Flowchart for the management of suspected COVID-19 patients at the first level of care and in remote areas in the Region of the Americas

JULY 2020

NOTE

This document offers an algorithm for the management of COVID-19 patients at the first level of care and in remote areas, with focus on early case identification based on severity, and timely indications of remission. The flowchart incorporates the results of a process that included a review of the evidence and validation by experts in the Region. It is subject to revision as new evidence becomes available.
Surveillance of Suspected COVID-19 Patients

- Fever higher than 38°C with dry cough and/or difficulty breathing?
- Shortness of breath, joint or muscle pain, loss of sense of smell/taste, weakness, diarrhea, abdominal pain, persistent diarrhea, headache, chills, fatigue, and/or sore throat?
- Patient has acute respiratory illness with fever and difficulty breathing in the absence of another diagnosis that would account for the clinical presentation?

NO

- Isolate patient in a facility designated for treating suspected COVID-19 cases.
- Monitor vital signs and watch for emergency signs. Consider administering oxygen support.

YES

- If emergency signs develop:
  - Initiate oxygen at 5 L/min (higher flows dry the mucous membranes). Insert nasal cannula and use intermittent awake prone positioning. Clear the airway if patient is producing secretions. Evaluate response and watch for emergency signs. Administer intravenous fluids conservatively. When administering oxygen, estimate FiO2 as follows: 2 L/min (FiO2 0.28-0.36); 5 L/min (FiO2 0.40); 6-10 L/min (FiO2 0.44-0.60); 10-15 L/min (FiO2 0.60-0.95).
  - If patient’s respiratory distress increases or SpO2 remains lower than 90%:
    - Increase oxygen flow to 6 to 10 L/min. With oxygen mask in place, use intermittent awake prone positioning. Evaluate response and check for signs of deterioration every 4 hours.***
  - If respiratory distress continues or SpO2 remains lower than 90% and signs of deterioration develop:
    - Use oxygen mask with reservoir bag. Increase oxygen flow to 10 to 15 L/min. Make sure that the bag is inflating. Call for virtual or in-person consultation with a clinical expert. Consider referral to second level of care.
  - If respiratory distress continues or SpO2 remains lower than 90%, arrange to transfer patient as quickly as possible to the nearest hospital with a mechanical ventilator.

Refer patient to second level of care.

- Perform the usual clinical evaluation in accordance with national guidelines, including evaluation for other respiratory infections.
- Evaluate risk for thromboembolism (respiratory rate over 20, increased levels of C-reactive protein, D-dimer, and fibrinogen).

LOW OR MODERATE
- Refer to second level of care.

HIGH
- Administer acetylsalicylic acid 500 mg every 6 to 8 hours (maximum 4 g per day).
- Administer enoxaparin 40 mg daily.
- Administer corticosteroids in accordance with clinical criteria. If the patient stabilizes (SpO2 ≥ 90%, stable vital signs), continue management, evaluate response, and watch for any signs of deterioration.***

** Risk Factors
- Arteriosclerosis
- Cancer
- Diabetes
- Male
- Cardiovascular disease
- Liver disease
- Neurological disease
- Lung disease
- Kidney disease
- Hypertension
- Immune deficiency due to any cause
- Obesity
- Over 60 years old

** Route laboratory tests, if available
- Respiratory specimens for COVID-19 viral test
- Liver function
- Complete blood count
- Other laboratory tests depending on local epidemiology (e.g., influenza, other respiratory infections, dengue, malaria)
- Urinalysis

Additional laboratory tests, if available
- CPK
- D-dimer and fibrinogen
- C-reactive protein

Diagnostic imaging, if available
- Chest X-ray
- Chest CT scan

* Risk Factors
- Over 60 years old
- Immunodeficiency due to any cause
- Male
- Diabetes
- Arteriosclerosis

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- Over 60 years old
- Immunodeficiency due to any cause
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LEVEL OF CARE AND IN REMOTE AREAS (1,2,3)

Surveillance of Suspected COVID-19 Patients

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- Shortness of breath, joint or muscle pain, loss of sense of smell/taste, weakness, diarrhea, abdominal pain, persistent diarrhea, headache, chills, fatigue, and/or sore throat?
- Patient has acute respiratory illness with fever and difficulty breathing in the absence of another diagnosis that would account for the clinical presentation?

NO

- Isolate patient at home or in a facility designated for suspected COVID-19 cases. If patient develops fever or pain, administer acetaminophen (500 mg every 6 to 8 hours up to 4 g a day).
- Provide recommendations regarding adequate hydration, proper nutrition, and recognition of emergency signs.
- Do not administer antibiotics.

YES

- If emergency signs develop:
  - Call for consultation and initiate referral to second level of care.

- If patient presents emergency signs (SpO2 < 90% or respiratory rate > 24) or pneumonia (fever, cough, shortness of breath, rapid breathing), call for consultation and initiate referral to second level of care.

- Isolate patient in a facility designated for treating suspected COVID-19 cases. Monitor vital signs and watch for emergency signs. Consider administering oxygen support.

- Isolate patient in a health facility and consider transfer to a higher level of care. Monitor vital signs and watch for emergency signs. Consider oxygen support and administration of fluids. Order available laboratory and imaging tests.**

- Evaluate risk for thromboembolism (respiratory rate over 20, increased levels of C-reactive protein, D-dimer, and fibrinogen)

- If patient’s respiratory distress continues or SpO2 remains lower than 90%, arrange to transfer patient as quickly as possible to the nearest hospital with a mechanical ventilator.

- Administer corticosteroids in accordance with clinical criteria. If the patient stabilizes (SpO2 ≥ 90%, stable vital signs), continue management, evaluate response, and watch for any signs of deterioration.***

** Signs of Deterioration
- Increased difficulty breathing
- Drop in blood pressure
- Bluish lips and face
- Confusion or inability to sit up
- Increased weakness
- Oxygen saturation lower than 90%
- Persistent chest pain
- Reddening or inflammation of limbs
- Dizziness
- Loss of consciousness
- Respiratory rate more than 20
TABLE 1. SYMPTOMS ASSOCIATED WITH COVID-19

| Clinical presentation | Presenting signs and symptoms of COVID-19 vary. Most persons experience fever (83–99%), cough (59–82%), fatigue (44–70%), anorexia (40–84%), shortness of breath (31–40%), myalgias (11–35%). Other non-specific symptoms, such as sore throat, nasal congestion, headache, diarrhea, nausea and vomiting, have also been reported. Loss of smell (anosmia) or loss of taste (ageusia) preceding the onset of respiratory symptoms has also been reported.

Older people and immunosuppressed patients in particular may present with atypical symptoms such as fatigue, reduced alertness, reduced mobility, diarrhea, loss of appetite, delirium, and absence of fever.

Symptoms such as dyspnea, fever, gastrointestinal (GI) symptoms or fatigue due to physiologic adaptations in pregnant women, adverse pregnancy events, or other diseases such as malaria, may overlap with symptoms of COVID-19.

Children might not have reported fever or cough as frequently as adults. |

TABLE 2. COVID-19 DISEASE SEVERITY

| Mild disease | Symptomatic patients (Table 1) meeting the case definition for COVID-19 without evidence of viral pneumonia or hypoxia. See the WHO website for most up-to-date case definitions |

| Moderate disease | Pneumonia | Adolescent or adult with clinical signs of pneumonia (fever, cough, dyspnoea, fast breathing) but no signs of severe pneumonia, including SpO2< 90% on room air

Child with clinical signs of non-severe pneumonia (cough or difficulty breathing + fast breathing and/or chest indrawing) and no signs of severe pneumonia.

Fast breathing (in breaths/min): < 2 months: = 60; 2–11 months: = 50; 1–5 years: = 40

While the diagnosis can be made on clinical grounds; chest imaging (radiograph, CT scan, ultrasound) may assist in diagnosis and identify or exclude pulmonary complications.

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| Moderate disease | Severe pneumonia | Adolescent or adult with clinical signs of pneumonia (fever, cough, dyspnea, fast breathing) plus one of the following: respiratory rate > 30 breaths/min; severe respiratory distress; or SpO2 < 90% on room air.

Child with clinical signs of pneumonia (cough or difficulty in breathing) + at least one of the following: |
<table>
<thead>
<tr>
<th>Critical disease</th>
<th>Acute respiratory distress syndrome (ARDS)</th>
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<tr>
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<td>Onset: within 1 week of a known clinical insult or new or worsening respiratory symptoms.</td>
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<td></td>
<td>Chest imaging (radiograph, CT scan, or lung ultrasound): bilateral opacities, not fully explained by volume overload, lobar or lung collapse, or nodules.</td>
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<td>Origin of pulmonary infiltrates: respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g. echocardiography) to exclude hydrostatic cause of infiltrates/o edema if no risk factor present.</td>
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**Oxygenation impairment in adults:**

- **Mild ARDS:** 200 mmHg < PaO2/FiO2 ≤ 300 mmHg (with PEEP or CPAP ≥ 5 cmH2O, or non-ventilated)
- **Moderate ARDS:** 100 mmHg < PaO2/FiO2 ≤ 200 mmHg (with PEEP ≥ 5 cmH2O, or non-ventilated)
- **Severe ARDS:** PaO2/FiO2 ≤ 100 mmHg (with PEEP ≥ 5 cmH2O, or non-ventilated)
- **When PaO2 is not available, SpO2/FiO2 ≤ 315 suggests ARDS** (including in non-ventilated patients).

**Oxygenation impairment in children:**

Use PaO2-based metric when available. If PaO2 not available, wean FiO2 to maintain SpO2 ≤ 97% to calculate OSI or SpO2/FiO2 ratio:

- **Bilevel (NIV or CPAP) ≥ 5 cmH2O via full face mask:** PaO2/FiO2 ≤ 300 mmHg or SpO2/FiO2 ≤ 264•Mild ARDS (invasively ventilated): 4 ≤ OI < 8 or 5 ≤ OSI < 7.5
- **Moderate ARDS (invasively ventilated): 8 ≤ OI < 16 or 7.5 ≤ OSI < 12.3.**
- **Severe ARDS (invasively ventilated): OI ≥ 16 or OSI ≥ 12.3.**

<table>
<thead>
<tr>
<th>Critical disease</th>
<th>Sepsis</th>
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<td>Adults: life-threatening organ dysfunction caused by a dysregulated host response to suspected or proven infection. Signs of organ dysfunction include: altered mental status, difficult or fast breathing, low oxygen saturation, reduced urine output, fast heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, or laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate, or hyperbilirubinemia.</td>
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<td></td>
<td>Children: suspected or proven infection and ≥ 2 age-based systemic inflammatory response syndrome criteria, of which one must be abnormal temperature or white blood cell count.</td>
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Critical disease Septic shock

Adults: persisting hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥ 65mmHg and serum lactate level > 2 mmol/L.

Children: any hypotension (SBP < 5th centile or > 2 SD below normal for age) or two or three of the following: altered mental state; tachycardia or bradycardia (HR < 90 bpm or > 160 bpm in infants and HR < 70 bpm or > 150 bpm in children); prolonged capillary refill (> 2 sec) or feeble pulse; tachypnoea; mottled or cool skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia.

Other complications that have been described in COVID-19 patients include acute, life-threatening conditions such as: acute pulmonary embolism, acute coronary syndrome, acute stroke and delirium. Clinical suspicion for these complications should be heightened when caring for COVID-19 patients, and appropriate diagnostic and treatment protocols available.

If altitude is higher than 1000 m, then correction factor should be calculated as follows: PaO2/FiO2 x barometric pressure/760.

When PaO2 is not available, SpO2/FiO2 ≤ 315 suggests ARDS (including in non-ventilated patients).

The SOFA score ranges from 0 to 24 and includes points related to six organ systems: respiratory (hypoxemia defined by low PaO2/FiO2); coagulation (low platelets); liver (high bilirubin); cardiovascular (hypotension); central nervous system (low level of consciousness defined by Glasgow Coma Scale); and renal (low urine output or high creatinine).

Sepsis is defined by an increase in the sepsis-related SOFA score of ≥ 2 points. Assume the baseline score is 0 if data are not available.

SIRS criteria: abnormal temperature (> 38.5 °C or < 36 °C); tachycardia for age or bradycardia for age if < 1 year; tachypnoea for age or need for mechanical ventilation; abnormal white blood cell count for age or > 10% bands.

Abbreviations: ARI acute respiratory infection; BP blood pressure; bpm beats/minute; CPAP continuous positive airway pressure; FiO2 fraction of inspired oxygen; MAP mean arterial pressure; NIV non-invasive ventilation; OI Oxygenation Index; OSI Oxygenation Index using SpO2; PaO2 partial pressure of oxygen; PEEP positive end-expiratory pressure; SBP systolic blood pressure; SD standard deviation; SIRS systemic inflammatory response syndrome; SOFA sequential organ failure assessment; SpO2 oxygen saturation.

Bibliography


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