Emergency Department COVID-19 Management Tool

This tool was developed to provide a pragmatic framework to assist with severity classification, risk assessment, diagnostic workup, disposition, and treatment of patients with suspected or confirmed SARS-CoV-2 (COVID-19) in the emergency department.

- It is designed to assist with the management of adult patients (≥18 years old) with symptomatic infection.
- For information on pediatric MIS-C protocols (CHOP, Minnesota, and Yale) and suggestion against Monoclonal Antibodies.
- This tool is not intended to represent a legal standard of care for emergency physicians. Recommendations offered in this tool are not intended to represent the only diagnostic or management options available to the emergency physician. Individual physicians’ judgment and consideration of patient resources/preferences is essential.
- This tool is not exhaustive in regards to diagnostic and treatment recommendations. Patients may present with particular conditions (MI, PE, stroke) that could be manifestations of severe or critical COVID-19. These conditions may require additional specific diagnostic and therapeutic interventions not discussed in this tool.
- Evidence on this topic (including differences in severity that may occur with evolving variants) is changing quickly and may alter recommendations.

A digitized version of this tool can now be found at MDCalc.

Step 1 - Severity Classification
Assess the patient’s severity of disease utilizing NIH criteria.

<table>
<thead>
<tr>
<th>MILD</th>
<th>MODERATE</th>
<th>SEVERE</th>
<th>CRITICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals who have various signs and symptoms of COVID-19 (ANY):</td>
<td>Individuals who show evidence of lower respiratory disease during (ANY):</td>
<td>Individuals who have (ANY):</td>
<td>Individuals with (ANY):</td>
</tr>
<tr>
<td>Fever</td>
<td>Clinical assessment</td>
<td>SpO2 &lt;94% on room air at sea level (in those with normal baseline SpO2 at rest)</td>
<td>Respiratory failure</td>
</tr>
<tr>
<td>Cough</td>
<td>Imaging</td>
<td>Ratio of arterial partial pressure of oxygen to fraction of inspired oxygen (PaO2/FiO2) &lt;300 mm Hg (if ABG obtained)</td>
<td>Septic shock</td>
</tr>
<tr>
<td>Sore throat</td>
<td></td>
<td>RR &gt;30 breaths/min</td>
<td>Multiorgan dysfunction or failure</td>
</tr>
<tr>
<td>Malaise</td>
<td></td>
<td>Lung infiltrates &gt;50%</td>
<td></td>
</tr>
<tr>
<td>Headache</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muscle pain</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nausea, vomiting, diarrhea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loss of taste and smell</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BUT who DO NOT have (ANY):</td>
<td>SpO2 &gt;94% on room air at sea level (in those with normal baseline SpO2 at rest)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shortness of breath</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dyspnea</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abnormal chest imaging (if obtained)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Step 2 - Risk Prognostication
Patients with MILD and MODERATE Severity should be further assessed to determine their risk of disease progression.

The PRIEST Score is a validated tool to predict a patient’s risk for end organ failure and/or mortality using readily available data on initial presentation to the ED.

The ACEP working group recognizes that there are other risk prognostication calculators that have been published. The PRIEST Score is included here as it offers a pragmatic approach with variables that don’t require diagnostic testing and don’t overlap with medical conditions that are within the separate risk assessment section.

<table>
<thead>
<tr>
<th>Variable</th>
<th>1 Point</th>
<th>2 Points</th>
<th>3 Points</th>
<th>4 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory rate (per minute)</td>
<td>□ 12-20</td>
<td>□ 9-11</td>
<td>□ 21-24</td>
<td>□ &lt;9 or &gt;24</td>
</tr>
<tr>
<td>Oxygen saturation (%)</td>
<td>□ &gt;95</td>
<td>□ 94-95</td>
<td>□ 92-93</td>
<td>□ &lt;92</td>
</tr>
<tr>
<td>Heart rate (per minute)</td>
<td>□ 51-90</td>
<td>□ 41-50 or 91-110</td>
<td>□ 111-130</td>
<td>□ &lt;41 or &gt;130</td>
</tr>
<tr>
<td>Systolic BP (mmHg)</td>
<td>□ 111-219</td>
<td>□ 101-110</td>
<td>□ 91-100</td>
<td>□ &lt;91 or &gt;219</td>
</tr>
<tr>
<td>Temperature (°C)</td>
<td>□ 36.1-38.0</td>
<td>□ 35.1-36.0 or 38.1-39.0</td>
<td>□ &gt;39.0</td>
<td>□ &lt;35.1</td>
</tr>
<tr>
<td>Alertness</td>
<td>□ Alert</td>
<td>□ Room Air</td>
<td>□ Male</td>
<td>□ Supplemental Oxygen</td>
</tr>
<tr>
<td>Inspired oxygen</td>
<td>□</td>
<td>□</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td>□ Male</td>
<td>□ Limited activity, can self-care</td>
<td>□ Limited self-care, no self-care</td>
<td></td>
</tr>
<tr>
<td>Age (years)</td>
<td>□ 16-49</td>
<td>□ 50-65</td>
<td>□ 66-80</td>
<td>□ &gt;80</td>
</tr>
<tr>
<td>Performance status</td>
<td>□ Unrestricted Normal Activity</td>
<td>□ Limited strenuous activity, can do light activity</td>
<td>□ Confused</td>
<td></td>
</tr>
</tbody>
</table>

Total number of boxes checked in each column:

Add Subtotals + + + +

Total Score = Score 0-1 2-3 4 5 6 7 8 9 10 11 12 13 14 15 16 17+ Risk % 1% 2% 3% 9% 15% 18% 22% 26% 29% 34% 38% 47% 48% 50% 55% 66% + + + + + +

Step 3 - Risk Assessment
The CDC maintains a list of underlying medical conditions associated with higher risk of severe COVID-19.

If your patient has one (or especially multiple) risk factors, you may want to consider in the approach taken in subsequent steps for diagnostic testing, disposition, and treatment.

- The CDC notes that patient race/ethnicity, socioeconomic status, and healthcare resources may effect clinical outcomes and advise consideration in clinical risk assessment.

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Meta-analysis / Systematic reviews:
- Bronchiectasis
- Bronchopulmonary dysplasia
- Pulmonary hypertension
- Pulmonary embolism
- Cancer
- Cerebrovascular disease
- Chronic kidney disease
- Chronic liver disease
- COPD
- Diabetes mellitus (type 1 and 2)
- Heart conditions
- Interstitial lung disease
- Smoking (current and former)
- Tuberculosis
- Obesity
- Pregnancy (and recent pregnancy)
- Mental health disorders

Cohort / Case-control / Cross-sectional:
- Children with certain underlying conditions
- Down syndrome
- HIV
- Neurologic conditions
- Overweight
- Sickle cell disease
- Solid organ or blood stem transplantation
- Substance use disorders
- Use of corticosteroids
- Immunosuppressive medications

Case series / Case reports:
- Cystic fibrosis
- Thalassemia

Mixed Evidence:
- Asthma
- Hypertension (possibly)
- Immune deficiencies
Step 4 - Diagnostic Testing
The following imaging and lab tests should be considered based on your patient’s severity and risk for disease progression.

<table>
<thead>
<tr>
<th>MILD</th>
<th>MODERATE</th>
<th>SEVERE</th>
<th>CRITICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Based on clinician’s judgement, diagnostic testing may not be necessary in patients with (ALL):</td>
<td>Per the NIH...</td>
<td></td>
<td>Additional tests to consider include:</td>
</tr>
<tr>
<td>Mild Severity</td>
<td>Imaging: the optimal imaging technique has not yet been defined for people with symptomatic COVID-19. Initial evaluation for these patients may include:</td>
<td></td>
<td>□ ABG</td>
</tr>
<tr>
<td>□ PRIEST score ≤4</td>
<td>□ Chest X-ray □ Pulmonary Ultrasound □ CT Chest (if indicated)</td>
<td></td>
<td>□ Coagulation screen</td>
</tr>
<tr>
<td>□ 1 or less Risk Factors</td>
<td>ECG: should be performed if indicated</td>
<td></td>
<td>□ Inflammatory markers (procalcitonin / c-reactive protein)</td>
</tr>
<tr>
<td>Exertional SpO2 may have limited ability to identify adverse outcomes in otherwise well-appearing patients:</td>
<td>Labs:</td>
<td></td>
<td>□ Ferritin</td>
</tr>
<tr>
<td>□ &lt;3% change in SpO2</td>
<td>□ CBC w/ differential □ CMP</td>
<td></td>
<td>□ LDH</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>□ CK, CK-MB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>□ Troponin</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>□ Blood and sputum cultures</td>
</tr>
</tbody>
</table>

Step 5 - Diagnostic Interpretation
It is recommended that users of this tool consult the ACEP COVID-19 Field Guide section on Laboratory Abnormalities.

Step 6 - Disposition
The following represents a pragmatic approach for disposition of patients depending on their disease severity. Clinicians may want to consider a patient’s risk for progression of disease based on PRIEST Score, risk factors, imaging, and labs in their disposition decision.

<table>
<thead>
<tr>
<th>MILD</th>
<th>MODERATE</th>
<th>SEVERE</th>
<th>CRITICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Discharge Home</td>
<td>□ Discharge Home, consider if ALL:</td>
<td>Admission Location:</td>
<td>Admission</td>
</tr>
<tr>
<td>□ Supply patient with educational materials on precautions and items to be monitoring at home (CDC Patient Educational Materials)</td>
<td>□ PRIEST Score ≤4</td>
<td>based on clinician’s judgement</td>
<td>□ ICU</td>
</tr>
<tr>
<td>Consider</td>
<td>□ 1 (or less) Risk Factors</td>
<td>□ Floor Bed</td>
<td>Transfer</td>
</tr>
<tr>
<td>□ Home pulse oximetry</td>
<td>□ No concerning Imaging or Lab results</td>
<td>□ Intermediate</td>
<td>□ Consider transfer if your facility does not have the resources or capacity to care for a critically ill COVID patient.</td>
</tr>
<tr>
<td>In patients with PRIEST Score ≥5 and/or multiple Risk Factors</td>
<td>□ Capability and resources to care for self at home</td>
<td>□ ICU</td>
<td>□ Consider transfer to an ECMO facility for patients who may benefit from this after consultation with receiving facility.</td>
</tr>
<tr>
<td>□ Clinicians should consider early follow-up with primary care physician or other health system access points.</td>
<td>□ No other condition that warrants admission</td>
<td>Admission Location:</td>
<td></td>
</tr>
<tr>
<td>□ Patient should be educated on their increased risk for severe disease and precautions to return to the ED.</td>
<td>□ Admission, consider if ANY:</td>
<td>based on clinician’s judgement</td>
<td>□ ICU</td>
</tr>
<tr>
<td></td>
<td>□ PRIEST Score ≥5</td>
<td>□ Floor Bed</td>
<td>Transfer</td>
</tr>
<tr>
<td></td>
<td>□ Multiple Risk Factors</td>
<td>□ Intermediate</td>
<td>□ Consider transfer if your facility does not have the resources or capacity to care for a critically ill COVID patient.</td>
</tr>
<tr>
<td></td>
<td>□ Concerning Imaging or Lab results</td>
<td>□ ICU</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Does NOT have the capability or resources to care for self at home</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Admission Location:</td>
<td></td>
<td>□ Consider transfer if your facility does not have the resources or capacity to care for a critically ill COVID patient.</td>
</tr>
<tr>
<td></td>
<td>Based on clinician’s judgement</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Observation</td>
<td>□ ICU</td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Inpatient Floor</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Intermediate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ At times of surge and capacity constraints some patient who would normally be admitted to the hospital, may need to be sent home:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Supply patient with educational materials on precautions and items to be monitoring at home (CDC Patient Educational Materials)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Follow-up visit arranged via PCP or tele-health</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Consider home pulse oximetry</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>□ Consider home oxygen therapy</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

AMA
□ Patient wishes to leave Against Medical Advice (AMA) for admission to the hospital and/or additional therapeutic treatment.
Emergency Department COVID-19 Management Tool

January 2022

Step 7a - Non-Pharmacologic Treatment

The following treatments should be considered based on your patient’s severity and risk of disease progression.

COVID-19 vaccination is recommended for everyone 5 years of age and older, regardless of a history of symptomatic or asymptomatic SARS-CoV-2 infection.

- People with known current SARS-CoV-2 infection should defer vaccination at least until recovery from the acute illness (if symptoms were present) has been achieved and criteria to discontinue isolation have been met.
- Current evidence about the optimal timing between SARS-CoV-2 infection and vaccination is insufficient to inform guidance.
- More information on vaccination can be found HERE and Vaccination FAQs.

Step 7b - Pharmacologic Treatment

The following medications should be considered for treatment based on the patient’s severity and risk of disease progression.

Pharmacologic recommendations for patients with COVID-19 are evolving quickly.

- See the Footnotes page for links to the EUA FDA fact sheets for these drugs.

For the latest information on local availability of therapies for COVID, check your State Health Department.

For the latest updates and details visit the IDSA or IDSA Guidelines.

For the latest information on local availability of therapies for COVID, check your State Health Department.

To view the pharmacologic treatment recommendations for pregnant or lactating females, see Caution note, below.

Adequate hydration

Breathing exercises for breathlessness

Balanced diet

Adequate rest/sleep

Non-Invasive Positive Pressure Ventilation (NIPPV) if HFNC not available

Surveillance chest radiograph

Pulse oximetry

More information on ventilation can be found HERE for the state’s Inpatient Treatment Page.
The ACEP Emergency Department COVID-19 Management Tool was utilized to assist in the decision process on how to best manage this patient. This tool is a pragmatic approach to management of patient’s with suspected or confirmed SARS-CoV-2 in the emergency department. It is based on guidelines from the CDC, NIH, and additional published studies. COVID-19 is a novel pandemic and as such evidence is rapidly evolving on the best way to manage patients with this condition.

### Step 1 - Severity

<table>
<thead>
<tr>
<th>Severity Classification</th>
<th>Determined based on NIH criteria.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILD</td>
<td>Based on the criteria present at the time of evaluation, the patient was determined to have MILD Severity.</td>
</tr>
<tr>
<td>MODERATE</td>
<td>Based on the criteria present at the time of evaluation, the patient was determined to have MODERATE Severity.</td>
</tr>
<tr>
<td>SEVERE</td>
<td>Based on the criteria present at the time of evaluation, the patient was determined to have SEVERE Severity.</td>
</tr>
<tr>
<td>CRITICAL</td>
<td>Based on the criteria present at the time of evaluation, the patient was determined to have CRITICAL Severity.</td>
</tr>
</tbody>
</table>

### Step 2 - Risk Prognostication

<table>
<thead>
<tr>
<th>PRIEST Score</th>
<th>Determined based on a PRIEST Score of _____ the patient is estimated to have a ______% risk.</th>
</tr>
</thead>
</table>

### Step 3 - Risk Assessment

<table>
<thead>
<tr>
<th>Risk Assessment</th>
<th>Performance that considers additional factors that have been shown in published studies to increase a patient's risk for disease progression.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Risk Factors</td>
<td>Patient did not have any additional risk factors based on those included within this tool.</td>
</tr>
<tr>
<td>1 Risk Factor</td>
<td>Patient was noted to have an additional risk factor.</td>
</tr>
<tr>
<td>2 (or more) Risk Factors</td>
<td>Patient was noted to have 2 (or more) additional risk factors.</td>
</tr>
</tbody>
</table>

### Step 4 - Diagnostic Testing

<table>
<thead>
<tr>
<th>Diagnostic Testing</th>
<th>Was performed on the patient based on their severity and risk of disease progression.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILD... no additional testing obtained</td>
<td>No diagnostic testing was obtained, because the patient was noted to have MILD severity, ≤4 on the PRIEST Score, and ≤1 additional risk factors.</td>
</tr>
<tr>
<td>Exertional O2</td>
<td>Negative: An O2 saturation was obtained after the patient exerted themselves for &gt;1 minute. Their SpO2 stayed stable.</td>
</tr>
<tr>
<td></td>
<td>Positive: An O2 saturation was obtained after the patient exerted themselves for &gt;1 minute. Their SpO2 dropped &gt;3%.</td>
</tr>
<tr>
<td>Imaging / Labs Obtained</td>
<td>Appropriate imaging and labs were obtained in the emergency department based on clinical assessment of the patient.</td>
</tr>
</tbody>
</table>

### Step 5 - Diagnostic Interpretation

<table>
<thead>
<tr>
<th>Diagnostic Interpretation</th>
<th>Of imaging and labs that were obtained was as follows:</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO Concerning Imaging/Labs</td>
<td>There was no concern on imaging or labs.</td>
</tr>
<tr>
<td>Concerning Imaging</td>
<td>There was a concerning finding discovered on imaging that may prognosticate an increase in the patient’s risk of disease progression.</td>
</tr>
<tr>
<td>Concerning Lab</td>
<td>There was a concerning finding discovered on lab testing that may prognosticate an increase in the patient’s risk of disease progression.</td>
</tr>
<tr>
<td>Multiple Concerning Imaging/ Labs</td>
<td>There were multiple imaging and/or lab testing results that may prognosticate an increase in the patient’s risk of disease progression.</td>
</tr>
</tbody>
</table>
**Emergency Department COVID-19 Management Tool**

**January 2022**

### SMART PHRASES (continued)

**Step 6 - Disposition**

<table>
<thead>
<tr>
<th>Severity</th>
<th>Discharge/Admission</th>
<th>SMART PHRASES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MILD</strong></td>
<td>Discharged Home</td>
<td>Patients with MILD Severity, a low PRIEST Score, and ≤1 risk factors are appropriate for Discharged Home.</td>
</tr>
<tr>
<td></td>
<td>PRIEST ≤4 AND ≤1 Risk Factors</td>
<td>Patients with MILD Severity who have an elevated PRIEST Score (≥5) and/or multiple risk factors, may still be discharged home. These patients should receive information on their elevated risk for Severe disease and should connected with early follow-up.</td>
</tr>
<tr>
<td></td>
<td>PRIEST &gt;5 OR ≥2 Risk Factors</td>
<td></td>
</tr>
<tr>
<td><strong>MODERATE</strong></td>
<td>Discharged Home</td>
<td>Patients with MODERATE Severity, a low PRIEST Score, and ≤1 risk factors may be Discharged Home based on an emergency physician’s clinical judgement.</td>
</tr>
<tr>
<td></td>
<td>Admission</td>
<td>Patients with MODERATE Severity and an elevated PRIEST Score or the presence of risk factors for disease progression meet criteria for Hospital Admission.</td>
</tr>
<tr>
<td></td>
<td>Reduced Capacity</td>
<td>At times of COVID volume surges or reductions in hospital bed capacity, some patients who would normally meet criteria to hospital admission, may need to be Discharged Home.</td>
</tr>
<tr>
<td><strong>SEVERE</strong></td>
<td>Admission</td>
<td>Patients with SEVERE Severity meet criteria for admission the hospital.</td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>Transfer should be considered if you are at a facility that does not have the resources or capacity to care for a patient with SEVERE Severity.</td>
</tr>
<tr>
<td><strong>CRITICAL</strong></td>
<td>Admission</td>
<td>Patients with CRITICAL Severity meet criteria for admission to an ICU setting.</td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>Transfer should be considered if you are a facility that does not have the ICU resources or capacity to care for a patient with CRITICAL Severity.</td>
</tr>
<tr>
<td></td>
<td>ECMO</td>
<td>Transfer may be considered to an ECMO facility if, based on clinical judgement, it is determined that the patient may benefit from this procedure.</td>
</tr>
<tr>
<td></td>
<td>AMA</td>
<td>The patient signed out Against Medical Advice, despite the offer of admission to the hospital and treatment due to the severity of their COVID manifestation. The patient is of normal mentation and has the capacity to make this decision, while understanding the consequences to their health.</td>
</tr>
</tbody>
</table>

**Step 7a - Non-Pharmacologic Treatment**

<table>
<thead>
<tr>
<th>Severity</th>
<th>SMART PHRASES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MILD / MODERATE</strong></td>
<td>Discharged Home</td>
</tr>
<tr>
<td></td>
<td>Home O2</td>
</tr>
<tr>
<td></td>
<td>Home Pulse Oximetry</td>
</tr>
<tr>
<td></td>
<td>Vaccination</td>
</tr>
<tr>
<td></td>
<td>O2 via NC</td>
</tr>
<tr>
<td></td>
<td>HFNC</td>
</tr>
<tr>
<td></td>
<td>NIPPV</td>
</tr>
<tr>
<td><strong>SEVERE</strong></td>
<td>Awake Proning</td>
</tr>
<tr>
<td></td>
<td>Intubation</td>
</tr>
<tr>
<td></td>
<td>Prone Ventilation</td>
</tr>
<tr>
<td></td>
<td>Conservative Fluids</td>
</tr>
</tbody>
</table>

**Step 7b - Pharmacologic Treatment**

<table>
<thead>
<tr>
<th>Patients Discharged from the Emergency Department</th>
<th>SMART PHRASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nirmatrelvir WITH Ritonavir</td>
<td>Initiated as soon as possible and within 5 days of symptom onset in those aged ≥12 years and weighing ≥40 kg. The patient’s medications were REVIEWED to assure no drug-drug interactions.</td>
</tr>
<tr>
<td>Sotrovimab</td>
<td>Administered as soon as possible and within 10 days of symptom onset in those aged ≥12 years and weighing ≥40 kg.</td>
</tr>
<tr>
<td>Remdesivir</td>
<td>Initiated as soon as possible and within 7 days of symptom onset in those aged ≥12 years and weighing ≥40 kg.</td>
</tr>
<tr>
<td>Molnupiravir</td>
<td>Initiated as soon as possible and within 5 days of symptom onset in those aged ≥18 years ONLY when none of the other options are available.</td>
</tr>
<tr>
<td>Steroids</td>
<td>Steroids are not recommended for patients with MILD or MODERATE Severity.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patients Admitted to the Hospital</th>
<th>SMART PHRASES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalized but does not require supplemental O2</td>
<td>Dexamethasone or other corticosteroids are not recommended. Remdesivir may be appropriate if the patient is at high risk of disease progression.</td>
</tr>
<tr>
<td>Hospitalized and requires supplemental O2</td>
<td>ONE of the following is indicated: Remdesivir (for pts requiring minimal supplemental O2), dexamethasone plus remdesivir, or dexamethasone alone.</td>
</tr>
<tr>
<td>Hospitalized and requires hi-flow device or noninvasive ventilation</td>
<td>ONE of the following is indicated: dexamethasone or dexamethasone PLUS remdesivir.</td>
</tr>
<tr>
<td>Hospitalized and requires mechanical ventilation or ECMO</td>
<td>Dexamethasone PLUS tocilizumab</td>
</tr>
<tr>
<td>Patients with rapidly increasing O2 needs and systemic inflammation</td>
<td>It is appropriate to add either baricitinib or tocilizumab.</td>
</tr>
<tr>
<td>Anticoagulation</td>
<td>Anticoagulation is recommended for admitted COVID-19 patients. Based on the patient severity and co-morbidities, prophylactic or therapeutic anticoagulation will be administered.</td>
</tr>
</tbody>
</table>
Emergency Department COVID-19 Management Tool

FOOTNOTES

Step 1 - Severity

- All severity classifications are outlined by the NIH. The [NIH COVID-19 Treatment Guidelines Panel](https://www.cdc.gov/coronavirus/2019-ncov/hcp/treatment-guidance/clinical-progress.html) is a multi-disciplinary team of experts that meets routinely to discuss the impact of new evidence on best practices in addition to providing a standardized system for classifying clinical severity.6

Step 2 - Risk Prognostication

- The PRIEST Score: is a validated tool to predict a patient's risk for end organ failure and/or mortality.14,35
- The PRIEST Score can be accessed on [MDCalc](https://www.mdcalc.com).

Step 3 - Risk Assessment

- Race/Ethnicity and access to healthcare: the CDC has more information on how race, ethnicity, and access to health care resources may affect outcomes 7
- Economic Disparity: has been shown to be an independent variable of risk 11
- Pregnancy: has been shown to have increased hospitalization (OR 3.5).7
- Severe cases have been shown to have pre-term labor 45.4% compared to 6.9% of mild and recovered cases.9
- ACOG has published a guideline to assist with risk stratification of pregnant patients

Step 4 - Diagnostic Testing

- Exertional SpO2: post-exertional SpO2 may provide modest prognostic information of adverse outcome at 30 days 5, 12, 14.
- Optimal time interval is not established.
- Some have suggested 1-2 minutes and a sit-stand option in the patient’s room (due to COVID restrictions)5
- A 3% drop has been used in several studies7, 13
- Another study used a quick walk test of 6 minutes. Decrease in ≥3% or ≥5% (conservative cutoff or postexercise ≥90%) suggest poor outcome (need for mechanical ventilation) with LR+=3.5 and LR-=0.22 21


Step 5 - Diagnostic Interpretation

Imaging Interpretation

- Pulmonary US (POCUS) is appropriate as a COVID rule-in test (with diagnostic accuracy similar to CT) but should not be used for risk classification.29
- Models to prognostic risk based on CXR 7 results have been published.

Lab Interpretation

- Reference the ACEP COVID-19 Field Guide section on [Laboratory Abnormalities](https://www.acep.org/guidelines/clinical-guidance/clinical-guidance-laboratory-abnormalities-2) for a review of common lab results at hospital admission, lab findings associated with severe disease, and those associated with mortality.

Step 6 - Disposition

Discharge of select COVID patients with Home Oxygen has been shown to be associated with low rates of mortality and return admission.20, 21


Helpful links from JAMA include:

- What does this mean for families?
  - [https://jamanetwork.com/journals/jamapediatrics/fullarticle/2763176](https://jamanetwork.com/journals/jamapediatrics/fullarticle/2763176)
- Masks
  - [https://jamanetwork.com/journals/jama/fullarticle/2764955](https://jamanetwork.com/journals/jama/fullarticle/2764955)
- Stopping the spread
  - [https://jamanetwork.com/journals/jama/fullarticle/2763533](https://jamanetwork.com/journals/jama/fullarticle/2763533)
- What is herd immunity?
  - [https://jamanetwork.com/journals/jama/fullarticle/2772168](https://jamanetwork.com/journals/jama/fullarticle/2772168)

Step 7a - Non-Pharmacologic Treatment

Home Supplemental O2

Discharge of select COVID patients with Home Oxygen has been shown to be associated with low rates of mortality and return admission.

- Studies in COVID and other viral illnesses 32, have shown the benefit of:
  - Rest 32
  - Healthy diet 37
  - Adequate sleep 36
  - Exercise 19

Issues with SpO2 measurements

- If sending patients home with instructions for pulse oximetry, be mindful that SpO2 readings should always be considered an estimate of oxygen saturation. The FDA has just issued precautions on SpO2 devices.24
- If an FDA-cleared pulse oximeter reads 90%, then the true oxygen saturation in the blood is generally between 86-94%. Pulse oximeter accuracy is highest at saturations of 90-100%, intermediate at 80-90%, and lowest below 80%.
- Additionally, SpO2 measurements have been shown not be as reliable in patients with pigmentation of their skin 25

Vaccination

- Additional information on current vaccinations recommendations, can be found [HERE](https://www.cdc.gov/coronavirus/2019-ncov/vaccines.html) and [Vaccination FAQs](https://www.cdc.gov/coronavirus/2019-ncov/vaccines/faq.html)
- SMART Phrases from ACEP for patients can be found [HERE](https://www.acep.org/guidelines/clinical-guidance/clinical-guidance-laboratory-abnormalities-2)

Treatment of Severe and Critical patients

- Recommendations for respiratory support, IV fluids, and other interventions are maintained by the NIH [HERE](https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-progress.html).

Step 7b - Pharmacologic Treatment

Medications - recommendations are maintained by the [NIH](https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-progress.html) and [IDSA](https://www.idsociety.org/patientsfamily/relatedtopics/coronavirus/)

- Recommendations for the treatment of patients discharged home, but who have a HIGH risk for disease progression is evolving quickly due to the Omicron Variant of Concern (VOC).
- Guidance can be found on the NIH [Outpatient Treatment Page](https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-progress.html)
- Paxlovid EUA Fact Sheet: [www.fda.gov/media/155050/download](https://www.fda.gov/media/155050/download)
- Sotrovimab EUA Fact Sheet: [www.fda.gov/media/149534/download](https://www.fda.gov/media/149534/download)
- Molnupiravir EUA Fact Sheet: [www.fda.gov/media/155054/download](https://www.fda.gov/media/155054/download)

**CAUTION with prescribing Paxlovid**

- Ritonavir-boosted nirmatrelvir (Paxlovid) has significant and complex drug-drug interactions, primarily due to the ritonavir component of the combination. Before prescribing, clinicians should carefully review the patient’s concomitant medications, including over-the-counter medications and herbal supplements, to evaluate potential drug-drug interactions.
- Clinicians who are not experienced in prescribing ritonavir-boosted drugs should refer to additional guidance on best practices in addition to providing a standardized system for classifying clinical severity.
- Consultation with an expert (e.g., clinical pharmacist, HIV specialist, and/or the patient’s specialist provider[s], if applicable) should also be considered.

NIH Rating of Recommendations

- A = Strong
- B = Moderate
- C = Optional

Rating of Evidence

- I = One or more randomized trials without major limitations
- IIa = Other randomized trials or subgroup analyses of randomized trials
- IIb = Nonrandomized trials or observational cohort studies
- III = expert opinion

2 Citation Removed


Emergency Department COVID-19 Management Tool

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