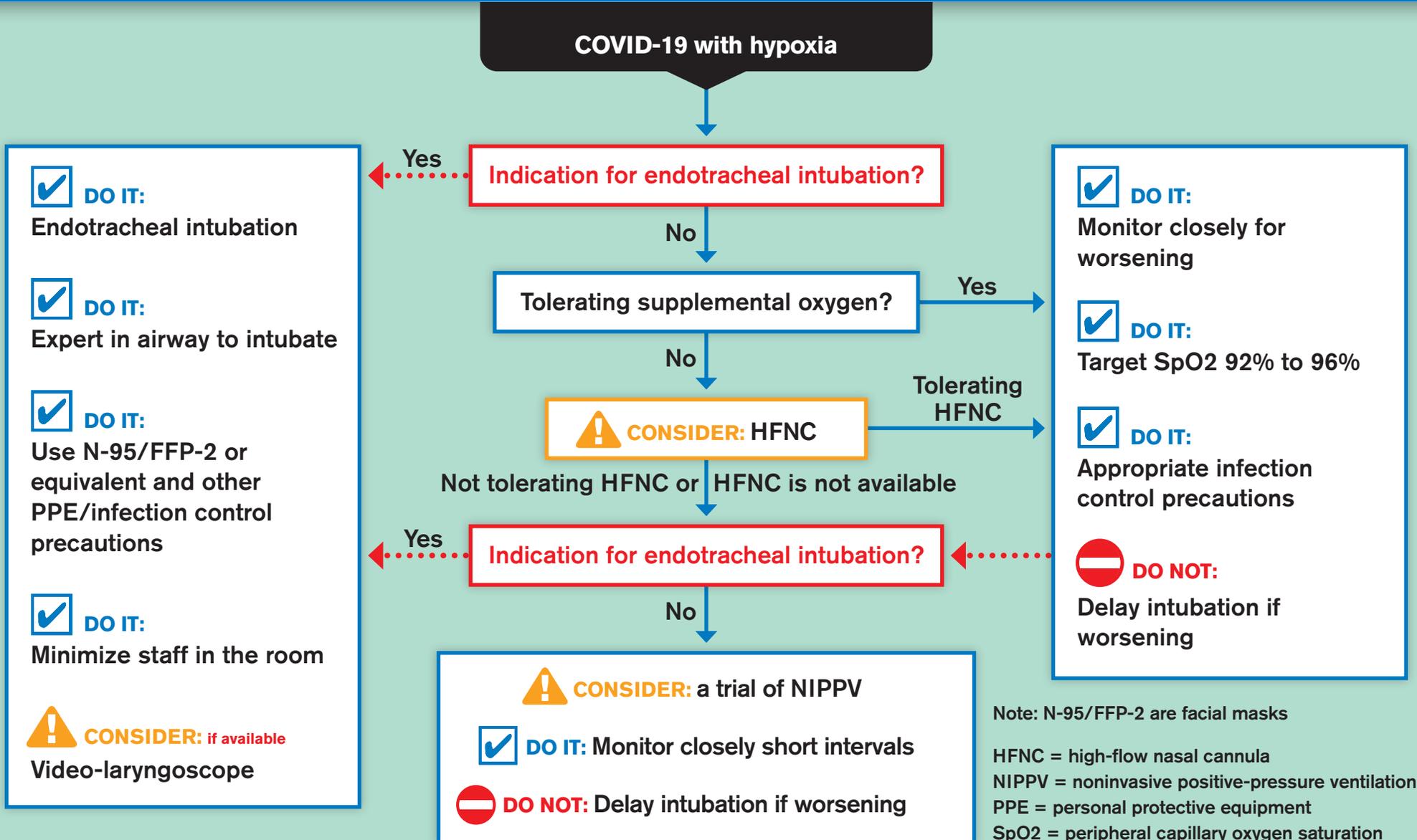


COVID-19 Resources

Summary of recommendations on the initial management of hypoxic COVID-19 patients



COVID-19 Resources

Summary of recommendations on the management of patients with COVID-19 and ARDS

COVID-19 with mild ARDS



DO:

Vt 4-8 ml/kg and $P_{plat} < 30$ cm H₂O



DO:

Investigate for bacterial infection



DO:

Target SpO₂ 92% - 96%



CONSIDER:

Conservative fluid strategy



CONSIDER:

Empiric antibiotics

COVID-19 with mod to severe ARDS



CONSIDER:

Higher PEEP

PEEP should be tailored to individual response



CONSIDER:

NMBA boluses to facilitate ventilation targets



CONSIDER:

if PEEP responsive

Traditional recruitment maneuvers



CONSIDER:

Prone ventilation 12 -16 h



CONSIDER:

if proning, high P_{pit} , asynchrony

NMBA infusion for 24 h



DON'T DO:

Staircase recruitment maneuvers

Rescue/adjunctive therapy



CONSIDER:

if proning, high P_{pit} , asynchrony

NMBA infusion for 24 h



CONSIDER:

Prone ventilation 12 -16 h



CONSIDER:

A trial of inhaled nitric oxide

STOP if no quick response



CONSIDER:

V-V ECMO or referral to ECMO center

follow local criteria for ECMO

Mod = moderate

ARDS = adult respiratory distress syndrome

P_{plat} = plateau pressure

SpO₂ = peripheral capillary oxygen saturation

PEEP = positive end-expiratory pressure

NMBA = neuromuscular blocking agents

ECMO = extracorporeal membrane oxygenation

COVID-19 Resources

Summary of recommendations of the COVID-19 guidelines therapeutic update

Severe COVID-19

 **DO:** Systemic corticosteroids

 **CONSIDER:** Dexamethasone over other corticosteroids

 **DO:** Pharmacologic VTE prophylaxis

 **CONSIDER:** Remdesivir

 **CONSIDER avoiding:** Remdesivir

 **CONSIDER avoiding:** Convalescent plasma outside of clinical trials

 **CONSIDER avoiding:** Full anticoagulation in patients without VTE outside of clinical trials

 **DON'T DO:** Hydroxychloroquine

 **UNCERTAIN:** Awake proning

Surviving Sepsis Campaign Guidelines on the Management of Adults with Coronavirus Disease 2019 (COVID-19) in the ICU

Recommendation Chart: Include First Updates

Category	Definition
Severe	Clinical signs of pneumonia (fever, cough, dyspnea, fast breathing) and one of the following: <ul style="list-style-type: none"> • Respiratory rate > 30 breaths/minute; • Severe respiratory distress; or • SpO₂ < 90% on room air
Critical	Presence of ARDS or respiratory failure requiring ventilation, sepsis or septic shock

SpO₂ = oxygen saturation

RECOMMENDATION	STRENGTH
Infection Control and Testing	
<ul style="list-style-type: none"> • For healthcare professionals 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 PPE (e.g., gloves, gown, and eye protection, such as a face shield or safety goggles) 	Best practice statement
<ul style="list-style-type: none"> • We recommend performing aerosol-generating procedures on ICU patients with COVID-19 in a negative-pressure room. 	Best practice statement
<ul style="list-style-type: none"> • For COVID-19 patients requiring endotracheal intubation, we recommend that endotracheal intubation be performed by the healthcare professional who is most experienced with airway management to minimize the number of attempts and risk of transmission. 	Best practice statement
<ul style="list-style-type: none"> • For healthcare professionals providing usual care for nonventilated COVID-19 patients, we suggest using surgical/medical masks as opposed to respirator masks, in addition to other PPE (e.g., gloves, gown, and eye protection, such as a face shield or safety goggles) 	Weak

<ul style="list-style-type: none"> For healthcare professionals performing non-aerosol-generating procedures on mechanically ventilated (closed circuit) patients with COVID-19, we suggest using surgical/medical masks as opposed to respirator masks, in addition to other PPE (e.g., gloves, gown, and eye protection, such as a face shield or safety goggles). 	Weak
<ul style="list-style-type: none"> For healthcare professionals performing endotracheal intubation on patients with COVID-19, we suggest using video-guided laryngoscopy over direct laryngoscopy, if available. 	Weak
<ul style="list-style-type: none"> 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. 	Weak
<ul style="list-style-type: none"> 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. 	Weak
HEMODYNAMICS	
<ul style="list-style-type: none"> For adults with COVID-19 and shock, we recommend against using dopamine if norepinephrine is available. 	Strong
<ul style="list-style-type: none"> For the acute resuscitation of adults with COVID-19 and shock, we recommend against using hydroxyethyl starches. 	Strong
<ul style="list-style-type: none"> In adults with COVID-19 and shock, we suggest using dynamic parameters of skin temperature, capillary refill time, and/or serum lactate measurement over static parameters to assess fluid responsiveness. 	Weak
<ul style="list-style-type: none"> For the acute resuscitation of adults with COVID-19 and shock, we suggest using a conservative over a liberal fluid strategy. 	Weak
<ul style="list-style-type: none"> For the acute resuscitation of adults with COVID-19 and shock, we recommend using crystalloids over colloids. 	Weak
<ul style="list-style-type: none"> For the acute resuscitation of adults with COVID-19 and shock, we suggest using buffered/balanced crystalloids over unbalanced crystalloids. 	Weak
<ul style="list-style-type: none"> For the acute resuscitation of adults with COVID-19 and shock, we suggest against using gelatins. 	Weak
<ul style="list-style-type: none"> For the acute resuscitation of adults with COVID-19 and shock, we suggest against using dextrans. 	Weak
<ul style="list-style-type: none"> For the acute resuscitation of adults with COVID-19 and shock, we suggest against the routine use of albumin for initial resuscitation. 	Weak
<ul style="list-style-type: none"> For adults with COVID-19 and shock, we suggest using norepinephrine as the first-line vasoactive agent over other agents. 	Weak
<ul style="list-style-type: none"> For adults with COVID-19 and shock, if norepinephrine is not available, we suggest using either vasopressin or epinephrine as the first-line vasoactive agent over other vasoactive agents. 	Weak

<ul style="list-style-type: none"> For adults with COVID-19 and shock, we suggest adding vasopressin as a second-line agent over titrating norepinephrine dose, if target MAP cannot be achieved by norepinephrine alone. 	Weak
<ul style="list-style-type: none"> For adults with COVID-19 and shock, we suggest titrating vasoactive agents to target a MAP of 60-65 mm Hg rather than higher MAP targets. 	Weak
<ul style="list-style-type: none"> 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. 	Weak
VENTILATION	
<ul style="list-style-type: none"> In adults with COVID-19, we suggest starting supplemental oxygen if the peripheral SpO₂ is < 92%, and recommend starting supplemental oxygen if SpO₂ is < 90%. 	Strong
<ul style="list-style-type: none"> In adults with COVID-19 and acute hypoxemic respiratory failure on oxygen, we recommend that SpO₂ be maintained no higher than 96%. 	Strong
<ul style="list-style-type: none"> If recruitment maneuvers are used, we recommend against using staircase (incremental PEEP) recruitment maneuvers. 	Strong
<ul style="list-style-type: none"> In mechanically ventilated adults with COVID-19 and ARDS, we recommend using low Vt ventilation (Vt 4-8 mL/kg of predicted body weight) over higher tidal volumes (Vt > 8 mL/kg). 	Strong
<ul style="list-style-type: none"> For mechanically ventilated adults with COVID-19 and ARDS, we recommend targeting Pplat of < 30 cm H₂O. 	Strong
<ul style="list-style-type: none"> For mechanically ventilated adults with COVID-19 and moderate to severe ARDS, we suggest using a higher PEEP strategy over a lower PEEP strategy. <i>Remark: If using a higher PEEP strategy (i.e., PEEP > 10 cm H₂O), clinicians should monitor patients for barotrauma.</i> 	Strong
<ul style="list-style-type: none"> 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. 	Best practice statement
<ul style="list-style-type: none"> For adults with COVID-19 and acute hypoxemic respiratory failure despite conventional oxygen therapy, we suggest using HFNC over conventional oxygen therapy. 	Weak
<ul style="list-style-type: none"> In adults with COVID-19 and acute hypoxemic respiratory failure, we suggest using HFNC over NIPPV. 	Weak
<ul style="list-style-type: none"> 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. 	Weak

<ul style="list-style-type: none"> For mechanically ventilated adults with COVID-19 and ARDS, we suggest using a conservative fluid strategy over a liberal fluid strategy. 	Weak
<ul style="list-style-type: none"> 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. 	Weak
<ul style="list-style-type: none"> For mechanically ventilated adults with COVID-19 and moderate to severe ARDS: We suggest using as-needed intermittent boluses of NMBA over continuous NMBA infusion to facilitate protective lung ventilation. 	Weak
<ul style="list-style-type: none"> In the event of persistent ventilator dyssynchrony or the need for ongoing deep sedation, prone ventilation, or persistently high plateau pressures, we suggest using a continuous NMBA infusion for up to 48 hours. 	Weak
<ul style="list-style-type: none"> In mechanically ventilated adults with COVID-19 ARDS, we recommend against the routine use of inhaled nitric oxide. 	Weak
<ul style="list-style-type: none"> In mechanically ventilated adults with COVID-19, severe ARDS, and hypoxemia despite optimizing ventilation and other rescue strategies, we suggest a trial of inhaled pulmonary vasodilator as a rescue therapy. If no rapid improvement in oxygenation is observed, the treatment should be tapered off. 	Weak
<ul style="list-style-type: none"> For mechanically ventilated adults with COVID-19 and hypoxemia despite optimizing ventilation, we suggest using recruitment maneuvers over not using recruitment maneuvers. 	Weak
<ul style="list-style-type: none"> In mechanically ventilated adults with COVID-19 and refractory hypoxemia despite optimizing ventilation, use of rescue therapies, and proning, we suggest using VV ECMO, if available, or referring the patient to an ECMO center. <i>Remark:</i> Because of the resource-intensive nature of ECMO and the need for experienced centers, healthcare professionals, and infrastructure, ECMO should be considered only for carefully selected patients with COVID-19 and severe ARDS. 	Weak
<ul style="list-style-type: none"> We were not able to make a recommendation regarding the use of helmet NIPPV compared with mask NIPPV. It is an option, but we are not certain about its safety or efficacy in COVID-19. 	No recommendation
<ul style="list-style-type: none"> There is insufficient evidence to issue a recommendation on the use of awake prone positioning in nonintubated adults with severe COVID-19. 	No recommendation New

THERAPY	
<ul style="list-style-type: none"> For adults with severe or critical COVID-19, we recommend against using hydroxychloroquine. 	Strong New
<ul style="list-style-type: none"> For adults with severe or critical COVID-19, we recommend using a short course of systemic corticosteroids over not using corticosteroids. 	Strong New
<ul style="list-style-type: none"> For adults with severe or critical COVID-19, we recommend using pharmacologic VTE prophylaxis over not using prophylaxis. 	Strong New
<ul style="list-style-type: none"> For adults with severe or critical COVID-19 who are considered for systemic corticosteroids, we suggest using dexamethasone over other corticosteroids. <i>Remark: If dexamethasone is not available, clinicians may use other corticosteroids in doses equivalent to 6 mg daily of dexamethasone for up to 10 days.</i> 	Weak New
<ul style="list-style-type: none"> For adults with severe COVID-19 who do not require mechanical ventilation, we suggest using IV remdesivir over not using it. <i>Remark: Remdesivir should ideally be started within 72 hours of positive SARS-CoV-2 polymerase chain reaction or antigen testing.</i> 	Weak New
<ul style="list-style-type: none"> For adults undergoing mechanical ventilation for critical COVID-19, we suggest against starting IV remdesivir. 	Weak New
<ul style="list-style-type: none"> For critically ill adults with COVID-19 who develop fever, we suggest using acetaminophen/paracetamol for temperature control over no treatment. 	Weak
<ul style="list-style-type: none"> In critically ill adults with COVID-19, we suggest against the routine use of standard IV IVIG. 	Weak
<ul style="list-style-type: none"> For adults with severe or critical COVID-19, we suggest against the use convalescent plasma outside clinical trials. 	Weak New
<ul style="list-style-type: none"> There is insufficient evidence to issue a recommendation on the routine use of therapeutic anticoagulation (compared to VTE prophylaxis) for adults with severe or critical COVID-19 and no confirmed VTE. 	No recommendation New

PPE=personal protective equipment, MAP=mean arterial pressure, SpO₂=oxygen saturation, HFNC=high-flow nasal canula, NIPPV=noninvasive positive pressure ventilation, ARDS=acute respiratory distress syndrome, Vt=tidal volume, Pplat=plateau pressure, PEEP=positive end-expiratory pressure, NMBA=neuromuscular blocking agent, VV=venovenous, ECMO=extracorporeal membrane oxygenation, IVIG=immunoglobulin.