3. Management of Suspected COVID-19 Cases

3.1 Early identification/triage

Patients seeking healthcare services for potential COVID-19 should preferably phone ahead of time to their doctor, clinic, emergency room, or closest testing centre, so that adequate precautions can be taken. Patients should wear masks while in transit to the hospital (cloth masks can suffice until they are given a surgical mask on arrival). Patients who do not self-identify as potentially having COVID-19 should be screened and identified as soon as possible upon arriving at a health facility, to avoid prolonged contact with other patients and healthcare workers.

A suspected COVID-19 case includes any person presenting with an **acute** (≤14 days) **respiratory tract infection** or other clinical illness compatible with COVID-19, or an asymptomatic person who is a close contact to a confirmed case.

In the context of COVID-19, the key respiratory syndrome consists of ANY of:

- Cough
- Sore throat
- Shortness of breath
- Anosmia or dysgeusia

… with or without other symptoms (which may include fever, weakness, myalgia, or diarrhoea).

Atypical manifestations are increasingly being recognised, including large vessel strokes in young patients, unexplained abdominal pain, various dermatological manifestations, and a multisystem inflammatory syndrome in children.[22-24]

A close contact is defined as a person having had face-to-face contact (≤1 metre) or having been in a closed space with a confirmed COVID-19 case for at least 15 minutes. This includes, amongst others:

- All persons living in the same household as a COVID-19 case, and people working closely in the same environment as a case.
- Healthcare workers or other people providing direct care for a COVID-19 case while not wearing recommended personal protective equipment or PPE (e.g., gowns, gloves, N95 respirator, eye protection).
- A contact in an aircraft sitting within two seats (in any direction) of the case, travel companions or persons providing care, and crew members serving in the section of the aircraft where the case was seated

- Measures that may facilitate early identification of suspected COVID-19 cases include:
    - Posters, pamphlets, billboards or staff members outside and within the healthcare facility asking patients who fulfil criteria for a PUI to identify themselves to healthcare workers as soon as possible (rather than remaining in line in a waiting area).
    - Including a screening questionnaire for COVID-19 as part of the standard triage form at healthcare facilities.
- Anyone who fulfils the criteria for a suspected COVID-19 case should immediately have the following measures taken:
    - Give them a medical (surgical) mask (N95 respirators are NOT required for patients).

- Direct them to a separate area, preferably an isolation room if available. Where an individual isolation room is not available, a 2 metre distance should be kept between suspected COVID-19 cases and other patients.
- Instruct them to cover their nose and mouth during coughing or sneezing with a tissue or a flexed elbow. They should perform hand hygiene after contact with respiratory secretions (wash hands or use alcohol-based hand rub, which should be readily available at the point of triage).
- Limit their movement (e.g. use portable X-rays rather than sending the patient to the X-ray department). If they have to be moved, ensure that they wear a surgical mask at all times.
- The patient should ideally have a specifically allocated bathroom (where this is possible).

- Patients should be quickly triaged using standard emergency department triage systems. This facilitates:
  - Rapid initiation of supportive therapy (e.g. supplementary oxygen)
  - Recognition of patients who can be allowed home to await results of the COVID-19 testing (see below).
  - Protection of both patients and staff.

Table 1 – Criteria for mild disease

Mild disease (all must apply)[1]

- SpO_2 ≥95% on room air
- Respiratory rate <25
- Heart rate <120
- Temp 36-39°C
- Mental status normal

[1]For age <12, use paediatric criteria in section 5.1
HFNO – high flow nasal oxygen. CPAP – continuous positive airway pressure. NIV – non-invasive ventilation

3.2 Testing

Testing for acute COVID-19 infection should be by means of polymerase chain reaction (PCR) assays.

Samples to be sent are:

- *Upper respiratory tract samples* – A sample from the upper respiratory tract should be sent from all patients. A single site is sufficient. Currently, a nasopharyngeal swab is the preferred specimen, but in patients where this is not possible (e.g. recent nasal surgery, or severe coagulopathy), an oropharyngeal, nasal mid-turbinate, or anterior nares swab can be collected instead.[25, 26]
  - Recently, saliva has emerged as a viable alternative to nasopharyngeal swabs.[27-29] Saliva can be collected without requiring aerosol precautions or invasive sampling, and does not require swabs or viral transport medium. Guidance on this will be updated shortly.
- *Lower respiratory tract samples* – send when available. Lower respiratory tract samples may have a higher sensitivity than upper respiratory tract samples.[25, 30] Sputum, tracheal aspirates, or

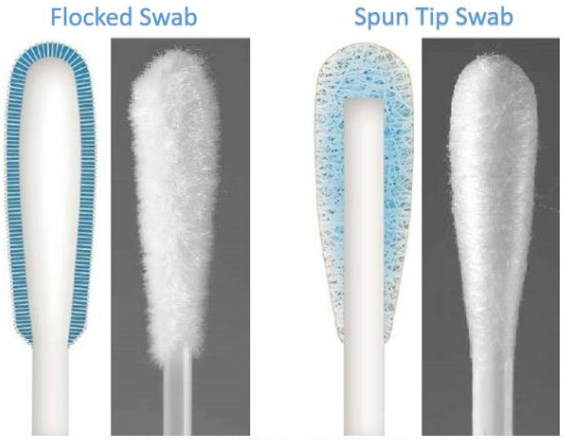
bronchoalveolar lavage fluid are all acceptable samples to send. Sputum induction should not be performed however.

Where both upper and lower respiratory tract samples are available, both should be sent.

Appropriate personal protective equipment (PPE) should be worn by all healthcare workers when obtaining specimens (see IPC section below).

Obtaining samples for SARS-CoV-2 testing

- Healthcare workers obtaining respiratory samples require appropriate personal protective equipment, including eye protection (goggles or visor), gloves, an apron or gown, and an N95 respirator (or equivalent, e.g. FFP2 mask). Meticulous hand hygiene is also essential. See section 6 for further details.
- Collecting a good quality specimen is vital – see box below.
- Appropriate swabs are flocked or spun, and consist of polyester, nylon or rayon material with a plastic or aluminium shaft. Cotton swabs, calcium alginate swabs, and swabs with a wooden shaft are not recommended, as they may contain substances that inactivate SARS-CoV-2 and inhibit PCR testing.



Illustrations obtained from publically available material

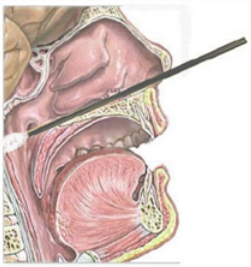
Transport of specimens

- Nasopharyngeal, mid-turbinate and anterior nares samples should ideally be placed in viral/universal transport medium (UTM) and kept between 2-8°C until they are processed at the laboratory. Due to constraints in the supply of viral/universal transport medium, dry swabs can be sent provided that the sample will reach the laboratory within 2 days. Dry swabs can be sent at ambient temperature.
- Lower respiratory tract samples can be sent in standard specimen containers and do not require viral/universal transport medium.

Transport time to testing laboratory	
<2 days: can use dry swab (no transport medium needed) and can be transported at ambient temperature	>2 days: transport in UTM, preferably at 2-8°C. If UTM is not available, can use normal saline as an alternative.

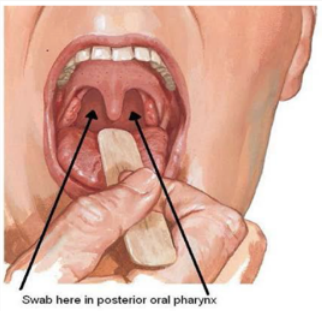
Collection of a nasopharyngeal specimen

1. Ask the patient to tilt his/her head back slightly.
2. Gently insert swab into the nostril, aiming backwards (not upwards) until a slight resistance is met – about the distance from the nose to the anterior ear. If resistance is met before fully inserted, remove and try the other nostril.
3. Rotate swab 2-3 times and hold in place for 2-3 seconds.
4. Slowly withdraw the swab and put it into the specimen tube containing universal transport medium.
5. Break the swab's shaft and close the tube.



Collection of an oropharyngeal specimen

1. Ask the patient to tilt his/her head back and open their mouth.
2. Hold the tongue down with a tongue depressor.
3. Have the patient say "aahh" to elevate the uvula.
4. Swab each tonsil first, then the posterior pharynx in a "figure 8" movement.
5. Avoid swabbing the soft palate or the tongue as this can induce the gag reflex.
6. Place the swab into the same specimen tube.
7. Break the swab's shaft and close the tube tightly.



Collection of a mid-turbinate specimen

1. Ask the patient to tilt his/her head back slightly.
2. Gently insert swab less than 2cm into the nostril (until resistance is met at the turbinates).
3. Gently rotate swab several times against the nasal wall,.
4. Repeat in the other nostril using the same swab.
5. Withdraw the swab and put it into the specimen tube containing universal transport medium.
6. Break the swab's shaft and close the tube.

Collection of an anterior nares (nasal) specimen

1. Ask the patient to tilt his/her head back slightly.
2. Insert the swab at least 1 cm inside the nares.
3. Firmly sample the nasal membrane by rotating the swab and leaving it in place for 10-15 seconds.
4. Sample both nares with the same swab.
5. Withdraw the swab and put it into the specimen tube containing universal transport medium.
6. Break the swab's shaft and close the tube.

<u>Repeat testing</u>

PCR tests may produce false negative results due to factors such as poor sampling technique, suboptimal specimen storage (e.g. unavailability of viral/universal transport medium, or specimen not stored at cold temperatures), the site the sample is obtained from, and the time point at which the swab is taken (viral loads are usually highest early on in the disease course). If a high clinical suspicion

for COVID-19 persists despite an initial negative test, repeat testing should be considered in consultation with an infectious diseases expert, particularly in hospitalised patients for whom management might be significantly altered. However, it is equally important to maintain a broad differential diagnosis and to always consider alternative diagnoses (see box below).

A single positive PCR test is sufficient proof of COVID-19 infection. There is no role for repeat "confirmatory" PCR testing on patients who test positive despite the absence of symptoms, as PCR-based tests have excellent specificity, and asymptomatic and presymptomatic COVID-19 patients are now well described.

The **differential diagnosis** of suspected cases includes influenza (remembering the seasonality), both conventional and atypical bacterial pneumonias, and in patients with HIV and a CD4 count <200 cells/mm^3 (or equivalent immunosuppression), *Pneumocystis jirovecii* pneumonia (PJP).

Malaria as the cause of an acute febrile illness (typically with headache, rigors and malaise) must always be considered in persons residing in or travelling from malaria transmission areas.

Non-infectious causes of dyspnoea and/or fever should also be considered, such as pulmonary emboli, myocardial infarction, and heart failure.

For patients with severe disease who require admission, appropriate tests may include:

- HIV test (if status unknown)
- Full blood count + differential
- Blood culture
- Nasopharyngeal and/or oropharyngeal swabs for detection of viral and atypical pathogens
- Chest radiography
- Sputum for MCS and *Mycobacterium tuberculosis* detection (GeneXpert MTB/RIF Ultra).
- Urine for lipoarabinomannan (LAM) if HIV positive
- Beta-D-glucan and expectorated sputum/tracheal aspirate for PJP if HIV positive and clinically suspicious of PJP (don't induce sputum though)

For patients with mild disease who do not require admission, a more limited workup may be appropriate. Depending on the specific presentation, test may include:

- HIV test (if status unknown)
- Sputum GeneXpert MTB/RIF Ultra if patient is HIV positive and is coughing (would fulfil case definition for TB), or if HIV negative and in close contact with TB patients

Antibody tests

Currently, we do not recommend using antibody-based (serological) tests for the diagnosis of acute COVID-19. These tests are insufficiently sensitive early in the disease course (before sufficient antibodies have been produced).[31, 32] In addition, antibody-based tests tend to be less specific than PCR-based tests. When the proportion of the population who have active or resolved COVID-19 is low,

antibody-based tests may consequently have a low positive-predictive value (meaning that a substantial proportion of "positive" results may be false positives).

- The role of antibody-based tests in other scenarios, such as for community surveillance, or when used in combination with RT-PCR tests, remains to be defined.

Point of care antigen tests

We do not currently recommend point of care antigen-based tests, due to concerns about poor sensitivity and specificity.[33]

3.3 Empiric treatment of other pathogens

Where the patient fits the appropriate clinical syndrome, consider treatment of other pathogens such as:

- **Conventional community-acquired pneumonia pathogens** (or hospital-acquired pneumonia pathogens if appropriate) – e.g. amoxicillin or ceftriaxone [see primary healthcare and hospital level adult and paediatric standard treatment guidelines]
- **Atypical pneumonia pathogens** – e.g. azithromycin [see hospital level adult and paediatric standard treatment guidelines]
- **Influenza** (if seasonal epidemiology fits and has severe illness or if patient is at risk of severe influenza) – oseltamivir [see NICD influenza guidelines]
- **PJP** (if appropriate risk factors present, e.g. HIV with CD4 count <200 cells/mL, and not on cotrimoxazole prophylaxis)

3.4 Managing patients at home while awaiting COVID-19 test results

Suspected COVID-19 cases who are medically well, or who are assessed as having only mild disease, may be managed at home while awaiting test results.

Such patients should be instructed to self-isolate at home. However, any deterioration in their ability to perform activities of daily living at home as a result of dyspnoea should prompt re-evaluation at a healthcare facility. Isolation is the act of separating a symptomatic individual with a contagious disease from healthy individuals without that contagious disease. The following advice should be given to a person self-isolating to reduce the possible transmission to others:

- Patients should stay in a specific room and use their own bathroom (if possible). Patients should avoid unnecessary travel and unnecessary contact with other people. If they live in shared accommodation (university halls of residence or similar) with a communal kitchen, bathroom(s) and living area, they should stay in their room with the door closed, only coming out when necessary, wearing a surgical mask if they do so.
- Where contact is unavoidable, the patient should wear a surgical mask, and maintain a distance of at least 1 metre (preferably 2 metres) from other people.
- Patients should clean their hands with soap and water frequently. Alcohol-based sanitizers may also be used, provided they contain at least 70% alcohol.
- Patients should practice good cough and sneeze hygiene, by using a tissue, and then immediately discarding the tissue in a lined trash can, followed by washing hands immediately.
- Patients should not have visitors in their home. Only those who usually live in their home should be allowed to stay.

- Patients should avoid sharing household items like dishes, cups, eating utensils and towels. After using any of these, the items should be thoroughly washed with soap and hot water.
- All high-touch surfaces like table tops, counters, toilets, phones, computers, etc. should be appropriately and frequently cleaned.
- If patients need to wash laundry at home before the PCR results are available, then they should wash all laundry at the highest temperature compatible with the fabric using laundry detergent. This should be above 60°C. If possible, they should tumble dry and iron using the highest setting compatible with the fabric. Disposable gloves and a plastic apron should be used when handling soiled materials if possible and all surfaces and the area around the washing machine should be cleaned. Laundry should not be taken to a launderette. The patient should wash his/her hands thoroughly with soap and water after handling dirty laundry (remove gloves first if used).
- Patients should know who to call and/or where to go if they develop any worsening symptoms, so that they can be safely reassessed.
- In addition to this advice, a patient information sheet should be provided (see Appendix 1 for an example).

Patients with suspected COVID-19 disease who are unable to meet the minimum criteria to safely self-isolate (stay in a separate room, maintain physical distancing, maintain good hand hygiene, and return timeously to a healthcare facility in case of deterioration) should be admitted to an appropriate isolation facility if available.

This is distinct from quarantine, which is the act of separating asymptomatic individuals potentially exposed to a disease from non-exposed individuals. See also further advice on self-quarantining from the NICD website.

For the **symptomatic management** of suspected COVID-19 patients managed at home or in isolation facilities, see section 4.2.

An example of patient management algorithm that may be suitable for primary care is provided in appendix 2.