AHNA COVID-19 Update
Tuesday, May 12, 2020

The American Holistic Nurses Association (AHNA) supports the Center for Disease Control (CDC) and the World Health Organization (WHO) in acknowledging the immediate global public health risk of the COVID-19.

This update is current to time of release. Previous updated information is reduced weekly to keep the report as concise as possible. For a comprehensive appraisal, please review subsequent weekly updates (since Feb 2020) at: https://www.ahna.org/Home/Resources/Coronavirus-COVID-19

Clinical Updates

TRANSMISSION
Airborne transmission is highly suspected. Negative pressure rooms are ideal, but may not always be available. When negative pressure rooms aren't available, portable air filtration systems may be considered (SSC guidelines). Aerosol-generating procedures may generate an increasing number of aerosol particles (e.g. intubation, extubation, noninvasive ventilation, high-flow nasal cannula, CPR prior to intubation, bag-mask ventilation, bronchoscopy, and tracheostomy. Patients with diagnosed COVID-19 should be under aerosol precautions regardless (ANZICS recommends airborne precautions be used for critically ill patients with COVID-19).

CPR as an aerosol generating procedure: https://app.box.com/s/3lkcbxepqixkg4mv640dpwg978ixjt/file/657486851975

AIR POLLUTION
The general consensus among COVID-19 experts remains transmission via respiratory droplets; however the role of other modes of transmission remains under investigation. A study conducted in Italy (not yet peer reviewed) detected the presence of SARS-CoV-2 RNA in air pollution particles. Potentially, inhalation would provide an additional mechanism for transmission. This study did not evaluate viability, nor the potential for this route of exposure to result in infection.

VIRAL MUTATION
COVID-19 binds via the angiotensin-converting enzyme 2 (ACE2) receptor located on type II alveolar cells, intestinal epithelia, and the vascular endothelium (Hamming 2004). The virus (as expected) is mutating, which complicates vaccine development. Virulence and transmission will shift in time. Ongoing phylogenetic mapping of new strains can be found here. Scientists publishing a pre-print article via bioRxiv, report 14 mutations of the spike protein to the COVID-19 virus. "Mutations are considered in a broader phylogenetic context, geographically, and over time, to provide an early warning system to reveal mutations that may confer selective advantages in transmission or resistance to interventions," they wrote. Findings include:

- Spike protein mutation D614G appears more virulent, accounting for many infected cases
• Circulating strains recombine forming new mutations (as virus’ do) which may create difficulty in treatment and immunity therapeutic interventions

SCREENING
Nasopharyngeal Swab accuracy depends on obtaining a sufficiently deep specimen. Poor technique will cause the PCR assay to under-perform. COVID-19 isn’t a binary disease, but a spectrum of illness. Sicker patients with higher viral burden are likely to have a positive assay; sampling early may reveal a lower sensitivity. If the RT-PCR is negative but suspicion for COVID-19 remain this warrants ongoing isolation and re-sampling 72 hours later. Specificity appears high (contamination can yield false-positives). Sensitivity varies. Image Analysis, Ai et al. determined sensitivity & specificity of PCR. Among patients with suspected COVID-19 and a negative initial PCR, repeat PCR was positive in 15/64 patients (23%); a PCR sensitivity of <80%. Conversion from negative to positive PCR seemed to take a period of days, with CT scan often showing evidence of disease well before PCR positivity (Ai et al).

The Centers for Disease Control (CDC) updated testing recommendations to now include asymptomatic persons; specifically if they meet risk criteria based upon population data such as socio-economics, imprisonment, or race (especially within the Navajo community as they have been disproportionately affected). Testing of minimally symptomatic and even asymptomatic long-term care facility residents should be priority; especially in facilities where one or more other residents have been diagnosed with symptomatic or asymptomatic COVID-19. https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-criteria.html?

ANTIBODIES

The National Institute of Health divisions; NIAID, NIBIB, NCATS, and the NCI, instituted a joint study to estimate the undetected spread of SARS-CoV-2 within the United States. The serosurvey will collect and analyze 10,000 volunteer samples for epidemiological models. "This study will give us a clearer picture of the true magnitude of the COVID-19 pandemic in the United States by telling us how many people in different communities have been infected without knowing it, because they had a very mild, undocumented illness or did not access testing while they were sick," said Anthony S. Fauci, M.D., NIAID Director. clinicalstudiesunit@nih.gov Individuals in the Washington DC area who are interested in participating should visit ClinicalTrials.gov using identifier NCT04334954

Belgium researchers found antibodies from a 4-year-old Llama neutralized SARS-CoV-2 in lab experiments. Scientists intend to develop the antibodies into serum to protect health care workers. One dose would offer a 30-60 window of protection. Additionally, University of Ottawa researchers were awarded funding for the manufacturing of home test kits from Llama antibodies. The aptamers would bind to hundreds of virus particles from a spit swab or a blood sample.

IMMUNITY
The World Health Organization (WHO), Dr. Maria Van Kerkhove, confirmed lingering Viral RNA fragments in dead lung cells, are the cause of positive tests in recovered patients (rather than evidence of re-infection). Research to determine whether the antibodies produced in response to SARS-CoV-2 infection confer immunity, and for what duration, are incomplete but continue.

PRESENTATION UPDATE

Chilblains- painful red or purple lesions (that typically emerge on fingers or toes in the winter) are reported in all demographics but frequently in teenagers and young adults. Understanding of the physiological process is limited. https://onlinelibrary.wiley.com/doi/10.1111/ijd.14937
Excessive Shaking/Chills: common in presentation in primary and urgent care settings - not consistently febrile.

Associated with Greater Severity of illness: lymphopenia; optimal cutoff for defining lymphopenia is unclear; a cutoff of <1,500 b/L may increase sensitivity for diagnosis of COVID-19 (Goyal et al), neutrophilia, high serum alanine aminotransferase (ALT), aspartate aminotransferase (AST), and lactate dehydrogenase (LDH), elevated C-reactive protein (CRP), ferritin. Mild thrombocytopenia is common (but platelets are rarely <100). Lower platelet count is a poor prognostic sign (Ruan et al 3/3).

EMERGENCY MANAGEMENT


A fluid-conservative strategy is often advisable (for example, avoid reflexive use of 30 cc/kg fluid boluses). For patients with a history of diarrhea and clinical evidence of hypovolemia, titrated fluid administration may be beneficial.

- If a patient requiring CT for trauma, abdominal pain, and COVID-19 is questionable, strongly consider adding a chest CT.
- For significant dyspnea or hypoxemia, try to stabilize with one of the following techniques: Prone positioning, +/- HFNC, CPAP or BiPAP with high levels of end-expiratory pressure. When in doubt, err on the side of avoiding intubation.
- Avoid all nephrotoxins (especially NSAIDs and vancomycin).
- For patients with infiltrates and possible bacterial pneumonia: usual treatment is azithromycin plus ceftriaxone.

DIAGNOSTICS

Chest X-Ray: Infiltrates may be subtle COVID-19 chest X-rays and CT Scan. (Sensitivity of 97% (580/601) in Ai et al) Among patients with constitutional symptoms only (but not respiratory symptoms), CT scan may be less sensitive (e.g., perhaps ~50%) (Kanne 2/27). Shi et al. performed CT scanning in 15 healthcare workers who were exposed to COVID-19 before they became symptomatic; ground glass opacification was seen in 14/15 patients, and 9/15 patients had peripheral lung involvement (some bilateral, some unilateral). Emergence of CT abnormality before symptoms explains the existence of an asymptomatic carrier state. Among one patient series in New York City, 17% of patients with COVID-19 had clear admission chest radiographs (Goyal et al). Pleural effusion is uncommon (seen in only ~5%). COVID-19 doesn't appear to cause masses, cavitiation, or lymphadenopathy.

Lung Ultrasound shows greater sensitivity and specificity among ambulatory patients. It is necessary to visualize as much lung tissue as possible. The patchy abnormalities on CT scan can be missed unless ultrasonography is performed overlying the abnormal lung tissue. Results with increasing disease severity: Mild ground-glass opacity. Moderate more confluent ground-glass opacity & "waterfall sign". Severe disease, small peripheral consolidations are seen on CT scan and ultrasound & the volume of consolidated lung increases. Abnormalities are common in the posterior & inferior lungs, Huang et al.

Bronchoscopy should be considered carefully; deterioration in clinical condition is common due to instillation of saline and sedation, the enormous risk of transmission, and the considerable resource allocation. It may be appropriate for patient with immunosuppression with concerns for Pneumocystis pneumonia or fungal pneumonia, but not for diagnostic purposes of COVID-19 (Bouadma et al.).


CRITICAL CARE

Recommend Lines & Tubes: OG or small-bore post-pyloric feeding tube. Central line: Low threshold to place a quad-lumen central line with meticulous sterility. Best site may be left internal jugular vein (save the right internal jugular for dialysis or ECMO). Transition to a PICC catheter for patients with an ongoing ICU stay. Arterial line if potential for multiple vasopressors.

Additional Resources:

- https://covidprotocols.org/

DIC- COVID-19 produces a form of disseminated intravascular coagulation usually marked by hypercoagulability. The exact causes of this are unclear but may include: Inflammation (e.g. IL-6) stimulates up-regulation of fibrinogen synthesis by the liver (Carty 2010). Virus directly binds endothelial cells. Possible synergistic relationship between DIC and cytokine storm (each exacerbating the other). DIC appears to be a driver of disease severity. As might be expected, it is a strong prognostic factor for poor outcome (Tang et al. 2020). Microthrombi have been reported as autopsy findings in patients with COVID-19 (Luo et al.).

DVT prophylaxis- continue unless platelets <30, as COVID-19 may cause a pro-coagulable form of DIC despite low platelet count. B&W guidelines. For patients with marked D-dimer elevation, consider higher doses of enoxaparin (more on this below). Conservative transfusion strategy (generally avoid transfusion unless Hgb <7 mg/dL, or <8 mg/dL with active myocardial ischemia).

Neurology: acetaminophen 1 gram enterally every 6hr for antipyretic and analgesic effects. Melatonin 5 mg QHS for sleep (Zhang et al 2020, Zhou et al. 2020). Opioid (fentanyl 50 mcg IV q 30 PRN bolus PRN pain). Low-dose propofol as a titratable sedative (e.g. ideally around 0-30 mcg/kg/min), however, COVID-19 patients are developing hypertriglyceridemia, (systemic inflammation) so ideally keep doses as low as safely possible. Adjunctive atypical antipsychotic (e.g. 10-20 mg olanzapine per tube QHS, or quetiapine). A pain-dose ketamine infusion (0.1-0.3 mg/kg/hr) may be beneficial.

Lung-protective ventilation: APRV might be the preferred ventilator mode (a primary pathophysiological problem is atelectasis, which APRV manages well). Conventional low-tidal volume ventilation is also effective. Avoid ABG/VBG if possible. Consider trending etCO2 and minute ventilation instead of obtaining serial ABG/VBG measurements. Oxygen saturation generally does appear to track with pO2 in these patients and can be used to titrate oxygen administration. Acute Respiratory Distress Syndrome Network; Brower RG, Matthay MA, Morris A, Schoenfeld D, Thompson BT, Wheeler A. Ventilation with lower tidal volumes as compared with traditional tidal volumes for acute lung injury and the acute respiratory distress syndrome. New England Journal of Medicine 2000;342(18):1301-1308.

STATUS EVAL- Lung ultrasonography the preferred modality for evaluating pulmonary status. Admission labs: Urine pregnancy test in reproductive-age women, Blood culture x2, Tracheal aspirate for gram stain & culture, Urine legionella & pneumococcal antigens, Liver function tests, Coagulation tests including INR, PTT, fibrinogen, Ferritin, LDH. Triglycerides every 72 hours, standard for patients on propofol. LFT every 48 hours. Thromboelastography (TEG) is recommended if questions arise about the overall balance of coagulation. -PulmCrit.org

MENTAL HEALTH
A wealth of articles from the NY Times to Seattle and Los Angeles have interviewed recovered patients discussing their experiences in critical care. The repeated theme is one of intense apprehension and loneliness. “While in the I.C.U., I spent nights awake thinking about whether I was going to die. The first night they told me that they might
have to intubate me, and I spent that whole night wondering whether I would ever see my family again."

It’s imperative that nurses recognize the isolation patients are facing. “The physical pain was mostly taken care of by drugs and oxygen...but the loneliness was real. The staff, too- everyone was in P.P.E., so the interactions were very impersonal. I still don’t know what any of the staff look like,” anonymous man in his 50’s.

Another reported gaining new perspective reflecting the significance of the holistic ‘art of being’, to the healing process, “I did have great staff. They are amazing- I just didn’t realize that seeing people’s faces was so important to feeling safe.” Mr. Clement Chow, 38, is an assistant professor of human genetics in Salt Lake City. These acts reflect the significance of the holistic ‘art of being’ in the healing space and process.

**Stages of Infection:** proposed by Siddiqi et al.

**Stage 1 - Early**

**Clinical:** Incubation followed by non-specific symptoms (e.g. malaise, fever, dry cough). This phase may last for several days, with fairly mild symptoms. Patients often don't require hospital admission.

**Biological:** Viral replication occurs. An innate immune response follows, but this fails to contain the virus. Symptoms reflect a combination of direct viral cytopathic effect and innate immune responses (Type-I interferon release).

**Treatment:** Anti-viral therapies could be beneficial, especially in patients predicted to be at higher risk for poor outcome. Anti-viral therapies probably have maximal efficacy when given early, during this phase.

- Interferon I-beta could theoretically be useful to augment the innate immune system response to the virus. This involves rendering cells resistant to viral infection, an intervention which would probably be most effective if deployed as early as possible (however this is a theoretical consideration, which currently is not recommended).
- Immunosuppression could theoretically be dangerous at this point, as it could delay the development of an adequate adaptive immune response. For example, early initiation of steroid has been shown to prolong virus shedding in SARS (Lee et al 2004).

**Stage II - Pulmonary phase**

**Clinical:** Despite being stable for several days patients may abruptly deteriorate with hypoxemic respiratory failure. Patients will often present to the hospital at this point. They may progress rapidly to ARDS, requiring intubation. Markers of systemic inflammation are often moderately elevated (e.g. C-reactive protein, ferritin).

**Biological:** An adaptive immune response occurs, which causes a reduction in viral titers, but leads to increase in inflammation and tissue damage. Data indicate that elevated HFABP is closely linked to rapid development of severe COVID-19. Yin L, Mou H, Shao J, Zhu Y, Pang X, Yang J, et al. (2020) Correlation between Heart fatty acid binding protein and severe COVID-19: A case-control study. PLoS ONE 15(4): e0231687. https://doi.org/10.1371/journal.pone.0231687 Registered with the Chinese Clinical Trial Registry, the registration number: ChiCTR2000029829. And PulmCrit.org

**Treatment:** Antiviral-therapy could be beneficial- initiate earlier for efficacy

Some immunosuppression could be beneficial for patients with more severe manifestations (moderate dose steroid for patients with ARDS).

- Some immunosuppression could be beneficial for patients with more severe manifestations (moderate dose steroid for patients with ARDS).

**Heart Failure Guidelines: New Treatment Options**

**Stage III - Hyperinflammation phase/Cytokine storm**
Clinical: Progressive disseminated intravascular coagulation and multi-organ failure (vasodilatory shock, myocarditis). Laboratory: elevation of D-dimer, C-reactive protein, and ferritin. Patients may initially respond to ventilation during stage II, but increased inflammation leads to clinical deterioration.

Biological: The adaptive immune response spirals into an immunopathological dysregulated cytokine storm (Mehta et al.). Evidence-based diagnosis of cytokine storm validated prognostic markers related to inflammation can be used for disease specific diagnosis of patients with COVID-19:

- presence of severe respiratory failure, abnormalities in ferritin, C-reactive protein, D-dimer, lactate dehydrogenase (LDH), and absolute lymphocyte count
- Rapid deterioration supports the presence of cytokine storm, more so if despite the use of low-dose steroid
- Procalcitonin- Among patients with known COVID-19, an elevated procalcitonin is a poor prognostic sign likely reflecting of cytokine storm (Lippi et al. 2020). Moderate increase (1-10 ng/ml). Severe disease, 14% level >0.5 ng/ml (Guan et al 2/28). Markedly elevated (>>10 ng/ml) might suggest the presence of a bacterial infection, rather than COVID-19.

Patients diagnosed with cytokine storm have a high likelihood of mortality, constituting an evidence-grounded rationale for more aggressive treatment of this subset of patients.

Treatment: Under study is aggressive immunomodulatory therapy.

- There is no well-established or evidence-based treatment for cytokine storm in COVID-19. Patients with COVID-19 and cytokine storm are at high risk of death without aggressive therapy. Low-dose steroid appears inadequate to quell inflammation in some (50 mg hydrocortisone q6hr or 1 mg/kg/day prednisone), but has been theorized as causing high immunosuppression, possibly contributing to nosocomial infection in others


Clinical Research Trials

Remdesivir: initial study from China was inconclusive; however the participants were in severe illness upon receipt. Previous research reflect antivirals administered earlier are more likely to be effective. A 2nd, study including over 1063 patients at 68 sites resulted in a 31% decrease in length of stay. Placebo patients' avg. stay length of 15 days. Patients receiving remdesivir average inpatient stay shortened to 11 days. Currently, there are 100,000 treatments available. US Study Finds Drug Remdesivir Works Against Coronavirus. [https://covid19.dkbmed.com/](https://covid19.dkbmed.com/)
lopinavir / ritonavir / ribavirin / interferon: The Lancet, May 11, 2020 press release announced the first evidence that early treatment with triple antiviral therapy of interferon beta-1b, lopinavir-ritonavir, and ribavirin showed potential to shorten the duration of viral shedding compared to lopinavir-ritonavir alone (average 7 days vs 12 days), in patients with mild to moderate COVID-19. "These findings suggest that interferon beta 1-b may be a key component of the combination treatment and is worth further investigation for the treatment of COVID-19", says co-author Dr Jenny Lo from Ruttonjee Hospital in Hong Kong. "Interferons are naturally occurring proteins, produced in response to viral infection, and the hope is that interferon beta-1b will boost the body's ability to fight SARS-CoV-2. Future phase 3 trials will soon confirm or refute the usefulness of this candidate drug as a backbone treatment for COVID-19." All participants had a SARS-CoV-2 positive nasopharyngeal swab at the start of the study. [https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31042-4/fulltext](https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31042-4/fulltext)


COVID19 INTEGRATIVE APPROACH

Virginia Medical Centers' Integrative Approach to COVID-19 was developed by the Chief of Pulmonary & Critical Care Medicine at Eastern Virginia Medical School. A South Africa educated internist, Paul Marik, MD, FCCP, FCCM, has medical diplomas in pharmacology, anesthesia,
tropical medicine, and is board certified in internal medicine, neurocritical care, critical care, and nutrition science. He based his protocol upon foundational nutrition and natural agents. "In terms of the prophylactic cocktail, we do not have 'high level' scientific data that it is effective. We have relied on efficacy of the components for other viral illnesses." Anecdotal evidence of 60 Long Term Care COVID-19 positive residents supports the prophylactic therapeutic protocol; after 3 weeks, the facility saw only one fatality. In an interview, Marik replied his prescription of HCQ noted openly, (as discussed above) that all published studies are reports from late in disease progression, early intervention may produce a better outcome.

Marik has grown a network of physicians. The current critical care informal study includes Houston and New Jersey with 120 ICU COVID-19 patients; each utilizing similar protocols and publishing their research as the results become clear. The questionable use of methylprednisone for pulmonary phase is gradually being disproved, *Early Short Course Corticosteroids in Hospitalized Patients with COVID-19.* "Once the patients enter the pulmonary phase, they need to be treated aggressively with anti-inflammatory agents to prevent progression. Timing is critical. We know once patients progress to this they require mechanical ventilation- the mortality rate is close to 90%," Marik. The unique SARS-CoV-2 protocol was an extension of Marik's unconventional, yet brilliant, *Hydrocortisone, Vitamin C, Thiamine in Treatment of Severe Sepsis and Shock,* Marik, P. E., Khangoora, V., Rivera, R., et al. (2017). Hydrocortisone, Vitamin C, and Thiamine for the Treatment of Severe Sepsis and Septic Shock: A Retrospective Before-After Study. Chest, 151(6), 1229-1238. "There
are doctors using these methods but they are afraid to speak out, afraid to come out because the control of orthodoxy is so strong. The work behind our sepsis strategy had 50 or 60 across the country using the protocol...we have a growing network sharing information on our COVID-19 experience and emerging papers. The innovative MATH Treatment Protocol, a treatment plan created in the partnership of the Front Line Critical Care COVID-19 Working Group, claims "if started in the emergency room and continued around the clock while in the hospital, has greatly reduced the mortality rate of this disease and the need for mechanical ventilation". Member of the group have published articles which AHNA has featured in previous COVID-19 updates. The collective has produced a number of documents to promote the validation of early intervention strategies.

  Vitamin C: an essential "stress hormone" during sepsis. Journal of Thoracic Disease, 12(Suppl 1), S84-S88.
- Rationale for Prolonged Corticosteroid Treatment in the Acute Respiratory Distress Syndrome Caused by Coronavirus Disease 2019, Critical Care Explorations. Villar, Jesús; Confalonieri, Marco, Pastores, Stephen M. et al. Rationale for Prolonged Corticosteroid Treatment in the Acute Respiratory Distress Syndrome Caused by Coronavirus Disease 2019, Critical Care Explorations: April 2020 - Volume 2 - Issue 4 - p e0111

To date, only 2 deaths have occurred in the critical care treatment group- both in their 80's with significant preexisting conditions.

PROCEDURAL GUIDANCE

Procedure Manual for COVID-19 All in One Resources from Intubation and Suctioning to Pronation positioning, Mechanical Ventilation/ CPAP / BIPAP, CVP/RAP monitoring, Arterial lines to IV flow Rates:

- Arterial Blood Gas (ABG) Analysis

Global Situation Report

Johns Hopkins Tracker Report for May 12, 2020 at 0900 CST:
4,201,921 global confirmed cases. 286,835 deaths
https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html?fbclid=IwAR0MR1BHPWbTbVFSw01Vq2UkJFXQNI4rT-Wb7uSH3ikGQYjJfohQfUxW3lzo#bda7594740f4d40299423467b48e9ef6

Africa: Several countries in Africa have fast doubling times, indicating rapid growth. The epidemics in Chad, Ghana, Guinea-Bissau, Sierra Leone, and South Sudan are all doubling in less than a week. African cases represent 2.8% of the global total (5/7/20).

The Eastern Mediterranean region has elevated or growing per capita COVID-19 incidence. Qatar has reported 250-300 cases/million pop, doubling others in the region, and more than 25 times the global incidence. Additionally, Bahrain, Kuwait, Saudi Arabia, and the United Arab Emirates are all exhibiting epidemic growth since mid-April. Iran reinitiated social distancing after new case reports rose pointedly.
Asia: India’s epidemic continues to accelerate, despite national “lockdown” measures. Increased testing capacity may be attributed. Singapore per capita incidence is 12 times the global value; including 725 (97.8% of new cases) among residents of migrant worker dormitories. Tajikistan first reported cases to the WHO on May 1; its outbreak has quickly grown to hundreds of reported cases and doubling daily.

Pan America: PAHO Director Calls on Each Country to Analyze Trends of the Pandemic Before Relaxing Social Distancing Measures (PAHO) The Director of the Pan American Health Organization (PAHO), Carissa F. Etienne, asked countries to analyze specific trends specific to their region to prevent re-acceleration and dramatic upsurge to adjacent areas.

South America: Several countries have recently reported elevated per capita COVID-19 incidence. While not necessarily notable in terms of total cases, the increase relative to population size warrants a closer look. Ecuador, Peru, Chile, and Brazil have all exhibited elevated per capita incidence several orders of magnitude above the global trend.

Europe: The strategy winning Germany a reprieve in isolation is a combination of cautious, science-led political leadership, wide-spread testing and tracing, and social distancing. This is precisely the example the world needs to follow. Germany shut down early and has been systematically testing its way back to some semblance of normality. Face masks, already mandatory in shops and public transport, are fast becoming the new normal, and socializing in restaurants and bars- even those reopened- are under strict restrictions. Russia surpassed both Germany and France in terms of total cases to become #5 globally. Russia’s per capita COVID-19 incidence has steadily increased, as has Belarus.

EPIDEMIOLOGY
The comprehensive strategy to negate further spread of SARS CoV-2 must include case identification, which some may perceive as a violation of privacy, isolation, testing, contact tracing and quarantine. These are critical activities to pandemic mitigation. If the world approaches COVID-19 as a rolling wave, recognizing the virus is predicted to ebb and flow, lingering and resurfacing for 2-3 years. With this analogy, epidemiologists and public health professionals anticipate communities will undergo intermittent isolation necessary to contain it within their region. Citizens will need to accept the restrictions of a 'new normal', likely to include sacrificing basic freedoms, (wearing a mask) to preserve larger (grocery shopping). It is essential that policy makers in all affected countries have the knowledge and resources to direct future strategic planning. The linchpin for a strategy to move out of lockdown seemingly rests on increased testing and contact tracing.

Newest guidance emphasizes adaptation and reinforcement of existing national systems and the ‘scale-up’ of local surveillance capacities as needed. Frequented facilities of primary care, hospitals, Sentinel (ILI/SARI), Residential and Vulnerable group sites, and Vital statistics offices would be viable options for reporting. Countries will need to agree to make SARS-CoV-2 a Mandatory Notifiable Disease- meaning immediate global notification when possible. The objectives listed by the WHO strive to enable rapid detection and isolation, testing and management of suspected cases, identify and follow up contacts, guide the implementation of control measures, detect and contain outbreaks among vulnerable populations and evaluate the impact of the pandemic on health-care systems and society. Long term monitoring of epidemiologic trends and evolution of COVID-19 virus will require further planning after mitigation. https://www.who.int/publications-detail/surveillance-strategies-for-covid-19-human-infection

Contact Tracing
When countries have passed the peak of transmission and case numbers are decreasing, and particularly when stringent public health and social measures are being adjusted, rapid identification of cases and contact tracing are critical to maintain low levels of transmission and rapidly identify and break new transmission chains. When systematically applied, this breaks transmission of an infectious disease. Countries such as South Korea, China, Singapore, Germany and New Zealand have employed contact tracing with varying degrees of success to hinder the spread of COVID-19 and re-open their economies. Centers for Disease Control and Prevention (2020a). Contact Tracing: Get and keep America open: supporting states, tribes, localities, and territories. Retrieved from CDC reopen America

How do we establish contact tracing capacity?
Critical elements: Community engagement and public support. “Communication needs to emphasize solidarity, reciprocity, and the common good...by participating in contact tracing, we contribute to controlling local spread of COVID-19, vulnerable people will be protected, and more restrictive measures, such as general stay-at-home orders, might be avoided or minimized,” WHO.

Local workforce of trained contact tracers sensitive to cultural barriers, and supervisors with logistical support to collate, compile, and analyze data in real-time are needed. Daily follow-up reporting and monitoring of those infected or with suspected infection, has been effective in countries with the lowest mortality rates from COVID-19. Taiwan & Vietnam have low COVID-19 mortality rates per population data. **New Zealand had Zero new cases on 5/8/2020.** These 3 lead in testing.

The United States, United Kingdom, and Ecuador are among in the lowest for testing but highest in deaths per population. **

Tests per case: how many tests to find one COVID-19 case?

This is reflective that testing is imperative to preventing high mortality. A Third of COVID-19 Patients Admitted to UK Hospitals Die (BMJ) Adequate testing capacity and expeditious processing, is the highest priority. In the bare minimum, testing should focus on specific high-risk settings with vulnerable individuals, hospitals, care homes, closed settings, dormitories. This emphasizes the importance of quarantining contacts to further reduce the potential for secondary transmission from asymptomatic individuals. **WHO contact-tracing-in-the-context-of-covid-19**

Additional Resources:
**COVID-19-Deaths in a Scatter Plot with global comparisons**
**Contact Tracing Education from Johns Hopkins Bloomberg School of Public Health** Free online course

Chart: Ourworldindata.org- How Many Tests to Find One COVID19Â

Water & Waste Monitoring is a possible method of surveillance for COVID-19 clusters. Patients with gastrointestinal symptoms have a longer duration of illness, and in nearly 25% of patients, nucleic acid particles are detected in stool as early as within three days of the infection - even before it appears in the respiratory tract. Biobot Analytics, working with a team from Massachusetts Institute of Technology, Hanard, and Brigham and Women's Hospital, tested SARS-CoV-2 titers of wastewater. The results led them to estimate at least 2,300 people infected with COVID-19 near a major metropolitan area in Massachusetts. At the time of analysis, there were 446 cases officially reported in that area, **Biobot Analytics White Paper.** The discovery indicates further peer edited research could be a welcome addition to cluster identification and severity. Regular and periodic sewage surveillance could become an early warning for public health authorities to prepare for waves of infection.

**United States of America**

Where do the numbers come from? **COVID-19 STATS- 1PT 3 ACRES** (at 0700 CST 5/12/2020)
Data tracker incorporating CHS, WHO, international CDC’s, and state public health agency information; the national “media aggregation site for the United States” used by Johns Hopkins for national data.

**US COVID-19 SURVEILLANCE**

The World Health Organization (WHO) published several strategic reports to assist countries in comprehensive national surveillance for COVID-19. Though the guidance was not well received by the President, the scientific logic is no less important for citizens to understand, and unite to implement. The U.S. Federal Government outlined a three-phased approach called, *Open Up America Again*, which should **not** commence until state governments have met the criteria and have appropriate processes in place to ensure mitigation and containment. Unfortunately, a number of states who have not met those benchmarks, have hastily stopped isolation: The Reopening of America Interactive Map - NY Times

Perhaps at a local level individual leaders will elect to utilize the guidelines to protect their constituents.

**SOCIAL DISTANCING**

Despite half the country having activated the ‘reopening’ process, last week two-thirds of respondents Pew Research Center poll conveyed they were more concerned of opening too quickly than taking too long. In a Quinnipiac University poll of residents in the epicenter, 71 percent of respondents said they wanted their state government to focus on controlling the virus, not on reopening. This is encouraging to healthcare workers consumed by COVID-19. For the majority of nurses, the recent objections of anti-isolation protestors are painful to watch. Four RN graduate students at the Lienhard School of Nursing at Pace University decided to share their thoughts.

*Excerpt from: Keep the Real Enemy in Sight, Rachel Maouyo, BSN, RN-BC, Bridget Noon, BSN, RN, CCRN, Barbara Hobilla, BSN, RN, CEN, Hojung Kim, BSN, RN, CCRN, Karen Roush, PhD, RN, FNP-BC*

“Those suffering economic fallout are wondering, ‘How do we live?’ Many Americans say they’re willing to risk COVID-19 to return to work. How is it that in this rich and resourceful nation, so many people are trapped in a situation where they are willing to risk illness and death to be able to keep a roof over their head and put food on the table? Let’s redirect the protests - instead of demanding that the government end the safeguards that are working to protect us, demand they provide effective, timely resources to get us through crisis with both our lives and our livelihoods intact.”

The government has advised States to implement appropriate protective measures as they relax social distancing - but what does this entail?

Individual organizations should plan a methodical restart, or expansion in operation. **Mitigation measures must exist before reopening with awareness that "Business as usual", should not look "Usual".**

The Center for Health Security created the Operational Toolkit for Businesses Considering Reopening or Expanding Operations in COVID-19 to promote educated strides toward a ‘new normal’. Resources for ancillary Health Facilities & Clinics:

*Clinic Preparedness - CDC, Building Disinfection, OSHA precautions for COVID-19, Liability Waivers*

Restrictions are lifting and epidemiological modeling becomes vital in anticipating new waves of infection. The process of Preparedness: from Investigation and Recognition to Containment strategies, and mitigation through phases of outbreak, are explained in a Free On-Demand Webinar from APHA & NMA; **Science of Social Distancing Free Webinar**.

Visual charting of ‘modeling, analysis of travel patterns, social events, commuter movement, and flight availability, deliver knowledge necessary to make social distancing decisions in a given community, area, or country."
This is one of several strategies officials should heed in evaluating on-going social distancing policy. Western civilization is accustomed to living high-stress, minimal self-care, and primarily unhealthy society, placing their health security in the erroneous assumption that pharmacology can cure decades of poor health risks/choices. With minimal 'reactive' options for treatment; Social distancing, considered an NPI, or non-pharmacological intervention, is our single preemptive protection from infection. This is a foreign concept for most US citizens.

**SKewed Curve Concerns**
The New York City area exhibits consistent decline; but simultaneously other areas have concerning upward trends in state specific data. Statisticians warn the decreasing epidemiological curves of New York, and epicenter metro areas, alter the perception of infection through the rest of the nation. This is partially attributable to augmented test availability, but is unlikely a large percentage. [State to State Based Epidemiological Curves](https://www.cnn.com/2020/05/06/opinions/wear-the-damn-mask-pearlman/index.html)

**Public Education**
Recent surveys on mask-wearing are inundating social media and news websites; initially 2/3 of Americans were mask-compliant. For those opposed, resulting observations were evident; the more educated an individual the more likely they were to wear a mask. Age demographics revealed Millennials and Gen Z were as likely to wear them in public as the aged. Evidence based messages to the public are needed to combat inaccurate information; though the pandemic is decentralizing 'normal' society, it is provoking large-scale enlightenment.

Workers in offices, or other close quarter environments, transmit infection regularly. The 'standard' of infection intervention policies in workplaces and schools is historically subpar. COVID-19 awakened inquisitiveness of the non-medical person and they are presently scrutinizing the status quo. Concerns the healthcare community has been touting for years- infection risk resulting from close proximity (CPI) - are being questioned, Salathé, M., Kazandjieva, M., Lee, J. W., Levis, P., Feldman, M. W., & Jones, J. H. (2010). A high-resolution human contact network for infectious disease transmission. *Proceedings of the National Academy of Sciences of the United States of America*, 107(51), 22020-22025.

Meat- packaging workers protest cramped workstations, germ-magnet children no longer seated at desks facing one another for convenience, and in absence of hand-sanitizer, the era of hand washing has returned. **There is high probability of surge recurrence. Repetitive mass campaigning for obligatory mask wearing is a critical public health intervention.** Though some are accepting it, there is still much disconnect with public who feel resolute they will not be the asymptomatic 25%. Healthcare should utilize this opportunity, the isolating of the masses, to publicize in language they can accept, or better, embrace. We are no longer speaking at a wall.

An opinion piece written to CNN delivered the message well, "Be prudent, be kind. One can think the government's response to the virus is an overreaction and still wear a mask, just in case you might make someone sick. That's reality."


**Healthcare Reimbursement for the Uninsured**
Presented extraordinary challenges and risks; lacking critical patient resources, trained personnel, and protective equipment, innovation is life or death for healthcare workers in the time of COVID-19. Through dramatic augmentation of surge capacity, deferral of other services, and implementation of crisis standards of care, staff have weathered the first peak of COVID cases, continuing to provide lifesaving care. Addressing these challenges has uncovered vulnerabilities of our healthcare system and provoked advocacy for longer-term structural reform to sustain it. Answers and tractable resolutions are coming slowly.
The US Dept. of Health and Human Services will be reimbursing providers for COVID-19 related services provided on or after February 4th to uninsured patients. Reimbursements will begin being distributed on May 18th. Eligible reimbursements for the uninsured with a COVID-19 diagnosis: any treatment with COVID-19 as a primary diagnosis, or in pregnancy with COVID-19 listed as secondary.

Specimen collection, diagnostic and antibody testing in office, urgent care, emergency room, or telehealth. Testing related visits and treatments including DME (e.g., oxygen, ventilator), emergency ambulance transportation, non-emergent ambulance transfers, and, FDA approved drugs to include vaccines when available. FDA approved drugs administered as part of an inpatient stay. Exclusions: hospice services and outpatient prescriptions, and services not covered by traditional Medicare. Claims submitted must be complete and final. Publication of new codes and updates to existing codes in accordance with CMS- where published rate does not exist, claims will be held until CMS publishes corresponding reimbursement information. Submission inquiries: coviduninsuredclaim.linkhealth.com

Vulnerable Populations

PEDIATRICS

Two discussions are circulating: SARS-CoV-2 is increasing in severity among pediatric patients, or, conceivably we are better interpreting limited data of its pathophysiology in pediatric patients. According to the New York Health Department, six children have died of COVID-19. The pediatric patients complained of fever, rash, and vomiting with diarrhea. The syndrome was also documented in children in Italy, and elsewhere.

NY Governor Cuomo, "73 children in the New York area had been reported to be afflicted with the illness which doctors have labeled pediatric multisystem inflammatory syndrome." The symptoms are atypical, rarely including the dry cough and fever expected of COVID-19. However, the septic shock noted upon or after admission warrants mechanical ventilation, and most need vasopressors. Other notable differences in the pediatric critical care patient include:

- Pro-calcitonin elevation and consolidation with surrounding halo signs were common in pediatric patients (different from adults) but underlying coinfection is common in pediatrics. Xia W1, Shao J1, Guo Y1, et al. Clinical and CT features in pediatric patients with COVID-19 infection: Different points from adults. Pediat Pulmonol. 2020 May;55 (5):1169-1174.

The Journal of Public Health Management and Practice from USF and the Women's Institute for Independent Social Enquiry estimate for each child who requires intensive care for COVID-19, there are 2,381 children infected with the virus. "The full spectrum of disease is undetermined, but of the 15 patients, most either tested positive for the coronavirus or were found, through antibody testing, to likely have been previously infected," NY Public Health Department. An Empirical Case Projection study completed in April, applied scenarios of cumulative pediatric infection proportion (CPiP). The outcomes, if reduced to just 5%, revealed 3.7 million infected children, 9,907 severely ill to hospitalize, and 1,086 requiring PICU admission. If as much as 25% are infected before December, 50,000 children with severe illness will need to be hospitalized, with 5,400 of them critically ill and requiring mechanical ventilation; the average length of stay for pediatric COVID-19 is 14 days. Critical Care Medicine report verified there are 5,100 PICU beds. These modest predictions indicate the potential to far exceed capacity and do not account for ventilators already redirected to adult care units. Pathak EB, Salemi JL, Sobers N, Menard J, Hambleton IR. COVID-19 in Children in the United States: Intensive Care Admissions, Estimated Total Infected, and Projected Numbers of Severe Pediatric Cases in 2020, J Public Health Manag Pract (2020) Apr 16, and, Dong Y, Mo X, Hu Y, et al. Epidemiological characteristics of 2143 pediatric patients with 2019 coronavirus disease in China. Pediatrics. 2020
Additional Resource: Academy of Pediatrics, American Association for Respiratory Care, American College of Emergency Physicians, The Society of Critical Care Anesthesiologists, and American Society of Anesthesiologists, and with the support of the American Association of Critical Care Nurses and National EMS Physicians, has compiled interim guidance to help rescuers treat victims of cardiac arrest with suspected or confirmed COVID-19.

- [https://pediatrics.aappublications.org/content/early/2020/04/13/peds.2020-1405](https://pediatrics.aappublications.org/content/early/2020/04/13/peds.2020-1405)

**NATIVE AMERICANS** are being disproportionately affected by the COVID-19 pandemic. The Navajo Nation has reported the third-highest per capita COVID-19 infection rate, after only New York and New Jersey, with 3,239 cases reported as of Saturday. The Navajo outbreak demonstrates how challenges of healthcare and public health infrastructure as well as poor access to basic needs can intensify the effects. Other Native American tribes across the country have taken measures to mitigate transmission in their communities, including the use of checkpoints or temporary roadblocks on state and federal highways to limit travel and mitigate transmission risk. South Dakota Governor Kristi Noem stated that her office intends to file a lawsuit against the Oglala and Cheyenne River Sioux tribes if they continue to operate checkpoints on state and federal highways. Harold Frazier, chairman of the Cheyenne River Sioux Tribe, responded by saying, "We will not apologize for being an island of safety in a sea of uncertainty and death." The Indian Health Service has reported a total of 5,225 COVID-19 cases across Native American tribes.

**VA HOSPITALS**

Over 2,000 VA health care workers have been diagnosed with COVID-19, twenty became fatalities by end of April. 400 of the 6,500 SARS-CoV-2 patients have succumbed. Opaque reports of supply shortages echo those from other healthcare worker systems, but the infection spread and fatality rates are higher within the Department of Veterans Affairs. Rationale could be patient and employee demographics, and the population sample size is the 2nd largest US government agency.

**NURSING HOMES**

In late March, the Health and Human Services inspector general launched a review of nursing homes and their preparedness, acknowledging that long-term care facilities are "particularly vulnerable" to disease outbreaks. The review is intended to determine whether facilities "that received Medicare or Medicaid funds complied with new Federal requirements for life safety and emergency and infectious disease control preparedness," according to the HHS IG. The review is expected in the coming months. The Federal Emergency Management Agency (FEMA) report the agency is preparing to coordinate shipments of PPE, like surgical masks, gowns and gloves, to nursing homes across the nation. The move comes weeks into the coronavirus response and targets facilities hardest hit by the pandemic. "For the 4,000 or so buildings that have COVID-positive residents, staffing quickly becomes the biggest problem," Parkinson said. In Maryland, Governor Larry Hogan has announced the state will provide supplemental healthcare professionals for staffing. Others would be befitted to follow suit.

**Advocacy**

"I ATTRIBUTE MY SUCCESS TO THIS- I NEVER GAVE OR TOOK ANY
From 2020: The Year of the Nurse as Seen Through a Coronavirus Lens, Susan Gennaro, "This pandemic provides us with an opportunity to change systems. Just as Florence Nightingale introduced sanitation and evidence-based interventions into nursing care, and as Clara Barton introduced systems whereby personnel and supplies could be brought onto battlefields, we now have the opportunity to make changes in our healthcare systems. War creates innovative measures which improve patient outcomes and efficacy of interventions, oft times out of necessity. Rather than a step back, the Nurse profession should push to uphold the practice modifications resulting from this crisis. PPE should not be a 'luxury' for the wealthiest of privatized care facilities.

Unsafe conditions should not be validated by hero worship by the public or a demand for martyrdom from government administration.

"Nurses are being hailed as heroes and angels. As I watch the news on television, I see the public cheering for nurses leaving hospitals. Although I smiled the first time, now I worry about these images. The public is paying attention to us and we need to use this opportunity to correct misunderstandings. We aren't angels. We are real human beings doing our jobs. If we had adequate personal protective equipment we wouldn't have to worry about providing safe care and risking our own health to care for others... We are facing unacceptable challenges that need to be corrected immediately and for the future. We are well-educated professionals..." writes Gennaro.

The purpose of social distancing is to avoid 'overwhelming the healthcare system' overnight so that we are available in the future. This will be more effective if organizations are supporting Healthcare Workers from within the walls as well. Beds and Nurses are not a 'short order' item to be flexed in and out at the publics' whim for freedom or relaxed measures. Nurse safety requires a commitment from every individual on the planet.

ICN Calls for Data on Healthcare Worker Infection Rates and Deaths (ICN) ICN has gathered further information from its member National Nursing Associations (NNAs, some official government figures and media reports), which suggest that at least 90,000 healthcare workers have been infected, and more than 260 nurses have died.

Resources

Resiliency Resources:

Stress Management & Resilience for Healthcare Workers from AHNA

AHNA Forest Guided Imagery for Resilience

Staying Calm and Well in the Midst of the COVID-19 Storm from OSU

Headspace - Clinical healthcare professionals are currently receiving complimentary premium memberships.

Holiblu - Self-care resources to use before, during, and after your shift!

Zen Meditation Music

Compassion Caravan Listening Circles by AHNA Chapter Leaders

https://NurseGroups.org is a non-profit initiative formed specifically to support the emotional resilience of nurses on the frontlines of COVID-19. Free, confidential, video conference groups where nurses can connect with other nurses and process their COVID-19 experiences together. All groups are led by members of our experienced facilitation team (https://NurseGroups.org/facilitators.html).
Tips for Managing Stress and Self-Care
American Psychiatric Nurses Association

AHNA Holistic Mental Health

ADVOCACY

Tell Congress Nurses Need PPE

COVID-19 Ethics Resource Center  AMA Journal of Ethics

PRACTICE

COVID19 Guidance for School Nurses

American College of Cardiology  -ACC's COVID-19 Hub

AHA COVID-19 Resources

American Academy of Emergency Medicine

American College of Gastroenterology

COVID-19 Guidance for Older Adults

Infectious Diseases Society of America

The Lancet COVID-19 Resource Center

NEJM Coronavirus (COVID-19)

American Academy of Neurology COVID-19 resources

NIH Primary Care COVID19 Guidance

Movement Disorders Society Resources for the COVID-19 Pandemic

COVID-19 Resources for Epilepsy Clinicians

American Society of Nephrology

Oncology Nurses Society Guidance during the COVID-19 Pandemic

Society for Maternal-Fetal Medicine  &  NIH COVID-19 Treatment Guidelines: Special Considerations in Pregnancy and Post-Delivery

American Psychiatric Association: COVID-19 mental health impacts

Not an AHNA member?  Learn more.