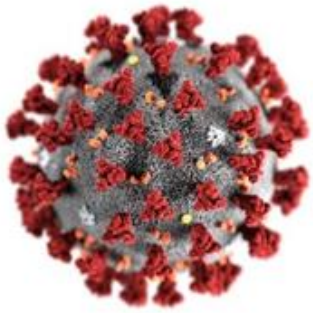
McMaster University

COVID–19



Survival Guide - 1st Edition

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The publication is designed to provide accurate and up to date information regarding the subject matter covered as of its publication date, with the understanding that medical knowledge and best practice constantly evolve and may vary among various institutions. Hence, neither the publishers nor the editors assume any liability for damages directly or indirectly related to use of the material contained in this guide. The information covered should be tailored with evidence-based approach and individual patient need. “Nothing can alternate for knowledge, clinical expertise and sound medical training in the field of medicine.”

Foreword to the 2020 First Edition

Dr. Hira Amir along with the staff physicians are pleased to contribute to the McMaster Internal Medicine Survival Guide for their peers.

Thank you to the staff physicians for their dedicated time and invaluable help in contributing and editing the content and updates: Dr. Ally Prebtani, Dr. Roman Jaeschke and Dr. Zain Chagla.

Special thanks, as always, to Dr. Ally Prebtani for his continued support, guidance and hope throughout this process.

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Contents

1.0 Epidemiology

1.1 Demographic Distribution

- A novel coronavirus COVID-19 (Corona Virus Disease-2019), identified as cause of pneumonia cases in Wuhan, Hubei Province of China, late 2019
- Outbreak began in China but has since spread to many other countries; it was officially declared by WHO to be a pandemic on March 11, 2020
- Cases in all continents, except Antarctica, are steadily rising in many countries

1.2 Route of Transmission

- Initial mode of transmission: Zoonotic (seafood market)
- Current mode of transmission: Person-to-person mainly via respiratory droplet (resembles Influenza spread)
- SARS-CoV-2 RNA has been detected in blood and stool specimens. Live virus has been cultured in stool, according to a joint WHO-China report, fecal-oral transmission is not the significant factor for the disease spread

1.3 Incubation Period

The incubation period is within 2 weeks after exposure. The median incubation period is estimated to be 5.1 days. 97.5% will develop symptoms within 11.5 days of exposure

2.0 Viral Classification

- Coronaviruses belong to a family within Nidovirale order that use a nested set of mRNAs to replicate
- The virus family has four genera: alpha, beta, gamma and delta; human coronavirus is in two of these genera – alpha and beta coronaviruses
- Pathogen is a beta coronavirus that has characteristics similar to the agents of SARS (Severe Acute Respiratory Syndrome) and MERS (Middle East Respiratory Syndrome)
- Designated as SARS-CoV-2 (severe acute respiratory syndrome corona virus 2)
- Coronavirus uses ACE-2 receptors for human cell entry

3.0 Clinical Presentation

3.1 History

- Common symptoms: Fever, dry cough, myalgias, anorexia, fatigue and dyspnea
- Less common symptoms: Headache, sore throat, rhinorrhea & GI symptoms – nausea/diarrhea, anosmia/taste disturbances
- Moderate to severe disease: Hemoptysis and dyspnea
- Patients may report exposure to infected individual, travel to an area of outbreak, or recent travel (within 2 weeks) to widespread infection area
- Many without travel history

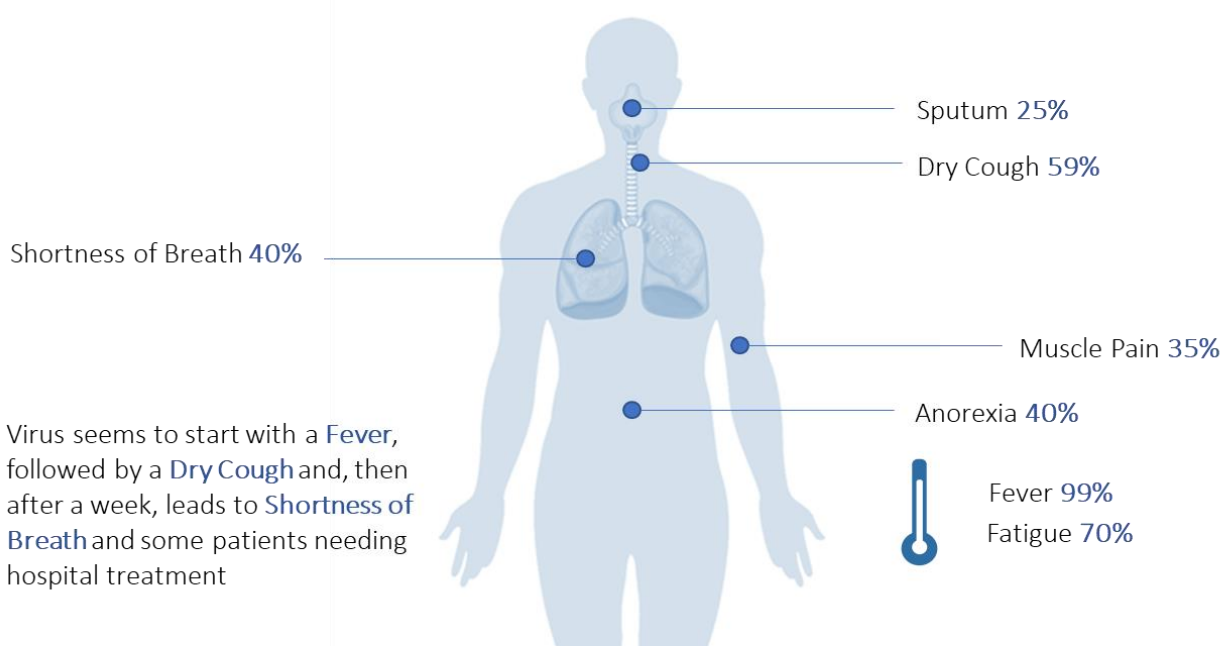

Figure 2: Symptoms of Covid-19

3.2 Physical Examination

- General: Severe disease – tachypnea, laboured breathing and cold clammy skin
- Vital signs: tachycardia, hypotension, fever (often 39°C); Children and elderly can present with hypothermia
- Indicators of Severe disease: Hemodynamic shock (Hypotension, tachycardia and cold clammy extremities), respiratory distress and ARDS

4.0 Spectrum of Disease Severity

- This viral illness has varied clinical course and ranges from asymptomatic to symptomatic respiratory illness and severe ARDS
    - Mild (no or mild pneumonia) 81%: non-specific clinical presentations including fever, cough ± dyspnea, sore throat, myalgia/fatigue and headache. Children and elderly can present with atypical signs/symptoms
    - Severe Disease 14%: Dyspnea (RR > 30/min), Hypoxemia (SpO2 < 90% on room air) or > than 50% lung involvement on CT imaging within 1 to 2 days
    - Critical Disease 5%: Respiratory failure, shock and multi-organ dysfunction
- Overall case fatality 2-3 (varies with time & region); No deaths in noncritical cases

5.0 Risk Factors for Disease Severity

Most of the fatal cases were reported in patients with following risk factors:

- Advanced age
- Cardiovascular disease
- Diabetes Mellitus
- Chronic lung disease
- Hypertension
- Malignancy
- Immunosuppression

6.0 Diagnostic Investigations

6.1 Most Accurate Tests

PCR or RT-PCR

- NPS of respiratory tract specimens of non-intubated patients
    - Technique is important, video link of how to perform: https://www.nejm.org/doi/full/10.1056/NEJMvcm2010260?query=RP
- Non-induced Sputum & endotracheal aspirates (ETAs) or BAL of intubated patients
- ***Pearls:***
    - ***NPS (SN 90-95%) first 5 days of symptom onset (URTI) and (SN 70%) 5-7 days after symptom onset with illness progression & pneumonia (LRTI)***
    - ***Sputum, BAL, ETAs SN increases after 5-7 days with illness progression and pneumonia (LRTI)***

6.2 Laboratory Tests

Following laboratory results can be related to worse outcomes:

- CBC (leukopenia, lymphocytopenia, thrombocytopenia)
- Elevated inflammatory markers (CRP, LDH and Ferritin)
- Elevated serum aminotransferase levels (AST, ALT)
- Elevated CK & troponins
- Elevated prothrombin time (PT)/INR
- Normal serum procalcitonin levels, despite pneumonia (limited availability)
- High D-Dimer; Don't forget PE if clinical suspicion high

NOTE: High D - dimers + Lymphopenia = ↑ Mortality

6.3 Chest Imaging

- Radiography – features consistent with viral pneumonia (*bilateral ground glass*)
- CT scan – (SN 97%, SP 25%) ground glass opacification with or without consolidation; mostly B/L lung involvement with predilection to RLL; peripheral > central

6.4 Routine Monitoring

Patients should be monitored for the following parameters during the acute phase of hospitalization:

- Vitals: BP, HR, RR
- Pulse oximetry for SpO2
- Quick Sequential Organ Failure Assessment (qSOFA)
  - *SBP < 100, RR > 22, Altered Mental Status GCS < 15*
- Myocardial dysfunction
- Clinical worsening to respiratory failure often on *day 4-5* post-symptom onset

7.0 Diagnostic Criteria

Case definitions by WHO as of March 20 2020 for COVID 19 illness

7.1 Suspect Case

a) A patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath), *AND* a history of travel to or residence in a location reporting community transmission of COVID-19 disease during the 14 days prior to symptom onset

OR

b) A patient with any acute respiratory illness *AND* having been in contact with a confirmed or probable COVID-19 case in the last 14 days prior to symptom-onset

OR

c) A patient with severe acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath; *AND* requiring hospitalization) *AND* in the absence of an alternative Dx that fully explains the clinical presentation

7.2 Probable Case

a) A suspect case for whom testing for the COVID-19 virus is inconclusive

OR

b) A suspect case for whom testing could not be performed for any reason

7.3 Confirmed Case

a) A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms

The case definitions should be followed according to country's epidemiologic data

7.4 Contact

a) A contact is a person who experienced any one of the following exposures during the 2 days before and the 14 days after the onset of symptoms of a probable or confirmed case:

(i) Face-to-face contact with a probable or confirmed case within *1 meter* and for >15 minutes

(ii) Direct physical contact with a probable or confirmed case

(iii) Direct care for a patient with probable or confirmed COVID-19 disease without using proper personal protective equipment
OR

(iv) Other situations as indicated by local risk assessments.

Note: for confirmed asymptomatic cases, the period of contact is measured as *2 days* before through the 14 days – after the date on which the sample was taken which led to confirmation.

8.0 Differential Diagnosis

Most common overlapping diagnoses are:

- Influenza
- Common cold
- Other viral pneumonia (parainfluenza, metapneumovirus…)
- Bacterial & Fungal pneumonia (Mycoplasma Pneumoniae, PJP/PCP)

Pearl: As COVID – 19 cannot often be differentiated from other pneumonias, travel or contact history remains an important risk factor

9.0 Treatment

9.1 Goals

- Adequate oxygenation and hemodynamic stability during acute phase of COVID – 19

9.2 Disposition

9.2.1 Criteria for Hospital Admission	9.2.2 Criteria for ICU Admission
• Non-severe pneumonia – Radiographic evidence of pneumonia; worsening clinical status • Risk factors for severe disease • Inadequate care at home • Inability to isolate at home	• Severe Pneumonia – WHO criteria ○ Tachypnea (resp. rate > *30* breaths per min), severe respiratory distress, inadequate oxygenation (e.g., FIO2 > 0.50 & *spO2 </=93%*) • Presence of severe complications – septic shock, ARDS

9.2.3 Specialist Referral

- All patients should be managed in consultation with public health authorities
- Consider Infectious disease specialist consult to coordinate diagnosis and management
- Respirologist/Intensivist to help in collecting deep specimens for Dx and managing mechanical ventilation if necessary, *using strict airborne protection precautions*
- Critical care MD to help in fluid management, mechanical ventilation, and hemodynamic support as needed
- Consider enrolling in a research trial if available

9.3 Treatment options

9.3.1 Potential Therapies

As of April 15, 2020, there has been ***NO*** FDA approved drug that has proven beneficial for treating the Coronavirus infection.

Multiple drugs/therapies are undergoing Clinical trials for treatment of COVID – 19, none approved yet:

a) Remdesivir (antiviral)
b) Chloroquine or Hydroxychloroquine
c) Azithromycin
d) Tocilizumab (IL-6 antagonist)
e) Lopinavir-ritonavir (antivirals)
f) Convalescent plasma
g) Colchicine

Investigators at centers interested in becoming ACTCOVID-19 Sites or for more information (COVID-19 Clinical Trial at McMaster), email ACT.ProjectTeam@phri.ca

9.3.2 Management of Mild COVID - 19 Disease

- Do not hospitalize the patients with mild illness
- Provide Symptomatic treatment e.g. antipyretics for fever (acetaminophen preferable over NSAIDs) prn
- Counsel the patient for the signs/symptoms of severe disease and that they should seek urgent hospital care
- Education on home isolation and reporting to public health

9.3.3 Management of Severe COVID–19 Disease

- Supportive therapy
- Immediate supplemental O2 therapy (target 92-96%; if CO2 retainer, then 88-92%)
    - Nasal cannula up to 6L/min (non-humidified low flow)
    - Venti Mask FiO2 up to FIO2 0.50 or 10L/min

        - If above not maintaining adequate oxygenation, low threshold for endotracheal intubation by experienced operated with using strict airborne protection precautions
- Adults with signs of respiratory distress, shock and convulsions – Airway management and O2 therapy with SpO2 92-96%
- Non-invasive ventilation (e.g. BIPAP/CPAP) and High flow nasal oxygen (e.g. Opti flow) **NOT** recommended due to increased risk of aerosolization except in exceptional circumstances (if negative pressure room, HEPA filter available_
- Avoid fans & nebulized therapy due to risk of aerosolization
- Maintenance targets for Oxygen therapy
    - Adults– SpO2 target 92-96% in non-pregnant adults (88-92% if CO2 retainer)
    - Pregnant Patients - SpO2 target ≥ 92–95% in pregnant patients
    - Children – SpO2 ≥ 94% during resuscitation and ≥ 90% once stable
- Conservative/Cautious fluid management with balanced crystalloid (Normal saline/Ringer's lactate) if without signs and symptoms of shock due to risk of pulmonary edema
- Use norepinephrine as the first-line vasoactive agent for shock. Vasopressin or epinephrine can be used as an alternative if norepinephrine not available and if fluid administration does not achieve adequate tissue perfusion (dopamine is not recommended)
- Adding vasopressin as a second-line agent is suggested if the target (60-65 mmHg) mean arterial pressure cannot be achieved by norepinephrine

9.3.4 Management of Severe COVID–19 Disease and Co-Infections

- Treating co-infections – mainstay of treatment
    - Broad spectrum antimicrobials – within one hour of presentation with sepsis
- Empiric antimicrobial therapy should be adjusted or discontinued based on clinical and microbiology results
- Consider empiric therapy with neuraminidase inhibitor (Oseltamivir/Tamiflu) for seasonal influenza for patients with or at risk of influenza

9.3.5 Management of Critical COVID–19 Disease and ARDS

- Provide advanced oxygen and ventilatory support
- Perform Endotracheal intubation *using strict airborne precautions* with most experienced operator
- Implement mechanical ventilation using low tidal volumes (4-8 ml/kg estimated body weight) and lower inspiratory pressures (plateau pressure < 30 cm of H2O)
- Prone ventilation x 12-16 hours/day suggested in adult patients with severe ARDS
- Conservative fluid management for patients with ARDS without tissue hypoperfusion

- Higher PEEP instead of lower PEEP – moderate to severe ARDS
- in patients with moderate to severe ARDS – suggest use of intermittent neuromuscular blockade as needed rather than continuous use
- Use of Glucocorticoids in COVID-19 ventilated patients with associated ARDS is suggested. It could also be used in refractory shock or if indicated for other medical reasons (e.g. known adrenal insufficiency)

End of Life Care (EOL) Discussions & Palliative Care

- Goals of care discussions should be done by the healthcare professional with the patients and their families during the **initial clinical encounter** with a sensitive and empathetic approach before the patient develops critical COVID-19 disease with increased mortality and potential lack of resources (ICU, ventilators…) in a surge status
- Usual recommendations for palliative care if patient deemed palliative

9.3.6 Special Populations

Patients with Cardiovascular Disease

According to Canadian Cardiovascular Society and Hypertension Canada (March 2020):

- Patients with confirmed or suspected COVID–19 infection should not stop taking an ACEI/ARB/ARNi (for HTN & CHF) since so far benefit > risk unless justified medical reason such as hypotension, AKI or hyperkalemia
- Patients on low-dose ASA for CVD should continue it unless advised by the responsible physician
- Acetaminophen is preferred over NSAIDS for fever & myalgias but if on NSAIDs, should consult with their doctor to decide if to continue or not
- Patients with CVD and CKD should take acetaminophen over NSAIDS to avoid deterioration in CV & renal status (CHF, HTN, AKI)

Pregnant Women

- Pregnant patients receive same supportive care as non-pregnant adults
- Mode of delivery should be determined by the obstetrical indication and patient preference; caesarean delivery is *only* recommended for medically indicated reason
- There is little evidence to suggest vertical transmission from mother to neonate
- Postpartum women and their neonates should practice skin-to-skin and kangaroo care if isolation measures not undertaken (using surgical mask, respiratory hygiene, and hand washing) with focus on ensuring initiation of breast-feeding
- Women should practice good handwashing before and wear a mask while providing infant care

Patients with HIV

- Recommendations for management of patients with HIV who develop COVID-19 do not differ from standard recommendations
- Empiric addition of lopinavir-ritonavir (for possible efficacy against or protection from SARS-CoV-2) is ***not*** recommended outside of a clinical trial

10.0 Complications and prognosis

10.1 Clinical Complications

- ARDS – most common
- Septic shock
- Acute Kidney injury
- Myocardial injury
- Secondary infections - bacterial and fungal
- Multi-organ dysfunction

10.2 Prognosis

- Patients requiring ICU admission often have prolonged hospital stay, > 20 days
- Recovery of pulmonary infection in short and long term remains to be seen with time
- **> 50%** mortality if requiring ventilatory support
- Mortality rate ranges between 2-3 % but varies by country, age and co-morbidities

11.0 Screening and/or Testing

11.1 Clinical Screening

- All returning travellers
- Anyone with symptoms & signs of suspicious of COVID-19
- Anyone with history of exposure/close contact with COVID-19 case

11.2 Low Threshold for Diagnostic Lab Testing for COVID-19

- Hospitalized patients
- Long-term care & retirement home patients
- Patients undergoing procedures with increased risk of aerosolization
- Essential workers (person working directly with the public) who have COVID-19 **symptoms or who have been exposed without protection**
- Healthcare workers or a household member of a healthcare worker who has **symptoms or who has been exposed without protection**
- Pregnant **women** in third trimester and have **symptoms or who have been exposed**

The recommendations for screening & testing are changing daily!

Pearl: *Anyone with a positive clinical screen or positive laboratory testing must be isolated*

12.0 Prevention

12.1 Specific Prevention

So far, no vaccine for COVID – 19 has been developed

12.2 General Prevention Measures

12.2.1 Advise to General Public

- If mild illness, stay home, call your doctor, public health agency, telehealth or fill online screening tool
- Practice physical distancing – avoid large and unnecessary gatherings; stay home except for critical needs – resupply food and medicine (stay at *2 meters* distance when in public)
- Greet without touching, nod instead of handshake and hugging
- Work from home if possible
- Frequent hand washing technique for at least 20 seconds with soap and water
- Use of alcohol-based hand sanitizer (> 60%) until next possible hand washing
- Cover your cough. Use the tissue and throw it away; second choice is sleeve not hand
- Avoid touching face
- **STAY AT HOME if possible**

Non-medical Face Masks

- Non-medical/home made face mask use in the community has not been evaluated systematically. They are ***NOT a substitute*** for physical distancing!
- Use of non-medical face masks has ***not been proven*** to protect the person wearing it, but can be a measure to reduce the spread to others where it could be difficult to ensure physical distancing

12.2.2 House-hold Members and Caregivers

- Wear face masks, gloves and gowns when caring for a patient with COVID-19; remove and dispose upon leaving the room. DO NOT REUSE
- Wash hands for at least 20 seconds after all contact; an alcohol-based hand sanitizer (at least 60% alcohol) is acceptable alternative to soap and water, if not available
- Do not share personal items such as towels, dishes, utensils before proper cleaning
- Wash laundry & high touch surfaces frequently; wear disposable gloves while handling dirty laundry
- Restrict contact to minimum number of caregivers

12.2.3 Healthcare Settings

- Provide the patient with a face mask and place the patient in a closed room
- Persons entering the room should follow standard contact and droplet precautions
- Follow infection prevention and control (IPC) guidelines and routine practices for preventing transmission of infection

Routine Practices

- Use of alcohol-based hand rub (> 60% alcohol) at point of care in healthcare settings
- Preference to single in-patient rooms with attached toilet and patient sinks
- Implementation of respiratory hygiene
- Distance of 2 meters (6 feet) between a coughing patient with suspected COVID and another patient without infection
- Strategies for preventing infection spread while performing aerosol generating medical procedures (AGMPs) – enhanced PPE with standard transmission precautions
- Point-of-care risk assessments by healthcare workers before each patient interaction

12.2.4 Personal Protective Equipment - PPE

Definition

"Specialized clothing or equipment worn by an employee for protection against infectious materials" (OSHA)

Types of PPE in Healthcare Settings:

- Gloves – Hand protection
- Gowns/aprons – Skin and clothing protection
- Mask/respirators – Mouth and nose protection
    - Surgical/procedure masks for droplets
    - N95/respirator mask for aerosol risk
- Goggles – Eyes protection
- Face shields – Face with eyes, nose and mouth protection

Factors for PPE Selection

- **Type of exposure -** determined by the probable exposure type such as touch, splashes or sprays or large amount of body fluids/blood
- **Type of isolation precaution -** Combination of PPE is determined by the patient's isolation type such as airborne, droplet or contact precautions
- **Task appropriateness -** Choice of PPE is determined by type of patient interaction such as a gown or an apron should be fluid resistant, fluid proof or neither.
- **Appropriate size -** PPE must fit the individual user

Key Points for PPE Use

- Don before patient contact and entry into patients' room
- Avoid spreading contamination while PPE use
- Remove and discard PPE after use, discard immediately at the doorway or outside the patients' room
- Remove respirator outside patients' room
- Perform immediate hand hygiene before going to the next patient

PPE Sequence & Instructions on Donning & Doffing

The following link provides the pictorial order for donning and doffing personal protective equipment for use in healthcare settings: PPE Sequence

Video link: Droplets and PPE https://www.youtube.com/watch?v=Ww0Rf079MZ4
Video link: Aerosols & PPE https://www.youtube.com/watch?v=syh5UnC6G2k

PPE Requirements

The following document entails the pictorial description of types of PPE products recommended for use in various patient encounters in a COVID 19 patient

PPE Requirements Graphic.pdf

Aerosol Generating Medical Procedures (AGMPs)

Use: Droplet + Contact + Enhanced PPE (N95 + Full Face Shield, Level 2 gown and gloves) in the following situations:

- Cardio-pulmonary resuscitation (CPR)
- Open suctioning (e.g. "deep" insertion for nasopharyngeal or tracheal suctioning, not inclusive of oral suction)
- Tracheotomy
- High frequency oscillating ventilation
- Bronchoscopy (Diagnostic or Therapeutic)
- Non-invasive positive pressure ventilation
- CPAP/BiPAP
- Large volume nebulizers for humidity
- High flow oxygen therapy
- Upper GI endoscopy (may be considered AGMEP)

Duration of PPE Use: Allow air clearance following AGMP – 15 mins in OR and 30 mins in all other rooms

12.2.5 Discontinuation of Transmission-based Precautions

In-Home Isolation and in Healthcare settings for "Symptomatic" Patients

There are two main strategies to help decide the time of discontinuation of isolation precautions (airborne & droplet) to prevent the spread of infection. These can be used for

persons who have COVID 19 symptoms and are staying at home self-isolating themselves and for patients requiring hospital admission (in consultation with public health authority +/- healthcare team in hospital)

Non-test-based strategy: (fulfill **ALL** discontinuation criteria)

- 72 hours after the recovery - Fever resolution without anti-pyretic use **and** improvement in respiratory symptoms such as cough and shortness of breath
- At least a week (7 days) have passed since the first day of symptom onset

Test-based strategy: (fulfill **ALL** discontinuation criteria)

- Negative results of PCR results from 2 consecutive sets preferably NPS specimens 24 hours apart (total 2 negative specimens before d/c of isolation precautions)
- Fever resolution without the use of anti-pyretic agents
- Improvement in respiratory symptoms such as cough and shortness of breath

In-Home isolation for "Asymptomatic" individuals (Positive COVID 19 testing)

- At least a week (7 days) after the date of their first positive COVID 19 diagnostic test and have no subsequent sickness

When Is Test-based-strategy the answer?

- Hospitalized patients - may have longer duration of SARS-CoV-2 RNA detection
- Severely immunocompromised – may have prolonged viral shedding hence more contagious than others. These include:
  - Medical treatment with immunosuppressive agents
  - Bone-marrow or solid organ transplant recipients
  - Inherited immunodeficiency
  - Poorly controlled HIV infection
- Long-term care facility or Assisted living facility – these settings have individuals that are at high risk for severe disease. Patient transfer to such facilities warrants close caution

When testing is NOT available?

- Healthcare settings should use the non-test-based strategy **OR**
- Extend beyond the duration for non-test-based strategy on individual basis and clinical assessment in consultation with public health authorities

12.2.6 Self-Assessment Tool

- This tool is a designed questionnaire for helping the general public to assess their risk factors for COVID – 19 and is based on the best possible resources from Canadian public health agencies
- This tool could also be used by the healthcare providers to assess the spread of infection: Link to the COVID Self-Assessment Tool

13.0 Mental health wellness in COVID 19 Pandemic

The COVID 19 pandemic has disrupted daily routines in most people's life resulting in stress and mental health concerns for all at once.

13.1 Coping Strategies for Stress and Anxiety

Centre for addiction and Mental Health (CAMH) recommends following strategies to manage stress while considering the importance of limiting infection transmission

- Accept that certain degree of stress & anxiety is a *normal* response; make organized plans
- Follow authentic, credible sources for seeking COVID 19 updates (local medical institution, WHO, Health Canada, Ontario Ministry of Health) and limit checking sources to **ONCE** per day
- Seek support – online support groups, distress lines, community, religious resources
- Acquire a healthy lifestyle – balanced diet, sleep hygiene, physical exercise, cognitive exercise, intentional unplugging of electronic devices and practice relaxation techniques
- **AVOID** substance abuse – alcohol, vaping/smoking and medication overdose

13.2 How to Address Social Stigma

Play your role

- *Spreading facts + amplify voices:* collect, consolidate and disseminate accurate country and community-specific information. Amplify the stories/images of the people who have recovered or who helped patients through recovery from COVID 19 disease
- *Engaging social influencers* (community/religious leaders/respected celebrities) to address stigmatization and provide support measures for them.
- *Portray diverse ethnic groups + Practice ethical journalism:* Materials should include diverse communities impacted and working together for preventing the COVID 19 spread
- *Link up:* Initiate activities to address stereotyping hence creating an empathetic and positive environment

Communication tips

- *Correct* misconceptions about COVID 19 disease and promote the significance of preventative measures to reduce infection spread
- *Share* sympathetic narratives and address the sufferers in a sensitive and empathetic manner
- *Communicate support* for all frontline responders (HCWs, volunteers and community leaderships)

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