Emergency Department COVID-19 Management Tool

April 2022

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.
- 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.
- 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><strong>Individuals who have various signs and symptoms of COVID-19 (ANY):</strong></td>
<td><strong>Individuals who show evidence of lower respiratory disease during (ANY):</strong></td>
<td><strong>Individuals who have (ANY):</strong></td>
<td><strong>Individuals with (ANY):</strong></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><strong>AND who have:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muscle pain</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>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><strong>BUT who do NOT have (ANY):</strong></td>
<td></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>

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.

### PRIEST Score

**Score Calculation:**

- 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 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.

### 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.

**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
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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>Additional tests to consider include:</td>
<td></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>- ABG</td>
<td></td>
</tr>
<tr>
<td>- PRIEST score ≤4</td>
<td>- Chest X-ray</td>
<td>- Coagulation screen</td>
<td></td>
</tr>
<tr>
<td>- 1 or less Risk Factors</td>
<td>- Pulmonary Ultrasound</td>
<td>- Inflammatory markers (procalcitonin / c-reactive protein)</td>
<td></td>
</tr>
<tr>
<td>Exertional SpO2 may have limited ability to identify adverse outcomes in otherwise well-appearing patients:</td>
<td>- CT Chest (if indicated)</td>
<td>- Ferritin</td>
<td></td>
</tr>
<tr>
<td>- &lt;3% change in SpO2</td>
<td>- ECG</td>
<td>- LDH</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Labs:</td>
<td>- CK, CK-MB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- CBC w/ differential</td>
<td>- Troponin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- CMP</td>
<td>- Blood and sputum cultures</td>
<td></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.

Topics maintained there include:
- Laboratory findings at hospital admission
- Laboratory abnormalities in severe disease
- Associated with severe or critical illness
- Associated with mortality
- Hypercoagulability and COVID-19

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. See Step 7 for treatment guidance.

<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: based on clinician’s judgement</td>
<td></td>
</tr>
<tr>
<td>- Supply patient with educational materials on precautions and items to be monitoring at home</td>
<td>- PRIEST Score ≤4</td>
<td>- Floor Bed</td>
<td></td>
</tr>
<tr>
<td>CDC Patient Educational Materials</td>
<td>- 1 (or less) Risk Factors</td>
<td>- Intermediate</td>
<td></td>
</tr>
<tr>
<td>SAEM Patient Toolkit</td>
<td>- No concerning Imaging or Lab results</td>
<td>- ICU</td>
<td></td>
</tr>
<tr>
<td>Consider</td>
<td>- Capability and resources to care for self at home</td>
<td>Transfer</td>
<td></td>
</tr>
<tr>
<td>- Home pulse oximetry</td>
<td>- No other condition that warrants admission</td>
<td>- Consider transfer if your facility does not have the resources or capacity to care for a critically ill COVID patient.</td>
<td></td>
</tr>
<tr>
<td>In patients with PRIEST Score ≥5 and/or multiple Risk Factors</td>
<td>Admission, consider if ANY:</td>
<td>- Consider transfer to an ECMO facility for patients who may benefit from this after consultation with receiving facility.</td>
<td></td>
</tr>
<tr>
<td>- Clinicians should consider early follow-up with primary care physician or other health system access points.</td>
<td>- PRIEST Score ≥5</td>
<td></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>- Multiple Risk Factors</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Concerning Imaging or Lab results</td>
<td></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></td>
</tr>
<tr>
<td></td>
<td>Based on clinician’s judgement</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Observation</td>
<td></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>
<tr>
<td></td>
<td>Clinicians should coordinate with their hospital administration to identify times of capacity constraint (i.e. this should not be a decision that individual physicians need to make)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AMA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Patient wishes to leave Against Medical Advice (AMA) for admission to the hospital and/or additional therapeutic treatment.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The following treatments should be considered based on your patient’s severity and risk of disease progression.

<table>
<thead>
<tr>
<th>MILD</th>
<th>MODERATE</th>
<th>SEVERE</th>
<th>CRITICAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Consider home oxygen therapy (for those who may benefit)</td>
<td>☐ Breathing exercises for breathlessness</td>
<td>☐ Progressive ambulation as tolerated (if no contraindication)</td>
<td>☐ Intubation is recommended for severe respiratory failure:</td>
</tr>
<tr>
<td>☐ Resting in the prone position if dyspneic</td>
<td>☐ Adequate rest/sleep</td>
<td>☐ Balanced diet</td>
<td>☐ Oxygenation goal for ventilated patients should be 92-96%</td>
</tr>
<tr>
<td>☐ Adequate hydration</td>
<td>☐ More information on vaccination can be found HERE and Vaccination FAQs</td>
<td>☐ Consider trial of awake prone positioning if patient can be monitored or can self-rescue.</td>
<td>☐ Consider low tidal volume (VT) ventilation (VT 4–8 mL/kg of predicted body weight) over higher VT ventilation (VT &gt;8 mL/kg) (AII).</td>
</tr>
</tbody>
</table>

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.

**CAUTION**

- Anticoagulation
- Vitamin D

**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.**

- For the latest updates and details visit the NIH or IDSA Guidelines.
- For the latest information on local availability of therapies for COVID, check your State Health Department.
- For tips and tricks on how to talk with patients about COVID treatment options see the SAEM Provider Toolkit.

**DISCHARGED FROM EMERGENCY DEPARTMENT**

**ADMITTED TO HOSPITAL**

| **Based upon the emergence of the Omicron Variant of Concern (VO(C), and the subvariant, BA.2 the following are the current recommendations for treatment of patients with a high risk of disease progression.** |
| **Preferred Therapies: Use 1 of the following (listed in order of preference).** |
| **1. Nirmatrelvir 300 mg with ritonavir 100 mg (Paxlovid) orally twice daily for 5 days, initiated as soon as possible and within 5 days of symptom onset in those aged ≥12 years and weighing ≥40 kg (AII). See Caution note, below and in the Footnote Section before prescribing.** |
| **2. Remdesivir 200 mg IV on Day 1, followed by remdesivir 100 mg IV daily on Days 2 and 3, initiated as soon as possible and within 5 days of symptom onset in those aged ≥12 years and weighing ≥40 kg (BII). (off label use)** |

**Alternative Therapies:** If none of the above therapies are available or clinically appropriate, use one of the following, listed alphabetically:

- Bebtelovimab 175 mg as a single IV infusion, administered as soon as possible and within 7 days of symptom onset in those aged ≥12 years and weighing ≥40 kg (CIII).
- Molnupiravir 800 mg orally twice daily for 5 days, initiated as soon as possible and within 5 days of symptom onset in those aged ≥18 years ONLY when none of the above options can be used (CII). Molnupiravir is not recommended for pregnant or lactating females. Women who could become pregnant should use contraception during treatment and for 4 days after the last dose. Men should use contraception during treatment and for at least 3 months after the last dose. See molnupiravir-us.com/patients/

As of April 5, 2022, Sotrovimab is no longer authorized by the FDA to treat COVID-19 in any U.S. region due to increases in the proportion of COVID-19 cases caused by the Omicron BA.2 subvariant. Providers should have CAUTION when prescribing Paxlovid due to the ritonavir component, which has significant and complex drug-drug interactions. Please see the Footnotes section for links to more information on these.

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

| **Hospitalized but does not require supplemental O2:** |
| ☐ Do not use dexamethasone (AII) or other corticosteroids (AIII) |
| ☐ For patients at high risk of disease progression, remdesivir may be appropriate |

**Hospitalized and requires supplemental O2, select ONE of the following:**

- Remdesivir (for pts requiring minimal supplemental O2 (BIIa)
- Dexamethasone plus remdesivir (BIIb)
- Dexamethasone (BII)

For patients on dexamethasone with rapidly increasing O2 needs and systemic inflammation, add a second immunomodulatory drug (e.g., baricitinib or tocilizumab) (CII)

| **Hospitalized and requires O2 through hi-flow device or noninvasive ventilation, select ONE of the following:** |
| ☐ Dexamethasone (AII) |
| ☐ Dexamethasone plus remdesivir (BII) |
| ☐ For patients with rapidly increasing O2 needs and systemic inflammation, add either baricitinib (BII) or IV tocilizumab (BII) |

**Hospitalized and requires mechanical ventilation or ECMO:**

- Dexamethasone (AII) PLUS IV tocilizumab (BII)
- If IV tocilizumab is not available or not feasible to use, IV sarilumab can be used (BII)
- If dexamethasone is NOT available: Alternative corticosteroids such as prednisone, methylprednisolone, or hydrocortisone can be used (BII).

**Do not use dexamethasone (AII) or other corticosteroids (AIII)**

**INSUFFICIENT EVIDENCE**

| **Insufficient Evidence** |
| At this time there is insufficient data to recommend either for or against the following medications for SARS-CoV-2 (COVID-19): |
| - Budesonide |
| - Fluvoxamine |
| - IL-1 inhibitors |
| - Budesonide (oral or IV) |
| - Fluvoxamine (oral or IV) |

**DO NOT USE - The following are recommended AGAINST for the treatment of SARS-CoV-2 (COVID-19) at the time of publication of this tool:**

- Anti-interleukin-6 receptor monoclonal antibodies (except tocilizumab) or anti-IL-6 monoclonal antibody (altuzumab), except in a clinical trial (BII).
- Azithromycin alone (AII) |
- Chloroquine or hydroxychloroquine with or without azithromycin (AII) |
- Colchicine (IV(PT)-Al) (IV(PT)-BIIla) |
- Famotidine, except in a clinical trial

- Interferon (early mild/mod disease) |
- Ivermectin |
- Vitamin D |

**For patients at high risk of disease progression, remdesivir may be appropriate**

| **For the latest updates and details visit the NIH or IDSA Guidelines.** |
| **For the latest information on local availability of therapies for COVID, check your State Health Department.** |
| **For tips and tricks on how to talk with patients about COVID treatment options see the SAEM Provider Toolkit.** |

| **For patients on dexamethasone with rapidly increasing O2 needs and systemic inflammation, add either baricitinib (BII) or IV tocilizumab (BII) | **Hospitalized and requires O2 through hi-flow device or noninvasive ventilation, select ONE of the following:** |
| ☐ Dexamethasone (AII) |
| ☐ Dexamethasone plus remdesivir (BII) |
| ☐ For patients with rapidly increasing O2 needs and systemic inflammation, add either baricitinib (BII) or IV tocilizumab (BII) |

| **Hospitalized and requires mechanical ventilation or ECMO:** |
| ☐ Dexamethasone (AII) PLUS IV tocilizumab (BII) |
| ☐ If IV tocilizumab is not available or not feasible to use, IV sarilumab can be used (BII) |
| ☐ If dexamethasone is NOT available: Alternative corticosteroids such as prednisone, methylprednisolone, or hydrocortisone can be used (BII). |

**Additional details on these options can be found at the NIH Inpt Treatment Page**
Emergency Department COVID-19 Management Tool

SMART PHRASES

This page represents a list of phrases that clinicians may want to utilize within their EMR documentation. It is broken down based on the steps that are outlined on the prior pages of this tool. EMR and IT vendors may want to utilize these phrases, along with specific data that is selected by clinicians as they utilize electronic versions of this tool.

☐ 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

☐ Severity Classification was determined based on NIH criteria.

| MILD | ☐ Based on the criteria present at the time of evaluation, the patient was determined to have MILD Severity. |
| MODERATE | ☐ Based on the criteria present at the time of evaluation, the patient was determined to have MODERATE Severity. |
| SEVERE | ☐ Based on the criteria present at the time of evaluation, the patient was determined to have SEVERE Severity. |
| CRITICAL | ☐ Based on the criteria present at the time of evaluation, the patient was determined to have CRITICAL Severity. |

Step 2 - Risk Prognostication

☐ The PRIEST Score, a validated tool to determine the risk of mortality and/or end-organ failure, was utilized to assess the patient’s risk of disease progression.

 PRIEST Score

☐ Based on a PRIEST Score of _____ the patient is estimated to have a _____% risk.

Step 3 - Risk Assessment

☐ A Risk Assessment was performed that considers additional factors that have been shown in published studies to increase a patient's risk for disease progression.

| 0 Risk Factors | ☐ Patient did not have any additional risk factors based on those included within this tool. |
| 1 Risk Factor | ☐ Patient was noted to have an additional risk factor. |
| 2 (or more) Risk Factors | ☐ Patient was noted to have 2 (or more) additional risk factors. |

Step 4 - Diagnostic Testing

☐ Appropriate Diagnostic Testing was performed on the patient based on their severity and risk of disease progression.

| MILD... no additional testing obtained | ☐ No diagnostic testing was obtained, because the patient was noted to have MILD severity, ≤4 on the PRIEST Score, and ≤1 additional risk factors. |
| Exertional O2 | □ An O2 saturation was obtained after the patient exerted themselves for >1 minute. Their SpO2 stayed stable. |
| Positive | ☐ An O2 saturation was obtained after the patient exerted themselves for >1 minute. Their SpO2 dropped >3%. |
| Imaging / Labs Obtained | ☐ Appropriate imaging and labs were obtained in the emergency department based on clinical assessment of the patient. |

Step 5 - Diagnostic Interpretation

☐ The Diagnostic Interpretation of imaging and labs that were obtained was as follows:

| NO Concerning Imaging/Labs | ☐ There was no concern on imaging or labs. |
| Concerning Imaging | ☐ There was a concerning finding discovered on imaging that may prognosticate an increase in the patient’s risk of disease progression. |
| Concerning Lab | ☐ There was a concerning finding discovered on lab testing that may prognosticate an increase in the patient’s risk of disease progression. |
| Multiple Concerning Imaging/ Labs | ☐ There were multiple imaging and/or lab testing results that may prognosticate an increase in the patient’s risk of disease progression. |
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SMART PHRASES (continued)

Step 6 - Disposition

☐ The most appropriate **Disposition** for the patient was determined based on the patient’s severity classification and risk for disease progression.

<table>
<thead>
<tr>
<th>Severity</th>
<th>Discharge Home</th>
<th>Admission</th>
<th>Reduced Capacity</th>
<th>Transfer</th>
<th>ECMO</th>
<th>AMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILD</td>
<td>PRIEST ≤4 AND ≤1 Risk Factors</td>
<td>Patients with MILD Severity, a low PRIEST Score, and ≤1 risk factors are appropriate for Discharge Home.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PRIEST &gt;5 OR ≥2 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>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MODERATE</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>
<td></td>
<td></td>
<td></td>
<td></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>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SEVERE</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>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRITICAL</td>
<td>Admission</td>
<td>Patients with CRITICAL Severity meet criteria for admission to an ICU setting.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transfer</td>
<td>Transfer should be considered if you are at a facility that does not have the ICU resources or capacity to care for a patient with CRITICAL Severity.</td>
<td></td>
<td></td>
<td></td>
<td></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>
<td></td>
<td></td>
<td></td>
<td></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>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Step 7a - Non-Pharmacologic Treatment

☐ The following **Non-Pharmacologic Treatments** were ordered on the patient, based on best practice guidelines at the time of publication of this tool.

<table>
<thead>
<tr>
<th>Severity</th>
<th>Discharged Home</th>
<th>Home O2</th>
<th>Home Pulse Oximetry</th>
<th>Vaccination</th>
<th>O2 via NC</th>
<th>HFNC</th>
<th>NIPPV</th>
<th>Awake Proning</th>
<th>Intubation</th>
<th>Prone Ventilation</th>
<th>Conservative Fluids</th>
</tr>
</thead>
<tbody>
<tr>
<td>MILD / MODERATE</td>
<td>The patient was supplied with discharge instructions that includes activities (breathing exercises, balanced diet, etc.) they should consider at home.</td>
<td>The patient was given a prescription for supplemental O2 at home.</td>
<td>The patient was given instructions for how to use a pulse oximeter at home to measure periodically their oxygen levels. They were given clear instructions on what measurements would warrant a return to the emergency department.</td>
<td>The patient was given information about the benefits of vaccination for COVID.</td>
<td>Suppemental oxygen was administered to the patient via nasal cannula. The patient was monitored for response to therapy.</td>
<td>Additional oxygen was delivered via High-Flow Nasal Cannula (HFNC) per institutional protocol.</td>
<td>Additional oxygen was delivered via Non-Invasive Positive Pressure Ventilation (NIPPV) per institutional protocol.</td>
<td>The patient was trialed on awake proning per institutional protocol.</td>
<td>Due to the patient’s CRITICAL Severity and compromised respiratory status, they were intubated.</td>
<td>Prone ventilation was utilized per institutional protocol.</td>
<td>Per NIH recommendations, a conservative fluid strategy was utilized.</td>
</tr>
<tr>
<td>SEVERE</td>
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<tr>
<td>CRITICAL</td>
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</tbody>
</table>

Step 7b - Pharmacologic Treatment

☐ The following **Pharmacologic Treatments** were administered to the patient, based on NIH recommendations at the time of publication of this tool.

<table>
<thead>
<tr>
<th>Patients Discharged from the Emergency Department</th>
<th>Nirmatrelvir WITH Ritonavir</th>
<th>Sotrovimab</th>
<th>Remdesivir</th>
<th>Molnupiravir</th>
<th>Steroids</th>
<th>Hospitalized but does not require supplemental O2</th>
<th>Hospitalized and requires supplemental O2</th>
</tr>
</thead>
<tbody>
<tr>
<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 REVIEWS to assure no drug-drug interactions.</td>
<td>Administered as soon as possible and within 10 days of symptom onset in those aged ≥12 years and weighing ≥40 kg.</td>
<td>Initiated as soon as possible and within 7 days of symptom onset in those aged ≥12 years and weighing ≥40 kg.</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>
<td></td>
<td>Dexamethasone or other corticosteroids are not recommended. Remdesivir may be appropriate if the patient is at high risk of disease progression.</td>
<td>ONE of the following is indicated: Remdesivir (for pts requiring minimal supplemental O2), dexamethasone plus remdesivir, or dexamethasone alone.</td>
<td></td>
</tr>
<tr>
<td>Hospitalized and requires supplemental O2</td>
<td>Hospitalized and requires O2 through hi-flow device or noninvasive ventilation</td>
<td>Hospitalized and requires mechanical ventilation or ECMO</td>
<td>Patients with rapidly increasing O2 needs and systemic inflammation</td>
<td>Anticoagulation</td>
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<tr>
<td>The patient may benefit from this procedure.</td>
<td>The patient was trialed on awake proning per institutional protocol.</td>
<td>Prone ventilation was utilized per institutional protocol.</td>
<td>It is appropriate to add either baricitinib or tocilizumab.</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>
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</tbody>
</table>
Step 1 - Severity

- All severity classifications are outlined by the NIH. The NIH COVID-19 Treatment Guidelines Panel 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.

Step 2 - Risk Prognostication

- The PRIEST Score is a validated tool to predict a patient’s risk for end organ failure and/or mortality.
- The PRIEST Score can be accessed on MDCalc.

Step 3 - Risk Assessment

The CDC maintains a reference for medical conditions associated with high risk for severe COVID-19.

- Race/Ethnicity and access to healthcare: the CDC has more information on how race, ethnicity, and access to health care resources may affect outcomes.
- Economic Disparity: has been shown to be an independent variable of risk.
- Pregnancy: has been shown to have increased hospitalization (OR 3.5). Severe cases have been shown to have pre-term labor 45.4% compared to 6.9% of mild and recovered cases.
- 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.
- 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).
- A 3% drop has been used in several studies.
- 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.

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.
- Models to prognostic risk based on CXR results have been published.

Lab Interpretation
- Reference the ACEP COVID-19 Field Guide section on Laboratory Abnormalities 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.

The CDC maintains Patient Educational Materials. SAEM Patient Toolkit has materials for patients to understand more about COVID.

Helpful links from JAMA include:
- What does this mean for families? https://jamanetwork.com/journals/jamapediatrics/fullarticle/2763176
- Masks https://jamanetwork.com/journals/jama/fullarticle/2764955
- Stopping the spread https://jamanetwork.com/journals/jama/fullarticle/276353
- What is herd immunity? https://jamanetwork.com/journals/jama/fullarticle/2772168

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 resources such as the EUA fact sheet for ritonavir-boosted nirmatrelvir (Paxlovid) and the Liverpool COVID-19 Drug Interactions website for additional guidance.
- 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

Co-Leads

Stephen Cantrill, MD, FACEP
Emergency Physician and Consultant
Denver Health

Brian Fengler, MD
Co-Founder and Chief Medical Officer
EvidenceCare

Contributors

Shannon Brown
Veterans Health Administration

Christopher R. Carpenter, MD, MSc, FACEP, AGSF
Professor
Wash University in St. Louis

Brenna Farmer, MD, MBA, MS
Associate Professor of Clinical Emergency Medicine
NYP/Weill Cornell Medical Center

Kent C. Grimes
Medical Student
Texas Tech University Health Sciences Center
El Paso

Tara Khan, DO, MS
Emergency Medicine Physician
Department of Veterans Affairs

Dan Mayer, MD
Retired Professor of Emergency Medicine
Niskayuna, NY

Laura Melville, MD, MS
Associate Research Director
NYP/Brooklyn Methodist Medical Center

David Ng, MD, MS, FACEP
Chief of Emergency Medicine and Occupational Health
Veterans Health Administration

Christopher Sampson, MD, FACEP
Associate Professor of Emergency Medicine
University of Missouri School of Medicine

Sandy Schneider, MD, FACEP
Associate Executive Director
ACEP

Saman Shahid, MBBS
Practice Management Manager
ACEP

Bradley Shy, MD, FACEP
Associate Professor
University A of Colorado - School of Medicine

Peter A D Steel, MA, MBBS
Director of Clinical Services
NYP/Weill Cornell Medical Center

Edward H Suh, MD
Assistant Professor of Emergency Medicine
Columbia University Medical Center

Contributors to Previous Versions

Amy Baxter, MD
Clinical Associate Professor
Augusta University

Jonathan A Handler, MD
Adjunct Associate Professor
Northwestern University Feinberg School of Medicine

Phil Parker, MD
SVP of Integration
SCP-Health

Matt Burton, MD
VP Clinical Informatics
Apervita

Sharon Hibay, DNP, RN
Chief Clinical Officer
Arch Systems, LLC

Amos J Shemesh, MD
Assistant Director of Clinical Services
NYP/Weill Cornell Medicine

Christopher Corbit, MD, FACEP
Facility Medical Director
Summerville Medical Center

Andrew S. Kanter, MD, MPH, FACMI, FAMIA
Chief Medical Officer
Intelligent Medical Objects

Todd B Taylor, MD, FACEP
Clinical Informaticist
Independent Consultant

Pawan Goyal, MD, MHA, FAMIA
Associate Executive Director, Quality
ACEP

Tamara Moores Todd, MD
Medical Director of Care Transformation and Information Services
Intermountain Health