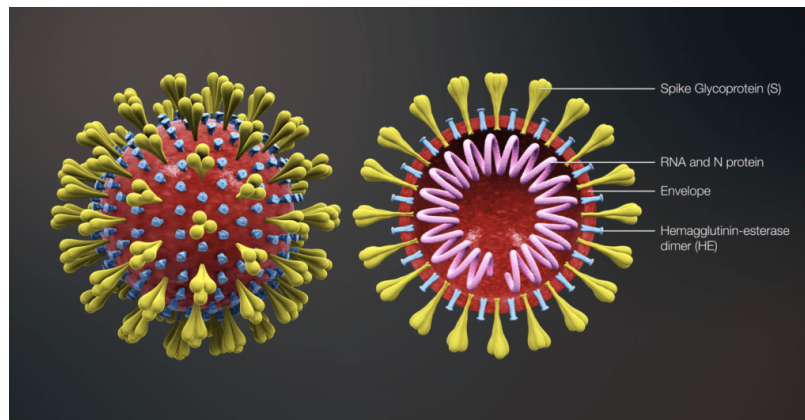


White paper: COVID-19 Update – Hospital Medicine

Submitted by D. Ruby Sahoo, DO, MBA, and Suj Sundararaj, MD, MBA



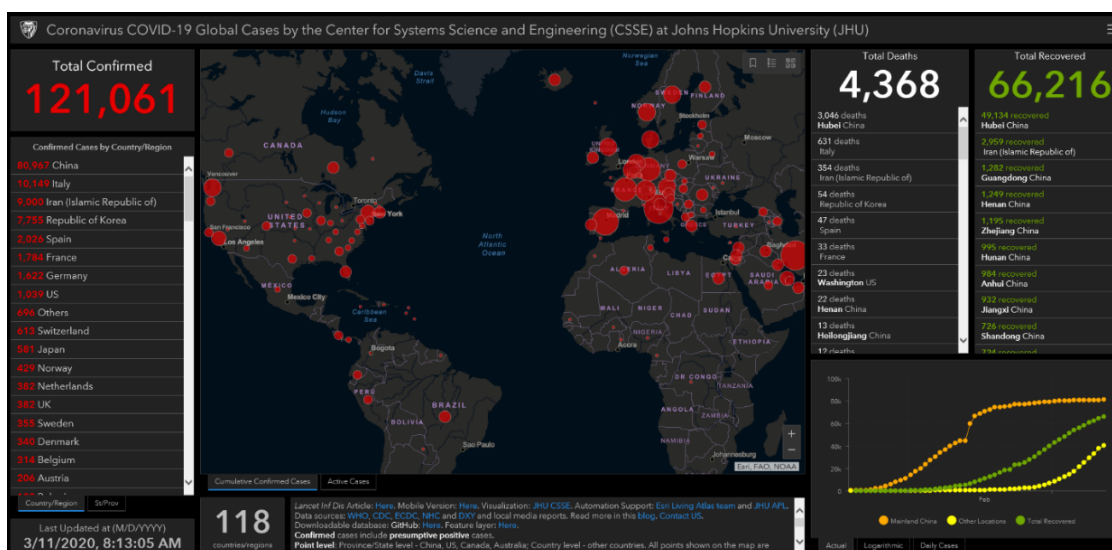
SARS-CoV-2 (Source: Wikipedia)

Purpose

The purpose of this document is to assist you with COVID-19 awareness and preparedness as you lead your patients and community through this public health emergency. The links below will provide the most updated information, including suggestions on how to put together emergent or backup coverage.

COVID-19 Cases

Over 35 states now have confirmed cases of COVID-19, and countless communities have been affected across the United States. We found this resource from Johns Hopkins that tracks cases of confirmed COVID-19 worldwide.



(Source: Johns Hopkins University –

<https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>)

Transmission

- Transmission is occurring person-to person via respiratory droplets (similar to influenza).
- Droplets are not felt to travel more than 6 feet and do not linger in the air.
- Transmission may occur via mucus membrane contact with virus-containing respiratory secretions that results from coughing, sneezing and talking, either directly or by touching an infected surface and then touching the eyes, nose or mouth.
- Transmission from asymptomatic individuals has also been described. [16-20].

Prevention

- There is currently no vaccine to protect against COVID-19.
- Avoid close contact with people who are sick.
- Cover your cough with the bend of your elbow or tissue.
- Wash your hands often, ideally with soap and water for 30 seconds. Hand sanitizer may be adequate as a second choice.

Risk Factors for Severe Illness

Per CDC, the following are underlying medical conditions that may increase the risk of serious COVID-19 for individuals of any age:

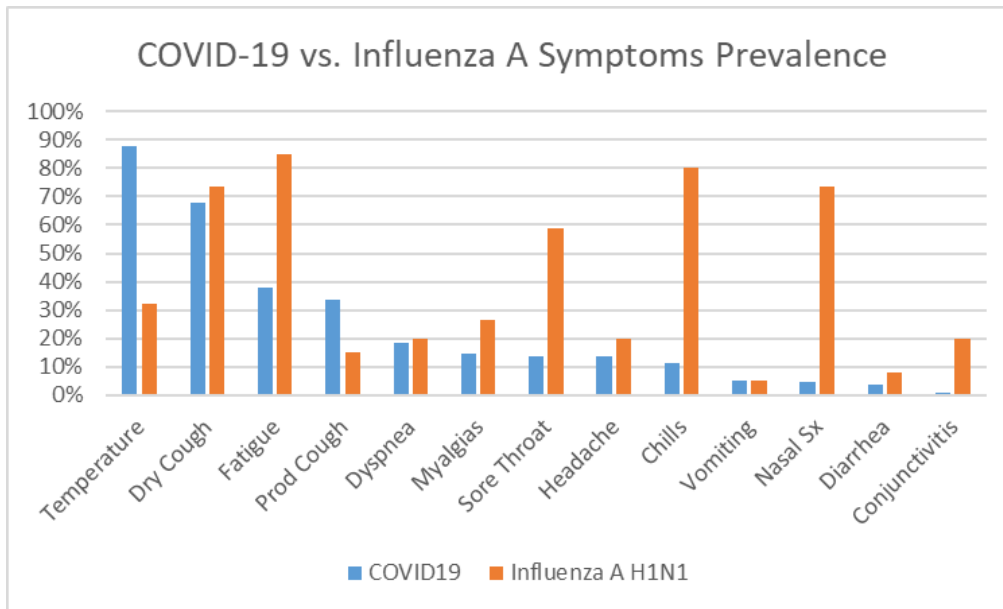
- Blood disorders
- Chronic kidney disease
- Chronic liver disease
- Immunosuppression
- Current or recent pregnancy in the last 2 weeks
- Endocrine disorders (e.g., diabetes mellitus)
- Metabolic disorders (such as inherited metabolic disorders and mitochondrial disorders)
- Heart disease (such as congenital heart disease, congestive heart failure and coronary artery disease)
- Lung disease including asthma or chronic obstructive pulmonary disease (chronic bronchitis emphysema) or other chronic conditions associated with impaired lung function or that require home oxygen
- Neurological and neurologic and neurodevelopment conditions (including disorders of brain, spinal cord, peripheral nerve, and muscle such as cerebral palsy, epilepsy (seizure disorders), stroke, intellectual disability, moderate to severe developmental delay, muscular dystrophy, or spinal cord injury)

(Source: CDC - <https://www.cdc.gov/coronavirus/2019-ncov/downloads/community-mitigation-strategy.pdf>)

Signs and Symptoms

- Incubation period is 2 – 14 days (Median 5 – 6 days)
- Fever (77 – 98%)
 - Of 1099 patients with confirmed COVID-19, 44% of patients had fever at admission, but 89% developed fever during hospitalization (Li Q, Guan X, Wu P, Wang X, Zhou L, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. *N Engl J Med.* 2020 Jan 29.)
- Cough (46 – 82%)
- Fatigue (38.1%)
- Dyspnea (33%)
- Myalgias (11%)

- Other:
 - Sore throat
 - Headache
 - Hemoptysis
 - GI symptoms prior to fever: Nausea, Diarrhea



(Source: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html>)

Lab and Radiographic Findings

On admission:

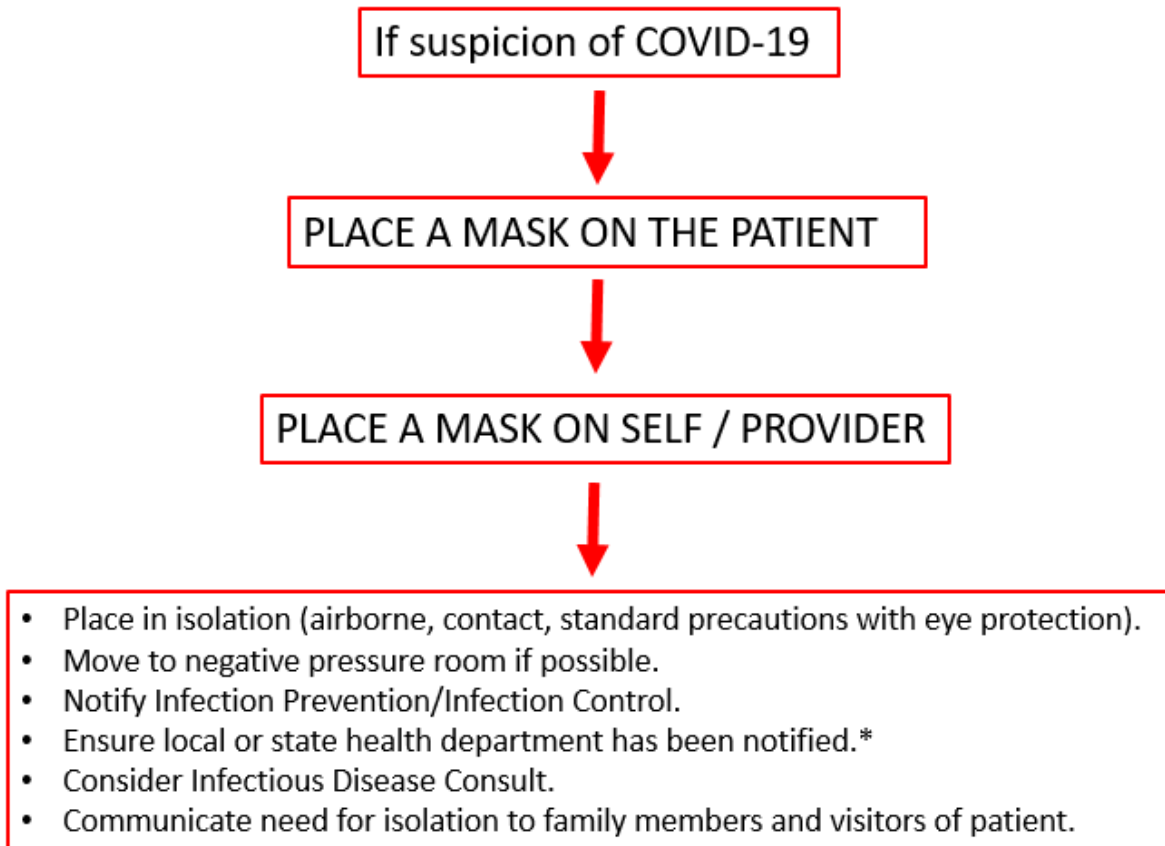
- Lymphopenia (63%)
- Elevated alanine aminotransferase and aspartate aminotransferase levels (37%) [2,4]
- Thrombocytopenia (36%) [6]
- Leukopenia (9-25%)
- Leukocytosis (24–30%)
- Normal serum levels of procalcitonin
- Chest X-ray (CXR)
 - Can be normal in the early stages of the disease
 - Most commonly reveals ground glass or patchy infiltrates
- Chest CT
 - Bilateral involvement in most patients.
 - Multiple areas of consolidation and ground glass opacities are typical findings reported to date. [2–4, 16–24]
 - 56% of patients who presented within 2 days of symptom onset had a normal CT on admission. [20]

Total Abnormal CXRs	59.1%	Total Abnormal Chest CTs	86.2%
Ground-glass opacity	20.1%	Ground-glass opacity	56.4%
Local patchy shadowing	28.1%	Local patchy shadowing	41.9%
Bilateral patchy shadowing	36.5%	Bilateral patchy shadowing	51.8%
Interstitial abnormalities	4.4%	Interstitial abnormalities	14.7%
No abnormality	41.9%	No abnormality	13.8%

Special Considerations

- Patients who develop severe respiratory illness may have a decline in respiratory status at day 6-10.
- Closer monitoring may be required in this subset of patients during this timeframe.

Screening Tool



Contact your local or state health department:

- <https://www.naccho.org/membership/lhd-directory>
- <https://www.cste.org/page/EpiOnCall>

Guidance for Management of Critically Ill Patients for the Hospitalist

Caring for critically ill patients with COVID-19 is based on the usual management of viral pneumonia with respiratory failure with additional precautions to reduce risk of transmission.

Usual critical care

Many patients with severe COVID-19 develop acute respiratory distress syndrome (ARDS). Evidence-based guidelines for ARDS in the context of COVID-19 include treatments such as

- Conservative intravenous fluid strategies
- Empirical early antibiotics for possible bacterial pneumonia
- Consideration for early invasive ventilation
- Lung-protective ventilation strategies
- Periodic prone positioning during mechanical ventilation
- Consideration of extracorporeal membrane oxygenation

Modifications to usual critical care

- Admission of patients with suspected disease to private rooms when possible
- Use of medical face masks for symptomatic patients during assessment and transfer
- Maintain distancing of at least 2 m between patients
- Caution when using high-flow nasal oxygen or noninvasive ventilation due to risk of dispersion of aerosolized virus in the health care environment with poorly fitting masks
- Clinicians involved with aerosol-generating procedures should use additional airborne precautions including N95 respirators and eye protection

Facility planning

- Ensure staff have updated training in infection prevention and control including personal protective equipment
- Planning at local and regional levels for a potential surge in the need for critical care resources

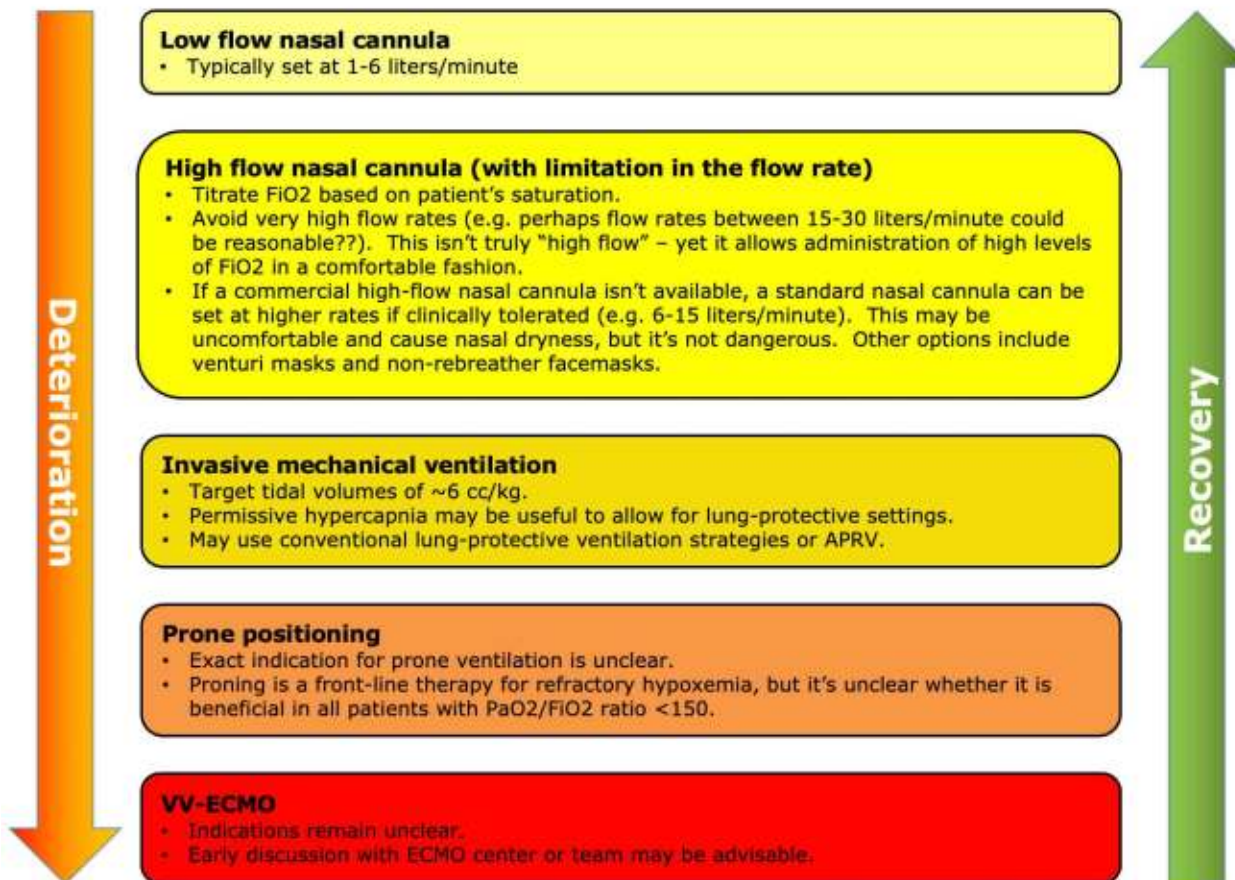
COVID-19-specific considerations

Antiviral or immunomodulatory therapies are not yet proven effective for treatment of COVID-19. Patients should be asked to participate in clinical trials of supportive or targeted therapies.

(Source: JAMA – 3-11-2020 Care for Critically Ill Patients with COVID-19 S. Murthy, MD; R. Gomersall, MBBS; R. Fowler, MD)

Respiratory Support

General schema for respiratory support in patients with COVID-19



The optimal strategy for respiratory support in COVID-19 remains unknown. The above strategy seems reasonable, adapted largely from experience with other types of viral pneumonia. Patients with more complex respiratory disease (e.g. COPD plus COVID-19) might benefit from BiPAP.

-The Internet Book of Critical Care, by @PulmCrit

High-Flow Nasal Cannula (HFNC) or Non-Invasive Ventilation (NIV)

- Should only be used in selected patients with hypoxemic respiratory failure.
- Risk of treatment failure is high in patients treated with HFNC or NIV and should be closely monitored for clinical deterioration
- WHO guidelines on COVID-19 state that "Recent publications suggest that new HFNC and NIV systems with good interface fitting do not create widespread dispersion of exhaled air and therefore should be associated with low risk of airborne transmission"
- Be aware of potential to exhaust the hospital's oxygen supply

Non-invasive Ventilation (BiPAP)

- Role of BiPAP is unclear
- Multiple studies have demonstrated that either patients had BiPAP failure and required intubation or worse outcomes compared to patients randomized to HFNC

Intubation Procedure

- REPRESENTS HIGH RISK OF TRANSMISSION TO HEALTHCARE WORKERS*

- Airborne precautions, with full face shields, and full contact precautions must be adhered to
- Use of video laryngoscopy may avoid placing the operator's face close to the patient
- Limit the number of people in the room to the minimum necessary only

Invasive Mechanical Ventilation

Ventilator Settings

- Use lower Tidal Volumes (4-8 ml/kg predicted body weight, PW) and lower inspiratory pressures (plateau pressure <30 cmH2O)
- Reports from Italy suggest-
 - Driving pressures required aren't very high
 - Patients require high PEEP and also respond well to prone ventilation
- Primary problem may be with small airway closure and atelectasis (rather than reduced lung compliance).
 - If conventional ventilation is used, high PEEP settings should be utilized
 - Early APRV should be considered
- Permissive Hypercapnia will likely be extremely important when ventilating these patients in a safe fashion.

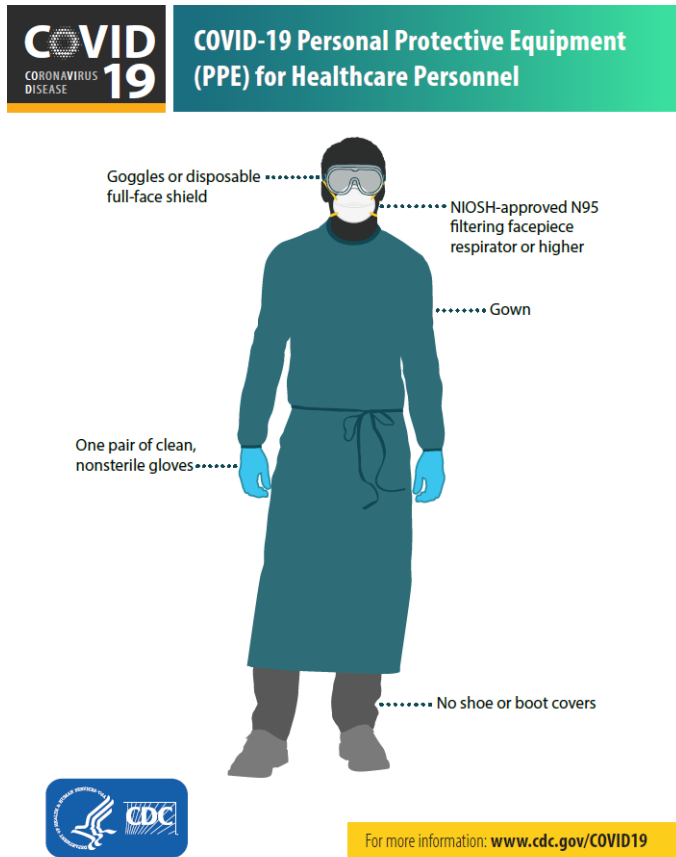
Proning

- Prior to consideration of proning, optimization on the ventilator for 12-24 hours is generally preferable.
- If failure to respond to initial ventilator optimization, prone ventilation may be considered.

Prognosis

- It is unclear as to what percentage of patients are hospitalized
 - Most mild cases don't present for medical attention
 - Vast majority of infected patients (e.g. >80%) don't get significantly ill and don't require hospitalization
- Among hospitalized patients
 - Approx. 10-20% are admitted to the ICU
 - Approx. 3-10% require intubation
 - Approx. 2-5% die

Personal Protective Equipment



(Source: CDC - <https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirator-use-faq.html>)

SEQUENCE FOR PUTTING ON PERSONAL PROTECTIVE EQUIPMENT (PPE)

The type of PPE used will vary based on the level of precautions required, such as standard and contact, droplet or airborne infection isolation precautions. The procedure for putting on and removing PPE should be tailored to the specific type of PPE.

- 1. GOWN**
 - Fully cover torso from neck to knees, arms to end of wrists, and wrap around the back
 - Fasten in back of neck and waist
- 2. MASK OR RESPIRATOR**
 - Secure ties or elastic bands at middle of head and neck
 - Fit flexible band to nose bridge
 - Fit snug to face and below chin
 - Fit-check respirator
- 3. GOGGLES OR FACE SHIELD**
 - Place over face and eyes and adjust to fit
- 4. GLOVES**
 - Extend to cover wrist of isolation gown

USE SAFE WORK PRACTICES TO PROTECT YOURSELF AND LIMIT THE SPREAD OF CONTAMINATION

- Keep hands away from face
- Limit surfaces touched
- Change gloves when torn or heavily contaminated
- Perform hand hygiene

CDC

HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 1

There are a variety of ways to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. Here is one example. **Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:**

- 1. GLOVES**
 - Outside of gloves are contaminated!
 - If your hands get contaminated during glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Using a gloved hand, grasp the palm area of the other gloved hand and peel off first glove
 - Hold removed glove in gloved hand
 - Slide fingers of ungloved hand under remaining glove at wrist and peel off second glove over first glove
 - Discard gloves in a waste container
- 2. GOGGLES OR FACE SHIELD**
 - Outside of goggles or face shield are contaminated!
 - If your hands get contaminated during goggles or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Remove goggles or face shield from the back by lifting head band or ear pieces
 - If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container
- 3. GOWN**
 - Gown front and sleeves are contaminated!
 - If your hands get contaminated during gown removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Unfasten gown ties, taking care that sleeves don't contact your body when reaching for ties
 - Roll gown away from neck and shoulders, touching inside of gown only
 - Turn gown inside out
 - Fold or roll into a bundle and discard in a waste container
- 4. MASK OR RESPIRATOR**
 - Front of mask/respirator is contaminated — DO NOT TOUCH!
 - If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Grasp bottom ties or elastic of the mask/respirator, then the area at the top, and remove without touching the front
 - Discard in a waste container
- 5. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE**

PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE

CDC

HOW TO SAFELY REMOVE PERSONAL PROTECTIVE EQUIPMENT (PPE) EXAMPLE 2

Here is another way to safely remove PPE without contaminating your clothing, skin, or mucous membranes with potentially infectious materials. **Remove all PPE before exiting the patient room except a respirator, if worn. Remove the respirator after leaving the patient room and closing the door. Remove PPE in the following sequence:**

- 1. GOWN AND GLOVES**
 - Down front and sleeves and the outside of gloves are contaminated!
 - If your hands get contaminated during gown or glove removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Grasp the gown in the front and pull away from your body so that the ties break, touching outside of gown only with gloved hands
 - While removing the gown, fold or roll the gown inside-out into a bundle
 - As you are removing the gown, peel off your gloves: at the same time, only touching the inside of the gloves and gown with your bare hands. Place the gown and gloves into a waste container
- 2. GOGGLES OR FACE SHIELD**
 - Outside of goggles or face shield are contaminated!
 - If your hands get contaminated during goggles or face shield removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Remove goggles or face shield from the back by lifting head band and without touching the front of the goggles or face shield
 - If the item is reusable, place in designated receptacle for reprocessing. Otherwise, discard in a waste container
- 3. MASK OR RESPIRATOR**
 - Front of mask/respirator is contaminated — DO NOT TOUCH!
 - If your hands get contaminated during mask/respirator removal, immediately wash your hands or use an alcohol-based hand sanitizer
 - Grasp bottom ties or elastic of the mask/respirator, then the area at the top, and remove without touching the front
 - Discard in a waste container
- 4. WASH HANDS OR USE AN ALCOHOL-BASED HAND SANITIZER IMMEDIATELY AFTER REMOVING ALL PPE**

PERFORM HAND HYGIENE BETWEEN STEPS IF HANDS BECOME CONTAMINATED AND IMMEDIATELY AFTER REMOVING ALL PPE

CDC

(Source: CDC - <https://www.cdc.gov/niosh/nppt/pdfs/PPE-Sequence-508.pdf>)

Treatment

- We are not covering triage level info (when to send home, when to admit)
- No specific treatment for COVID-19 is currently available.
- Antiviral treatments (remdesivir, lopinavir/ritonavir) have not been approved for use in COVID-19 but are being used at some facilities with promising results.
- Clinical management should include infection prevention and control measures and supportive management of complications.
- Antibacterials are not effective against COVID-19 and are not recommended unless a complicating bacterial infection is also present.
- Corticosteroids should be avoided because of the potential for prolonging viral replication as observed in MERS-CoV patients, unless indicated for other reasons. [\[31, 40–42\]](#) For example, for a chronic obstructive pulmonary disease exacerbation or for septic shock per Surviving Sepsis guidelines for [adults \(Reference A\)](#) and [children. \(Reference B\)](#)
- Use conservative fluid management strategy for ARDS patients without tissue hypoperfusion.

Quarantine

Provider quarantine varies widely based on local health department and individual site decisions. As the pandemic progresses, we are seeing more return to work decisions for providers who have a medium risk exposure (ie. unmasked patient, masked provider without goggles). These providers are being advised to self-monitor by checking temperature and symptoms twice daily and staying home if febrile or respiratory symptoms develop. In some cases, our providers are required to wear a mask in order to return to work.

Epidemiologic risk factors	Exposure category	Recommended Monitoring for COVID-19 (until 14 days after last potential exposure)	Work Restrictions for Asymptomatic HCP
Prolonged close contact with a COVID-19 patient who was wearing a facemask (i.e., source control)			
HCP PPE: None	Medium	Active	Exclude from work for 14 days after last exposure
HCP PPE: Not wearing a facemask or respirator	Medium	Active	Exclude from work for 14 days after last exposure
HCP PPE: Not wearing eye protection	Low	Self with delegated supervision	None
HCP PPE: Not wearing gown or gloves ^a	Low	Self with delegated supervision	None
HCP PPE: Wearing all recommended PPE (except wearing a facemask instead of a respirator)	Low	Self with delegated supervision	None

Prolonged close contact with a COVID-19 patient who was not wearing a facemask (i.e., no source control)

HCP PPE: None	High	Active	Exclude from work for 14 days after last exposure
HCP PPE: Not wearing a facemask or respirator	High	Active	Exclude from work for 14 days after last exposure
HCP PPE: Not wearing eye protection ^b	Medium	Active	Exclude from work for 14 days after last exposure
HCP PPE: Not wearing gown or gloves ^{a,b}	Low	Self with delegated supervision	None
HCP PPE: Wearing all recommended PPE (except wearing a facemask instead of a respirator) ²	Low	Self with delegated supervision	None

Keeping your family safe: Mitigation strategies for individuals and families at home

Factor	Potential mitigation activities according to level of community transmission or impact of COVID-19 by setting		
	None (preparedness phase)	Minimal to moderate	Substantial
Individuals and Families at Home "What you can do to prepare, if you or a family member gets ill, or if your community experiences spread of COVID-19"	<ul style="list-style-type: none"> Know where to find local information on COVID-19 and local trends of COVID-19 cases. Know the signs and symptoms of COVID-19 and what to do if symptomatic: <ul style="list-style-type: none"> » Stay home when you are sick » Call your health care provider's office in advance of a visit » Limit movement in the community » Limit visitors Know what additional measures those at high-risk and who are vulnerable should take. Implement personal protective measures (e.g., stay home when sick, handwashing, respiratory etiquette, clean frequently touched surfaces daily). Create a household plan of action in case of illness in the household or disruption of daily activities due to COVID-19 in the community. <ul style="list-style-type: none"> » Consider 2-week supply of prescription and over the counter medications, food and other essentials. Know how to get food delivered if possible. » Establish ways to communicate with others (e.g., family, friends, co-workers). » Establish plans to telework, what to do about childcare needs, how to adapt to cancellation of events. Know about emergency operations plans for schools/workplaces of household members. 	<ul style="list-style-type: none"> Continue to monitor local information about COVID-19 in your community. Continue to practice personal protective measures. Continue to put household plan into action. Individuals at increased risk of severe illness should consider staying at home and avoiding gatherings or other situations of potential exposures, including travel. 	<ul style="list-style-type: none"> Continue to monitor local information. Continue to practice personal protective measures. Continue to put household plan into place. All individuals should limit community movement and adapt to disruptions in routine activities (e.g., school and/or work closures) according to guidance from local officials.



What to do if you are sick with coronavirus disease 2019 (COVID-19)

If you are sick with COVID-19 or suspect you are infected with the virus that causes COVID-19, follow the steps below to help prevent the disease from spreading to people in your home and community.

Stay home except to get medical care

You should restrict activities outside your home, except for getting medical care. Do not go to work, school, or public areas. Avoid using public transportation, ride-sharing, or taxis.

Separate yourself from other people and animals in your home

People: As much as possible, you should stay in a specific room and away from other people in your home. Also, you should use a separate bathroom, if available.

Animals: Do not handle pets or other animals while sick. See [COVID-19 and Animals](#) for more information.

Call ahead before visiting your doctor

If you have a medical appointment, call the healthcare provider and tell them that you have or may have COVID-19. This will help the healthcare provider's office take steps to keep other people from getting infected or exposed.

Wear a facemask

You should wear a facemask when you are around other people (e.g., sharing a room or vehicle) or pets and before you enter a healthcare provider's office. If you are not able to wear a facemask (for example, because it causes trouble breathing), then people who live with you should not stay in the same room with you, or they should wear a facemask if they enter your room.

Cover your coughs and sneezes

Cover your mouth and nose with a tissue when you cough or sneeze. Throw used tissues in a lined trash can; immediately wash your hands with soap and water for at least 20 seconds or clean your hands with an alcohol-based hand sanitizer that contains at least 60% alcohol covering all surfaces of your hands and rubbing them together until they feel dry. Soap and water should be used preferentially if hands are visibly dirty.

Avoid sharing personal household items

You should not share dishes, drinking glasses, cups, eating utensils, towels, or bedding with other people or pets in your home. After using these items, they should be washed thoroughly with soap and water.

Clean your hands often

Wash your hands often with soap and water for at least 20 seconds. If soap and water are not available, clean your hands with an alcohol-based hand sanitizer that contains at least 60% alcohol, covering all surfaces of your hands and rubbing them together until they feel dry. Soap and water should be used preferentially if hands are visibly dirty. Avoid touching your eyes, nose, and mouth with unwashed hands.

Clean all "high-touch" surfaces every day

High touch surfaces include counters, tabletops, doorknobs, bathroom fixtures, toilets, phones, keyboards, tablets, and bedside tables. Also, clean any surfaces that may have blood, stool, or body fluids on them. Use a household cleaning spray or wipe, according to the label instructions. Labels contain instructions for safe and effective use of the cleaning product including precautions you should take when applying the product, such as wearing gloves and making sure you have good ventilation during use of the product.

Monitor your symptoms

Seek prompt medical attention if your illness is worsening (e.g., difficulty breathing). **Before** seeking care, call your healthcare provider and tell them that you have, or are being evaluated for, COVID-19. Put on a facemask before you enter the facility. These steps will help the healthcare provider's office to keep other people in the office or waiting room from getting infected or exposed.

Ask your healthcare provider to call the local or state health department. Persons who are placed under active monitoring or facilitated self-monitoring should follow instructions provided by their local health department or occupational health professionals, as appropriate. When working with your local health department check their available hours.

If you have a medical emergency and need to call 911, notify the dispatch personnel that you have, or are being evaluated for COVID-19. If possible, put on a facemask before emergency medical services arrive.

Discontinuing home isolation

Patients with confirmed COVID-19 should remain under home isolation precautions until the risk of secondary transmission to others is thought to be low. The decision to discontinue home isolation precautions should be made on a case-by-case basis, in consultation with healthcare providers and state and local health departments.



CS-114037-D 02/29/2020

For more information: www.cdc.gov/COVID19

Emergent Coverage Planning

- For the next 12 weeks at a minimum, plan an emergent coverage staffing plan.
- If you have questions about compensation regarding quarantined clinicians or emergent coverage, talk to your VPO/RMD.

Jeopardy system

- Voluntary Sign up by clinicians for on-call
- Emergent Staffing responsibilities made clear: Admitter, Observation discharger, Rounder etc. for a set amount of hours and set compensation per hour

Flex Shifts

- Consider flexing shifts up in hours for additional coverage (ie flex 10hr shift up to 12hr shift as needed).

Reallocate Resources where they're needed the most:

- Swing shifts and admitter shifts can be flexed to rounding + admissions (i.e. 1p-9p swing shift can be extended to 7a-9p for rounding on 10 patients, then admissions 1p-9p).
- Depending on FMD schedule and availability, utilize FMD in surge capacity instead of strict 7 on / 7 off.

Designated Physicians

- Consider limiting the number of clinicians being exposed to COVID-19 patients.

Disclaimer: These are suggestions of workflows. We advise that you discuss with the hospital administration and/or infection control before implementing these.

Additional Resources

The data surrounding this public health emergency is changing daily and sometimes hourly, so we have included some links below of websites to stay updated.

- <https://www.nejm.org/doi/full/10.1056/NEJMoa2002032>
- <https://www.thelancet.com/coronavirus>
- <https://jamanetwork.com/journals/jama/fullarticle/2762130>
- <https://my.visme.co/projects/4d80743j-covid19-sheet#s1>
- https://emcrit.org/wp-content/uploads/2020/03/4_SARS-CoV-2-COVID-19-Toolkit-Version-3.pdf
- <https://criticalcarenorthampton.com/2020/03/08/covid-19-your-one-stop-resource/>
- <https://rebelem.com/covid-19-the-novel-coronavirus-2019/>
- <https://www.ncsl.org/research/health/state-quarantine-and-isolation-statutes.aspx>
- https://phpa.health.maryland.gov/Documents/coronavirus_FAQ.pdf
- <https://www.arcgis.com/apps/opstdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>
- <https://www.cdc.gov/coronavirus/2019-ncov/cases-in-us.html>
- <https://www.cdc.gov/coronavirus/2019-ncov/locations-confirmed-cases.html>

Clinical Management of severe acute respiratory infection when novel coronavirus (2019-nCoV) infection is suspected – Interim Guidance – 1/28/2020 – WHO
COVID-19, The Internet Book of Critical Care, 3/2/2020 - J. Farkas

Appendix 1: Printable information from Critical Care Northampton

CORONAVIRUS - #COVID19

DR. DAVID LYNES & DR. JONNY WILKINSON

ZOONOTIC, BETA, NOVEL, HUMAN CORONAVIRUS

CAN PASS FROM ANIMALS TO HUMANS SUBTYPE OF THE VIRUS NEW AS OF DECEMBER 2019 IS SEEN AND CAN CAUSE DISEASE IN HUMANS, INCLUDING RESPIRATORY SYMPTOMS

THE VIRUS IS CALLED SARS-COV-2 AND THE ILLNESS IS COVID19
IT IS A MUTATING VIRUS, WHICH MAY COMPLICATE MATTERS IN TIME

www.cdc.gov
www.who.int
www.who.int/news-room/fact-sheets/detail/novel-coronavirus-2019-ncov
www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports

@GAS_CRAIC
@WILKINSONJONNY

RESPIRATORY SYMPTOMS → PNEUMONIA → ARDS

COUGH, FEVER, DYSPNOEA AND SPUTUM PRODUCTION ARE MOST COMMON
ALSO MYALGIA, HEADACHE, SORE THROAT, RHINORRHOEA, NAUSEA & DIARRHOEA

PATCHY GROUND GLASS OPACITIES
PREDOMINANTLY PERIPHERAL AND BASAL
MORE - WORSE
CAN COALESCE INTO DENSER CONSOLIDATIONS

PLEURAL EFFUSION IS RARE ~5%
WAZES, CAVITATIONS AND LYMPHADENOPATHY - NOT COMMONLY SEEN

TRANSMISSION

THOSE WHO ARE ASYMPTOMATIC WITH NO CT CHANGES, DON'T TRANSMIT

LARGE DROPLET TRANSMISSION - LIMITED RISK AT 6 FEET AWAY FROM PATIENT
THIS IS TYPICAL FOR VIRUSES SUCH AS INFLUENZA TOO (FLU)
THIS SORT OF TRANSMISSION CAN BE PREVENTED VIA STANDARD SURGICAL FACEMASK

AIRBORNE TRANSMISSION - UNSURE IF IT CAN TRAVEL THIS WAY
IF THIS ROUTE IS THE VECTOR, ONE WOULD NEED FFP3 MASKS & ADVANCED PPE IF CARRYING OUT AEROSOL GENERATING PROCEDURES

FOLLOW YOUR OWN HOSPITAL'S GUIDELINES FOR THE USE OF PPE IF DEALING WITH PATIENTS WHO HAVE COVID19

THE VIRUS PERSISTS ON 'FOMITES' OR VECTORS IN THE ENVIRONMENT. ALL EFFORTS TO CONTROL THE VIRAL SPREAD MUST FOCUS ON STOPPING THE SPREAD OF THE LARGE DROPLETS WHICH ARE COUGHED OUT, SETTLING ON SURFACES, BEING TOUCHED AND THEN TRANSMITTED TO THE FACE.

SURFACES WILL NEED TO BE FREQUENTLY CLEANED (ETHANOL OR HYPOCHLORITE), HANDS WASHED APPROPRIATELY + ALCOHOL HAND GEL AND AVOID TOUCHING YOUR FACE

TYPICAL EVOLUTION

THIS, OBVIOUSLY, DOES NOT HAPPEN IN EVERY CASE!

~6 DAYS POST EXPOSURE = DYSPNOEA
~8 DAYS POST EXPOSURE = ADMISSION
~10 DAYS POST EXPOSURE = ICU ADMISSION/INTUBATION

INCUBATION IS A MEDIAN TIME OF ~4 DAYS (IQR 2-7 DAYS)
RANGE OF INCUBATION TIME IS UP TO 14 DAYS

SICKER PATIENTS MAY BE MORE LIKELY TO PRESENT WITH FEVER
GENERALLY UNREVEALING INITIAL PHYSICAL EXAMINATION
CAN BE HYPOXAEMIC WITHOUT SIGNS OF RESPIRATORY DISTRESS

THE TURNING POINT - DETERIORATION OR RECOVERY MOST COMMONLY OCCURS AT DAYS 6-7 OF ILLNESS

TREATMENT MODALITIES

ANTIBIOTICS - NOT UNLESS SEVERE DISEASE WITH POTENTIAL OF BACTERIAL ADDITION - YES IN LATE INFECTION
ANTIVIRALS - CONSIDER IN DETERIORATION - CURRENTLY SCANT EVIDENCE BASE
STERIODS - UNLIKELY A ROLE - BUT SOME DEBATE - MAY PROLONG VIRAL SHEDDING TOO
HFNO, NIV, NEBS AND MV - BEWARE OF AEROSOL GENERATION & SPREAD OF INFECTION

RISK FACTORS THAT INCREASE SEVERITY

- ELDERLY, MALE PATIENTS
- >65 YEARS OF AGE
- HYPERTENSIVE
- SMOKER/EX-SMOKER
- BACTERIAL CO-INFECTION
- CO-MORBIDITIES

LABS

- WBC TENDS TO BE NORMAL
- LYMPHOPENIA IS COMMON IN ~80%
- MILD THROMBOCYTOPENIA (<100 IS UNCOMMON)
- ELEVATED D-DIMER CAN OCCUR
- DOES NOT APPEAR TO INCREASE PROCALCITONIN
- ELEVATED PROCALCITONIN MAY INDICATE BACTERIAL INVOLVEMENT
- ELEVATED LIVER ENZYMES IN ~30%
- PTT DECREASED IN ABOUT 30%
- LAB FINDINGS TEND TO BE GENERALLY NONSPECIFIC

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