# The Daily COVID-19 Literature Surveillance Summary

## October 06, 2020

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COVID19LST

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# LEVEL OF EVIDENCE

**Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence**

| Question | Step 1 (Level 1*) | Step 2 (Level 2*) | Step 3 (Level 3*) | Step 4 (Level 4*) | Step 5 (Level 5) |
|---|---|---|---|---|---|
| **How common is the problem?** | Local and current random sample surveys (or censuses) | Systematic review of surveys that allow matching to local circumstances** | Local non-random sample** | Case-series** | n/a |
| **Is this diagnostic or monitoring test accurate?** (Diagnosis) | Systematic review of cross sectional studies with consistently applied reference standard and blinding | Individual cross sectional studies with consistently applied reference standard and blinding | Non-consecutive studies, or studies without consistently applied reference standards** | Case-control studies, or "poor or non-independent reference standard** | Mechanism-based reasoning |
| **What will happen if we do not add a therapy?** (Prognosis) | Systematic review of inception cohort studies | Inception cohort studies | Cohort study or control arm of randomized trial* | Case-series or case-control studies, or poor quality prognostic cohort study** | n/a |
| **Does this intervention help?** (Treatment Benefits) | Systematic review of randomized trials or *n*-of-1 trials | Randomized trial or observational study with dramatic effect | Non-randomized controlled cohort/follow-up study** | Case-series, case-control studies, or historically controlled studies** | Mechanism-based reasoning |
| **What are the COMMON harms?** (Treatment Harms) | Systematic review of randomized trials, systematic review of nested case-control studies, *n*-of-1 trial with the patient you are raising the question about, or observational study with dramatic effect | Individual randomized trial or (exceptionally) observational study with dramatic effect | Non-randomized controlled cohort/follow-up study (post-marketing surveillance) provided there are sufficient numbers to rule out a common harm. (For long-term harms the duration of follow-up must be sufficient.)** | Case-series, case-control, or historically controlled studies** | Mechanism-based reasoning |
| **What are the RARE harms?** (Treatment Harms) | Systematic review of randomized trials or *n*-of-1 trial | Randomized trial or (exceptionally) observational study with dramatic effect | | | |
| **Is this (early detection) test worthwhile?** (Screening) | Systematic review of randomized trials | Randomized trial | Non -randomized controlled cohort/follow-up study** | Case-series, case-control, or historically controlled studies** | Mechanism-based reasoning |

*** Level may be graded down on the basis of study quality, imprecision, indirectness (study PICO does not match questions PICO), because of inconsistency between studies, or because the absolute effect size is very small; Level may be graded up if there is a large or very large effect size.**

**** As always, a systematic review is generally better than an individual study.**

**How to cite the Levels of Evidence Table**

OCEBM Levels of Evidence Working Group*. "The Oxford 2011 Levels of Evidence".

Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=5653

** OCEBM Table of Evidence Working Group = Jeremy Howick, Iain Chalmers (James Lind Library), Paul Glasziou, Trish Greenhalgh, Carl Heneghan, Alessandro Liberati, Ivan Moschetti, Bob Phillips, Hazel Thornton, Olive Goddard and Mary Hodgkinson*

# EXECUTIVE SUMMARY

**Understanding the Pathology**

- Discordance between Serum Neutralizing Antibody (NAbs) Titers and the Recovery from COVID-19 was seen in a cross-sectional study of adult serum samples after recovery from COVID-19 (n=49) conducted at Bezmialem Vakif University Hospital in Turkey. 20.36% of participants had low titers of NAbs, while NAbs increased with the severity of disease (r=0.73, p=0.016, 95%CI 0.18-0.93) and patient age (r=0.29, p=0.04,95%CI 0.01-0.53). Authors suggest COVID-19 recovery may not be dependent on antibody titers alone and the SARS-CoV-2 immune response likely depends on patient age, disease severity, and several other complex factors.

**Management**

- Treatment of COVID-19 atypical pneumonia by early Tocilizumab administration in "non-critically-ill" patients on hemodialysis was explored in three case reports of hemodialysis (HD) patients with atypical COVID-19 pneumonia and progressively worsening alteration of inflammatory markers, most notably increased interleukin-6 (IL-6). All three patients showed significant symptom improvement and progressive resolution of disease after administration of tocilizumab (an anti-IL-6 monoclonal antibody). These findings show potential for tocilizumab as a treatment option for atypical COVID-19 pneumonia, specifically for patients on HD.

**R&D: Diagnosis & Treatments**

- Androgen Receptor Genetic Variant Predicts COVID-19 Disease Severity according to a Prospective Longitudinal Study of Hospitalized COVID-19 Male Patients. The study followed 65 hospitalized male COVID-19 patients over 60 days and found that patients with high glutamine (CAG) repeats in the androgen response (AR) gene had longer hospitalizations (mean: 45.7 days) and a high rate of ICU admissions (70.6%) compared to patients with low CAG repeats (mean 25 days, 45.2%). These findings suggest AR CAG length is associated with severe COVID-19 disease in males, which supports current evidence of the importance of androgens in SARS-CoV-2 infection. The authors recommend AR CAG length as a potential biomarker for risk of ICU admission and suggest further study into the use of anti-androgens in treating COVID-19.

- Mass screening of asymptomatic persons (n=1,924) for SARS-CoV-2 using saliva conducted in Japan by researchers affiliated with Hokkaido University Hospital and Hokkaido Graduate School of Medicine found self-collected saliva and nasopharyngeal swabs had equivalent utility with similar specificity and sensitivity as specimens for nucleic acid amplification. Authors suggest the self-collected saliva method may be superior to nasopharyngeal swabs for mass testing in asymptomatic populations as it eliminates close contact between the test subject and provider, allows for parallel sample collection, and minimizes discomfort.

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# CLIMATE

## AFFECTING THE HEALTHCARE WORKFORCE

### EFFECTS OF THE COVID-19 PANDEMIC ON ACTIVE NON-COVID CLINICAL TRIALS

Gaudino M, Arvind V, Hameed I, Di Franco A, Spadaccio C, Bhatt DL, Bagiella E.. J Am Coll Cardiol. 2020 Sep 29;76(13):1605-1606. doi: 10.1016/j.jacc.2020.07.051. Epub 2020 Jul 31.
Level of Evidence: 2 - Systematic review of surveys that allow matching to local circumstances

#### BLUF

In this letter to the editor, cardiologists and cardiothoracic surgeons at Weill Cornell Medicine explore the impact of COVID-19 on non-COVID-19-related clinical trials by correlating the number of COVID-19 cases per million to the number of clinical trials unrelated to COVID-19. In the three years prior to December 19, 2019 there were 638 trials on average halted each month, but from January 1, 2020 to May 31, 2020 there were 1,147 halted trials per month (Figure 1). Given a possible delay in updating trial data, authors suggest these findings may underestimate the full impact of COVID-19 on clinical trials and long-term tracking will likely be required to accurately assess the level of disruption the pandemic has caused regarding non-COVID-19 research.

#### FIGURES

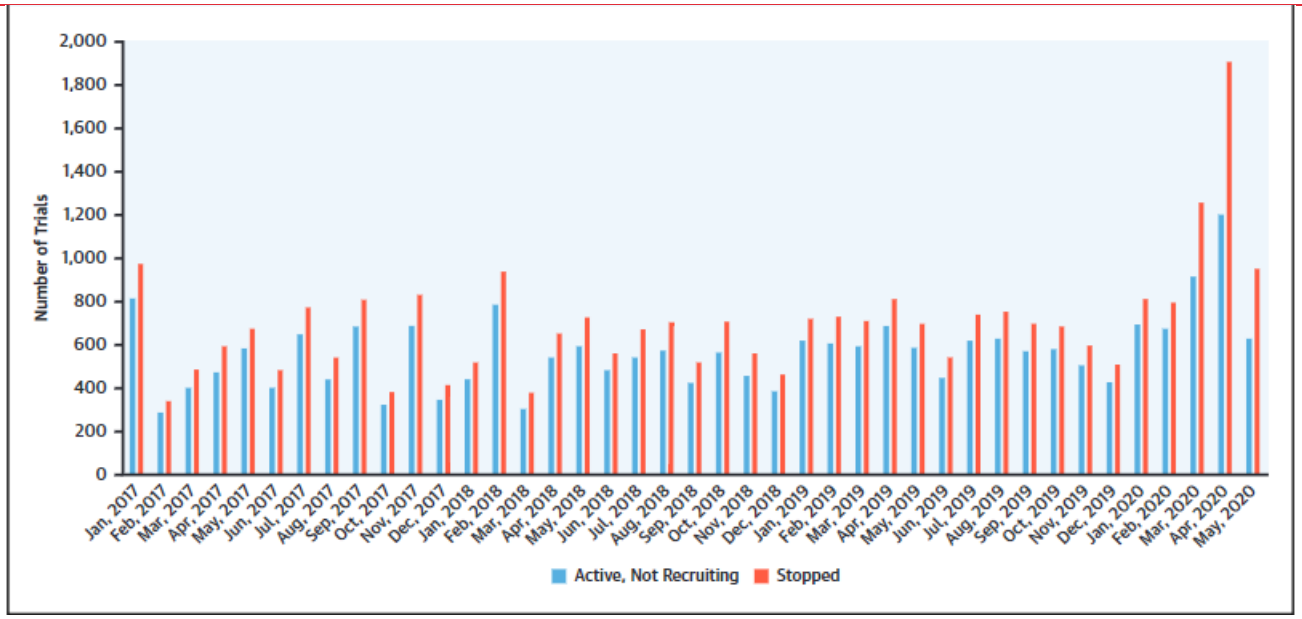


Figure 1. Temporal trend for active but not recruiting and stopped trials on Clinicaltrials.gov from January 2017 to May 2020.

# DISCORDANCE BETWEEN SERUM NEUTRALIZING ANTIBODY TITERS AND THE RECOVERY FROM COVID-19

Kalkan Yazıcı M, Koç MM, Çetin NS, Karaaslan E, Okay G, Durdu B, Sümbül B, Doymaz MZ.. J Immunol. 2020 Sep 25:ji2000840. doi: 10.4049/jimmunol.2000840. Online ahead of print.
Level of Evidence: 3 - Local non-random sample

## BLUF

A cross-sectional study of adult serum samples after recovery from COVID-19 (n=49; Table 1) conducted at Bezmialem Vakif University Hospital by microbiologists in Turkey found 20.36% of participants had low titers of neutralizing antibodies (NAbs), while NAbs increased with the severity of disease (r=0.73, p=0.016, 95%CI 0.18-0.93; Figures 2,4) and patient age (r=0.29, p=0.04,95%CI 0.01-0.53). Authors suggest COVID-19 recovery may not be dependent on antibody titers alone and the SARS-CoV-2 immune response likely depends on patient age, disease severity, and several other complex factors.

## ABSTRACT

The recent pandemic of COVID-19 has caused a tremendous alarm around the world. Details of the infection process in the host have significant bearings on both recovery from the disease and on the correlates of the protection from the future exposures. One of these factors is the presence and titers of neutralizing Abs (NAbs) in infected people. In the current study, we set out to investigate NAbs in the recovered subjects discharged from the hospital in full health. Serum samples from a total of 49 documented consecutive COVID-19 subjects were included in the study. All the subjects were adults, and serum samples collected during the discharge were tested in viral neutralization, enzyme immunoassay (EIA), and Western immunoblot tests against viral Ags. Even though a majority of the recovered subjects had raised significant NAb titers, there is a substantial number of recovered patients (10 out of 49) with no or low titers of NAbs against the virus. In these cohorts as well as in patients with high NAb titers, viral Ag binding Abs were detectable in EIA tests. Both NAb titers and EIA detectable Abs are increased in patients experiencing a severe form of the disease, and in older patients the Ab titers were heightened. The main conclusion is that the recovery from SARS-CoV-2 infection is not solely dependent on high NAb titers in affected subjects, and this recovery process is probably produced by a complex interplay between many factors, including immune response, age of the subjects, and viral pathology.

## FIGURES

Table I. Demographics and clinical characteristics of COVID-19 patients and healthy control subjects

| Characteristic | Median | IQR |
|---|---|---|
| Characteristics of 49 subjects recovered from COVID-19 | | |
| Age, median (y) | 52 | 59–42 |
| Male sex (%) | 53 | |
| Time since symptom onset (d) | 15 | 21–13 |
| Time since positive nasal swab SARS-CoV-2 PCR (d) | 14 | 14–9 |
| Illness severity[a] | | |
| Mild (%) | 18 | |
| Moderate (%) | 55 | |
| Severe (%) | 18 | |
| Critical (%) | 8 | |
| Age and sex of 10 healthy control sera | | |
| Age (y) | 41 | 51, 25–36 |
| Male sex (%) | 50 | |

[a]The severity of the clinical symptoms ranged from mild to critical conditions as determined by WHO interim guidelines.
IQR, interquartile range.

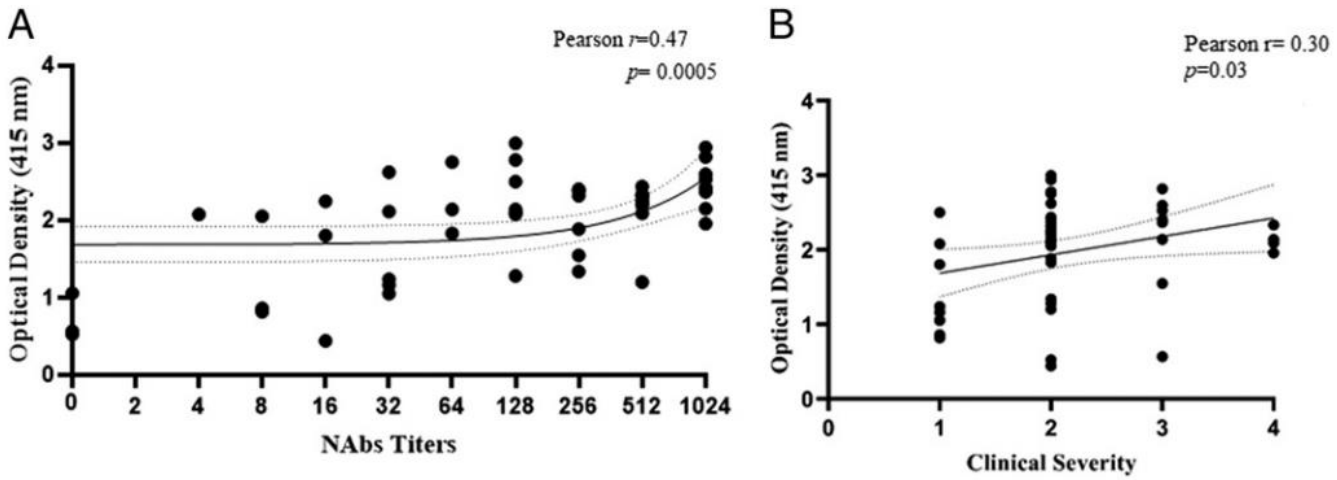


Figure 4. The relationships between EIA results and NAb titers (A) and between EIA results and clinical severity (B) are presented. Spearman correlation (two-tailed) of whole virus-specific Ab titer of recovered patients with the serum neutralization activity and with clinical severity (n = 49) are presented. For EIA, 49 SARS-CoV-2 Ab-positive and 10 SARS-CoV-2 Ab-negative human sera were tested. All reactions were performed in duplicate. For VNA, all the samples were tested in two occasions, and each time, all the samples were tested in duplicate. On each 96-well plate, Ab-positive and -negative serum samples and no-serum-added wells as well as no-virus-added wells, all in duplicate, were included.

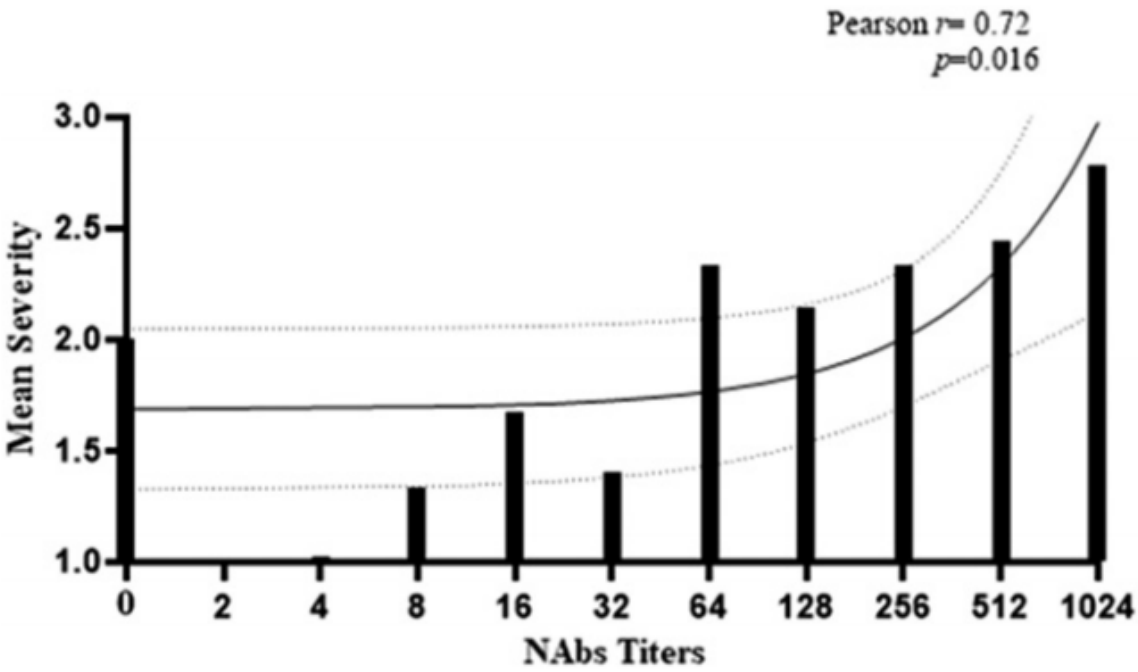


Figure 2. The relationship between the NAb titers and mean score of clinical severity. Spearman correlation (two-tailed) of the serum neutralization activity with mean score of clinical severity (n = 49) is performed. All the samples were tested in two occasions, and each time, all the samples were tested in duplicate. On each 96-well plate, Ab-positive and -negative serum samples and no-serum-added wells as well as no-virus added wells, all in duplicate, were included.

# MANAGEMENT

## ACUTE CARE

## NEUROLOGY

### BRAIN MRI FINDINGS IN PATIENTS IN THE INTENSIVE CARE UNIT WITH COVID-19 INFECTION

Kandemirli SG, Dogan L, Sarikaya ZT, Kara S, Akinci C, Kaya D, Kaya Y, Yildirim D, Tuzuner F, Yildirim MS, Ozluk E, Gucyetmez B, Karaarslan E, Koyluoglu I, Demirel Kaya HS, Mammadov O, Kisa Ozdemir I, Afsar N, Citci Yalcinkaya B, Rasimoglu S, Guduk DE, Kedir Jima A, Ilksoz A, Ersoz V, Yonca Eren M, Celtik N, Arslan S, Korkmazer B, Dincer SS, Gulek E, Dikmen I, Yazici M, Unsal S, Ljama T, Demirel I, Ayyildiz A, Kesimci I, Bolsoy Deveci S, Tutuncu M, Kizilkilic O, Telci L, Zengin R, Dincer A, Akinci IO, Kocer N.. Radiology. 2020 Oct;297(1):E232-E235. doi: 10.1148/radiol.2020201697. Epub 2020 May 8.
Level of Evidence: 4 - Case-series

#### BLUF

A case series conducted by neuroradiologists across several hospitals from March 1 - April 18, 2020 found that 12/27 inpatients with COVID-19 for whom an MRI was obtained for neurologic symptoms had acute findings. Ten patients exhibited signal intensity abnormality on cortical fluid attenuated inversion recovery MRI scans with involvement of areas including the frontal lobe (4 patients), parietal lobe (3 patients), occipital lobe (4 patients), temporal lobe (2 patients), insular cortex (3 patients), and cingulate gyrus (3 patients). The findings in this study suggest that neurologic symptoms in severe COVID-19 should include a differential diagnosis of infectious or autoimmune encephalitis, seizure, hypoglycemia, and hypoxia.

## MEDICAL SUBSPECIALTIES

## NEPHROLOGY

### TREATMENT OF COVID-19 ATYPICAL PNEUMONIA BY EARLY TOCILIZUMAB ADMINISTRATION IN "NON-CRITICALLY-ILL" PATIENTS ON HEMODIALYSIS

Castellano G, Infante B, Mercuri S, Forcella M, Cox SN, Serviddio G, Gesualdo L, Stallone G.. J Nephrol. 2020 Sep 30. doi: 10.1007/s40620-020-00872-4. Online ahead of print.
Level of Evidence: 4 - Case-series, case-control studies, or historically controlled studies

#### BLUF

Italian researchers with expertise in nephrology, immunology, and transplant science present three case reports of hemodialysis (HD) patients with atypical COVID-19 pneumonia and progressively worsening alteration of inflammatory markers, most notably increased interleukin-6 (IL-6). All three patients showed significant symptom improvement and progressive resolution of disease after administration of tocilizumab (an anti-IL-6 monoclonal antibody; see summary). These findings show potential for tocilizumab as a treatment option for atypical COVID-19 pneumonia, specifically for patients on HD.

#### SUMMARY

Additional details of case reports as follows:
- Case 1: A 49 year old female on HD due to immunoglobulin A (IgA) nephropathy presented with increasingly severe COVID-19 pneumonia and rising inflammatory markers over the course of six days of hospitalization. One day after tocilizumab administration, her cough and fever attenuated and inflammatory markers progressively normalized (Figure 1).
- Case 2: A 36 year old female on HD showed significant decrease in lymphocyte/monocyte counts and altered C-reactive protein (CRP) and lactate dehydrogenase (LDH) levels six days after COVID-19 symptom onset. Following tocilizumab administration her fever remitted and white blood cell count and other inflammatory markers progressively normalized

(Figure 2).
- Case 3: A 70 year old male on HD whose fever and pneumonia resolved after tocilizumab administration.

## FIGURES

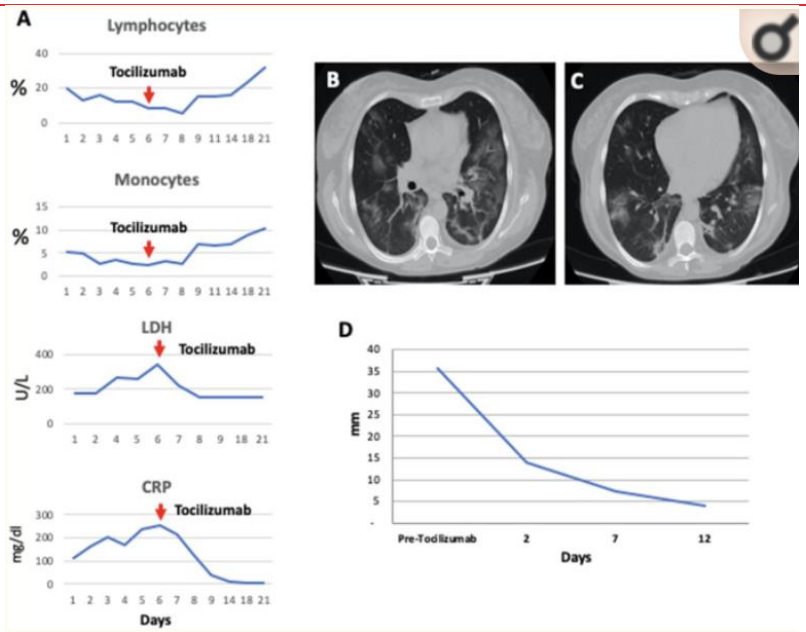


Figure 1. Laboratory tests and chest manifestations before and after Tocilizumab administration in Patient 1. During the first days of hospital admission the patient presented a progressive and rapid decrease in Lymphocyte and Monocyte blood count, associated with a significant increase in LDH and CRP blood levels (a). The administration of Tocilizumab at day 6 resulted in a progressive improvement of all laboratory parameters (a). CT chest scan shows interstitial-alveolar multiple opacities with a 'ground-glass' look, some of which were widely confluent, with a predominant mantle disposition and irregular triangular morphology, located, in particular, at the apex and dorsal segment of the upper left lobe, at the anterior and posterior segments of the upper right lobe, at the middle lobe, at the lingula site and at the lower lobes (b–c). Monitoring of lung lesions by chest echography: time course of lung lesion reduction after Tocilizumab administration (d)

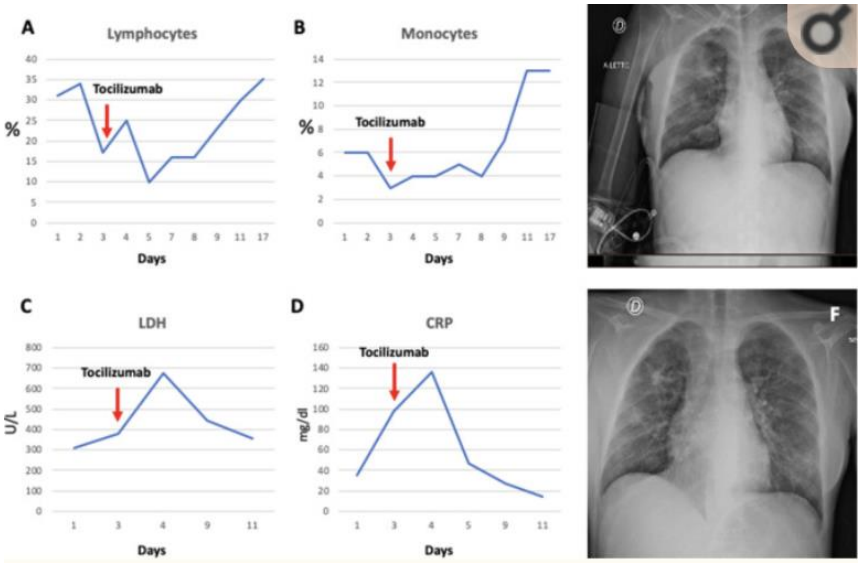


Figure 2. Laboratory tests and chest manifestations before and after Tocilizumab administration in Patient 2. The administration of Tocilizumab at day 3 induced a progressive improvement of all the laboratory parameters.We found a progressive decrease in Lymphocyte (a) and Monocyte (b) blood count, associated with a significant increase in LDH (c) and CRP blood levels (d). Evidence of new parenchymal thickening and bilateral widespread pulmonary interstitial involvement in pre-Tocilizumab administration (e); Bilateral improvement of lung lesions with a decrease in the density and in the extension of lung thicknesses as seen from X-ray images (f)

# GENERAL SURGERY

## UNDERWATER-SEAL EVACUATION OF SURGICAL SMOKE IN LAPAROSCOPY DURING THE COVID-19 PANDEMIC: A FEASIBILITY REPORT OF A SIMPLE TECHNIQUE

Hamed H.. Br J Surg. 2020 Oct 3. doi: 10.1002/bjs.11987. Online ahead of print.
Level of Evidence: Other - Expert Opinion

### BLUF

A general surgeon affiliated with Mansoura University in Egypt addresses concerns of SARS-CoV-2 transmission during laparoscopic procedures. The author recommends evacuating pneumoperitoneum through an intravenous-line tube into a container of water that can then be heated and sanitized to reduce viral load (Figure 1). This protocol can help minimize aerosolized SARS-CoV-2 particles in the operating room and reducing risk of transmission to medical personnel.

### FIGURES

Figure 1. Two ports are connected by two intravenous-line tubes to underwater seal

## ANDROGEN RECEPTOR GENETIC VARIANT PREDICTS COVID-19 DISEASE SEVERITY: A PROSPECTIVE LONGITUDINAL STUDY OF HOSPITALIZED COVID-19 MALE PATIENTS

McCoy J, Wambier CG, Herrera S, Vaño-Galván S, Gioia F, Comeche B, Ron R, Serrano-Villar S, Iwasiow RM, Tayeb MA, Cadegiani FA, Mesinkovska NA, Shapiro J, Sinclair R, Goren A.. J Eur Acad Dermatol Venereol. 2020 Sep 25. doi: 10.1111/jdv.16956. Online ahead of print.
Level of Evidence: 3 - Cohort study or control arm of randomized trial

### BLUF

Investigators from multiple institutions, including Applied Biology, Inc. (Irvine, California) and Ramón y Cajal Hospital (Madrid, Spain), performed a prospective cohort sutdy following 65 hospitalized male COVID-19 patients over 60 days. They found that patients with high glutamine (CAG) repeats in the androgen response (AR) gene had longer hospitalizations (mean: 45.7 days) and a high rate of ICU admissions (70.6%) compared to patients with low CAG repeats (mean 25 days, 45.2%). These findings suggest AR CAG length is associated with severe COVID-19 disease in males, which supports current evidence of the importance of androgens in SARS-CoV-2 infection. The authors recommend AR CAG length as a potential biomarker for risk of ICU admission and suggest further study into the use of anti-androgens in treating COVID-19.

### ABSTRACT

Men infected with SARS-CoV-2 are more likely to be admitted to the intensive care unit (ICU) compared to women.1 Previously, we have reported that among hospitalized men with COVID-19, 79% presented with androgenetic alopecia (AA) compared to 31-53% that would be expected in a similar aged match population.2 AA is known to be mediated by variations in the androgen receptor (AR) gene.3 In addition, the only known promoter of the enzyme implicated in SARS-CoV-2 infectivity, TMPRSS2, is regulated by an androgen response element.4 The polyglutamine repeat (CAG repeat) located in the AR gene is associated with androgen sensitivity and AA.3 These observations led us to hypothesize that variations in the AR gene may predispose male COVID-19 patients to increased disease severity.

## MASS SCREENING OF ASYMPTOMATIC PERSONS FOR SARS-COV-2 USING SALIVA

Yokota I, Shane PY, Okada K, Unoki Y, Yang Y, Inao T, Sakamaki K, Iwasaki S, Hayasaka K, Sugita J, Nishida M, Fujisawa S, Teshima T.. Clin Infect Dis. 2020 Sep 25:ciaa1388. doi: 10.1093/cid/ciaa1388. Online ahead of print.
Level of Evidence: 3 - Non -randomized controlled cohort/follow-up study

### BLUF

A mass-screening cohort study (n=1,924) conducted in Japan between June 12 and July 7, 2020 by researchers affiliated with Hokkaido University Hospital and Hokkaido Graduate School of Medicine found self-collected saliva and nasopharyngeal swabs had equivalent utility with similar specificity and sensitivity as specimens for nucleic acid amplification (Figure 1). Authors suggest the self-collected saliva method may be superior to nasopharyngeal swabs for mass testing in asymptomatic populations as it eliminates close contact between the test subject and provider, allows for parallel sample collection, and minimizes discomfort.

### ABSTRACT

BACKGROUND: COVID-19 has rapidly evolved to become a global pandemic due largely to the transmission of its causative virus through asymptomatic carriers. Detection of SARS-CoV-2 in asymptomatic people is an urgent priority for the prevention and containment of disease outbreaks in communities. However, few data are available in asymptomatic persons regarding the accuracy of PCR testing. Additionally, although self-collected saliva has significant logistical advantages in mass screening, its utility as an alternative specimen in asymptomatic persons is yet to be determined. METHODS: We conducted a mass-screening study to compare the utility of nucleic acid amplification, such as reverse transcriptase polymerase chain reaction (RT-PCR) testing, using nasopharyngeal swabs (NPS) and saliva samples from each individual in two cohorts of asymptomatic persons: the contact tracing cohort and the airport quarantine cohort. RESULTS: In this mass-screening study including 1,924

individuals, the sensitivity of nucleic acid amplification testing with nasopharyngeal and saliva specimens were 86% (90%CI:77-93%) and 92% (90%CI:83-97%), respectively, with specificities greater than 99.9%. The true concordance probability between the nasopharyngeal and saliva tests was estimated at 0.998 (90%CI:0.996-0.999) on the estimated airport prevalence at 0.3%. In positive individuals, viral load was highly correlated between NPS and saliva. CONCLUSION: Both nasopharyngeal and saliva specimens had high sensitivity and specificity. Self-collected saliva is a valuable specimen to detect SARS-CoV-2 in mass screening of asymptomatic persons.

## FIGURES

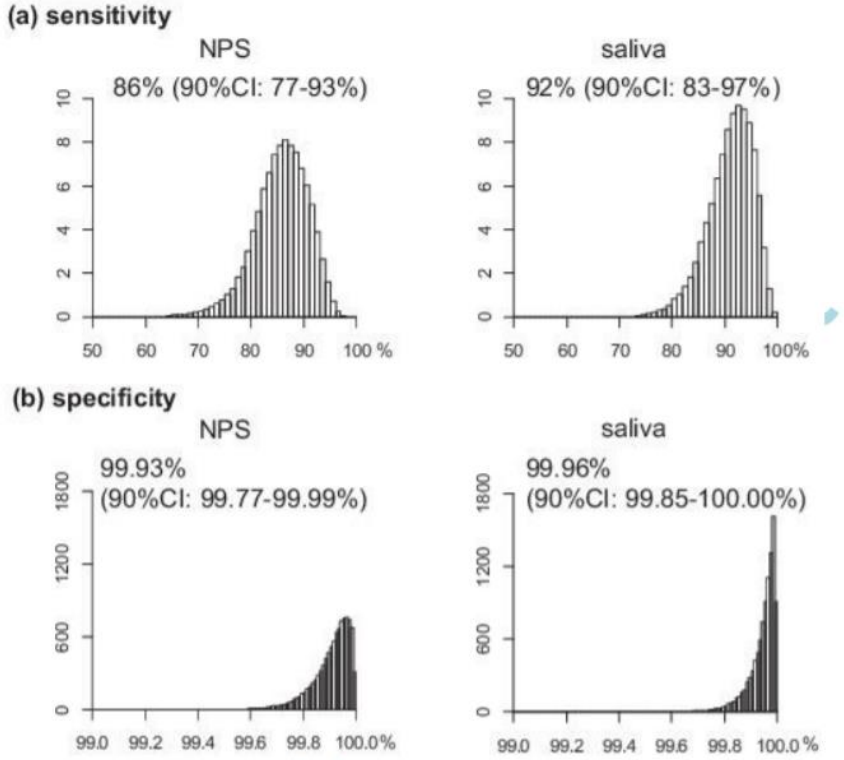


Figure 1. The sensitivity and specificity of nasopharyngeal swab and saliva histograms of posterior distribution of (a) sensitivity and (b) specificity. Point estimates and 90% credible interval (90%CI) defined by 5th to 95th percentile are shown.

# DETECTION METHODS OF COVID-19

Echtioui A, Zouch W, Ghorbel M, Mhiri C, Hamam H.. SLAS Technol. 2020 Sep 30:2472630320962002. doi: 10.1177/2472630320962002. Online ahead of print.
Level of Evidence: 4 - Case-control studies, or "poor or non-independent reference standard

## BLUF

A multi-disciplinary team from Tunisia, Saudi Arabia, and Canada presents a convolutional neural network (CNN, described in summary below) method for COVID-19 detection as an imaging-based alternative to currently used diagnostics. They propose a new CNN comprised of 10 convolutional layers to detect and classify images as: COVID-19, pneumonia, or no findings from chest x-rays (Figures 1 & 3). Their proposed model performed with 91% precision, 88.33% recall, 89.66% F1 score, and 91.34% accuracy (Table 3) when using a dataset of 500 COVID-19 x-rays, 500 pneumonia x-rays, and 500 controls. The authors contend that the CNN model can be more effective than current modalities, implicating its potential for early diagnosis and containment of COVID-19.

## SUMMARY

CNN uses a convolutional layer, flatten layer, pooling layer, and fully connected layer for feature extraction and classification. The new CNN model proposed in this study is comprised of 10 convolutional layers, batch normalization, and 3 fully connected layers. This model classifies images into 3 groups: COVID-19, pneumonia, and no findings based on 500 chest Xray images extracted from the datasets (Figures 1,3).
- The proposed CNN detects COVID-19 positive cases with 96% precision, 86% recall, 91% F1 score, and 94.14% accuracy

(Table 3). High recall indicates lower false negatives.
- The proposed CNN model displayed a higher average accuracy (91.34%) than chest x-ray (87.02%) and chest CT (86.7%).

## ABSTRACT

Since being first detected in China, coronavirus disease 2019 (COVID-19) has spread rapidly across the world, triggering a global pandemic with no viable cure in sight. As a result, national responses have focused on the effective minimization of the spread. Border control measures and travel restrictions have been implemented in a number of countries to limit the import and export of the virus. The detection of COVID-19 is a key task for physicians. The erroneous results of early laboratory tests and their delays led researchers to focus on different options. Information obtained from computed tomography (CT) and radiological images is important for clinical diagnosis. Therefore, it is worth developing a rapid method of detection of viral diseases through the analysis of radiographic images. We propose a novel method of detection of COVID-19. The purpose is to provide clinical decision support to healthcare workers and researchers. The article is to support researchers working on early detection of COVID-19 as well as similar viral diseases.

## FIGURES

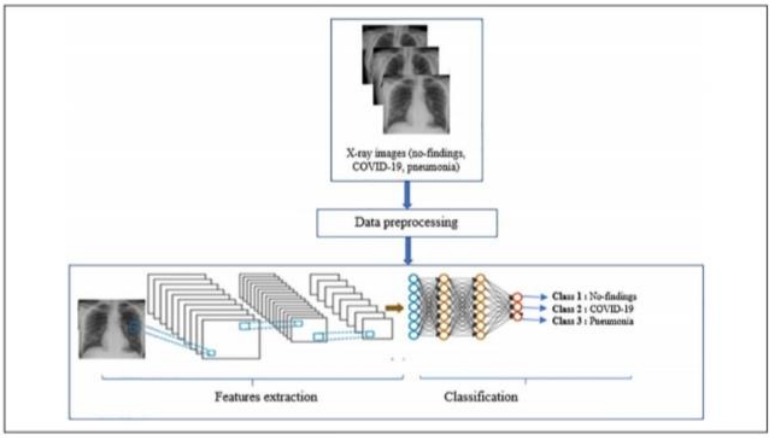


Figure 1: Flow diagram of the proposed method.

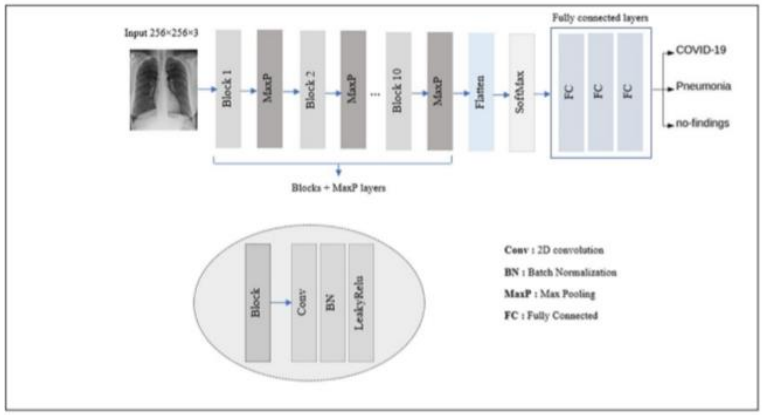


Figure 3: The proposed convolutional neural network (CNN) architecture.

| Class | Precision | Recall | F1 Score | Accuracy |
|---|---|---|---|---|
| COVID-19 | 96.00% | 86.00% | 91.00% | 94.14% |
| No-findings | 89.00% | 94.00% | 91.00% | 90.97% |
| Pneumonia | 88.00% | 85.00% | 87.00% | 88.92% |
| Average | 91.00% | 88.33% | 89.66% | 91.34% |

COVID-19, coronavirus disease 2019.

Table 3: Classification Report for the Proposed Model.

## PERFORMANCE EVALUATION OF PANTHER FUSION SARS-COV-2 ASSAY FOR DETECTION OF SARS-COV-2 FROM DEEP THROAT SALIVA, NASOPHARYNGEAL AND LOWER-RESPIRATORY-TRACT SPECIMENS

Wong RC, Wong AH, Ho YI, Leung EC, Lai RW.. J Med Virol. 2020 Sep 30. doi: 10.1002/jmv.26574. Online ahead of print.
Level of Evidence: 5 - Mechanism-based reasoning

### BLUF

Microbiologists at the Prince of Wales Hospital (Hong Kong) evaluated the performance of the Panther Fusion (PF) SARS-CoV-2 assay by comparing positive and negative viral results to the TIB-MolBiol LightMix SarbecoV E-gene assay (TIB-Molbiol) and the Expert Xpress assay (only in the case of discrepancies), using 158 specimens from 142 patients. The PF assay had similar results to the consensus findings in samples from nasopharyngeal, oropharyngeal, and bronchoalveolar lavage specimens 96.43%, 100.00%, and 96.00% of the time, respectively. Given these results and PF assay's "capability of random access and high-throughput," the authors believe that this SARS-CoV-2 testing tool may be an alternative option for clinical laboratories.

### ABSTRACT

Tremendous increase in workload due to COVID-19 pandemic has caused intense strain on laboratory service. 

## REFLECTIONS ON THE LIVED EXPERIENCE OF WORKING WITH LIMITED PERSONAL PROTECTIVE EQUIPMENT DURING THE COVID-19 CRISIS

Iheduru-Anderson K.. Nurs Inq. 2020 Oct 3:e12382. doi: 10.1111/nin.12382. Online ahead of print.
Level of Evidence: 3 - Local non-random sample

### BLUF

A qualitative study based on unstructured interviews with 28 acute care nurses on PPE shortages during the COVID-19 pandemic identified common emotional themes such as fear, anger, sense of isolation, betrayal by their employers, fatigue, grief, and denial. The authors conclude that as a result of the pandemic, most nurses will experience normal grief responses which may include lasting negative effects on their physical and psychological well-being, recommending that systems should be put in place to support the needs of acute care nurses now and to prevent similar negative effects in the future.

### SUMMARY

Below is a description of negative feelings the nurses in this study experienced:
- Fear: All participants identified feeling scared or afraid for their health.
- Anger: Nurses expressed feeling upset toward the federal government/agencies and their employers or supervisors.
- Isolation: Some participants were physically isolated from their family or felt they could not share their experience with them.
- Betrayal: Lack of adequate PPE, poor communication, and disregard for their safety led the nurses to feel like they have not been protected.
- Fatigue: All participants reported feeling emotionally and mentally drained since the pandemic began.
- Grief: Many nurses reported feeling heartbroken for those who have been lost and their loved ones, in addition to expressing they feel "numb with the pain."
- Denial: A few nurses stated they were in denial due to receiving mixed messages from leadership, with one participant expressing that the conditions in this pandemic have felt like an out-of-body experience.

### ABSTRACT

Coronavirus disease 2019 (COVID-19) has placed significant strain on United States' health care and health care providers. While most Americans were sheltering in place, nurses headed to work. Many lacked adequate personal protective equipment (PPE), increasing the risk of becoming infected or infecting others. Some health care organizations were not transparent with their nurses; many nurses were gagged from speaking up about the conditions in their workplaces. This study used a descriptive phenomenological design to describe the lived experience of acute care nurses working with limited access to PPE during the COVID-19 pandemic. Unstructured interviews were conducted with 28 acute care nurses via telephone, WebEx, and Zoom. Data were analyzed using thematic analysis. The major theme, emotional roller coaster, describes the varied intense emotions the nurses experienced during the early weeks of the pandemic, encompassing eight subthemes: scared and afraid, sense of isolation, anger, betrayal, overwhelmed and exhausted, grief, helpless and at a loss, and denial. Other themes include: self-care, 'hoping for the best', 'nurses are not invincible', and 'I feel lucky'. The high levels of stress and mental assault resulting from the COVID-19 crisis call for early stress assessment of nurses and provision of psychological intervention to mitigate lasting psychological trauma.

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