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

**Clinical Manifestations**
- Fever 44-94% (less common earlier in course)
- Cough 68-83%
- Anosmia and/or ageusia ~70%
- Myalgias 11-15%
- Shortness of breath 11-40%
- URI symptoms 5-25%
- GI symptoms 3-17%

**High Risk Groups**
- Demographics: older age, male
- Comorbidities: cardiovascular disease, HTN, obesity, pulmonary disease, diabetes, malignancy, immunosuppression

**Clinical Course**
**Duration of Symptoms** *(Zhou et al, Lancet, 2020; Young et al, JAMA, 2020)*
- Fever, median 4-12 days
- Dyspnea, median 13 days
- Cough, median 19 days

**Timing of Complications** from symptom onset *(Zhou et al, Lancet, 2020)*
- Sepsis, median 9 days
- ARDS, median 12 days
- Acute cardiac injury, median 15 days
- AKI, median 15 days
- Secondary bacterial infection, median 17 days

**Testing Guidelines**
All hospitalized patients should receive COVID-19 testing
- Santa Clara County Health Department testing guidelines found [here](5/2/20)
- California Health Department guidelines found [here](5/1/20)
- SHC interventional platform testing criteria and protocols for procedures and surgeries found [here](6/1/20)

**Initial Work-Up for Suspected COVID-19**

- **COVID-19 Testing**
  - Obtain nasopharyngeal swab for non-rapid COVID-19 (LABSARSCOV2) or rapid (LABSTATCOV2) or test*
  - OPTIONAL: Respiratory Pathogen PCR panel (can be ordered as add-on to COVID swab)

- **Labs**
  - CBC with diff
  - CMP
  - Procalcitonin
  - Ferritin
  - D-dimer
  - CRP
  - LDH
  - PT/INR
  - PTT
  - Thrombin time
  - Fibrinogen
  - Type and screen

- **Additional labs**
  - TnI/pro-BNP IF cardiac symptoms or volume overload
  - Blood cultures x2 and sputum gram stain and culture IF concern for bacterial superinfection

- **Studies/Imaging**
  - Portable CXR (optional)
  - EKG IF cardiac symptoms of volume overload
  - Usually NOT Necessary:
    - CT Chest
    - CXR PA/Lateral

**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)

- **Studies**
  - CXR – variable, bilateral patchy opacities most common
  - CT – ground glass opacification with or without consolidative abnormalities; more likely bilateral with peripheral distribution

*Potential marker of disease severity

+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 6/23/20
Discharge Considerations

- Stable for Discharge?

  - Yes
    - Discharge with instructions for self-quarantine – refer to patient’s home county health department guidelines
    - Obtain health department approval prior to discharge for residents of San Mateo and San Francisco counties (not required for Santa Clara County)
    - Discharge medications picked up by family members or delivered to bedside
    - Currently no guidance to obtain repeat COVID testing
  
  - No
    - Does patient have stable housing and ability to self-isolate at home?
      - Yes
      - Stay Inpatient or *AMA Discharge
      - 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)
      
      - No
      - *AMA Discharge

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 illness 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

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**COVID-19 Supportive Treatment**

**IV fluids**
Use conservative fluid management to mitigate risk of progression of respiratory failure

**Antibiotics**
- Only use if concern for superinfection – use procalcitonin for guidance
- Refer to CAP guidelines

**Anti-pyretics**
- ACE2 receptor which SARS-CoV-2 binds to is upregulated by NSAIDS
- WHO does NOT recommend against using NSAIDs
- Can use acetaminophen as needed (check LFTs)

**Bronchodilators**
- Increased risk of aerosolization with nebulizers compared to MDI
- Use MDI over nebulizers

**Anticoagulation (adapted from Stanford Hematology)**
- Initiate SCDs and prophylactic anticoagulation unless contraindication
- Treatment dose anticoagulation NOT recommended by Stanford Hematology at this time in the absence of confirmed or strongly suspected thrombosis
- DOACs are not first choice due to drug-drug interactions with antivirals and interference with anti-Xa monitoring
- Post-discharge VTE prophylaxis
  - Consider in patients with additional VTE risk factors such as older age, obesity, active cancer, or immobilization. Bleeding risk must be taken into consieration.
  - Reasonable post-discharge VTE prophylaxis regimens:
    - Rivaroxaban 10 mg daily for 31-39 days (MAGELLAN trial)
    - Enoxaparin 40 mg daily x 2-4 weeks

**Mucolytics**
- Infection can lead to thick secretions/mucous plugs but airway clearance treatment can increase aerosolization
- Do NOT use flutter valve and cough assist devices without Pulmonary consult

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**VTE prophylaxis for non-ICU patients:**

<table>
<thead>
<tr>
<th>Weight</th>
<th>CrCl &gt; 30</th>
<th>CrCl &lt; 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50 kg</td>
<td>Enoxaparin 30 mg daily</td>
<td>Unfractionated heparin 5000 units BID</td>
</tr>
<tr>
<td>50-100 kg</td>
<td>Enoxaparin 40 mg daily</td>
<td>Enoxaparin 30 mg daily if CrCl 15-30 (preferred) or unfractionated heparin 5000 units TID</td>
</tr>
<tr>
<td>&gt; 100 kg or BMI &gt; 40</td>
<td>Enoxaparin 40 mg BID or 0.5 mg/kg daily</td>
<td>Unfractionated heparin 7500 units TID</td>
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**VTE prophylaxis for ICU patients:**

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<tr>
<th>Weight</th>
<th>CrCl &gt; 30</th>
<th>CrCl &lt; 30</th>
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<tbody>
<tr>
<td>&lt; 60 kg</td>
<td>Enoxaparin 30 mg BID</td>
<td>Unfractionated heparin 5000 units BID-TID</td>
</tr>
<tr>
<td>60-100 kg</td>
<td>Enoxaparin 40 mg BID</td>
<td>Unfractionated heparin 10000 units BID</td>
</tr>
<tr>
<td>&gt; 100 kg or BMI &gt; 40</td>
<td>Enoxaparin 0.5 mg/kg BID</td>
<td>Unfractionated heparin 10000 units TID</td>
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**Therapeutic anticoagulation:**
Goal platelet count > 50 K, if less, consult Hematology.
Discuss dosing with pharmacy if CrCl 30-60. Use UFH if CrCl < 30.

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<tr>
<th>Weight</th>
<th>Enoxaparin (CrCl &gt; 60)</th>
<th>If contraindication to enoxaparin, use UFH</th>
</tr>
</thead>
<tbody>
<tr>
<td>40-150 kg</td>
<td>1 mg/kg every 12 hours</td>
<td>Follow heparin protocol based and and adjust for goal anti-Xa 0.3-0.7 units/mL</td>
</tr>
<tr>
<td>&gt; 150 kg</td>
<td>0.75 mg/kg every 12 hours</td>
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## COVID-19 Chronic Medication Management

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

## 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 associated with 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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