



# FOCUS ON **HEALTH**

## **General**

### **Activity for 2020**

### **Activity No: G5 (20) 2025**

#### **Topic**

Clinical management of COVID-19

#### **Article**

Clinical management of suspected or confirmed COVID-19 disease

#### **Speciality**

MP's /DP's / OH's / PT's / DR / PS/ Emergency Care

Approved for **THREE (3)** Clinical Continuing Education Units (CEU's)

# **Clinical management of suspected or confirmed COVID-19 disease**

<b>1. BACKGROUND</b>	<b>2</b>
<b>2. EPIDEMIOLOGY AND CLINICAL CHARACTERISTICS</b>	<b>2</b>
<b>3. MANAGEMENT OF SUSPECTED COVID-19 CASES</b>	<b>3</b>
<b>4. MANAGEMENT OF CONFIRMED COVID-19 CASES</b>	<b>7</b>
<b>5. INFECTION PREVENTION AND CONTROL (IPC)</b>	<b>12</b>
<b>6. RECORDING AND REPORTING</b>	<b>12</b>
<b>APPENDIX 1 – EXAMPLE OF A PATIENT INFORMATION SHEET</b>	<b>15</b>

Version 1.1 – 13<sup>th</sup> March 2020

**Writing committee** (in alphabetical order): David Anderson, Lucille Blumberg, Cheryl Cohen, Tendesayi Kufa-Chakezha, Shaheen Mehtar, Natalie Mayet, Jeremy Nel

# Clinical management of suspected or confirmed COVID-19 disease

## 1. Background

On 31<sup>st</sup> December 2019, the World Health Organization (WHO) was alerted to a cluster of pneumonia of unknown aetiology in patients in Wuhan City, Hubei Province of China. One week later the novel coronavirus (severe acute respiratory syndrome coronavirus 2: SARS-CoV-2) was identified as the cause. The resulting illness was named COVID-19 on the 11<sup>th</sup> February 2020. The clinical spectrum of COVID-19 ranges from an asymptomatic or mild flu-like illness to a severe pneumonia requiring critical care. These guidelines describe the clinical management of cases of COVID-19 disease and covers clinical care in and outside health care facilities. It is intended for health care practitioners taking care of symptomatic patients with suspected or confirmed COVID-19.

## 2. Epidemiology and clinical characteristics

SARS-CoV-2 is a betacoronavirus closely related to SARS-CoV and MERS-CoV. It is an enveloped, non-segmented, positive sense RNA virus. It is thought to have originated in bats but the animal that mediated transmission to humans remains unknown.

### 2.1 Epidemiology

The mean incubation period for COVID-19 is estimated to be 4-5 days, with an interquartile range of 2-7 days.<sup>1,2</sup> Transmission from asymptomatic patients has been postulated, but the extent of this is unknown.<sup>3</sup> The reproductive number for the virus is approximately 2.2.<sup>1</sup> In the early reported cases, the median age of reported cases was 50 years with a male preponderance of cases (~60%). Very few severe cases which required hospitalisation have been reported among children under the age of 15 years (~1%), although school closures may have influenced this figure. Risk factors for severe disease include older age and cardiopulmonary comorbidities.

### 2.2 Clinical characteristics – what to look for

80% of symptomatic patients develop mild disease, an estimated 15% develop severe disease (with hypoxaemia, dyspnoea and tachypnoea) while 5% become critically ill (with respiratory failure, septic shock and/or multiorgan dysfunction).<sup>4</sup> The proportion of asymptomatic carriers is currently unknown.

The most common presenting symptom has been fever (~90%, but only present in 44% on admission). Other common symptoms include cough (68%), fatigue (38%), sputum production (34%), shortness of breath (19%), myalgia or arthralgia (15%), sore throat (14%), headache (13.6%) and chills (12%).<sup>2</sup>

Gastrointestinal symptoms such as nausea or vomiting (5.0%) and diarrhoea (3.8%) appear to be uncommon.

Abnormalities are visible on chest X-ray in ~60% of COVID-19 patients, and on ~85% of patients' chest CT scans. Both are more common with severe disease (77% and 95% respectively).

### 2.3 Outcomes and prognosis

The vast majority of cases will make a full recovery, though this may take several weeks, particularly in severe cases. In a minority of cases, COVID-19 has been associated with rapid progression to acute respiratory distress syndrome (ARDS), multiple organ failure and sometimes death. The case fatality ratio is currently unknown, but is estimated to be within the range of 0.5-4%. Among the critically ill, mortality was attributed to secondary bacterial infections with multi-drug resistant organisms, sepsis and septic shock.

## 3. Management of Suspected COVID-19 Cases

### 3.1 Early identification/triage

Patients fulfilling the latest case definition for suspected COVID-19 case (a “person under investigation”) should be identified as soon as possible upon entering a health facility, to avoid prolonged contact with other patients and healthcare workers.

- The criteria for a “person under investigation” (PUI) are dynamic and will change with time. For the latest criteria, please see the NICD’s website: <http://www.nicd.ac.za/diseases-a-z-index/covid-19/>

As of 10<sup>th</sup> March 2020, the case NICD’s case definition is:

Persons with acute respiratory illness with sudden onset of at least one of the following: cough, sore throat, shortness of breath or fever [ $\geq 38^{\circ}\text{C}$  (measured) or history of fever (subjective)] irrespective of admission status

**AND**

In the 14 days prior to onset of symptoms, met at least one of the following epidemiological criteria:

- Were in close contact with a confirmed or probable case of SARS-CoV-2 infection;

**OR**

- Had a history of travel to areas with local transmission of SARS-CoV-2 (the list of these countries will change with time – consult the NICD website)

**OR**

- Worked in, or attended a health care facility where patients with SARS-CoV-2 infections were being treated

**OR**

- Admitted with severe pneumonia of unknown aetiology

- Measures that may facilitate the earliest possible 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.
- Any patient who fulfils criteria for a suspected COVID-19 case should immediately have the following measures taken:
  - Give the patient a medical (surgical) mask (N95 respirators are NOT required for patients).
  - Direct the patient 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 the patient to cover his/her nose and mouth during coughing or sneezing with a tissue with a flexed elbow. The patient 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 the movement of the patient (e.g. use portable X-rays rather than sending the patient to the X-ray department). If the patient has to be moved, ensure that (s)he wears a mask.
  - The patient should have a dedicated bathroom (where this is possible).
- Patients should be quickly triaged in terms of clinical severity. Routine emergency department triage systems may be used. In the context of COVID-19, triaging is essential because:
  - It allows for rapid initiation of supportive therapy (e.g. oxygen supplementation)
  - It has implications for whether or not the patient can be allowed home to await results of the COVID-19 testing (see below).
  - It protects both patients and staff.

### 3.2 Testing

All persons under investigation require testing for SARS-CoV-2 by means of reverse transcriptase PCR (RT-PCR). Samples to be sent are:

- *Upper respiratory tract samples* – nasopharyngeal and oropharyngeal swabs (combined in the same universal transport medium tube) in all patients.
- *Lower respiratory tract samples* – may not be possible depending on the patient's symptoms. Where available, send sputum, tracheal aspirates, or bronchoalveolar lavage fluid. Sputum induction is not recommended.
- *Serum sample* – may be sent to NICD in addition, though the primary method of diagnosis remains respiratory samples as above. Send one sample during acute illness (1<sup>st</sup> week), and a second sample during convalescence (3<sup>rd</sup>-4<sup>th</sup> week).

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

The **differential diagnosis** of suspected cases includes influenza (remembering the seasonality in patients from the northern hemisphere differs from those of the southern hemisphere), both conventional and atypical bacterial pneumonias, and in patients with HIV and a CD4 count <200 cells/mm<sup>3</sup> (or equivalent immunosuppression), *Pneumocystis jirovecii* pneumonia. Depending on the patient, appropriate samples may include:

- Full blood count + differential count
- Blood cultures
- Nasopharyngeal swabs or aspirates and oropharyngeal swabs for detection of viral and atypical pathogens
- Chest radiography
- Sputum for MCS and/or *Mycobacterium tuberculosis* detection (GeneXpert MTB/RIF Ultra).

#### Obtaining samples for SARS-CoV-2 testing

- Healthcare workers obtaining respiratory samples require appropriate personal protective equipment, including those for contact, droplet and aerosol precautions (see infection prevention and control section below).
- Collecting a good quality specimen is vital. For details on how to properly obtain good quality specimens, please see Appendix 5 of the NICD's COVID-19 guidelines for case-finding, diagnosis, management and public health response in South Africa: <http://www.nicd.ac.za/wp-content/uploads/2020/02/Guidelines-for-case-finding-diagnosis-management-and-public-health-response-in-South-Africa.pdf>

#### Transport of specimens

- Ensure that samples are kept between 2-8°C until they are processed.

#### **For samples sent to the NICD:**

Mark all samples as :

Suspected COVID-19 CRDM  
NHLS/NICD  
Centre for Respiratory Diseases and Meningitis (CRDM)  
Lower North Wing, SAVP Building  
1 Modderfontein Road, Sandringham, Johannesburg, 2131

NHLS laboratories use usual overnight region courier service. Private labs should organise shipment using existing systems, or contact CRDM for assistance if shipping is unavailable.

### **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-clavulante [see [SA community-acquired pneumonia guidelines](#)]

- Atypical pneumonia pathogens – e.g. azithromycin [see [SA community-acquired pneumonia guidelines](#)]
- Influenza (if influenza epidemiology fits and has severe illness or if patient is at risk of severe influenza) – oseltamivir [see [NICD influenza guidelines](#)]
- PCP (if appropriate risk factors present, e.g. HIV with low CD4 count)

### 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.

**Table 1 – Criteria for “mild” disease (for age >12 years)<sup>1</sup>**

Criteria for "mild" disease
<ul style="list-style-type: none"> <li>• SpO<sub>2</sub> ≥95%</li> <li>• Respiratory rate &lt;25</li> <li>• Heart rate &lt;120</li> <li>• Temp 36-39°C</li> <li>• Mental status normal</li> </ul>

<sup>1</sup>For age 5-12, use respiratory rate <30, and heart rate <130. For younger ages, use age-appropriate normal values.

Such patients should be instructed to self-isolate at home and be given appropriate advice about reducing 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.
- Where contact is unavoidable, the patient should wear a facemask, 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 live in their home should be allowed to stay.
- At home, the patient should stay in a specific room and use his/her own bathroom (if possible). 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 facemask if they do so.
- 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 results are available, then they should wash all laundry at the highest temperature compatible for 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 laundrette. 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 if they develop any worsening symptoms, so that they can be safely reassessed.
- In addition to being given the above advice, a patient information sheet can be given if possible (see Appendix 1 for an example).

## 4. Management of Confirmed COVID-19 Cases

The goal in clinical management of cases is to reduce morbidity and mortality and minimise transmission to uninfected contacts. Triageing patients and early identification of patients who are severely or critically ill and require hospital or ICU admission will be essential in reducing morbidity and mortality while isolation and implementation of infection prevention and control (IPC) measures within facilities as well as contact tracing, education on good cough hygiene and IPC at home will help minimise onward transmission of the virus. Key management principles include:

**4.1 Rapid triage of cases** – in order that appropriate IPC measures and an appropriate level of supportive care can be commenced.

- Cases triaged as having moderate or severe disease will require admission for medical reasons. Provided capacity exists, hospitals designated to manage COVID-19 cases should be primarily used for admissions.
- Patients with mild disease may be considered for management at home, provided they are able to safely self-isolate and are not at risk of developing severe disease (see criteria in table 2).
- If patients are to be managed at home, is imperative that all appropriate measures are taken to prevent onward transmission of the disease to others - give advice as in section 3.1 above.
- Note also that in 10-15% of cases, those patients assessed as having “mild” disease may continue to worsen over the course of a week or more and become severely ill. **Patients managed from home need to be given the contact details of their doctor or healthcare facility that they can reach out to in case of any clinical deterioration.**
- Patients managed from home will have monitoring and subsequent viral sampling (see section 4.5) facilitated by their local health department. The NICD will alert each provincial health department of all new cases on a daily basis to facilitate this process.






**Table 2 - Criteria for management at home (for age >12 years<sup>1</sup>):**

<p>Mild disease</p> <ul style="list-style-type: none"><li>• SpO<sub>2</sub> ≥95%</li><li>• Respiratory rate &lt;25</li><li>• HR &lt;120</li><li>• Temp 36-39°C</li><li>• Mental status normal</li></ul>
<p>Able to safely self-isolate</p> <ul style="list-style-type: none"><li>• Separate bedroom available for patient to self-isolate in</li><li>• Patient able to contact, and return to, healthcare facility in case of deterioration</li></ul>
<p>Not at high risk of deterioration</p> <ul style="list-style-type: none"><li>• Age &lt;50 years</li><li>• No cardiac or pulmonary comorbidities</li><li>• No other debilitating comorbidities (e.g. cancer)</li></ul>

<sup>1</sup>For age 5-12, use respiratory rate <30, and heart rate <130. For younger ages, use age-appropriate normal values.

#### **4.2 Early supportive therapy in hospitalised COVID-19 patients**

- ✔ **Give supplemental oxygen therapy immediately to patients with low oxygen saturation.**
  - Oxygen therapy is likely to be the single most effective supportive measure in COVID-19 patients overall. Target SpO<sub>2</sub> ≥90% in non-pregnant adults and SpO<sub>2</sub> ≥92-95 % in pregnant patients.<sup>5</sup> Children with emergency signs (obstructed or absent breathing, severe respiratory distress, central cyanosis, shock, coma or convulsions) should receive oxygen therapy during resuscitation to target SpO<sub>2</sub> ≥94%; otherwise, the target SpO<sub>2</sub> is ≥90%.
  - Titrate oxygen therapy up and down to reach targets by means of nasal cannula, a simple face mask or a face mask with reservoir bag, as appropriate:

		
O <sub>2</sub> dose 1–5 L/min	O <sub>2</sub> dose 6–10 L/min	O <sub>2</sub> dose 10–15 L/min
FiO <sub>2</sub> estimate 0.25–0.40	FiO <sub>2</sub> estimate 0.40– 0.60	FiO <sub>2</sub> estimate 0.60–0.95
Nasal cannula	Simple face mask	Face mask with reservoir bag

- ✔ **Use conservative fluid management in patients with SARI when there is no evidence of shock.** Aggressive fluid resuscitation may worsen oxygenation, especially in settings where there is limited availability of mechanical ventilation.<sup>6,7</sup>
- ✔ **If a clinical suspicion for co-infection exists, consider empiric antimicrobials to treat co-pathogens pathogens causing the syndrome, particularly in severe cases.** This may include conventional and atypical bacterial pathogens, influenza and PCP (see section 3.3 above).
- ✔ **Closely monitor patients with SARI for signs of clinical deterioration, such as rapidly progressive respiratory failure and sepsis, and apply supportive care interventions immediately.**

#### 4.3 Specific therapies

✘ **Do not routinely give systemic corticosteroids for treatment of COVID-19 unless they are indicated for another reason.**

A systematic review of observational studies of corticosteroids administered to patients with SARS reported no survival benefit and possible harms (avascular necrosis, psychosis, diabetes, and delayed viral clearance).<sup>8</sup> A systematic review of observational studies in influenza found a higher risk of mortality and secondary infections with corticosteroids; the evidence was judged as very low to low quality due to confounding by indication.<sup>9</sup> A subsequent study that addressed this limitation by adjusting for time-varying confounders found no effect on mortality.<sup>10</sup> Finally, a recent study of patients receiving corticosteroids for MERS used a similar statistical approach and found no effect of corticosteroids on mortality but delayed lower respiratory tract (LRT) clearance of MERS-CoV.<sup>11</sup> Given lack of effectiveness and possible harm, routine corticosteroids should be avoided unless they are indicated for another reason.

! **There is no current evidence from RCTs to recommend any specific anti-nCoV treatment for patients with suspected or confirmed 2019-nCoV infection.** Unlicensed treatments should be administered only in the context of ethically approved clinical trials or the Monitored Emergency Use of Unregistered Interventions Framework (MEURI), with strict monitoring.

#### 4.4 Management of hypoxemic respiratory failure and ARDS

✔ **Recognize severe hypoxemic respiratory failure when a patient with respiratory distress is failing standard oxygen therapy.** Patients may continue to have increased work of breathing or hypoxemia (SpO<sub>2</sub> <90%, PaO<sub>2</sub> <60 mmHg [<8.0 kPa]) even when oxygen is delivered via a face mask

with reservoir bag. Hypoxemic respiratory failure in ARDS commonly results from intrapulmonary ventilation-perfusion mismatch or shunt and usually requires mechanical ventilation.

**⚠ High-flow nasal oxygen (HFNO) or non-invasive ventilation (NIV) should only be used in selected patients with hypoxemic respiratory failure. The risk of treatment failure was high in patients with MERS treated with NIV, and patients treated with either HFNO or NIV should be closely monitored for clinical deterioration.**

Patients with hypercapnia (exacerbation of obstructive lung disease, cardiogenic pulmonary oedema), hemodynamic instability, multi-organ failure, or abnormal mental status should generally not receive HFNO, although emerging data suggest that HFNO may be safe in patients with mild-moderate and non-worsening hypercapnia.<sup>12</sup> Patients receiving HFNO should be in a monitored setting and cared for by experienced personnel capable of endotracheal intubation in case the patient acutely deteriorates or does not improve after a short trial (about 1-2 hrs).

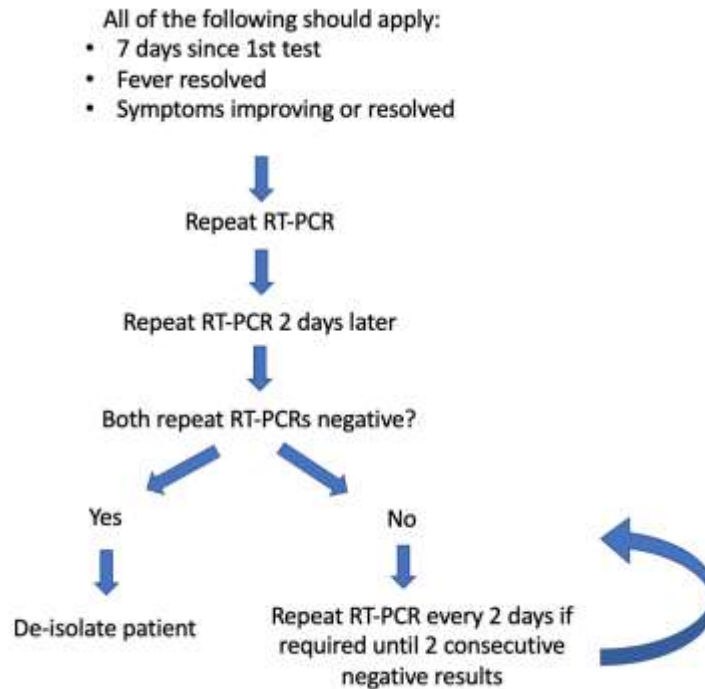
- Risks of NIV include delayed intubation, large tidal volumes, and injurious transpulmonary pressures. Limited data suggest a high failure rate when MERS patients receive NIV.<sup>11</sup>
- Recent publications suggest that newer HFNO and NIV systems with good interface fitting do not create widespread dispersion of exhaled air and therefore should be associated with low risk of airborne transmission, though this is an area of ongoing study and so airborne precautions should be used.<sup>13-15</sup>

**✔ For intubated patients with ARDS use lung-protective ventilation strategies.** Always consult an expert intensivist if possible. Detailed recommendations on mechanical ventilation strategies are beyond the scope of the guideline. Nonetheless, the general principles in patients with ARDS include:

- Aim for an initial tidal volume of 6ml/kg.<sup>16</sup> Tidal volume up to 8 ml/kg predicted body weight is allowed if undesirable side effects occur (e.g. dyssynchrony, pH <7.15).
- Use lower inspiratory pressures (plateau pressure <30 cmH<sub>2</sub>O).<sup>16</sup>
- Hypercapnia is permitted if meeting the pH goal of 7.30-7.45.
- Application of prone ventilation >12 hours a day is strongly recommended for patients with severe ARDS.<sup>16</sup>
- In patients with moderate or severe ARDS, moderately higher PEEP instead of lower PEEP is suggested.<sup>16</sup>
- The use of deep sedation may be required to control respiratory drive and achieve tidal volume targets.
- In patients with moderate-severe ARDS (PaO<sub>2</sub>/FiO<sub>2</sub> <150), neuromuscular blockade by continuous infusion should not be routinely used.<sup>17</sup> Continuous neuromuscular blockade may still be considered in patients with ARDS in certain situations: ventilator dyssynchrony despite sedation, such that tidal volume limitation cannot be reliably achieved; or refractory hypoxemia or hypercapnia.
- In settings with access to expertise in extracorporeal life support (ECLS), consider referral of patients with refractory hypoxemia despite lung protective ventilation.<sup>18-20</sup>
- Avoid disconnecting the patient from the ventilator, which results in loss of PEEP and atelectasis. Use in-line catheters for airway suctioning and clamp endotracheal tube when disconnection is required (for example, transfer to a transport ventilator).

#### 4.5 Repeat specimens

Patients may continue to be PCR positive after clinical resolution, although for how long such virus is viable (and thus infectious) remains to be determined. Repeat nasopharyngeal and oropharyngeal swabs should only be sent once the patient's fever (if present) has resolved, clinical improvement has been noted, and a minimum of 7 days has passed since the initial positive test. Samples should be sent every 2 days until two consecutive negative RT-PCR tests have been documented.



#### 4.6 Discharge and deisolation criteria

Patients with COVID-19 can be discharged home provided they meet ALL of the following criteria:

1. There are no medical indications for admission.
2. The patient's symptoms have improved or resolved. (Note: full recovery can take several weeks, especially in severe cases. It is not necessary for every symptom to have completely resolved prior to discharge, only that there has been improvement).
3. The patient has two consecutive negative combined nasopharyngeal and oropharyngeal RT-PCR tests, performed at least 24-48 hours apart.

Patients with mild disease who were managed at home from the outset can be deisolated using the same criteria.

## 5. Infection prevention and control (IPC)

IPC is a critical and integral part of clinical management of patients and should be initiated at the point of entry of the patient to hospital (typically the Emergency Department). **A combination of standard, contact and droplet precautions should be practiced for all COVID-19 cases, and further precautions when performing aerosol-generating procedures (AGP).**

**Standard precautions** are used to prevent or minimize transmission of pathogens at all times, and should be applied to all patients in healthcare facilities irrespective of their diagnosis or status. These include hand hygiene, appropriate use of PPE, safe handling of sharps, linen and waste, disinfection of patient care articles, respiratory hygiene, occupational health and injection safety.

### **Transmission-based precautions - droplet, and contact:**

- Hand hygiene is the first and most essential aspect
- Healthcare worker PPE consists of gloves, gown, and a medical mask.
- Safe waste management
- Use either disposable or dedicated equipment (e.g. stethoscopes, blood pressure cuffs and thermometers). If equipment needs to be shared among patients, clean and disinfect between each patient use.
- Limit patient movement within the institution (e.g. where possible, use portable X-rays rather than sending the patient to the X-ray department), and ensure that patients wear medical masks when outside their rooms.

### **Aerosol-generating Procedures:**

Aerosol precautions are required when performing aerosol-generating procedures. These include taking respiratory tract samples for SARS-CoV-2 testing (such as nasopharyngeal and oropharyngeal swabs), intubation, bronchoscopy, open suctioning of the respiratory tract, and cardiopulmonary resuscitation.

Aerosol precautions for healthcare workers:

- Healthcare worker PPE consists of gloves, gown, a fit-tested particulate respirator (N95 respirator), and eye protection (goggles or face shield).
- Use an adequately ventilated single room when performing aerosol-generating procedures, with spacing between beds of at least 1-1.5 metres.

For more details, refer to the World Health Organization IPC guidelines:

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technical-guidance/infection-prevention-and-control>

## 6. Recording and reporting

The goal of clinical management is to reduce morbidity and mortality from COVID-19. It is important to record and report the cases of COVID-19 disease in order to track the size and severity of the epidemic, the care received by patients in and out of hospital and identify areas for improvement in current and

future outbreaks. There different tools which will be needed to record and report clinical cases of COVID-19.

<b>Tool</b>	<b>When to complete</b>	<b>Comments</b>
Person of interest form	To be completed for all individuals <u>suspected</u> of COVID 19 disease and have a specimen taken	
NMC case notification	To be completed for all cases who meet the case definition for COVID-19	Can be completed online using NICD NMC mobile or web based app
Admission form (For <u>inpatients</u> )	To be completed for all <u>confirmed</u> patients admitted to a health care facility at admission or as soon as possible after admission	This form will document presence of co-morbidities, severity of illness at admission
Daily monitoring form (separate forms for inpatients and outpatients)	To be completed for all <u>confirmed</u> patients for each day until they are considered cured (by PCR criteria).	This form will document the daily symptoms, signs and severity of disease during admission
Discharge form (different forms for inpatients and outpatients)	To be completed for all <u>confirmed</u> patients	This form will document patient outcomes such as death, transfer or discharge.
Homecare form (for <u>outpatients</u> )	To be completed for all <u>confirmed</u> patients admitted with mild disease managed at home.	This form will document presence of co-morbidities, severity of illness at admission

The latest version of these forms are available from [www.nicd.ac.za](http://www.nicd.ac.za)

### References

1. Li Q, Guan X, Wu P, Wang X, Zhou L, Tong Y, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. N Engl J Med. 2020.
2. Guan WJ, Ni ZY, Hu Y, Liang WH, Ou CQ, He JX, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. N Engl J Med. 2020.
3. Yu P, Zhu J, Zhang Z, Han Y, Huang L. A familial cluster of infection associated with the 2019 novel coronavirus indicating potential person-to-person transmission during the incubation period. J Infect Dis. 2020.
4. Wu Z, McGoogan JM. Characteristics of and Important Lessons From the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72314 Cases From the Chinese Center for Disease Control and Prevention. JAMA. 2020.
5. World Health Organization. Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspected 2020 [Available from: [https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-\(ncov\)-infection-is-suspected](https://www.who.int/publications-detail/clinical-management-of-severe-acute-respiratory-infection-when-novel-coronavirus-(ncov)-infection-is-suspected)].

6. Schultz MJ, Dunser MW, Dondorp AM, Adhikari NK, Iyer S, Kwizera A, et al. Current challenges in the management of sepsis in ICUs in resource-poor settings and suggestions for the future. *Intensive Care Med.* 2017;43(5):612-24.
7. Rhodes A, Evans LE, Alhazzani W, Levy MM, Antonelli M, Ferrer R, et al. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. *Intensive Care Med.* 2017;43(3):304-77.
8. Stockman LJ, Bellamy R, Garner P. SARS: systematic review of treatment effects. *PLoS Med.* 2006;3(9):e343.
9. Lansbury L, Rodrigo C, Leonardi-Bee J, Nguyen-Van-Tam J, Lim WS. Corticosteroids as adjunctive therapy in the treatment of influenza. *Cochrane Database Syst Rev.* 2019;2:CD010406.
10. Delaney JW, Pinto R, Long J, Lamontagne F, Adhikari NK, Kumar A, et al. The influence of corticosteroid treatment on the outcome of influenza A(H1N1pdm09)-related critical illness. *Crit Care.* 2016;20:75.
11. Arabi YM, Mandourah Y, Al-Hameed F, Sindi AA, Almekhlafi GA, Hussein MA, et al. Corticosteroid Therapy for Critically Ill Patients with Middle East Respiratory Syndrome. *Am J Respir Crit Care Med.* 2018;197(6):757-67.
12. Lee MK, Choi J, Park B, Kim B, Lee SJ, Kim SH, et al. High flow nasal cannulae oxygen therapy in acute-moderate hypercapnic respiratory failure. *Clin Respir J.* 2018;12(6):2046-56.
13. Leung CCH, Joynt GM, Gomersall CD, Wong WT, Lee A, Ling L, et al. Comparison of high-flow nasal cannula versus oxygen face mask for environmental bacterial contamination in critically ill pneumonia patients: a randomized controlled crossover trial. *J Hosp Infect.* 2019;101(1):84-7.
14. Hui DS, Chow BK, Lo T, Tsang OTY, Ko FW, Ng SS, et al. Exhaled air dispersion during high-flow nasal cannula therapy versus CPAP via different masks. *Eur Respir J.* 2019;53(4).
15. Hui DS, Chow BK, Lo T, Ng SS, Ko FW, Gin T, et al. Exhaled air dispersion during noninvasive ventilation via helmets and a total facemask. *Chest.* 2015;147(5):1336-43.
16. Fan E, Del Sorbo L, Goligher EC, Hodgson CL, Munshi L, Walkey AJ, et al. An Official American Thoracic Society/European Society of Intensive Care Medicine/Society of Critical Care Medicine Clinical Practice Guideline: Mechanical Ventilation in Adult Patients with Acute Respiratory Distress Syndrome. *Am J Respir Crit Care Med.* 2017;195(9):1253-63.
17. National Heart L, Blood Institute PCTN, Moss M, Huang DT, Brower RG, Ferguson ND, et al. Early Neuromuscular Blockade in the Acute Respiratory Distress Syndrome. *N Engl J Med.* 2019;380(21):1997-2008.
18. Combes A, Hajage D, Capellier G, Demoule A, Lavoue S, Guervilly C, et al. Extracorporeal Membrane Oxygenation for Severe Acute Respiratory Distress Syndrome. *N Engl J Med.* 2018;378(21):1965-75.
19. Goligher EC, Tomlinson G, Hajage D, Wijeyesundera DN, Fan E, Juni P, et al. Extracorporeal Membrane Oxygenation for Severe Acute Respiratory Distress Syndrome and Posterior Probability of Mortality Benefit in a Post Hoc Bayesian Analysis of a Randomized Clinical Trial. *JAMA.* 2018;320(21):2251-9.
20. Alshahrani MS, Sindi A, Alshamsi F, Al-Omari A, El Tahan M, Alahmadi B, et al. Extracorporeal membrane oxygenation for severe Middle East respiratory syndrome coronavirus. *Ann Intensive Care.* 2018;8(1):3.

## Appendix 1 – Example of a patient information sheet

### **Example of a patient information sheet for use with suspected cases who are being sent home to await test results for SARS-CoV-2 (COVID-19).**

While awaiting test results for COVID-19 (the novel coronavirus), you have been assessed as being medically well enough to be managed at home.

However, please consider yourself as potentially infectious until the final results are available. You will need to abide by the following:

- You should quarantine yourself at home. Don't go to work, avoid unnecessary travel, and as far as possible avoid close interactions with other people.
- You should clean your hands with soap and water frequently. Alcohol-based sanitizers may also be used, provided they contain at least 60% alcohol.
- Do not have visitors in your home. Only those who live in your home should be allowed to stay. If it is urgent to speak to someone who is not a member of your household, do this over the phone.
- You should wear a facemask when in the same room (or vehicle) as other people.
- At home, you should stay in a specific room and use your own bathroom (if possible). If you live in shared accommodation (university halls of residence or similar) with a communal kitchen, bathroom(s) and living area, you should stay in your room with the door closed, only coming out when necessary, wearing a facemask if one has been issued to you.
- You should practice good cough and sneeze hygiene by coughing or sneezing into a tissue, discarding the tissue immediately afterwards in a lined trash can, and then wash your hands immediately.
- If you need to wash the laundry at home before the results are available, then wash all laundry at the highest temperature compatible for the fabric using laundry detergent. This should be above 60° C. If possible, tumble dry and iron using the highest setting compatible with the fabric. Wear disposable gloves and a plastic apron when handling soiled materials if possible and clean all surfaces and the area around the washing machine. Do not take laundry to a laundrette. Wash your hands thoroughly with soap and water after handling dirty laundry (remove gloves first if used).
- You 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 water.
- All high-touch surfaces like table tops, counters, toilets, phones, computers, etc. that you may have touched should be appropriately and frequently cleaned.
- Monitor your symptoms - Seek prompt medical attention if your illness is worsening, for example, if you have difficulty breathing, or if the person you are caring for symptoms are worsening. If it's not an emergency, call your doctor or healthcare facility at the number below. If it is an emergency and you need to call an ambulance, inform the call handler or operator that you are being tested for SARS-CoV-2.





While awaiting the results, if your symptoms worsen:

- Call:
  
- Or come to:



For more information on COVID-19, see the NICD's FAQ page:  
<http://www.nicd.ac.za/diseases-a-z-index/covid-19/frequently-asked-questions/>

## Standard precautions to prevent transmission of COVID-19

	<p><b>Keep your hands clean</b></p> <p><b>When?</b></p> <ul style="list-style-type: none"><li>• After visiting the bathroom</li><li>• Before and after eating</li><li>• After blowing your nose</li><li>• Whenever you think your hands are dirty</li></ul> <p><b>How?</b> Use alcohol hand rub or wash hands with soap and water</p> <p><b>Caution</b> Never touch your eyes, nose or mouth with unwashed hands</p>
	<p><b>Cough etiquette</b></p> <ul style="list-style-type: none"><li>• Keep a distance of 2 meters between you and a person with a cough</li><li>• Cover your own cough or sneeze with a tissue</li><li>• Once used, throw the tissue away in a closed container</li><li>• Clean your hands afterwards</li></ul>
	<ul style="list-style-type: none"><li>• <b>Do not share items with other people</b> (clothing, blankets, pillows, towels, mobile phones, uncovered food, magazines, books)</li><li>• <b>Do not keep the toilet lid up when you flush the toilet</b> (you can transmit the virus from all body excretions)</li></ul>
	<p><b>Keep your immediate environment clean</b></p> <ul style="list-style-type: none"><li>• Wipe frequently-touched areas regularly with a disinfectant cloth</li><li>• Discard all waste immediately</li></ul>

# QUESTIONNAIRE

## G5 (20)

### Clinical management of suspected or confirmed COVID-19 disease

#### INSTRUCTIONS

- Read through the article and answer the multiple choice questions provided below
- **Some questions may have more than one answer;** in which case you must please **mark all the** correct answers

#### Epidemiology and clinical characteristics

**Question 1:** The National Institute for Communicable Diseases (NICD) reports the first case of a patient testing positive for COVID-19 in your province. You are responsible for managing a number of GP practices in the province and research the epidemiology of COVID-19. Which of the following do you find?

- A:** The mean incubation period is estimated to be 4-5 days
- B:** Transmission from asymptomatic patients is significant
- C:** The reproductive number for this virus is approximately 2.2
- D:** Very few severe cases which required hospitalisation have been reported among children under the age of 15
- E:** The median age of reported cases was 50 years with a female preponderance

**Question 2:** Some health care professionals in your area question the preparations you are doing to combat the disease and argue that COVID-19 “really is not much worse than the flu”. Which of the following statements will you use to convince them of the seriousness of the virus?

- A:** An estimated 15 out of every hundred patients infected will develop severe disease
- B:** Severe disease is accompanied by hypoxaemia, dyspnea and tachypnoea often requiring hospitalisation
- C:** An estimated 5% become critically ill
- D:** Critically ill patients present with respiratory failure, septic shock and / or multiorgan dysfunction

**Question 3:** A medical practitioner in your network of practices mentions that gastrointestinal symptoms are often missed as some of the most common presenting symptoms, and that everybody should be on the lookout for patients presenting with this. Is his statement TRUE?

- A:** YES
- B:** NO

**Question 4:** The five most common presenting symptoms include which of the following?

- A:** Fever
- B:** Sore throat
- C:** Cough
- D:** Fatigue
- E:** Shortness of breath

**Question 5:** Regarding the use of diagnostic imaging modalities, which of the following statements are TRUE?

- A:** Abnormalities on chest X-ray are visible in the minority of COVID-19 patients
- B:** Abnormalities are visible in 85% of patients on chest CT scans
- C:** In severe disease, abnormalities can be seen in 95% of patients on chest CT scans
- D:** In severe disease, abnormalities can be seen on chest X-ray
- E:** All the above

#### Management of suspected COVID-19 cases

**Question 6:** The NICD’s case definition includes persons with acute respiratory illness with sudden onset of at least one of which of the following?

- A:** Cough
- B:** Sore throat
- C:** Myalgia
- D:** Shortness of breath
- E:** Fever  $\geq 38$  degrees Celsius

**Question 7:** Is it TRUE or FALSE that a **history** of fever is not important in the case definition?

- A:** TRUE
- B:** FALSE

**Question 8:** You are required to give guidance to your practices regarding what measures should be taken when any patient fulfils the criteria for a suspected COVID-19 case. Which of the following will you pass on to your practices?

- A:** The patient should immediately be given a N95 respirator as surgical masks are not sufficient
- B:** The patient should be directed to a separate area and a 2 metre distance should be kept between the suspected case and other patients
- C:** The movement of the patient should be limited
- D:** The patient should have a dedicated bathroom where possible

**Question 9:** Regarding testing of Persons under Investigation (PUI), which of the following are TRUE?

- A:** Upper respiratory tract samples – nasopharyngeal and oropharyngeal swabs (combined in the same universal transport medium ) for all patients
- B:** Lower respiratory tract samples – sputum induction is recommended
- C:** Serum samples may be sent to the NICD, but the primary method of diagnosis remains respiratory samples
- D:** All the above

**Question 10:** The differential diagnosis of suspected cases includes which of the following?

- A:** Influenza
- B:** Conventional and atypical bacterial pneumonias
- C:** *Pneumocystis jirovecii* pneumonia in patients with HIV and a CD4 count <200 cells/mm<sup>3</sup> (or equivalent immunosuppression)
- D:** Tuberculosis
- E:** All the above

**Question 11:** Which of the following is NOT part of the criteria for mild disease?

- A:** Normal mental status
- B:** Heart rate <110
- C:** Respiratory rate <25
- D:** Oxygen saturation ≥90%

**Question 12:** You diagnose your patient as fulfilling the criteria for mild disease and instruct him to self-isolate at home. What advice will you give in this regard?

- A:** Stay in a specific room and use own bathroom if possible
- B:** Avoid sharing household items like dishes, cups, eating utensils and towels
- C:** All high-touch surfaces like tabletops, counters, toilets, phones and computers should frequently and appropriately be cleaned
- D:** Laundry should be washed at the highest temperature available, above 60 degrees Celsius
- E:** If possible washing should be tumble dried and ironed using the highest setting compatible with the fabric

## Management of confirmed COVID-19 cases

**Question 13:** Is it TRUE that in 10-15% of cases, those patients assessed as having “mild” disease may continue to worsen over the course of a week or more and become severely ill?

- A:** YES
- B:** NO

**Question 14:** Which of the following are NOT TRUE regarding early supportive therapy in hospitalized COVID-19 patients?

- A:** Oxygen is likely to be the single most effective supportive measure
- B:** In non-pregnant adults target SpO<sub>2</sub> ≥95%
- C:** Emergency signs in children include obstructed or absent breathing, central cyanosis, shock, coma or convulsions
- D:** Aggressive fluid resuscitation may worsen oxygenation

**Question 15:** Regarding specific therapies, repeat specimens and discharge criteria, which of the following are TRUE?

- A:** Corticosteroids should NOT routinely be given
- B:** Patients may continue to be PCR positive after clinical resolution
- C:** Repeat nasopharyngeal and oropharyngeal swabs should only be sent once the patient’s fever (if present) has resolved
- D:** All three discharge criteria must be met before the patient can be discharged



**PERSONAL INFORMATION**

(If your personal details have not changed, only complete the sections marked with an asterisk \*)

<b>HPCSA No</b>		<b>*FOH Number</b>						
<b>*Initials &amp; Surname</b>		<b>*Cell Number</b>		needed for confirmation sms				
<b>Employer</b>		<b>Email address</b>						
<b>*Time spent on activity</b>	_____ Hour _____ Min							
<b>Circle your speciality</b>	Diagnostic Radiography	CT	MRI	X Ray	Mammography	Ultrasound	Radiation Oncology	Nuclear Medicine

**ANSWER SHEET**  
**G5 (20)**

Clinical management of suspected or confirmed COVID-19 disease

	A	B	C	D	E		A	B	C	D	E
1						9					
2						10					
3						11					
4						12					
5						13					
6						14					
7						15					
8											

*I hereby declare that the completion of this document is my own effort without any assistance.*

**Signed:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**SEND ANSWER SHEET TO:**

**FAX:** 086 614 4200 / **012 653 2073** OR **WHATSAPP:** 074 230 3874 OR **EMAIL:** SAFOCUS@IAFRICA.COM

**YOU WILL RECEIVE A CONFIRMATION OF RECEIPT SMS WITHIN 12-24 HOURS, IF NOT RECEIVED PLEASE SEND AGAIN**

***Please rate the article:***

<b>POOR</b> 1		<b>FAIR</b> 2		<b>AVERAGE</b> 3		<b>GOOD</b> 4		<b>EXCELLENT</b> 5	
------------------	--	------------------	--	---------------------	--	------------------	--	-----------------------	--

Activity is accredited for **THREE (3) CLINICAL CEU's**

For office use		
<b>MARK:</b>	/15 = _____%	
	(70% PASS RATE)	
<b>MODERATED BY:</b>	<b>FAILED</b> (R50 to resubmit)	<b>PASSED</b> (IAR will be sent)
	<b>CAPTURED:</b>	<b>DATE:</b>