**Task 1: What is known about transmission, incubation, and environmental stability?**

1. **is the coronavirus / covid-19 transmitted by aerisol, droplets, food, close contact, fecal matter, or water?**

**{Output could not be printed on web-page. I would be debugging it. For now I have pasted the raw output from model}**

['Coronavirus disease 2019 (COVID-19) emerged in Hubei Province, China in December 2019 and has since become a global pandemic, with hundreds of thousands of cases and over 165 countries affected. Primary routes of transmission of the causative virus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), are through respiratory droplets and close person-to-person contact. While information about other potential modes of transmission are relatively sparse, evidence supporting the possibility of a fecally mediated mode of transmission has been accumulating. Here, current knowledge on the potential for fecal transmission is briefly reviewed and the possible implications are discussed from a public health perspective.',

'It is a widely accepted view that COVID 19 is either transmitted via surface contamination or via close contact of an un-infected person with an infected person. Surface contamination usually happens when infected water droplets from exhalation/sneeze/cough of COVID sick person settle on nearby surfaces. To curb this, social distancing and good hand hygiene advise is advocated by World health Organization (WHO). We argue that COVID 19 coronovirus can also be airborne in a puff cloud loaded with infected droplets generated by COVID sick person. An elementary calculation shows that a $5~\\mu m$ respiratory infected droplet can remain suspended for about 9.0 minutes and a $2~\\mu m$ droplet can remain suspended for about an hour! And social distancing advise of 3 feet by WHO and 6 feet by CDC (Centers for Disease Control and Prevention) may not be sufficient in some circumstances as discussed in the text.', 'Coronavirus disease 2019 (COVID-19), caused by a novel coronavirus, SARS-COV-2 was declared a Public Health Emergency of International Concern (PHEIC) by the World Health Organization (WHO) in January 2020. Human-to-Human transmission occurs through close contact with an infected person or surfaces that are contaminated with droplets or secretions.',

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'We simulated three transmission modes including close contact, respiratory droplets and aerosol routes in labratory. SARS-CoV-2 can be highly transmitted among naive hACE2 mice via close contact because 7/13 naive hACE2 mice were SARS-CoV-2 antibodies seropositivity on 14 days after introduced into the same cage with 3 infected-hACE2 mice. For respiratory droplets, SARS-CoV-2 antibodies from 3/10 naive hACE2 mice showed seropositivity on 14 days after introduced into the grids separated same cage from 3 infected-hACE2 mice. Additionally, hACE2 mice cannot be experimentally infected via aerosol inoculation until continued up to 25 min with high virus concentrations.',

'Enteric viruses are those human viruses that are primarily transmitted by the fecal-oral route, either by person-to-person contact or by ingestion of contaminated food or water. The importance of viral foodborne diseases is increasingly being recognized, and several international organizations have found that there is an upward trend in their incidence. Thus, in this review, state-of-the-art information regarding virus persistence in food and the environment is compiled.', 'COVID-19 pandemic is now a global threat on human health reaching up to 2 million infected people all around the World. Since its first recognition in Wuhan, many topics were discussed intensively about COVID-19, both in the public and scientific community. Personal protective equipments and especially masks were among the hottest topics during this pandemic. Regardless of which mask is used, performing hand hygiene frequently with an alcohol-based hand rub or with soap and water if hands are dirty; is the most effective preventive measure for COVID-19. The type of mask used when caring for COVID-19 patients will vary according to the setting, type of personnel/person, and activity. Although the main transmission route for COVID-19 is droplets, during aerosol generating procedures airborne transmission may occur. Keeping the distancing and medical masks and eye protection during close contact efficiently protects against respiratory diseases transmitted via droplets. Airborne precautions include goggles and respiratory protection with the use of an N95 or an equivalent mask respirator to prevent airborne transmission.',

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**2. how long is the incubation period for the coronavirus / covid-19?**

The epidemic of coronavirus disease 2019 (COVID-19) has become a severe and complicated situation As of February 23, 2020, there have been more than 77,038 confirmed cases of new coronavirus infection nationwide COVID-19 is highly infectious and has a long incubation period and a variety of clinical manifestations, which has a great impact on society and economy and also seriously affects the daily operation of hepatobiliary surgery This article discusses and recommends the medical protection measures required for outpatient, ward, and operation of hepatobiliary surgery, in order to reduce the risk of nosocomial infection in hepatobiliary surgery during the COVID-19 epidemic

The 2019 coronavirus disease(COVID-19) is a highly infectious disease, has a long incubation period and a variety of clinical manifestations, which has a significant impact on public health and life. Afterwards, scientific and standardized work processing during the epidemic is of great significance for prevention and control. In order to implement the central government's decision-making deployment and defeat the COVID-19 as soon as possible, we had focused on the key points in the clinical work of general surgery according to latest relevant guidelines, literature and experience in epidemic prevention. Finally, we drafted the prevention and control strategies and recommendations to make a reference for medical staff of general surgery to fight against COVID-19.

From a large medical center in Wuhan, the epicenter of the 2019 novel coronavirus disease (COVID-19), we report clinical features and prognosis for three women diagnosed with COVID-19 after gynecologic oncology surgery and hospitalized in January 2020. The incidence of COVID-19 was 0.77% (3 of 389) of total hospitalizations and 1.59% (3 of 189) of patients undergoing surgeries in the ward. The infection of severe acute respiratory syndrome coronavirus 2 may be related to the older age, comorbidities, malignant tumor, and surgery in gynecologic hospitalizations. By February 20, 2020, only two of the three patients had met the clinical discharge criteria. Given the long and uncertain incubation period of COVID-19, screening for the virus infection should be carried out for all patients, both preoperatively and postoperatively. Postponement of scheduled gynecologic surgery for patients in the epidemic area should be considered.

Controversy remains over whether the coronavirus disease 2019 (COVID-19) virus may have infectivity during the incubation period before the onset of symptoms. The author had the opportunity to examine the infectivity of COVID-19 during the incubation period by conducting an epidemiological survey on a confirmed patient who had visited Jeju Island during the incubation period. The epidemiological findings support the claim that the COVID-19 virus does not have infectivity during the incubation period.

The COVID-19 pandemic has completely disrupted the operation of our societies. Its elusive transmission process, characterized by an unusually long incubation period, as well as a high contagion capacity, has forced many countries to take quarantine and social isolation measures that conspire against the performance of national economies. This situation confronts decision makers in different countries with the alternative of reopening the economies, thus facing the unpredictable cost of a rebound of the infection. This work tries to offer an initial theoretical framework to handle this alternative.

The World Health Organization (WHO) has declared that Coronavirus disease 2019 (Covid-19) is a public health emergency of international concern as it continues to spread worldwide.1 After a median incubation period of 4 days, fever and cough are the two most common manifestations of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection.

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Since December 2019, an outbreak of coronavirus disease 2019 (COVID-19) has posed significant threats to the public health and life in China. Unlike the other 6 identified coronaviruses, the SARS-Cov-2 has a high infectious rate, a long incubation period and a variety of manifestations. In the absence of effective treatments for the virus, it becomes extremely urgent to develop scientific and standardized proposals for prevention and control of virus transmission. Hereby we focused on the surgical practice in Neurosurgery Department, Tongji Hospital, Wuhan, and drafted several recommendations based on the latest relevant guidelines and our experience. These recommendations have helped us until now to achieve ‘zero infection’ of doctors and nurses in our department, we would like to share them with other medical staff of neurosurgery to fight 2019-nCoV infection.

**3. can the coronavirus / covid-19 be transmitted asymptomatically or during the incubation period?**

The Coronavirus Disease Pandemic 2019 (COVID-19), caused by the Severe Acute Respiratory Syndrome-related Coronavirus 2 (SARS-CoV-2), started in December 2019 in China. SARS-CoV-2 is easily transmitted by droplet infection. After an incubation period of 1-14 days, COVID-19 shows a mild course in 80 % of observed cases and a severe course in 20 %, with a lethality rate of 0.3-5.8 %. Elderly people and people with underlying diseases have a higher risk of severe courses with mandatory ventilation. So far there are neither effective drugs nor vaccinations available, so only public health interventions such as physical distancing and hygiene measures on the one hand and targeted testing followed by isolation and quarantine measures on the other hand are available. China has shown that maximum use of these measures can control the epidemic. The further course and also the consequences for the global economy cannot be clearly predicted at present.

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We report a familial cluster of 2019 novel coronavirus disease (COVID-19) to assess its potential transmission during the incubation period. The first patient in this familial cluster was identified during the presymptomatic period, as a close contact of a confirmed patient. Five family members had close contact with this first patient during his incubation period, with four of them confirmed positive for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection in the subsequent sampling tests.

An [Formula: see text] epidemic model is formulated that describes the spread of an epidemic in a population. The model incorporates an Erlang distribution of times of sojourn in incubating, symptomatically and asymptomatically infectious compartments. Basic properties of the model are explored, with focus on properties important in the context of current COVID-19 pandemic.

**4. how does weather, heat, and humidity affect the tramsmission of coronavirus / covid-19?**

As the number of confirmed cases of Coronavirus disease 2019 (COVID-19) continues to increase, there has been a rising concern regarding the effect of weather conditions, especially over the upcoming summer, on the transmission of this disease. In this study, we assess the transmission of COVID-19 under different weather conditions by investigating the propagation of infectious respiratory droplets. A comprehensive mathematical model is established to explore their evaporation, heat transfer and kinematics under different temperature, humidity and ventilation conditions. The transmitting pathway of COVID-19 through respiratory droplets is divided into short-range droplet contacts and long-range aerosol exposure. We show that the effect of weather conditions is not monotonic: low temperature and high humidity facilitate droplet contact transmission, while high temperature and low humidity promote the formation of aerosol particles and accumulation of particles with a diameter of 2.5 m or less (PM2.5). Our model suggests that the 6 ft of social distance recommended by the Center for Disease Control and Prevention (CDC) may be insufficient in certain environmental conditions, as the droplet spreading distance can be as long as 6 m (19.7 ft) in cold and humid weather. The results of this study suggest that the current pandemic may not ebb in the summer of the northern hemisphere without proper intervention, as there is an increasing chance of aerosol transmission. We also emphasize that the meticulous design of building ventilation systems is critical in containing both the droplet contact infections and aerosol exposures.

This study aims to analyze the correlation between weather and covid-19 pandemic in Jakarta Indonesia. This study employed a secondary data analysis of surveillance data of covid-19 from the Ministry of Health of the Republic of Indonesia and weather from the Meteorological Department of the Republic of Indonesia. The components of weather include minimum temperature (°C), maximum temperature (°C), temperature average (°C), humidity (%), and amount of rainfall (mm). Spearman-rank correlation test was used for data analysis. Among the components of the weather, only temperature average (°C) was significantly correlated with covid-19 pandemic (r = 0.392; p < .01). The finding serves as an input to reduce the incidence rate of covid-19 in Indonesia.

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Object Meteorological parameters are the important factors influencing the infectious diseases like severe acute respiratory syndrome (SARS). This study aims to explore the association between coronavirus disease (COVID-19) death and weather parameters. Methods In this study, we collected the daily death number of COVID-19, meteorological and air pollutant data from 20 January, 2020 to 29 February, 2020 in Wuhan, China. Then, the generalized additive model was applied to explore the impact of temperature, humidity and diurnal temperature range on daily mortality of COVID-19. Results There were in total 2299 COVID-19 mortality counts in Wuhan. A positive association with COVID-19 mortality was observed for diurnal temperature range (r = 0.44), but negative association for relative humidity (r = -0.32). In addition, each 1 unit increase in diurnal temperature range was only associated with a 2.92% (95% CI: 0.61%, 5.28%) increase in COVID-19 mortality at lag 3. However, both per 1 unit increase of temperature and absolute humidity were related to the decreased COVID-19 mortality at lag 3 and lag 5, respectively. Conclusion In summary, this study suggests the temperature variation and humidity may be important factors affecting the COVID-19 mortality.

A descriptive approach is adopted in reviewing the probable impact of environmental factors during the summer Olympic Games since their inception in 1896. A historical analytical perspective is impractical due to the lack of reliable climatic data for the earlier Games and the evolution of a myriad of factors that impinge on competitive performance at elite level. Nevertheless, the endurance running events, particularly the marathon, are considered in detail with respect to exposure to environmental forces. Heat, humidity, air pollution, altitude and the geographical features of the race course are considered selectively and dealt with in order of chronology and global climatic zones. We focus on diverse climate zones and particular environmental conditions in order to scrutinize their likely influences on competitive performance, especially in the Olympic marathon races. Notwithstanding the limitations of a narrative approach, performances are related to particular weather data and mitigating influences. Travel difficulties are addressed where these affected a majority of competitors. Environmental stress was associated with the ill-timing and poor organization of the earlier Games. While many of these detrimental and injurious features have been alleviated since then, other environmental stress factors are less prone to mitigation and thus remain a sometimes severe challenge to endurance races. The unique environment conditions for outdoor endurance races in temperate climate zones tend to be highly variable and therefore difficult to predict.

**5. how long can the coronavirus / covid-19 remain viable on common surfaces?**

At room temperature, SARS-CoV-2 was stable on environmental surfaces and remained viable up to 7 days on smooth surfaces. This virus could survive for several hours in feces and 3-4 days in urine.

Frequently touched surfaces of a university classroom that is cleaned daily contained viable human coronavirus 229E (CoV-229E). Tests of a CoV-229E laboratory strain under conditions that simulated the ambient light, temperature, and relative humidity conditions of the classroom revealed that some of the virus remained viable on various surfaces for 7 days, suggesting CoV-229E is relatively stable in the environment. Our findings reinforce the notion that contact transmission may be possible for this virus.

We evaluated the stability of Ebola virus on surfaces and in fluids under simulated environmental conditions for the climate of West Africa and for climate-controlled hospitals. This virus remains viable for a longer duration on surfaces in hospital conditions than in African conditions and in liquid than in dried blood.

SARS-CoV-2 survives and remains viable on surfaces for several days under different environments as reported in recent studies. However, it is unclear how the viruses survive for such a long time and why their survivability varies across different surfaces. To address these questions, we conduct systematic experiments investigating the evaporation of droplets produced by a nebulizer and human-exhaled gas on surfaces. We found that these droplets do not disappear with evaporation, but instead shrink to a size of a few micrometers (referred to as residues), persist for more than 24 hours, and are highly durable against changes of environmental conditions. The characteristics of these residues change significantly across surface types. Specifically, surfaces with high thermal conductivity like copper do not leave any resolvable residues, while stainless steel, plastic, and glass surfaces form residues from a varying fraction of all deposited droplets at 40% relative humidity. Lowering humidity level suppresses the formation of residues while increasing humidity level enhances it. Our results suggest that these microscale residues can potentially insulate the virus against environmental changes, allowing them to survive inhospitable environments and remain infectious for prolonged durations after deposition. Our findings can also be extended to other viruses transmitted through respiratory droplets (e.g., SARS-CoV, flu viruses, etc.), and can thus lead to practical guidelines for disinfecting surfaces and other prevention measures (e.g., humidity control) for limiting viral transmission.

Contaminated objects or surfaces, referred to as fomites, play a critical role in the spread of viruses, including SARS-CoV-2, the virus responsible for the COVID-19 pandemic. The long persistence of viruses (hours to days) on surfaces calls for an urgent need for surface disinfection strategies to intercept virus transmission and the spread of the disease. Elucidating the physicochemical processes and surface science underlying the adsorption and transfer of virus between surfaces, as well as their inactivation, are important in understanding how the disease is transmitted, and in developing effective interception strategies. This review aims to summarize the current knowledge and underlying physicochemical processes of virus transmission, in particular via fomites, and common disinfection approaches. Gaps in knowledge and needs for further research are also identified. The review focuses on SARS-CoV-2, but will supplement the discussions with related viruses.

While children, particularly infants, are susceptible to severe and critical COVID-19 disease, over 55% of pediatric cases are present in asymptomatic or mildly symptomatic children. Aerosolized SARS-CoV-2 viral particles remain viable for up to 3 hours, raising concern about risk to healthcare workers during aerosol generating procedures (APGs) in the airway and nasopharynx. Herein we describe the first case of a nasal foreign body in an asymptomatic child with SARS-CoV-2 infection. We discuss management of this child and highlight the importance of considering asymptomatic infection and preoperative testing when planning procedures of the airway in the COVID-19 era.

Coronavirus disease 2019 (COVID19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARSCoV2), it was first identified in 2019 in Wuhan, China and has resulted in the 2019-20 coronavirus pandemic. As of March 1, 2020, 79,968 patients in China and 7169 outside of China had tested positive for COVID19 and a mortality rate of 3.6% has been observed amongst Chinese patients. Its primary mode of transmission is via respiratory droplets from coughs and sneezes. The virus can remain viable for up to three days on plastic and stainless steel or in aerosols for upto 3 hours and is relatively more stable than the known human coronaviruses. It is stable in faeces at room temperature for at least 1-2 days and can be stable in infected patients for up to 4 days. Heat at 56 degree Celsius kills the SARS coronavirus at around 10000 units per 15 minutes. Thus, temperature is an important factor in survival of COVID19 virus and this article focuses on understanding the relationship between temperature and COVID19 transmission from the data available between January-March 2020.

**Task 2: What do we know about COVID-19 risk factors?**

**1. what risk factors contribute to the severity of 2019-ncov?**

Respiratory infections are associated with wheezing illnesses in all ages and may also impact the development and severity of asthma. Respiratory tract infections caused by viruses, Chlamydophila or Mycoplasma have been hypothesized to have significant roles in the pathogenesis of asthma. Progress is being made toward establishing the mechanisms by which these agents can cause acute wheezing and impact the pathophysiology of asthma. Host factors probably contribute to the risk of asthma inception and exacerbation, and these contributions may also vary with respect to early- versus adult-onset disease. This review discusses these various associations as they pertain to the development and exacerbation of asthma.

Since the emergence of the first cases in Wuhan, China, the novel coronavirus (2019-nCoV) infection has been quickly spreading out to other provinces and neighboring countries. Estimation of the basic reproduction number by means of mathematical modeling can be helpful for determining the potential and severity of an outbreak and providing critical information for identifying the type of disease interventions and intensity. A deterministic compartmental model was devised based on the clinical progression of the disease, epidemiological status of the individuals, and intervention measures. The estimations based on likelihood and model analysis show that the control reproduction number may be as high as 6.47 (95% CI 5.71–7.23). Sensitivity analyses show that interventions, such as intensive contact tracing followed by quarantine and isolation, can effectively reduce the control reproduction number and transmission risk, with the effect of travel restriction adopted by Wuhan on 2019-nCoV infection in Beijing being almost equivalent to increasing quarantine by a 100 thousand baseline value. It is essential to assess how the expensive, resource-intensive measures implemented by the Chinese authorities can contribute to the prevention and control of the 2019-nCoV infection, and how long they should be maintained. Under the most restrictive measures, the outbreak is expected to peak within two weeks (since 23 January 2020) with a significant low peak value. With travel restriction (no imported exposed individuals to Beijing), the number of infected individuals in seven days will decrease by 91.14% in Beijing, compared with the scenario of no travel restriction.

**2. how does hypertension affect patients?**

Atherosclerotic renal artery stenosis (ARAS) is the most common cause of renal artery stenosis in the adult population. ARAS may result in progressive renal impairment, renovascular hypertension, and/or cardiac disturbance syndromes. Because medical therapy does not affect the progressive nature of this disease process, more aggressive treatments are needed to definitively treat ARAS. When performed correctly, renal artery stenting has been shown to stabilize or improve renal function and/or renovascular hypertension in 65-70% of carefully selected patients with ARAS. Therefore, percutaneous renal artery stenting should be considered the primary treatment for patients with symptomatic ARAS.

Comorbid hypertension correlates with poorer outcomes in patients with Covid-19.

PURPOSE To evaluate changes in liver function and portal hypertension parameters after repeated percutaneous radiofrequency (RF) ablation for hepatocellular carcinoma (HCC) in patients with cirrhosis. MATERIALS AND METHODS This study included 24 patients (male-to-female ratio, 15:9; mean age, 59.4 y) with early-stage HCC (mean tumor size, 1.91 cm) and cirrhosis who underwent three consecutive treatments with RF ablation between April 1999 and August 2011. Serial changes of liver function and portal hypertension parameters after repeated RF ablation were compared with baseline values using a mixed model and Wilcoxon signed rank test. RESULTS The interval between the first and second RF ablation measurements and between the second and third RF ablation measurements was 26.1 months ± 18.3 (range, 3.8-65.8 mo) and 16.6 months ± 9.8 (range, 4.7-35.4 mo), respectively. Total bilirubin level was significantly increased between the first RF ablation and 6 months after the third RF ablation (0.75 g/dL ± 0.37 to 1.06 g/dL ± 0.68, P = .001), but all values were within the normal range. No other liver function parameter showed a significant change (P > .05 for all). Portal hypertension parameters did not show significant changes between the first RF ablation and 6 months after the third RF ablation (P > .05). CONCLUSIONS Repeated RF ablation for controlling recurrent HCC did not seem to affect liver function and portal hypertension in patients.

Bariatric patients are unique from other surgical patients due to their higher prevalence of hypertension, type 2 diabetes, cardiovascular disease, and respiratory illnesses The outbreak of the No

OBJECTIVES This study examined whether outpatient haemodialysis providers changed their treatment practices with the establishment of an outpatient dialysis global budget (ODGB) through analysing the outpatient visits and medication received by those patients. METHODS A sample of 4668 observations (patient year) of 1350 haemodialysis with hypertension (HH) patients and 4668 observations of 1436 non-HH (NHH) patients were drawn from the National Health Insurance Research Database over the years from 1999 to 2005. The impact of ODGB on hypertension-related outpatient utilization of HH was estimated using the difference in difference (DID) method and examined in three stages: (1) the fee for service stage, the pre-ODGB (2000), (2) the phase-in stage (2001-2002) and (3) the post-ODGB stage (2003-2005). RESULTS ODGB implementation did not affect the number of dialysis visits for HH patients. However, it did lead to a reduction in fees for antihypertension drugs used by haemodialysis facilities. There was an increase of 4.06 visits per patient per year (P < 0.001) in the number of non-dialysis outpatient with antihypertensive drugs visits for HH patients compared with the control group. The total fees for antihypertensive drugs for HH patients increased by New Taiwan Dollars (NT$)13 008 (P < 0.001) per patient per year relative to the control group after the implementation of ODGB. CONCLUSIONS As ODGB was implemented, HH patients received fewer antihypertensive drugs during their dialysis visit. In addition, there was an increase in the number of non-dialysis outpatient visits by HH patients as well as increased payment in the drugs associated with their non-dialysis outpatient visits compared with the control group.

**3. how does heart disease affect patients?**

This chapter reviews the cardiovascular anatomy, the effects of medications on the cardiovascular system, and current guidelines. Patients in the perioperative period often receive agents that affect hemodynamic variables such as heart rhythm and rate, blood pressure, or cardiac output.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has confounded the healthcare system organizations, especially in Italy, in the management of a dramatically increasing number of patients over a short period of time Coronavirus disease 2019 (COVID-19) may cause interstitial pneumonia and respiratory distress syndrome, which can lead to multi-organ failure During the acute phase of COVID-19 pneumonia, patients may need noninvasive ventilation, CPAP or NIV, or endotracheal intubation Furthermore, COVID-19 seems to affect multiple organs, such as heart and kidney, and also to cause vascular damages facilitating thrombosis

Background Intermittent claudication (IC) is traditionally managed with risk factor modification, best medical treatment (BMT), and exercise training. Comorbidities such as diabetes and ischemic heart disease affect both results of invasive treatment and health-related quality of life (HRQoL) negatively. It is unknown how chronic widespread pain (CWP) influences the results of invasive treatment. We evaluated the influence of CWP on HRQoL in patients undergoing invasive (open surgery or endovascular treatment) and noninvasive BMT of IC. Methods A total of 242 patients with IC treated with invasive or noninvasive methods responded to the validated HRQoL questionnaires Short Form 36 Health Survey, EuroQoL 5-dimensions, and distribution of pain with the Epipain questionnaire at baseline and after 12 months. Results Invasively treated patients without CWP improved in all primary outcome measures. Patients with CWP reported significant improvements in most of the HRQoL-related outcome measures after invasive treatment, but patients with CWP in the noninvasive treatment group did not improve in any HRQoL-related outcome measure. Conclusions The presence of CWP not should be a cause to withhold invasive treatment in patients with IC.

BACKGROUND: Studies have reminded that cardiovascular metabolic comorbidities made patients more susceptible to suffer 2019 novel corona virus (2019-nCoV) disease (COVID-19), and exacerbated the infection. The aim of this analysis is to determine the association of cardiovascular metabolic diseases with the development of COVID-19. METHODS: A meta-analysis of eligible studies that summarized the prevalence of cardiovascular metabolic diseases in COVID-19 and compared the incidences of the comorbidities in ICU/severe and non-ICU/severe patients was performed. Embase and PubMed were searched for relevant studies. RESULTS: A total of six studies with 1527 patients were included in this analysis. The proportions of hypertension, cardia-cerebrovascular disease and diabetes in patients with COVID-19 were 17.1%, 16.4% and 9.7%, respectively. The incidences of hypertension, cardia-cerebrovascular diseases and diabetes were about twofolds, threefolds and twofolds, respectively, higher in ICU/severe cases than in their non-ICU/severe counterparts. At least 8.0% patients with COVID-19 suffered the acute cardiac injury. The incidence of acute cardiac injury was about 13 folds higher in ICU/severe patients compared with the non-ICU/severe patients. CONCLUSION: Patients with previous cardiovascular metabolic diseases may face a greater risk of developing into the severe condition and the comorbidities can also greatly affect the prognosis of the COVID-19. On the other hand, COVID-19 can, in turn, aggravate the damage to the heart.

From the time of Hippocratic medicine, heart-brain interactions have been recognized and contributed to both mental and physical health. Heart-brain interactions are complex and multifaceted and appear to be bidirectional. Exposure to chronic and daily stressors such as quarantine, or severe psychological trauma like a significant person in danger of life can affect the cardiovascular system and the emotional experience of the individual, leading to an increased risk of developing a cardiovascular disease or mental illness. Subjects with comorbidities between mental disorders and heart diseases are obviously more susceptible to be influenced by emotional burden due to the spread of COVID-19, with emotional responses characterized by fear, panic, anger, frustration. Psychological services and crisis interventions are needed at an early stage to reduce anxiety, depression and post-traumatic stress disorder in such a stressful period, with a special attention to special groups of patients, such as women, children, or the elderly.

Chronic obstructive pulmonary disease (COPD) is characterised by progressive airflow obstruction that is only partly reversible, inflammation in the airways, and systemic effects or comorbities. The main cause is smoking tobacco, but other factors have been identified. Several pathobiological processes interact on a complex background of genetic determinants, lung growth, and environmental stimuli. The disease is further aggravated by exacerbations, particularly in patients with severe disease, up to 78% of which are due to bacterial infections, viral infections, or both. Comorbidities include ischaemic heart disease, diabetes, and lung cancer. Bronchodilators constitute the mainstay of treatment: β(2) agonists and long-acting anticholinergic agents are frequently used (the former often with inhaled corticosteroids). Besides improving symptoms, these treatments are also thought to lead to some degree of disease modification. Future research should be directed towards the development of agents that notably affect the course of disease.

**4. how does copd affect patients?**

Chronic lung diseases, such as chronic obstructive pulmonary disease (COPD), asthma, cystic fibrosis (CF) and interstitial lung diseases (ILD), affect many individuals worldwide. Patients with these chronic lung diseases are susceptible to respiratory lung infections and some of these viral infections can contribute to disease pathogenesis. This review highlights the associations of lung infections and the respective chronic lung diseases and how infection in the different lung diseases affects disease exacerbation and progression.

Acute exacerbations of COPD (AECOPD) or “COPD crises” [1], are crucial events in the natural course of COPD. Although they can occur at any severity stage, their impact increases as patients develop more severe airflow limitation.

Chronic obstructive pulmonary disease (COPD) is characterised by progressive airflow obstruction that is only partly reversible, inflammation in the airways, and systemic effects or comorbities. The main cause is smoking tobacco, but other factors have been identified. Several pathobiological processes interact on a complex background of genetic determinants, lung growth, and environmental stimuli. The disease is further aggravated by exacerbations, particularly in patients with severe disease, up to 78% of which are due to bacterial infections, viral infections, or both. Comorbidities include ischaemic heart disease, diabetes, and lung cancer. Bronchodilators constitute the mainstay of treatment: β(2) agonists and long-acting anticholinergic agents are frequently used (the former often with inhaled corticosteroids). Besides improving symptoms, these treatments are also thought to lead to some degree of disease modification. Future research should be directed towards the development of agents that notably affect the course of disease.

The strict range of applicability of noninvasive ventilation (NIV)—which had been applied only to patients with an exacerbation of chronic obstructive pulmonary disease (COPD) or acute cardiogenic pulmonary edema (ACPO)—has been extended during the last two decades.

Vitamin D is an important regulator of calcium and bone homeostasis. It is also involved in the regulation of different genes and cellular functions, particularly in the context of inflammation, regeneration and immune control. Conversely, vitamin D deficiency which is often found in chronic, infectious and inflammatory diseases is thought to drive or enhance uncontrolled inflammation. Chronic obstructive pulmonary disease (COPD) is characterized by chronic inflammation of the airways most often because of cigarette smoking. It has been recognized that repetitive airway infections and systemic consequences or co-morbidities also contribute to the progressive nature of COPD. Vitamin D deficiency is known to sneak in from the early stages of COPD, to become highly prevalent at the more severe stages, and may thereby catalyse airway infection, inflammation and systemic consequences. Undoubtedly, vitamin D deficiency enhances bone resorption and osteoporosis in COPD for which appropriate vitamin D supplementation is recommended. However, conflicting evidence has emerged on the extra-calcemic effects of vitamin D in COPD. A recent intervention trial with high-dose supplementation in COPD was only able to reduce exacerbation frequency in the subgroup of patients with lowest baseline vitamin D levels. It confirms that severe vitamin D deficiency is a health hazard but that more clinical and experimental studies are needed to explore how vitamin D deficiency may affect airway biology and systemic effects in the context of smoke-induced lung diseases.

Our understanding of the etiology, pathogenesis and consequences of acute exacerbations of chronic obstructive pulmonary disease (COPD) has increased substantially in the last decade. Several new lines of evidence demonstrate that bacterial isolation from sputum during acute exacerbation in many instances reflects a cause-effect relationship. Placebo-controlled antibiotic trials in exacerbations of COPD demonstrate significant clinical benefits of antibiotic treatment in moderate and severe episodes. However, in the multitude of antibiotic comparison trials, the choice of antibiotics does not appear to affect the clinical outcome, which can be explained by several methodological limitations of these trials. Recently, comparison trials with nontraditional end-points have shown differences among antibiotics in the treatment of exacerbations of COPD. Observational studies that have examined clinical outcome of exacerbations have repeatedly demonstrated certain clinical characteristics to be associated with treatment failure or early relapse. Optimal antibiotic selection for exacerbations has therefore incorporated quantifying the risk for a poor outcome of the exacerbation and choosing antibiotics differently for low risk and high risk patients, reserving the broader spectrum drugs for the high risk patients. Though improved outcomes in exacerbations with antibiotic choice based on such risk stratification has not yet been demonstrated in prospective controlled trials, this approach takes into account concerns of disease heterogeneity, antibiotic resistance and judicious antibiotic use in exacerbations.

BACKGROUND: Acute exacerbations of chronic obstructive pulmonary disease (AECOPD) and asthma are associated with a variety of precipitating factors including infection. This study assessed the infective viral etiologies by real-time multiplex polymerase chain reaction of patients hospitalized with AECOPD and asthma exacerbations. In addition, infective etiologies were assessed for association with the clinical outcome of the patients. METHODS: Adults admitted with AECOPD and asthma exacerbations between August 2016 and July 2017 were recruited. Nasopharyngeal aspirate (NPA) samples were obtained from the patients within 1–2 days of admission and subjected to pathogen detection and human rhinovirus (HRV) typing. RESULTS: Altogether 402 patients with AECOPD, 80 stable COPD, 100 asthma exacerbation and 21 stable asthma subjects were recruited. Among those admitted for AECOPD and asthma exacerbations, 141(35.1%) and 45(45.0%) respectively had pathogens identified in the NPA specimens. The commonest virus identified was influenza A followed by HRV. HRV typing identified HRV-A and HRV-C as the more common HRV with a wide variety of genotypes. Identification of pathogens in NPA or HRV typing otherwise did not affect clinical outcomes including the hospital length of stay, readmission rates and mortality except that identification of pathogens in asthma exacerbation was associated with a lower rate of readmissions at 30 and 60 days. CONCLUSIONS: Many respiratory viruses were associated with AECOPD and asthma exacerbation. HRV-A and HRV-C were the more common HRV associated with exacerbations. Identification of pathogens in NPA was associated with less readmissions for asthma patients at 30 and 60 days. TRIAL REGISTRATION: ClinicalTrials.gov NCT02866357. SUPPLEMENTARY INFORMATION: Supplementary information accompanies this paper at10.1186/s12931-019-1181-0.

RATIONALE: Systemic glucocorticosteroids (steroids) are commonly prescribed for patients with exacerbations of COPD during acute viral infections such as respiratory syncytial virus (RSV). The effects of short-term high-dose steroid treatment on viral load and adaptive immunity to RSV have not been examined in adults. OBJECTIVES: The objectives of this study were to measure peak viral load and duration of viral shedding, serum and nasal cytokines, RSV-specific antibody response, and lymphocyte subsets in patients admitted to the hospital with RSV infection and to compare patients treated with steroids to patients untreated with steroids. METHODS: Hospitalized adults who tested positive for RSV by reverse transcription-polymerase chain reaction (RT-PCR) on admission had respiratory samples collected for quantitative RT-PCR and cytokine analysis. Serum and nasal secretions were tested for RSV antibody and lymphocyte subsets were analyzed by flow cytometry at 2 days, 2 weeks, and 1 month. MAIN RESULTS: Thirty-three of 50 (66%) patients hospitalized with RSV received systemic steroids for a mean duration of 11 days. Those who received steroids more frequently wheezed and were less often febrile. There were no serious adverse events related to steroids and no significant differences in peak viral load, duration of RSV shedding, nasal cytokines, or lymphocyte subsets in patients treated with steroids and patients untreated with steroids. Antibody responses to RSV were slightly blunted in the steroid-treated group. CONCLUSIONS: Short courses of systemic steroids in patients hospitalized with RSV infection did not affect viral load or shedding. Humoral immunity may be mildly diminished, and thus potential benefits of systemic steroids must be balanced against potential risks.

**5. how does smoking affect patients?**

OBJECTIVE Hypoplasia of the A1 segment of the anterior cerebral artery is frequently observed in patients with anterior communicating artery (ACoA) aneurysms. The effect of this anatomical variant on ACoA aneurysm morphology is not well understood. METHODS Digital subtraction angiography images were reviewed for 204 patients presenting to the authors' institution with either a ruptured or an unruptured ACoA aneurysm. The ratio of the width of the larger A1 segment to the smaller A1 segment was calculated. Patients with an A1 ratio greater than 2 were categorized as having A1 segment hypoplasia. The relationship of A1 segment hypoplasia to both patient and aneurysm characteristics was then assessed. RESULTS Of 204 patients that presented with an ACoA aneurysm, 34 (16.7%) were found to have a hypoplastic A1. Patients with A1 segment hypoplasia were less likely to have a history of smoking (44.1% vs 62.9%, p = 0.0410). ACoA aneurysms occurring in the setting of a hypoplastic A1 were also found to have a larger maximum diameter (mean 7.7 vs 6.0 mm, p = 0.0084). When considered as a continuous variable, increasing A1 ratio was associated with decreasing aneurysm dome-to-neck ratio (p = 0.0289). There was no significant difference in the prevalence of A1 segment hypoplasia between ruptured and unruptured aneurysms (18.9% vs 10.7%; p = 0.1605). CONCLUSIONS Our results suggest that a hypoplastic A1 may affect the morphology of ACoA aneurysms. In addition, the relative lack of traditional risk factors for aneurysm formation in patients with A1 segment hypoplasia argues for the importance of hemodynamic factors in the formation of ACoA aneurysms in this anatomical setting.

PURPOSE OF REVIEW: The purpose of this review is to assess how residual neuromuscular block impacts postoperative pulmonary complications and whether we can modify the risk by improving certain aspects in daily clinical care. RECENT FINDINGS: Postoperative respiratory impairment may be due to various causes, such as age, surgery type, comorbidity, smoking, preoperative anemia, and general anesthesia. However, increasing evidence suggests that residual neuromuscular block is an important risk factor for postoperative pulmonary complications and may affect the outcome. Conflicting data from some recent reports show that the use of quantitative neuromuscular monitoring alone does not preclude residual neuromuscular block and that improvements in the interpretation of neuromuscular monitoring may be required. Pulmonary complications seem to be reduced for train-of-four ratios > 0.95 before tracheal extubation compared with > 0.9. SUMMARY: This review stresses the need for appropriate management of neuromuscular block in the prevention of postoperative pulmonary complications but acknowledges that the causes are multifactorial.

**6. how does pregnancy affect patients?**

As the COVID-19 pandemic continues to affect millions of people across continents, it follows that pregnancy and childbirth will also be affected. Data are emerging on the consequences of the infection on mother and baby [1]. Many guidelines on pregnancy management during the pandemic have been released [2-6], but the actual journey to establishing an obstetric unit can be challenging. The present article describes the stepwise informed approach that was taken to rapidly establish a unit for suspected COVID-19 patients within existing resources, and the experience of delivering the first pregnant patient with confirmed COVID-19 in India.

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As new infectious diseases, such as West Nile virus, monkeypox, and severe acute respiratory syndrome (SARS) are recognized in the United States, there are critical questions about how these infectious diseases will affect pregnant women and their infants. In addition, the implications of bioterrorist attacks for exposed pregnant women need to be considered. In this article, the authors address the following questions for a number of infectious disease threats: (1) does pregnancy affect the clinical course of these novel infectious diseases?, (2) what are the implications for prophylaxis and treatment of exposed or infected pregnant women?, and (3) are these novel infectious diseases transmitted during pregnancy, labor and delivery, or breastfeeding?

Asthma in pregnancy is a health issue of great concern. Physiological changes and drug compliance during pregnancy can affect asthma control in varying degrees, and the control level of asthma and the side effects of asthma medications are closely related to the adverse perinatal outcomes of mother and fetus. This article provides an update on the available literature regarding the alleviating or aggravating mechanism of asthma in pregnancy, diagnosis, disease assessment, and systematic management, to provide a new guidance for physician, obstetric joint doctor, and health care practitioner.

**7. what is the fatality rate of 2019-ncov?**

We present a timely evaluation of the Chinese 2019-nCov epidemic in its initial phase, where 2019-nCov demonstrates comparable transmissibility but lower fatality rates than SARS and MERS. A quick diagnosis that leads to case isolation and integrated interventions will have a major impact on its future trend. Nevertheless, as China is facing its Spring Festival travel rush and the epidemic has spread beyond its borders, further investigation on its potential spatiotemporal transmission pattern and novel intervention strategies are warranted.

**8. what public health policies prevent or control the spread of 2019-ncov?**

Effectively controlling infectious diseases requires quantitative comparisons of quarantine, infection control precautions, case identification and isolation, and immunization interventions. We used contact network epidemiology to predict the effect of various control policies for a mildly contagious disease, such as severe acute respiratory syndrome, and a moderately contagious disease, such as smallpox. The success of an intervention depends on the transmissibility of the disease and the contact pattern between persons within a community. The model predicts that use of face masks and general vaccination will only moderately affect the spread of mildly contagious diseases. In contrast, quarantine and ring vaccination can prevent the spread of a wide spectrum of diseases. Contact network epidemiology can provide valuable quantitative input to public health decisionmaking, even before a pathogen is well characterized.

Bad advice can lead to tragedy, such as death from taking an unproven medication.1 Now, more than ever, public health policies should be based on the best available evidence. Consumers, clinicians, and policymakers need balanced information that is free of commercial influence to make decisions about the best ways to prevent the spread and manage the symptoms and clinical consequences of COVID-19. The benefits and harms of each decision must be considered. Public health measures such as isolation, quarantine, and social distancing have fundamentally changed the way we live. (Am J Public Health. Published online ahead of print May 14, 2020: e1-e2. doi:10.2105/AJPH.2020.305734).

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With the worldwide outbreak of COVID-19, an accurate model to predict how the coronavirus pandemic will evolve becomes important and urgent to help policy makers in different countries address the epidemic outbreak and determine policies to control spread more efficiently and effectively. Unlike the classic public health and virus propagation models, this new projection model takes government intervention and public response into account to make reliable projections of the outbreak 10 days to 2 weeks in advance.

Estimating the number of people affected by COVID-19 is crucial in deciding which public health policies to follow. The authorities in different countries carry out mortality counts. We propose that the mortality reported in each country can be used to create an index of the number of actual cases at a given time. The specificity of whether or not deaths are rapid or not by COVID-19 also affects the number of actual cases. The number of days between the declaration of illness and death varies between 12 and 18 days. For a delay of 18 days, and using an estimated mortality rate of 2%, the number of cases in April 2020 in Tunisia would be 5 580 people. The pessimistic scenario predicts 22 320 infected people, and the most optimistic predicts 744 (which is the number of reported cases on April 12, 2020). Modeling the occurrence of COVID-19 cases is critical to assess the impact of policies to prevent the spread of the virus.

On December 31, 2019, the World Health Organization was notified about a cluster of pneumonia of unknown aetiology in the city of Wuhan, China. Chinese authorities later identified a new coronavirus (2019-nCoV) as the causative agent of the outbreak. As of January 23, 2020, 655 cases have been confirmed in China and several other countries. Understanding the transmission characteristics and the potential for sustained human-to-human transmission of 2019-nCoV is critically important for coordinating current screening and containment strategies, and determining whether the outbreak constitutes a public health emergency of international concern (PHEIC). We performed stochastic simulations of early outbreak trajectories that are consistent with the epidemiological findings to date. We found the basic reproduction number, R0, to be around 2.2 (90% high density interval 1.4—3.8), indicating the potential for sustained human-to-human transmission. Transmission characteristics appear to be of a similar magnitude to severe acute respiratory syndrome-related coronavirus (SARS-CoV) and the 1918 pandemic influenza. These findings underline the importance of heightened screening, surveillance and control efforts, particularly at airports and other travel hubs, in order to prevent further international spread of 2019-nCoV.