

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

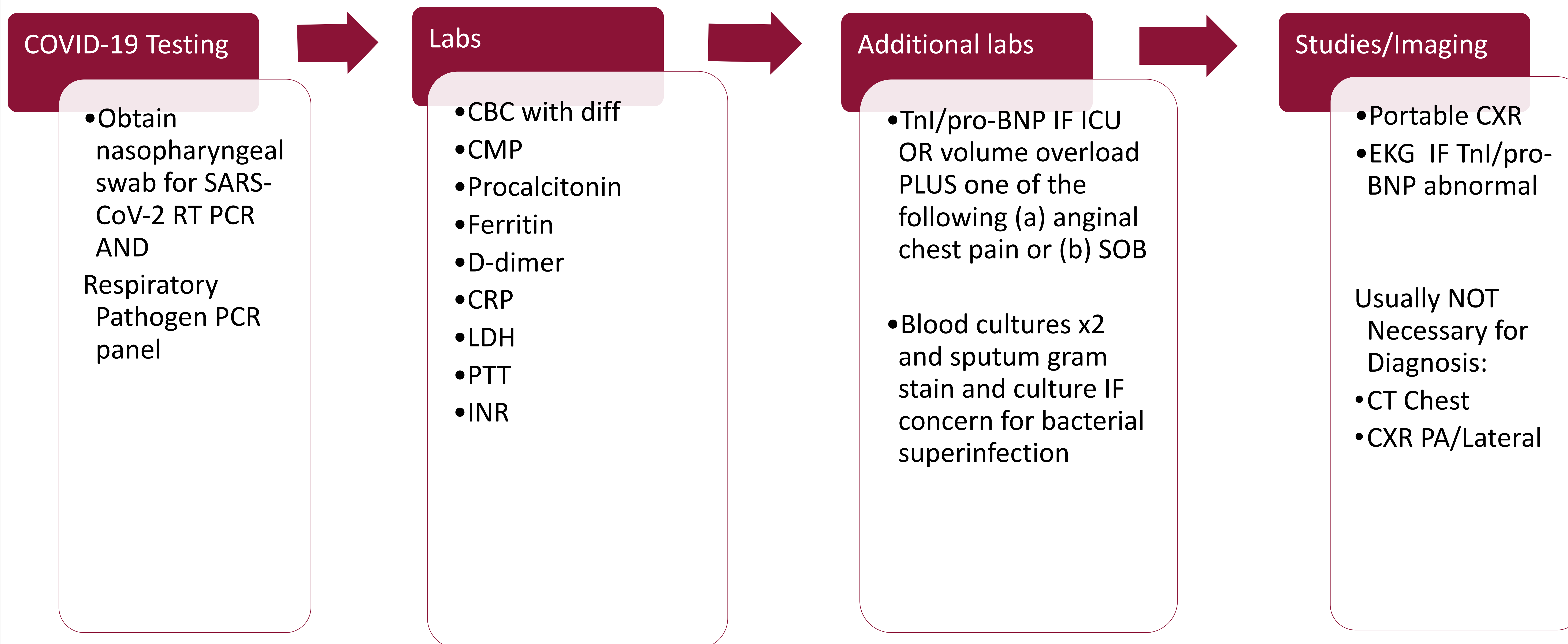
Additional guidance for hospitalized patients

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

Initial Work-Up for Suspected COVID-19



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

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

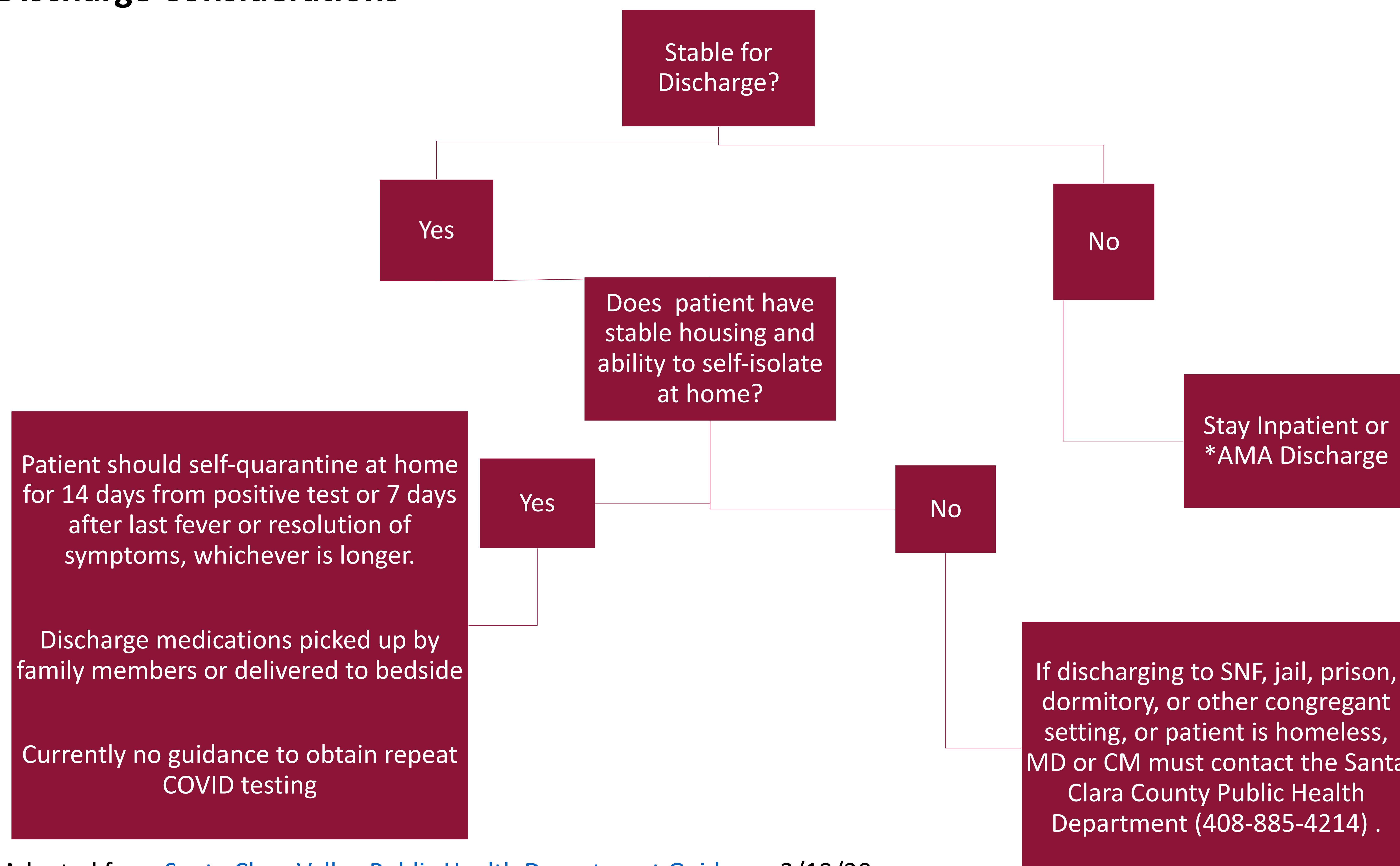
- See “Therapeutics” section of this guide

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

Discharge Considerations



Adapted from [Santa Clara Valley Public Health Department Guidance](#) 3/19/20

***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

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.

Remdesivir

- Inhibits viral replication through early termination of RNA transcription

To access:

- Enroll in one of Stanford's clinical trials

Hydroxychloroquine

- Inhibition of viral entry and release, reduction of infectivity, immune modulation
- SARS-CoV-2 studies are in vitro to date
- Long-term use can lead to cardiomyopathy

May consider in high risk patients who do NOT qualify for remdesivir.

- 400 mg PO q12h x 2 doses then 200 mg PO q12h x 5 days
- Check EKG to evaluate QTc.

Anti-IL 6 agents, Lopinavir/Ritonavir, Azithromycin, and Interferon β 1

Data is pending. Routine use is not recommended at this time.

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 – can use procalcitonin for guidance
- Check patients for flu co-infection

Refer to [CAP](#) guidelines

If flu +, treat with oseltamivir 75 mg BID x 5 days

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

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

Steroids (more trials pending)

- Increased mortality, secondary infections, impaired viral clearance

- Data is pending. Routine use is **not** recommended at this time.

COVID-19 Chronic Medication Management

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 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 PUIs or patients with confirmed COVID-19 disease

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

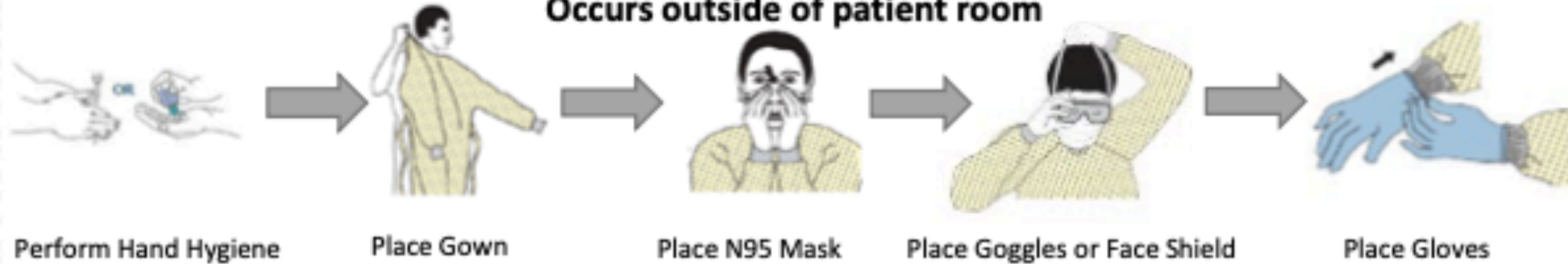
[Click here](#)
For 9-minute
All PPE Video



Scan for
CDC PPE
Video

PPE DONNING SEQUENCE: Putting on PPE

Occurs outside of patient room



[Click here](#)
For 4 minute
Donning PPE
Video

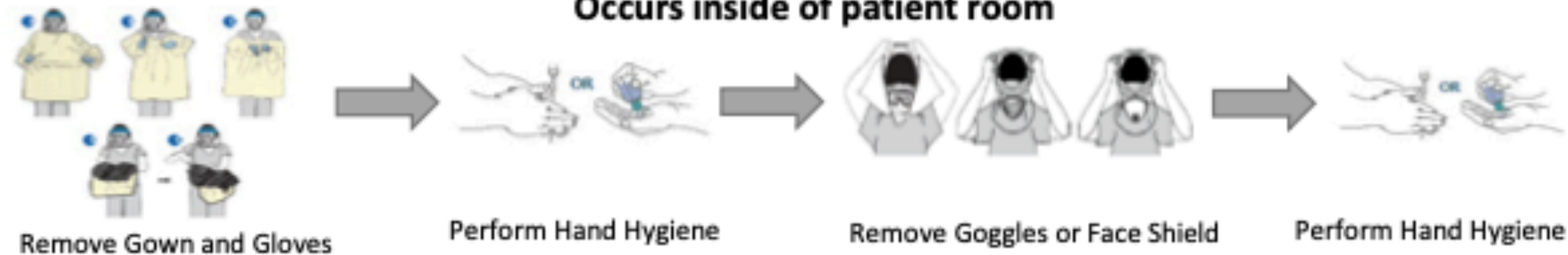


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PPE Video

PPE DOFFING SEQUENCE: Removing PPE

Perform hand hygiene between steps to prevent contamination

Occurs inside of patient room



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



[Click here](#)
For 5 minute
Doffing PPE
Video



Scan for
Doffing
PPE Video

COVID-19 Adult Quick Clinical Guide: References

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