THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, ELDERLY AND CHILDREN

NATIONAL GUIDELINE OF CLINICAL MANAGEMENT AND INFECTION PREVENTION AND CONTROL OF NOVEL CORONAVIRUS (COVID-19).

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Executive summary

This is the first manual of management, infection prevention and control for novel coronavirus in Tanzania, the infection prevention and control (IPC) together with clinical management guidance has been adapted from WHO's IPC and clinical management recommendations for Infection Prevention and Control during managing probable or confirmed cases of Severe Acute Respiratory Syndrome Coronavirus. This manual is intended for health-care workers (HCWs), health-care managers, and IPC teams.

Since early January 2020, the national authorities in China have reported an increasing number of confirmed cases of infection with a novel coronavirus (called 2019-nCoV), including fatal cases, in an outbreak cantered in Wuhan City, Hubei Province. Confirmed cases with links to Wuhan have been reported elsewhere in China and in other countries, including (as of late January 2020) the United States, Thailand, Japan, Taiwan and also Australia. The situation continues to rapidly evolve as these management guidelines are being published.

Clinical triage including early recognition and immediate placement of patients in separate area from other patients (source control) is an essential measure for rapid identification and appropriate isolation and care of patients with suspected nCoV infection. Standard Precautions include hand and respiratory hygiene; use of Personal protective equipment (PPE) depending on risk; prevention of needle-stick or sharps injury; safe waste management; environmental cleaning and sterilization of patient-care equipment and linen.

Up to now, there is neither evidence from randomized control trials to recommend any specific anti-nCoV treatment for patients with suspected or confirmed nCoV nor vaccine developed.

Foreword

Vovel CoronaVirus (2019-nCoV) Infection has a public health threat to Tanzania since it was declared by the world health organization as a public health emergency of international concern (PHEIC). The CoronaVirus outbreak was reported on 31st December 2019 in Wuhan city, Hubei Province China. Since then, the disease has been spreading at an exponential rate posing global threat. Other Countries have been reporting of news affecting largely the Asian countries, Europe, Australia and America. The trend shows that the outbreak is far from being abated due to a rampant spread.

Clinical presentation of CoronaVirus infection varies from mild to severe form depending on the comorbidities, immunity of an individual as well as diagnostic and treatment measures undertaken.

To enable prompt and effective management of CoronaVirus patients, availability of all necessary commodities, supplies and equipment in highly infectious disease treatment unit for proper treatment and management of cases is required. In line with the above, health care workers need to be oriented to ensure proper case management and infection control at all levels, which will enable early detection of cases and avoidance or minimization of complications. In this regard, I urge all health care workers to be observant of signs and symptoms of CoronaVirus among patients and adhere to the standard case definition in making a diagnosis.

This guideline will facilitate a standardized case management at all levels. It also clearly outlines the steps needed in management of Coronavirus cases of different forms based on the capacity of a highly infectious disease treatment unit.

I therefore urge all health care providers to use this guideline for early detection, isolation and effective management of CoronaVirus patients in case is detected in our country. It should also be understood that, this guideline is a living document, its revisions will be done regularly as will be guided by results of various research and feedback from users.

Dr. Zainab A. S Chaula

PERMANENT SECRETARY

Acknowledgement

National Guideline of clinical management and infection prevention and control of novel coronavirus is a product of efforts and contributions from various. The multidisciplinary nature of the technical committee that developed this Guideline made the development process timely and possible. The Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC) therefore, would like to acknowledge everyone who contributed to this endeavor.

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Moreover, I am highly thankful to the technical experts from Emergency Preparedness and Response Unit for coordinating the development of this Guideline. It is my expectation that this Guideline will provide a guidance on early detection of suspect cases, triaging, isolation and management of cases which will optimally lead to early disease containment making the country at large safe.

Prof. Muhammad B. Kambi
CHIEF MEDICAL OFFICER

Abbreviations

ACH	-Air changes per hour
ARDS	-Acute Respiratory Distress Syndrome
CT scan	-Computed Tomography Scan
Fio_2	-Fraction of Inspired Oxygen
HFNO	-High-flow nasal oxygen
HR	-Heart Rate
IPC	-Infection Prevention Control
IPC	-Infection prevention and control
LRT	-Lower Respiratory Tract
MAP	-Mean Arterial Pressure
MERS-CoV	-Middle East Respiratory Syndrome- coronavirus
nCoV	-novel Corona Virus
NIV	-Non-invasive ventilation
PBW	-Predicted body weight
PCR	-Polymerase Chain Reaction
PPE	-Personal Protective Equipment
RT-PCR	-Real Time Polymerase Chain Reaction
SARI	-Severe Acute Respiratory Infection
SARS-CoV	-Severe Acute Respiratory Syndrome –coronavirus
SBP	-Systolic Blood Pressure
URT	-Upper Respiratory Tract

TABLE OF CONTENTS

1. Background

1. 1 Introduction

Since early January 2020, the national authorities in China have reported an increasing number of confirmed cases of infection with a novel coronavirus (called 2019-nCoV), including fatal cases, in an outbreak centred in Wuhan City, Hubei Province. Confirmed cases with links to Wuhan have been reported elsewhere in China and in other countries, including (as of late January 2020) the United States, Thailand, Japan, Taiwan and also Australia(Hu *et al.*, 2015)(World Health Organization, 2020a). The situation continues to rapidly evolve as these management guidelines are being published.

Initial reports indicate that most of the initial patients had reported exposure to the Wuhan South China Seafood City (a seafood and live animal market), suggesting a zoonotic source for the outbreak. Subsequent investigations have identified cases with no links to the market. Patients initially reported in this outbreak were reported to have had fever, cough, dyspnoea, and bilateral lung infiltrates on chest X-ray. Broader surveillance and testing has also identified more cases including patients with mild symptoms.

Further investigation is required to assess the mode of transmission, the risk of human-to-human transmission, common animal or environmental exposure sources, and whether there are undetected asymptomatic or mildly symptomatic cases(World Health Organization, 2020a).

This guidance will be updated as further information becomes available.

1.2 Disease epidemiology

Coronaviruses are a large family of viruses. There are several known human coronaviruses that usually only cause mild respiratory disease, such as the common cold. However, at least twice previously, coronaviruses have emerged to infect people and cause severe disease. The severe acute respiratory syndrome (SARS) of unknown aetiology among people was first reported on 31st December 2019 in Wuhan City

(population of 19 million), capital of Hubei Province (population of 58 million), southeast of China; of which 7 were reported as severe cases. On 7th January 2020, the authorities of China reported that a novel coronavirus (nCoV) was identified as a possible etiology. Other tests have ruled out severe acute respiratory syndrome due to coronavirus (SARS-CoV), Middle East respiratory syndrome coronavirus (MERS-CoV), influenza, avian influenza, adenovirus, and other common viral or bacterial respiratory infections. As of 12th January 2020, 41 cases with nCoV infection have been preliminarily diagnosed in Wuhan City. Of the 41 cases reported, seven are seriously ill(Scotia, 2020).

On 13th January 2020, the Thailand Ministry of Public Health reported the first laboratory confirmed nCoV case in the country related with Wuhan City, China. The case is a 61-year- old female resident of Wuhan City, Hubei Province, China, with the onset of symptoms (fever, chills, sore throat, and headache) on 5 January 2020, who travelled on a direct flight to Bangkok, Thailand from Wuhan.

On January 14th , a medical institution in Kanagawa Prefecture, Japan reported a case of pneumonia in a person with history of travel to Wuhan City, Hubei Province, China. The patient sample was examined at the National Institute of Infectious Diseases (Murayama government office), identifying nCoV. Fifteen (15) healthcare workers have been infected, it's not known whether these are all from one or multiple facilities.

On 2nd February, Globally, Total confirmed cases 14557, in china cases are 14411 reported, with deaths 304 Outside of china, confirmed cases 146 in 23 countries and 1 death in Philippines. There is uncertainty on the transmissibility and virulence of the new pathogen, and hence its epidemiology, laboratory tests, and control measures to allow a comprehensive risk assessment. Reports indicate that there is no evidence to suggest that person-to-person transmission occurs easily. However, human-to-human transmission, included in the nosocomial environment, has been documented on a recurring basis for other emerging coronaviruses, such as SARS CoV and MERS-CoV. There remain many unanswered questions, including source, transmission and epidemic potential(NSW Government, 2020).

1.3 Standard Precautions

Its recommended to have a cautious approach to the initial management of suspect 2019-nCoV cases until more is known about the transmissibility of this novel virus.

Standard recommended measures for suspects include the following:

- Ask the patient to wear a surgical mask and move them to a single room with the door closed (preferably a negative pressure isolation room, if available).
- Staff entering the room should use standard, contact and airborne precautions – including wearing a fit- checked P2 respiratory (or a N95) mask, disposable gown, gloves and eye protection – in addition to standard precautions.
- Ensure that the patient, potentially contaminated areas, and waste are managed appropriately.

These precautions should continue if the patient is admitted and moved (maintaining infection control) to another hospital area, and should continue until advised by the senior clinician or infection prevention and control team.

1.4 Expert assessment

Prior to commencing the assessment, the experienced clinician conducting the assessment must:

- Confirm that the infection control measures described above have been implemented.
- Confirm that the person taking the patient history is wearing appropriate personal protective equipment (PPE) – fit-checked P2 respiratory (or a N95) mask, disposable gown, gloves and eye protection.

The assessment of the patient should consider the surveillance case definitions for a suspect 2019-nCoV case and, if met, arrange for laboratory testing of appropriate clinical specimens (see Laboratory testing section).

Staff conducting the assessment should also be aware of any updated information on the illness, including any updates on particular locations or exposures associated with an increased risk of transmission(NSW Government, 2020).

1.5 definitions

Suspected case

As the full clinical spectrum of illness is not known, clinical and public health judgement should also be used to determine the need for testing in patients who do not meet the epidemiological or clinical criteria ((CDNA)., 2020).

If the patient satisfies epidemiological AND clinical criteria, they are classified as a suspect case.

Epidemiological criteria

- Travel from China in the 14 days before the onset of illness.

OR

- Travel to agreed areas of human-to-human transmission, or a declared outbreak, within 14 days before onset of illness

OR

- Close contact with a confirmed case of 2019-nCoV within the last 14 days.

Clinical criteria

- Fever of measured temperature ≥38 C° or history of fever and acute respiratory infection (sudden onset of respiratory infection with at least one of the following: shortness of breath, cough or sore throat).

OR

- Severe acute respiratory infection requiring admission to hospital with clinical or radiological evidence of pneumonia or acute respiratory distress syndrome (i.e. even if no evidence of fever).

A suspect case has any of the epidemiological history plus any two clinical manifestations; or all three clinical manifestations if there is no clear epidemiological history.

Confirmed case

A person who tests positive to a specific 2019-nCoV PCR test at a reference laboratory.

Contact is defined as:

- Health care associated exposure, including providing direct care for nCoV patients, working with health care workers infected with nCoV, visiting patients or staying in the same close environment of a nCoV patient.
- Working together in close proximity or sharing the same environment with a with nCoV patient
- Traveling together with nCoV patient in any kind of conveyance
- Living in the same household as a nCoV patient

The epidemiological link may have occurred within a 14-day period before or after the onset of illness in the case under consideration.

2. Clinical management

2.1 Clinical Presentation

Coronaviruses are a large group of viruses that are common among animals. In rare cases, they are what scientists call "zoonotic", meaning can be transmitted from animal to human. The virus can make people sick, usually with a mild to moderate upper respiratory tract illness, similar to a common cold. Usually patients present with runny nose, headache, cough, sore throat, fever and feeling of being unwell.

The virus can also cause severe lower and much more serious respiratory tract illness like a pneumonia or bronchitis, and even respiratory failure and death, especially to those with a weakened immune system, the elderly, the very young and those with co-morbidities.

2.2 Triage and care

Clinical Case management in this manual is organized into the following sections:

1. Triage: Identify case, **recognize and sort patients with SARI**
2. IPC implementation measures; **Immediate and appropriate infection prevention and control (IPC)**
3. Initial clinical assessment
4. Early supportive therapy and monitoring
5. Collection of specimens for laboratory diagnosis
6. Syndromic and management of complications; **hypoxemic respiratory failure, acute respiratory distress syndrome (ARDS) and septic shock**
7. Prevention of complications
8. Specific anti-nCoV treatments
9. Special considerations for pregnant patients

2.2.1 Triage: early recognition of patients with suspected nCoV infection

For Triaging, the following should be undertaken:

- Recognize and sort all patients with suspected nCoV at first point of contact with health care system (such as the emergency department/OPD).
- Consider nCoV as a possible etiology of SARI under above mentioned criteria.
- Triage patients and start emergency treatments based on disease severity.

Note: nCoV infection may present with mild, moderate, or severe illness; the latter includes severe pneumonia, ARDS, sepsis and septic shock (see Table 1).

Early recognition of suspected patients allows for timely initiation of IPC (Table 2). Early identification of those with severe manifestations (see Table 1) allows for immediate optimized supportive care treatments and safe, rapid admission (or referral) to intensive care unit according to institutional or national protocols (World Health Organization, 2020a).

Note; All patients meeting the standard case definition must be isolated and managed accordingly.

Table 1. Triaging according to severity of nCoV infection

Uncomplicated illness	Patients with uncomplicated upper respiratory tract viral infection, may have non-specific symptoms such as; • fever, • cough, • sore throat, • nasal congestion, • malaise, • headache, • muscle pain or malaise. The elderly and immunosuppressed may present with atypical symptoms. These patients do not have any signs of dehydration, sepsis or shortness of breath.

Mild pneumonia	Patient with pneumonia and no signs of severe pneumonia.
	• Child with non-severe pneumonia has cough or difficulty breathing + fast breathing:
	• Fast breathing (in breaths/min) depending on the patient's age:
	  ○ <2 months, ≥60;
	  ○ 2–11 months, ≥50;
	  ○ 1–5 years, ≥40 and
	• No signs of severe pneumonia.

Severe pneumonia	Adolescent or adult: Fever or suspected respiratory infection, plus one of the following;
	• Respiratory rate >30 breaths/min,
	• Severe respiratory distress, or SpO 2 <90% in room air.
	
	Child with cough or difficulty in breathing, plus at least one of the following:
	• Central cyanosis or SpO 2 <90%;
	• Severe respiratory distress (e.g. grunting, very severe chest in drawing);
	• 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 in drawing, fast breathing (in breaths/min) depending on the patient's age:
	  ○ <2 months, ≥60;
	  ○ 2–11 months, ≥50;

	○ 1–5 years, ≥40. The diagnosis is clinical; chest imaging can exclude complications.
Acute Respiratory Distress Syndrome (ARDS)	Onset: • New or worsening respiratory symptoms within one week of known clinical insult. Chest imaging (radiograph, CT scan, or lung ultrasound): • Bilateral opacities, not fully explained by effusions, lobar or lung collapse, or nodules. Origin of oedema: • Respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g. echocardiography) to exclude hydrostatic cause of edema if no risk factor present.
Sepsis	Adults: life-threatening organ dysfunction caused by a dysregulated host response to suspected or proven infection, with organ dysfunction. Signs of organ dysfunction include: • Altered mental status, • Difficult or fast breathing, • Low oxygen saturation, • Reduced urine output, • Fast heart rate, weak pulse, • Cold extremities or low blood pressure, • Skin mottling, or laboratory evidence of coagulopathy, thrombocytopenia, • Acidosis, high lactate or hyperbilirubinemia. Children: suspected or proven infection and ≥2 SIRS (*Systemic Inflammatory Response Syndrome*) criteria, of which one must be abnormal temperature or white blood cell count.
Septic shock	Adults: • Persisting hypotension despite volume resuscitation, requiring vasopressors to maintain Mean Arterial Pressure (MAP) ≥65 mmHg and serum lactate level >2 mmol/L. Children: • Any hypotension (SBP <5 th 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.

2.2.2 Immediate implementation of appropriate IPC measures

Appropriate institution of IPC is a critical and integral part of clinical management of patients and should be initiated at the point of entry of the patient (OPD/emergency department). Standard precautions should always be routinely applied in all areas of health care facilities.

Standard precautions include;

- Hand hygiene
- Use of PPE to avoid direct contact with patients' blood, body fluids, secretions (including respiratory secretions) and non-intact skin.
- Appropriate handling of sharps
- Safe waste management; cleaning and disinfection of equipment; and
- Cleaning of the environment.

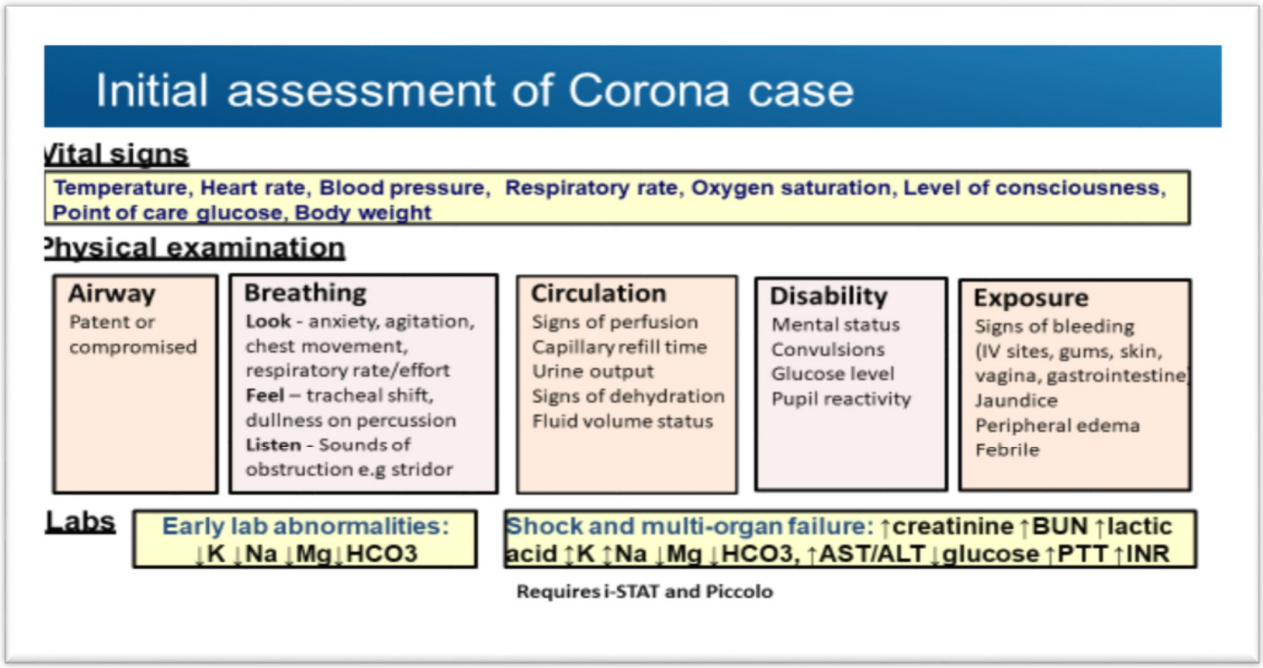
Table 2. How to implement Infection Prevention and Control (IPC) measures for patients with suspected or confirmed nCoV infection.

At triage	• Give suspect patient a medical mask and direct the patient to a separate area, an isolation room if available. • Keep at least 1-meter distance between suspected patients and other patients. • Instruct all patients to cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others. • Perform hand hygiene after contact with respiratory secretions
Apply droplet precautions	Droplet precautions prevent large droplet transmission of respiratory viruses. Hence • Use a medical mask if working within 1-2 meter from the patient. • Place patients in single rooms.

	• If an etiological diagnosis is not possible, group patients with similar clinical diagnosis and based on epidemiological risk factors, with a spatial separation using examination screens. • When providing care in close contact with a patient with respiratory symptoms (e.g. coughing or sneezing), use eye protection (face-mask or goggles), because sprays of secretions may occur. • Limit patient movement within the facility and ensure that patients wear medical masks when outside their rooms.
Apply contact precautions	Droplet and contact precautions prevent direct or indirect transmission from contact with contaminated surfaces or equipment (i.e. contact with contaminated oxygen tubing). • Use PPE (N95, eye protection, gloves and gown) when entering room and remove PPE when leaving. • If possible, 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. • Ensure that health care workers refrain from touching their eyes, nose, and mouth with potentially contaminated gloved or ungloved hands. • Avoid contaminating environmental surfaces that are not directly related to patient care (e.g. door handles and light switches). • Ensure adequate room ventilation. Avoid movement of patients or transport. • Perform hand hygiene.
Apply airborne precautions when performing an aerosol generating procedure	• Ensure that healthcare workers performing aerosol-generating procedures (i.e. open suctioning of respiratory tract, intubation, bronchoscopy, cardiopulmonary resuscitation) use PPE, including gloves, long-sleeved gowns, eye protection, and fit-tested particulate respirators (N95 or equivalent, or higher level of protection). • Whenever possible, use adequately ventilated single rooms when performing aerosol-generating procedures, meaning negative pressure rooms with minimum of 12 air changes per hour or at least 160 litres/second/patient in facilities with natural ventilation. • Avoid the presence of unnecessary individuals in the room. • Care for the patient in the same type of room after mechanical ventilation commences.

2.2.3 Initial clinical assessment

The table below summarizes procedures to be undertaken during the initial assessment of a suspected or confirmed n-CoV infection.



2.2.4. Early supportive therapy and monitoring

The following should be undertaken as early supportive therapy:

1. **Give supplemental oxygen therapy immediately to patients with SARI and respiratory distress, hypoxemia, or shock.**
   - Initiate oxygen therapy at 5 L/min and titrate flow rates to reach target SpO 2 ≥90% in non-pregnant adults and SpO 2 ≥92-95 % in pregnant patients.
   - 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 2 ≥94%; otherwise, the target SpO 2 is ≥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 nCoV infection.

2. **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.

3. **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 nCoV, administer appropriate empiric antimicrobials within **ONE** hour of identification of sepsis.

   Empiric antibiotic treatment should be based on the clinical diagnosis;

Do not routinely give systemic corticosteroids for treatment of viral pneumonia.

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). 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. A subsequent study that addressed this limitation by adjusting for time-varying confounders found no effect on mortality. 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. Given lack of effectiveness and possible harm, routine corticosteroids should be avoided unless they are indicated for another reason.

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

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

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.

2.2.5. Collection of specimens for laboratory diagnosis

Testing should be according to our local guidance for management of community-acquired pneumonia. Examples of other etiologies include Streptococcus pneumonia, Haemophilus influenza type B, Legionella pneumophila, other recognized primary bacterial pneumonias, influenza viruses, and respiratory syncytial virus.

WHO guidance on specimen collection, processing, and laboratory testing, including related biosafety procedures, is available.

- Collect blood cultures for bacteria that cause pneumonia and sepsis, ideally before antimicrobial therapy.
- DO NOT delay antimicrobial therapy to collect blood cultures.
- Collect specimens from BOTH the upper respiratory tract (URT; nasopharyngeal and oropharyngeal) AND lower respiratory tract (LRT; expectorated sputum, endotracheal aspirate, or Broncho alveolar lavage) for nCoV testing by RT-PCR.

Clinicians may elect to collect only LRT samples when these are readily available (for example, in mechanically ventilated patients).

- Serology for diagnostic purposes is recommended only when RT-PCR is not available.
- Use appropriate PPE for specimen collection (droplet and contact precautions for URT specimens; airborne precautions for LRT specimens).
- When collecting URT samples, use viral swabs (sterile Dacron or rayon, not cotton) and viral transport media.

Confirmatory test for Corona Virus is through ***reverse-transcriptase polymerase chain reaction (RT-PCR)*** with probe detection or sequencing.

NB: Do not sample the nostrils or tonsils.

In a patient with suspected novel coronavirus, especially with pneumonia or severe illness, a single URT sample does not exclude the diagnosis, and additional URT and LRT samples are recommended. LRT (vs.URT) samples are more likely to be positive and for a longer period. Clinicians may elect to collect only LRT samples when these are readily available (for example, in mechanically ventilated patients). Sputum induction should be avoided due to increased risk of increasing aerosol transmission. Dual infections with other respiratory viral infections have been found in SARS and MERS cases.

At this stage we need detailed microbiologic studies in all suspected cases. Where feasible both URT and LRT specimens can be tested for other respiratory viruses, such as;

- Influenza A and B (including zoonotic influenza A),
- Respiratory syncytial virus,
- Parainfluenza viruses,
- Rhinoviruses,
- Adenoviruses,
- Enteroviruses (e.g. EVD68),
- Human meta pneumovirus, and

- Endemic human coronaviruses (i.e. HKU1, OC43, NL63, and 229E).

The LRT specimens can also be tested for bacterial pathogens, including Legionella pneumophila. In hospitalized patients with confirmed nCoV infection, repeat URT and LRT samples should be collected to demonstrate viral clearance. Frequency of specimen collection should be at least every 2 to 4 days until there are two consecutive negative results (both URT and LRT samples if both are collected) in a clinically recovered patient at least 24 hours apart(World Health Organization, 2020b).

2.2.6. Syndromic Management.

Guidelines for the Syndromic Management of Hypoxemic respiratory failure and septic shock are as follows.

2.2.6.1 Hypoxemic respiratory failure.

Such patients will normally be managed in highly specialized facilities. 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; 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.
- Patients with hypoxemic respiratory failure on non-invasive ventilation are at risk of clinical deterioration, therefore it should only be used in selected patients and be closely monitored.

HFNO systems can deliver 60 L/min of gas flow and FiO 2 up to 1.0; paediatric circuits generally only handle up to 15 L/min, and many children will require an adult circuit to deliver adequate flow. Compared to standard oxygen therapy, HFNO reduces the need

for intubation. 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.

NB: ***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 hr.). Evidence-based guidelines on HFNO do not exist, and reports on HFNO in MERS patients are limited***.

Guidelines NIV make no recommendation on use in hypoxemic respiratory failure (apart from cardiogenic pulmonary oedema and post-operative respiratory failure) or pandemic viral illness (referring to studies of SARS and pandemic influenza). Risks include; delayed intubation, Large tidal volumes, and Injurious trans-pulmonary pressures.

Limited data suggest a high failure rate when MERS patients receive NIV. Patients receiving a trial of NIV 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 hr). Patients with hemodynamic instability, multiorgan failure, or abnormal mental status should not receive NIV.

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.

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. Thus pre-oxygenate with 100% 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 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 cmH_2O).

This is a strong recommendation from a clinical guideline for patients with ARDS, and is suggested for patients with sepsis-induced respiratory failure who do not meet ARDS criteria.

- The initial tidal volume is 6 ml/kg PBW; tidal volume up to 8 ml/kg PBW is allowed if undesirable side effects occur (e.g. dysynchrony, pH <7.15).
- Hypercapnia is permitted if meeting the pH goal of 7.30-7.45. Ventilator protocols are available.
- The use of deep sedation may be required to control respiratory drive and achieve tidal volume targets.
- 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 hypo perfusion. This is a strong guideline recommendation; the main effect is to shorten the duration of ventilation.
- In patients with moderate or severe ARDS, higher positive end-expiratory pressure (PEEP) instead of lower PEEP is suggested.

PEEP titration requires consideration of benefits (reducing atelectrauma and improving alveolar recruitment) vs. risks (end-inspiratory over distension leading to lung injury and higher pulmonary vascular resistance). Tables are available to guide PEEP titration based on the FiO_2 required to maintain SpO^2. A related intervention of recruitment manoeuvres (RMs) is delivered as episodic periods of high continuous positive airway pressure [30–40 cm H 2 O], progressive incremental increases in PEEP with constant driving pressure, or high driving pressure; considerations of benefits vs. risks are similar. Higher PEEP and RMs were both conditionally recommended and patients should be monitored. In patients with moderate to severe ARDS (PaO_2 /FiO_2 <150), neuromuscular blockade by continuous infusion should not be routinely used.

- 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.

- 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).

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Table 3. Syndromic management of ARDS

Acute Respiratory Distress Syndrome	Onset: • New or worsening respiratory symptoms within one week of known clinical insult. Chest imaging (radiograph, CT scan, or lung ultrasound): • Bilateral opacities, not fully explained by effusions, lobar or lung collapse, or nodules. Origin of oedema: • Respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g. echocardiography) to exclude hydrostatic cause of oedema if no risk factor present. Oxygenation (adults): • Mild ARDS: 200 mmHg < PaO_2 /FiO_2 ≤ 300 mmHg (with PEEP or CPAP ≥5 cmH_2O, 7 or non-ventilated) • Moderate ARDS: 100 mmHg < PaO_2 /FiO_2 ≤200 mmHg with PEEP ≥5 cmH_2O, 7 or non-ventilated) • Severe ARDS: PaO_2 /FiO_2 ≤ 100 mmHg with PEEP ≥5 cmH_2O, 7 or non-ventilated) • When PaO_2 is not available, SpO_2 /FiO_2 ≤315 suggests ARDS (including in non-ventilated patients) Oxygenation (children; note OI = Oxygenation Index and OSI = Oxygenation Index using SpO_2): • Bilevel NIV or CPAP ≥5 cmH_2O via full face mask: PaO_2 /FiO_2 ≤ 300 mmHg or SpO_2/FiO_2 ≤264 • Mild ARDS (invasively ventilated): 4 ≤ OI < 8 or 5 ≤ OSI < 7.5 • Moderate ARDS (invasively ventilated): 8 ≤ OI < 16 or 7.5 ≤ OSI < 12.3 • Severe ARDS (invasively ventilated): OI ≥ 16 or OSI ≥ 12.3

2.2.6.2 Septic shock

Recognize septic shock in adults

- when infection is suspected or confirmed AND vasopressors are needed to maintain mean arterial pressure (MAP) ≥65 mmHg AND lactate is ≥2 mmol/L, in absence of hypovolemia.

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.
- In resuscitation from septic shock in adults, give at least 30 ml/kg of isotonic crystalloid in adults in the first 3 hours.
- In resuscitation from septic shock in children in well-resourced settings, give 20 ml/kg as a rapid bolus and up to 40-60 ml/kg in the first 1 hr.

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. Crystalloids include normal saline and Ringer's lactate. Determine need for additional fluid boluses

- (250-1000 ml in adults or 10-20 ml/kg in children) based on clinical response and improvement of perfusion targets.
- Perfusion targets include MAP (>65 mmHg or age-appropriate targets in children), urine output (>0.5 ml/kg/hr in adults, 1 ml/kg/hr in children), and improvement of skin mottling, capillary refill, level of consciousness, and lactate.

Consider dynamic indices of volume responsiveness to guide volume administration beyond initial resuscitation based on local resources and experience. These indices include passive leg raises, fluid challenges with serial stroke volume measurements, or variations in systolic pressure, pulse pressure, inferior vena cava size, or stroke volume in response to changes in intrathoracic pressure during mechanical ventilation.

Starches are associated with an increased risk of death and acute kidney injury vs. crystalloids.

The effects of gelatins are less clear, but they are more expensive than crystalloids. Hypotonic (vs. isotonic) solutions are less effective at increasing intravascular volume. Surviving Sepsis also suggests albumin for resuscitation when patients require substantial amounts of crystalloids, but this conditional recommendation is based on low-quality evidence.

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).

No RCTs have compared dobutamine to placebo for clinical outcomes.

2.2.7 Prevention of complications.

To prevent complications associated with critical illness a number of critical interventions (Table 3) have to be implemented. These interventions are based on Surviving Sepsis or other guidelines and are generally limited to feasible recommendations based on high quality evidence.

Table 3. Prevention of complications.

Anticipated Outcome	**Interventions**
Reduce days of invasive mechanical ventilation	• Use weaning protocols that include daily assessment for readiness to breathe spontaneously • Minimize continuous or intermittent sedation, targeting specific titration endpoints (light sedation unless contraindicated) or with daily interruption of continuous sedative infusions

Reduce incidence of ventilator-associated pneumonia	• Oral intubation is preferable to nasal intubation in adolescents and adults. • Keep patient in semi-recumbent position (head of bed elevation 30-45^{o}). • Use a closed suctioning system; periodically drain and discard condensate in tubing. • Use a new ventilator circuit for each patient; once patient is ventilated, change circuit if it is soiled or damaged but not routinely • Change heat moisture exchanger when it malfunctions, when soiled, or every 5–7 days
Reduce incidence of venous thromboembolism	• Use pharmacological prophylaxis (low molecular-weight heparin [preferred if available] or heparin 5000 units subcutaneously once or twice daily) in adolescents and adults without contraindications. For those with contraindications, use mechanical prophylaxis (intermittent pneumatic compression devices if available).
Reduce incidence of catheter-related bloodstream infection	• 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
Reduce incidence of pressure ulcers	• Turn patient every two hours
Reduce incidence of stress ulcers and gastrointestinal bleeding	• Give early enteral nutrition (within 24–48 hours of admission). • 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
Reduce incidence of ICU-related weakness	Actively mobilize the patient early in the course of illness when safe to do so

2.2.8 Specific anti-Novel-CoV treatments and clinical research

Currently there is no evidence from randomized controlled trials (RCTs) to recommend any specific anti-nCoV treatment for patients with suspected or confirmed nCoV.

These are a few therapeutic drugs at different trial phases;

Antiviral therapy: There are currently no effective antiviral drugs. Hospitals can try Alpha-interferon inhalation (5 million U each time for an adult, add 2 ml of sterilized water for injection twice daily); lopinavir/ ritonavir (200mg/50mg for each pill), 2 capsules a time and twice a day; or add Ribavirin (4g for the first time for adults, every 8 hours a time on the following day; or 8mg/kg iv. every 8 hours a time). Be aware of such adverse reactions as lopinavir/ritonavir-related diarrhea, nausea, vomiting, liver damage, and pay attention to interactions with other drugs(Commission, 2019).

2. 2. 9 Discharge criteria

Patients meeting the following criteria can be removed from medical isolation and discharged or be transferred to other departments to treat other medical conditions, if any:

1. Body temperature is back to normal for more than three days;
2. Respiratory symptoms improve obviously;
3. Pulmonary imaging shows obvious absorption of inflammation, and
4. Nuclei acid tests negative for respiratory tract pathogen twice consecutively (sampling interval being at least one day).

2.3.0 Special considerations for pregnant patients

The following considerations need to be taken on board in cases of pregnant women with suspected or confirmed nCoV;

- Should be treated with supportive therapies as described above, taking 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 fetus, with consultation from an obstetrics specialist and ethics committee.

- Emergency delivery and pregnancy termination decisions are challenging and based on many factors: gestational age, maternal condition, and fetal stability. Consultations with obstetric, neonatal, and intensive care specialists (depending on the condition of the mother) are essential (World Health Organization, 2020a).

3. Principles of infection prevention and control associated with health care settings with suspected nCoV infection

IPC strategies to prevent or limit infection transmission in health-care settings include the following:

1. Early recognition and source control

2. Application of Standard Precautions for all patients

3. Implementation of additional precautions (droplet and contact and whenever applicable airborne precautions) for suspected cases.

4. Environmental controls

3.1. Early recognition and source control

Clinical triage including early recognition and immediate placement of patients in separate area from other patients (source control) is an essential measure for rapid identification and appropriate isolation and care of patients with suspected nCoV infection. To facilitate early identification of suspect cases, healthcare facilities should:

- Encourage HCWs to have a high level of clinical suspicion
- Institute screening questionnaire and
- Post signage in public areas reminding symptomatic patients to alert HCWs.
- Ensure the promotion of respiratory hygiene as an important preventative measure.
- Ensure that suspected nCoV patients are placed in an area separate from other patients, and additional IPC (droplet and contact) precautions are promptly implemented.

3. 2. Application of Standard Precautions for all patients

Standard Precautions include hand and respiratory hygiene; use of Personal protective equipment (PPE) depending on risk; prevention of needle-stick or sharps injury; safe waste management; environmental cleaning and sterilization of patient-care equipment and linen.

Ensure the following respiratory hygiene measures:

- Offer a medical mask (N95) for suspected nCoV infection for those who can tolerate it
- Cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others
- Perform hand hygiene after contact with respiratory secretions.

PERSONAL PROTECTIVE EQUIPMENT (PPE).

Rational, correct, and consistent use of available PPE and appropriate hand hygiene also helps to reduce the spread of the pathogens. PPE effectiveness depends on adequate and regular supplies, adequate staff training, proper hand hygiene and specifically appropriate human behaviour.

Health care workers and Administrators should ensure that environmental cleaning and disinfection procedures are followed consistently and correctly. Thorough cleaning of environmental surfaces with water and detergent and applying commonly used hospital level disinfectants (such as sodium hypochlorite) is an effective and sufficient procedure. Laundry, food service utensils and medical waste should be managed in accordance with safe routine procedures (World Health Organization(WHO), 2020).

3.3. Implementation of additional Precautions for suspected nCoV infections

3.3.1 Contact and Droplet precautions for suspected nCoV infection:

- In addition to Standard Precautions, all individuals, including family members, visitors and HCWs should apply Contact and Droplet precautions
- Place patients in adequately ventilated single rooms. For naturally ventilated general ward rooms this is considered to be 160 L/second/patient;
- When single rooms are not available, cohort patients suspected of nCoV infection together;
- Apply Infection prevention and control measures when providing health care where novel coronavirus (nCoV) infection is suspected, the Interim Guidance is to:
    - Place patient beds at least 1m apart;

- Where possible, cohort HCWs to exclusively care for cases to reduce the risk of spreading transmission due to inadvertent infection control breaches;
- Use a medical mask
- Use eye/facial protection (i.e. goggles or a face shield);
- Use a clean, non-sterile, long-sleeved fluid resistant gown;
- Use gloves;
- Use either single use disposable equipment 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 (e.g. ethyl alcohol 70%);
- Refrain from touching eyes, nose or mouth with potentially contaminated hands;
- Avoid the movement and transport of patients out of the room or area unless medically necessary.
- Use designated portable X-ray equipment and/or other important diagnostic equipment.
- If transport is required, use pre-determined transport routes to minimize exposures to staff, other patients and visitors and apply medical mask to patient;
- Ensure that HCWs who are transporting patients wear appropriate PPE as described above and perform hand hygiene;
- Notify the receiving area of necessary precautions as soon as possible before the patient's arrival;
- Routinely clean and disinfect patient-contact surfaces;
- Limit the number of HCWs, family members and visitors in contact with a patient with suspected nCoV infection;
- Maintain a record of all persons entering the patient's room including all staff and visitors.

3.3.2 Airborne precautions for aerosol-generating procedures for patients suspected to have nCoV infection:

Some aerosol generating procedures have been associated with increased risk of transmission of coronaviruses (SARS-CoV and MERS-CoV) such as tracheal intubation, non-invasive ventilation, tracheotomy, cardiopulmonary resuscitation, manual ventilation before intubation and bronchoscopy. Hence

nsure that HCWs performing aerosol-generating procedures:

- Use a particulate respirator at least as protective as N95, or equivalent when putting on a disposable particulate respirator, always performing the seal-check before. Note that if the wearer has facial hear (beard) this can prevent a proper respirator fit.
- Have eye protection (i.e. goggles or a face shield);
- Put on clean, non-sterile, long-sleeved gown and gloves;
    - If gowns are not fluid resistant, use a waterproof apron for procedures with expected high fluid volumes that might penetrate the gown;
- Perform procedures in an adequately ventilated room; i.e. at least natural ventilation with at least 160 l/s/patient air flow or negative pressure rooms with at least 12 air changes per hour (ACH) and controlled direction of air flow when using mechanical ventilation
- Limit the number of persons present in the room to the absolute minimum required for the patient's care and support.

3.4 Duration of contact and droplet precautions for nCoV infection

Standard precautions should always be applied at all times. Additional contact and droplet precautions should continue until the patient is asymptomatic. More comprehensive information on the nCoV infection mode of transmission is required to define duration of additional precautions.

3.5 Collection and handling of laboratory specimens from patients with suspected nCoV.

All specimens collected for laboratory investigations should be regarded as potentially infectious, and HCWs who collect, or transport clinical specimens should adhere rigorously to Standard Precautions to minimize the possibility of exposure to pathogens. To achieve this, Supervisors should;(Hu *et al.*, 2015).

- Ensure that HCWs who collect specimens use appropriate PPE (eye protection, medical mask, Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected, long-sleeved gown, gloves). If the specimen is collected under aerosol generating procedure, personnel should wear a particulate respirator at least as protective as N95, or equivalent.

- Ensure that all personnel who transport specimens are trained in safe handling practices and spill decontamination procedures.
- Place specimens for transport in leak-proof specimen bags (secondary container) that have a separate seal able pocket for the specimen (i.e. a plastic biohazard specimen bag), with the patient's label on the specimen container (primary container), and a clearly written laboratory request form.
- Ensure that health-care facility laboratories adhere to appropriate biosafety practices and transport requirements according to the type of organism being handled.
- Deliver all specimens by hand whenever possible.
- Document patient's full name, date of birth of suspected nCoV of potential concern clearly on the accompanying laboratory request form. Notify the laboratory as soon as possible that the specimen is being transported.

3.6 Environmental controls

These include basic health-care facility infrastructures. They are aimed at reducing the spread of many pathogens during health care. The controls include ensuring;

- Adequate environmental ventilation in all areas within a health-care facility, as well as adequate environmental cleaning.
- Spatial separation of at least 1-meter distance to be maintained between each suspect patient and others.

3.7 Other important Recommendations

- To strengthen surveillance & epidemiological investigation activities to detect any unusual respiratory health event.
- Health professionals should be informed about the possibility of the occurrence of infection caused by this virus and the actions to be implemented in case of a suspected case.
- Health practitioners and public health authorities should provide travelers, who arrive and leave the country, with information to promote and facilitate seeking medical attention in the event of an illness before, during, or after an international trip.

- Promote good practices and behavior to reduce the overall risk of acute respiratory infections during travel, such as following cough etiquette and frequent handwashing.
- Promote avoiding close contact with people suffering from acute respiratory infections, as well as avoiding places where farm or wild animals are present, alive or dead.

4. Disease prevention and control

Measures to limit the infection transmission in health-care settings include the following measures:

4.1. Infection prevention and control measures

The following measures are recommended for infection prevention and control (IPC):

- Early recognition and control of the possible source of infection in the hospital environment;
- Application of standard precautions for all patients:
- Hand hygiene,
- Use of personal protective equipment according to risk assessment
- Respiratory hygiene and cough etiquette
- Safe disposal of sharp objects
- Proper environmental and hospital waste management
- Sterilization and disinfection of medical and hospital devices

4.2. Empirical implementation of additional precautions according to transmission mechanism:

- Institute contact and droplet precautions with suspected cases
- Institute contact and aerosol nucleus droplet precautions where procedures may be performed, such as tracheal intubation, non-invasive ventilation, tracheostomy cardiopulmonary resuscitation, manual ventilation before intubation, and bronchoscopy for suspected cases;

4. 3 Administrative control:

- Training and education of health care workers
- SOP on early recognition of acute respiratory infection potentially due to 2019 nCoV
- Access to rapid laboratory tests for the identification of the etiologic agent.
- Overcrowding prevention, especially in emergency services.

- Provision of specific waiting areas (Isolation Units) for symptomatic patients and adequate disposition of hospitalized patients that promote an adequate patient-personal health relationship

4. 4 Environmental control:

- Adequate environmental ventilation in areas within health facilities
- Cleanliness of hospital environment

Separation of at least 1-meter distance between patients must be respected

4. 5 IPC for coronavirus disease (covid-19) at community level

1. **Washing hands frequently**

Washing hands frequently with soap and water or use an alcohol-based hand rub if your hands are not visibly dirty.

2. **Practice respiratory hygiene**

When coughing and sneezing, cover mouth and nose with flexed elbow or tissue – discard tissue immediately into a closed bin and clean your hands with alcohol-based hand rub or soap and water.

3. **Maintain social distancing**

Maintain at least 1 meter (3 feet) distance between yourself and other people, particularly those who are coughing, sneezing and have a fever.

4. **Avoid touching eyes, nose and mouth**

Hands touch many surfaces which can be contaminated with the virus. If you touch your eyes, nose or mouth with your contaminated hands, you can transfer the virus from the surface to yourself.

5. **If you have fever, cough and difficulty breathing, seek medical care early**

Tell your health care provider if you have traveled in an area where 2019-nCoV has been reported, or if you have been in close contact with someone with who has traveled from China and has respiratory symptoms.

6. **If you have mild respiratory symptoms and no travel history to area where the disease has been reported**

If you have mild respiratory symptoms and no travel history to the area where the disease has been reported, carefully practice basic respiratory and hand hygiene and stay home until you are recovered, if possible.

7. **As a general precaution, practice general hygiene measures when visiting live animal markets, wet markets or animal product markets**

Ensure regular hand washing with soap and potable water after touching animals and animal products; avoid touching eyes, nose or mouth with hands; and avoid contact with sick animals or spoiled animal products. Strictly avoid any contact with other animals in the market (e.g., stray cats and dogs, rodents, birds, bats). Avoid contact with potentially contaminated animal waste or fluids on the soil or structures of shops and market facilities

8. **Avoid consumption of raw or undercooked animal products**

Handle raw meat, milk or animal organs with care, to avoid cross-contamination with uncooked foods, as per good food safety practices.

4. 6 Home care for a suspected novel coronavirus infection case presenting with mild symptoms

- Place the patient in a well-ventilated single room (i.e. open window and open door);
- Limit the movement of the patient and minimize shared space.
- Household members should stay in a different room;
- Limit the number of caregivers of the patient. Ideally assign one person who is in a good health without underlying chronic conditions or immunocompromised conditions. Visitors should not be allowed until the patient has completely recovered from signs and symptoms;
- Perform hand hygiene following any type of contact with patients or their immediate environment. Hand hygiene should also be performed before and after preparing

food, before eating, after using the toilet, and whenever hands look dirty. If hands are not visibly soiled, alcohol-based hand rub can be used. For visibly soiled hands perform hand hygiene using soap and water;

- When washing hands with soap and water, the use of disposable paper towels to dry hands is desirable. If not available, use clean cloth towels and replace them when they become wet;
- To contain respiratory secretions, a medical mask should be provided to the patient and worn as much as possible. For individuals who cannot tolerate a medical mask, he/she should rigorously apply respiratory hygiene, i.e. cover mouth and nose when coughing or sneezing with disposable paper tissue. Discard or appropriately clean materials used to cover the mouth and nose after use (e.g. wash handkerchiefs using regular soap or detergent and water);
- The caregiver should wear a tightly fitted medical mask that covers her/his mouth and nose when in the same room with the patient. Masks should not be touched or handled during use. If the mask gets wet or dirty with secretions, it must be replaced immediately with a new, clean, dry mask. Remove the mask by using appropriate technique (i.e. do not touch the front but remove the lace from behind). Discard the mask immediately after use and perform hand hygiene;
- Avoid direct contact with body fluids, particularly oral or respiratory secretions, and stool. Use disposable gloves and mask to provide oral or respiratory care and when handling stool, urine and waste. Perform hand hygiene before and after removing gloves and mask;
- Do not reuse masks or gloves;
- Use dedicated linen and eating utensils for the patient; these items should be cleaned with soap and water after use and may be re-used instead of being discarded;
- Clean and disinfect daily the frequently touched surfaces throughout the patient's care area such as bedside tables, bedframes, and other bedroom furniture. Regular household soap or detergent should be used for cleaning first and then, after rinsing, regular household disinfectant containing 0.5% sodium hypochlorite

- Clean and disinfect bathroom and toilet surfaces at least once daily. Regular household soap or detergent should be used for cleaning and first and then, after rinsing, regular household disinfectant containing 0.5% sodium hypochlorite should be applied;
- Clean the patient's clothes, bedclothes, bath and hand towels, etc. using regular laundry soap and water or machine wash at 60–90 °C with common household detergent, and dry thoroughly. Place contaminated linen into a laundry bag. Do not shake soiled laundry and avoid direct contact of the skin and clothes with the contaminated materials;
- Gloves and protective clothing (e.g. plastic aprons), should be used when cleaning or handling surfaces, clothing or linen soiled with body fluids. Depending on the context either utility or single use gloves can be used. Utility gloves should be cleaned with soap and water and decontaminated with 0.5% of sodium hypochlorite after use. Single-use gloves (nitrile or latex or nitrile) should be discard after each use. Perform hand hygiene before and after removing gloves;
- Gloves, masks and other waste generated during the health care of patient at home should be placed in a waste bin with lid in the patient's room before disposal as infection waste;
- Avoid other types of exposure to contaminated items from the immediate environment of the patient (e.g. no sharing of toothbrushes, cigarettes, eating utensils, dishes, drinks, towels, washcloths or bed linen);
- When a HCW provides home care, he/she should perform risk assessment to select the appropriate personal protective equipment (PPE), and follow the recommendations for droplet and contact precautions.
- Give information to a nearby health facility

5. Mortuary and care of the deceased

The following principles should be followed up when handling a dead body due to nCoV.

5.1 Packing and transport of the dead body of patients with ARI of potential concern, to a mortuary or burial

- Ensure that the body is fully sealed in an impermeable body bag before being removed from the isolation room or area, and before being transferred to the mortuary or morgue, to avoid leakage of body fluid.
- Transfer the body to the mortuary as soon as possible after death. When properly packed in the body bag, the body can be safely removed for storage in the mortuary, placed in a coffin for burial.

5.2 Personal Protective Equipment for handling dead bodies

- Wear a disposable, long-sleeved, cuffed gown; if the outside of the body is visibly contaminated with body fluids, excretions, or secretions, ensure that this gown is waterproof. If no waterproof gown is available, wear a waterproof apron in addition to the gown.
- Wear nonsterile gloves (single layer) that cover the cuffs of the gown.
- Use facial protection: preferably a face shield, or if not, goggles and a medical mask.
- Perform hand hygiene after taking off the PPE.
- Use PPE for heavy-duty tasks (e.g. rubber gloves, rubber apron and resistant closed shoes) in addition to regular PPE.

NB: Refer to EVD donning and doffing SOP and EVD case management guideline.

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Annex I; nCoV preparedness and readiness assessment tool

Ministry of Health, Community Development, Gender, Eldery and Children
Emergency Preparedness and Response Unit
Check list for Assessment of 2019_nCoV Isolation Centers

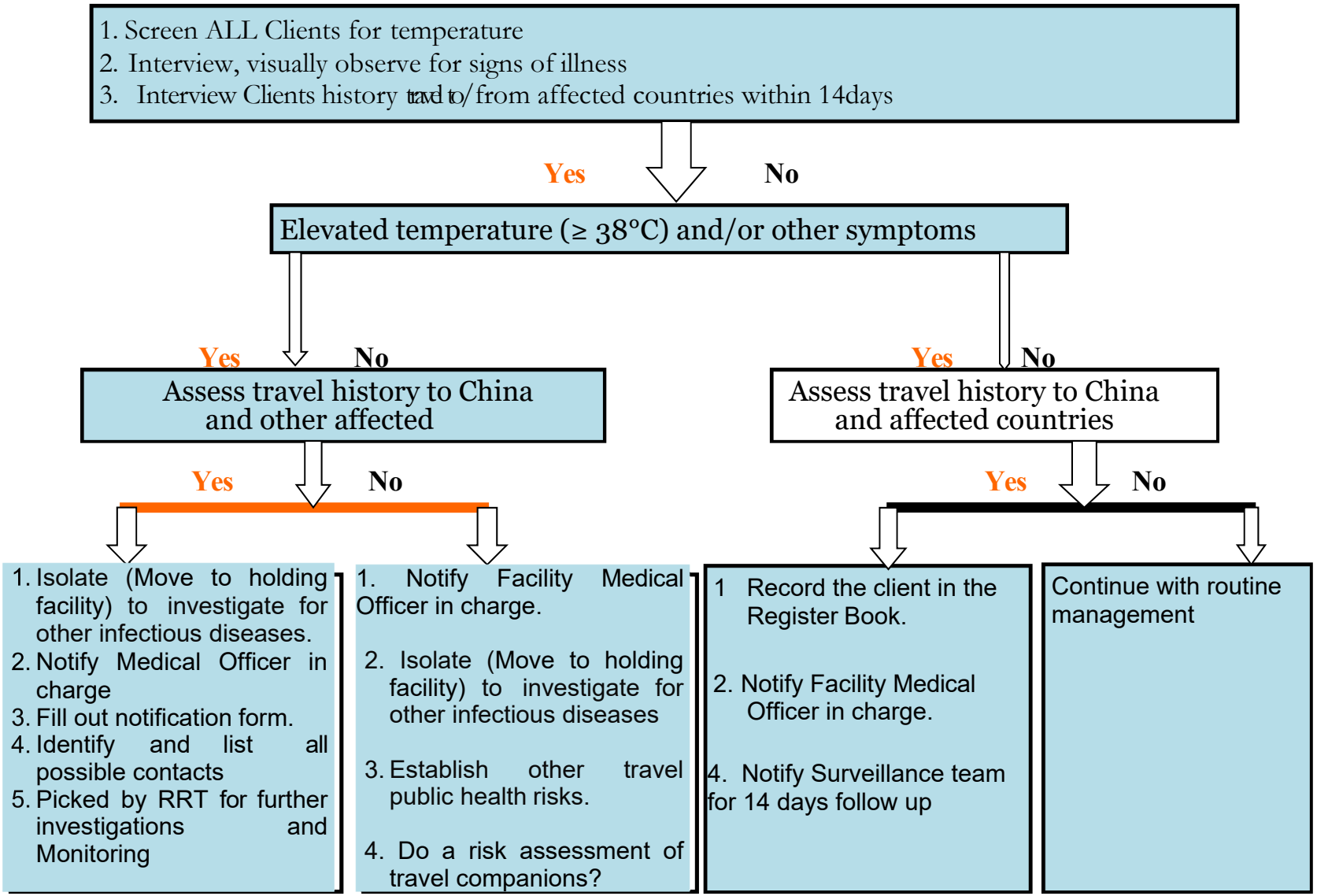
Sn	Requrement	Standard/Verification Criteria	Availability Status			
			Yes	No	Need Improvement	Remarks
1	Physical characteristics of the facility	**Check fo the following:**				
		Enough Space				
		Surge capacity area (minimum3 acres)				
		Accessibility (road, easy to reach)				
		Site gradient accommodate natural drainage (No slope)				
		Community Involvement and Acceptance (Verify meeting minutes)				
		Not close to the public institution (School, markets e.t.c)				
		Single room care for suspects				
		Shared rooms for confirmed				
		Individualised toilets for suspect				
		Access of running water - Public water supply				
		Bore hole				
		Availability of Elecricity - Grid				
		Generator				

		Solar				
		Number of Hand hygiene facilities				
		Running tap water with elbow cork				
		Containers for water				
		Containers for chlorine 0.05%				
		Senitizers				
		Sewage system				
2	Layout of the Isolation Center	Triage				
		Staff entrance				
		Suspect patient entrace				
		Confirmed patient entrace				
		Staff exit door				
		Patient exit door				
		Staff entrance and exit gate				
		Patient entrance and exit gate				
		Wards for suspect with single room per each suspect				
		Wards for confirmed with two (2) meters interval per bed				

		Number of toilets in a confirmed ward				
		Waste material exit door				
		Red and green zones with staff and patient flow				
		Nurse station				
		Donning area				
		Staff lounge (Cafteria, rest and conference area etc)				
		Changing room (Male and female)				
		Incenerator and waste segregation				
		Morgue				
		Laundry				
		Drying area				
		Chlorine preparation area				
		Sterilization Chamber				
		Decontamination area				
		Doffing zone				
		Sprayers				
		Chlorine 0.5% containers				
		Basins				
		Main Store				
		Sub Store				
		Ambulance decontamination area				
		Ambulance bay				
		Discharge Shower for recovered				

3	Trained Staffs on Highly Infectious diseases eg EVD, nCoV, IPC ***(Put Numbers in remark area)***	Nurses				
		Clinician				
		Lab Practitioner				
		Psychosocial				
		Pharmacist				
		Nutritionist				
		Hygenist				
		Cleaners				
		Store Keepers				
		Data Clerk				
		Security guard				
		Ambulance drivers				
		Maintenance team				
		Burial staffs				
4	IPC, MEDICAL EQUIPMENTS & SUPPLIES	**Sets PPE**				
		Gowns (Coverall)				
		Apron				
		Mask				
		Googgles				
		Head covers				
		Scrub suits				
		Boots				
		Chlorine				
		Senitizers				
		Medical equipments *(See equipment checklist)*				
		Medical supplies *(See supplies checklist)*				
		Medicine *(See medicine checklist)*				

Annex II: Screening and triaging tool



Annex III: Patient investigation form

MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, GENDER, EDELY AND CHILDREN
National Health Laboratory- Quality Assurance and Training Centre
Address: 2448 Luthuli Road/Sokoine drive 3rd floor NIMR HQ building Dar es Salaam Tanzania
Telephone: ((+255) 222126390)

Laboratory request form for 2019-nCoV.

Site /Health facility: ……. Address……

Tel/Mobile ……

Patient ID Number …… Patient Nambe ……

Age …… Sex: M / F; (circle one) Date patient seen……/……/…… (dd/mm/yy)

Residency ☐ **TZ resident** ☐ **Non-TZ resident, country……**

Requested by…… Position ……Signature……..

Date of specimen collection……/……/…… (dd/mm/yy)

Time of specimen collection ……

Case Criteria

Date of symptom onset…….

Does the patient have the following signs and symptoms (check all that apply)?

☐ Fever ☐ Cough ☐ Sore throat ☐ Shortness of breath

In the 14 days before symptom onset, did the patient:

Spend time in China?	☐ Y ☐ N ☐ Unknown
Does the patient live in China? ☐ Y ☐ N ☐ Unknown Date traveled **to** China_____Date traveled **from** China_____Date **arrived** in TZ_____	

Have close contact[3] with a person who is under investigation for 2019-nCoV while that person was ill?	□ Y □ N □ Unknown
Have close contact[3] with a laboratory-confirmed 2019-nCoV case while that case was ill?	□ Y □ N □ Unknown

Additional Patient Information

Is the patient a health care worker? ☐ Y ☐ N ☐ Unknown

Have history of being in a healthcare facility (as a patient, worker, or visitor) in China? ☐ Y ☐ N ☐ Unknown

Is patient a member of a cluster of patients with severe acute respiratory illness (e.g., fever and pneumonia requiring hospitalization) of unknown etiology in which nCoV is being evaluated? ☐ Y ☐ N ☐ Unknown

Does the patient have these additional signs and symptoms (check all that apply)?

□ Chills ☐ Headache ☐ Muscle aches ☐ Vomiting ☐ Abdominal pain ☐ Diarrhea ☐ Other, specify_____ **Diagnosis (select all that apply):** Pneumonia (clinical or radiologic) ☐ Y ☐ N Acute respiratory distress syndrome ☐ Y ☐ N **Comorbid conditions (check all that apply):** ☐ None ☐ Unknown ☐ Pregnancy ☐ Diabetes ☐ Cardiac disease ☐ Hypertension

Chronic pulmonary disease ☐ Chronic kidney disease ☐ Chronic liver disease ☐ Immunocompromised ☐ Other, specify

Is/was the patient: Hospitalized? ☐ Y, admit date___☐ N **Admitted to ICU?** ☐ Y ☐ N

Intubated? ☐ Y ☐ N **Patient died?** ☐ Y ☐ N

Does the patient have another diagnosis/etiology for their respiratory illness? ☐ Y, Specify_____☐ N ☐ Unknown

Respiratory diagnostic results

Test	Pos	Neg	Pending	Not done
Influenza rapid Ag ☐ A ☐ B	☐	☐	☐	☐
Influenza PCR ☐ A ☐ B	☐	☐	☐	☐
RSV	☐	☐	☐	☐
H. metapneumovirus	☐	☐	☐	☐
Parainfluenza (1-4)	☐	☐	☐	☐
Adenovirus	☐	☐	☐	☐

Test	Pos	Neg	Pending	Not done
Rhinovirus/enterovirus	☐	☐	☐	☐
Coronavirus (OC43, 229E, HKU1, NL63)	☐	☐	☐	☐
M. pneumonia	☐	☐	☐	☐
C. pneumonia	☐	☐	☐	☐
Other, Specify__	☐	☐	☐	☐

Specimens for 2019-nCoV testing

Specimen type	Specimen ID	Date collected	Sent to TNL?
NP swab			☐
OP swab			☐
Sputum			☐
BAL fluid			☐
Tracheal aspirate			☐

Specimen type	Specimen ID	Date collected	Sent to TNL?
Stool			☐
Urine			☐
Serum			☐
Other, specify__			☐
Other, specify__			☐

[1] *Fever may not be present in some patients, such as those who are very young, elderly, immunosuppressed, or taking certain medications. Clinical judgement should be used to guide testing of patients in such situations.*

[2] *Close contact is defined as: a) being within approximately 6 feet (2 meters) or within the room or care area for a prolonged period of time (e.g., healthcare personnel, household members) while not wearing recommended personal protective equipment (i.e., gowns, gloves, respirator, eye protection); or b) having direct contact with infectious secretions (e.g., being coughed on) while not wearing recommended personal protective equipment. Data to inform the definition of close contact are limited. At this time, brief interactions, such as walking by a person, are considered low risk and do not constitute close contact.*