Surviving Sepsis Campaign: Guidelines on the Management of Critically Ill Adults with Coronavirus Disease 2019 (COVID-19)

Infection Control and Testing:
For healthcare workers performing **aerosol-generating procedures*** on patients with COVID-19 in the ICU, we **recommend** using **fitted respirator masks (N95 respirators, FFP2, or equivalent)**, as opposed to surgical/medical masks, in addition to other personal protective equipment (i.e., gloves, gown, and eye protection, such as a face shield or safety goggles)
We **recommend** performing **aerosol-generating procedures** on ICU patients with COVID-19 in a negative pressure room.
For intubated and mechanically ventilated adults with suspicion of COVID-19: For diagnostic testing, we **suggest** obtaining lower respiratory tract samples in preference to upper respiratory tract (nasopharyngeal or oropharyngeal) samples.
For intubated and mechanically ventilated adults with suspicion of COVID-19: With regard to lower respiratory samples, we **suggest** obtaining endotracheal aspirates in preference to bronchial wash or bronchoalveolar lavage samples.

Hemodynamics:
In adults with **COVID-19 and shock**, we **suggest** using dynamic parameters skin temperature, capillary refilling time, and/or serum lactate measurement over static parameters in order to assess fluid responsiveness.
For the **acute resuscitation** of adults with **COVID-19 and shock**, we **suggest** using a conservative over a liberal fluid strategy.
For the **acute resuscitation** of adults with **COVID-19 and shock**, we **recommend** using crystalloids over colloids.
For the **acute resuscitation** of adults with **COVID-19 and shock**, we **suggest** using buffered/balanced crystalloids over unbalanced crystalloids.
For adults with **COVID-19 and shock**, we **suggest** using norepinephrine as the first-line vasoactive agent, over other agents.
For adults with **COVID-19 and shock**, we **suggest** adding vasopressin as a second-line
For adults with **COVID-19 and shock**, we **suggest titrating** vasoactive agents to target a MAP of 60-65 mmHg, rather than higher MAP targets.
For adults with **COVID-19 and shock with evidence of cardiac dysfunction and persistent hypoperfusion despite fluid resuscitation and norepinephrine**, we **suggest** adding dobutamine, over increasing norepinephrine dose.

Ventilation
In adults with COVID-19, we **suggest** starting supplemental oxygen if the peripheral oxygen saturation (SPO_2) is < 92%, and **recommend** starting supplemental oxygen if SPO_2 is < 90%
In adults with COVID-19 and **acute hypoxemic respiratory failure on oxygen**, we **recommend** that SPO_2 be maintained no higher than 96%.
For adults with COVID-19 and **acute hypoxemic respiratory failure** despite conventional oxygen therapy, we **suggest using** HFNC over conventional oxygen therapy.
In adults with COVID-19 and **acute hypoxemic respiratory failure**, we **suggest** using HFNC over NIPPV.
In adults with COVID-19 and **acute hypoxemic respiratory failure**, if HFNC is not available and there is no urgent indication for endotracheal intubation, we **suggest** a trial of NIPPV with close monitoring and short-interval assessment for worsening of respiratory failure.
In adults with COVID-19 receiving NIPPV or HFNC, we **recommend** close monitoring for worsening of respiratory status, and early intubation in a controlled setting if worsening occurs.
In mechanically ventilated adults with COVID-19 and ARDS, we **recommend** using low tidal volume (Vt) ventilation (Vt 4-8 mL/kg of predicted body weight), over higher tidal volumes (Vt>8 mL/kg).
For mechanically ventilated adults with COVID-19 and **ARDS**, we **recommend** targeting plateau pressures (Pplat) of < 30 cm H_2O.
For mechanically ventilated adults with COVID-19 and moderate to severe ARDS, we **suggest** using a higher PEEP strategy, over a lower PEEP strategy.
For mechanically ventilated adults with COVID-19 and **moderate to severe ARDS**, we **suggest** prone ventilation for **12 to 16 hours**, over no prone ventilation.
For mechanically ventilated adults with COVID-19 and **moderate to severe ARDS**: We **suggest** using, as needed, intermittent boluses of neuromuscular blocking agents (NMBA), over continuous NMBA infusion, to facilitate protective lung ventilation.
For mechanically ventilated adults with COVID-19 and hypoxemia despite optimizing ventilation, we **suggest** using recruitment maneuvers, over not using recruitment maneuvers.

Waleed Alhazzani[1,2], Morten Hylander Møller[3,4], Yaseen M. Arabi[5], Mark Loeb[1,2], Michelle Ng Gong[6] Kathryn Maitland[20], Fayez Alshamsi[21], Emilie Belley-Cote[1,22], Massimiliano Greco[16,17], Matthew Eddy Fan[7], Simon Oczkowski[1,2], Mitchell M. Levy[8,9], Lennie Derde[10,11], Amy Dzierba[12], Bin Du[13], Laundy[23], Jill S. Morgan[24], Jozef Kesecioglu[10], Allison McGeer[25], Leonard Mermel[8], Manoj J. Michael Aboodi[5], Hannah Wunsch[14,15], Maurizio Cecconi[16,17], Younsuck Koh[18], Daniel S. Chertow[19], Mammen[26], Paul E. Alexander[2,27], Amy Arrington[28], John Centofanti[29], Giuseppe Citerio[30,31], Bandar Baw[1,32], Ziad A. Memish[33], Naomi Hammond[34,35], Frederick G. Hayden[36], Laura Evans[37], Andrew

General facts

Spread: Droplet spread, survives 2-3 hours on most surfaces, 2 days on smooth metal/plastic

Incubation: 2-14 days

1st week: Fever, cough, headache, fatigue, myalgias, pharyngitis

2nd week: Resolves in 80%, Viral pneumonia 20%

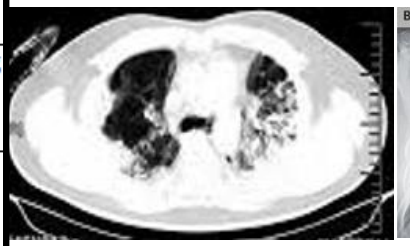
Risk increased: Heart/lung disease, immunosuppression, poorly controlled DM

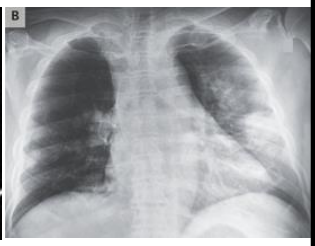
Exam: Non specific

Labs: Lymphopenia with normal WBC count or relative leukopenia, Elevated Ferritin/CRP/D-Dimer is negative prognostic indicator

Mortality: Due to oxygenation failure or septic shock/multiorgan failure

Imaging:





Testing: CBC, CMP, ABG, Troponin, G6PD, Rapid flu testing and bacterial sputum and blood cultures (coinfection with BACTERIAL respiratory pathogens unlikely), Coronavirus PCR testing, CRP, Ferritin, D-Dimer

Treatment: Symptomatic support for stable patients otherwise refer to guidelines for critical care support -Currently under investigation (Plaquenil, Azithromycin and Remdesivir)

Per présentation by Dr. Leon Liang-Yu Lai, MD

M. Daniyal Hashmi, MD
@MDaniyalHashmi1 (twitter)