## UCSF Adult COVID-19 Management Guidelines

<table>
<thead>
<tr>
<th>Category¹</th>
<th>Symptoms (constitutional, respiratory, GI or other)</th>
<th>Lower respiratory infection (clinical OR imaging evidence)</th>
<th>Hypoxia</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| **Outpatient, asymptomatic** | No | No | No | • Supportive care  
• Recommend against steroids |
| **Outpatient, symptomatic** | Yes | Yes or No | Yes or No | • Supportive care for most  
• Prioritize clinical trials if eligible  
• High-risk for progression: Consider EUA monoclonal antibodies  
• Recommend against steroids |
| **Inpatient, asymptomatic** | No | No | No | • Supportive care  
• Recommend against steroids |
| **Inpatient, mild disease** | Yes | No | No | • High-risk for progression: Consider remdesivir x 5 days  
• Recommend against steroids |
| **Inpatient, moderate disease** | Yes | Yes | No | • Remdesivir x 5 days  
• Recommend against steroids |
| **Inpatient, severe disease** | Yes | Yes | Yes | • Remdesivir x 5 days  
• Steroids if: Persistently hypoxia requiring ≥ 3-4L O₂ OR trajectory suggests increasing severity of disease |
| **Inpatient, critical disease** | Yes | Yes | Yes | • Remdesivir x 5 days; can consider extension to 10 days if ongoing severe illness at day 5  
• Steroids recommended |

Table 1. Diagnostic testing for patients with confirmed or suspected COVID

<table>
<thead>
<tr>
<th>Testing for COVID 19.</th>
<th>Repeat PCR testing:</th>
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<tbody>
<tr>
<td><strong>Initial testing:</strong> &lt;br&gt;CODVID-19 PCR (collection method based on swab availability)</td>
<td>If negative initial PCR and very high suspicion:</td>
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<tr>
<td>1. Flocked swab Nasopharyngeal (NP) plus Oropharyngeal (OP)</td>
<td>o  Tracheal aspirate COVID-19 PCR in mechanically ventilated patients</td>
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<tr>
<td>2. Flocked swab Mid-Turbinate (MNT) plus OP</td>
<td>o  Repeat NP or MNT + OP testing if not mechanically ventilated</td>
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<tr>
<td>3. Synthetic swab MNT plus OP</td>
<td>Certain COVID-19 confirmed patients may require additional testing for disposition;</td>
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<tr>
<td><em>Anterior nares swab acceptable if contraindication to deeper sample or patient refusal</em></td>
<td>consult ID to discuss next steps</td>
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| Retesting of previously negatively tested patients should be done if:             |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| o  New compatible symptoms                                                          |                                                                                     |
| o  Exposure investigation                                                            |                                                                                     |
| o  Planned or continuous aerosol-generating procedure (every 7 days)                |                                                                                     |
| o  Shared room (Monday and Thursday)                                                |                                                                                     |

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<thead>
<tr>
<th>Serologic testing, clinical indications:</th>
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<tbody>
<tr>
<td>o  Confirmation of infection if high clinical suspicion, negative PCR testing, and</td>
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<tr>
<td>symptoms &gt; 7 days</td>
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<tr>
<td>o  Documentation of serological response prior to convalescent plasma donation</td>
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<tr>
<td>o  Utility for determining immunity uncertain</td>
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<table>
<thead>
<tr>
<th>Laboratory testing</th>
<th>Routine monitoring:</th>
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<tr>
<td><strong>On admission</strong> &lt;br&gt;<em>All patients</em>³:</td>
<td>CBC with differential, BMP, Mg</td>
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<tr>
<td>o  CBC with differential, BMP, Mg, LFTs, coagulation studies</td>
<td>Trend LFTs Q48h-72h if abnormal at baseline (&gt; 2 x ULN) or receiving remdesivir</td>
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<tr>
<td>o  Send RVP if during flu season (declared by HEIP and executive leadership based on</td>
<td></td>
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<tr>
<td>Bay Area flu incidence)</td>
<td>therapy</td>
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<td><em>If clinically indicated:</em></td>
<td>These may not be required on a daily basis, consider decrease in frequency</td>
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<tr>
<td></td>
<td>depending on clinical condition</td>
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Procalcitonin, troponin, BNP, lactate, ABG
If concern for bacterial infection (prior to starting empirical antibiotics): blood cultures (2 sets), sputum bacterial culture
Hepatitis B and C serologies if elevated liver biochemistries
Consider to estimate risk for severe disease: fibrin d-dimer, CRP, LDH and CPK.

If clinical deterioration:
Repeat sputum and blood cultures (tracheal aspirate culture if intubated)

Do not obtain unless clinical suspicion for a specific diagnosis (e.g. HLH)
Ferritin, soluble IL-2-receptor-alpha, NK cell activity
Do not obtain:
IL-6 levels

Imaging
Chest radiograph:
Baseline AP CXR on admission
Monitoring for complications (pneumothorax, atelectasis) at interval deemed appropriate by clinical team

Chest CT:
Limited role in diagnosis of COVID-19 (PCR test of choice)
Primary role is evaluation of superimposed processes such as pulmonary embolism or aortic dissection.

Table 2. Therapeutics

Therapies
Experimental therapeutics should only be offered in the context of a clinical trial

Convalescent plasma
Available via EUA. Outside of clinical trial, may consider for use if: Severe immunocompromise not expected to mount an antibody response (e.g. recent solid organ transplant or stem cell transplant)

Bamlanivimab
Preliminary data suggest a decrease in hospitalizations and ED visits if given to high-risk outpatients within 3 days of initial positive SARS-CoV-2 test. Available via EUA.
The data on monoclonal antibodies remains new and evolving, and these agents should not be considered standard of care
Consider use in high-risk outpatients
Dosing: 700 mg IV infusion over 1 hour
Contraindications:
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<th></th>
<th>Hospitalized</th>
<th>New O2 requirement</th>
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<td></td>
<td>Worsening O2 requirement in those on supplemental O2</td>
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**Baricitinib**

Initial data suggests baricitinib in combination with remdesivir reduces time to recovery and decreases progression of illness in patients with moderate to severe COVID-19. Available via EUA.

- Unclear where this medication will fit in with dexamethasone; further clinical trials will be needed
- Most use of this agent should be through ongoing clinical trials
- EUA use may be considered in patients with severe COVID-19 who have contraindications to steroids
- **Dosing**: 4 mg PO once daily
  - Adjust dosing for renal failure as follows:
    - CrCl 30-59 mL/min: 2 mg PO once daily
    - CrCl 15-29 mL/min: 1 mg PO once daily
- **Contraindications**:
  - CrCl < 15 mL/min
  - Discontinue if absolute lymphocyte count < 200 cells/ml or ANC < 500 cells/ml. Can restart once above these thresholds.
  - Interrupt treatment if drug-induced liver injury is suspected or if ALT and/or AST rises to > 10x upper limit of normal

**Casirivimab and Imdevimab**

Not currently available

**Remdesivir**

Initial data suggest some benefit in time to recovery and possibly in mortality. FDA approved

- Treatment should be administered to hospitalized patients with evidence of lower respiratory tract infection (e.g. hypoxia, abnormal chest radiograph)
- **Dosing**: 200mg IV x 1, then 100mg IV q24h for 4 additional days; may consider 10 days on a case-by-case basis if not responding to initial course
- Vehicle contains cyclodextrin, which can accumulate in renal failure. Not well studied in renal replacement therapy (including intermittent hemodialysis), though likely to be safe given short duration of therapy. Dose adjustment is not required.
- **Contraindications**: 
| Steroids | Initial data suggests mortality benefit in those with severe or critical disease. No benefit (and trend towards harm) seen in those who do not require supplemental oxygen.  
**Dosing**: Dexamethasone 6 mg IV or PO qday (or equivalent) up to 10 days while in the hospital. Administer PO if able to take oral medication.  
**Populations**:  
- Patients undergoing mechanical ventilation, non-invasive ventilation, or high-flow nasal cannula: Most patients should be treated with steroids  
- Patients on nasal cannula: Consider steroids in those with persistently low oxygen saturation and requiring substantial supplemental oxygen (e.g. ≥ 3-4L O2) or whose trajectory suggests increasing severity of disease  
**Contraindications**:  
- Patients who do not require supplemental oxygen should not get steroids for the indication of COVID-19  
**Factors to consider in determination of whether to withhold (or stop) steroids**:  
- Uncontrolled invasive fungal infections  
- Uncontrolled hyperglycemia  
- Existing delirium  
- Other immunosuppressive medications  
- Pregnancy (dexamethasone crosses the placenta and should be discussed with OB/Maternal-Fetal Medicine before administration)  
*Consult ID for patients with any of the above factors to discuss relative risk/benefit of steroid administration*

| Other antiviral and immunomodulatory agents | Administer only in the context of a clinical trial

**Medications/interventions to avoid**
- Do not give other pharmaceutical treatments (e.g. tocilizumab, lopinavir/ritonavir, etc.) specifically for COVID-19 unless part of a clinical trial

**Anticoagulation**
Prophylactic enoxaparin (standard dosing, 40 mg SQ QD; 40 mg sq BID if > 120 kg or BMI > 40) is recommended for all patients with COVID-19 except those with contraindications (e.g. active CNS bleed, severe thrombocytopenia with platelet count < 25,000).

- If CrCl 15-30 mL/min, use enoxaparin 30 mg SQ Qdaily. If CrCl < 15 mL/min, use UFH 5000 units SQ q8 hours
- If baseline elevated aPTT, obese, underweight, or CrCl<30, check peak anti-Xa level 4-6 hours after 3rd- 4th dose to ensure appropriate dose (goal 0.2-0.5)
- Therapeutic anticoagulation is not recommended outside of a clinical trial except for patient with known indications (e.g. DVT/PE, atrial fibrillation, etc.)
- If persistent clotting of lines and/or worsening clinical course, therapeutic anticoagulation may be considered via multidisciplinary discussion.

**Immunosuppression**
- In immunosuppressed patients without COVID-19, do not make anticipatory adjustment to current immunosuppressive drugs or dosages
- In immunosuppressed patients with COVID-19, consider reducing levels of immunosuppression if possible

**Other**
- Renin-angiotensin system (RAS) blockers
  - Theoretical concerns have been raised as some RAS blockers may increase expression of ACE2, which may facilitate viral entry into cells. However, currently there is not clinical or epidemiological data to support this concern. Patients who routinely take ACE inhibitors or ARB medications should generally continue these medications.
- Nonsteroidal anti-inflammatory drugs
  - Concerns have been raised that NSAIDs may worsen COVID-19 disease. However, to date, there is no scientific evidence connecting the use of NSAIDS with worsening COVID-19 symptoms or outcomes.

**Table 3: Critical Care**

**Respiratory and Ventilator Management**
- Only essential providers in the room during intubation or other aerosol generating procedures

**Nebulizer therapy:**
- Nebulizer therapy is an aerosol generating procedure and should be avoided except:
### ICU-level care due to respiratory status
- Requiring high-flow nasal oxygen or non-rebreather mask
- Inability to follow commands (altered mental status, severe cognitive impairment)
- Mechanically ventilated and can be delivered in-line with circuit.

### Non-invasive respiratory support:
- High flow nasal oxygen (HFNO) should be considered for use in hypoxemic patients but caution with higher flows (e.g. >25 LPM) in order to avoid emergent intubation. Close monitoring of respiratory status is essential.
- Non-invasive ventilation (NIV, e.g CPAP or BiPAP) should only be used in selected patients with respiratory failure or known obstructive sleep apnea
- Both HFNO and NIV are aerosol generating procedures and require airborne precautions
- Patients receiving either HFNO or NIV should be cared for in a monitored setting by personnel capable of performing endotracheal intubation

### Intubation:
- Emergent intubations are to be avoided given the prolonged time to apply PPE and increased risk of infection to the person performing the intubation
- Only experienced providers should perform intubation
- Consider video laryngoscopy as preferential airway equipment
- Once intubated, minimize circuit disconnects and use in-line suction

### Mechanical Ventilation and Advanced Respiratory Care:
- Lung protective ventilation is the mainstay of care: preferred mode is volume controlled ventilation with low tidal volume (6 mL/kg predicted bodyweight) with a plateau airway pressure of less than 30 cm H2O.
- For severe hypoxemia (P/F ratio < 150) consider:
  - Moderate-high PEEP
  - Recruitment maneuvers (monitor hemodynamics and discontinue if patient develops hypotension or no improvement in driving pressure or oxygenation)
  - Deep sedation +/- neuromuscular blockade, especially with ventilator asynchrony
  - Early use of manual proning

### Extracorporeal Membrane Oxygenation (ECMO) Considerations
ECMO (VA or VV, as appropriate) will be considered per criteria established by Critical Care Medicine and Cardiac Surgery
Continuous Renal Replacement Therapy (CRRT)

- For patients with acute kidney injury (AKI), consider delaying CRRT until significant metabolic complications arise ($K > 5.5$ mmol/L) or until significant positive fluid balance despite high-dose diuretics or unable to achieve lung protective ventilation due to severe metabolic acidosis.
- For ESRD patients, CRRT should be used to avoid markedly positive fluid balance, which may exacerbate hypoxemia.

Table 4: Palliative Care

Palliative Care (PC) best practices

For primary teams:
- Perform a Goals of Care discussion within 48hrs of admission and offer age- and comorbidity-specific prognostic information.
- Use the comfort care order set for actively dying patients (consult PCS only if there are questions or additional support is needed).

Indications for Palliative Care Consultation unique to patients with COVID-19

- All patients with COVID-19 in the ICU
- Emotional, spiritual and symptomatic support at the end of life for patient/family
- Ethical decision making

Caring for the Caregiver

- The Caring for the Caregiver Program is dedicated to providing support to faculty, staff and trainees experiencing emotional distress related to the clinical care of patients.
- Please contact caringforthecaregiver@ucsf.edu anytime to request support for yourself or a peer (can also coordinate group debriefings).

Table 5: Discontinuation of isolation and discharge considerations

Discontinuation of Isolation at UCSF Health

See COVID-19 Guidelines for Discontinuing of Isolation

Discharge considerations
Discharge coordination for hospitalized patients with COVID-19 requires advanced planning and close coordination between multiple disciplines in the hospital including clinicians, infection control, and case management, particularly for discharge to congregate settings.

Coordination with local departments of public health is mandatory for all patients. DPH COVID Discharge Hotline: 415-554-2830

Explicit guidance and return precautions for evaluation of concerning symptoms after discharge must be provided (utilize prepared communications tools with anticipatory guidance).

Inpatient discharge dot-phrases:
- .COVIDPOSINPTDced
- .COVIDPOSINPTDCEDES (Spanish)

Outpatient discharge dot-phrase:
- .COVIDDISCHARGEADULT

### Self-discharge:
- **All Patients**
  - Notify attending and DPH COVID-19 Containment Call Center 628-652-2810 if patient:
    - SEEMS to want to leave the hospital against medical advice
    - HAS left against medical advice; or
    - Declines Isolation and Quarantine
  - Complete **SFPDH COVID Case Report Form CMR 043020** on ALL COVID+/PUI patients; fax to number on form

- **Homeless patients**
  - Email DPH AMA recovery at **covid19AMArecovery@sfdph.org** (24/7, 7 days a week) and/or call 415-608-1515 (M-F 8am-8PM)
  - Include information:
    - name
    - date of birth
    - time they departed
    - whether they are a PUI or Covid Positive
    - Information about where they may have gone/phone number

  - DPH contact: Sarah Strieff RN 415-238-1485 or **sarah.strieff@sfdph.org**

Discharge to Skilled Nursing Facilities
<table>
<thead>
<tr>
<th>Patients can be discharged to SNF and LTAC at this time while still on precautions if the accepting SNF has adequate PPE supply/training and:</th>
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<tbody>
<tr>
<td>▪ Improvement in respiratory symptoms; AND</td>
</tr>
<tr>
<td>▪ At least 24 hours fever-free without use of anti-pyretic</td>
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</tbody>
</table>

**Discharge to Group Settings**
- If the patient has the ability to isolate after discharge, they are able to return to RCFE/Group setting.

**Reviewed by representatives from:**
- Care Delivery Committee
- Hospital Medicine
- Critical Care Medicine
- Infectious Diseases
- Pharmacy
- Nephrology
- Case Management