DEPARTMENTAL GUIDELINES/PEARLS

COVID-19

CARDIOLOGY

These proposals/guidelines serve as a response to, and preparation for, the COVID-19 pandemic for the Ventura County Medical Center and Santa Paula Hospital system. These are based on current available literature and recommendations from specialty societies.

Consultations:

Cardiology consult is available as per usual schedule. Recommend in-person consultation only for those that are absolutely necessary; otherwise, telemedicine is preferable so as to limit exposure.

ICU/DOU Beds:

VCMC/SPH guidelines for admission to be followed.

1. VT/VF
2. Severe bradycardia with hemodynamic compromise
3. Acute MI
4. Acute Decompensated Heart Failure on IV diuretics/inotropes
5. Syncope with structural heart disease
6. SVT with hemodynamic compromise

Telemetry Beds:

Any COVID-19 patient discharged from ICU to floor and as per VCMC/SPH telemetry guidelines. Not to be used for all COVID-19 patients.

STEMI :

STEMI should be discussed with the Interventionalist on Call. The patients COVID-19 status should be communicated to the accepting provider. Recognizing that PCI remains the standard of care for STEMI in hospitals that have PCI capabilities, our partners at CMH have not adopted a specific TPA protocol. TPA may be considered in some patients after weighing risks and benefits.

STEMI ACC/SCAI guidelines for cath lab during the COVID-19 pandemic:

1. Patients with confirmed COVID infection

    a. Send STEMI patients to the cath lab for primary PCI with appropriate personal protective equipment (PPE) for the entire cath lab team. Fibrinolysis may be considered for stable STEMI patients after weighing the risks versus benefits.
2. Patient with suspected COVID
    a. Primary PCI should be performed in patients presenting with STEMI and suspected COVID symptoms
3. Patients with no respiratory symptoms
    a. Primary PCI should be performed in patients presenting with STEMI determined to be candidates for revascularization

NSTEMI/UA:

1. Suspected or Confirmed COVID-19 Patients
    a. Medical management is recommended unless there is evidence of ongoing ischemia, hemodynamic compromise, or electrical instability
    b. Elective cath can be pursued for these patients when they are less infectious

Myocarditis:

Prevalence of myocarditis is higher in critically ill patients with COVID-19. There is overlap with ACS in terms of symptoms and diagnosis and hence physicians should be aware of this. Steroids have been used with success as suggested in case reports. Cardiology should be consulted if there is suspected myocarditis.

Arrhythmias:

1. For Management of arrhythmias, follow established guidelines with some caveats
    a. Hemodynamically unstable tachyarrhythmias/bradyarrhythmias: Follow ACLS guidelines
    b. Atrial Fibrillation/Flutter with RVR: anticoagulation if no contraindication, beta blockers if not in shock, IV amiodarone, IV digoxin (check renal function). Ensure there is no evidence of pre-excitation prior to using IV BB, amiodarone, CCB or digoxin.
    c. Supraventricular Tachycardia: vagal maneuvers, adenosine, betablockers/CCBs, if incessant and in shock, may use IV amiodarone, catheter ablation not recommended routinely due to need for isolation. Discuss with Cardiology.
    d. Stable ventricular tachycardia: Obtain 12-lead EKG, load IV amiodarone and start gtt; may use beta blockers if not in shock
        i. Rule out ischemia, correct electrolytes, wean vasopressors
        ii. Other considerations: IV Mg if TdP, transvenous pacing/isoproterenol if bradycardia
        iii. Synchronized cardioversion if symptomatic/unresponsive to meds, becomes hemodynamically unstable

    e. VT/VF Storm: IV beta blockers, Load IV anti-arrhythmic drug followed by maintenance drips, intubate and sedate, consider transfer to quaternary care center for advanced heart failure therapies
2. Monitoring QT interval with Hydroxychloroquine, Azithromycin, Chloroquine, and Lopinavir/Ritonavir
    a. OK to measure interval on telemetry strip to minimize risk of COVID transmission with 12-lead EKGs
    b. Stop all non-critical QT-prolonging drugs
    c. Baseline measurement for QTc , then daily measurement for patients on these drugs with documentation of the QTc while on therapy, last measurement on day after therapy is discontinued
    d. For QRS duration <120 ms, QTc increase of >60 ms or QTc ≥500 ms would be considered high-risk for torsades, consider discontinuation of drug depending on individual clinical situation
    e. For QRS duration ≥120 ms, QTc increase of >60 ms or QTc ≥550 ms would be considered high-risk for torsades, consider discontinuation of drug depending on individual clinical situation
    f. Correct K and Mg levels if low
    g. Caution is advised when considering these drugs in patients with chronic medical conditions (e.g. renal failure, hepatic disease) or who are receiving medications that may interact to cause arrythmias. Not to be used in patients with known hereditary or acquired long QT syndrome.

Echocardiograms:

All inpatient Echocardiogram requests to be screened for medical necessity and urgency. Only studies that change management or outcomes are to be performed. This applies to all echocardiograms regardless of COVID status to minimize exposure of all patients to our sonographers and machines and to minimize exposure to asymptomatic cases of COVID positive patients.

After review of request consideration to be given by Attending Cardiologist for limited versus standard echo protocol. Plan for contrast is to be made ahead of time, if possible, to minimize wait time and decreased use of PPE. This is to be communicated to technician.

Common Indications for Urgent/Semi-urgent TTE:

1. Symptoms or conditions potentially related to suspected acute cardiac etiology including but not limited to chest pain, shortness of breath, palpitations, lightheadedness/ presyncope/syncope TIA, stroke, or peripheral embolic event
2. Hypotension or hemodynamic instability of uncertain or suspected cardiac etiology
3. Acute chest pain with suspected MI and non-diagnostic ECG
4. Suspected complication of myocardial ischemia/infarction, including but not limited to acute mitral regurgitation, ventricular septal defect, free-wall rupture/tamponade, shock, right ventricular involvement, HF, or thrombus
5. Respiratory failure or hypoxemia of uncertain etiology
6. Known acute pulmonary embolism to guide therapy (e.g., thrombectomy and thrombolytics)

7. Evaluation of suspected pulmonary hypertension including evaluation of right ventricular function and estimated pulmonary artery pressure
8. Reasonable suspicion of valvular or structural heart disease or re-evaluation of known valvular heart disease with a change in clinical status or cardiac exam or to guide therapy
9. Evaluation of suspected infective endocarditis with positive blood cultures or a new murmur
10. Evaluation of sustained or non-sustained atrial fibrillation, SVT, or VT
11. Evaluation of pericardial effusion/pericardial tamponade
12. Other indications may be determined as urgent on a case-by-case basis

Transesophageal echocardiography (TEE):

1. Only clinically indicated TEEs will be performed in urgent cases for cardiac disorders that would put patients at risk for decompensation if deferred and not treated within the expected duration of the COVID-19 pandemic
2. TEEs will not be done if an alternative imaging modality (e.g. off axis TTE views, ultrasound enhancing agent with TTE, CT or cardiac MRI) can provide the necessary information
3. Airborne precautions are required during a TEE for suspected and confirmed cases, due to the increased risk for aerosolization

EKGS:

1. Daily EKGS are reasonable for ICU patients
2. EKGs are reasonable for clinical concern for ischemia, arrhythmia, or QTC monitoring

Biomarkers:

1. No recommendations for routine monitoring of troponins
2. BNP daily can be considered for ICU patients and ICU to floor discharges

RAAS Therapy:

Recommendation: Per the American College of Cardiology, American Heart Association and Heart Failure Society of America joint statement (Bozkurt et al, HFSA/ACC/AHA Statement Addresses Concerns Re: Using RAAS Antagonists in COVID-19, 2020)

1. For stable outpatients:
    a. No evidence to support the discontinuation of outpatient ACEi/ARBs/ARNI's
2. For inpatients
    a. There is no evidence for routine discontinuation of ACEi/ARBs/ARNI, unless otherwise indicated in situations including hypotension or acute kidney injury, etc.

GASTROENTEROLOGY

The situation involving the COVID-19 pandemic continues to evolve. There is recent evidence suggesting the potential for coronavirus transmission through droplets and perhaps fecal shedding posing potential risks during endoscopy and colonoscopy to other patients and endoscopy personnel.

What we know:

1. Cough, fever, fatigue, or sore throat are the most common symptoms in adults.

2. The incidence of GI symptoms including nausea and/or diarrhea are uncertain with some reports below 5% and others at 50%. There have been some reports of isolated diarrhea preceding cough and fever.

3. The virus may be present in GI secretions and viral RNA is detectable in stool. Gastrointestinal infection and potential fecal-oral transmission must be considered.

4. Asymptomatic spread can occur during the prodromal phase (the mean incubation period is ~5 days, with a range of 0-14 days), with viral shedding greatest when symptoms begin.

5. Abnormal liver enzymes are observed in 20-30% of persons with COVID-19 infection.

6. Leukocyte counts drop in persons with COVID-19 infection, and elevated WBC is a poor prognostic sign.

7. Older people and those listed by the CDC as vulnerable populations, including severe chronic health conditions, such as heart disease, lung disease, diabetes, decompensated cirrhosis, HIV with low CD4 counts, and immunosuppression, (including liver and other solid organ transplant recipients) are at higher risk of developing more serious illness. Pregnancy may be a risk.

8. Best protection against virus transmission:

   a. Wash hands
   b. Don’t touch your face
   c. Cough etiquette
   d. Social distancing
   e. Avoid crowds

GASTROENTEROLOGY PROFESSIONAL SOCIETY

GUIDANCE ON ENDOSCOPIC PROCEDURES

DURING THE COVID-19 PANDEMIC

Below is guidance regarding how to manage the clinical procedural needs of patients during the COVID-19 pandemic. Any decisions should be informed by the local situation and available resources. There may be state, local and institutional rules in place that must be considered as well. This guidance is offered until more definitive data-driven information becomes available.

For those patients for whom a procedure or appointment is not deemed immediately necessary, each practice should implement mechanisms to assure appropriate follow-up once the immediate impact of the COVID-19 pandemic has eased or passed.

All Elective Procedures Should Be Delayed

1. Screening and surveillance colonoscopy in asymptomatic patients
2. Screening and surveillance for upper GI diseases in asymptomatic patients, including surveillance for esophageal varices in patients with cirrhosis
3. For patients needing interval endoscopy for obliteration of esophageal varices post-acute bleeding, the individual circumstances of the patient need to be taken into account to determine safety of delay (i.e., size of varices, red wale markings, CTP status of the patient, acute bleed characteristics).
4. Evaluation of non-urgent symptoms or disease states where procedure results will not imminently (within 4-6 weeks) change clinical management (e.g., EGD for non-alarm symptoms, EUS for intermediate risk pancreatic cysts)
5. Motility procedures - esophageal manometry, ambulatory pH testing, wireless motility capsule testing and anorectal manometry

Urgent/Emergent Procedures Should Not Be Delayed

1. Upper and lower GI bleeding or suspected bleeding leading to symptoms
2. Dysphagia significantly impacting oral intake (including EGD for intolerance of secretions due to foreign body impaction or malignancy (stent placement))
3. Cholangitis or impeding cholangitis (perform ERCP)
4. Symptomatic pancreaticobiliary disease (perform EUS drainage procedure if necessary for necrotizing pancreatitis and non-surgical cholecystitis, if patient fails antibiotics)
5. Palliation of GI obstruction [UGI, LGI (including stent placement for large bowel obstruction) and pancreaticobiliary]
6. Patients with a time-sensitive diagnosis (evaluation/surveillance/treatment of premalignant or malignant conditions, staging malignancy prior to chemotherapy or surgery)
7. Cases where endoscopic procedure will urgently change management (e.g., IBD)

Key Clinical Frequently Asked Questions

Q. How do I treat a patient who presents with a positive FIT or Cologuard® who is asymptomatic?

A. In most cases, a colonoscopy should be considered non-urgent and can be delayed by at least 4-6 weeks and reassessed.

Q. If a patient had an upper GI bleed (PUD, non-variceal), has been put on a PPI and is due for follow-up surveillance, should this patient have an EGD?

A. A follow-up EGD to assess large gastric ulcer healing, etc. should be able to be delayed 4-8 weeks absent any other alarm symptoms.

Q. Should all emergent EGD patients be intubated?

A. Absent other reasons that present a threat to the airway, intubation is not indicated for all EGDs. Proper use of PPE, including N95 masks is paramount.

Q. Does a septic patient with an unknown and not obvious respiratory cause undergoing EUS or ERCP require use of an N95 mask?

A. All EGDs require proper PPE, including use of N95 masks.

Q. Should procedures be performed on patients with intermediate level cases such as Iron Deficiency Anemia (IDA) or mild dysphagia?

A. Decisions regarding cases such as these will need to be made on a case by case basis, taking into account resource availability, level of community infectivity and risk to the patient. Exceptional cases will require evaluation and approval by local leadership on a case by case basis

ICU PREPAREDNESS SURGE PLAN

Beds:

- beds 1 and 16 will be preferentially left open for aerosol generating procedures (AGPs); after intubation and with adequate time allowed for aerosol to clear, intubated patient will be moved to non-negative pressure room (i.e. ICU-1, bed 8, then bed 7, then bed 6, etc.)
- If 3-7 COVID-19 patients, fill ICU 1, leaving 1 negative pressure room open for intubations/procedures (prefer Bed 1). Patient remains in procedure room until sufficient air exchanges have occurred to clear potentially aerosolized particles
- Sufficient air exchanges occur after 45 minutes in negative pressure rooms, after 3.5 hours in non-negative pressure rooms at VCMC, and after 1.5 hours in non-negative pressure rooms at SPH
- If 8 or more COVID-19 patients, will overflow to ICU 2
- If 16 or more COVID-19 patients, overflow to ICU 3, again filling negative pressure rooms (17 & 18), 28 beds total
- If sufficient volume, cohort COVID-19 patients starting in the ICU's, preferably ICU 1> ICU 2> ICU 3
- further overflow into MS 1
- prefer non-COVID ICU to be the PACU, then the OR (utilizing anesthesia ventilators if needed)
- proning may be necessary with severe ARDS COVID-19 patients. If Rotaprone bed unavailable, manual proning will be initiated as staffing allows

Airway:

The initial airway will be managed by Anesthesia, in addition to any initial procedures (such as CVC and arterial line placement), if time allows, to conserve PPE.

Staffing:

If we have a surge and there is a lack of staffing to care for ICU patients in the usual fashion, we will initiate a team-caring algorithm.

LABOR AND DELIVERY

General Principles:

- Wear a surgical mask at all times in L&D- patients, healthcare workers, visitors
- Ask all patients whether they have any symptoms of coronavirus infection. Notify M.D if you believe they do. Test for COVID-19 AND influenza
- Test all admitted asymptomatic patient for COVID-19 with in-house test: SARS CoV-2 VCMC
- Test triage patients who you expect will return within 24 hours: SARS CoV-2 VCMC
- Doffing PPE in setting of COVID+/PUI is the highest risk step! Use hygienist.
- Attend COVID rounds when on call.

ASYMPTOMATIC labor patients who are COVID negative:

- Standard precautions

Asymptomatic labor patients COVID test result unknown:

- Standard precautions with Contact/Droplet PPE* in active labor/2nd stage. N95 may be worn at provider's discretion

COVID+ or PUI with COVID test pending:

- Encourage early epidural and consult with anesthesia to maintain good block
- Patient wears mask
- Airborne PPE*
- Generally 1 nurse, and 1 physician

COVID+ or PUI with COVID test pending requires C-section:

- All personnel in Airborne PPE.*
- Nurse, anesthesiologist, scrub tech, surgeon prepare the OR to receive patient
- Scrub tech moves table with surgeons' gown and gloves outside the OR.
- Labor nurse and labor physician transport patient to OR in PPE. Patient wearing a surgical mask and covered with clean sheet or drape. Surgeon helps position patient.
- Surgeon doffs gown and gloves, and leaves OR with N95 and goggles or face shield on.
- Surgeon/assistant scrub and don gown and gloves outside the OR. Enter OR
- C-section performed. Baby handed to personnel wearing clean PPE.
- Baby becomes PUI-follow pediatric/NICU guidelines.
- Patient transported directly to room where she will recover. Nurses may transport her in PPE worn in OR.

Asymptomatic patients undergoing C-section with regional anesthesia –COVID status unknown

- Anesthesiologist, surgeon, assistant surgeon, scrub tech wear N95, goggles or face shield, gown, and gloves in case patient must be intubated during the case
- All others in standard OR PPE. If patient must be intubated, others will step outside to don N95 and goggles or face shield.

Asymptomatic patients undergoing C-section -COVID negative

- Standard precautions

Wait to clean time for COVID/PUI rooms

- VCMC OR: 30 minutes after extubation/10 minutes if regional anesthesia
- SPH OR: 45 minutes after extubation/10 minutes if regional anesthesia
- *VCMC/SPH Labor rooms: 10 minutes after patient leaves the room.

*Contact/Droplet = surgical mask, face shield, gown, gloves
*Airborne = N95 or PAPR, face shield, gown, gloves

NEPHROLOGY

Renal involvement in COVID 19 infection

- Lower incidence of AKI with COVID 19 infection than the SARS and MERS-CoV infections
- Higher frequency of renal abnormalities including albuminuria, hematuria and higher frequency of azotemia
- CT findings showing reduced density, suggestive of inflammation and edema
- AKI is an independent predictor of patient's in-hospital mortality
    - Pathogenesis
        - Sepsis leading to cytokine storm syndrome
        - Direct cellular injury due to the virus (Viral RNA identified in urine sample)
    - Treatments
        - General and Supportive management and Kidney replacement therapy
        - Utilization of CRRT with high volume hemofiltration maybe beneficial as seen in the treatment of SARS and MERS sepsis

COVID-19 in patients with CKD/ESKD

- ESKD patients on dialysis may exhibit greater variation in clinical symptoms and infectivity
- Dialysis patients shown to have less lymphopenia, lower serum levels of inflammatory cytokines, and milder clinical disease than other patients
- In-Center HD increases the risk of transmission of infection, not only to patients themselves but also to the medical staff, facility workers, and family members

COVID-19 in transplant patients

- Due to immunosuppression, it is suspected that transplant recipients may have a greater viral burden and shedding resulting in greater infectivity and potential spread to other individuals
- Transplant patient and immediate household contacts should avoid travelling unless absolutely necessary

NEWBORN COVID-19 GENERAL GUIDELINES

There is a paucity of evidence with regard to transmission, pathophysiology, treatment and prevention of COVID-19 in newborns. Guidance will be updated as medical knowledge grows. Nursing and medical staff are encouraged to consult NICU and infectious disease experts.

Current knowledge regarding Coronavirus and fetuses/neonates

- Risk of fetus being infected is very low
- Current data suggest that approximately 2-5% of infants born to women with COVID-19 near the time of delivery have tested positive in the first 24-96 hours after birth. We do not yet know if any of the newborns reported to the AAP Registry have become ill at home following hospital discharge.
- Greatest risk is horizontal transmission
- Risk for perinatally-acquired COVID-19 is through contact with respiratory/droplet secretions from mother or other caregivers
- Theoretical risk of transmission through urine and stool during delivery process
- Newborns do not readily aerosolize secretions.

Delivery room response team for COVID-19 positive mother

- Uncomplicated delivery: NICU team not usually called
- Standard delivery: decelerations, late preterm (>=35 weeks), cesarean section
    - RT and RN in PPE
    - RT may remain outside LDR/OR
- Complex delivery: preterm (<35 weeks, congenital anomalies)
    - NNP/Neonatologist + RT + RN in PPE
    - RT inside/outside of room depending on delivery circumstance
- Don a gown and gloves, and use either an N95 respirator mask and eye protection /goggles, or a powered air-purifying respirator that provides eye protection.

Guidance for newborn care in baby born to COVID-19 positive or suspect mother

1. Rooming-in vs separation of mother and newborn at delivery
    a. Data from the National Perinatal COVID-19 Registry suggests that the risk of an infant testing positive for COVID-19 appears to be no greater if mother and infant room-in together using infection control measures compared to physical separation of the infant in a room separate from the mother. Currently the following is recommended regarding the care of mothers with confirmed or suspected COVID-19 and their well newborns:

- Mothers and newborns may room-in according to usual center practice.
- During the birth hospitalization, the mother should maintain a reasonable distance from her infant when possible. When mother provides hands-on care to her newborn, she should wear a mask and perform hand-hygiene. Use of an isolette may facilitate distancing and provide the infant an added measure of protection from respiratory droplets. If using an isolette, care should be taken to properly latch doors to prevent infant falls.
- A mother who is acutely ill with COVID-19 may not be able to care for her infant in a safe way. In this situation, it may be appropriate to temporarily separate mother and newborn or to have the newborn cared for by non-infected caregivers in mother's room.
- Healthcare workers should use gowns, gloves, standard procedural masks, and eye protection (face shields or goggles) when providing care for well infants. When this care is provided in the same room as a mother with COVID-19, healthcare workers may opt to use N95 respirators in place of standard procedural masks, if available.
- If non-infected partners or other family members are present during the birth hospitalization, they should use masks and hand hygiene when providing hands-on care to the infant.

b. If separated at delivery: Infant will be placed in an incubator so mom can see infant and then transported to the NICU or Pediatric unit for further care

- Sick full-term newborns or preterm newborns: Private room in NICU on enhanced droplet + contact isolation (airborne isolation for aerosol-generating procedures)
- One adult family member may visit if they are asymptomatic and are NOT PUI; visitors should wear gown, gloves, procedural mask while visiting
- If the infant requires ongoing medical care for any reason, it is recommended that the mother not visit her newborn until she meets CDC recommendations for suspending transmission-based precautions

2. Bathing

Bathing of infant will be performed as soon as possible after birth per CDC recommendations to prevent spread of disease through bodily fluids from birth.

3. Breastfeeding: The AAP strongly supports breastfeeding as the best choice for infant feeding. Several published studies have detected SARS-CoV-2 nucleic acid in breast milk. It is not yet known whether viable, infectious virus is secreted in breast milk, nor is it yet

established whether protective antibody is found in breast milk. Given these uncertainties, breastfeeding is not contraindicated at this time.

a. Mothers should perform hand hygiene before breastfeeding and wear a mask during breastfeeding.

b. If an infected mother chooses not to nurse her newborn, she may express breast milk after appropriate hand hygiene, and this may be fed to the infant by other uninfected caregivers.

c. Mothers of NICU infants may express breast milk for their infants during any time that their infection status prohibits their presence in the NICU.

4. Inpatient procedures

a. The number of caregivers and hospital personnel entering the patient room will be minimized to the greatest extent possible. Erythromycin, Hep B, and Vitamin K will all be given according to the normal schedule. The hearing screen may be deferred to outpatient at 14 days of life when newborn is not infectious.

b. If the infant requires CPAP, HFNC >2 liters/min as CPAP, or any form of mechanical ventilation, airborne precautions must be used until infection status is determined AND newborn is cleared of COVID-19 infection.

5. Infant testing for COVID-19

a. Hospitalized infants who develop symptoms should be tested at the time they develop symptoms. Otherwise, infants who become ill after discharge should present to care – ED or PCP as needed – and be evaluated/tested then. The incubation period is 2-14 days, so a negative test after birth does not rule out disease.

b. Testing should be done first at approximately 24 hours of age and again at approximately 48 hours of age.

c. If it is planned that a healthy newborn will be discharged prior to 48 hours of age, clinicians may choose to order a single test at 24-48 hours of age.

d. Obtain either a single swab of the nasopharynx; *or* a single swab of the throat followed by the nasopharynx; *or* two separate swabs from each of these sites, and submit for a single test. Place single swab in one viral transport media tube and send to lab for molecular testing.

e. Test results:
    i. If test is positive, consult ID and consider follow up testing of combined OP/NP specimens at 48 – 72-hour intervals until two consecutive negative tests >= 24 hours apart.
    ii. If test is negative, but newborn is symptomatic, continue isolation precautions x 14 days
    iii. If COVID-19 negative infant is born to a COVID-19 positive mother, consider repeat testing at 14 days of age, or sooner if infant becomes

symptomatic

Discharge Plan:

Asymptomatic COVID-19 positive newborn:

- Plan for frequent outpatient follow-up (either by phone, telemedicine, or in-office) through 14 days after birth.
- Use precautions to prevent household spread from infant to caregivers
- use this CDC guidance on use of masks, gloves and hand hygiene by caregivers in the home environment and by healthcare staff in the outpatient office practice.

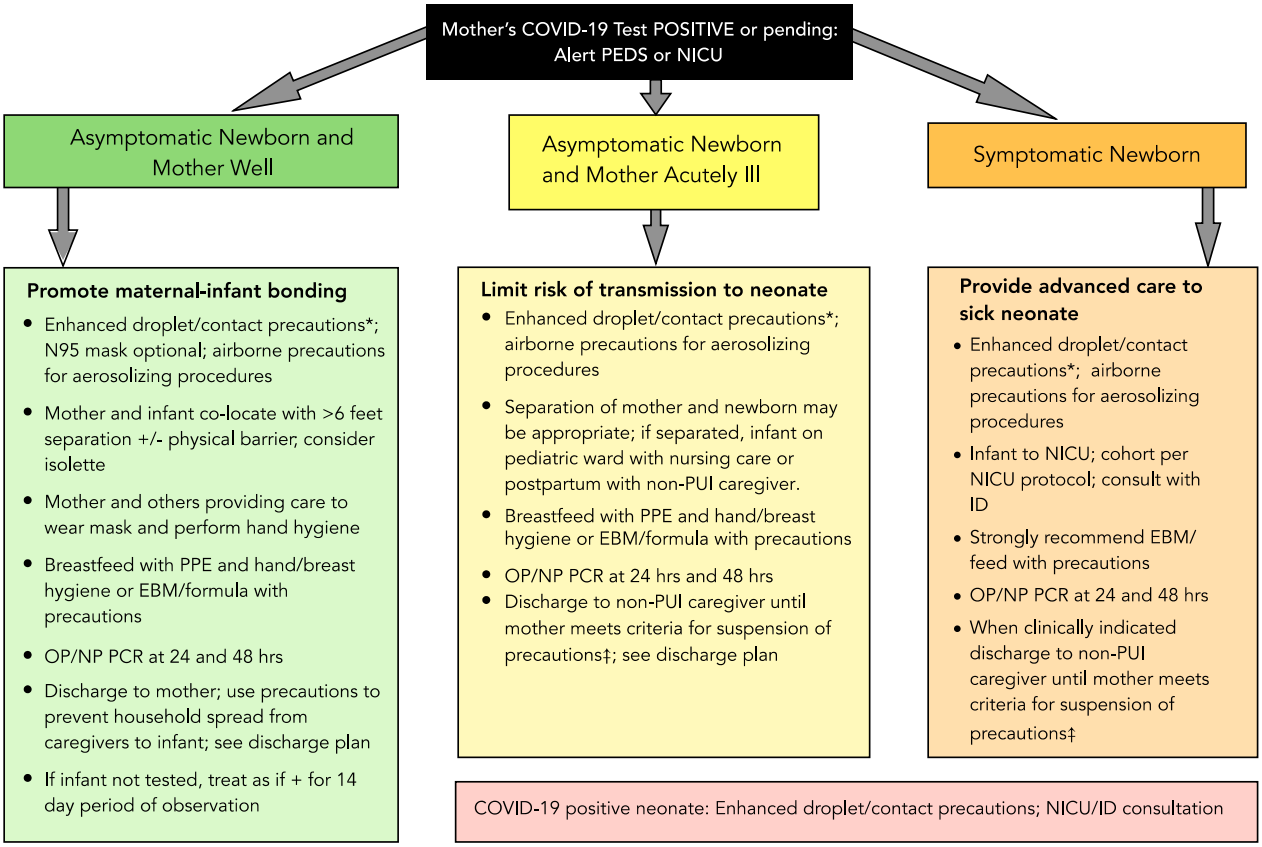
COVID-19 positive mom and asymptomatic COVID-19 negative newborn:

- Coordinate discharge and follow-up out-patient testing with PCP.
- Frequent outpatient follow-up (either by phone, telemedicine, or in-office) is recommended through 14 days after birth.
- Use precautions to prevent household spread from caregivers to infant; see the CDC guidance on use of standard procedural masks, gloves and hand hygiene in the home environment.
- While challenging in the home environment, mother should maintain a distance of at least 6 feet when possible, and use a mask and hand-hygiene when directly caring for the infant, until EITHER (a) she has been afebrile for 24 hours without use of antipyretics, and (b) at least 10 days have passed since her symptoms first appeared (or, in the case of asymptomatic women identified only by obstetric screening tests, at least 10 days have passed since the positive test).
- Other caregivers in the home who are persons under investigation (PUIs) for COVID-19 should use standard procedural masks and hand hygiene when within 6 feet of the newborn until their status is resolved.

Newborn not tested:

- Treat the baby as if virus-positive for the 14-day period of observation.
- Mother should still maintain precautions until she meets the criteria for non-infectivity as above.

Management of Full Term and Late Preterm Newborns - Maternal COVID-19 POSITIVE or Pending



* Enhanced droplet/contact precautions = gown, gloves, mask, eye protection (face shield or goggles)

‡ Criteria for suspension of precautions: EITHER resolution of fever and symptoms + at least 10 days since start of symptoms OR two negative COVID-19 tests > 24 hrs apart

ONCOLOGY/HEMATOLOGY

Considerations to determine if patients are high risk

- Older patients
- Poor performance status/nutrition status
- Length of time on chemotherapy – new versus months/years
- Patients under active chemotherapy
- Multi-agent chemotherapy more high risk than single agent chemotherapy
- Intravenous chemotherapy more high risk than oral "chemotherapy"
- Hematologic malignancies such as leukemia and lymphoma requiring chemotherapy are generally higher risk given the myeloablative nature of the regimens

Neutropenic Fever Considerations

- More common in patients being treated for Hematologic malignancies
- antibiotic recommendation is broad spectrum to cover for pseudomonas – cefepime and Zosyn are common
- General requirement is 48 hours of being afebrile, but if neutropenia subsides and there are several cases of COVID-19 in the hospital we can consider treatment at home
- Always call attending on call to review case

Blood Product Transfusions

- This may be required for some of our patients
- No change in protocol
- Ideally quicker turn-around time to get them in and out of the hospital ASAP

Inpatient chemo

- Small subset of patients (1-2% of all treatments are in the hospital)
- Only reason is logistical challenges
- Blood counts tend to be normal in house, but may be suppressed the week after

Version 7/23/2020

Anti-Coagulation Recommendations from the Department of Hematology & Oncology for Hospitalized Patients with COVID-19 at Ventura County Medical Center

Hematology guideline for COVID-19 has been prepared by VCMC hematology/oncology department. Due to the emerging and often conflicting data regarding COVID-19, this document is meant to guide clinicians. This guideline should be adapted to each specific patient based on the treating medical professional's independent professional judgment and consideration of the patient's needs, and any other unique circumstances.

For Medical-Surgical COVID-19 Patients NOT in the ICU:

- Standard VTE prophylaxis should apply to all admitted patients.
- For example enoxaparin 40mg SQ daily if CrCl>30 and heparin 5000 units SQ TID if CrCl<30. Consult dosing guideline for obese/renal failure patients.

For ICU patients or High-Risk non-ICU patients with COVID-19:

- **High risk non-ICU patients are defined as those on non-invasive ventilation, including high flow nasal cannula.**
- Given the elevated VTE risk, **VTE prophylactic doses are higher (intermediate dosing). VTE prophylactic dosage would apply to duration of hospitalization, even when stepped down to a lower acuity floor.** See table below for VTE prophylaxis dosages. Of note, higher dosage of VTE prophylaxis is considered off-label, but reasonable per consensus amongst specialists and other hospital protocols.
- Due to inconclusive and controversial data**,** full dose therapeutic anticoagulation for the purpose of VTE prophylaxis is NOT recommended. Per current assessment, risk of full dose anticoagulation for VTE prophylaxis outweighs the benefit at this time.
- Always assess the patients bleeding risk upon initiation anticoagulation
- Hold prophylaxis if platelets <25k or high risk bleeding (such as active bleeding/neurosurgical patients, etc). Replace prophylaxis with mechanical SCD's.
- Therapeutic anticoagulation (LMWH preferred) recommended in the following patients
    - with known DVT/PE,
    - or patients with recurrent clotting of intravascular access devices (arterial lines, central venous catheters,, CRRT)
    - or patients already on direct oral anticoagulants for Afib/VTE
- TPA can be considered for documented for DVT/PE per the usual indications (eg, limb-threatening DVT, massive PE)

VTE Dosing Weight Adjustment	CrCl ≥ 30mL/min	CrCl < 30mL
Standard	Enoxaparin 40mg BID	UFH 7,500 un
Obese (≥120kg or BMI ≥ 35)	Enoxaparin 0.5mg/kg BID* (max dose 100mg BID)	UFH 10,000u
Low Body Weight (< 60kg)	Enoxaparin 30mg BID*	UFH 7,500 un

For Admitted Patients Already on Some Form of Anticoagulation:

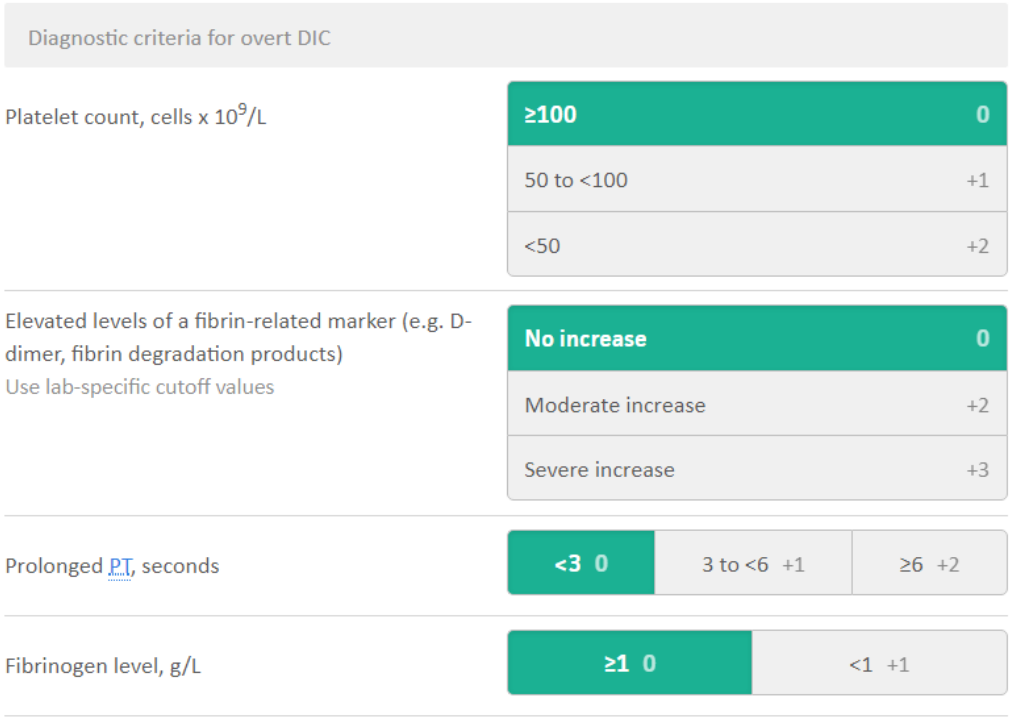
- Therapeutic anticoagulation is continued as inpatient.
- For patients already on therapeutic anticoagulation and admitted for COVID infection, conversion from DOAC to LMWH/UFH is preferred due to flexibility of dosing as well as decrease in drug-drug interactions.
- For patients on "maintenance" DOAC in the form of indefinite anticoagulation for history of VTE (such as rivaroxaban 10mg daily), recommend conversion to THERAPEUTIC LMWH dosing. The rationale is that even at a lower intensity DOAC dose, the purpose of anticoagulation is still therapeutic anticoagulation. However, if a patient is on prophylactic DOAC (such as rivaroxaban 10mg in the post-surgical patient), would convert to PROPHYLACTIC LMWH dosing since the original intent is prophylaxis.
- If in doubt, consult hematology/cardiology/surgery for case specific discussion

Routine Testing for DIC:

- All admitted patients should have baseline coags PT/PTT/INR, fibrinogen, and D-dimer. Repeat testing frequency as indicated clinically
- For ICU patients, PT/PTT, fibrinogen, and D-dimer should be tested daily

DIC Work-up in COVID-19 Patients:

- COVID-19 patients have increased incidence of DIC and multi-organ dysfunction
- In suspected DIC cases work-up with PT/PTT, D-dimer, fibrinogen
- Consult ISTH DIC score as an aid to diagnosis – MD Calc (https://www.mdcalc.com/isth-criteria-disseminated-intravascular-coagulation-dic)
  - DIC score <5- not suggestive of DIC, repeat within next 1-2 days and manage clinically as appropriate
  - DIC score >5- compatible with overt DIC and repeat scoring daily



DIC Management in COVID-19 Patients:

- Management of DIC similar to usual protocol.
- Supportive care if not bleeding
    - FFP or cryo if <150
- Platelet transfusion if below 30k
    - Consider holding anticoagulation at this point
- Give blood products if bleeding
    - FFP for bleeding with elevated PT/PTT
    - Avoid tranexemic acid due to concern for thrombosis
- Systemic Anticoagulation indicated in the following:
    - New VTE or organ failure due to clot

Possible continued VTE prophylaxis following hospital discharge:

- Prospective data is lacking with need for more information. Any decision to use post-discharge thromboprophylaxis should consider the individual patient's VTE risk factors, including reduced mobility and bleeding risk as well as feasibility.
- Not all discharged patients need to be on VTE prophylaxis
- It is reasonable to utilize the modified IMPROVE score (MARINER trial) and offer post discharge outpatient VTE prophylaxis when patients have a score of 4 or more, or score of 2 to 3 with D-dimer >2x ULN.
- VTE prophylaxis would consist of Rivaroxaban 10mg daily 31 to 39 days

- Not enough data for VTE prophylaxis recommendations for the never hospitalized outpatient, although can consider utilizing same IMPROVE score as outlined

The subject must be at increased risk for VTE by the total modified IMPROVE VTE Risk Score assessed at screening and verified at randomization.
a. If the total modified IMPROVE VTE Risk Score is ≥4, the subject meets this inclusion criterion.
b. If the total modified IMPROVE VTE Risk Score is 2 or 3, a D-dimer >2X ULN must have been obtained after the beginning of the index hospitalization and before randomization

Modified IMPROVE VTE Risk Score	
VTE Risk Factor	VTE Risk Score
Previous VTE	3
Known thrombophilia(a)	2
Current lower limb paralysis or paresis(b)	2
History of cancer(c)	2
ICU/CCU stay	1
Complete immobilization(d)≥1 day	1
Age ≥60 years	1

CCU= cardiac care unit; ICU= intensive care unit; VTE= venous thromboembolism.
a: A congenital or acquired condition leading to excess risk of thrombosis (eg, factor V Leiden, lupus anticoagulant, factor C or factor S deficiency).
b: Leg falls to bed by 5 seconds, but has some effort against gravity (taken from NIH stroke scale).
c: Cancer (excluding non-melanoma skin cancer) present at any time in the last 5 years (cancer must be in remission to meet eligibility criteria)
d: Immobilization is being confined to bed or chair with or without bathroom privileges.

References:

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- https://www.onlinejacc.org/content/75/23/2950
- https://link.springer.com/article/10.1007%2Fs11239-020-02138-z
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PULMONARY

Guideline for COPD, adult and pediatric asthma exacerbation during COVID-19 pandemic at VCMC

This guideline is based on discussion with pulmonary/critical care, pediatric critical care and emergency medicine colleagues, GOLD recommendation, GINA recommendation and Cedars-Sinai

Patients with COPD and asthma are at high risk for serious complications due to COVID-19. Patients that develop an acute exacerbation of COPD or asthma may continue their bronchodilator regimen including inhaled or oral corticosteroids. Goal oxygen saturation is 90% or greater.

Oral/IV corticosteroids can be prescribed during acute exacerbation of COPD and asthma in the COVID-19 pandemic.

Nebulizers should be avoided (if possible) for acute exacerbations due to increased risk of COVID-19 transmission to other patients and health care workers.

NIV therapy with BPAP and CPAP to be avoided due to increased risk of COVID-19 transmission to other patients and health care workers.

For pediatric patients attempt therapy w/MDI and regular NC O2, but if persistently hypoxic, increased work of breathing, or poor aeration proceed to HFNC and nebulizer treatments at the attending physician's discretion.

Use MDIs with spacer chamber device during acute exacerbation.

Continue maintenance bronchodilator regimen including inhaled corticosteroid during the acute exacerbation.

No routine PFT/spirometry to reduce risk of COVID-19 transmission.

Maintain euvolemic fluid status. Fluid boluses allowed for septic or hypovolemic patients.

Medication Management

Adult Severe Asthma and COPD:

- Albuterol MDI 4-8 puffs q 20 min x 3using chamber, then q 1 hr prn
- Ipratropium MDI 4-8 puffs q 20 min x 3 using chamber, then q 1 hr prn
- Magnesium sulfate 2 gm IVPV over 20 min (Only for asthma not COPD)
- Prednisone 60 mg po, or Solumedrol 125mg IV for severe exacerbation

Pediatric Severe Asthma:

- Albuterol MDI 4-8 puffs q 20 min x 3using chamber, then q 1 hr prn
- Ipratropium MDI 4-8 puffs q 20 min x 3 using chamber, then q 1 hr prn
- Magnesium sulfate 25 mg/kg IVPV over 20 min
- Solumedrol 1 mg/kg IV Q6H for severe exacerbation

See VCMC COVID-19 Respiratory Care Guidelines

PSYCHIATRY

1. CSU
    a. Telepsychiatry expansion
        i. 3 CSU shifts successfully covered exclusively via telepsych last week
        ii. SP and CSU currently have dedicated camera and Zoom
        iii. VCMC telepsych currently via Zoom app/site on computer/iphone/tablet (no dedicated camera yet)
        iv. 5150 evaluation and decertification via telepsych approved by patient's rights
2. IPU
    a. In terms of a surge, our biggest worry is having a COVID + patient in the IPU space. We are not equipped well to manage a COVID + patient in our space.
    b. We are currently implementing measures to minimize risk
        i. staff wearing masks
        ii. increased hand hygiene (soap, limited hand sanitizer)
        iii. no visitors
        iv. patient education
        v. restricting numbers in groups
        vi. staff screening
    c. Telepsychiatry
        i. Could be rolled out in case of COVID + patients in IPU
        ii. We have 2 cameras for IPU
        iii. MD's conversations regarding rapid roll out and Zoom use have taken place
        iv. Zoom accounts available through TBH immediately