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

**Clinical Manifestations**
- Fever 44-98% (less common earlier in course)
- Cough 46-82%
- Myalgias 35%
- Shortness of breath 20-64%
- 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 3/17/2020*
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 SARS-CoV-2 RT PCR AND 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
- EKG IF TnI/pro-BNP abnormal

Usually NOT Necessary for Diagnosis:
- CT Chest
- CXR PA/Lateral

**Lab and Imaging Results in COVID-19**

**Labs**
- CBC with lymphopenia* (83%) and low, normal, or elevated white blood cell count
- Elevated AST/ALT* (53%)
- Elevated CRP*
- Elevated d-dimer*
- Elevated troponin*
- Normal procalcitonin (though can be elevated in those requiring ICU care)
*Potential marker of disease severity

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

*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 3/25/20
Respiratory Management
- Non-invasive ventilation (BiPAP, CPAP), High Flow Nasal Cannula (HFNC), Humidified Venturi Masks, and nebulizers all increase aerosolization and should not be used in caring for PUI or COVID-19 patients.
- If COVID+ or COVID-suspected patient requires oxygen beyond nasal cannula consider non-rebreather or intubation

Monitoring Labs/Studies
- Daily or QOD: CBC with differential, BMP
- If clinically worsening: LFT, CRP, procalcitonin, LDH, d-dimer, fibrinogen, PTT, INR

Therapeutic Strategies
- See “Therapeutics” section of this guide

Discharge Considerations

Consultation

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

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 AMA and document this 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. If the patient refuses to sign, document their refusal in the chart. The form should be scanned into EPIC.
- Contact Santa Clara County Public Health Department. Phone: (408) 885-4214 Email: disease@phd.sccgov.org

Adapted from Santa Clara Valley Public Health Department Guidance 3/19/20
## COVID-19 Therapeutic Modalities

To date, there is in vitro and anecdotal data for these therapies, but we do not have any FDA approved therapies for COVID-19.

<table>
<thead>
<tr>
<th>Therapy</th>
<th>Description</th>
<th>Access Information</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Remdesivir</strong></td>
<td>• Inhibits viral replication through early termination of RNA transcription</td>
<td>To access: • Enroll in one of Stanford’s clinical trials</td>
<td>May consider in high risk patients who do NOT qualify for remdesivir.</td>
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<td></td>
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<td>• 400 mg PO q12h x 2 doses then 200 mg PO q12h x 5 days</td>
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<td>• Check EKG to evaluate QTc.</td>
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<td><strong>Hydroxychloroquine</strong></td>
<td>• Inhibition of viral entry and release, reduction of infectivity, immune modulation</td>
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<td></td>
<td>• SARS-CoV-2 studies are in vitro to date</td>
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<td></td>
<td>• Long-term use can lead to cardiomyopathy</td>
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<tr>
<td><strong>Anti-IL 6 agents, Lopinavir/Ritonavir, Azithromycin, and Interferon β1</strong></td>
<td>Data is pending. Routine use is not recommended at this time.</td>
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## COVID-19 Supportive Treatment

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Use conservative fluid management to mitigate risk of progression of respiratory failure</th>
<th>Refer to CAP guidelines</th>
<th>If flu +, treat with oseltamivir 75 mg BID x 5 days</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IV fluids</strong></td>
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<tr>
<td><strong>Antibiotics</strong></td>
<td>• Only use if concern for superinfection – can use procalcitonin for guidance</td>
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<tr>
<td></td>
<td>• Check patients for flu co-infection</td>
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<tr>
<td><strong>Anti-pyretics</strong></td>
<td>• WHO does NOT recommend against using NSAIDs</td>
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<td></td>
<td>• Can use acetaminophen as needed (check LFTs)</td>
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<td><strong>Bronchodilators</strong></td>
<td>• Use MDI over nebulizers</td>
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<td></td>
<td>• Increased risk of aerosolization with nebulizers compared to MDI</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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<td></td>
<td>• Infection can lead to thick secretions/mucous plugs but airway clearance treatment can increase aerosolization</td>
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<td></td>
</tr>
<tr>
<td><strong>Steroids (more trials pending)</strong></td>
<td>• Increased mortality, secondary infections, impaired viral clearance</td>
<td></td>
<td>• Data is pending. Routine use is not recommended at this time.</td>
</tr>
</tbody>
</table>

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## COVID-19 Chronic Medication Management

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<th>Management</th>
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<tr>
<td>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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</table>
| 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 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%)
**ROUTINE CARE PPE GUIDELINES**

Purpose: To ensure appropriate use of PPE for PIUs or patients with confirmed COVID-19 disease

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**ROUTINE PPE REQUIREMENTS**

The following PPE is required for routine patient care:

- Gown
- N95 Mask
  - OR CAPR/PAPR *only* if N95 Fit Testing was Failed
- Goggles or Face Shield
- Gloves

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**PPE DONNING SEQUENCE: Putting on PPE**

Occurs outside of patient room

1. Perform Hand Hygiene
2. Place Gown
3. Place N95 Mask
4. Place Goggles or Face Shield
5. Place Gloves

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**PPE DOFFING SEQUENCE: Removing PPE**

*Perform hand hygiene between steps to prevent contamination*

**Occurs inside of patient room**

1. Remove Gown and Gloves
2. Perform Hand Hygiene
3. Remove Goggles or Face Shield
4. Perform Hand Hygiene

Unless soiled, used PPE can be disposed of in a non-biohazard waste container

**Occurs in anteroom**

*If there is no anteroom, this occurs outside of the patient room*

1. Perform Hand Hygiene
2. Remove N95 Mask
3. Perform Hand Hygiene