SC COVID-19 CLINICAL MANAGEMENT RESOURCES

The Centers for Disease Control and Prevention is responding to a pandemic of respiratory disease spreading from person-to-person caused by a novel (new) coronavirus. The disease has been named "coronavirus disease 2019" (abbreviated "COVID-19"). This situation poses a serious public health risk. The federal government is working closely with state, local, tribal, and territorial partners, as well as public health partners, to respond to this situation.

This living document was developed by members of the South Carolina Hospital Association's Clinical Leadership Council to provide clinicians with a concise resource for accessing relevant information related to COVID-19. Within this document, you will find information on emerging best practices in South Carolina as well as links to valuable materials from around the world. As we learn more, we will update this clinical management tool.

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Airway Management

- If you have suspicion for COVID-19 infection, try to avoid positive pressure ventilation (BVM, BiPAP, or CPAP) to avoid aerosolization.
- Intubate early.
- Any patient in whom there is concern for COVID-19, should be intubated using airborne precautions and this should always occur in a negative pressure room if possible.
  - Use a non-rebreather (NRB) for pre-oxygenation with rapid sequence intubation (RSI).
  - If BVM is required, use HEPA filter between endotracheal tube and BVM or ventilator.
  - Video-laryngoscope is preferred to direct laryngoscopy.
- Limit the number of people involved in intubation in ALL cases: provider (attending physician and/or resident), RT, and bedside nurse.
- In known COVID patient, intubation should be performed by the most experienced provider (ATTENDING) to limit the number of people in contact and PPE use.
  - Albuterol MDI rather than Nebs
  - Non-rebreather (NRB) or high flow nasal canula with an NRB over it is a potential alternative.
- Any patient intubated immediately from the field must be done by health care workers (HCWs) using N95 facemasks as well as contact precautions (eye shield, gown, gloves). This includes all individuals in the room at the time of intubation.
- Ventilate using ARDSNet Protocol if required.
- Portable CXR whenever possible.

Behavioral Health and Resilience

- [Managing anxiety related to COVID-19](#)
- [CDC – Managing Anxiety & Stress](#)
- *[Building personal resilience](#)*
- [Wellness Resources from St. Barnabas Hospital](#)

Dialysis

- [Interim Additional Guidance for Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed COVID-19 in Outpatient Hemodialysis Facilities](#)
- [ESRD Provider Telehealth and Telemedicine Tool Kit](#)

Discharge Instructions for PUI/families

- [COVID-19 Preparedness Checklist for Nursing Homes and other Long-Term Care Settings](#)
- Nursing homes and other long-term care facilities can take steps to assess and improve their preparedness for responding to COVID-19. This checklist does not describe mandatory requirements or standards; rather, it highlights important areas to review to prepare for the possibility of residents with COVID-19.
    - Rapid identification and management of ill residents
    - Supplies and resources
    - Sick leave policies and other occupational health considerations
    - Education and training
    - Surge capacity for staffing, equipment and supplies, and postmortem care
    - Restrict all visitation except for certain compassionate care situations, such as end of life situations
    - Restrict all volunteers and non-essential HCWs, including non-essential healthcare personnel (e.g., barbers)
    - Cancel all group activities and communal dining

- o Implement active screening of residents and HCP for fever and respiratory symptoms

Elective Surgery

- CMS Adult Elective Surgery and Procedures Recommendations
- COVID-19: Guidance for Triage of Non-Emergent Surgical Procedures
- On March 17, 2020, Governor McMaster's recommended that healthcare providers "halt all elective and non-threatening surgical and medical procedures".
- CMS Adult Elective Surgery and Procedures Recommendations

EMTALA/Off site screening resource

- Emergency Medical Treatment and Labor Act (EMTALA) Requirements and Implications Related to Coronavirus Disease 2019 (COVID-19)

Exposed Healthcare Workers

- Review your infection prevention and control policies and CDC infection control recommendations for COVID-19 for:
  - o Assessment and triage of patients with acute respiratory symptoms
  - o Patient placement
  - o Implementation of Standard, Contact, and Airborne Precautions, including the use of eye protection
  - o Visitor management and exclusion
  - o Source control measures for patients (e.g., put facemask on suspect patients)
  - o Requirements for performing aerosol generating procedures
- Be alert for patients who meet the persons under investigation (PUI) definition
- Know how to report a potential COVID-19 case or exposure to facility infection control leads and public health officials.

- Know who, when, and how to seek evaluation by occupational health following an unprotected exposure (i.e., not wearing recommended PPE) to a suspected or confirmed coronavirus disease 2019 patient.
- Remain at home, and notify occupational health services, if you are ill.
- Know how to contact and receive information from your state or local public health agency.
- Home temperature monitoring form
- What Healthcare Personnel Should Know about Caring for Patients with Confirmed or Possible COVID-19 Infection
- HCP return to work with suspected or confirmed COVID-19

First responder/EMS

- COVID-19 Guidance for EMS
- Hospital to Post-Acute Care Facility Transfer – COVID-19 Assessment
  - SCHA and SCHCA are pleased to offer this new assessment form to assist in the process of transfers for post-acute care during the pandemic. The form was developed for use in Florida and we requested permission to adapt for SC hospitals and long-term care facilities.
  - Use of the form should free up timing for the transfer process as a one source document related to COVID-19, relaxing the spread-dread for the LTCs and assisting hospitals with movement of non-acute patients for capacity purposes. This form is user friendly for computer use for completion and electronic signature. Please contact Diane Paschal for further information.

Inpatient

- Clinical Guidance for Management of Patient with Confirmed COVID-19
- COVID-19 Critical Care for the Non-ICU Physician

Outpatient

- Reschedule non-urgent outpatient visits as necessary.
- Consider reaching out to patients who may be a higher risk of COVID-19-related complications (e.g., elderly, those with medical co-morbidities, and potentially other persons who are at higher risk for complications from respiratory diseases, such as pregnant women) to ensure adherence to current medications and therapeutic regimens, confirm they have sufficient medication refills, and provide instructions to notify their provider by phone if they become ill.
- Consider accelerating the timing of high priority screening and intervention needs for the short-term, in anticipation of the possible need to manage an influx of COVID-19 patients in the weeks to come.
- Symptomatic patients who need to be seen in a clinical setting should be asked to call before they leave home, so staff are ready to receive them using appropriate infection control practices and personal protective equipment.
- Eliminate patient penalties for cancellations and missed appointments related to respiratory illness.

Pediatrics

- Pediatricians should continue scheduling younger patients for Well-child checks and Immunizations and consider deferring older patients until later. Also, consider cohorting well vs. sick patients and telehealth visits where available.
- American Academy of Pediatrics COVID FAQ
- American Academy of Pediatrics Letter

Personal Protective Equipment (PPE)

- Please use a surgical mask for all patients with respiratory complaints. RE-USE this mask on patients you deem to be non-infectious for your entire shift.
    - Avoid touching mask
    - Remove & replace the contaminated mask if you see an infectious patient.

- For any patient who is a COVID PUI, use Respiratory droplet and contact precautions: gown, gloves, mask, eye protection (eye protection may take form of shield, goggles, trauma glasses).
  - Don prior to entry and doff immediately upon exit using appropriate technique.
- Use N95 in negative pressure rooms for aerosolizing procedures which include NP specimen collection.
- Fit Testing: SC OSHA has suspended fit testing requirement (29 CFR 1910.134) for those healthcare workers that meet the following criteria:
  - No facial hair
  - No major changes in weight or facial structure in the last 12 months
  - No changes in medical health within the last 12 months.
- N95 Mask Reuse: the extended and/or limited reuse of N95 masks is permitted in the following situations:
  - Immediately following a fit test
  - Extended use – when multiple patients are infected with the same respiratory pathogen and are placed together in dedicated waiting rooms and/or hospital wards.
  - Limited Reuse – by the same wearer as long as the respirator remains functional (i.e. respirator maintains its physical integrity and provides the same level of protection).
- Eye Protection: You only need eye protection in the room of a COVID PUI. As always, limit the individuals and the number of times you enter and exit patient rooms to limit PPE usage. Document a patient's cell phone number so you can call them in the room with updates (avoiding PPE use). If you use the eye frame with shield, remove and throw away the shield, but keep and sanitize the frame with sani-wipes. You can then re-use the frame.
- Strategies for Optimizing the Supply of N95 Respirators during the COVID-19 Response

- Trauma Resuscitations: Minimize PPE for trauma resuscitation (eye/mask) if EMS encode does not suggest significant injury. Entire trauma team should not don PPE.
- PPE Conservation example from UW Medicine
- When caring for a COVID-19 patient, consider moving IV pumps into hallway with extension tubing running to the patient to conserve PPE.
- PPE Resources – Respirators:
  - OSHA Temporary Enforcement Guidance - Healthcare Respiratory Protection Annual Fit-Testing for N95 During the COVID-19 Outbreak
  - WHO Advice for the Public: When and How to Use Masks
- PPE Resources – Don & Doff:
  - CDC Sequence for putting on and removing PPE
  - How to Don and Doff PPE (Fight COVID-19 Coronavirus)
  - Donning and Doffing PPE: HCID Level One Full Barrier Isolation
  - Demonstration of donning and removing of the appropriate PPE when caring for a person who has COVID-19.

Physician/Provider Credentialing

- Physician/Provider Credentialing: WAIVING OF LICENSE REQUIREMENTS: The South Carolina Medical Board issued an Order Waiving Licensing Requirements for physicians, physician assistants, and respiratory care practitioners licensed in good standing in another state and whose services are determined to be necessary by DHEC.

Room Cleaning

- Room cleaning in a PUI that had an aerosolizing procedure:
  - Once the patient is discharged, close the door to the room, hang the stop sign on the door and use a dry erase marker to fill in the time:
  - If it is a negative pressure room, the room needs to sit for 35 minutes without entry

- o If it is not negative pressure, the room needs to sit for 70 minutes without entry
- o Alert EVS when time has elapsed for a terminal clean of the room. Be sure EVS is aware this is a COVID room.
- o Please ensure EVS is wearing proper PPE
- o SARS-CoV-2 was detectable in aerosols for up to three hours, up to four hours on copper, up to 24 hours on cardboard and up to two to three days on plastic and stainless steel. *The New England Journal of Medicine.*
- o Ultrasound- Consider not using ultrasound in a PUI room unless cleared with the provider. They need to be thoroughly cleaned if used, consider using a portable machine.

Signage

- Consider four signs to be placed in a COVID patients' room: A log sheet, the cleaning stop sign, PPE process, and the room setup and PPE check list.
- Place a patient sticker on the log sheet - once completed store in retrievable binder or location.

Situation in the US/COVID 19 Statistics

- Different parts of the country are seeing different levels of COVID-19 activity. The United States nationally is currently in the initiation phases, but states where community spread is occurring are in the acceleration phase. The duration and severity of each phase can vary depending on the characteristics of the virus and the public health response.
- CDC and state and local public health laboratories are testing for the virus that causes COVID-19. View CDC's Public Health Laboratory Testing map.
- All 50 states have reported cases of COVID-19 to CDC.
- U.S. COVID-19 cases include:
  - o Imported cases in travelers
  - o Cases among close contacts of a known case

- o Community-acquired cases where the source of the infection is unknown.
- Three U.S. states are experiencing sustained community spread.
- View latest case counts, deaths, and a map of states with reported cases.
- Coronavirus Cases in SC: https://www.scdhec.gov/monitoring-testing-covid-19

TABLE. Hospitalization, intensive care unit (ICU) admission, and case−fatality percentages for reported COVID−19 cases, by age group —United States, February 12−March 16, 2020

Age group (yrs) (no. of cases)	%*		
	Hospitalization	ICU admission	Case-fatality
0–19 (123)	1.6–2.5	0	0
20–44 (705)	14.3–20.8	2.0–4.2	0.1–0.2
45–54 (429)	21.2–28.3	5.4–10.4	0.5–0.8
55–64 (429)	20.5–30.1	4.7–11.2	1.4–2.6
65–74 (409)	28.6–43.5	8.1–18.8	2.7–4.9
75–84 (210)	30.5–58.7	10.5–31.0	4.3–10.5
≥85 (144)	31.3–70.3	6.3–29.0	10.4–27.3
Total (2,449)	20.7–31.4	4.9–11.5	1.8–3.4

Case Fatality Rate in US through 3/16

- UpToDate Coronavirus Disease 2019 resource
- CDC – Get Your Clinic Ready for Coronavirus Disease 2019
- *Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China*
  - o *Fever* (40/41 patients; 98%)
  - o *Cough* (31/41 patients; 76%)
  - o *Myalgia or Fatigue* (18/41 patients; 44%)
  - o These three symptoms were the major ones. There were patients who had sputum production, headache, hemoptysis, and diarrhea; however, these symptoms were less common.
  - o *Dyspnea* occurred in 55% later in the course, with mean time to onset of dyspnea at 8 days.

- sicker patients who were admitted to the ICU were more likely to have *lymphopenia; AST elevation; elevated D-dimer; elevated AST; elevated cardiac biomarkers; and elevated plasma levels of cytokines*
- Imaging:
- *Abnormalities in chest CT images in ALL patients*
- *Bilateral involvement on chest CT* (40/41 patients; 98%)
- The sicker patients who were admitted to the ICU were more likely to have bilateral multilobular and subsegmental areas of consolidation (compared to non-ICU patients who tended to have bilateral ground glass opacities and subsegmental areas of consolidation).

Telemedicine

- [Medicare and Coronavirus](#)
- [New Telemedicine Strategies help hospitals address COVID 19 article](#)
- [Telehealth Virtual Care Providers COVID-19](#)

Testing

- DHEC prior approval for COVID-19 testing is [no longer required](#).
- e-Visit screen followed by drive through sample collection centers emerging as best practice. If patient screens + on e-visit, an appointment time is assigned for drive through outpatient sample collection.
- Ideal sample collection includes viral RVP swab in viral transport medium. The medium and swabs are in short supply across the state. NP (not OP) swab only is needed.
- Alternative sampling of patient when viral RVP swab/media is limited:
  - If viral swab but no media: NP swab in sterile container/tube, add 3cc saline as transport medium. SC DHEC will accept this collection system.
  - Nasal washing with saline only, in sterile specimen collection. SC DHEC is investigating this alternative (v3.20.20), some private labs and hospitals

developing in house PCR COVID testing will use the saline only medium for specimen collection.

- o Both wood and cotton can inhibit PCR so not a good choice for COVID-19 testing. Synthetic fiber with plastic shaft. Also, calcium alginate tipped swabs don't work well for PCR.
- *Inside the South Korean Labs Churning Out Coronavirus Tests*

COVID-19 testing per capita

COUNTRY/PROVINCE	POP.	# TESTED (AS OF)	TESTS PER MILLION PEOPLE
US*	329M	1,707 (Mar. 8)	5
Japan	127M	8,411 (Mar. 4)	66
UK	67.8M	23,513 (Mar. 8)	347
Netherlands	17.1M	6,000 (Mar. 7)	350
Israel	8.6M	3,451 (Mar. 8)	401
Italy	60.5M	49,937 (Mar. 8)	826
Guangdong, China	113.5M	320,000 (Feb. 28)	2,820
South Korea	51.3M	189,236 (Mar. 8)	3,692

*Based on CDC and does not include accurate test counts performed at state, local, private, and commercial labs.

US Census Bureau, World Population Review, CDC, FDA, KCDC, UK Dept. of Health and Social Care, Italian Ministry of Health, Japan Ministry of Health, Labour, and Welfare, Netherlands National Institute for Public Health and the Environment, WHO   BUSINESS INSIDER

Treatment

- Isolate the patient.
- Provide supportive care.
- Contact local and state health departments.
- Avoid steroids, as they may prolong viral shedding.
- It is unclear whether oseltamivir and other antivirals provide benefits.
- Investigational therapies include remdesivir, lopinavir/ritonavir, chloroquine, favipiravir, and others. None of these therapies are currently recommended by the United States Centers for Disease Control and Prevention (CDC).
- Chloroquine has invitro activity against SARS, and against corona virus in mice. In Chikungunya had invitro activity, but enhanced replication of virus and worsened disease outcomes

- Chloroquine: In early in vitro studies, chloroquine was found to block the COVID-19 infection at low micromolar concentrations1. Recent evidence has indicated a positive result with the use of chloroquine phosphate compared with control for the treatment in inhibition of the exacerbation of pneumonia, improving lung imaging, promoting virus negative conversion, and shortening the disease course. The anti-viral and anti-inflammatory activities of chloroquine may account for its potent efficacy in treating patients with COVID-19 pneumonia2. According to a consensus statement from a multicenter collaboration group in China, chloroquine phosphate 500 mg twice daily in tablet form for 10 days (also cited anywhere from 7-10 days depending on clinical progress) may be considered in patients with COVID-19 pneumonia.

- Hydroxychloroquine: A recent study compared chloroquine to hydroxychloroquine in vitro for the treatment of SARS-CoV-2. Hydroxychloroquine was found to be more potent than chloroquine in vitro. Hydroxychloroquine exhibits superior antiviral and prophylactic activity and a more tolerable safety profile in comparison to chloroquine, which may provide promising results in treatment. Based on PBPK (physiologically based pharmacokinetic) model results, hydroxychloroquine sulfate 400 mg PO twice daily x 1 day followed by 200 mg twice daily x 4 days is recommended for SARS-CoV-2 infection, as it reached three times the potency of chloroquine phosphate 500 mg twice daily 5 days in advance (prophylactically). When to initiate prophylaxis has not been determined as this regimen was studied in a PBPK model.

- However, the Marseille Study is current underway through the European Union Clinical Trials Register, which included COVID-19 patients comprising of five patients aged 12-17, 10 aged 18-64, and 10 patients over 65. The data has not been published yet, therefore; results should be interpreted with caution. But a strong reduction in viral load with hydroxychloroquine and after 6 days, the percent of patients positive for

COVID-19 who received hydroxychloroquine fell to 25% vs 90% for those who did not receive the treatment. They also observed an increase in treatment effect with combination therapy consisting of hydroxychloroquine and azithromycin. Patients were given 600 mg of hydroxychloroquine daily for 10 days in this study.

- It is unclear whether intravenous immunoglobulin or convalescent plasma provides any benefit.
- *A Trial of Lopinavir–Ritonavir in Adults Hospitalized with Severe Covid-19*
- Ethics-based guidelines for triage of limited ICU and ventilator resources-including use of clinical triage resources like SOFA scoring system
- Steroids
  - Concern:
    - Previous studies indicate cytokine storm and inflammation induced by a dysregulated immunologic response to a viral infection contributes to the development fatal pneumonia.
  - Evidence:
    - Available evidence in those infected with COVID-19 is conflicting but overall, it appears to demonstrate no difference in clinical outcomes and may have the potential to worsen outcomes.
  - Current Recommendation:
    - The empiric use of corticosteroids in patients with COVID-19 is not recommended in the absence of compelling indications such as:
      - Persistent hemodynamic instability refractory to fluid resuscitation and vasopressor utilization
      - Baseline adrenal insufficiency
- NSAIDs
  - Concern:
    - The French Ministry issued a recommendation that NSAIDs should be avoided in COVID-19 due to the high risk of acute kidney injury in this population.

- o Evidence:
  - There is no published scientific evidence evaluating the use of NSAIDs in a COVID-19 infection.
- o Current Recommendation:
  - Although there is no evidence to support not using NSAIDs in this setting, based on the current evidence demonstrating a high incidence of renal dysfunction in those with severe COVID-19 infections, acetaminophen should be used as first line therapy when possible.
  - If NSAIDs are necessary, they should be utilized for the shortest duration of therapy possible.
- ACE Inhibitors and ARBs
  - o Concern:
    - People with cardiovascular disease are at a much higher risk of serious complications including death from COVID-19. This has led to concerns regarding using RAAS antagonists in COVID-19
  - o Evidence:
    - The evidence does not confirm the need to discontinue ACE Inhibitors or ARBs
  - o Current Recommendation:
    - The American Heart Association, Heart Failure Society of America, and the American College of Cardiology recommend continuation of ACE Inhibitors and ARBs for all patients already prescribed for indications such as heart failure, hypertension or ischemic heart disease in the setting of COVID-19.
- Recommend to strongly consider the individual needs of each patient before making changes to their regimens

Triage Protocols

- Screen for symptoms of URI or flu-like illness including
    - Cough
    - Fever
    - Laryngitis or pharyngitis
    - Rhinorrhea, congestion
- Shortness of breath (unless there is an obvious non-infectious cause, i.e., patient in arrhythmia, CHF exacerbation w/o infectious symptoms)
    - If uncertain, err on the side of COVID positive screen and send to designated treatment location
    - Do not put COVID + screened patients in common areas
    - Consider separate entrance/exit for COVIT + screened patients (PUI)
- For PUI, take the patient's cell phone number and use to communicate to reduce need to go in the room.
- ED MD places order to initiate PPE for suspected PUI and they will place an order to discontinue PPE. Limits non-evidence-based use of PPE.
- For suspected PUI with FEVER and RESPIRATORY symptoms the full PPE is required until the MD discontinues.
- For radiographic studies on PUI patients, please include COVID PUI on the comments so radiology techs can know to PPE and decontaminate.
- [Protect Your Patients and Staff from COVID-19: CDC's Recommendations for Infection Control Procedures](#)

Ventilator Allocation/ICU Beds

- [Oregon Crisis Care Guidance: Providing a Framework for Crisis Healthcare](#)
- [Hastings Center COVID Framework](#)
- [Surge Capacity Mechanical Ventilation](#)
- [Conceptual Framework for Allocation of Federally Stockpile Ventilators During Large-Scale Public Health Emergencies](#)

- [UW's Conservation - Respiratory Supplies Protocol](#)
- [Who Should Receive Life Support During a Public Health Emergency? Ethical Principals to Improve Allocation Decisions](#)
- [Allocation of Scarce Resources](#)
- [SC Ethical Framework for Crisis Standards of Care and Allocation of Scare Resources in a Public Health Emergency](#)

Visitor Policies

- [CDC- Manage Visitor Access and Movement Within the Facility](#)
- [Implementation of Mitigation Strategies for Communities and Local COVID-19 Transmission](#)

Chart 7: Timeline of Events in Hubei

Source: Tomas Pueyo analysis over chart from the Journal of the American Medical Association, based on raw case data from the Chinese Center for Disease Control and Prevention