COVID-19 Adult Quick Clinical Guide: Initial Considerations and Workup

Clinical Manifestations*
- Fever 44-94% (less common earlier in course)
- Cough 68-83%
- Myalgias 11-15%
- Shortness of breath 11-40%
- URI symptoms 5-25%
*Note: a wide spectrum of symptoms and presentations has been reported

High Risk Groups
- Demographics: Age > 65, male
- Comorbidities: cardiovascular disease (including HTN), pulmonary disease, diabetes, malignancy, immunosuppression

Spectrum of Disease for Admitted Patients
- ~20% Require critical care
- ~10-20% Develop bacterial superinfection
- >20% Have respiratory viral co-infection

When to Consider Testing Per SHC guidelines updated 3/26/2020
Symptomatic patients or healthcare workers with or without known COVID-19 exposure with:
- Influenza-like-illness (ILI)
- OR fever (subjective OR T ≥ 100F)
- OR sore throat
- OR cough
- OR shortness of breath
- AND physician judgment

Additional guidance for hospitalized patients
For patients hospitalized for two weeks or less with any of the following without alternative explanation:
- Fever
- OR lower respiratory symptoms
- OR infiltrates on imaging or respiratory failure
For uncertainty about testing, consider ID consult

COVID-19 Testing
- Obtain nasopharyngeal swab for non-rapid COVID-19 (LABSARSCOV2) or rapid (LABSTATCOV2) or test*
  OPTIONAL: Respiratory Pathogen PCR panel

Labs
- CBC with diff
- CMP
- Procalcitonin
- Ferritin
- D-dimer
- CRP
- LDH
- PTT
- INR

Additional labs
- TnI/pro-BNP IF ICU OR volume overload PLUS one of the following (a) anginal chest pain or (b) SOB
- Blood cultures x2 and sputum gram stain and culture IF concern for bacterial superinfection

Studies/Imaging
- Portable CXR (optional)
- EKG IF TnI/pro-BNP abnormal

Lab and Imaging Results in COVID-19

Labs
- CBC with lymphopenia* (35-83%) and variable white blood cell count
- Elevated AST/ALT* (28-38%)
- Elevated CRP*
- Elevated d-dimer*
- Elevated troponin*
- Normal procalcitonin (though can be elevated in those requiring ICU care)
*Potential marker of disease severity

Studies
- CT Chest
- CXR PA/Lateral

*Indications for Rapid COVID-19 found here: SHC guidelines 4/2/20
+If no alternative diagnosis and high suspicion for COVID-19 despite negative test, continue isolation and repeat NP swab in 2-4 days

Saloni Kumar, MD, Julia Caton, MD, Neera Ahuja, MD, Meghan Ramsey, MD, Shanthi Kappagoda, MD, Lisa Shieh, MD, Stanford University Department of Medicine; Updated 4/16/20
Discharge Considerations

When to Call the ICU

- Provider Concern
- Respiratory Distress (needing > 4L NC to maintain Spo2 >92% or PaO2 > 65, rapid escalation of O2 requirement, or significant work of breathing)
- Hemodynamic instability after initial conservative fluid resuscitation
- Severe comorbid instability or high concern for deterioration

COVID-19 and PUI Decedent Care (SHC Guidelines 4/12/20)

For all COVID/PUI deaths:
- Provider immediately contacts coroner: 408-793-1900, ext. 2
- If coroner releases the case, approach family for Consent for Autopsy at Stanford
- Infection Prevention and Control to notify Public Health Department of patient’s county of residence
- For cause of death, list <cause A,B,C> due to COVID-19; if PUI do not mention COVID-19 (Decedent Care Chaplain will amend if positive)
- Questions? Contact decedent care chaplain via Voalte or pager 25683

*AMA Discharges (SHC Guidelines 3/22/20)

Patients who have capacity and who want to refuse medical treatment or hospitalization have the legal right to do so.

- For concerns about capacity, page Ethics (#16230) or Voalte the on-call Ethics consultant
- Discuss with the patient the risks of leaving and document discussion in the chart including the reason the patient wants to leave.
- Notify the patient that we are required to contact the Public Health Department and document this
- Request that the patient sign the AMA form and scan form into EPIC. If the patient refuses to sign, document their refusal in the chart.
- Contact Santa Clara County Public Health Department. Phone: (408) 885-4214 Email: disease@phd.sccgov.org

Respiratory Management

- Non-invasive ventilation (BiPAP, CPAP), Humidified Venturi Masks, and nebulizers all increase aerosolization and should not be used in caring for PUI or COVID-19 patients.
- High Flow Nasal Canula (HFNC) can be considered in selected patients based on these SHC Guidelines
- If COVID+ or COVID-suspected patient requires oxygen beyond nasal cannula consider non-rebreather or intubation
- Consider trial of awake proning in patients with respiratory symptoms or requiring supplemental oxygen following these SHC Guidelines
- If a low-suspicion PUI has another reason for NIPPV (e.g. chronic nocturnal BiPAP), consult ICU to discuss (SHC Guidelines 3/28/20)

Monitoring Labs/Studies

- Daily or QOD (based on clinical judgment): CBC with differential and CMP

Discharge Instructions

- Stable for Discharge?
  - Yes
  - Does patient have stable housing and ability to self-isolate at home?
    - Yes
  - No
    - If discharging to SNF, jail, prison, dormitory, or other congregate setting, or patient is homeless, MD or CM must contact the Santa Clara County Public Health Department (408-885-4214).
    - Stay Inpatient or *AMA Discharge

- No
  - Patient should self-quarantine at home for 14 days from positive test or 7 days after last fever, whichever is longer.
  - Discharge medications picked up by family members or delivered to bedside
  - Once home, patients should follow these discharge instructions
  - Currently no guidance to obtain repeat COVID testing

Adapted from Santa Clara Valley Public Health Department Guidance 4/14/20

Saloni Kumar, MD, Julia Caton, MD, Neera Ahuja, MD, Meghan Ramsey, MD, Shanthi Kappagoda, MD, Lisa Shieh, MD, Stanford University Department of Medicine; Updated 4/16/20
Per the CDC and WHO, the mainstay of treatment for COVID-19 is supportive therapy. There are no FDA approved or known effective therapies for COVID-19. Our recommendation, in line with that of the WHO, is that investigational anti-COVID-19 therapeutics should be used only in ongoing randomized, controlled trials. Currently at Stanford we are enrolling patients in clinical trials of remdesivir, a novel anti-viral agent.

For a literature review of experimental therapies, click here.

## COVID-19 Supportive Treatment

<table>
<thead>
<tr>
<th><strong>IV fluids</strong></th>
<th>Use <em>conservative</em> fluid management to mitigate risk of progression of respiratory failure</th>
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</thead>
<tbody>
<tr>
<td><strong>Antibiotics</strong></td>
<td>Refer to CAP guidelines</td>
</tr>
<tr>
<td>• Only use if concern for superinfection – can use procalcitonin for guidance&lt;br&gt;• Check patients for flu co-infection</td>
<td>If flu +, treat with oseltamivir 75 mg BID x 5 days</td>
</tr>
<tr>
<td><strong>Anti-pyretics</strong></td>
<td>• WHO does NOT recommend against using NSAIDs&lt;br&gt;• Can use acetaminophen as needed (check LFTs)</td>
</tr>
<tr>
<td>• ACE2 receptor which SARS-CoV-2 binds to is upregulated by NSAIDS</td>
<td></td>
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<tr>
<td><strong>Bronchodilators</strong></td>
<td>• Use MDI over nebulizers</td>
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<tr>
<td>• Increased risk of aerosolization with nebulizers compared to MDI</td>
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<tr>
<td><strong>Anticoagulation</strong></td>
<td>• If CrCl &gt; 30, use lovenox 40 mg SQ daily&lt;br&gt;• If CrCl &lt; 30, use heparin 5000 units SQ TID&lt;br&gt;• If platelets &lt; 30 or bleeding, use SCDs</td>
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<tr>
<td>• Initiate prophylactic anticoagulation unless contraindication</td>
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<tr>
<td><strong>Mucolytics</strong></td>
<td>• Do NOT use flutter valve and cough assist devices without Pulmonary consult</td>
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<tr>
<td>• Infection can lead to thick secretions/mucous plugs but airway clearance treatment can increase aerosolization</td>
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<tr>
<td><strong>Steroids (more trials pending)</strong></td>
<td>• Routine use is NOT recommended at this time unless if treating for another indication (asthma/COPD, adrenal insufficiency, etc)</td>
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<td>• Current data shows mixed outcomes</td>
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## COVID-19 Chronic Medication Management

<table>
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<tr>
<th>ACEI/ARB</th>
<th>Statins</th>
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<td>• ACE2 receptor which SARS-CoV-2 binds to is upregulated by ACEi/ARB</td>
<td>• Per the ACC/AHA/HFSA → do NOT discontinue ACEi/ARB in patients who are already taking them</td>
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<tr>
<td>• Per the ACC, continue statin if already on one (unless acute rhabdomyolysis)</td>
<td>• Unclear data on initiating a statin as novel therapy, but currently no harm shown</td>
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## COVID 19 Organ System Involvement

### Pulmonary
- Dry cough (59%)
- Dyspnea (31%) → if not a presenting symptoms, develops at 5-8 days after admission
- Sputum production (27%)
- Pneumonia with bilateral patchy infiltrates
- ARDS (20%) → about 8-12 days after diagnosis
- Acute hypoxic respiratory failure → rapid progression to intubation (12-24 hours)

### Cardiac
- Acute cardiac injury in 7-22% of hospitalized patients
  - ACS
  - Stress cardiomyopathy/heart failure
  - Demand ischemia
  - Viral myocarditis
  - Arrhythmia (17%)
- Shock was rarely a presenting sign and usually presented after days of critical illness

### Renal
- AKI in 2-29% of patients
  - Etiology primarily ATN due to direct cellular injury from virus or shock
  - Proteinuria (44%)
  - Hematuria (26.9%)
- Renal replacement therapy needed in 1-5% of hospitalized patients and resulted in worse outcomes

### Hematologic
- Cytokine storm and secondary HLH
- Increased risk of VTE
- DIC (median 4 days from hospitalization)
- Microthrombi in pulmonary vasculature
- Lymphopenia, ↑ LDH, ↑ ferritin, ↑ D-Dimer

### GI
- GI symptoms (nausea/diarrhea) manifested before respiratory symptoms about 10% of the time
- Diarrhea (2-10%) → COVID+ stool test
- Elevated ALT or AST (53%)

### ENT
- Loss of smell or taste
COVID-19 Adult Quick Clinical Guide: References


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