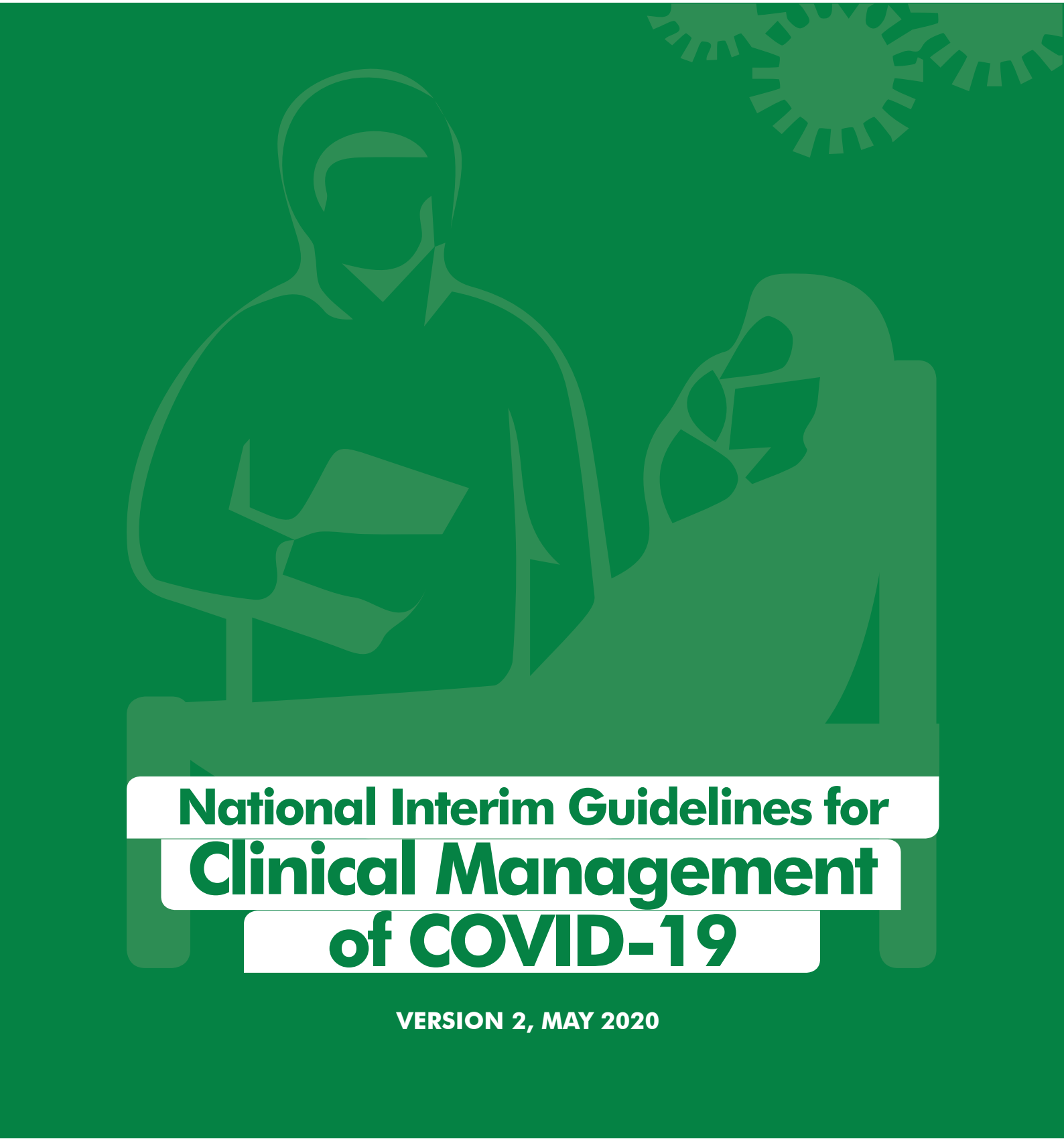
COVID-19

FEDERAL MINISTRY OF HEALTH

NCDC
NIGERIA CENTRE FOR DISEASE CONTROL



National Interim Guidelines for Clinical Management of COVID-19

VERSION 2, MAY 2020

NCDC Toll-free Number: **080097000010** SMS: **0809 955 5577** WhatsApp: **0708 711 0839**
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Contents

About NCDC

Nigeria Centre for Disease Control (NCDC) is Nigeria's national public health institute with the mandate to protect Nigerians from the impact of communicable diseases of public health significance, amongst other responsibilities. It focuses on this through evidence-based prevention, integrated disease surveillance and response activities, using a One Health approach, guided by research and led by a skilled workforce.

NCDC operations and activities are guided by five key goals to:

- Accurately measure the burden of infectious diseases in Nigeria
- Ensure Nigeria is able to meet its international obligations as a member of the World Health Assembly
- Develop a Public Health laboratory service network to support the detection and prevention of, and response to critical infectious diseases
- Reduce the adverse impact of predictable and unpredicted public health emergencies
- Create an efficiently managed and evidence-based organisation with a clear focus of health promotion and disease prevention.

NCDC currently operates through five directorates: Surveillance and Epidemiology, Public Health Laboratory Services, Health Emergency Preparedness and Response, Prevention and Programmes Coordination, Finance and Accounts and Administration and Human Resources.

Preface

This is an interim guideline developed by the Nigeria Centre for Disease Control to guide health workers in response to cases of COVID-19 in Nigeria.

This guideline will continue to be updated based on emerging research and evidence.

These guidelines should be used by all health care providers in Nigeria, including those working in the public and private sector.

The guidelines include guidance on:

- Identifying and reporting suspect COVID-19 cases
- Diagnosing COVID-19
- Clinical management of COVID-19 cases
- Managing complications in patients with COVID-19
- Discharge criteria for patients

Abbreviations

ARDS	Acute Respiratory Distress Syndrome
BP	Blood Pressure
COVID-19	Coronavirus disease
CRP	C-reactive Protein
CV	Central Venous
ECLS	Extracorporeal life support
EPID ID	Epidemiology Identification number
FiO_2	Fraction of Inspired Oxygen
HFNO	High Flow Nasal Oxygen
HRF	Hypoxaemic Respiratory Failure
CU	IIntensive Care Unit
IPC	Infection Prevention Control
IV	Intravenous
LFT	Liver Function Test
LGA	Local Government Area
MAP	Mean Arterial Pressure
MERS	Middle East Respiratory Syndrome
NIV	Non-Invasive Ventilation
PCR	Polymerase Chain Reaction
PCT	Procalcitonin
PEEP	Positive End Expiratory Pressure
PHEIC	Public Health Emergency of International Concern
PPE	Personal Protective Equipment
RR	Respiratory Rate
SARS	Severe Acute Respiratory Syndrome
SBP	Systolic Blood Pressure
SE	State Epidemiologist
SOP	Standard Operating Protocol
SpO_2	Oxygen saturation
SVR	Systemic Vascular Resistance
VTM	Viral Transport Medium

CHAPTER 1

Introduction

1.1 Background of Coronavirus Disease (COVID-19)

Coronaviruses are a large family of RNA viruses that infect birds and many mammals including humans. These viruses cause illnesses that range from common cold to more severe respiratory diseases and rarely gastroenteritis. Coronavirus disease (COVID-19) is caused by an emerging strain of coronavirus (SARS-Cov-2) that has not been previously identified in humans, belonging to the same family of viruses responsible for severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS), for which zoonotic and person- to-person transmission have been confirmed.

Person-to-person transmission has been established between people who are in close contact with one another (within about 2 metres/6 feet), primarily via respiratory droplets. Droplet transmission occurs when respiratory droplets generated via coughing, sneezing or talking contact susceptible mucosal surfaces, such as the eyes, nose or mouth. Transmission may also occur indirectly via contact with contaminated fomites with hands and then mucosal surfaces. Respiratory droplets are large and are not able to remain suspended in the air thus they are usually dispersed over short distances.

Since the declaration of COVID-19 as a Public Health Emergency of International Concern (PHEIC) on January 30, 2020, the Nigerian Government has closely monitored the ongoing outbreak which originated in Wuhan, China.

This document has been developed as a guide for the management of COVID-19 cases in Nigeria.

Every healthcare worker should take this as a serious disease and treat patients with respect and utmost care.

1.2 Classification of Patients

1.2.1 Definitions used in this document for COVID-19 cases

Symptoms compatible with COVID-19 are fever, cough and difficulty in breathing.

Classification of patients with COVID-19 is based on a combination of clinical, epidemiological and laboratory findings.

1.2.2 Suspect case

A suspect case is defined as any person (including severely ill patients) presenting with fever, cough or difficulty in breathing AND who within 14 days before the onset of illness had any of the following exposures:

- History of travel to any country* with confirmed and ongoing community transmission of SARS-CoV-2 OR
- Close contact with a confirmed case of COVID-19 OR
- Exposure to a healthcare facility where COVID-19 case(s) have been reported

SUSPECT CASE DEFINITION		
Any person (including severely ill patients) with:		
Fever OR **Cough** OR **Difficulty breathing**	AND	**In the last 14 days had:** History of travel to any country* with confirmed and ongoing community transmission of SARS-CoV-2 OR Close contact with a confirmed case of COVID-19 OR Exposure to a healthcare facility where COVID-19 case(s) have been reported

1.2.3 Probable case

A probable case is defined as a person who meets the criteria for a suspect case AND for whom testing for COVID-19 is inconclusive or for whom testing was positive on a pan-coronavirus assay

PROBABLE CASE DEFINITION		
Any person (including severely ill patients) who:		
Meets the definition of a probable case	AND	Testing for COVID-19 is inconclusive OR Testing on a pan-coronavirus assay was positive

* *As at 14/03/2020, countries with widespread community transmission are China, Republic of Korea, Iran, Italy and Japan.*

1.2.4 Confirmed case

A person with laboratory confirmation of SARS-CoV-2 infection with or without signs and symptoms.

1.3 Triage

Cases of COVID-19 may present as mild or severe cases.

Table 1: Features of Mild and Severe Cases of COVID-19

MILD CASE	SEVERE CASE
Presence of: • Fever < 38°C or (maybe afebrile) • No difficulty in breathing • Presence or absence of cough • No underlying chronic diseases, e.g.: heart, lung, asthma and kidney diseases	Presence of severe condition: • Difficulty in breathing • Crackles in lungs • Reduced/decreased breath sounds • Dullness in percussion • Increased or decreased vocal resonance • Presence of co-morbid conditions such as diabetes, asthma, hypertension, etc.

*__A contact case__ - someone who had contact (within 1 metre) with a confirmed case during their symptomatic period, including one day before symptom onset.

1.3.1 Triaging Modalities for Different Classes of COVID-19 Cases

All healthcare workers must ensure use of appropriate PPE before triage commences

For the purpose of triage, appropriate Personal Protective Equipment (PPE) are gloves and face mask. For specimen collection, healthcare workers MUST wear gloves, N95, face shield/goggles and apron. This is also true for aerosol producing procedure like mechanical ventilation. Rational use of PPE is important.

1.3.1.1 Suspect Case

a. Document using the standard tool for case investigation to check that patient meets the case definition in section 1.2 *(see Annex 1)*.
b. Put patient in a holding area and institute infection prevention measures *(Refer to guideline on IPC)*.

c. Alert the relevant authorities – Hospital management, infectious disease team or responsible physician, State Epidemiologist, NCDC on NCDC toll-free number: **0800 9700 0010**

   SMS: **0809 955 5577** and *WhatsApp*: **0708 711 0839.**

d. Using full PPE (gown, gloves, N95, and face shield), arrange for the collection of 1 nasal and 1 oropharyngeal swab. Both swabs should be placed into a single tube of virus transport medium (VTM). Sputum samples can be collected if a patient has a productive cough. For severely ill patients, endotracheal aspirate or bronchoalveolar lavage are recommended. Samples should be packaged according to national SOPs and sent to a designated testing laboratory for diagnostic testing (see sample collection section). These samples are recommended for deceased patients.

e. Using full PPE (apron, gloves, face mask and goggles/face shield) conduct vital signs at presentation and closely monitor vital signs at least every 4 hours (Pulse Rate, Blood Pressure, Respiratory Rate (RR), Temperature, **SpO_2**).

f. Commence oxygen if **RR >30/min**, or **SpO_2 < 90% (<92% in children).**

g. Commence IV fluids once **BP < 90/60mmHg**.

h. If in a designated treatment centre: take samples for full blood count and C-reactive protein

1.3.1.2 Probable Case

In addition to steps listed under suspected case,

a. Assess for severity of disease

b. Provide further supportive care as appropriate

c. Prepare patient for transfer (see *SOP on Transfer of Patient*).

1.3.1.3 Confirmed Case

In addition to steps listed under suspected case,

a. Assess for severity of disease

b. Notify the appropriate and relevant authorities – State Epidemiologist for transfer of patient and inform the National

EOC through email on **NG-COVID19@ncdc.gov.ng** and NCDC Toll-Free Number: **0800 9700 0010**; SMS: **08099555577** and *WhatsApp*: **0708 711 0839**

c. Continue supportive care as appropriate

d. Prepare patient for transfer (see *SOP on Transfer of Patient*)

Suspected and confirmed cases should be treated in designated hospitals with effective isolation and protection conditions.

Suspected cases should be treated separately in a single room, confirmed cases should be admitted to wards based on the severity of the illness – mild or severe, while critical cases should be admitted to ICU immediately.

1.4 Recommendations on Strategies to be Employed by Health Workers and Caregivers

Table 2: Recommended strategies for health workers after confirmation of a case

S/N	RECOMMENDATION ITEMS
1	Isolate patients • Stop visits by family and friends • Restrict the patient's movement activity • Have the patient stay alone in a well-ventilated room • In cases where wards with multiple beds are used, maintain a bed distance of at least • 2 metres in-between patients (alternative strategy)
2	Maintain a sanitary environment • Clean and disinfect patients surrounding using 500 mg/L chlorine containing disinfectant frequently every day (e.g. *JIK, Hypo*)
3	Use of Appropriate PPEs • Wear gloves, face mask, face shield/goggles and apron at all times when interacting with patient • Wear N95 respirator, face shield/goggle, gloves and apron while performing aerosol generating procedures like intubation.
4	Commence therapy • Ensure optimal oxygenation • Conservative fluid therapy • Use broad spectrum antibiotics based on local epidemiology • Use antiviral agents e.g. Lopinavir/Ritonavir

Table 3: Recommended strategies for persons and caregivers at home, during self-isolation

S/N	RECOMMENDATION ITEMS
1	Self-isolate • Stop visits by family and friends • Restrict movement • Person in self-isolation should stay alone in a well-ventilated room
2	Maintain a sanitary environment • Clean and disinfect patients surrounding using 500 mg/L chlorine containing disinfectant frequently every day (e.g. *JIK, Hypo*)
3	Observe IPC measures • Wash hands with soap and water frequently • Use hand sanitizer when hands are not visibly dirty or soiled • Cough or sneeze into a disposable toilet roll/towel and wash hands immediately after this; if not available cough/sneeze into your elbow • Avoid sharing of toothbrush, towel, bedsheets, etc. • Wash and disinfect towel daily
4	Selection of a caregiver • Select a person who is healthy family member/caregiver without underlying diseases

1.5 Overview Of PPE

Personal protective equipment (PPE) is designed to protect the wearer's skin, eyes, mucous membranes, airways and clothing from coming into contact with infectious agents. Mucous membranes and skin with compromised integrity are portals of entry that are highly susceptible to infectious agents such as COVID-19. It is important to note that the use of PPE is not a substitute for proper infection prevention and control practice. For example, the use of gloves is not a substitute for hand hygiene.

Healthcare workers who work with COVID-19 patients must be proficient in donning and doffing PPE and this requires specific training.

PPE is recommended in the care and management of suspected or confirmed cases of COVID-19.

1.5.1 Who should wear protective clothing?

Select which PPE items to wear based on this assessment:

- **Patients** with suspect or confirmed COVID-19 infection should wear a face mask when being evaluated medically.
- **Healthcare workers:** All doctors, nurses, and health workers who work in COVID-19 treatment centres must be proficient in donning and doffing PPE and this requires specific training.
- **All support staff** who clean the isolation room, handle contaminated supplies and equipment, launder re-usable supplies, and collect and dispose of infectious waste from COVID-19 patients should wear gown, gloves, and face masks while working in the treatment centre.
- **All laboratory staff** who handle patient specimens and body fluids from suspected COVID-19 cases should have complete PPEs (gown, gloves, N95, and face shield) on while performing their official duties.
- **Laboratory support staff** who clean and disinfect laboratory equipment used to test COVID-19 specimens should have complete PPEs on gown, gloves, N95, and face shield) on while performing their official duties.
- **Safe burial teams** who remove bodies of deceased COVID-19 patients and prepare them for burial (gown, gloves, N95, and face shield).

Risk assessment is critical for all activities, i.e. assess each health care activity and determine the personal protective equipment (PPE) that is needed for adequate protection.

The choice and combination of PPE ensemble to be worn in dealing with COVID-19 patients should be based on a careful risk assessment that considers risk of exposure and extent of contact anticipated with blood, body fluids, respiratory droplets, and/or open skin.

The PPE is to be worn systematically

Table 3-: Personal Protective Equipment and Use

PPE	CHARACTERISTICS AND HOW TO USE
Eye protection (goggles or face shield) 	• Face shield or goggles can be used • Should adequately protect the healthcare workers conjunctival mucous membranes from splashes • Goggles should be preferably used for high risk situations • Normal reading glasses are not acceptable as PPE for eye protection so a face shield with anti-fog should be worn over the glasses or goggles big enough to cover the glasses • Goggles must fit comfortably and securely; each person should have his/her own goggles/face shield with personal names on them • Condensation of the goggles can be a major problem: it impairs the user's vision and is dangerous but can be minimized by anti-fog spray
Mouth and nose protection **(surgical face mask)** 	• Healthcare workers must cover the mouth and nose to avoid body fluid splashes and droplet spread. • Medical-surgical mask should be fluid-resistant with structured design that does not collapse against the mouth
Respiratory protection (N95, FFP3) 	• The respirator protects from the inhalation of droplets and particles. • Given that the fitting of different types of respirator will vary for each user, the respirator will require a fitting test in order to find the best match of PPE to user. • A respirator should always be used when performing aerosol-generating procedures in a COVID-19 patient.

PPE	CHARACTERISTICS AND HOW TO USE
Gloves 	• Correctly sized latex or nitrile examination gloves should be used to protect hands against both direct and indirect contact. • A new pair of gloves should be used for each patient. Remember that for invasive procedures you need sterile gloves. • DO NOT touch eyes, nose or mouth areas with gloved hands.
Body protection (gowns) 	• Long-sleeved water-resistant gowns should be used. This PPE does not need to be sterile, unless used in a sterile environment (e.g. operating room). • If water-resistant gowns are not available, single-use plastic aprons can be used on top of the non-water-resistant gowns to prevent body contamination.
Apron 	• When the risk of splashes from patient's vomiting, diarrhea or bleeding is high, aprons should be worn over the gown or coverall because fluid-proof aprons provide extra protection of the front part of the body and is easier to replace than a soiled gown or coverall. • Disposable aprons should be used.
Protective body wear (Coverall) 	• Disposable gown or coverall made of fabric that is tested for resistance to penetration by blood or body fluids or blood borne pathogens should be worn over scrubs. This should only be used when there is a risk that the environment is highly contaminated and there will be very close contact with the patient

PPE	CHARACTERISTICS AND HOW TO USE
Footwear 	• Rubber or gum boots are preferred over closed shoes because they are fluid-proof, easier to clean and disinfect. • They provide optimal protection from splashes/wetness and protect from sharp injuries. • If not available, then wear closed shoes with disposable impermeable shoe covers. • Boots should also be cleaned to remove gross contamination and then disinfected prior to re-use.
Head cover 	• The purpose of head covers is to protect the skin and hair from virus contamination with subsequent unrecognised transmission to the mucosa of the eyes, nose or mouth.
Heavy-duty rubber gloves 	• Cleaners, laundry workers and healthcare workers when handling infectious waste (i.e. solid waste or any secretion or excretion of with visible blood) should wear heavy duty rubber gloves over nitrile gloves. • Movement of human remains or performing environmental cleaning activities also requires the use of heavy-duty rubber gloves.

- Before exiting isolation area, carefully remove PPE and dispose in waste containers in a designated doffing area.
- Do not recycle any single-use PPE.
- Remove PPE under supervision of a trained buddy.
- Avoid any contact with soiled items and areas of the face or skin.
- Place reusable equipment in bin for decontamination.

1.5.2 Key IPC strategies to prevent transmission in healthcare settings

Summary of key IPC strategies to limit or prevent transmission in healthcare settings include the following:

a. Ensuring triage, early recognition, and source control (isolation) of patients with suspected COVID-19 infection.

b. Application of standard precautions for all patients at all times.

c. Implementation of empiric additional precautions – droplet, contact and airborne precautions – whenever applicable for suspected cases of COVID-19 infection.

d. Implementation of administrative controls – all healthcare facilities in Nigeria must ensure that they have an IPC programme, their healthcare workers are correctly trained on basic IPC procedures and able to implement standard and droplet precautions. All facilities must provide the supplies, equipment, information leaflets and posters needed to assist healthcare workers and visitors adhere to IPC requirements.

e. Use of environmental and engineering controls such as adequate spatial separation of patients, ventilation requirements and appropriate cleaning of the facility environment.

1.6 Standard Precautions

The highest risk of healthcare- associated transmission is in the absence of standard precautions, when basic infection prevention and control measures for respiratory infections are not in place, including when caring for patients for whom COVID-19 infection has not yet been confirmed. Although airborne transmission is not considered the principal transmission route for COVID-19, we recommend a cautious approach due to possible transmission through aerosols.

Modes of transmission: Droplets sprayed by affected individuals, contact with patient respiratory secretions, contaminated surfaces and equipment. However, possibility of airborne infection should be cautiously monitored, especially while performing aerosol-generating procedures on severely ill patient(s), such as intubation. As such airborne precautions must be observed during such procedures.

CHAPTER 2

Diagnosis of COVID-19

Laboratory diagnosis of COVID-19 is by real-time Polymerase Chain Reaction (PCR)

2.1 Procedure for Sample Collection

2.1.1 Recommended samples for diagnosis

A minimum of 1 nasal swab and 1 oropharyngeal swab should be collected. Sputum should be collected from patients with a productive cough. Only synthetic fibre swabs with plastic shafts should be used (Calcium alginate swabs or swabs with wooden shafts may contain substances that inactivate some viruses and inhibit PCR testing).

A minimum of 2 specimens possibly from different sites should be collected for each patient

Patients with mild disease: oropharyngeal swab, nasal swabs and sputum (if it can be produced) should be collected.

Severely ill patients: endotracheal aspirate or bronchoalveolar lavage is recommended if the patient is intubated

Deceased patients: oropharyngeal swab and nasal swab

2.1.2 Materials and supplies required

- Spatula (tongue depressor)
- Dacron flocked swabs/ plastic swabs. Do not use swabs with wooden stick
- 2ml Viral transport medium
- Parafilm (or any leak proof film that serves the purpose)
- Triple packaging box
- Ice packs
- Waste bins
- Bin liners (Black, yellow and Red)
- Falcon tubes
- Ziploc bags

- Sterile collection Bottle for sputum/ bronchoalveolar lavage
- Freshly prepared 0.5% Hypochlorite solution
- Personal Protective Equipment (PPE) (Hand gloves, head cover, lab coat, N95 face mask, eye goggle/face shield, lab boots)
- Marker pens

2.1.3 Storage conditions of samples after collection

Specimen collected from patients must be appropriately packaged and transported at the right temperature for successful testing of samples. The table below provides the detail of material needed and appropriate temperature for the specimen, for successful testing.

Table 4: Description of specimen types, storage and transportation conditions and key considerations.

SPECIMEN TYPE	COLLECTION MATERIALS	TRANSPORT TO LABORATORY	STORAGE TILL TESTING	KEY CONSIDERATIONS
Nasal swab	Dacron or polyester flocked swab and VTM	2°C to 4°C; frozen ice packs	≤5 days; 4°C >5days; -20°C to -70°C	Can be placed in the same Virus Transport Medium (VTM) tube as oropharyngeal swab;
Oropharyngeal swab	Dacron or polyester flocked swab and VTM	2°C to 4°C; frozen ice packs	≤5 days; 4°C >5days; -20°C to -70°C	Can be placed in the same VTM tube as nasal swab
Sputum	Sterile container	2°C to 4°C; frozen ice packs	48 hrs; 4°C >48hrs -20°C to -70°C	Ensure material is from lower respiratory tract; ensure adherence to IPC standards and correct use of PPE
Bronchoalveolar Lavage	Sterile container	2°C to 4°C; frozen ice packs	≤48 hrs; 4°C >48hrs -20°C to -70°C	Collected from severely ill patient, Dry swab to be used if bacterial or fungal culture is to be performed. Ensure adherence to IPC standards and correct use of PPE

SPECIMEN TYPE	COLLECTION MATERIALS	TRANSPORT TO LABORATORY	STORAGE TILL TESTING	KEY CONSIDERATIONS
(Endo)tracheal aspirate, nasopharyngeal aspirate or nasal wash	Sterile container	2°C to 4°C; frozen ice packs	≤48hrs; 4°C >48hrs -20°C to -70°C	Dry swab to be used if bacterial or fungal culture is to be performed. Ensure adherence to IPC standards and correct use of PPE

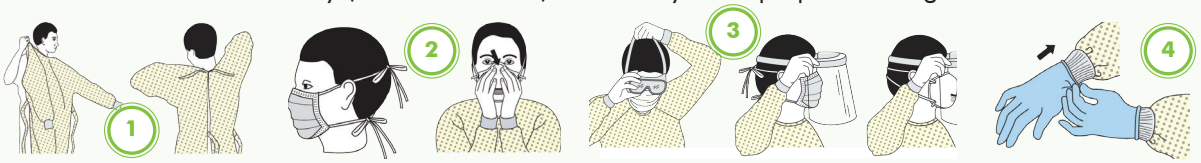
2.1.4 Step-by-step guide for sample collection

a. **Assemble materials** for respiratory specimen collection

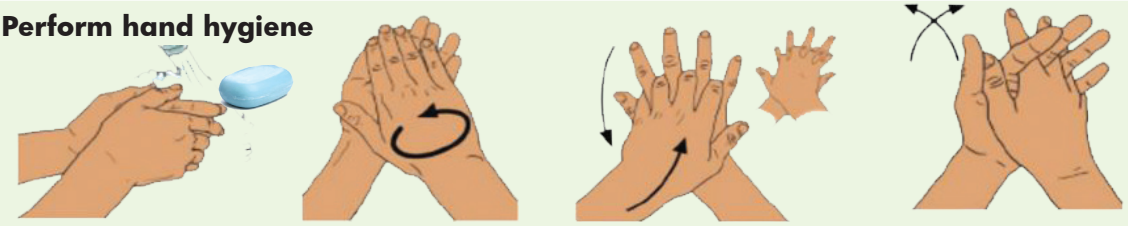
b. **Label sample containers** with suspected case /deceased person's name, **EPID ID number**, hospital number, date of sample collection and time. (Contact State Epidemiologist for Epid ID number)

c. **Fill the Case Investigation form**

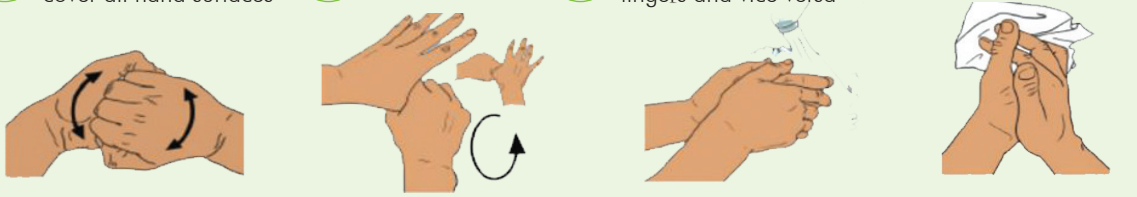
d. **Don PPE**. Allow buddy (trained observer) to mirror you for proper donning



e. **Perform hand hygiene**

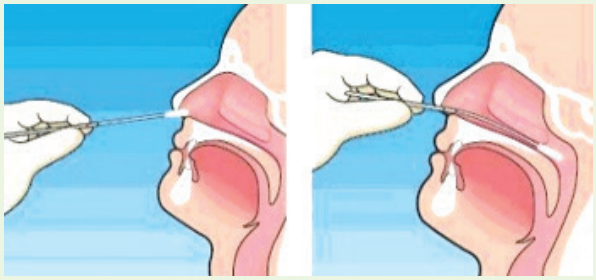


1. Wet hands with water and enough soap to cover all hand surfaces
2. Rub hands, palm to palm
3. Right palm over left dorsum with interlaced fingers and vice versa
4. Palm to palm with fingers interlaced

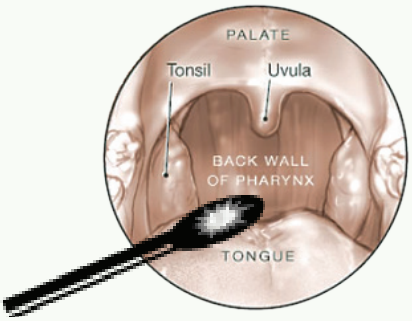


5. Back of fingers to opposing palms with fingers interlocked
6. Rotational rubbing of left thumb clasped in right palm and vice versa
7. Rinse hands with water
8. Dry hands thoroughly with single use towel

f. **Two swabs should be collected.** Swab each nostril for 10 – 15 secs. Place both swabs into a single VTM. Wrap VTM with parafilm



g. **Oropharyngeal sample collection:** Use tongue depressor to hold down the tongue. Swab each tonsil for 10 – 15 secs. Place swab into a single VTM. Wrap the lid of VTM tube with parafilm



h. **Sputum collection:** For suspect/ill persons coughing, ask the person to take a deep breath and cough to produce sputum sample into the leak-proof screw cap sputum collection cup or sterile-dry collection bottle.

i. **For severely ill persons,** bronchoalveolar lavage or tracheal aspirate may be considered (to be collected by respiratory physicians or trained personnel only).

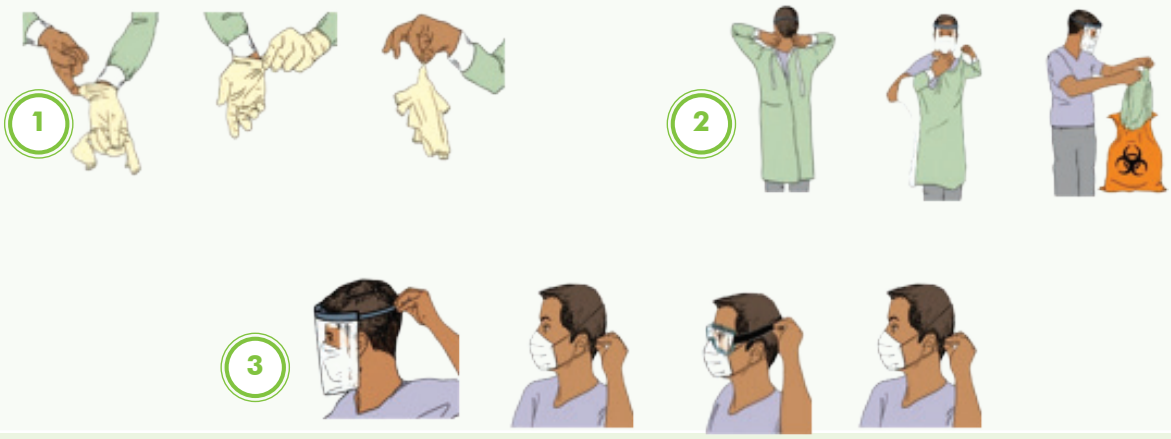
j. **Packaging of sample:** Place the VTM tubes into a Falcon tube. Place the Falcon tube into a Ziploc bag

k. **Packaging of container:** Place Ziploc bag into Geostyle container

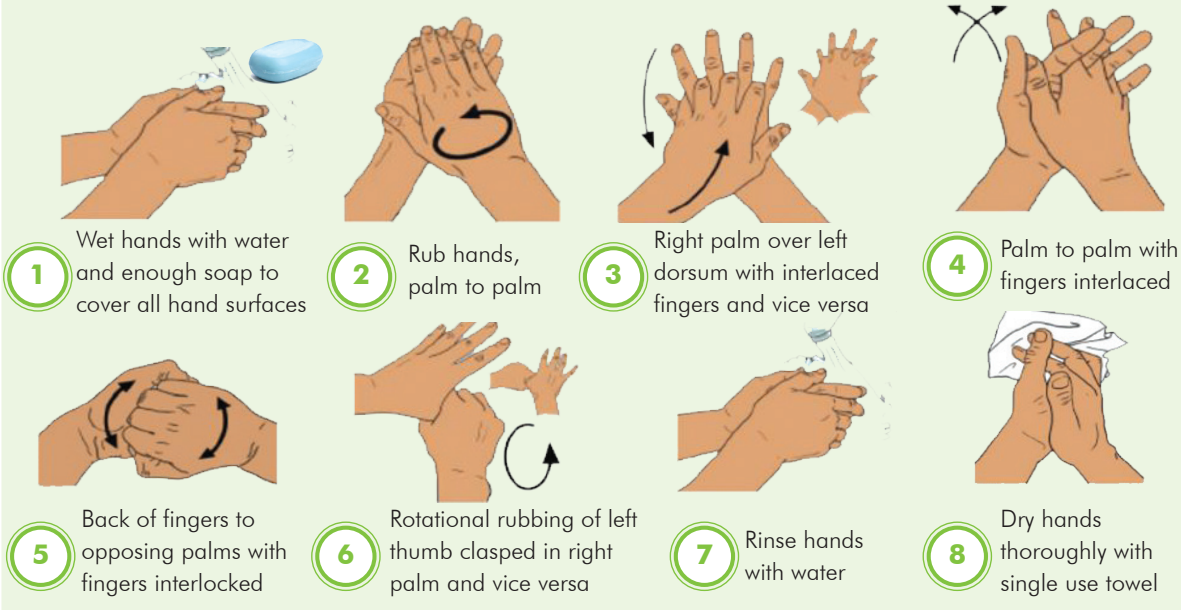
l. **Discard sample collection materials in a properly labeled biohazard bin.** Decontaminate work surfaces with freshly prepared 0.5% hypochlorite solution

m. **Discard sample collection materials in a properly labelled biohazard bin.**
Decontaminate work surfaces with freshly prepared 0.5% hypochlorite solution

n. **Doff PEE**



e. **Perform hand hygiene**



CHAPTER 3

Clinical Management of COVID-19

Clinical management of COVID-19 is guided by general principles of management of respiratory illnesses – there is ongoing research and as such management is very dynamic at the moment. There will be updates as more evidence emerges.

3.1 Management of Mild Cases

3.1.1 Clinical features

- Patient may have non- specific symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache and muscle pain.
- Some patients may be asymptomatic.
- Early symptomatic treatment and careful monitoring is recommended for a favourable outcome
- Remember that children with non-severe pneumonia could present with cough or difficulty in breathing ± fast breathing and no sign of progression to the severe form of pneumonia

3.1.2 Treatment materials and supplies required

Early supportive therapy and monitoring is recommended for a favourable outcome

- Manage symptoms fever, cough, sore throat, nasal congestion, malaise, headache and muscle pain – with antipyretics, cough medicine, rest,
- Close monitoring of all vital signs
- Rest, oral hydration

3.2 Management of Severe Cases

3.2.1 Clinical features

3.2.1.1 Adults

A severe COVID-19 case in an adult is characterised by fever (>38°C) or suspected respiratory infection AND one of the following:

- respiratory rate >30 breaths/minute
- severe respiratory distress
- SpO_2 <90% on room air

Elderly and immunosuppressed patient may present with atypical symptoms.

Patients with mild pneumonia may progress to the severe form of the disease and thus require close monitoring

3.2.1.2 Children

Children with severe COVID-19 infection will typically present with cough or difficulty in breathing AND at least one of the following:

- central cyanosis or SpO_2 <92%
- severe respiratory distress e.g. grunting
- very severe chest in-drawing
- signs of pneumonia with a general danger sign
- inability to breast feed or drink
- lethargy/unconsciousness/convulsion

3.2.2 Treatment

- Provision of supplemental oxygen therapy is a hallmark of treatment for severe cases
- As much as possible, all areas where severely ill patients are being cared should be equipped with pulse oximeter, functioning oxygen system and disposable, single use oxygen delivery interfaces (nasal cannula, simple face mask, and mask with reservoir bag).
- Empiric therapy for severe cases may include a nucleotide-analog inhibitor of RNA-dependent RNA polymerases like Remdesivir. Other antiviral agents include lopinavir/ritonavir (LPV/RTV) – a protease inhibitor.
- Empiric therapy should be de-escalated based on microbiology results and clinical judgement

3.3 General Principles for Treatment

a. Supplemental oxygen therapy

- Commence oxygen therapy at 5L/min and titrate flow rate to reach target SpO_2 >90% in non-pregnant adult and SpO_2 >92-95% in a pregnant adult.
- Children with emergency signs (obstructed or absent breathing, severe respiratory distress, central cyanosis, shock, coma and convulsion) should receive oxygen therapy during resuscitation to target SpO_2 >94%.

b. Cautious and conservative use of fluid – to prevent fluid overload, as aggressive fluid resuscitation worsen oxygenation

c. Empiric antibiotics treatment

- Choice of antibiotics is based on the clinical diagnosis, local epidemiology, and antibiotic susceptibility and treatment guidelines
- Empiric therapy may include a nucleotide-analog inhibitor of RNA-dependent RNA polymerases like Remdesivir. Other antiviral agents include lopinavir/ritonavir (LPV/RTV) – a protease inhibitor.
- Empiric therapy should be de-escalated based on PCR, anti-microbial susceptibility testing results and clinical judgement

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

Cautious use of intravenous fluid is recommended as aggressive fluid resuscitation may worsen oxygenation, especially in settings with limited facilities for mechanical ventilation.

CHAPTER 4

Management of Complications of COVID-19

There are several complications that can arise following infection with COVID-19. Common complications include:

a. Hypoxaemic Respiratory Failure (HRF) and Acute Respiratory Distress Syndrome (ARDS)
b. Sepsis and Septic Shock

4.1 Hypoxaemic Respiratory Failure (HRF) And Acute Respiratory Distress Syndrome (ARDS)

Acute **HRF** is defined as severe arterial hypoxemia that is refractory to supplemental oxygen which is caused by intrapulmonary shunting of blood resulting from airspace filling or collapse.

ARDS is said to be a new or worsening respiratory symptoms within one week of known clinical insult.

Worsening respiratory distress is evidenced by failure of response to standard oxygen therapy (continuous increased work of breathing /hypoxaemia despite oxygen delivery via a face mask with reservoir bag). In such situations:

- Transfer patient to the Intensive Care Unit (ICU) or High Dependency Unit (HDU)
- Place patient in a comfortable position (raise head of bed; 300 – 450 is advised)
- Commence High-Flow Nasal Oxygen (HFNO) or Non-Invasive Ventilation (NIV) at 10-15L/minutes. Do not place patient on HFNO or NIV if hypercapnia is suspected (exacerbation of obstructive lung disease, cardiogenic pulmonary oedema, hemodynamic instability, multi-organ failure, or abnormal mental status)
- Monitor closely for 1 hour for clinical improvement/deterioration.
- If status deteriorates, pre oxygenate with 100% FiO_2 for 5 minutes, via a face mask with reservoir bag/bag-valve mask/HFNO/NIV
- Institute mechanical ventilation (endotracheal intubation) while maintaining strict IPC practices (refer to IPC section) by a trained and experienced provider *(A rapid sequence intubation is appropriate after an airway assessment that identifies no signs of difficult intubation)*

- Implement mechanical ventilation using lower tidal volumes (4-8mL/kg predicted body weight) and lower inspiratory pressures (plateau pressure <30cmH2O) in ARDS *(Deep sedation may be required to control respiratory drive and achieve tidal volume targets)*
- If ARDS worsens, safely commence prone ventilation for >12 hours per day.
- Commence conservative fluid management strategy (for ARDS patients without tissue hypoperfusion) to reduce the duration of ventilation.
- In patients with moderate or severe ARDS, give higher Positive End Expiratory Pressure (PEEP) instead of lower PEEP.
- Monitor patients closely for response to the initial application of higher PEEP otherwise, discontinue if no response
- Offer extracorporeal life support (ECLS) under strict IPC guidance (if facility and trained personnel are available) when there is adequate case volume to maintain expertise.
- Avoid disconnecting the patient from the ventilator, to prevent loss of PEEP and atelectasis. Rather, use in-line catheters for airway suctioning and clamp endotracheal tube when disconnection is required (e.g. transfer to a transport ventilator).
- Ensure close monitoring of vital signs (heart rate, respiratory rate, blood pressure, pulse, oxygen saturation).
- Give supportive therapy as the need arises. This is to ensure adequate fluid and electrolyte balance (Exercise caution to avoid overload).
- Maintain nutrition support (enteral or parental as indicated)
- Monitor for blood routine, CRP, PCT, organ function (E/U/Cr, LFT and Bilirubin, cardiac biomarkers, Urine volume, analysis, and culture etc.), coagulation function, arterial and venous gas analysis and chest imaging.

Avoid neuromuscular blockade by continuous infusion routinely in moderate-severe ARDS patients (PaO_2/FiO_2<150).

Exceptions in patients with ARDS include:

I. Ventilator dyssynchrony (occurs when patient's demands are not met by the ventilator) despite sedation, such that tidal volume limitation cannot be reliably achieved

II. Refractory hypoxemia or hypercapnia.

4.2 Sepsis and Septic Shock

Sepsis in adults is a life threatening organ dysfunction caused by a dysregulated host response to suspected or proven infection; while in children, it is defined as suspected or proven infection with ≥2 systemic inflammatory response syndrome (SIRS) criteria, of which one must be abnormal temperature or white blood cell count.

Septic shock on the other hand in adults, is defined as persisting hypotension despite volume resuscitation, requiring vasopressors to maintain mean arterial pressure (MAP) ≥65 mmHg and serum lactate level >2 mmol/L.

In children, septic shock is any hypotension (SBP <5th percentile or >2 SD below normal for age) or 2-3 of the following: altered mental state, tachycardia/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, petechial or purpuric rash, increased lactate, oliguria, hyperthermia or hypothermia.

Early goal-directed therapy remains the mainstay of the resuscitation bundle in the management of severe sepsis and septic shock.

Upon recognition of COVID-19 infection, with clinical signs/laboratory evidence of life-threatening organ dysfunction,

- Obtain vascular access within 5 minutes. Use of central venous and arterial catheters should be based on resource availability and individual patient needs.
- Within 1 hour of recognition of sepsis, following sample collection, commence:
  - antimicrobial therapy based on sensitivity result
  - Intravenous fluid
  - vasopressors for hypotension.
- Give at least 30 mL/kg of isotonic crystalloid (e.g. 0.9% Normal saline, Ringer's lactate etc.) in the first 3 hours. Avoid use of hypotonic crystalloids (e.g. 0.45% Normal saline), starches, or gelatins for resuscitation.
- 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), then reduce or discontinue fluid administration.
  - This is important where mechanical ventilation is not available.

- Determine need for additional fluid boluses (250-1000 ml in adults) based on clinical response and improvement of perfusion targets.
- Monitor patient closely to guide volume administration beyond initial resuscitation;
    - *Perfusion* - MAP >65 mmHg, urine output >0.5 mL/kg/hr, and improvement of skin mottling, capillary refill, level of consciousness, and lactate.
    - *Dynamic indices of volume responsiveness* - passive leg raises, fluid challenges with serial stroke volume measurements/variations in systolic pressure, pulse pressure, inferior vena cava size, or stroke volume in response to changes in intrathoracic pressure during mechanical ventilation
- Administer vasopressors (e.g. norepinephrine, epinephrine, vasopressin, and dopamine) through central venous (CV) line when shock persists during/after fluid resuscitation.
    - Alternatively, use large vein intravenous (IV) line but monitor for signs of extravasation and local tissue necrosis. If this occurs, discontinue IV line.
    - Vasopressors can be administered using intraosseous needle
    - Titrate to the minimum dose necessary to maintain perfusion and prevent side effects
- Monitor blood pressure frequently (at least every 15 minutes)
- Give oxygen therapy via intra-nasal catheter, face mask with reservoir bag/bag-valve mask/HFNO/NIV
- Monitor closely for about 1 hour for clinical improvement/deterioration
- If condition deteriorates, implement mechanical ventilation using lower tidal volumes (4-8mL/kg predicted body weight) and lower inspiratory pressures (plateau pressure <30cmH_2O)
    - Deep sedation may be required to control respiratory drive and achieve tidal volume targets.
- Ensure close monitoring of vital signs (heart rate, respiratory rate, blood pressure, pulse oxygen saturation).
- Give supportive therapy as need arises to ensure sufficient fluid and electrolyte balance

- Maintain nutrition support (enteral or parental as indicated)
- Monitor for blood routine, CRP, PCT, organ function (E/U/Cr, LFT and Bilirubin, cardiac biomarkers, Urine volume, analysis, and culture etc.), coagulation function, arterial and venous gas analysis and chest imaging

Clinical signs of perfusion and MAP maybe used to define shock when measurement for lactate cannot be done

4.3 Management Of COVID-19 in Special Population

4.3.1 Children and Elderly

- In addition to the management above, the following should be considered
- Give 20 mL/kg of isotonic crystalloid as a rapid bolus and up to 40mL/kg–60mL/kg in the first 1 hour
  - Consider use of colloid infusion with albumin 5% for children who have **not** improved following >60mL/kg of crystalloid fluid, have hypoalbuminemia (albumin <3g/dL), or who develop a hyperchloremic metabolic acidosis.
- Determine need for additional fluid boluses (10-20mL/kg in children and elderly) based on clinical response and improvement of perfusion targets.
- Monitor closely to guide volume administration beyond initial resuscitation
  - *Perfusion* – MAP age appropriate target, urine output >1mL/kg/hr, and improvement of skin mottling, capillary refill, level of consciousness, and lactate.
- In children with **cold shock** (state of elevated systemic vascular resistance SVR and low cardiac output, cold extremities and delayed capillary refill), **low-dose epinephrine should be considered as first-line**, while norepinephrine should be used in those with warm shock (state of low SVR and normal or increased cardiac output)

- When performing rapid sequence endotracheal intubation:
  - If haemodynamically unstable, give appropriate support with fluid and/or catecholamines prior intubation
  - Pre-treatment with atropine (infants and younger children) to counteract reflex bradycardia; or
  - Administer ketamine if available and not contraindicated (e.g. patients younger than 3 months old or with psychosis etc.) for sedation prior endotracheal intubation
  - Do not use short-acting barbiturates and propofol in children with septic shock. These are associated with hypotension.
- Give lower Positive End Expiratory Pressure (PEEP) instead of higher PEEP.

4.3.2 Pregnant women

- Supportive therapies as generically described, taking into consideration, physiologic adaptations of pregnancy.
- The use of investigational therapeutic agents (outside of a research study) should be guided by weighing individual potential risk-benefit for mother and safety to foetus, with consultation from an obstetric specialist and ethics committee.
- Emergency delivery and pregnancy termination decisions should be based on these factors: gestational age, maternal condition, and foetal stability.
- Consultations with obstetric, neonatal, and intensive care specialists (depending on the condition of the mother) is recommended.

4.3.3 Co-morbidities

- In addition to general management, assessment of pre-morbid state must be conducted, and appropriate management instituted.

4.4 Prevention of Complications

The following interventions are recommended to prevent complications associated with critical illnesses These recommendations are based on WHO guidelines on surviving sepsis and are generally limited to feasible recommendations based on high quality evidence.

Table 4: Overview of anticipated outcome and recommended interventions

ANTICIPATED OUTCOME	INTERVENTIONS
Reduce days of invasive mechanic Ventilation	• Use weaning protocols that include daily assessment for readiness to breath spontaneously • Minimise continuous or intermittent sedation, targeting specific titration end points (light sedation unless contraindicated) or with daily interruption of continuous sedative infusion
Reduce incidence of ventilator -associated pneumonia	• Oral intubation is preferable to nasal intubation in adults • Keep patient in semi-recumbent position (head of bed elevation at 300-450 • Use a close 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 each moisture exchanger when it malfunctions, when soiled, or every 5-7 days
Reduce incidence of thromboembolism	• Use pharmacological prophylaxis (low molecular weight heparin (preferred if available) or heparin 5,000 units subcutaneously twice daily) in adults without contraindication. For those with contraindications, use mechanical prophylaxis (intermittent pneumatic compression device).
Reduce incidence of catheter-related bloodstream infection	• Use a check list, with completion verified by a real time observer as a reminder of each step needed for sterile insertion and as a daily reminder to remove catheter if no longer needed
Reduce incidence of pressure ulcer	• Turn patient every 2 hours (use appropriate PPE) • Use a ripple mattress where available
Reduce incidence of stress ulcers and gastrointestinal bleeding.	• Give early enteral nutrition (within 24-48 hours of admission) • Administer histamine-2 receptor blocker or proton pump inhibitor in patients with risk factors for GI bleeding. • Risk factors for gastrointestinal bleeding include mechanical ventilation for greater than 48 hours, coagulopathy, renal replacement therapy, liver disease, multiple comorbidities like diabetes and higher organ failure score.
Reduce incidence of ICU-related weakness	• Actively mobilise patient early in the course of illness when it is safe to do so

CHAPTER 5

Discharge Criteria for COVID-19 Infection

The decision to discharge a patient should be taken on clinical grounds and supported by laboratory results. A negative PCR means that the virus can no longer be detected in the respiratory samples.

- A patient should be discharged if the following criteria is met:

5.1 Clinical Discharge Criteria

- Afebrile continuously for 72 hours or more in symptomatic patients without use of antipyretics
- Significant resolution of clinical symptoms
- $SpO_2 \geq 95\%$ in room air for 3 days

5.2 Laboratory Discharge Criteria

- A negative respiratory nucleic acid test
  - After 7 days of admission in an asymptomatic patients
  - After meeting clinical discharge criteria for symptomatic patients
  - Other laboratory investigations
- *Imaging*: Inflammation of the lungs show obvious signs of absorption of airspace opacity, lobar consolidation, or interstitial opacities

5.3 Recommendations for Follow-up

- Discharged patients should continue self-isolation 1 week after discharge home- (see Self-isolation Guideline)
- Continue hand hygiene, social distancing, use of face mask in public, adequate hydration and rest as well as multivitamin supplementation
- Patients should be followed up the first week of discharge and monthly for the next three months

**There is no sufficient evidence that SARS-CoV-2 is found in semen and breast milk

CHAPTER 6

Annexes

Annex 1: Case investigation form

Unique Case ID / Cluster Number (if applicable):

1. CURRENT STATUS	
☐ Alive ☐ Dead	
2. DATA COLLECTOR INFORMATION	
Name of data collector	
Data collector Institution	
Data collector telephone number	
Email	
Form completion date (dd/mm/yyyy)	___/___/___
3A. CASE IDENTIFIER INFORMATION	
Given name(s)	
Family name	
Sex	☐ Male ☐ Female ☐ Not known
Date of Birth (dd/mm/yyyy)	___/___/___ ☐ Unknown
Telephone (mobile) number	
Age (years, months)	___ years ___ months ☐ Unknown
Email	
Address	
National social number/ identifier (if applicable)	
Country of residence	
Case status	☐ Suspected ☐ Probable ☐ Confirmed
3B. INTERVIEW RESPONDENT INFORMATION (if the persons providing the information is not the patient)	
First name	
Surname	
Sex	☐ Male ☐ Female ☐ Not known
Date of Birth (dd/mm/yyyy)	___/___/___
Relationship to patient	
Respondent address	
Telephone (mobile) number	

Annex 2: SOP for transfer of COVID-19 suspect cases from POI to treatment centre

Purpose

This SOP provides operational guidance on transferring COVID-19 suspected cases from point of identification (e.g. health facility, home) to a designated treatment centre.

Steps

- **NOTIFICATION**

  On identification of a suspected case, the POI should immediately notify the State Epidemiologist through the quickest possible means. State Epidemiologist should immediately activate contact listing.

- **PRE-TRANSFER PREPARATION**

  a. Point of Identification: Health Facility/Home

  i. Maintain appropriate IPC measures
  ii. Identify staff/persons who will be involved in transfer of suspected case(s)
  iii. Prepare relevant transfer documents e.g. referral notes, contact tracing forms etc.
  iv. Assemble personal belongings of suspected case(s) to be handed over to the receiving team (health personnel), packed appropriately in a new clean sealed bag.
  v. Prepare suspect case(s) for transfer with appropriate Personal Protective Equipment (PPE) e.g. medical face mask and gloves
  vi. If at a health facility, communicate reason for referral and transfer procedure to family/friends of suspected case(s)
  vii. Identify a room/space for donning of PPE for the transporting team

  b. State Epidemiologist should:

  i. Notify focal person at designated treatment centre and confirm readiness to receive suspect case(s)
  ii. Create **direct** linkage between **designated** focal persons in referring facility/home and receiving treatment centre
  iii. Notify relevant authorities i.e. Director of Public Health (State), and Director of Surveillance (NCDC)

  c. Designated Treatment Centre

  i. Identify health worker(s) who will be involved in the transfer of the suspected case(s)
  ii. Health worker(s) to conduct a pre-departure briefing for the transfer team

iii. Dispatch designated ambulance and transfer team to the POI
iv. Communicate to the referring team the estimated time of arrival (ETA) after confirmation of the specific route of travel
v. Notify designated managing team of impending referral
vi. Prepare ward in treatment centre to accommodate and manage suspected case(s)

It is the responsibility of the referring health facility/home to identify and make available an appropriate parking area (which has a short direct route from the holding area) for the ambulance

Transfer Procedure

- **ON ARRIVAL OF AMBULANCE AT THE REFERRING HEALTH FACILITY/HOME:**

a. Health Facility/Home

i. Direct the receiving team to the designated PPE donning area
ii. Debrief the receiving team on current clinical status of the suspect case(s)
iii. Conduct pre-departure clinical evaluation (vital signs and general severity of illness, to decide appropriateness of planned transfer mechanism) before official transfer of suspected case(s)
iv. Hand-over transfer documents and personnel belongings to the receiving team
v. Transfer suspected case(s) to transporting team

b. Designated Treatment Centre

i. Park in the designated parking area, as shown by the transferring health facility/home
ii. Don appropriate PPE before debriefing
iii. Receive transfer documents and personal belongings of suspected case(s)
iv. Implement procedures to limit contamination on ambulance environmental surfaces
v. Receive suspected case(s) from referring team
vi. Conduct pre-departure vital signs after receiving suspected case(s)

- **UPON DEPARTURE FROM REFERRING HEALTH FACILITY/ HOME**

  a. Health Facility/Home

  i. Follow mission completion SOP (Doffing PPE, cleaning and disinfection)
  ii. Communicate to the State Epidemiologist on the transfer of suspected case(s)

  b. Designated Treatment Centre

  i. Communicate to the focal person the Expected Time of Arrival after confirmation of the specific route of travel
  ii. Monitor suspected case(s) closely at least every 30 minutes, if stable or PRN and administer necessary care
  iii. Maintain strict IPC measures throughout the drive
  iv. Update the focal person of the treatment centre on the clinical status of the suspected case(s)

- **ARRIVAL AT THE DESIGNATED TREATMENT CENTRE**

  The Transfer team should:

  i. Confirm arrival within treatment centre and specific route of travel within the facility before disembarking the suspected case (s) from the ambulance.
  ii. Move suspected case(s) via earmarked direct route to designated ward(s)
  iii. Return to ambulance and proceed to designated decontamination or disinfection station.
  iv. Disinfect ambulance (refer to IPC SOP)
  v. Ambulance transport personnel doff PPE under supervision of qualified personnel.
  vi. Have appropriately trained personnel package waste from ambulance.
  vii. Proper waste disposal should be carried out by trained personnel
  viii. Debrief managing team and initiate post-mission surveillance, as needed.

Annex 3: SOP on Sample Collection

Specimen collection and transportation Guide: Coronavirus Disease (COVID-19) – Nigeria 2020

Scope

To be used by government and non-government health authorities, health facilities, clinicians, laboratories and public health practitioners in collection, packaging and transporting suspected and confirmed infectious samples of COVID-19 for individuals meeting the case definitions for diagnosis in Nigeria.

Purpose

This document describes the process of collecting specimens from patients suspected of COVID-19 and the transportation of collected samples to the indicated testing laboratories.

Sample collection requirements

PPE (apron, hand gloves, face shield and N95 Masks), nasal and oropharyngeal swabs, tongue depressor, viral transport medium, centrifuge tube, zip-loc bag, hand sanitizer, secondary container, hard frozen gel packs, case investigation form, sample transportation form (if sample is to be transported), marker, disinfectant, and hard card box/ transport box

Sample packaging requirements

PPE (Apron, hand gloves, face shield and N95 Masks), viral transport medium, centrifuge tube, zip-loc bag, biohazard label, secondary container, hard frozen gel packs, Gio-style carrier, sample transportation form, marker, disinfectant, and hard card box/transport box.

Case investigation forms should be filled AND specimen collection containers should be labelled before sample collection.

Section 1: Labeling specimens for Transport

a. Label VTM tube and any other sample tube with the following:

- Name of patient (First name first, then surname)
- Hospital number/Epid number
- Sex (F or M)
- Date (dd/mm/yy)

b. State the full name (first name first, then surname), date of birth of the suspected COVID-19 case, date of symptoms onset, date of sample collection and all other required information, clearly on the accompanying request form and the case investigation form (CIF).

c. Note the date and time of pick-up on the specimen tracking form.

Section 2: Sample collection procedure

One nasal swab and one oropharyngeal swab (1 of each type) are the preferred specimen type. Sputum (if it can be produced) can be collected as an additional specimen type, in a separate sterile container. Only synthetic fiber swabs with plastic shafts should be used (Calcium alginate swabs or swabs with wooden shafts may contain substances that inactivate some viruses and inhibit PCR testing)

The procedure below must be conducted in well ventilated rooms ensuring the number of persons in the room is limited.

1. Donn Personal Protective Equipment (PPE)
2. Clinicians/ Laboratorian must wear long sleeve apron/lab coat, hand gloves, face shield and N95 Masks before collecting COVID-19 samples. In combination with a face-shield, if hands are cleaned with soap and water or an alcohol-based hand sanitizer before and after touching or adjusting the respirator.
3. i. *Nasal Swab:* Insert swab into the nostril parallel to the palate. Leave the swab in place for a few seconds to absorb secretion. Both nostrils should be swabbed with the same swab.

   ii. Oropharyngeal swab: Have the patient open his/her mouth wide open. Using a wooden tongue depressor, depress the tongue and swab the posterior pharynx, avoiding the tongue.

Only nasal and oropharyngeal swabs is recommended for COVID19 laboratory testing in Nigeria. However, sputum, bronchoalveolar lavage and tracheal aspirate can be collected as additional samples and used to diagnose COVID-19.

4. Place nasal and oropharyngeal swabs into a single sterile tube containing 2-3 ml of viral transport media (VTM) immediately after collection.

   If sputum, bronchoalveolar lavage or endotracheal aspirate is collected, please collect in a sterile sample tube

5. Label sample correctly and appropriately

6. Store samples at 4°C for ≤5 days and -70°C for >5 days in the fridge and refrigerator respectively.

   If samples are to be transported immediately, please move to Section 3.

   If samples are to be packaged by a different individual, please transfer and continue with steps 7 and 8.

7. Doff PPE (in the correct sequence –gown, gloves, face shield, N95 mask).

8. Wash hands with soap under running water

Section 3: Sample packaging procedure

Samples should be packed in triple container packing and transported under cold chain to the reference laboratory as described below:

1. Apron/lab coat, hand gloves, face shield and N95 Masks must be worn during COVID-19 sample packaging, in combination with a face-shield.

2. Wrap the VTM tube containing the nasal and oropharyngeal sample in an adsorbent material that can absorb the content of the VTM tube in the event of breakage or spillage. Where an adsorbent rack-style holder is unavailable, cotton balls, tissue paper, paper towel, styro-foam may be used as adsorbent material. A cello tape should be used to hold the absorbent material in place if the material sits loosely.

3. Place the VTM tube wrapped in adsorbent material in a leak-proof secondary container. A falcon tube should be used as a secondary container.

4. Place the falcon tube in a zip-lock bag and attach a biohazard sign on the zip-lock bag.
5. Place the zip-lock bag into another airtight, sturdy container (e.g. bio-bottle).
6. Place the sturdy container into gio-styles ensuring the specimen is **surrounded (bottom and sides) by hard frozen gel packs** to make certain the sample is preserved during transport. COVID-19 specimen should be transported at 4°C for ≤5 days and -70°C for >5 days.
7. Disinfect the gio-style.
8. Place the gio-styles into a hard card box container and disinfect again.
9. Doff PPE (in the correct sequence, gown, gloves, face shield, N95 mask).
10. Wash hands with soap under running water
11. Call TRANEX for sample pickup. To invite TRANEX for pick-up, call any of the following numbers telling them explicitly what sample needs to be transported, from which location, and to which laboratory.
    - **0818 105 5406**
    - **0907 036 0007**
    - **0803 499 0971**
    - **0907 036 0001**
    - **0706 193 9703**
    - **0907 036 0092**
12. Notify the testing laboratory as soon as the specimen is handed over to TRANEX.

NIGERIA CENTRE FOR DISEASE CONTROL

NATIONAL INTERIM GUIDELINES FOR CLINICAL MANAGEMENT OF COVID-19

VERSION 2, MAY 2020

NIGERIA CENTRE FOR DISEASE CONTROL

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