSION(S): SP occurs in 25-30% of patients with LAM during pregnancy and has a high recurrence risk. SP during pregnancy in LAM patients occurs most commonly during the 2nd trimester and can be the presenting disease manifestation. Clinicians should maintain a high index of suspicion for LAM when evaluating pregnant women with SP. CLINICAL IMPLICATIONS: These results can be used to counsel LAM patients on the risks of pregnancy and help establish a diagnosis of LAM in a timely fashion in women presenting with a SP during pregnancy. DISCLOSURES: No relevant relationships by Nishant Gupta, source=Web Response No relevant relationships by Alan Hyslop, source=Web ResponseCopyright © 2019 American College of Chest Physicians

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1. **Spontaneous pneumothorax in cocaine users**  
   Ciriaco P. QJM : monthly journal of the Association of Physicians 2019;112:519-522.

BACKGROUND: Pneumothorax is one of the respiratory toxic effects of cocaine inhalation. The literature counts several cases, some associated to other respiratory conditions such as pneumomediastinum, haemoptysis and others not requiring surgical treatment., AIM: We present a series of nonHIV cocaine-inhaler subjects who underwent video-assisted thoracoscopic surgery (VATS) for isolated spontaneous pneumothorax., DESIGN: Nine subjects, with a mean age of 24 +/- 4 years, admitting cocaine inhalation, developed spontaneous pneumothorax and underwent 10 surgical treatments by means of VATS, at our Institution., RESULTS: Previous pneumothorax occurred in six cases episodes ranged from 0 to 5 (mean 1.6 +/- 1.6). Chest computed tomography (CT) scan showed abnormalities in seven cases. All subjects underwent lung apicectomy, apical pleurectomy and mechanical pleurodesis. Seven subjects had also bullectomy. In all cases the visceral pleura was partially covered by fibrinous exudate. Histology of the lung showed small foreign body granulomatous inflammation in fibrotic and/or emphysematous pulmonary parenchyma. Relapse of pneumothorax occurred in one subject at 60 days and it was surgically treated. Mean follow-up was 150 +/- 38 months (range 120-239). All subjects are now well, with no evidence of pneumothorax., CONCLUSIONS: Spontaneous pneumothorax in cocaine-inhaler subjects is a reality of which physicians need to be aware. Chest CT scan might not reveal abnormalities. Macroscopically the lung might presents bullae and/or peculiar visceral pleura. Foreign body granulomas observed in the specimens suggest that the particulate component of inhaled substances can injure the lung. Surgical treatment of the bullous disease and mechanical pleurodesis can provide a long-term follow-up without relapse of pneumothorax. Copyright © The Author(s) 2019. Published by Oxford University Press on behalf of the Association of Physicians. All rights reserved. For permissions, please email: journals.permissions@oup.com.

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1. **THE "MASS" PRODUCTION OF MARIJUANA**  
   Tadavarthi Y. Chest 2019;156:A2213-A2214.

SESSION TITLE: Wednesday Medical Student/Resident Case Report Posters SESSION TYPE: Med Student/Res Case Rep Postr PRESENTED ON: 10/23/2019 09:45 AM - 10:45 AM INTRODUCTION: Marijuana smoking is associated with various forms of acute and chronic lung injury with radiological findings ranging from diffuse alveolar hemorrhage to paraseptal emphysema.[1] These effects may be attributed to marijuana usage habits which include increased inhalation volumes, depths of inhalation, and breath-holding times.[1] Such maneuvers have increased risk of subpleural blebs and emphysematous changes compared to tobacco inhalation alone.[1] We report the finding of post traumatic hemorrhage into paraseptal emphysema in a chronic marijuana smoker mimicking a mass. CASE PRESENTATION: A 41-year-old male patient with history of extensive marijuana smoking presented complaining of cough. Two weeks prior, patient was in a motorbike accident. He was found to have bilateral pneumothoraces, multifocal pulmonary contusions, renal lacerations with perirenal hematoma, and multiple rib fractures requiring bilateral chest tubes. Chest radiograph 2 weeks later showed multiple lung masses. CT chest confirmed multiple lobular, soft tissue density masses in the periphery of the left lung. DISCUSSION: Inhalational marijuana use has a wide spectrum of presentation in the acute and chronic setting. Marijuana usage is associated with increased cough, sputum production, dyspnea, and wheezing.[1] Chronic use can result in emphysema, subpleural blebs, and lung cancer[1,2] The risk of lung cancer increases 8% for each joint year of cannabis smoking after adjusting for confounding variables including cigarette smoking.[2] The blebs and bullous disease from marijuana smoking may result in spontaneous pneumothoraces, pneumomediastinum, and alveolar hemorrhage in the acute setting.[1] In our case, mass-like lesions presented a broad differential diagnosis which included septic emboli, lung cancer (primary or metastatic), and infectious nodules. However, these masses were confirmed to have an acute onset and were not present on imaging from two weeks prior making lung cancer less likely. The masses also have the density of blood suggesting blood-filled bullae. These bullae could also be post-traumatic pneumatoceles, which have thin walls with fully circumferential lung parenchyma.[3] However, the bullae in this patient did not have surrounding lung parenchyma, favoring emphysematous changes secondary to marijuana. Overall, these findings are consistent with paraseptal hemorrhage into marijuana-induced emphysematous blebs. CONCLUSION(S): The occurrence of these unusual masquerading "masses" should be considered a deleterious structural effect of chronic marijuana smoking on pulmonary parenchyma. With the increasing popularity of marijuana as a result of its legalization, it is important that clinicians stay up to date with the pulmonary sequelae of inhalational marijuana use. Reference #1: Golwala, H. (2012). Marijuana abuse and bullous emphysema. Lung India, 29(1), 56-58. Reference #2: Aldington, S., Harwood, M., Cox, B., Weatherall, M., Beckert, L., Hansell, A.,... Respiratory Disease Research, G. (2008). Cannabis use and risk of lung cancer: a case-control study. Eur Respir J, 31(2), 280-286. Reference #3: Quigley, M. J., & Fraser, R. S. (1988). Pulmonary pneumatocele: pathology and pathogenesis. AJR Am J Roentgenol, 150(6), 1275-1277. DISCLOSURES: No relevant relationships by Crystal Duran, source=Web Response No relevant relationships by Corey Garvin, source=Web Response No relevant relationships by jayanth keshavamurthy, source=Web Response No relevant relationships by Yasasvi Tadavarthi, source=Web Response No relevant relationships by Varsha Taskar, source=Web ResponseCopyright © 2019 American College of Chest Physicians

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1. **The acute (ambulance CPAP: Use, treatment effect and economics) feasibility study: A pilot randomised controlled trial of prehospital CPAP for acute respiratory failure**  
   Fuller G. Emergency Medicine Journal 2019;36:809-810.

Background Acute respiratory failure (ARF) is a common and life-threatening medical emergency. Continuous positive airway pressure (CPAP) is a potentially beneficial prehospital treatment, but it is uncertain whether this could improve important outcomes in NHS ambulance services. Methods An individually randomised, external pilot study was conducted to test the feasibility of a definitive pragmatic trial. Adults with respiratory distress and peripheral oxygen saturations below British Thoracic Society target levels were recruited from the West Midlands Ambulance Service between August 2017 and July 2018. Participants were randomised 1:1 to prehospital CPAP or standard oxygen therapy. Feasibility objectives estimated the: incidence of eligible patients; proportion recruited and allocated to treatment appropriately; adherence to allocated treatment; retention and data completeness; and 30-day mortality, as a potential primary outcome for a definitive trial. Results Over 12 months, 77 patients were enrolled (CPAP arm 42, standard oxygen arm 35 cases, target 120). CPAP was fully delivered as planned in 74% (target 75%). There were no major protocol violations/non-compliances (target 0%). Full data were available for key outcomes (target >=90%). Mortality was higher than expected (overall 27.3%, CPAP arm 28.6% n=12/42, standard care arm 25.7% n=9/35). Of deceased patients, 14/21 (68%) either did not have a respiratory condition or had ceiling of treatment decisions excluding hospital non-invasive ventilation and critical care. Two patients required emergency department treatment for a pneumothorax, neither having received prehospital CPAP. There were no other serious adverse events. Conclusions The lower than expected recruitment rate, limited compliance with CPAP, and the difficulty in identifying patients who could benefit from CPAP, indicate limited potential for prehospital CPAP to reduce mortality. A definitive effectiveness trial is therefore not recommended. These findings also argue against routine implementation of CPAP into NHS ambulance services.

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1. **The relationship between the occurrence of spontaneous pneumothorax and atmospheric pressure**  
   Wassil G. Revue des Maladies Respiratoires 2019;36:1-6.

Introduction: This study analyzes the relationship between the occurrence of spontaneous pneumothorax and atmospheric pressure. Patients and Methods: We conducted a retrospective study on 74 patients hospitalized for spontaneous pneumothorax in the department of respiratory diseases from the Ibn Roshd university hospital of Casablanca between January 2013 and June 2014. The value of atmospheric pressure at the time of the occurrence of pneumothorax was recorded and analyzed. Result(s): The mean age was 46 years with 70 men and 4 women. Eighty-one percent of patients were smokers and 89% lived in an urban zone. Overall, 79.7% of pneumothoraces occurred in anticyclonic conditions, with a median atmospheric pressure of 1018 hPa +/- 4.18. In all, 12.2% of pneumothoraces occurred in atmospheric depression with a median atmospheric pressure of 1010 hPa +/- 1.92. The remaining 8.1% occurred in isobaric conditions. Pneumothoraces occurred significantly more during periods of high pressure compared to other periods (P <0.001; odds ratio: 28.41; relative risk 6.56 [3.52 < RR < 12.22]). There was no difference in the age, number pf patients with chronic obstructive pulmonary disease or idiopathic pneumothorax between the atmospheric condition groups. Conclusion(s): Increased atmospheric pressure is a risk factor for spontaneous pneumothorax independent of age or the presence of underlying lung disease.Copyright © 2018 SPLF

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1. **The role of ultrasound lung artifacts in the diagnosis of respiratory diseases**  
   Soldati Gino Expert review of respiratory medicine 2019;13:163-172.

INTRODUCTION: Thoracic ultrasound is employed for the diagnosis of many thoracic diseases and is an accepted detection tool of pleural effusions, atelectasis, pneumothorax, and pneumonia. However, the use of ultrasound for the evaluation of parenchymal lung disease, when the organ is still aerated, is a relatively new application. Areas covered: The diagnosis of a normal lung and the differentiation between a normally aerated lung and a lung with interstitial pathology is based on the interpretation of ultrasound artifacts universally known as A and B-Lines. Even though the practical role of lung ultrasound artifacts is accepted by many clinicians, their physical basis and the correlations between these signs and the causal pathology is not known in depth. Expert commentary: In this review, we discuss the meaning of A- and B-Lines in the diagnostic ultrasound imaging of the lung and the acoustic properties of the pleural plane which are at the basis of their generation.

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1. **Thoracic ultrasound accuracy for the investigation of initial neonatal respiratory distress**  
   Grimaldi C. Archives de pediatrie : organe officiel de la Societe francaise de pediatrie 2019;26:459-465.

Thoracic ultrasound (TUS) is increasingly studied in neonatal respiratory distress but chest x-ray (CXR) remains the first-line exam. We aimed to evaluate its diagnostic performance for the investigation of unselected causes of neonatal respiratory distress in daily practice. We conducted a descriptive, prospective, and single-center diagnostic accuracy study in a tertiary hospital, including term and preterm newborns who needed a CXR because of respiratory conditions occurring at birth or during the first 24h of life. TUS was compared to the reference diagnosis, which was the association between the CXR results, the clinical initial context, and the patient's outcome. Fifty-two newborns were included and 104 hemi-thorax ultrasounds were analyzed. Sensitivity, specificity, positive and negative predictive values (PPV, NPV), diagnosis accuracy, as well as the positive and negative likelihood ratio of TUSs were 100% for respiratory distress syndrome (RDS), transient tachypnea of newborn (TTN), pneumomediastinum, meconium aspiration syndrome, and absence of pulmonary disease. TUS also showed 100% sensitivity and NPV for pneumothorax, but specificity was 97% and PPV was 50%. Kappa concordance between TUS and either CXR alone or the radiological/clinical gold standard was 0.79 and 0.95, respectively. CONCLUSION : TUS at the newborn's bedside is efficient for investigating the main neonatal respiratory diseases, especially for the confirmation of RDS or TTN and for the exclusion of differential diagnosis or complications. Copyright © 2019 French Society of Pediatrics. Published by Elsevier Masson SAS. All rights reserved.

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1. **Transbronchial biopsy from the upper pulmonary lobes is associated with increased risk of pneumothorax - A retrospective study**  
   Herout V. BMC Pulmonary Medicine 2019;19:56.

Background: Pneumothorax (PTX) is one of the most common complications of transbronchial biopsy (TBB). Previous research suggests that upper pulmonary lobe TBB may be associated with increased risk of PTX development. The aim of this study was to compare the risk of PTX after TBB performed from different pulmonary lobes. Method(s): All bronchoscopic records from the period January 1st, 2015 - December 31st, 2017 (from the Department of Respiratory Diseases, University Hospital Brno, Czech Republic) were retrospectively analyzed. Of the 3542 bronchoscopic records, 796 patients underwent TBB and were further analyzed. Basic demographic data, TBB procedure-related factors, smoking history and radiological features were analyzed. Furthermore, in patients who developed PTX, PTX onset, PTX symptoms, distribution of the abnormal radiological findings and duration of hospitalization were also analyzed. Result(s): Patients who developed PTX had significantly lower body mass index (BMI) and more than 4 samples taken during procedure (all p < 0.05). TBB performed from the left upper pulmonary lobe was associated with a significant risk of PTX development (OR 2.27; 95% CI 1.18-4.35; p = 0.02). On the contrary, TBB performed from the right lower lobe was associated with a significant reduction of risk of developing PTX (OR 0.47; 95% CI 0.22-0.98; p = 0.04). Logistic regression analysis showed BMI (OR 1.08; 95% CI 1.02-1.16; p = 0.01), left upper lobe as sampling site (OR 2.15; 95% CI 1.13-4.11; p = 0.02) and more than 4 samples taken (OR 1.91; 95% CI 1.04-3.49; p = 0.04) to be significantly associated with PTX development. Conclusion(s): We conclude that TBB from the left upper pulmonary lobe is associated with significantly increased risk of post-procedural PTX. The right lower pulmonary lobe seems to be the safest sampling site to perform TBB. In patients with diffuse-type pulmonary disease, TBB should be performed preferably from the right lower lobe in order to decrease the risk of post-procedural PTX.Copyright © 2019 The Author(s).

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1. **Two operated cases of spontanous pneumothorax with Marfan syndrome**  
   Takamori S. Respirology 2019;24:92.

Background and Aims: Respiratory diseases associated with Marfan syndrome include spontaneous pneumothorax and sleep apnoea syndrome. Spontaneous pneumothorax develops in 4%-11% of patients with Marfan syndrome. The frequency of recurrent pneumothorax is as high as 91%. Owing to the character of the disease, postoperative new bulla formation may show high recurrence. Therefore, prevention of recurrence is particularly important in the treatment of pneumothorax associated with Marfan syndrome. We report 2 cases of spontaneous pneumothorax associated with Marfan syndrome. Case series: Case 1. A 14-year-old man was admitted to our hospital for treatment of left pneumothorax that recurred 2 years after initial bullectomy. Following bullectomy and pleural abrasion, he developed right pneumothorax and underwent bullectomy using the pleural covering method with an oxidized cellulose sheet. Right pneumothorax recurred twice and was treated conservatively. Left pneumothorax has not recurred for 2.5 years. Case 2. A 19-year-old woman developed left pneumothorax. Following initial conservative treatment, pneumothorax recurred after 1 month. Therefore, we performed bullectomy using the polyglycolic acid sheet. No recurrence was reported 9 months after the surgery. The recurrence rates following treatment with oxidized cellulose sheet and pleural abrasion were reported as 14.2% and 13.8%, respectively, while those with polyglycolic acid sheet and oxidized cellulose sheet were 3.6% and 22.8%, respectively. Polyglycolic sheets cause advanced adhesion in the thoracic cavity, making the next operation difficult. The survival prognosis of Marfan syndrome is aortic disease, which needs to be considered for intrathoracic adhesions. Conclusion(s): Although the recurrence rate of pneumothorax associated with Marfan syndrome is high, the preventive methods have not been standardized. Operation techniques must be selected considering the individual cases.

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1. **Use of NIV in cystic fibrosis: 10-year experience of a large adult CF centre**  
   Spoletini G. European Respiratory Journal 2019;54:No page numbers.

Background: In the UK, 10% of patients with CF received NIV on at least one occasion, despite limited evidence on its use. We report our 10-year experience in the use of NIV with regards to indications and outcomes. Method(s): A retrospective analysis of data captured prospectively was performed. All patients started on NIV between 2008 and 2018 were included; lung transplant (LTX) recipients and those who received NIV for <12 hrs, physiotherapy or OSA were excluded. Result(s): A total of 56 patients were started on NIV on 64 occasions [age 29 (17-52)y; best FEV1 in the 12mo prior 30 (14-66)%]. In 22 cases (34.4%) NIV was initiated in patients not yet considered for LTx. The most common reasons to start NIV were chronic (46.9%) and acute (32.8%) type 2 respiratory failure. Other reasons included symptomatic nocturnal hypoventilation (6.25%), hypoxia (7.8%) and increased work of breathing (6.25%). 37 patients continued on long-term NIV. Nine and seven subjects had a previous pneumothorax (PTX) and moderate/massive haemoptysis. On or after NIV initiation, these occurred in 4 subjects each. One patient had a prior history of PTX and 2 of haemoptysis. Three patients were intubated and ultimately died. NIV was continued until LTx in 18 cases. A total of 31 patients died without a LTx, with NIV being continued 17 cases until the day of death. Seven patients remain alive, with four remaining on NIV. Conclusion(s): In CF, NIV can be a bridge to lung transplantation and is being used in a similar fashion to other respiratory conditions. NIV is often continued during end-of-life with many patients on treatment until death. PTX and haemoptysis, often considered contraindication to NIV, should not limit the use of this technique.

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1. **Utility of open surgical lung biopsy in children**  
   Sinha A. Pulmonary Pharmacology and Therapeutics 2019;58:101816.

Introduction: Open lung biopsy (OLB) is commonly used to obtain a definitive histological diagnosis in children with respiratory disorders. This allows correct treatment pathways to be followed and guides discussions surrounding prognosis. Our aim was to determine if OLB is useful in obtaining a conclusive diagnosis in a child with complex respiratory disease. Material(s) and Method(s): In total, 179 OLB episodes were identified in children under 18 years from 2006 to 2016. Biopsies confirming congenital thoracic malformations or pulmonary metastatic disease were excluded. Result(s): 42 patients had 44 episodes of OLB in the period studied. A definitive histological diagnosis was reached in 35 (79%) cases. There were no deaths directly attributable to OLB surgery. Conclusion(s): OLB contributed substantially in obtaining a definitive diagnosis for our patient population, no increase in mortality. It allowed targeted treatment and provided valuable prognostic information on the likely progression of the disease so families could plan for palliation where appropriate.Copyright © 2019

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1. **Utilization of ultrasound in respiratory medicine-our experience**  
   Prakash S. Lung India 2019;36:S150.

Introduction: Chest ultrasound is a useful diagnostic tool for identifying respiratory conditions. ultrasound-guided pleural procedures are associated with fewer adverse events than 'blind' procedures for patients with pleural effusion. Objective(s): The goal of this study was to report our experience on diagnosis, safety and utilization of ultrasound. Method(s): A review of diagnostic ultrasound done in department of thoracic medicine, kilpauk Medical College during 2016 to 2019 were analysed. Data include name, age, gender, indication for usg, findings in usg, quantity of fluid in case of pleural effusion, procedures done after doing usg, complications encountered in usg guided procedures. Result(s): USG was done in 75 patients which includes 49 male and 25 females, main indication for usg is to localize the site for doing procedure, diagnosis arrived loculated effusion in 10, free fluid in 37, bilateral pleural effusion in 3, massive effusion in 5, normal study in 15, consolidation in 3, and pneumothorax in 2. Procedures following usg, thoracentesis-49, thoracoscopy- 3. Complications encounterd were traumatic bleeding. Overall diagnosis achieved by usg is 80%. Conclusion(s): Ultrasonography is accurate, inexpensive, and easy to perform at the bedside, making it especially suitable for patients, who are difficult to transport to the radiology department. Lung ultrasonography may also be useful for guiding life-saving therapies.

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1. **Venovenous extracorporeal membrane oxygenation as a bridge to traumatic bronchial fistula closure**  
   Rodriguez-Ruiz E. Membrana de oxigenacion extracorporea venovenosa como puente a la reparacion de una fistula bronquial traumatica. 2019;66:533-536.

Traumatic tracheobronchial injuries occur in 1% of patients with thoracic trauma, most of them dying at the site of the trauma. In this case report, we present a 26-year-old female patient admitted to the ICU due to a blunt chest trauma causing life threatening hypoxaemia and acidosis; deciding to implant percutaneous venovenous extracorporeal membrane oxygenation. The use of percutaneous venovenous extracorporeal membrane oxygenation, implemented with a lower anticoagulation target, allowed the diagnosis and treatment of a bronchopleural fistula under conditions of respiratory and hemodynamic stability without haemorrhagic complications, obtaining a fast and adequate assistance achieving the survival of the patient. Copyright © 2019 Sociedad Espanola de Anestesiologia, Reanimacion y Terapeutica del Dolor. Publicado por Elsevier Espana, S.L.U. All rights reserved.

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1. **Whole lung lavage is safe and effective for pulmonary alveolar proteinosis: A Ten year single centre experience in Hong Kong**  
   Yan S. W. Respirology 2019;24:221-222.

Background and Aims: Whole lung lavage (WLL) is the standard treatment for pulmonary alveolar proteinosis (PAP). Because of the disease rarity, experience is limited for this technically unique and challenging procedure. Method(s): All WLLs in TBCU GH/CTSD QMH, Hong Kong from 2009 to 2018 were reviewed. Procedural Details: WLL was performed in operating theatre supervised by pulmomologists. Patients under general anaesthesia were in supine position, intubated with left-sided double-lumen endotracheal tube. After pre-oxygenation for 10 minutes, the lung to be lavaged was degassed by clamping of the tube on that side. It was then connected to the lavage set-up. Aliquots of 1 litre of warmed (37C) saline was instilled into the lung. Drainage of the fluid commenced immediately afterwards, during which physiotherapists performed chest percussions to facilitate agitation and mixing of the proteinaceous material and the lavage fluid. The returned fluid was turbid with protein sediment on standing. The cycles were repeated until the returned fluid was clear. The airways were then cleared with generous suction before extubation. Result(s): Five patients with 14 sessions of WLLs were included. Two patients required repeated WLLs for disease progression. The number of cycles in each session ranged from 16 to 32. There were no adverse events like pneumothorax, fluid or electrolyte imbalance. All patients were extubated immediately. All reported dramatic improvement in respiratory symptoms in dyspnoea and cough together with rise in lung function parameters as shown in Table 1. Conclusion(s): WLL is a safe and effective therapeutic procedure when performed by experienced team under proper supervision.

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## B. Search History

|  | **Source** | **Criteria** | **Results** |
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| 1. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | exp \*CORONAVIRUS/ | 35513 |
| 2. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | ((corona\* or corono\*) adj1 (virus\* or viral\* or virinae\*)).ti,ab. | 1803 |
| 3. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | (coronavirus\* or coronovirus\* or coronavirinae\* or Coronavirus\* or Coronovirus\* or Wuhan\* or Hubei\* or Huanan or "2019-nCoV" or 2019nCoV or nCoV2019 or "nCoV-2019" or "COVID-19" or COVID19 or "CORVID-19" or CORVID19 or "WN-CoV" or WNCoV or "HCoV-19" or HCoV19 or CoV or "2019 novel\*" or Ncov or "n-cov" or "SARS-CoV-2" or "SARSCoV-2" or "SARSCoV2" or "SARS-CoV2" or SARSCov19 or "SARS-Cov19" or "SARSCov-19" or "SARS-Cov-19" or Ncovor or Ncorona\* or Ncorono\* or NcovWuhan\* or NcovHubei\* or NcovChina\* or NcovChinese\*).ti,ab. | 126432 |
| 4. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | (respiratory\* adj2 (symptom\* or disease\* or illness\* or condition\*)).ti,ab. | 65238 |
| 5. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | (("seafood market\*" or "food market\*") adj10 (Wuhan\* or Hubei\* or China\* or Chinese\* or Huanan\*)).ti,ab. | 97 |
| 6. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | ((outbreak\* or wildlife\* or pandemic\* or epidemic\*) adj1 (China\* or Chinese\* or Huanan\*)).ti,ab. | 142 |
| 7. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | "severe acute respiratory syndrome\*".ti,ab. | 17214 |
| 8. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | or/1-7 | 193632 |
| 9. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | Pneumothorax/ | 17172 |
| 10. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | (pneumothorax or "collapsed lung").ti,ab. | 22521 |
| 11. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | or/9-10 | 27914 |
| 12. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | 8 and 11 | 494 |
| 13. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | limit 12 to english language | 424 |
| 14. | Ovid MEDLINE(R) ALL <1946 to March 11, 2021> | limit 13 to yr="2019 -Current" | 212 |
| 1. | Embase <1974 to 2021 Week 09> | exp \*Coronavirinae/ | 10739 |
| 2. | Embase <1974 to 2021 Week 09> | ((corona\* or corono\*) adj1 (virus\* or viral\* or virinae\*)).ti,ab. | 2120 |
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| 6. | Embase <1974 to 2021 Week 09> | ((outbreak\* or wildlife\* or pandemic\* or epidemic\*) adj1 (China\* or Chinese\* or Huanan\*)).ti,ab. | 140 |
| 7. | Embase <1974 to 2021 Week 09> | "severe acute respiratory syndrome\*".ti,ab. | 16760 |
| 8. | Embase <1974 to 2021 Week 09> | or/1-7 | 216775 |
| 9. | Embase <1974 to 2021 Week 09> | pneumothorax/ | 37317 |
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| 11. | Embase <1974 to 2021 Week 09> | or/9-10 | 46088 |
| 12. | Embase <1974 to 2021 Week 09> | 8 and 11 | 1105 |
| 13. | Embase <1974 to 2021 Week 09> | limit 12 to english language | 990 |
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