Horizon Health Network

SJRH Emergency Department COVID-19 Clinical Treatment Guidance
Standard of Practice

POLICY
This document shall guide the clinical management of patients suspected or proven to harbor COVID-19 as indicated by current evidence as of the date of the most recent version and is supplemented by the SJRH EM COVID-19 Clinical Treatment Guidance Algorithm (appendix 1).

DIRECTLY AFFECTED
Physicians and staff providing frontline clinical care to patients presenting to the Emergency Departments (EDs) in the Saint John area, and Grand Manan.

CASE DEFINITIONS

GNB Directive (13 April 2020):
Chief Medical Officer of Health, Province of NB advocates testing for any patient displaying >2 of: fever (T>38.0C), new/exacerbated chronic cough, runny nose, or headache.

Public Health Agency of Canada Interim Case Definitions (2 April 2020)

Exposure Criteria
Travel to an affected area (including inside Canada).

OR
Had close contact with a person with acute respiratory illness (ARI) who traveled to an affected area (including inside Canada) within 14 days prior to onset of illness.

OR
Participated in a mass gathering identified as a source of exposure (e.g. conference).

OR
Had laboratory exposure to biological material (e.g. primary clinical specimens, virus culture isolates) known to contain COVID-19.

Suspect
Two or more of: fever, cough (new or exacerbated chronic), sore throat, runny nose, or headache AND meets exposure criteria OR has had close contact with probable case.

Probable
A person (who has had a laboratory test) with a fever (T>38.0C) OR new onset/exacerbation of chronic cough AND who meets the exposure criteria and in whom a laboratory diagnosis of COVID-19 is inconclusive.

OR
A person (who has not had a laboratory test) with fever (T>38.0C) or new onset/exacerbation of chronic cough AND has had close contact with a confirmed case of COVID-19 OR lived/worked in a facility known to be experiencing and outbreak of COVID-19 (e.g. long-term care, correctional facilities).

Confirmed
A person with laboratory confirmation of infection with the virus that causes COVID-19 performed at a community, hospital, or reference laboratory running a validated assay.

NOTE: This is a CONTROLLED document. Any document appearing in paper form is not controlled and should ALWAYS be checked against the electronic version prior to use.
DEFINITIONS (other):
Aerosol Generating Medical Procedures (AGMPs): include but are not limited to high-flow oxygen, nebulized medication, high-flow nasal oxygen/Optiflow, CPAP/BiPAP, bag-mask ventilation (BVM), open suctioning, intubation, CPR, surgical airways.
At Risk Conditions: age over 65, end organ dysfunction, coronary artery disease (CAD), diabetes mellitus (DM), congestive heart failure (CHF), Chronic lung disease (Chronic obstructive pulmonary disease, asthma, cystic fibrosis), hypertension (HTN), immunocompromised/suppressed.

SEVERITY-BASED CLINICAL MANAGEMENT
Patients should be risk stratified and subsequently managed using triage vital signs and initial clinical assessment using the National Early Warning Score (NEWS) to a severity category from mild to moderate to severe and critical as follows:

Mild:
Alert patients with normal vital signs meeting the case definition are evaluated under droplet-contact precautions in the designated area within the ED unless aerosol generating medical procedures (AGMPs) are anticipated, in which case airborne-contact precautions must be adhered to. Patients in this group will undergo nasopharyngeal swab (NPS) testing for COVID-19 and a corresponding order entered in I3 (at available sites) or an appropriately flagged green microbiology lab requisition (at sites without electronic order entry).

Well-appearing patients in this category who have appropriate social supports in place (all of: access to food/water, shelter, adult support person, and telephone) AND succeed in maintain oxygen saturation greater than, or equal to 94% on room air (RA) following a 30 metre walk-test in the ED, may be considered for discharge from the emergency department. Patients discharged from the ED should receive clear verbal and written instructions on how to maintain self-isolation safely at home (Appendix 2a), AND clear return instructions for themselves/support person (dyspnea, altered mental status, respiratory rate <20/min in adults, or home pulse oximetry [if available] <94%RA), (appendix 2b). Should the attending deem prudent, the department of family medicine is amenable to being contacted through the pre-existing team/hospitalist system to provide interim follow-up of persons under investigation (PUI) for COVID-19 pending the serial telephone follow-up provided by public health upon test result.

Well-appearing mild patients with no comorbidities AND <25-50% radiographic pulmonary involvement who have inadequate social accesses (as described above) may be considered for admission to the family medicine team based on the usual team/hospitalist system on a designated ward (currently 3BS).

Moderate:
Alert patients presenting with mild tachypnea (RR21-24/min, for adults), or mild hypoxemia (SpO2 94-95% RA), or mild tachycardia (111-130bpm, for adults) should be considered moderate severity and if such patients meet the case definition must be evaluated under droplet-contact precautions in the designated area within the emergency department unless AGMPs are anticipated, in which case airborne-contact precautions must be adhered to. All such patients will undergo NPS for COVID-19 and a corresponding order entered in I3 (where electronic order entry available) or an appropriately flagged green microbiology lab requisition (at sites without electronic order entry) AND portable chest x-ray with “suspect COVID-19” indicated specifically on the requisition to facilitate standardized radiologic interpretation for this disease.
Well-appearing patients in this category with NO at risk conditions (see definitions) in whom clinical worsening is NOT anticipated with respect to timing of presentation can be anticipated to in disease process (i.e. clinical decline should be anticipated in those patients presenting earlier in disease with moderate symptoms) AND less than 25-50% radiographic pulmonary involvement who have appropriate social supports in place (all of: access to food/water, shelter, adult support person, and telephone) AND succeed in maintain oxygen saturation greater than, or equal to 94% on room air (RA) following a 30m walk-test in the ED, may be considered for discharge from the emergency department. Patients discharged from the ED should receive clear verbal and written instructions on how to maintain self-isolation safely at home, AND return instructions for themselves/support person (dyspnea, altered mental status, respiratory rate <20/min in adults, or home pulse oximetry [if available] <94%RA), (appendix 2b). Should the attending deem prudent, the department of family medicine is amenable to being contacted through the pre-existing team/hospitalist system to provide interim follow-up of persons under investigation (PUI) for COVID-19 pending the serial telephone follow-up provided by public health upon test result.

Well-appearing moderate patients with no comorbidities AND <25-50% radiographic pulmonary involvement who have inadequate social accesses (as described above) should be considered for admission to the family medicine team based on the usual team/hospitalist system on a designated ward (currently 3BS).

Patients with at risk conditions AND/OR more than 25-50% radiographic pulmonary involvement, AND/OR who fail to maintain oxygen saturation greater than, or equal to 94%RA following a 30m walk-test should are at risk for severe disease and should be managed as per “Severe”- see below. This moderate-severe subgroup of patients should be considered for admission to a designated hospital ward (currently, 3BS under the most appropriate admitting service/attending) with continuation of droplet-contact precautions.

Patients should NOT receive:

- NSAID therapy if contraindicated by conventional criterion.
- hydroxychloroquine unless proven to have COVID-19 AND part of clinical registry/enrolled in clinical trial.
- systemic corticosteroids unless otherwise indicated (e.g. AECOPD, asthma, Addison’s, etc)
- incentive spirometry is not currently recommended.

### Severe:

Patients presenting with altered mental status (AMS), or moderate tachypnea (RR>24/min), or moderate hypoxemia (SpO2 92-93%RA), or moderate tachycardia (HR>130bpm) and meeting the case definition should be categorized as severe and should be managed in the designated area within the ED with a minimum of droplet-contact precautions. However, initial staff risk assessment may deem airborne-contact necessary, as would any AGMP. These patients should be comprehensively investigated including: NPS for COVID-19, portable chest x-ray with “suspect COVID-19” noted in indication, ED sepsis bloods (including CBC, Lytes, Cr, LFTs, Trop, VBG/Lactate, CRP, blood cultures) and an electrocardiogram. Supportive care should be implemented including supplemental oxygen administered at the lowest flow rate possible to achieve an oxygen saturation of greater than or equal to 90%. Crystalloid intravenous fluid administration should be limited to minimal maintenance in the absence of circulatory compromise, which should be considered a harbinger of critical, not severe, disease. Bronchodilators should be administered by MDI when possible (nebulized medications constitute an AGMP and necessitate airborne-contact precautions) for reactive lung disease if present, and should be administered antimicrobial therapy to address potential co-infection including antiviral therapy for seasonal influenza (while circulating and awaiting NPS result) and

The anti-infective stewardship committee advocates for the following regimen for ward admission if COVID-19 is suspected:

- **cefuroxime 1.5g IV q8h + 500mg azithromycin IV/po od for 48h, then reassess**
- **OR**
- **moxifloxacin 400mg IV/po q24x48h if true penicillin/cephalosporin allergy.**

**AND**

- **oseltamivir 75mp po twice daily while influenza is circulating AND awaiting NPS result. Discontinue once patient is determined to NOT be co-infected with influenza.**

When patients are spontaneously ventilating and clinical stability permits, they should receive education and directed to initiate self-guided conscious prone positioning (appendix 3) or be repositioned every two hours following conscious prone positioning algorithm (appendices 4-5).

Patients should NOT receive:

- NSAID therapy if contraindicated by conventional criterion.
- hydroxychloroquine unless proven to have COVID-19 AND part of clinical registry/enrolled in clinical trial.
- systemic corticosteroids unless otherwise indicated (e.g. AECOPD, asthma, Addison’s, etc)
- incentive spirometry is not currently recommended

**Critical:**

Patients presenting with AMS or are unresponsive, or severely tachypneic/hypopneic (RR <24/min or <8/min), or severely hypoxemic (SpO2<91%RA), or severely tachycardic (>130bpm), or display signs of circulatory compromise/end-organ dysfunction and meeting the case definition are categorized as critical. These patients should be immediately assessed in a designated area in the ED and all staff should adhere strictly to airborne-contact precautions for all patient contact while in the ED. These patients should be comprehensively investigated including: NPS for COVID-19, portable chest x-ray with “suspect COVID-19” noted in indication, ED sepsis bloods (including CBC, Lytes, Cr, LFTs, Trop, VBG/Lactate, CRP, blood cultures) and an electrocardiogram. Initial resuscitative measures should include administration of supplemental oxygen at the lowest possible flow rate to achieve an oxygen saturation greater than or equal to 94% during the resuscitative phase, then greater than or equal to 90% thereafter. Higher flow and non-invasive ventilation increase risk of aerosolization and should be limited or avoided where possible. Where impossible, it is recommended to place a surgical mask over the oxygenating device applied to the patient. Over-resuscitation is associated with worsening outcomes in patients who suffer ARDS so circulatory compromise should be addressed with judicious administration of relatively small (250-500ml in adults, 10-20ml/kg in children) boluses of crystalloid every 30-60min with frequent reassessment of cardiovascular parameters, and peripheral/end-organ perfusion (including POCUS). Bronchodilators should be administered for reactive lung disease if present, and should be administered antimicrobial therapy to address potential co-infection including antiviral therapy for seasonal influenza (while circulating and awaiting NPS result) and antibiotic therapy for bacterial pneumonia per NB Anti-infective Stewardship Committee Guidelines (https://en.horizonnb.ca/media/951180/antimicrobial_treatment_guidelines_for_common_infections_en.pdf).

The anti-infective stewardship committee advocates for the following regimen ICU admission if COVID-19 is suspected:
ceftiraxone 2g IV q24 + azithromycin 500mg IV q24 for 48 hours, then reassess
OR
moxifloxacin 400mg IV/po q24x48h if true penicillin/cephalosporin allergy.
AND
oseltamivir 75mp po twice daily while influenza is circulating AND awaiting NPS result. **Discontinue** once patient is determined to **NOT** be co-infected with influenza.

When patients are spontaneously ventilating and clinical stability permits, they should receive education and direction to initiate self-guided conscious prone positioning (appendix 3), or be repositioned every two hours following conscious prone positioning algorithm (appendices 4-5).

Patients should **NOT** receive:

- NSAID therapy if contraindicated by conventional criterion.
- hydroxychloroquine unless proven to have COVID-19 AND part of clinical registry/enrolled in clinical trial.
- systemic corticosteroids unless otherwise indicated (e.g. AECOPD, asthma, Addion’s, etc.)
- incentive spirometry is not currently recommended

**Critical and Persistent Hypoxemia:**

Clinicians should have a high index of suspicion for evolving acute respiratory distress syndrome (ARDS) in patients for whom oxygen delivered at 5-6L by nasal cannulae is ineffective at maintaining an oxygen saturation greater than, or equal to 90%. Once identified, escalation of oxygen delivery may proceed to maintain adequate oxygenation, but a clear plan for intubation should be devised, delineated to team members, and prepared for including team role assignment, medications, and equipment. Reference should be made to the most current iteration of the SJRHEM COVID Airway & Ventilation document and RSI checklist ([http://sjrhem.ca/covid-19-clinical-management/](http://sjrhem.ca/covid-19-clinical-management/)) but principles include:

- Attentive buddy-system donning-doffing, airborne-contact PPE/precautions.
- MD/RN/RT team inside and MD/RN outside team- all donned.
- All medications/equipment prepared in supplied airway boxes.
- HEPA filter nearest patient for all circuits.
- Avoid bag-valve-mask ventilation (BVM) unless two-person AND absolutely imperative.
- Rapid sequence intubation. Liberal sedation and paralytics are felt to limit aerosolization and strongly recommended in the absence of contraindications.
- Video-laryngoscopy by most experienced provider is highly endorsed as first/best
- Laryngeal-mask airway should be used as for rescue ventilation and oxygenation between any failed attempts in lieu of BVM
- In-line suction and limited disconnections following successful intubation
- In the absence of a respiratory therapist physicians may refer to:


Prone ventilation should be considered in consultation with intensivist for ongoing refractory hypoxemia.

**Critical and Persistent Shock:**

In patients refractory to crystalloid resuscitation (no further improvement of vital signs and perfusion on sequential reassessments) and to spare overly aggressive fluid resuscitation which may complicate management of concomitant or ensuing ARDS, early initiation of vasopressor support is advocated. Norepinephrine is the preferred first-line vasopressor in adults to which vasopressin or epinephrine may be added if maximum dose is inadequate to reach the target mean arterial pressure (MAP) of 65mmHg (or 60-65mmHg in patients over age 65y). In pediatric patients epinephrine is considered first-line with norepinephrine reserved for refractory shock, again with a target MAP of 65mmHg. Vasopressors should be administered through central venous access, but may temporarily be administered through a proximal, large-bore, peripheral intravenous access until central access is permitted by patient condition and resources. Dosing parameters are as follows:

- **Adults**
  1) norepinephrine 0.01-3mcg/kg/min
  2a) epinephrine 0.1-0.5mcg/kg/min
  or
  2b) Vasopressin 0.03 units/min

- **Peds**
  1) epinephrine 0.1-1.5mcg/kg/min
  2) norepinephrine 0.01-3mcg/kg/min

Patients should NOT receive:

- NSAID therapy if contraindicated by conventional criterion.
- hydroxychloroquine unless proven to have COVID-19 AND part of clinical registry/enrolled in clinical trial.
- systemic corticosteroids unless otherwise indicated (e.g. AECOPD, asthma, Addison’s, etc).

**REFERENCE(S)**


3. Greenhalgh, T., Koh, CGH., Car, J. A remote assessment in primary care (25 March 2020) *BMJ* 2020; 368 doi: [https://doi.org/10.1136/bmj.m1182](https://doi.org/10.1136/bmj.m1182)


7. Management of Severe Acute Respiratory Infection (SARI) when COVID-19 is suspected? (17 March 2020) Horizon Area Anti-infective Stewardship Committee and Infectious Disease Service “Did you Know?” Vol.2 No.1


Appendix 1

**General Treatment:**
- FIO2: lowest flow possible to maintain SpO2 ≥90% (≥80% if maintenance limited)
- ABX: ceftiraxone 1.5g IV q8h + azithromycin 500mg IV q24h (if allergic, moxifloxacin 400mg IV q24h)
- Antiviral IF infection circulating: oseltamivir 75mg p.o bid-D/C if neg influenza swab
- Bronchodilators by MD (COPD/Asthma)
- Consider Conscious Proneing — per guidance document

**Shock:**
- Trial IVF as above w/ freq of 2a (VS, POCS)
- Early vasopressors to MAP 65 mmHg (60-65 >65 yo):
  - Adults 1) norepinephrine 0.01-0.03 mcg/kg/min
  - 2a) epinephrine 0.1-0.5 mcg/kg/min
  - 2b) Vasopressin 0.9-3 units/min
- Peds 1) epinephrine 0.1-1.5 mcg/kg/min
  - 2) norepinephrine 0.01-0.3 mcg/kg/min
- Vasopressors should be infused through CVA ASAP.

**Hydroxychloroquine:** only in select/confirmed cases in consultation and for compassionate care and/or enrolled in a clinical registry. NOT STANDARD.
How to Self-Isolate

You have been asked to isolate yourself because you might have been diagnosed with COVID-19 or you might be at risk of developing COVID-19. Self-isolation means staying at home and avoiding contact with other people to help prevent the spread of disease to others in your home and your community.

For the time period given to you by Public Health or your health care provider, it is expected that you take the following measures:

**Limit contact with others**
- Do not leave home unless absolutely necessary, such as to seek medical care.
- Do not go to school, work, other public areas or use public transportation (e.g., buses, taxis).
- Avoid contact with individuals with chronic conditions, compromised immune systems and older adults.

**Keep your hands clean**
- Wash your hands often with soap and water for at least 20 seconds, and dry with disposable paper towels or dry reusable towel, replacing it when it becomes wet.
- Avoid touching your eyes, nose and mouth.
- Cough/sneeze into the band of your arm, not your hand, or into a tissue. Dispose of tissues in a lined waste container.

**Avoid contaminating common items and surfaces:**
- Do not share personal items with others, such as toothbrushes, towels, bed linen, utensils or electronic devices.
- At least once daily, clean and disinfect surfaces that you touch often, like toilets, bedside tables, doorknobs, phones and television remotes.
- Put the lid of the toilet down before flushing.

For the latest information visit: [www.gnb.ca/coronavirus](http://www.gnb.ca/coronavirus)
**Monitor your symptoms daily:**

- Monitor your health and symptoms daily *(fever, cough, and difficulty breathing)*
- Record your temperature daily.
- If you develop symptoms or your symptoms get worse, immediately contact Tele-care 811.

**Care for yourself:**

- Get some rest, eat a balanced diet and nutritious food, and stay hydrated with fluids like water.
- Stay in touch with family and friends by phone or computer.
- Make alternative work/study arrangements where possible.

If you start having symptoms isolate yourself from others as quickly as possible. Immediately **CALL TELECARE-811**. Describe your symptoms and travel history. They will provide advice on what you should do.

For the latest information visit: [www.gnb.ca/coronavirus](http://www.gnb.ca/coronavirus)
Returning home with suspected COVID-19

When should you seek medical attention again?

- You have more trouble breathing.
- Your resting breathing rate is more than 20 breaths in a minute, or more than 5 breaths per minute greater than the previous count.
- You or your support person are concerned you are getting sicker or that you are confused.
- You are unable to keep down liquids by mouth, or are concerned you may be dehydrated.

PLEASE CALL:

911 if you are having an emergency
811 for advice OR before returning to the Emergency Department

To help keep your lungs healthy:

- Please do NOT lie flat on your back!
- Resting or sleeping on your sides, reclined, or upright helps to use all parts of your lungs.
- Discontinue smoking tobacco, cannabis, and vaping/e-cigarettes.
- Continue any previously prescribed lung treatments, like inhalers/puffers.
Appendix 3. SJRHEM Conscious Prone Positioning Advice

SJRHEM Conscious Prone Positioning Guide

To help keep your lungs healthy:
➢ Please do NOT lie flat on your back!
➢ These positions help to use all parts of your lungs.
➢ If you are resting at home while recovering from COVID-19 please cycle through the following resting positions.
➢ Spend from 30 minutes to a maximum of 2 hours in one position before switching to the next.
➢ You may need to set an alarm to remind you to move, especially at night or while napping.

You should:

1) Lay flat on your BELLY for 30min-2 hours.
2) Lay on your RIGHT side for 30min-2 hours
3) SIT UP (reclined, or upright) for 30min-2 hours
4) Lay on your LEFT side for 30min-2 hours
5) Lay flat on your BELLY for 30min-2 hours ... and so on ....
Appendices 4 ICS Prone Positioning Algorithm

Figure 1 – Flow diagram decision tool for Conscious Proning process

FiO2 ≥ 28% or requiring basic respiratory support to achieve SaO2 92 – 96% (88-92% if risk of hypercapnic respiratory failure) AND suspected/confirmed COVID-19.

**Consider prone position if ability to:**
- Communicate and co-operate with procedure.
- Rotate to front and adjust position **independently**
- No anticipated airway issues

**Absolute contraindications**
- Respiratory distress (RR ≥ 35, PaCO2 ≥ 6.5, accessory muscle use)
- Immediate need for intubation
- Haemodynamic instability (SBP < 90mmHg) or arrhythmia
- Agitation or altered mental status
- Unstable spine/thoracic injury/recent abdominal surgery

**Relative Contraindications:**
- Facial injury
- Neurological issues (e.g. frequent seizures)
- Morbid obesity
- Pregnancy (2/3rd trimesters)
- Pressure sores / ulcers

**Assist patient to prone position (See Table 1)**
- Explain procedure/benefit
- Ensure oxygen therapy and basic respiratory support secure with adequate length on the tubing
- Pillows may be required to support the chest
- Reverse Trendelenberg position may aid comfort
- Monitor oxygen saturations – if drop then ensure O2 connected and working
- Sedation must not be administered to facilitate proning

**Monitor Oxygen Saturations for 15 minutes:**
SaO2 92-96% (88-92% if risk of hypercapnic respiratory failure) and nil obvious distress

**If deteriorating oxygen saturations:**
- Ensure oxygen is connected to patient
- Increase inspired oxygen
- Change patients position
- Consider return to supine position
- **Escalate to critical care if appropriate**
- Discontinue if:
  - No improvement with change of position
  - Patient unable to tolerate position
  - RR ≥ 35, looks tired, using accessory muscles

**Continue proning process (See Table 1):**
- Change position every 1-2 hrs aiming to achieve a prone time as long as possible
- When not prone aim to be sat at between 30-60 degrees upright
- Monitor oxygen saturations after every position change
- Titrate down oxygen requirements as able

**Continue supine**
Appendix 5. ICS Conscious Prone Positioning Cycle

**Timed Position Changes:**

If patient fulfils criteria for proning ask the patient to switch positions as follows. Monitor oxygen saturations 15 minutes after each position change to ensure oxygen saturation has not decreased. Continue to monitor oxygen saturations as per the National Early Warning Score (NEWS)

- 30 minutes to 2 hours lying fully prone (bed flat)
- 30 minutes to 2 hours lying on right side (bed flat)
- 30 minutes to 2 hours sitting up (30-60 degrees) by adjusting head of the bed
- 30 minutes to 2 hours lying on left side (bed flat)
- 30 minutes to 2 hours lying prone again
- Continue to repeat the cycle......

References used in the preparation of Figure 1 and Table 1