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<th>Description</th>
</tr>
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<tbody>
<tr>
<td>AIIR</td>
<td>Airborne Infection Isolation Room</td>
</tr>
<tr>
<td>ARDS</td>
<td>Acute Respiratory Distress Syndrome</td>
</tr>
<tr>
<td>ARI</td>
<td>Acute Respiratory Infection</td>
</tr>
<tr>
<td>CAP</td>
<td>Community Acquired Pneumonia</td>
</tr>
<tr>
<td>COVID-19</td>
<td>Coronavirus Disease-19</td>
</tr>
<tr>
<td>EMS</td>
<td>Emergency Medical Service</td>
</tr>
<tr>
<td>FBC</td>
<td>Full Blood Count</td>
</tr>
<tr>
<td>HAP</td>
<td>Hospital Acquire Pneumonia</td>
</tr>
<tr>
<td>Hb</td>
<td>Haemoglobin</td>
</tr>
<tr>
<td>HCW</td>
<td>Healthcare Worker</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Syndrome</td>
</tr>
<tr>
<td>ICU</td>
<td>Intensive Care Unit</td>
</tr>
<tr>
<td>IPC</td>
<td>Infection Prevention and Control</td>
</tr>
<tr>
<td>MERS</td>
<td>Middle East Respiratory Syndrome</td>
</tr>
<tr>
<td>MERS-CoV</td>
<td>Middle East Respiratory Syndrome Coronavirus</td>
</tr>
<tr>
<td>MoH</td>
<td>Ministry of Health</td>
</tr>
<tr>
<td>PBW</td>
<td>Predicted Body Weight</td>
</tr>
<tr>
<td>PCP</td>
<td>Pneumocystis Carinii Pneumonia</td>
</tr>
<tr>
<td>PCR</td>
<td>Polymerase Chain Reaction</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>PUI</td>
<td>Patients Under Investigation</td>
</tr>
<tr>
<td>RDT</td>
<td>Rapid Diagnostic Test</td>
</tr>
<tr>
<td>RT-PCR</td>
<td>Real Time Polymerase Chain Reaction</td>
</tr>
<tr>
<td>SBP</td>
<td>Systolic Blood Pressure</td>
</tr>
<tr>
<td>SARI</td>
<td>Severe Acute Respiratory Infection</td>
</tr>
<tr>
<td>SARS</td>
<td>Severe Acute Respiratory Syndrome</td>
</tr>
<tr>
<td>SARS-CoV-2</td>
<td>Severe Acute Respiratory Syndrome Coronavirus-2</td>
</tr>
<tr>
<td>SARS-CoV</td>
<td>Severe Acute Respiratory Syndrome Coronavirus</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
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</table>
Foreword

On January 30, 2020, the International Health Regulations Emergency Committee of the World Health Organization (WHO) declared the Severe Acute Respiratory Syndrome due to novel (new) coronavirus (SARS-CoV-2) outbreak a “Public Health Emergency of International concern” (PHEIC) and the global risk level was raised to “very high” on February 28, 2020. The disease caused by this novel coronavirus (SARS-CoV-2) has been named “Coronavirus Disease 2019” and abbreviated as COVID-19.

To protect the health and wellbeing of its citizens, the Government of the Republic of Zambia is resolved to creating strong and resilient health care systems using a community based and primary health care approach. Key to this aspiration is having enhanced health security in our country to save our people from many emerging and re-emerging public health threats and emergencies such as the COVID-19.

Zambia’s socio-economic agenda as espoused in the seventh National development Plan and the National Health Strategic Plan 2017 – 2021 aim at ensuring that our people are healthy and productive, an aspiration highly threatened by global public health emergencies.

The novel Coronavirus (SARS-CoV-2) has a high propensity to be transmitted from person-to-person and community spread has been reported in countries such as the United States raising the possibility of asymptomatic transmission. Therefore, this in itself calls for heightened high impact interventions focused on prevention, preparedness, detection and response including case management. Whilst no cure is available yet, optimized supportive care has be shown to increase the survival outcomes of those who are severely or critically ill.

It is therefore critical that COVID-19 treatment guidelines are developed and made available to all health care workers country wide to improve patient outcomes. This document therefore, is an interim guideline for the management of SARS-CoV-2 infected persons of all ages. It is intended for use by healthcare providers taking care of hospitalized adult and paediatric patients with Severe Acute Respiratory Infection (SARI) when novel Coronavirus infection is suspected. This document is not meant to replace clinical judgment or specialist consultation but rather to strengthen clinical management of these patients and provide an up-to-date guidance which can change any time as new evidence emerges.

This interim guidance should be shared with all front-line health workers. I urge all healthcare workers to adhere to the principles outlined in this document. I am positive that the information contained in this document will allay the fears, apprehension and misinformation that has characterized this outbreak.

I am confident that this document will make our country more prepared to timely detect and effectively manage patients with COVID-19.
Acknowledgements

The Ministry of Health is committed to provide quality and effective healthcare service to those who fall ill as clearly outlined through its legacy goals. The development of this interim guidance on the management of patients infected with the Novel Coronavirus (SARS-CoV-2) demonstrates the Ministry’s resolve to have optimal clinical care for all diseases.

I am very thankful to the team of experts without whose effort this document could never have been developed. These include but not limited to the following institutions:

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- University Teaching Hospital
- Zambia National Public Health Institute
- Zambia Medical Association

**World Health Organization**
- Centre for Diseases Control and Prevention
- University of Maryland
- University of North Carolina

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Chapter 1: Overview of COVID-19 Infection

Background

There is an outbreak of respiratory disease caused by a novel (new) Coronavirus that was first detected in China and which has now been detected in almost 70 locations internationally, including sub-Saharan Africa (South Africa, Nigeria, Senegal and Cameroon). This virus has been named “SARS-CoV-2” and the disease it causes has been named “Coronavirus Disease 2019” (abbreviated “COVID-19”).

Coronaviruses are a large family of viruses that rarely cause disease in people but are common in many different species of animals, including camels, cattle, cats, and bats. Rarely, animal Coronaviruses can infect people and then spread between people such as with MERS-CoV, SARS-CoV, and now with this new virus (named SARS-CoV-2). All three of these viruses have their origins in bats. Sequences from this current outbreak suggest a likely single, recent emergence of this virus from an animal reservoir. It is worth noting that SARS-CoV-2 represents the causative agent of a potentially fatal disease that is of great global public health concern.

Since its discovery, COVID-19 is rapidly evolving and much is being discovered about the disease. The lack of clinical trial data has made the treatment of infected persons challenging. Much of what is known today is likely to change as the disease evolves.

Spread of the SARS-CoV-2

1. Animal-to-person spread: this is based on the initial large number of the infected individuals that were exposed to the wet animal market in Wuhan City, China
2. Person-to-person spread: in individuals who had no exposure to animals and primarily occurs via direct contact or through droplets spread by coughing or sneezing from an infected person
3. Community spread: in individuals who have been infected without knowledge of how or where they became exposed

Clinical Presentation

There are a limited number of reports that describe the clinical presentation of patients with confirmed COVID-19, and most are limited to hospitalized patients with pneumonia. The incubation period has a wide range from 4–21 days.\(^{1,2}\) Frequently reported signs and symptoms include fever (83–98%), cough (46%–82%), myalgia or fatigue (11–44%), and shortness of breath (31%) at COVID-19 illness onset.\(^{3,5}\) Sore throat has also been reported in some patients early in the clinical course. Less commonly reported symptoms may include sputum production, headache, hemoptysis, and diarrhea. Some patients have experienced gastrointestinal symptoms such as diarrhea and nausea prior to developing fever and lower respiratory tract signs and symptoms. The fever course among patients with COVID-19 is not fully understood; it may be prolonged and intermittent. Asymptomatic infection has been described in one child with confirmed COVID-19 and chest Computed Tomography (CT) abnormalities.\(^6\)

Risk factors for severe illness are not yet clear, although older patients (median age 59 years) and those with chronic medical conditions (including diabetes, hypertension, and cardiovascular disease) may be at higher risk for severe illness.\(^{1,3,4}\)
Clinical Course
Clinical presentation among reported cases of COVID-19 varies in severity from asymptomatic infection or mild illness to severe or fatal illness. Some reports suggest the potential for clinical deterioration during the second week of illness. In one report, among patients with confirmed COVID-19 and pneumonia, just over half of patients developed dyspnea with a median of 8 days after illness onset (range: 5–13 days). Disease severity ranges severe acute respiratory infection (SARI) or pneumonia, acute respiratory distress syndrome (ARDS) to sepsis and septic shock. Other reported complications include acute cardiac injury, arrhythmia, shock, and acute kidney injury. Among hospitalized patients with pneumonia, the case fatality proportion has been reported as 4–15%.

Laboratory and Radiographic Findings
The most common laboratory abnormalities reported among hospitalized patients with pneumonia on admission included leukopenia (9–25%), leukocytosis (24–30%), lymphopenia (63%), and elevated alanine aminotransferase and aspartate aminotransferase levels (37%). Most patients had normal serum levels of procalcitonin on admission. Chest CT images have shown bilateral involvement in most patients. Multiple areas of consolidation and ground-glass opacities are typical findings reported to date.

Limited data are available about the detection of SARS-CoV-2 in clinical specimens. SARS-CoV-2 RNA has been detected from upper and lower respiratory tract specimens, bronchoalveolar lavage fluid, blood and stool specimens. It is not known whether or not an infectious virus is present in extrapulmonary specimens. Unlike MERS-CoV or SARS-CoV infection where the RNA could be detected for weeks, the duration of SARS-CoV-2 RNA detection is not known. Viable SARS-CoV has been isolated from respiratory, blood, urine, and stool specimens but only from respiratory tract specimens for MERS-CoV.

Clinical Management and Treatment
Special attention and efforts to protect or reduce the transmission of COVID-19 should be applied especially in susceptible populations such as children, healthcare providers, and the elderly. Healthcare personnel should care for patients in an Airborne Infection Isolation Room (AIIR). Standard Precautions, Contact Precautions, and Airborne Precautions with eye protection should be used when caring for the patient. Patients with a mild clinical presentation may not initially require hospitalization. However, clinical signs and symptoms may worsen with progression to lower respiratory tract disease in the second week of illness; all patients should be monitored closely. Possible risk factors for progressing to severe illness may include, but are not limited to, older age, and underlying chronic medical conditions such as lung disease, cancer, heart failure, cerebrovascular disease, renal disease, liver disease, diabetes, immunocompromising conditions and pregnancy.

No specific treatment for COVID-19 is currently available. Clinical management includes prompt implementation of recommended infection prevention and control measures and supportive management of complications, including advanced organ support if indicated.
Investigational Therapeutics

There are currently no antiviral drugs licensed by the U.S. Food and Drug Administration (FDA) to treat patients with COVID-19. Some in-vitro or in-vivo studies suggest potential therapeutic activity of compounds against related coronaviruses, but there are no available data from observational studies or randomized controlled trials in humans to support recommending any investigational therapeutics for patients with confirmed or suspected COVID-19 at this time.

Remdesivir, an investigational broad-spectrum antiviral drug, was reported to have in-vitro activity against SARS-CoV-2.25 A small number of patients with COVID-19 have received intravenous Remdesivir for compassionate use outside of a clinical trial setting. A randomized placebo-controlled clinical trial of Remdesivir for treatment of hospitalized patients with pneumonia and COVID-19 has been implemented in China.

A randomized open label trial of combination Lopinavir-ritonavir treatment has also been conducted in hospitalized patients with pneumonia and COVID-19 in China, but no results are available to date. Clinical trials of other potential therapeutics for COVID-19 are being planned. It is clear however, that more clinical research is urgently needed so as to identify novel chemotherapeutic agents for treating COVID-19 infections. More information on specific clinical trials underway for treatment of patients with COVID-19 can be found on clinicaltrials.gov.
Chapter 2: Triage

Early recognition of patients with SARI associated with COVID-19 infection

Goals of Triage:

1. Recognize and sort all patients with SARI at first point of contact with health care system (such as the outpatient and emergency departments)
2. Consider COVID-19 infection as a possible aetiology of SARI under certain conditions
3. Triage patients and start emergency treatments based on disease severity

For a summary on the COVID-19 Symptomatic Patient Flow, please refer to Appendix 4

Note: COVID-19 may present with as mild, severe, or critical illness; the latter includes severe pneumonia with respiratory failure, ARDS, sepsis and septic shock. Early recognition of suspected patients allows for timely initiation of Infection Prevention Control (IPC). Early identification of those with severe manifestations allows for immediate optimized supportive care treatments and safe, rapid admission (or referral) to intensive care unit. For those with mild illness, hospitalization may not be required unless there is concern for rapid deterioration such as the elderly, those with diabetes, cardiovascular comorbidities, and children. All patients discharged home should be monitored by the District Rapid Response Team (RRT) and patients should be instructed to alert the RRT should they develop any worsening of illness.

Case definitions

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 with no other aetiology that fully explains the clinical presentation AND a history of travel to or residence in a country/area or territory reporting local transmission of COVID-19 disease during the last 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 (see definition of contact) in the last 14 days prior to onset of symptoms; OR

c) A patient with severe acute respiratory infection (fever and at least one sign/symptom of respiratory disease (e.g., cough, shortness breath) AND requiring hospitalization AND with no other aetiology that fully explains the clinical presentation

Probable case

A suspect case for whom testing for COVID-19 is inconclusive.

Confirmed case

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

b) A person with bilateral infiltrates/ground glass opacities on Chest CT where available with epidemiology or suggested clinical symptoms

Definition of Contact

A contact is a person that is involved in any of the following:

- Providing direct care without proper Personal Protective Equipment (PPE) for COVID-19 patients
• Staying in the same close environment of a COVID-19 patient (including workplace, classroom, household, and gatherings)
• Traveling together in close proximity (within 2 meters) with a COVID-19 patient in any kind of conveyance within a 14-day period after the onset of symptoms in the case under consideration

**Note:** Clinical threshold for testing COVID-19 is lower compared to surveillance definition and thus clinicians must always exercise clinical judgement.

**Principles of caring for the critically ill patients with severe acute respiratory infection**

The following should be implemented to all critically ill patients with SARI;

• Apply appropriate Infection Prevention and Control (IPC) precautions immediately
• Recognize the critically ill patients early
• Treat the underlying aetiology as soon as possible
• Treat with evidence-based, supportive therapies as soon as possible
• Monitor, record, interpret and respond to all laboratory and clinical parameters of the patient
• Deliver quality care

**Screening of suspected patients**

Step 1: Suspect COVID-19 in a patient with SARI that

• Resides or has travelled to countries with ongoing human or animal infections
• Exposure to live or dead animals (i.e. birds, swine, camels)
• Close exposure to patient with SARI of unclear aetiology

Step 2: Apply appropriate IPC at triage if any ARI

• Apply droplet precautions *(see Appendix 1)*
• Give the suspect patient with ARI a medical mask
• Instruct the patient to practice respiratory hygiene and hand hygiene and to avoid movements within the facility
• Locate the suspect patient in separate area
• Keep at least 2 meters distance between patients

Step 3: If suspected COVID-19

• **Add contact to droplet precaution measures**
  - The healthcare worker should wear gown, gloves, medical mask and eye protection when examining the patient. See video on link below: [https://www.dropbox.com/s/ym9g5c0hhr16gul/DonningDoffing_COVID19_PPE_480p_04Mar2020.mov?dl=0](https://www.dropbox.com/s/ym9g5c0hhr16gul/DonningDoffing_COVID19_PPE_480p_04Mar2020.mov?dl=0)
  - Should use dedicated patient equipment when possible, (such as stethoscopes) or wash and disinfect between patients

• **Add airborne precautions** if there is an emergent need for intubation or cardiopulmonary resuscitation at triage

Step 4: Assess severity

Conduct triage at patient’s first contact with healthcare system.

**Prioritize and sort** patients based on their severity of illness and need for immediate care.

• Use standardized triage tools to ensure reliability and valid sorting of patients
**Figure 1: Assessing Patients with Acute Respiratory Infection at Triage**

- **Fever or history of fever (≥ 38 °C)**
  - + Cough
  - + Epidemiologic link

**Uncomplicated Influenza-like Illness**
- Low-risk patient
- *Discharge home for home isolation with instructions to return if worsens or fails to improve*

**High-risk patient**
- Hospitalization for close monitoring

**SARI* complications**
- Hospitalization, consider Intensive Care Unit (ICU) admission if critically ill. Treat with supportive care and antibiotics if indicated. Consider investigational therapeutics in consultation with ID Specialists

---

**Recommended Investigation in Suspected and confirmed COVID-19 cases**

**MILD CASES**
- Malaria RDT
- Hb/FBC
- HIV
  - If HIV+, do CD4 count, viral load and TB test

**SEVERE CASES**
- Malaria RDT
- Hb/FBC
- HIV
  - If HIV+, do CD4 count and viral load
- Chest X-ray
- Sputum for Xpert/microscopy
- Liver & kidney tests
- Electrolytes

**CRITICAL CASES**
- Malaria RDT
- Hb/FBC
- HIV
  - If HIV+, do CD4 count and viral load
- Chest X-ray
- Sputum for Xpert/microscopy
- Liver & kidney tests
- Electrolytes
- Chest CT scan
- Blood culture
- Arterial Blood Gases

---

*Uncomplicated*  
Complicated
Interim Clinical Guidance for Management of Patients with COVID-19

Table 1: Clinical Features of Acute Respiratory Infection (ARI)

<table>
<thead>
<tr>
<th>Uncomplicated</th>
<th>Complicated</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Symptoms</strong></td>
<td><strong>Signs</strong></td>
</tr>
<tr>
<td>Symptoms Are Non-Specific:</td>
<td>Patient with uncomplicated disease are without signs of:</td>
</tr>
<tr>
<td>• Fever and cough within 10 days</td>
<td>• dehydration</td>
</tr>
<tr>
<td>• Sore throat, nasal congestion or rhinorrhea</td>
<td>• shortness of breath</td>
</tr>
<tr>
<td>• Headache, muscle pain or malaise</td>
<td>• Sepsis</td>
</tr>
<tr>
<td>• Diarrhoea or vomiting</td>
<td></td>
</tr>
<tr>
<td>• Elderly or immunosuppressed patients may present with atypical symptoms and may not have fever</td>
<td></td>
</tr>
</tbody>
</table>

*Children may also present with poor feeding, excessive diarrhoea and vomiting

Pre-hospital care: Health Centres and Ambulances

- Apply IPC interventions at all times (e.g. putting a medical/surgical mask on the patient immediately at the first contact)
- Provide available emergency care; call for help (Toll free-line: 7040)
- Refer to local Emergency Medical Service (EMS) protocols (COVID-protocol, central dispatch)
- Arrange for safe transfer to hospital with isolation and Intensive Care Unit (ICU) capacity (COVID-designated centres)

Hospital Care

Always attend to COVID-19 suspected cases in designated Emergency Room

- Apply IPC interventions at all times
- Provide available emergency care, call for help (Call ID, Critical Care Teams)
- Refer to local ward and ICU admission criteria
- Arrange for safe admission to ward or ICU
**Emergency Care**
Based on clinical condition and available resources:

- Administer oxygen +/- advanced ventilatory support
- Insert peripheral IV and start fluid therapy (if hypotension, sepsis, shock or clinical dehydration in setting of GI symptoms, nausea, diarrhoea)
- Give appropriate antimicrobial therapies before transfer
- Obtain appropriate laboratory testing (see above)

**Intensive Care Unit (ICU) admission**
Ensure ICUs care for critically ill patients with the following characteristics:

- Impending or ongoing acute, life-threatening organ dysfunction
- Need intensive and continuous monitoring
- Need intensive therapies that cannot be delivered on the general ward (i.e. ventilation)

**Safe transfer of patients**
This applies for transfer of patients from one point to another

- Ensure IPC measures are always applied
- Ensure appropriate diagnostics and emergency treatments have been given and patient is stable and ready for transport
- Ensure all monitors and ongoing treatments are secured and can be maintained during transport
- Ensure appropriate documentation and handover of care to next responsible clinicians
- Ensure the responsible health care worker is prepared
Chapter 3: Differential Diagnosis and Diagnostics

Goals of Differential Diagnosis and Diagnostics

1. Develop a differential diagnosis for patients with severe pneumonia
2. Recognize patients with SARI that may have respiratory virus with epidemic potential
3. Describe when and what specimens to collect for laboratory diagnosis
4. Describe the characteristics of diagnostic tests for respiratory virus infections

Severe pneumonia is caused by different micro-organisms. These are categorized into Community Acquired Pneumonia (CAP) and Hospital Acquired Pneumonia (HAP). CAP is further divided into typical and atypical pneumonia based on the characteristics of the causative organisms.

Special consideration is given to organisms of zoonotic origin and pneumonia in the immunocompromised individuals. Clinicians must remember that pulmonary tuberculosis is very common in Zambia and all patients who present with respiratory symptoms or fever must be evaluated for TB.

Table 2: Clinical Features of Acute Respiratory Infection (ARI)

<table>
<thead>
<tr>
<th></th>
<th>Community Acquired</th>
<th>Hospital Acquired</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical</td>
<td><em>Streptococcus pneumoniae, Hemophilus influenzae</em>, <em>Moraxella catarrhalis</em>,</td>
<td>Methicillin-resistant <em>Staphylococcus aureus</em> (MRSA)</td>
</tr>
<tr>
<td></td>
<td><em>Klebsiella pneumonia, Staphylococcus aureus</em></td>
<td><em>Pseudomonas aeruginosa, Acinetobacter</em></td>
</tr>
<tr>
<td></td>
<td>Respiratory Syncytial Virus (RSV), parainfluenza virus, Rhinoviruses,</td>
<td>Extended Spectrum Beta-Lactamase (ESBL) producers such as *Escherichia coli,</td>
</tr>
<tr>
<td></td>
<td>Adenovirus, Enterovirus (EVD68), Human metapneumovirus, Bocavirus</td>
<td><em>Klebsiella, Enterobacter</em></td>
</tr>
<tr>
<td>Fungal</td>
<td>*Histoplasmosis, Coccidiodomycosis, Blastomycosis, Paracoccidiomycosis,</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Sporotrichosis</em></td>
<td></td>
</tr>
<tr>
<td>Atypical</td>
<td>*Legionella pneumophila, Non-pneumophila Legionella, Chlamydia pneumoniae,</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Mycoplasma pneumoniae, Chlamydia psittaci</em></td>
<td></td>
</tr>
<tr>
<td>Zoonotic</td>
<td><em>Burkholderia pseudomallei</em>, Rickettsial infections, <em>Coxiella burneti</em> (Q fever),</td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Leptospira spp, Chlamydia psittaci, Bordetella pertussis</em></td>
<td></td>
</tr>
<tr>
<td>Immunocompromised host</td>
<td><em>Pneumocystis jirovecii, Penicilliosis, Aspergillosis, Cryptococcosis, Mucormycosis, Fusariosis, Varicella zoster, Measles, Human Coronavirus, Hantavirus, Cytomegalovirus, Herpes Simplex Viruses</em></td>
<td></td>
</tr>
</tbody>
</table>
If suspect an emerging infection of international public health concern:

- Isolate patients and apply appropriate IPC
- Collect specimens
- Start supportive management
- Start empiric treatments based on broader differential, as soon as possible
- Notify health officials

**Specimen collection**

- Guided by differential diagnosis and laboratory capacity:
  - collect samples before antimicrobial therapy provided it does **not** delay the administration of antimicrobial therapy by > 30 minutes
  - notify laboratory and public health authorities if concerns regarding emerging or high-risk pathogens
  - use results for better and focused clinical management
  - use results to influence public health interventions
- Use appropriate PPE during collection procedure (gown, mask, gloves and eye protection)
- Collect Nasal or nasopharyngeal samples
  - **Also collect throat swabs** to improve the yield for suspected emerging or zoonotic viruses (i.e. COVID-19)
  - Collect samples as soon as possible

**How to collect**

**Nasopharyngeal (NP) swabs**

1) Have patient blow nose prior to collection
2) Insert NP swab in level/flat position into back of nasopharynx until resistance if felt
3) Rotate for 10-15 seconds

**Oropharyngeal swab**

1) Swab both tonsils and back of throat
2) Avoid touching tongue and teeth

Use sterile dacron or rayon swabs. Do not use cotton swabs or wood shafts as can interfere with RT-PCR assays
• Also collect **lower respiratory tract** samples in patients with radiographic evidence or clinical diagnosis of lower respiratory tract disease, in certain situations, if results will impact clinical interventions:
  – expectorated sputum
  – tracheal aspirates
  – bronchoalveolar lavage
• Collection can generate aerosols, thus use airborne precautions during the procedure
• Use sterile collection trap
• Do not send suction catheter tip to laboratory

**Benefits of lower respiratory samples**
• Higher sensitivity than upper respiratory specimens for zoonotic influenza virus, MERS-CoV and other emerging respiratory viruses
• Increases diagnostic yield for seasonal influenza if upper samples are negative or tested late
• Can also be tested for bacterial, fungal and parasitic infections e.g. M. tuberculosis, Pneumocystis Carinii Pneumonia (PCP)

**Collection site and time**
Collect samples as soon as possible:
• In patients with respiratory failure diagnosis may still be made by sampling the lower respiratory tract at any time
• In children, oropharyngeal swabs may be alternative
• Collect lower tract samples for zoonotic influenza and MERS
• If you sample the upper respiratory tract illness at day 6, you might miss detection of these viruses, and still make the diagnosis by testing endotracheal aspirate

**Collection of Additional tests**
• Complete blood cell count for white blood cells
• Sputum for bacteriology:
  – including TB if in high prevalence country or fungus if immunosuppressed, etc
• Specimens from other sites that may be infected and may yield pathogens, as clinically indicated:
  – urine, cerebrospinal fluid, stool, pleural fluid, peritoneal fluid, etc
• Two sets of blood cultures for bacteriology from two different sites (where possible) for patients with sepsis
Discuss with Environmental Health Officer for additional samples and interval of repeat testing, if suspect emerging infection:

- collection of blood for virus detection may aid in prognosis and IPC implementation
- repeated specimens can enhance understanding of viral replication patterns and response to experimental treatments for research purposes (use standard protocol)
- serial collection should be part of standardized protocol (e.g. ISARIC protocol which is a WHO clinical characterization protocol that aims to capture observational data during outbreaks of severe emerging infections such as Ebola, MERS-CoV, SARS-CoV, SARS-CoV 2)

**Figure 2: Laboratory Testing and Empiric Treatment Flow**

Suspected patient with or at risk of severe illness

- Batch PCR or equivalent molecular assay is available and yields results < 24 hrs
  - Collect URT and test. Start supportive management. Re-evaluate treatment when results available

- Batch PCR or equivalent assay with high sensitivity is not available to yield results < 24 hrs
  - Do not collect URT/test. Start supportive management
Chapter 4: Management of Complicated Clinical Syndromes Associated with COVID-19

The clinical syndromes associated with COVID-19 are as follows;

1. Severe Acute Respiratory Infection (SARI) or pneumonia
2. Acute Respiratory Distress syndrome (ARDS)
3. Sepsis and septic shock

A. Management of Acute Respiratory Infection (ARI)

Non-Severe Pneumonia

Adolescent or adult:

- with fever or suspected respiratory infection

Child:

- non-severe pneumonia with
  - Cough or difficulty breathing + fast breathing
  - Fast breathing (in beats per minute) is:
    - <2 months, ≥60
    - 2–11 months, ≥50
    - 1–5 years, ≥40

Treatment

- Give oral antibiotics:
  - In Children: Amoxycillin or Co-trimoxazole
  - Adults: Amoxycillin

Severe Pneumonia

Adolescent or adult:

- Fever or suspected respiratory infection, plus one of
- Respiratory rate >30 breaths/min
- Severe respiratory distress, or
- \( \text{SpO}_2 < 90\% \) on room air

Child:

- cough or difficulty in breathing, plus at least one of the following:
  - Central cyanosis or \( \text{SpO}_2 < 90\% \)
  - Severe respiratory distress (e.g. grunting, very severe chest indrawing);

Signs of pneumonia with a general danger sign:

- Inability to breastfeed or drink
- Lethargy or unconsciousness, or convulsions
Other signs of pneumonia may be present:

- Chest indrawing
- Fast breathing (in breaths/min):
  - <2 months, ≥60
  - 2–11 months, ≥50
  - 1–5 years, ≥40.2

*The diagnosis is clinical; chest imaging can exclude complications.

Diagnostics Tests

As for complicated cases listed above

Management

Early supportive therapy and monitoring

Supplemental Oxygen

Give supplemental oxygen therapy immediately to patients with SARI and respiratory distress, hypoxaemia, or shock.

Remarks: Initiate oxygen therapy at 5 L/min and titrate flow rates to reach target $\text{SpO}_2 \geq 90\%$ in non-pregnant adults and $\text{SpO}_2 \geq 92-95\%$ in pregnant patients.

Indication of Oxygen therapy in adults

- In the hospital setting, give oxygen **immediately** to patients (adults and children) with SARI who have signs of severe illness:
  - severe respiratory distress
  - sepsis with hypoperfusion or shock
  - alteration of mental status or
  - hypoxaemia

- **$\text{SpO}_2 < 90\%$** (if patient is haemodynamically normal)
- **$\text{SpO}_2 < 94\%$** (if patient with any emergency signs of airway, breathing or circulation)
- **$\text{SpO}_2 < 92–95\%$** (if pregnant woman)

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 $\text{SpO}_2 \geq 94\%$; otherwise, the target $\text{SpO}_2$ is $\geq 90\%$. All areas where patients with SARI are cared for should be equipped with pulse oximeters, functioning oxygen systems and disposable, single-use, oxygen-delivering interfaces (nasal cannula, simple face mask, and mask with reservoir bag). Use contact precautions when handling contaminated oxygen interfaces of patients with COVID-19 infection.
Interim Clinical Guidance for Management of Patients with COVID-19

In children under 5 years, use a nasal canular

<table>
<thead>
<tr>
<th>Age of child</th>
<th>Maximal Oxygen flow rates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neonates</td>
<td>0.5–1.0 L/min by nasal cannula</td>
</tr>
<tr>
<td>Infants</td>
<td>1–2 L/min by nasal cannula</td>
</tr>
<tr>
<td>Pre-school aged</td>
<td>1–4 L/min by nasal cannula</td>
</tr>
<tr>
<td>School-aged</td>
<td>1–6 L/min by nasal cannula</td>
</tr>
</tbody>
</table>

If severe hypoxaemia persists despite maximal flow rates:
- start CPAP (if available)
- start secondary source of oxygen with face mask with reservoir bag
- insert nasopharyngeal catheter (passed uvula into the pharynx) and give oxygen at flow rates: neonates 0.5 L/min; infants 1 L/min

Acute hypoxemic Respiratory failure

Patients not responding to increasing oxygen therapy are developing acute hypoxaemic respiratory failure:
- Signs of severe respiratory distress
- Hypoxaemia ($\text{SpO}_2 < 90\%$) despite escalating oxygen therapy
- $\text{SpO}_2/\text{FiO}_2 < 300$ while on at least 10 L/min oxygen therapy
- Cardiogenic pulmonary oedema not primary cause

Treatment
- Intubate and manage in ICU. See below for further details.

Fluid management

Use conservative fluid management in patients with SARI when there is no evidence of shock. Patients with SARI should be treated cautiously with intravenous fluids, because aggressive fluid resuscitation may worsen oxygenation, especially in settings where there is limited availability of mechanical ventilation. The FEAST trial revealed that fluid boluses significantly increased 48-hour mortality in critically ill children with impaired perfusion in resource-limited settings in Africa.26
Empiric antimicrobials
Give empiric antimicrobials to treat all likely pathogens causing SARI. Give antimicrobials within one hour of initial patient assessment for patients with sepsis.

Although the patient may be suspected to have COVID-19, administer appropriate empiric antimicrobials within ONE hour of identification of sepsis. Empiric antibiotic treatment should be based on the clinical diagnosis (community-acquired pneumonia, health care-associated pneumonia [if infection was acquired in healthcare setting], or sepsis), local epidemiology and susceptibility data, and treatment guidelines.

Broad spectrum antibiotics
- Community Acquired Pneumonia (CAP): β-lactam (Amoxicillin, Co-amoxiclav) PLUS Macrolide (Clarithromycin or Azithromycin)
- Penicillin allergy: Doxycycline OR Respiratory quinolone (Levofloxacin OR Moxifloxacin) OR 3G cephalosporin
- Hospital Acquired Pneumonia (HAP): consider MDR organisms including Pseudomonas.

Anti-pseudomonal coverage:
Pseudomonas infection can be treated with a combination of
- An antipseudomonal β-lactam (e.g. Penicillin of Cephalosporin) and an aminoglycoside or
- Carbapenems (e.g. Meropenem or Imipenem not Ertapenem) with antipseudomonal
  Flouroquinolone (e.g. Levofloxacin (high dose) or Ciprofloxacin) may be used in conjunction
  with an aminoglycoside (e.g. Tobramycin, Amikacin, Gentamicin)

In people living with HIV (PLHIV) and immunosuppressed:
- Consider PCP treatment with High dose Sulfamethoxazole/Trimethoprim

In pregnant women:
- Use of macrolides, cephalosporins and penicillins are safe
- Do not use fluoroquinolones or Doxycycline

In children
Combination therapy:
- Ampicillin or Penicillin G for fully immunized child if local epidemiology documents lack of substantial high-level penicillin-resistance for invasive S. pneumoniae. or
- Third generation cephalosporin (e.g. Cefotaxime or Ceftriaxone) for non-fully immunized child, known high-level, penicillin-resistance for invasive S. pneumoniae or life-threatening infection
- And antibiotic against atypical pneumonia (i.e. macrolide)
- If community-acquired S. aureus suspected:
  - add Vancomycin or Clindamycin based on local susceptibility data
* Fluoroquinolones and Doxycycline are not used to treat CAP in children
When to stop antimicrobial treatment

Considerations include:

- signs of clinical improvement (i.e. once shock resolved)
- signs of infection resolution (i.e. Procalcitonin)
- 5–10 days of duration of treatment is adequate for most serious infections associated with sepsis

Longer treatment courses may be appropriate in patients with slow clinical response, undrainable foci and certain infections (i.e. S. aureus bacteraemia).

Steroids

Do not routinely give systemic corticosteroids for treatment of viral pneumonia or ARDS outside of clinical trials unless they are indicated for another reason.27-30

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).27 **DO NOT USE STEROIDS IN COVID-19 SARI**

Closely monitor patients with SARI for signs of clinical deterioration, such as rapidly progressive respiratory failure and sepsis, and apply supportive care interventions immediately.

Signs of clinical deterioration in SARI

- $\text{SpO}_2 \leq 90$
- $\text{SBP} \leq 100 \text{ mmHg}$
- Urine output < 0.5 mL/kg/hr

Application of timely, effective, and safe supportive therapies is the cornerstone of therapy for patients that develop severe manifestations of COVID-19.

Understand the patient’s co-morbid condition(s) to tailor the management of critical illness and appreciate the prognosis.

Communicate early with patient and family:

During intensive care management of SARI, determine which chronic therapies should be continued and which therapies should be stopped temporarily. Communicate proactively with patients and families and provide support and prognostic information. Understand the patient’s values and preferences regarding life-sustaining interventions.

Experimental Drugs

There are several experimental drugs under going trials in several countries. Before you commence any patient with SARI on any experimental drugs, consult Infectious Disease specialists for guidance through the 7040 Toll free-line.

**DO NOT USE EXPERIMENTAL DRUGS WITHOUT CONSULTING INFECTIOUS DISEASE SPECIALISTS**
B. Management of hypoxemic respiratory failure and ARDS

Principles of ARDS management

1. Recognize ARDS early
2. Initiate ventilatory support without delay
3. Treat underlying cause
4. Monitor-record-interpret-respond
5. Deliver quality of care

Recognize ARDS early

<table>
<thead>
<tr>
<th>Acute Respiratory Distress Syndrome</th>
</tr>
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<tbody>
<tr>
<td><strong>Timing</strong></td>
</tr>
<tr>
<td><strong>Imaging</strong></td>
</tr>
<tr>
<td><strong>Origin of oedema</strong></td>
</tr>
</tbody>
</table>

**Oxygenation**

| Mild | $200 \text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 300 \text{ mmHg}$ with PEEP or CPAP $\geq 5 \text{ cmH}_2\text{O}$ |
| Moderate | $100 \text{ mmHg} < \text{PaO}_2/\text{FiO}_2 \leq 200 \text{ mmHg}$ with PEEP $\geq 5 \text{ cmH}_2\text{O}$ |
| Severe | $\text{PaO}_2/\text{FiO}_2 \leq 100 \text{ mmHg}$ with PEEP $\geq 5 \text{ cmH}_2\text{O}$ |

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 even when oxygen is delivered via a face mask with reservoir bag (flow rates of 10-15 L/min, which is typically the minimum flow required to maintain bag inflation; $\text{FiO}_2$ 0.60-0.95). Hypoxemic respiratory failure in ARDS commonly results from intrapulmonary ventilation-perfusion mismatch or shunt and usually requires mechanical ventilation.

**Endotracheal intubation should be performed by a trained and experienced provider using airborne precautions.**

Patients with ARDS, especially young children or those who are obese or pregnant, may desaturate quickly during intubation. Pre-oxygenate with 100% $\text{FiO}_2$ for 5 minutes, via a face mask with reservoir bag, bag-valve mask, HFNO, or NIV. Rapid sequence intubation is appropriate after an airway assessment that identifies no signs of difficult intubation.

*The following recommendations in this section pertain to mechanically ventilated patients with ARDS. These focus on adults; consensus-based recommendations for children are available.*
Implement mechanical ventilation using lower tidal volumes (4–8 mL/kg predicted body weight, PBW) and lower inspiratory pressures (plateau pressure <30 cm H₂O).

This is a strong recommendation from a clinical guideline for patients with ARDS, 33 and is suggested for patients with sepsis-induced respiratory failure who do not meet ARDS criteria. 17 The initial tidal volume is 6 mL/kg PBW; tidal volume up to 8mL/kg PBW is allowed if undesirable side effects occur (e.g. dyssynchrony, pH <7.15). Hypercapnia is permitted if meeting the pH goal of 7.30. Ventilator protocols are available. The use of deep sedation may be required to control respiratory drive and achieve tidal volume targets. Although high driving pressure (plateau pressure−PEEP) may more accurately predict increased mortality in ARDS compared to high tidal volume or plateau pressure, RCTs of ventilation strategies that target driving pressure are not currently available.

In patients with severe ARDS, prone ventilation for >12 hours per day is recommended.

Application of prone ventilation is strongly recommended for adult and paediatric patients with severe ARDS but requires sufficient human resources and expertise to be performed safely.

Use a conservative fluid management strategy for ARDS patients without tissue hypoperfusion.

This is a strong guideline recommendation; the main effect is to shorten the duration of ventilation.

- In patients with moderate or severe ARDS, higher PEEP instead of lower PEEP is suggested
- In patients with moderate-severe ARDS (PaO₂/FiO₂ <150), neuromuscular blockade by continuous infusion should not be routinely used
- In settings with access to expertise in extracorporeal life support (ECLS), consider referral of patients with refractory hypoxemia despite lung protective ventilation

TIPS ON VENTILATOR SETTINGS IN ARDS

- Low tidal volume of 6mL/kg ideal body weight
- Titrate tidal volume with SpO₂
- Target low plateau airway pressure of < 30 cm H₂O
- Moderate high PEEP levels to recruit airways
- Consider neuromuscular blockade
- Nurse in prone position

NOTE: Consult Critical care Specialists on Ventilator Settings if in doubt
Management of Septic Shock

Principles of management of Septic Shock

1. Recognize sepsis and septic shock early
2. Give appropriate antimicrobials within 1 hour
3. Give a targeted resuscitation during the first 6 hours
4. Monitor-record-interpret-respond
5. Deliver quality care

DEFINITION:
SEPSIS: Acute severe life-threatening organ dysfunction caused by dysregulated host response to infection.
SEPTIC SHOCK: Sepsis with hypotension unresponsive to fluids and requiring vasopressors to maintain Mean Arterial Pressure (MAP) ≥65mmHg and Lactate ≥2mmol/L in the absence of hypovolaemia

Recognize patients with sepsis and septic shock:
– Patients with sepsis have suspected or documented infection and acute, life-threatening organ dysfunction
– A subset of these patients may have septic shock and show clinical signs of circulatory failure and hypoperfusion
– Patients with sepsis and septic shock need treatment and resuscitation immediately!

   Step 1: Get Intravenous access
   Step 2: Get bloods for investigations
   Step 3: Give empiric antibiotics without delay preferably within the first 1 hour
   Step 4: Start IV fluids

Treatment
In resuscitation from septic shock in adults, give at least 30 mL/kg of isotonic crystalloid in adults in the first 3 hours

• Give initial fluid challenge of 20–30 mL/kg over 30–60 minutes (or faster)
• Perform sequential evaluations to assess clinical response
• If shock persists, continue to give additional fluid challenges (i.e. 250–500 mL) over 30 minutes as long as there is a clinical response

If MAP <65
Start vasopressors after initial fluid bolus:

• But can be given early, during ongoing resuscitation when shock is severe and diastolic pressure is low
• Do not delay administration
Management of Septic Shock in Children

Recognize septic shock in children with any hypotension (systolic blood pressure [SBP] <5th centile or >2 SD below normal for age) or 2-3 of the following:

- altered mental state
- tachycardia or bradycardia (HR <90 bpm or >160 bpm in infants and HR <70 bpm or >150 bpm in children)
- prolonged capillary refill (>2 sec) or
- warm vasodilation with bounding pulses
- tachypnea
- mottled skin or petechial or purpuric rash
- increased lactate
- oliguria
- hyperthermia or hypothermia

In the absence of a lactate measurement, use MAP and clinical signs of perfusion to define shock. Standard care includes early recognition and the following treatments within 1 hour of recognition: antimicrobial therapy and fluid loading and vasopressors for hypotension. The use of central venous and arterial catheters should be based on resource availability and individual patient needs. Detailed guidelines are available for the management of septic shock in adults and children.

In resuscitation from septic shock in children in, give 20 mL/kg as a rapid bolus and up to 40-60 mL/kg in the first 1 hour.

Special consideration for children

- severe acute malnutrition
- severe malaria with profound anaemia (i.e. Hb < 5)
- diarrhoea and severe dehydration
- severe dengue shock syndrome

*Do not use hypotonic crystalloids, starches, or gelatins for resuscitation.

Fluid resuscitation may lead to volume overload, including respiratory failure. If there is no response to fluid loading and signs of volume overload appear (for example, jugular venous distension, crackles on lung auscultation, pulmonary oedema on imaging, or hepatomegaly in children), then reduce or discontinue fluid administration. This step is particularly important where mechanical ventilation is not available. Alternate fluid regimens are suggested when caring for children in resource-limited settings.

Administer vasopressors when shock persists during or after fluid resuscitation. The initial blood pressure target is MAP ≥65 mmHg in adults and age-appropriate targets in children.

If central venous catheters are not available, vasopressors can be given through a peripheral IV, but use a large vein and closely monitor for signs of extravasation and local tissue necrosis. If extravasation occurs, stop infusion. Vasopressors can also be administered through intraosseous needles.

If signs of poor perfusion and cardiac dysfunction persist despite achieving MAP target with fluids and vasopressors, consider an inotrope such as dobutamine.
Vasopressors (i.e. Norepinephrine, Epinephrine, Vasopressin, and Dopamine) are most safely given through a central venous catheter at a strictly controlled rate, but it is also possible to safely administer them via peripheral vein and intraosseous needle. Monitor blood pressure frequently and titrate the vasopressor to the minimum dose necessary to maintain perfusion and prevent side effects. Norepinephrine is considered first-line in adult patients; Epinephrine or Vasopressin can be added to achieve the MAP target. Because of the risk of tachyarrhythmia, reserve dopamine for selected patients with low risk of tachyarrhythmia or those with bradycardia. In children with cold shock (more common), Epinephrine is considered first-line, while norepinephrine is used in patients with warm shock (less common).

WHEN TO STOP VASOPRESSORS
- Titrate vasopressors to desired effect
- Target MAP range ≥ 65–70 mmHg
  - consider higher MAP (i.e. ≥ 80 mmHg) in patients with chronic hypertension

Check markers of perfusion:
- **Mental status, urine output, normalization of lactate** and skin examination.
- Titrate down vasopressors if blood pressure in above target range

### Blood Transfusion in Septic shock
- Give packed red blood cells (PRBCs) transfusion when there is severe anaemia:
  - Hb ≤ 70g/L (7.0 g/dL) in absence of extenuating circumstances such as myocardial infarction, severe hypoxaemia, or acute haemorrhage
  - Targeting higher thresholds (≥ 90–100 g/L) does not lead to better outcomes in patients with sepsis

### Management of shock in Pregnant women
- Ensure adequate hydration, use IV fluids as necessary:
  - Close attention to fluid balance to prevent fluid overload and pulmonary oedema.
  - Oncotic pressure decreases throughout pregnancy and in the postpartum period.
- Vasopressors – use cautiously with appropriate available monitoring:
  - May decrease uterine perfusion
  - Administer with IV fluids – uteroplacental flow will not be adequate with vasopressors alone

*Must monitor foetus when administering.*

### Special considerations for pregnant patients
- Supportive therapies should take into account the physiologic adaptations of pregnancy
- The use of investigational therapeutic agents outside of a research study should be guided by individual risk-benefit analysis based on potential benefit for mother and safety to foetus, with consultation from an obstetric specialist and ethics committee
- Emergency delivery and pregnancy termination decisions are challenging and based on many factors: gestational age, maternal condition, and foetal stability
### Table 3: Prevention of complications

<table>
<thead>
<tr>
<th>Anticipated Outcome</th>
<th>Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce days of invasive mechanical ventilation</td>
<td>• Use weaning protocols that include daily assessment for readiness to breathe spontaneously&lt;br&gt;• Minimize continuous or intermittent sedation, targeting specific titration endpoints (light sedation unless contraindicated) or with daily interruption of continuous sedative infusions</td>
</tr>
<tr>
<td>Reduce incidence of ventilator-associated pneumonia</td>
<td>• Oral intubation is preferable to nasal intubation in adolescents and adults&lt;br&gt;• Keep patient in semi-recumbent position (head of bed elevation 30-45°)&lt;br&gt;• Use a closed suctioning system; periodically drain and discard condensate in tubing&lt;br&gt;• Use a new ventilator circuit for each patient; once patient is ventilated, change circuit if it is soiled or damaged but not routinely&lt;br&gt;• Change heat moisture exchanger when it malfunctions, when soiled, or every 5–7 days</td>
</tr>
<tr>
<td>Reduce incidence of venous thromboembolism</td>
<td>• Use pharmacological prophylaxis (low molecular-weight heparin [preferred if available] or heparin 5000 units subcutaneously twice daily) in adolescents and adults without contraindications. For those with contraindications, use mechanical prophylaxis (intermittent pneumatic compression devices)</td>
</tr>
<tr>
<td>Reduce incidence of catheter-related bloodstream infection</td>
<td>• Use a checklist with completion verified by a real-time observer as reminder of each step needed for sterile insertion and as a daily reminder to remove catheter if no longer needed</td>
</tr>
<tr>
<td>Reduce incidence of pressure ulcer</td>
<td>• Turn patient every two hours</td>
</tr>
<tr>
<td>Reduce incidence of stress ulcers and gastrointestinal bleeding</td>
<td>• Give early enteral nutrition (within 24–48 hours of admission)&lt;br&gt;• Administer histamine-2 receptor blockers or proton-pump inhibitors in patients with risk factors for GI bleeding. Risk factors for gastrointestinal bleeding include mechanical ventilation for ≥48 hours, coagulopathy, renal replacement therapy, liver disease, multiple comorbidities, and higher organ failure score</td>
</tr>
<tr>
<td>Reduce incidence of ICU-related weakness</td>
<td>• Actively mobilize the patient early in the course of illness when safe to do so</td>
</tr>
</tbody>
</table>
Chapter 5: Home Care

All suspected COVID-19 patients with Severe Acute Respiratory Infection should be triaged at first point of care with healthcare system and emergence treatment started based on disease severity. Those with mild disease, hospitalization MAY NOT be required unless there is concern for rapid deterioration.

There are four types of patients who will not require admission to a healthcare facility:

1. Mild disease without risk factors for deterioration (e.g. Diabetes, hypertension, etc)
2. Returning travellers from countries with epidemic outbreak who are asymptomatic
3. Symptomatic patients no longer requiring hospitalization (discharged patients)
4. Limited capacity in healthcare services

RISK FACTORS FOR DETERIORATION
- Chronic lung diseases
- Cardiovascular diseases
- Kidney diseases
- Advanced HIV

Requirements for Home Care for Mild Disease
- Stable enough to receive care at home
  o Designated caregivers are available
- There is a separate bedroom or other space where the patient can recover without sharing immediate space with others
- The patient and other household members have access to appropriate, PPE
- Minimal risk to the vulnerable

Discharge criteria
- Afebrile for greater than 3 days
- Respiratory symptoms significantly improved and
- Improvement in the radiological abnormalities on chest radiograph or CT; and
- Two consecutive negative SARS-CoV-2 nucleic acid detection at least 24 - 48 hours apart

Steps in committing patient to home care
1. Assessment by HCW from district health office on suitability appropriateness of home care
2. Establish communication link with healthcare provider/public health personnel.
3. Educate household members on care for infected family members

Recommendations for home care

Before committing a person to home, the healthcare worker should ensure that the following conditions are met and followed:

1. Patient should be placed in a well-ventilated single room (i.e. open window and door)
2. Limit the movement of the patient to shared spaces i.e. kitchen, bathroom
3. Family members should maintain a safe distance of at least 1m apart from the patient
4. Limit the number of care givers to the patient (identify 1)
5. Perform hand hygiene at all times. Use soap and water and avoid use of same towels
6. The patient should wear the medical mask at all times which should be properly discarded
7. The caregiver should wear a tightly fitted medical mask covering both nostrils and mouth
Discard the mask when wet
8. Avoid direct contact with body fluids particularly oral and respiratory secretions and stool
9. Use disposable gloves when caring for infected persons
10. Use dedicated linen and utensils for the patient and maybe re-used after proper disinfection and washing
11. Clean and disinfect frequently touched surfaces throughout the patients care space. Use regular household soap and then disinfect with household sodium hypochlorite 0.5%
12. Clean and disinfect bedroom and bathroom at least once daily
13. Use gloves, and protective clothing e.g. aprons when attending to the infected patient at all times
14. Waste generated when caring for the patient should be placed in a separate bin and covered with a lid
15. HCW home assessment should select appropriate PPEs

Management of contacts

A contact is an individual who has been providing direct care for an infected patient including caregivers at home and healthcare workers. They include;

- Healthcare-associated exposure, visiting patients or staying in the same close environment of a COVID-19 patient
- Working together in close proximity or sharing the same classroom
- Travelling together with a COVID-19 patient I any form of transportation
- Living together in the same household as a COVID-19 patient within the 14-21-day period after onset of symptoms in the case under consideration

Establish a communication link with healthcare provider for the duration of observation period. Health care providers should be involved in the reviewing of contacts by phone and, ideally by face-to-face visits on a daily basis. Recommended diagnostics tests should be performed when necessary. All contacts should be given advance instructions on when and where to seek care when they become ill including the mode of transportation and where to enter the designated facility.

Management of a contact who falls ill

1. Contact person should inform the designated healthcare provider when they fall ill
2. Notify the receiving health facility that the symptomatic contact will be coming to their facility.
3. During transportation, the contact should wear the medical mask at all times
4. Avoid public transport, if possible, use ambulance or designated district transportation
5. Other persons including healthcare workers should maintain a distance of at least 1m from the contact
6. Disinfect any surfaces soiled with respiratory secretions and other body fluids during transportation with diluted bleach at 0.5%

All contact should be advised to monitor their health including temperature for 14-21 days from the last day of possible contact

Over-the-Counter Medicines (in Mild Cases)

- Antipyretics – Paracetamol 500mg q6-8h and/or Ibuprofen 400mg q8h
  - Avoid Aspirin in children less than 12yrs
- Sore throat – Lozenges
- Cough – Cough suppressants, mucolytics, and expectorants alone or in combination
- Nasal congestion – Antihistamines and/or decongestants

*For severe cases, refer to Guide on hospital treatment
Appendices

Appendix 1: Infection prevention and control measures in the healthcare setting

<table>
<thead>
<tr>
<th>How to implement infection prevention and control measures for patients with suspected or confirmed COVID-19 infection</th>
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<tbody>
<tr>
<td><strong>At triage</strong></td>
</tr>
<tr>
<td><strong>Apply droplet precautions</strong></td>
</tr>
<tr>
<td><strong>Apply contact precautions</strong></td>
</tr>
<tr>
<td><strong>Apply airborne precautions when performing an aerosol generating procedure</strong></td>
</tr>
</tbody>
</table>
## Appendix 2: PPE recommendations in the care and management of suspected or confirmed cases of COVID-19: Inpatient Setting

<table>
<thead>
<tr>
<th>Area</th>
<th>Target personnel</th>
<th>Activity</th>
<th>Type of PPE or IPC precaution</th>
</tr>
</thead>
</table>
| **Patient room**                  | Healthcare workers                | Providing direct care to COVID-19 patients                               | • Medical mask
• Gown
• Eye protection (goggles or face shield)                                                     |
|                                   |                                   | Aerosol-generating procedures performed on COVID-19 patients             | • Respirator N95 or FFP2 standard, or equivalent
• Gown                                                                                       |
|                                   |                                   | COVID-19 patients                                                        | • Gloves
• Eye protection Apron                                                                       |
| Cleaners                          |                                   | Entering the room of COVID-19 patients                                  | • Medical mask
• Heavy duty gloves
• Eye protection (if risk of splash from organic material or chemicals)
• Boots or closed work shoes                                                                |
| Visitors                          |                                   | Entering the room of a COVID-19 patient                                 | • Medical mask
• Gown                                                                                       |
|                                   |                                   | Any activity that does not involve contact with COVID-19 patients        | • No PPE required                                                                               |
| **Other areas of patient transit**| All staff, including healthcare workers | Any activity that does not involve contact with COVID-19 patients       | • No PPE required                                                                               |
| **Triage**                        | Healthcare workers                | Preliminary screening not involving direct contact                        | • Maintain spatial distance of at least 1m
• No PPE required                                                                             |
| Patients with respiratory symptoms|                                   | Any                                                                      | • Maintain spatial distance of at least 1m
• Provide medical mask if tolerated by patient                                                 |
| Patients without respiratory symptoms|                                   | Any                                                                      | • No PPE required                                                                               |
| **Laboratory**                    | Lab technician                    | Manipulation of respiratory samples                                     | • Medical mask Gown
• Gloves
• Eye protection (if risk of splash)                                                         |
| **Administrative areas**          | All staff, including healthcare workers | Administrative tasks that do not involve contact with COVID-19 patients | • No PPE required                                                                               |
## Appendix 3: PPE recommendations in the care and management of suspected or confirmed cases of COVID-19: Outpatient Setting

<table>
<thead>
<tr>
<th>Area</th>
<th>Target personnel</th>
<th>Activity</th>
<th>Type of PPE or IPC precaution</th>
</tr>
</thead>
</table>
| **Consultation room** | Healthcare workers                 | Physical examination of patient with respiratory symptoms | • Medical mask  
• Gown  
• Gloves  
• Eye protection                                                              |
|                   | Healthcare workers                 | Physical examination of patients without respiratory symptoms | • PPE according to standard precautions and risk assessment                                               |
|                   | Patients with respiratory symptoms | Any                                                | • Provide medical mask if tolerated                                                                 |
|                   | Patients without respiratory symptoms | Any                                                | • No PPE required                                                                                  |
| Cleaners          |                                    | After and between consultations with patients with respiratory symptoms | • Medical mask  
• Gown  
• Heavy duty gloves  
• Eye protection (if risk of splash from organic material or chemicals)  
• Boots or closed work shoes                                                                 |
| **Waiting room**  | Patients with respiratory symptoms | Any                                                | • Provide medical mask if tolerated  
• Immediately move the patient to an isolation room or separate area away from others; if this is not feasible, ensure spatial distance of at least 1m from other patients |
|                   | Patients without respiratory symptoms | Any                                                | • No PPE required                                                                                  |
| **Administrative areas** | All staff, including healthcare workers | Administrative tasks                              | • No PPE required                                                                                  |
| **Triage**        | Healthcare workers                 | Preliminary screening not involving direct contact  | • Maintain spatial distance of at least 1m  
• No PPE required                                                                 |
|                   | Patients with respiratory symptoms | Any                                                | • Maintain spatial distance of at least 1m  
• Provide medical mask if tolerated                                                                 |
|                   | Patients without respiratory symptoms | Any                                                | • No PPE required                                                                                  |
Appendix 4: COVID-19 Symptomatic Patient Flow

**REGISTRATION/TRIAGE or DIRECT ADMIT**

- Patient presenting with flu-like illness (subjective/objective fever OR lower respiratory symptoms) AND Recent travel contact with a known or suspected case of COVID-19

**HIGH RISK**

- Patient is given a surgical mask and IMMEDIATELY placed in:
  - Negative pressure room or designated Biocontainment unit
  - NOTIFY INFECTION PREVENTION and INFECTIOUS DISEASE CONSULT PER HOSPITAL PROTOCOL

- Staff must wear appropriate PPE:
  - N-95 (if fit tested) + Welders face shield
  - Surgical mask
  - Isolation gown and gloves

- Testing:
  - Order Viral Respiratory testing, portable CXR, and
  - Treat patient as clinically indicated
  - Additional tests per ID recommendations

**Does NOT require hospitalization**

- Obtain sample for COVID-19 testing if available
- Notify IP during working hours
- Patient can be sent home with discharge instructions

**ReQUIRES hospitalization**

- Discussion among primary team, ID consult, Infection Prevention, and Hospital Operations for
  - Appropriate physical location and staffing model per hospital protocol
  - Call to health department by primary provider of patient
  - Testing for COVID-19

**LOW RISK**

- Patient presenting with flu-like illness (subjective/objective fever AND lower respiratory symptoms) NO Recent travel contact with a known or suspected case of COVID-19

- Patient is given a surgical mask and IMMEDIATELY roomed as noted below:
  - Acutely ill to a private room
  - Stable and well appearing to an appropriate Influenza like illness waiting room

- Staff must wear appropriate PPE per hospital protocol:
  - Surgical mask or N-95 (if fit tested)* + face shield/goggles
  - Isolation gown and gloves

*Move to a negative pressure and wear N95 if an aerosol generating procedure is needed

- Testing:
  - Order Viral Respiratory testing
  - Order CXR if clinically indicated
  - Additional workup and clinical disposition as clinically indicated
  - ID consult ONLY if no clear diagnosis and disposition of patient is uncertain
  - Additional tests per ID recommendations

**Deemed as PUI**

- Obtain sample for COVID-19 testing if available
- Notify IP during working hours
- Patient can be sent home with discharge instructions

**NOT deemed as PUI**

- Usual care
Interim Clinical Guidance for Management of Patients with COVID-19

References


