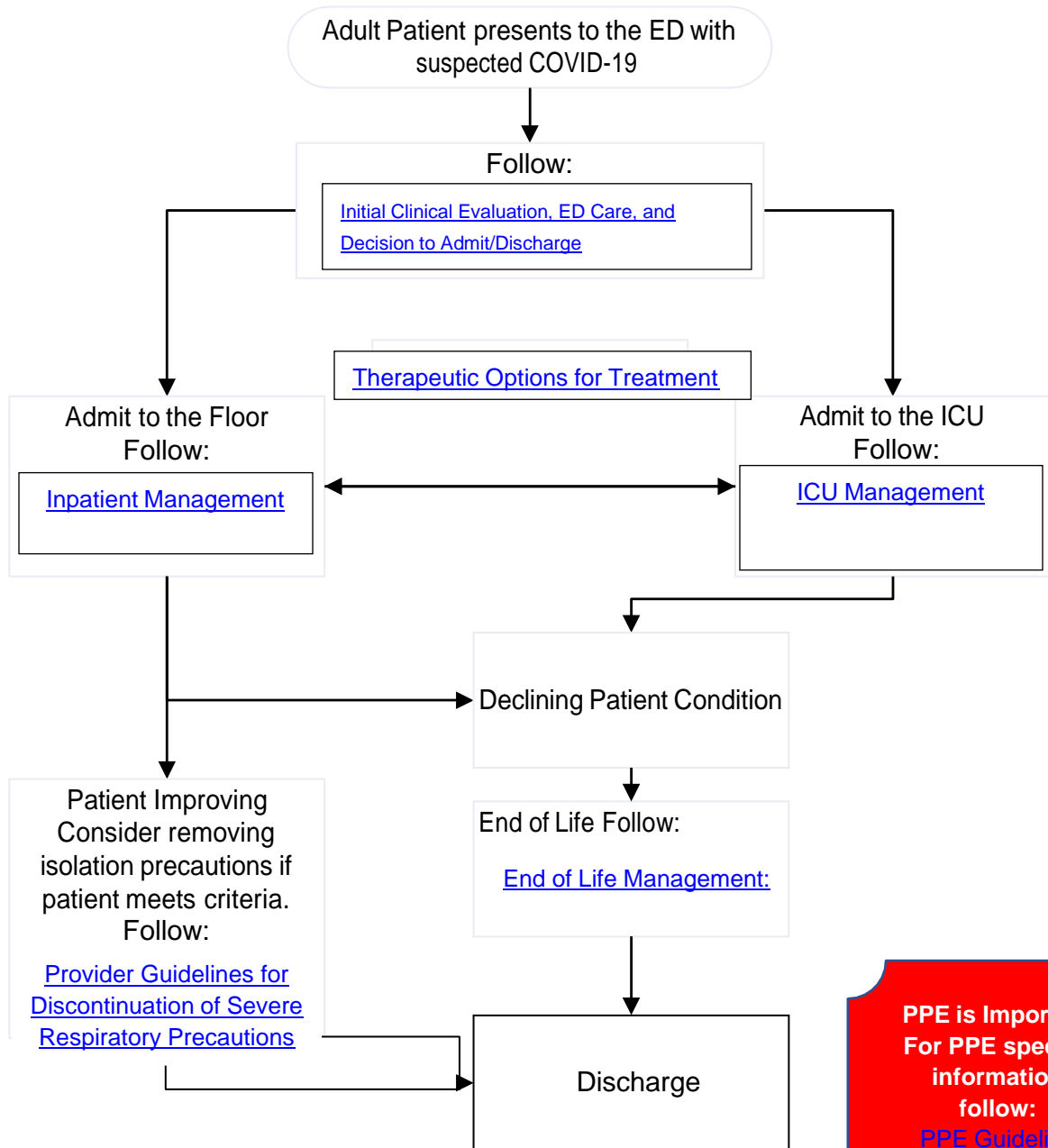


# Clinical Pathway: Evaluation and Management of Adult COVID-19, Inpatient

Updated: November 12, 2021

## Clinical algorithm:



**PPE is Important For PPE specific information follow: [PPE Guideline](#)**

# Clinical Pathway Summary

**CLINICAL PATHWAY NAME:** Evaluation and Management of Adult COVID-19, Inpatient

**PATIENT POPULATION AND DIAGNOSIS:** Adult patients requiring evaluation and management of COVID-19 related illness in the Emergency Department (ED) or Inpatient/Observation Units

**APPLICABLE TO:** All Spectrum Health Sites

**BRIEF DESCRIPTION:** This clinical pathway focuses on the evaluation and management of adult patients presenting to the ED with Covid-19 related illness, and those that subsequently require admission to inpatient or observation units. This work includes guidance surrounding laboratory and imaging studies, symptomatic management of cough and diarrhea, management of severe respiratory illness, therapeutic options for treatment of Covid-19, monitoring and management of complications related to therapeutics such as steroid induced hyperglycemia and acute liver injury, and end of life management of the declining Covid-19 patient. This pathway is intended to support patient facing clinical providers with resources necessary provide optimal to care for adult patients with Covid-19 related illness in the ED and inpatient settings.

**OPTIMIZED EPIC SUPPORT:** Epic Orderset - COVID-19 [30410001461]

**OVERSIGHT TEAM LEADER(S):** Steve Fitch MD, Raymond Scurek MD, Michael Brown MD, Stephanie Burdick MD, David Vandyke MD, Umair Ahmed MD, Gretchen Roe MD, Gordana Simeunovic MD, and Derek Vanderhorst PharmD

**OWNING EXPERT IMPROVEMENT TEAM (EIT):** COVID-19

**MANAGING CLINICAL PRACTICE COUNCIL (CPC):** COVID-19

**OTHER TEAM(S) IMPACTED:** Acute Health, Adult Emergency

**IMPLEMENTATION DATE:** January 1, 2021

**LAST REVISED:** November 12, 2021

**FOR MORE INFORMATION, CONTACT:** Dr. Stephanie Burdick

# Clinical pathways clinical approach

## TREATMENT AND MANAGEMENT:

### Introduction

Covid-19 is a respiratory illness caused by the novel coronavirus SARS-COV2. Some individuals may have minimal to no symptoms of Covid-19 if they contract the illness, while others may develop fevers, chills, cough, fatigue, myalgias, headache, loss of taste/smell, sore throat, congestion, diarrhea, headache, nausea or vomiting, or shortness of breath. Symptoms may appear 2-14 days after exposure to a contagious individual. Some people are more likely to become severely ill, including older adults and people with medical conditions such as obesity, chronic kidney disease, diabetes, cancer, COPD, chronic kidney disease, pregnancy, smoking, or patient's whose immune system is compromised. While there have been many learnings about Covid-19 since cases first appeared in west Michigan in spring of 2020, there remains much uncertainty about the optimum management and pharmacologic treatment for patients with Covid-19 disease. This pathway is intended to support a patient facing adult clinical provider with all the resources necessary to care for a patient with Covid-19 related illness in the ED and inpatient settings.

### PPE

The most important recommendation surrounding the care of patient's with Covid-19 is to use the appropriate PPE to protect yourself from becoming ill. This includes reviewing appropriate donning and doffing procedures, ensuring one is appropriately fit-tested for an N95 mask, and understanding what precautions must be taken for aerosolizing procedures.

[PPE Guidelines](#)

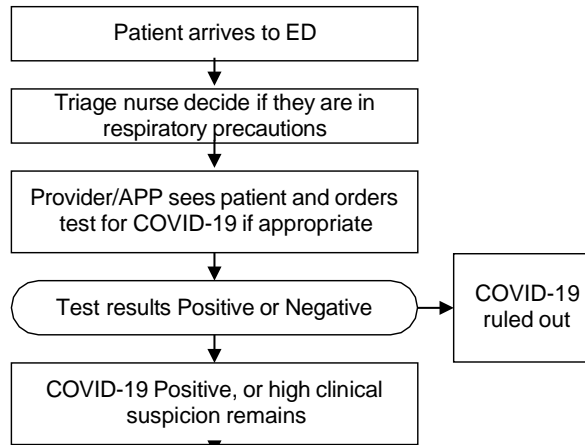
[N-95 Toolkit](#)

[N-95 Seal Check](#)

[Donning and Doffing Guidance](#)

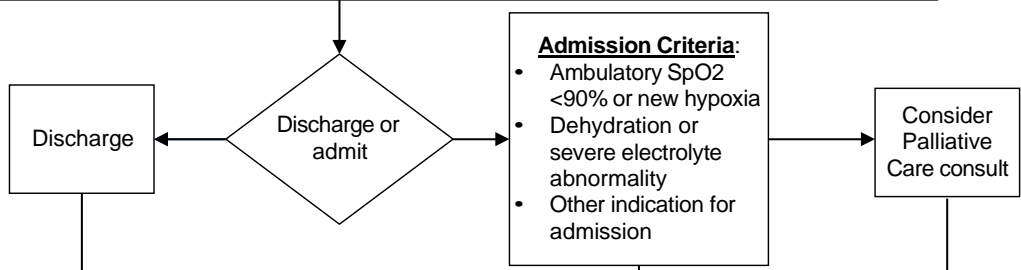
[PAPR Guide](#)

## Initial Clinical Evaluation, ED Care, and Decision to Admit/Discharge



Additional patient specific evaluation and management. **Consider:**

- IV fluid resuscitation (goal=euvolemia)
- Chest x-ray and labs as indicated or if admitted
- Symptomatic management with antiemetics, anti-diarrheal agents, anti-pyretics
- Avoid routine administration of antibiotics (not indicated in Sepsis protocols unless a bacterial infection is suspected)
- Avoid initiation of Remdesivir or Convalescent Plasma therapies in the ED - outside of clinical trials.
- Start dexamethasone in admitted patients with a new or worsening oxygen requirement (for those on baseline O2 supplementation)
  - Initial dose = 6 mg IV or PO
  - If that patient has wheezing/bronchospasm requiring steroids, consider 10 mg IV or PO



**Discharge**

- Provide COVID-19 Discharge Instructions
- Provide isolation/quarantine instructions for the patient and close contacts
- Provide return precautions for
  - Increased dyspnea or worsening pulse oximetry (if the patient has a pulse oximeter)
  - Inability to take in oral fluids
- Any additional patient concerns
- For patients with new or increasing oxygen requirements, discharge home from the Emergency Department on home O2 is Discouraged.

**Admission Criteria:**

- Ambulatory SpO2 <90% or new hypoxia
- Dehydration or severe electrolyte abnormality
- Other indication for admission

- If not intubated, admit to hospitalist service.
- If intubated, admit to ICU-CC1

**Consider Palliative Care consult**

- Patient with multiple comorbidities or a life limiting illness (end stage CHF, COPD, dementia, cancer, CNS disease, ESRD)
- Dependency for ADLs and/or albumin <2.5
- Severe hypoxia or respiratory failure
- COVID positive with DNR DNI code status
- Complex goals of care discussions
- Complex social determinants
- Assistance with end of life symptom management
- Coordination for discharging home with Spectrum Health Hospice support

If admission is recommended, but the patient refuses:

- Consider arranging home oxygen if indicated
- If there is new hypoxia or increased oxygen requirement, then give:
  - Dexamethasone 6mg IV or PO AND
  - Provide a prescription for dexamethasone 6 mg daily x 9 days
- Reinforce strict return precautions

## ED Management

ED management consists of evaluation of either an undifferentiated patient that may have Covid-19 or evaluation of a patient with a prior positive Covid-19 test. Initially, a triage nurse determines if the patient requires severe respiratory precautions. A provider then evaluates the patient and orders appropriate testing while simultaneously initiating any appropriate treatments. The provider evaluates results, re-evaluates the patient and orders additional treatments or tests. The provider determines the patient's disposition. Appropriate follow up instructions are given to discharged patients and a provider-to-provider call is made for hand-off of any admitted patients. Discharged patients are given appropriate instructions regarding isolation/quarantine, prescriptions (if indicated), and return instructions. Admitted patients are started on dexamethasone, if indicated.

When a patient arrives in the ED, a triage nurse uses a pre-specified set of criteria to determine if the patient requires severe respiratory precautions. These precautions are continued throughout the ED course unless discontinued by the ED provider. If the patient's test for Covid-19 comes back negative, the provider decides whether to continue or discontinue severe respiratory precautions based on the post-test clinical suspicion.

A provider evaluates the patient and determines appropriate testing and initial treatment. The most common initial testing may include a nasopharyngeal PCR for SARS-CoV-2, routine lab testing, and/or a single view chest xray. Common initial treatments may include supplemental oxygen, inhaled albuterol via MDI (if wheezing/bronchospasms is present), IV fluids and/or antipyretics. Antitussives and antidiarrheals may occasionally be used. Steroids may be started if indicated for wheezing/bronchospasm or in the hypoxic Covid-19 patient who needs supplemental oxygen.

In the patient with initially unknown Covid-19 status, the nasopharyngeal PCR may or may not detect SARS-CoV-2. If the PCR test is positive, it can be presumed that the patient has Covid-19. In some cases where SARS-CoV-2 is not detected, there may still be a high level of clinical suspicion for Covid-19 (e.g., imaging findings consistent with COVID-19 or a highly suggestive clinical picture) and the patient should be managed accordingly.

To help inform the decision to admit or discharge a Covid-19 patient, an ambulatory pulse oximetry on room air or on their baseline level of oxygen supplementation. Patients with new hypoxia (<90%) are at high risk for deterioration and admission is recommended. Other reasons for admission may include significant dehydration or electrolyte abnormalities or various other comorbid conditions.

For the hypoxic Covid-19 patient on supplemental oxygen but without wheezing/bronchospasm, we recommend giving 6 mg of dexamethasone IV or po in accordance with the protocol in the RECOVERY trial. For the Covid-19 patient with wheezing/bronchospasm who requires admission, we suggest giving 10 mg of dexamethasone IV or po.

We do not recommend starting other inpatient treatments such as Remdesivir or convalescent plasma in the ED. These will be ordered by the inpatient team. We also do not recommend ordering 'inpatient Covid-19 labs' such as d-dimer, ferritin, CRP, etc. unless otherwise indicated. These will be ordered by the inpatient team.

For the deteriorating patient requiring more aggressive oxygen support, we recommend high flow nasal cannula preferentially over BiPAP due to decreased aerosolization. For the patient that fails high flow

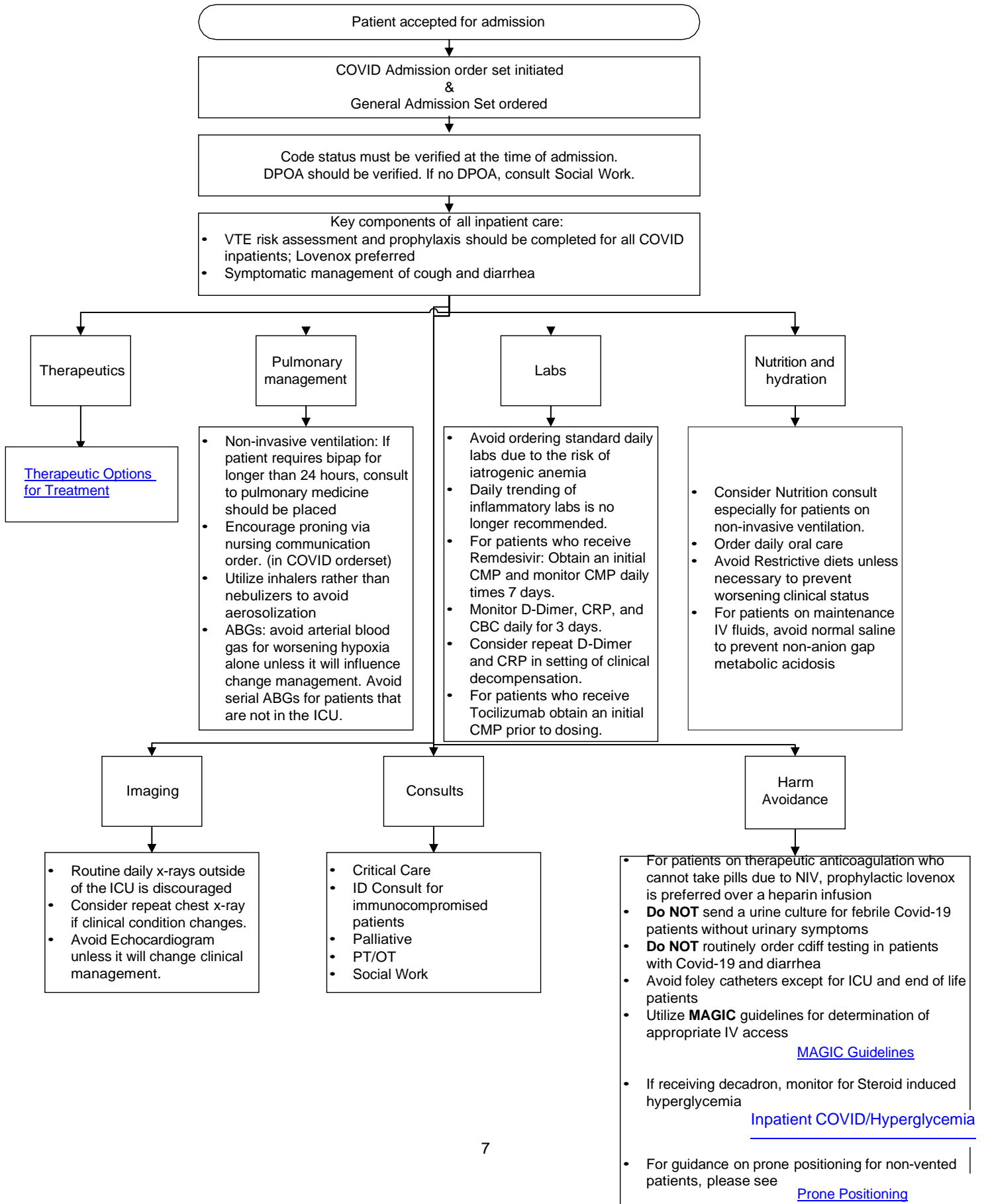
nasal cannula, we suggest a trial of BiPAP. For the patient that fails BiPAP or if BiPAP is contraindicated, endotracheal intubation will likely be necessary. Appropriate PPE must be worn by the proceduralist, respiratory therapist and any other staff in the room. It is recommended that PPE include a PAPR or an N95 mask. Video laryngoscopy may be preferred over direct laryngoscopy given that this technique allows the proceduralist to be further from the airway.

For the discharged patient, provide appropriate isolation/quarantine instructions, including quarantine of any close contacts. Provide appropriate return instructions for worsening dyspnea, inability to take in oral fluids, or worsening pulse oximetry (for those that have a pulse oximeter at home). Provide prescriptions as indicated.

For certain patients, a Palliative Care consult may be indicated. Please consider this for patients that meet criteria on the algorithm above.

For admitted patients, give the initial dose of dexamethasone (if indicated) and complete a provider-to-provider hand off via the call center.

# Inpatient Management



## Inpatient Management

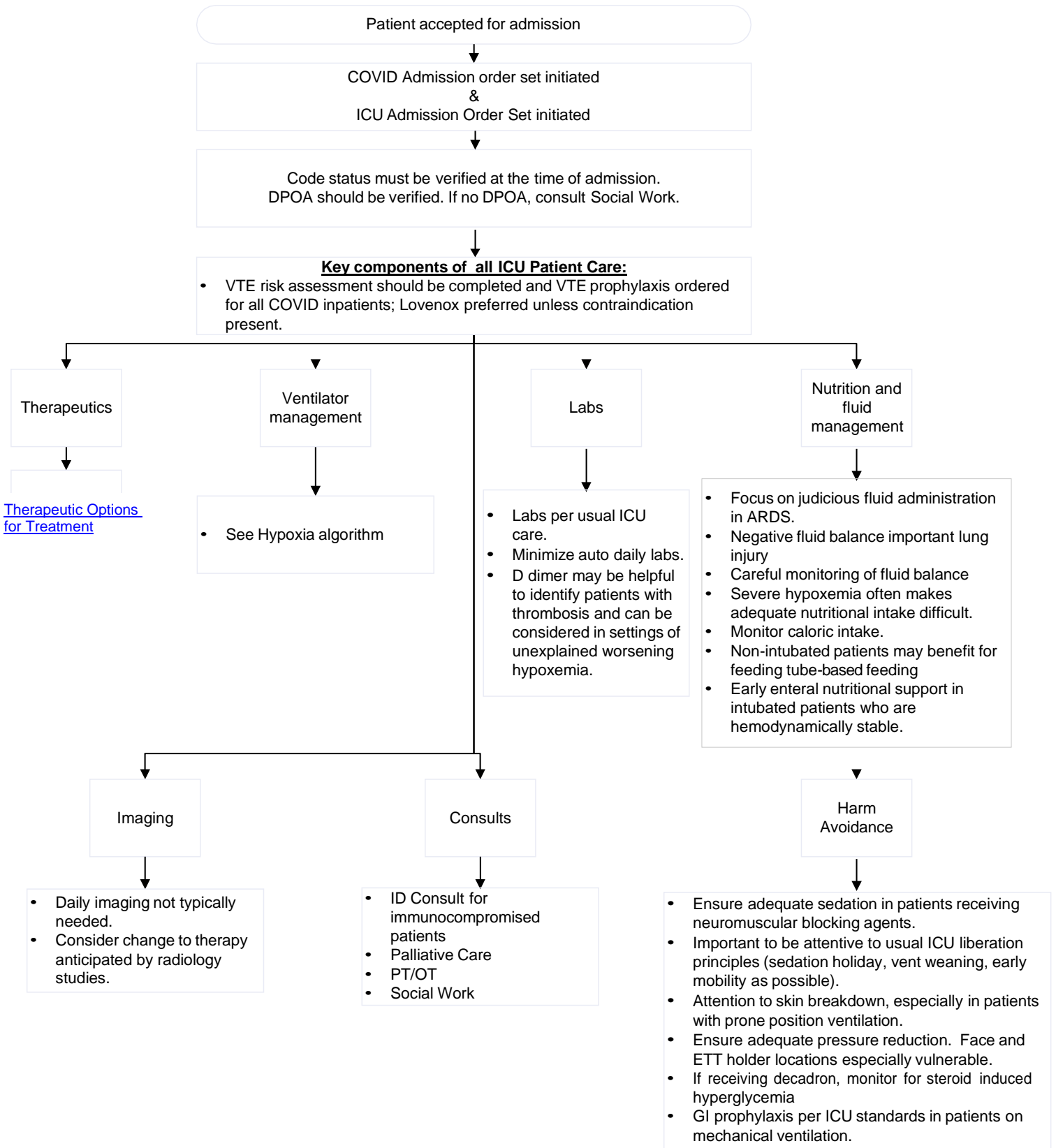
Inpatient management of a patient with covid-19 consists of supportive care, covid-19 related therapeutic treatments, monitoring and treatment of complications related to covid-19, and transition to critical care or end of life management if necessary. All patients admitted for conditions related to covid-19 should have code status discussed and verified by the admitting physician at the time of admission. The admitting team should also discuss whether the patient has a designated power of attorney for healthcare who would be able to make medical decisions for the patient in the setting of incapacitation. If the patient does not have such documentation, a social work consult should be placed to assist the patient with making this designation and filling out the appropriate paperwork. This will ensure that all patients have their wishes honored in the case that they experience further medical decline.

At the time of admission, the Covid-19 order set should be utilized to guide appropriate care. The VTE navigator should be completed and all patients with covid-19. Due to increased risks of thrombosis in this patient population, all Covid-19 patients should be placed on VTE prophylaxis unless contraindications are noted. Supportive care involves ensuring appropriate oxygenation with oxygen delivered by nasal cannula or noninvasive ventilation, along with symptomatic management of cough and diarrhea, as well as volume status management with IV fluids or diuretics. Bacterial pneumonia is uncommon early in the course of covid-19 pneumonia, thus routine administration of antibiotics is not encouraged. Procalcitonin should not be used to drive the decision to initiate or withhold antibiotic therapy. In addition, if a patient remains clinically stable, a daily chest xray does not need to be performed and should be reserved for patients with a change in respiratory status. For Covid-19 patients requiring Bipap for >24 hours, this pathway team recommends a consult be placed to the pulmonary team for assistance with respiratory management. The rationale for this includes significant risk for pressure-related pulmonary damage with prolonged use of bipap in this patient population, as well as high risk for subsequent decline with need for invasive mechanical ventilation.

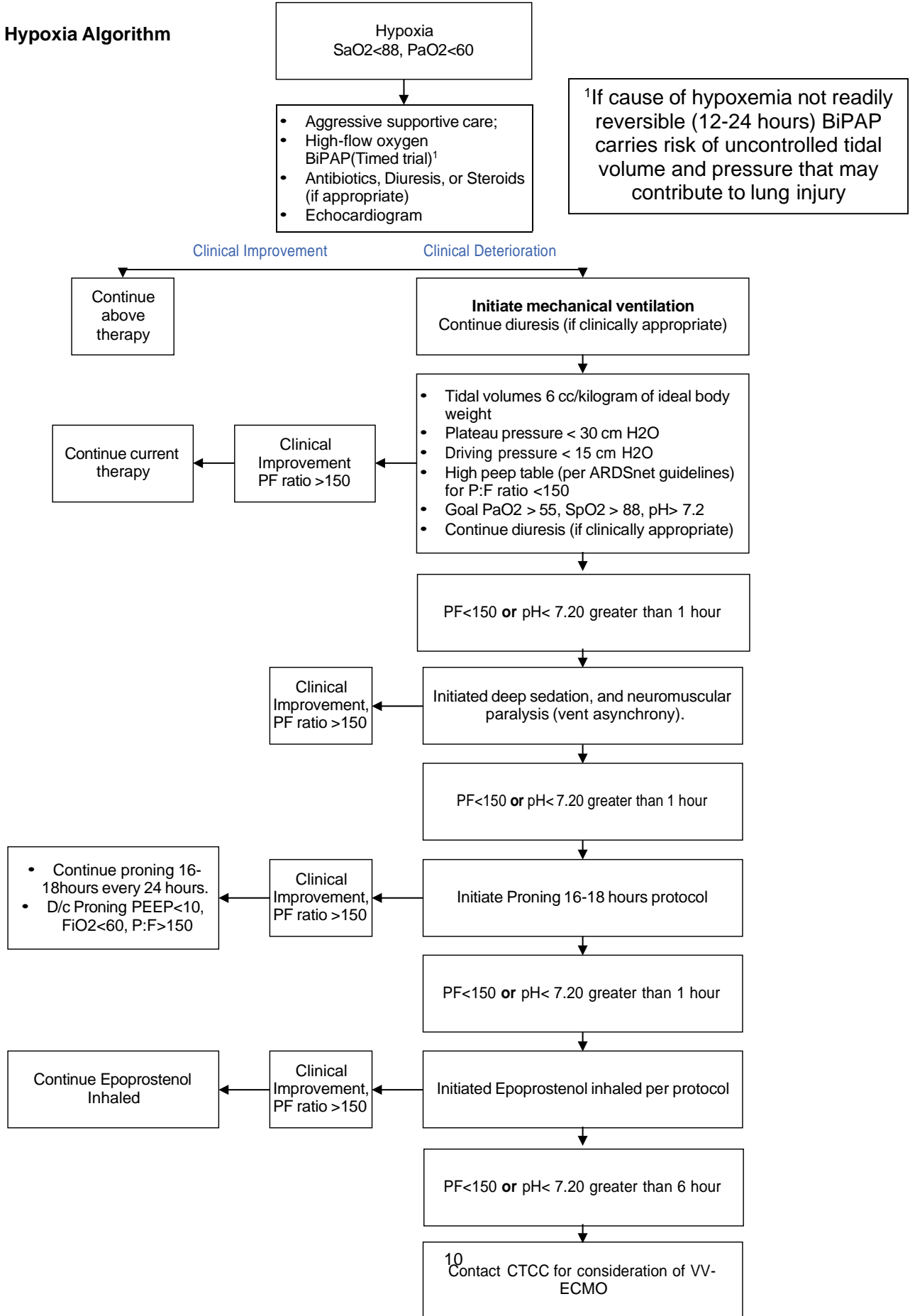
This pathway team discourages ordering routine labs in patients outside of the intensive care unit, including "covid labs," unless the results will actively change clinical management. Inflammatory labs such as ferritin and CRP do not require daily monitoring unless there is suspicion for HLH-related illness for which anakinra or tocilizumab could be considered on a case-by-case basis. For patients receiving Remdesivir, liver enzymes should be monitored daily and for three days after discontinuation of the drug. D dimer may be useful for patients with an abrupt respiratory decline or signs and symptoms consistent with deep vein thrombosis or pulmonary embolism. This pathway also includes guidance surrounding management of steroid induced hyperglycemia for patients receiving dexamethasone. Many of these patients will require escalating doses of insulin. See [Inpatient COVID/Hyperglycemia](#). Nutrition consultation is encouraged for patients with poor oral intake, significant nausea, and those requiring high levels of oxygen or non-invasive ventilation. For further discussion of covid-19 related therapeutics for adult inpatients, see the Therapeutics Options for Treatment [here](#).



# ICU Management



# Hypoxia Algorithm



## **End of Life Management:**

Our Spectrum Health Hospice team can assist with symptom management and provide interdisciplinary support to provide an exceptional end of life experience. If the desire of the patient and family is to transition out of the hospital, they will help with discharge planning to the appropriate location as quickly as possible. Patients who require inpatient hospice support for symptom management can be admitted GIP (General Inpatient Hospice) if the patient meets criteria. Choice of hospice is offered for each patient by care management prior to referral.

Spectrum Health Palliative Care and Hospice can be reached directly by Perfect Serving **Palliative Care SHMG** or having the **care manager or unit MSW place an Allscripts referral to Hospice**.

### **See end of life toolkit below:**

This a resource if we are in a situation where the Hospice and Palliative team is not immediately available which could happen in a red surge state.

\*Please note, these links lead to the Spectrum Health Insite Pages and are not available on spectrumhealth.org

[Guide For Symptom Management at End of Life - Providers](#)

[End of Life Communication Guidelines - COVID-19](#)

[Communication Guidelines COVID 19 Poor Prognosis Limited Options](#)

[Provider Tip Sheet for Discharging a Comfort Care Patient](#)

# Inpatient COVID/Hyperglycemia

Initiate insulin therapy for blood sugars > 180 mg/dL  
 Treatment target – 140-180 mg/dL

Diabetes Mellitus 2/Stress/Steroid-induced Hyperglycemia

- Basal Bolus Insulin calculation total daily dosing 0.6-0.8 u/kg (40% basal/60% bolus split)
- Use of DPP-4s – Sitagliptin/Januvia (renally dosed). Italian study with modest benefit.\*
  - No known contraindications – h/o pancreatitis, NPO status
- If high dose insulin needs occur restrictive carb diets can help
- reduce insulin requirements  
**COVID inflammatory response TDD can be > 1u/kg**

\*There is some retrospective data that suggests Sitagliptin is associated with improved outcomes for inpatient diabetics with COVID-19. Based on this information, use of Sitagliptin in type 2 diabetics with COVID-19 can be considered on a case by case basis until discharge.

Sitagliptin should not be used in patients without type 2 diabetes.

See dosing guidelines below.

Marked Hyperglycemia/steroid start/critically ill/Change in Nutrition status (TF start)  
 Initiate Endotool.

Tube Feedings:

- Similar for TDD calculating.
- Emphasize 60% bolus dosing q4 hours (if on steroids).
- Typically, DGMS consult.
- Ideally encourage nutrition 12 or 24 hour runs.
- Try to delineate NPO/TF or PO nutrition.
- Please use TF specific bolus order set (Continuous/Nocturnal)
- Nutrition Services manages TPN, DGMS is not involved

Endotool Concepts

- DKA/HHS MUST be managed in the Critical Care space (Hospital Protocol).
- Bed utilization is an issue.
- Hyperglycemia, resolved DKA and persistent IV insulin management can be provided on approved floors.

Diabetes Mellitus 1  
 Use home dosing for baseline, otherwise, TDD ~ 0.3-0.5 u/KG  
 Steroid use typically 20% increased need (40/60 split)

When to Consult

- High dose Insulin requirements (> 1u/kg TDD),
- ET transitions
- New to insulin at discharge
- Known to DGMS in outpatient clinic
- Poor renal function
- Complicated nutrition plans.

**Encourage consultation requests > 48 hours prior to anticipated Discharge/Curbside/Perfect**  
**Serve messages are always welcomed**

**Sitagliptin Dosing:**  
 eGFR ≥ 50 mL/min/1.73m<sup>2</sup>: Sitagliptin 50mg twice daily  
 eGFR ≥ 30 to < 50 mL/min/1.73m<sup>2</sup>: Sitagliptin 50mg once daily  
 eGFR < 30 mL/min/1.73m<sup>2</sup>: Sitagliptin 25mg once daily  
 Hemodialysis or Peritoneal Dialysis: Sitagliptin 25mg once daily

## Spectrum Health Medical Group, Diabetes & Endocrinology

“Is it time to stop the I.V. insulin?” Checklist:

- The current time is between 07:00 and 18:00. (Do not stop IV insulin during the night.)
- The patient’s blood sugar is less than 180 mg/dl and well controlled on EndoTool.
- DKA has resolved and patient has been appropriately resuscitated with IV fluids.
- BG < 180 mg/dl
- Anion Gap < 18 mEq/L
- Serum Bicarbonate (HCO<sub>3</sub>) ≥ 18 mEq/L
- Venous pH > 7.30
- The patient is not critically ill and has stable blood pressure and respiratory status without use of pressor medications.
- The patient’s nutritional status is stable for the next 24 hours.
- Nausea and vomiting are resolved
- No starting or stopping or changing tube feeding rates or products.
- No starting or stopping or changing TPN
- surgical or other procedures are planned in the next 24 hours.
- ABG patients: Today is POD #2 or later. (Do not consider stopping IV insulin before 09:00 on POD#2)

If **ALL** the above conditions are true, then you may consider transition to subcutaneous insulin.

Please discuss with the attending physician or DGMS during daytime rounds.

Please contact **Spectrum Health Diabetes & Glycemia Management Service (DGMS)** for assistance.

A SHMG Diabetes & Endocrinology provider can be reached 24hrs/day via PerfectServe Messaging System.

## References:

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