ZIMBABWE GUIDELINES FOR THE MANAGEMENT OF COVID-19

November 2020

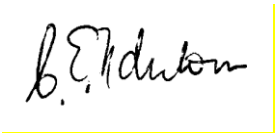
Published by:
The National Medicine and Therapeutics Policy Advisory Committee
[NMTPAC]
Ministry of Health & Child Care
Republic of Zimbabwe

ACKNOWLEDGEMENTS

We would like to thank all the individuals who made contributions through colleagues, their associations, discussion forums and/or by communicating through electronic mail. We are grateful to all who have made this edition a national guide that serves as the standard for Zimbabwe for management of the COVID-19 pandemic. These current guidelines are based on the currently available scientific evidence and feasibility of applying the guidelines in our setting. The guidelines will be reviewed as and when new evidence arises. We expect the users to comment on these guidelines as they use them so that they can be updated as the need arises.

- NMTPAC members (2020)
- Case Management Group (Pillar 7) at MOHCC
- Prof Valerie Robertson (Medical Microbiologist, ICAZ)
- Ms Marcelyn Magwenzi (Medical Microbiologist, ICAZ)
- Dr Musvo Mapfanyangira (Anaethetist)
- Dr Tsitsi Monera-Penduka (Pharmacist)
- Dr Golden Fana, Physician, UZCHS
- Dr Chris Pasi (Physician, MOHCC)
- Dr Tapiwa Bwakura (Physician, MOHCC)
- Dr Tariro Makadzange (Physician)
- Dr Shingai Nyaguse (Anaesthetist)
- Dr Abaden Svisva (Clinton Health Access Initiative)
- Dr Trevor Kanyowa (WHO Zimbabwe Country Office)
- Dr Vonai Chimhamhiwa (Public Health Physician)
- Dr Agnes Katsidzira (Chairperson, CPCPZ)
- Dr Simon Peter Opolot (UN Women)
- Dr Onismas Madzudzo (Consultant Physician & Nephrologist, MOHCC)
- Dr Nyasha Masuka (WHO Zimbabwe Country Office)
- Dr Jonas Mwale (Health Manager, UNICEF)
- Dr Gerald Tsoka (President, Zimbabwe Dental Association)
- Dr Hardwicke Matikiti (Acting Director, Oral Health, MOHCC)
- Dr MacJohn Chirisa (President, Paediatric Association of Zimbabwe (PAZ)
- Dr H Chifamba (Consultant, Anaesthesia and Critical Care)
- Dr Tsitsi Apollo (Deputy Director, HIV/AIDS and STIs, MOHCC)
- Prof Margaret Borok (Physician, UZCHS)
- Dr Linda Haj Omar (Epidemiologist, WHO-AFRO)
- Dr Hayfa Elamin (WHO-AFRO)
- Mr Khuzi Ncube (Chief Physiotherapist & Deputy Director, Rehabilitation Services, MOHCC)
- Dr E Mupeta (United Nations Population Fund)
- Dr Margaret Maulana (Zimbabwe Emergency Medical Society)
- Dr. S Chirisa (Deputy Director, Mental Health Department, MOHCC)
- Debra Machando (Clinical Psychologist, Dept of Psychiatry UZCHS)
- Brighton Mufakwadziya (Occupational Therapist)
- Jacob Shamuyarira (Director Consolidated Africa Services)
- Dr. Fungisai Mazhandu (Psychiatrist, Parirenyatwa Hospital)
- Rejoice Mabika (Social Worker)

- Tarisai Bere (Clinical Psychologist, UZCHS)
- Sister Chivese (Mental Health Nurse, MOHCC)
- Surgical Society of Zimbabwe (SSZ)
- College of Primary Care Physicians of Zimbabwe (CPCPZ)
- Zimbabwe Confederation of Midwives (ZICOM)
- Paediatric Association of Zimbabwe (PAZ)
- Zimbabwe Dental Association
- National Physician Association of Zimbabwe (NAPAZ)
- Zimbabwe Anaesthetic Association (ZAA)
- Department of Health, Harare City Council
- Department of Health, Bulawayo City Council
- Private Ambulance Services Association of Zimbabwe(PASAZ)
- Infection Control Association of Zimbabwe (ICAZ)
- IPC Response Team MOHCC
- National Physicians Association of Zimbabwe (NAPAZ)
- Paediatrics Association of Zimbabwe (PAZ)
- Zimbabwe Society of Obstetricians and Gynaecologists (ZSOG)
- Medicines Control Authority of Zimbabwe (MCAZ)



……

Prof C E Ndhlovu, MMed Sci, FRCP
Chairperson: National Medicine and Therapeutics Policy Advisory Committee

FOREWORD

It is the national objective that the health care of Zimbabweans is met through the provision and proper use of essential medicines and scientifically approved therapeutics. Sometimes we do not need to give medicines, that is, there is not always a "pill for every ill". Thus, there is need to use medicines appropriately, efficiently, and effectively.

This comprehensive edition of the COVID-19 case management guidelines reflects the consensus of local experts, and takes into consideration factors such as the Zimbabwean setting, prevailing economic climate, practical experience as well as evidence-based therapeutics and is meant to be used at all levels of the health system.

This first version of the comprehensive COVID-19 case management guidelines has considered the current trends and science for the novel disease and will be updated as the ongoing research and clinical trials produce new evidence.

I urge all health workers to familiarize themselves with the guidelines, to prescribe within the bounds of this publication, and to recognise the critical importance of providing a quality service to all health care recipients through the rational use of medicines.

Air Commodore (Dr) Jasper Chimedza

Permanent Secretary for Health and Child Care

ACRONYMS

ACBT	Active Cycle of Breathing Technique
AGP	Aerosol Generating Procedures
AGT	Aerosol Generating Techniques
ARDS	Acute Respiratory Distress Syndrome
BiPAP	Bilevel Positive Airway Pressure
COVID-19	Coronavirus Disease 2019
CPAP	Continuous Positive Airway Pressure
CPR	Cardiopulmonary Resuscitation
$ETCO_2$	End Tidal Carbon Dioxide
ETT	Endotracheal Tube
HDU	High Dependence Unit
HFOV	High frequency oscillatory ventilation
ICAZ	Infection Control Association of Zimbabwe
ICU-AW	Intensive Care Unit Acquired Weakness
IPC	Infection Prevention and Control
IPPB	Intermittent Positive Pressure Breathing
LFNC	Low Flow Nasal Cannula
MAP	Mean Arterial Pressure
MCAZ	Medicines Control Authority of Zimbabwe
MERS	Middle Eastern Respiratory Syndrome
MRCZ	Medicine Research Council of Zimbabwe
NIV	Non invasive Ventilation
PCP	Pneumocystis pneumonia
PCR	Polymerase Chain Reaction
PEEP	Positive End Expiratory Pressure

PEP	Positive Expiratory Prevention
PIP	Positive Injury Prevention
PPE	Personal Protective Equipment
RDT	Rapid Diagnostic Test
RR	Respiratory Rate
RRT	Rapid Response Team
RSI	Rapid Sequence Induction
SARI	Severe Acute Respiratory Infection
SARS	Severe Acute Respiratory Syndrome
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus2
SOPs	Standard Operating Procedures
VHW	Village Health Worker

CONTENTS

ACKNOWLEDGEMENTS ii
FOREWORD ..... **Error! Bookmark not defined.**
ACRONYMS v
Latest Updates-What has changed in these latest guidelines 1
1. MANAGEMENT OF HOSPITALIZED COVID-19 PATIENTS 1
2. REVISION OF DEISOLATION CRITERIA FOR COVID-19 CONFIRMED PATIENTS 2
1. INTRODUCTION 3
2. CASE DEFINITION OF COVID-19 6
3. INFECTION PREVENTION AND CONTROL (IPC) 7
4. HANDLING OF CONTACTS OF COVID-19 CASES 9
5. HANDLING OF PATIENTS AT DIFFERENT LEVELS OF CARE (ABCS) 11
6. ADMISSION OF PATIENTS INTO WARDS/HDU/ICU SETTINGS 20
7. PRIVATE SECTOR HOSPITALS / PRACTICE 25
8. HOSPITAL/ COMMUNITY DISCHARGE PROCESS 26
9. PSYCHOSOCIAL SUPPORT GUIDELINES 27
10. MANAGEMENT OF CHILDREN 31
11. MANAGEMENT OF PREGNANCY 35
12. MANAGEMENT OF SURGICAL CASES 37
13. MANAGEMENT IN DENTAL PRACTICE 40
14. ROLE OF REHABILITATION SERVICES 44
15. PATIENT TRANSPORT BY AMBULANCE 50
ANNEX 1: ASSESSMENT AND REFERRAL DOCUMENTATION 51
ANNEX 2: COVID-19 MANAGEMENT POSTER 53
ANNEX 3: PROPOSED TRANSPORTATION GUIDELINES FOR COVID-19 PATIENTS 54
ANNEX 4: BASIC EQUIPMENT AND MEDICINES NEEDS AT VARIOUS LEVELS 59
ANNEX 5: ADAPTED FROM WHO PPE GUIDANCE 60
ANNEX 6: TRIAGING FLOWCHARTS 63
REFERENCES 64

Latest Updates-What has changed in these latest guidelines

1. MANAGEMENT OF HOSPITALIZED COVID-19 PATIENTS

In the May 2020 COVID-19 guidelines, we had stated that there were no specific therapeutic agents for COVID-19. We still do not have antivirals that can be given to prevent or treat COVID-19. However, a recent National Institutes of Health (NIH)-funded study has shown that Remdesivir has a clinical benefit i.e. reducing recovery times down to 11 days compared to 15 days. This NIH study did not show any mortality benefit. The UK based RECOVERY trial has also suggested the mortality benefit of using Dexamethasone in COVID-19 patients who need oxygen or are mechanically ventilated. However, the interim results of the WHO SOLIDARITY Trial(https://www.medrxiv.org/content/10.1101/2020.10.15.20209817v1 have shown "little or no effect on the 28 day mortality" of using remdesivir, hydroxychloroquine, lopinavi/ritonavir or interferons. Studies using repurposed medicines still continue to be conducted. It would appear that Remdesivir, being an antiviral, should be administered very early on in Covid-19 but we may not be seeing our patients during this early phase of their symptoms.

Use of Dexamethasone is recommended and will be made available for the treatment of COVID-19. Remdesivir will also be added to our Specialist essential medicines list (EML -S list) and should be used in a hospital setting for those who are oxygen dependent. Dexamethasone is already available in our EML.

Caution: Prescribers will need to ensure they familiarize themselves with new medicines e.g. how to use Remdesivir i.e how to reconstitute it for use, how to infuse it (30 minutes or more) as well as its side effects.

- The use of any other therapeutic agents should only happen off-label as previously guided and SHOULD BE done in a hospital setting or clinical trial.

When to prescribe specific medicines in COVID-19 patients:

Use in patients who are oxygen dependent i.e. not for use in those deemed to have mild disease. According to our national guidelines, only those with mild COVID-19 and no risk factors for increased mortality e.g. elderly, with chronic heart disease hypertension etc are most likely to be cared for at home.

- **Remdesivir** 200mg intravenously initially followed by 100mg IV daily for up to 10 days. Remdesivir can be used for 5 days or stopped before the 10 days if the patient is well enough to be discharged from the hospital care.
  Administer Remdesivir as follows: 200 mg (2 vials) on day 1
  followed by 100 mg(1 vial) on days 2–10 in single daily infusions
  The total volume of administration can be 250 mL or 500 mL of Normal Saline. The infusion can be administered over a period of between 30 minutes and 2 hours.

  Do not use Remdesivir if ALT is > 5 times upper limit of normal

- **Dexamethasone** 6mg orally (or IV) daily for 10 days.
  Avoid using if use of steroids is contraindicated in the patient.

Other general recommendations for COVID-19 management:

Proning: We encourage that patients spend most of their time lying on their stomachs.

Anticoagulation Prophylaxis: Given the high risk of developing thrombosis and pulmonary embolism (PE), immobile/admitted COVID-19 patients should be heparinized:

- Low molecular weight heparin e.g. Enoxaparin 40mg subcutaneously once daily (if suspected PE, give 40mg sc twice a day)
- Or use unfractionated heparin 5000 units sc three times a day.

2. REVISION OF DEISOLATION CRITERIA FOR COVID-19 CONFIRMED PATIENTS

On the 17th of June 2020, the World Health Organisation (WHO) released revised guidance on clinical management of Covid-19 and the discharging of patients from isolation. The NMTPAC has adopted the WHO guidance and hence recommends de-isolation of patients in line with the new WHO guidance which does not require retesting.

The current discharge criteria had led to long periods of isolation due to limited testing capacity and long turnaround times. This created an avoidable financial burden for both the patient and the health care delivery system. There is evidence to suggest that 5 to 10 days after infection with the virus the likelihood of transmission drastically decreases. Patients should continue strict infection control measures both at home and in public areas.

The new recommendation is to apply to all COVID-19 cases regardless of isolation location or disease severity. The discharge criteria are outlined below:-

- **For symptomatic patients:** 10 days after symptom onset, plus at least 3 additional days without symptoms (including without fever and without respiratory symptoms)
- **For asymptomatic cases:** 10 days after positive test for SARS-CoV-2

1. INTRODUCTION

What is COVID-19?

Coronaviruses are responsible for the simple colds that we know about but COVID-19 is a viral infection due to the new/novel corona virus that was identified in China in December 2019. This new coronavirus (SARS-CoV-2) is easily transmissible from person to person and those not exhibiting symptoms i.e. asymptomatic/pre-symptomatic, can transmit it too, unlike SARS/MERS where transmission is via symptomatic cases.

We expect that 80% of those who get infected will be classified as having mild symptoms and may be able to take care of themselves at home if they do not fall into the high-risk category. Those who have been noted to be at higher risk of dying were likely to be at older age >60 years or having other comorbidities such as hypertension, chronic heart disease, chronic lung disease, cancers and other immunosuppressed patients. HIV infected patients should also be considered as at higher risk although the data is still limited at this point in time. About 20% of COVID-19 patients are likely to be admitted as they will have moderate /severe symptoms. We also expect that 5% of the admitted cases will fall into the severe/critical group/cohort and may need mechanical ventilation in an intensive care setting.

Infection prevention and control interventions against this coronavirus are the main strategy against getting this coronavirus infection. We have limited capacity to handle infected cases and there are no specific medicines for COVID-19 at this point in time. It is crucial we avoid getting infected. Hence, we need to observe the current public health measures and practice infection prevention and control to the highest extent possible.

What is the incubation period?

The incubation period appears to be about 14 days in most cases but most symptoms will appear between day 5 and 14 of infection. Hence, WHO recommends that contacts of patients with laboratory-confirmed COVID-19 be quarantined for 14 days from the last time they were exposed to the patient.

What is self-quarantine and self–isolation?

Self-quarantine refers to when you distance yourself from others after exposure or potential exposure just in case you may develop symptoms of COVID-19.

Self-isolation refers to those with symptoms suggestive of COVID-19 and therefore need to assume they are infected even if not yet tested so as to protect others around them. This will also apply to confirmed COVID-19 cases with mild symptoms and being managed at home i.e. not deemed sick enough to be admitted and those with mild symptoms and no high-risk factors.

What are the symptoms?

The case definition is changing all the time but in general symptoms within the past 14 days e.g. a new fever, dry cough, myalgia, extreme fatigue, shortness of breath, sore throat, loss of sense of smell/ taste, gastrointestinal symptoms like abdominal pain/diarrhoea, rashes warrant an exclusion of COVID-19. Thus, anyone presenting with flu-like symptoms should be assumed to be a potential COVID-19 case until proven otherwise. Children may also have poor feeding, nausea and vomiting plus rashes e.g. Kawasaki like syndrome.

Table 1: COVID-19 symptoms in adults

Common Symptoms	Less Common Symptoms
• Fever	• Sore throat
• Dry Cough	• Headache
• Shortness of breath	• Productive cough
• Muscle aches/Myalgia	• Nausea, vomiting, diarrhea
• Fatigue	
• Loss of smell/taste	

How do we expect these COVID-19 cases to be managed?

We assume that most (80%) of the COVID-19 cases will present exhibiting mild symptoms i.e. not needing to be admitted in a hospital. Some of these mild cases who are not able to self-isolate at home will need to be admitted in an isolation centre/hospital setting. Those who are being monitored at home will need support from the community healthcare workers or village health workers. The cases that will need admission (20%), will be handled from District to Quaternary level hospitals. At these levels, apart from trained human resources, there will be need for access to essential medicines e.g. oxygen supplementation, ceftriaxone, azithromycin and basic equipment for patient assessment e.g. infrared thermometers, pulse oximeters, glucometers, BP machines. The moderate/severe cases may be handled at the ordinary ward level but about 5% will need to be cared for at a High Care /Intensive Care setting.

Healthcare workers at every level will need to be trained in the following areas:

A. Infection Prevention and Control
B. Case management at their level of service delivery
C. Referral pathway
D. Ambulance transfers using Rapid Response Teams and/or designated ambulances

E. Communicating with their clients at community level and other healthcare workers at Centre that they will be referring to.

Do we have any recommended specific antiviral interventions for COVID-19?

We still do not have any specific therapies for COVID-19 and any use of specific medicines is “off-label”.

Use of any medicines like Chloroquine, Hydroxychloroquine, Lopinavir/Ritonavir, Interferon alpha-2b or Remdesivir etc. should be in a clinical trial setting.

We encourage clinical trials e.g. WHO SOLIDARITY Trial or any other trials that will have been approved by our institutional and national review boards such as MRCZ and MCAZ.

2. CASE DEFINITION OF COVID-19

Definitions of COVID-19 cases and contacts are as per the World Health Organisation guidelines which are updated periodically. They are depicted in the table below:

Table 2: COVID-19 Case Definition (adapted from WHO 2020)

Suspect cases meet one of the following criteria	A. A patient with acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath), AND a history of travel to or residence in a location reporting community transmission of COVID-19 disease during the 14 days prior to symptom onset
	B. A patient with any acute respiratory illness AND having been in contact with a confirmed or probable COVID-19 case (see definition of contact) in the last 14 days prior to symptom onset
	C. A patient with severe acute respiratory illness (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness of breath; AND requiring hospitalization) AND in the absence of an alternative diagnosis that fully explains the clinical presentation.
A probable case has either one of the following	A. A suspect case for whom testing for the COVID-19 virus is inconclusive
	B. A suspect case for whom testing could not be performed for any reason
Confirmed case	A person with laboratory confirmation of COVID-19 infection, irrespective of clinical signs and symptoms.

Patient with the following should be considered at high risk of dying if they have COVID-19 symptoms and should be considered for admission:

- Patients older than 60 years,
- Patients with underlying medical conditions
    - chronic lung disease
    - chronic heart disease and hypertension
    - diabetes mellitus
    - chronic kidney disease
    - immunosuppressed persons e.g. cancer and/or HIV infection
- Pregnant women.

*******COVID-19 HOTLINE -Call 2019*******

3. INFECTION PREVENTION AND CONTROL (IPC)

(See latest national COVID-19 IPC guidelines)

A COVID-19 IPC response plan should be embedded in the overall facility IPC policy and plan. In COVID-19, the hierarchy of control measures are:

1. **Administrative** – Policies and SOPs to enable early assessments and triaging of cases (including spatial distancing); early recognition and reporting of cases, adequate staffing levels, and implementation of the two-tier control measures (Standard and Transmission based precautions)
2. **Engineering controls** – including ventilation, isolation facilities with dedicated ablution facilities, restricting access, signage for contact and droplet precautions, provide hand hygiene stations (with soap and water or sanitizers) at health facilities and mobilize clients and staff to use them
3. **Personal Protective Equipment (PPE)** – availability of appropriate and adequate PPE at all settings to prevent transmission of SARS-CoV-2 to staff and other patients (**refer to latest COVID-19 PPE Policy)**

The following measures should be strictly observed in order to prevent transmission of SARS-CoV-2:

- Perform hand hygiene frequently with an alcohol-based hand rub (60 -80% alcohol content) or wash hands with soap and water if hands are visibly soiled. Avoid touching your face, mouth, nose and eyes with dirty hands. Also avoid hand shaking. To effectively clean hands, rub the hands for at least 20 seconds using the recommended steps (refer to the latest National IPC Guidelines on the 5 moments and the technique for hand hygiene).
- Wear a face mask all the time when outside in the public arena.
- Staff who develop symptoms should self-quarantine until they are cleared of COVID-19 and are feeling better. Teach cough etiquette and provide information, education and communication (IEC) materials as a reminder for staff and patients.
- When caring for patients or working in areas providing care to suspected and confirmed cases of COVID-19, wear PPE as recommended in the PPE Policy for COVID-19. Training in the proper donning and doffing of PPE should be given to all healthcare workers.

Cleaning of equipment, linen and waste disposal

- Increase the frequency of environmental cleaning and provide appropriate cleaning agents and disinfectants, which are active against enveloped viruses. Segregate linen, without shaking, according to the National IPC Guidelines. Wet linen should be placed in impervious bags before putting in laundry bags. It is crucial to train laundry workers on linen management and provide them with appropriate PPE.
- Frequent cleaning of the environment, at least every few hours, in rooms which patients with respiratory symptoms have been waiting or examined should be performed using detergent and water, followed by a disinfectant such as 1000ppm sodium hypochlorite or an alcohol wipe.

- Practise waste segregation at point of care (using colour coded bins and job aides), provision of PPE for waste handlers and timely disposal of the waste. Note waste from COVID-19 care areas is highly infectious and should not be kept in the facility waste holding area.
- Used masks, gloves, disposable aprons and disposable gowns should be disposed of into a special plastic bags for appropriate disposal. If used for a COVID-19 patient should not be placed in the general waste stream.
- Reusable PPE such as protective eyewear or face shield must be placed in appropriate bins for later cleaning and decontamination according to the manufacturer's instructions.

What is social/physical distancing?

This is a strategy to reduce the transmission of SARS-CoV-2. Reducing contact between people reduces the number of opportunities for transmission of the virus.

This happens at two levels i.e individual and at community levels.

- At individual level-
    - People should wear a face mask when outside the home, adopt non-contact greetings i.e. no handshakes, keep a distance of at least 1 metre from each other so that if one coughs or sneezes, there is less likelihood of inhaling the droplets that might have the virus. Stay at home when unwell.
    - Limit getting out of your home for social visits.
- Community level-
    - Limit being in gatherings such as funerals, church services, schools, workplaces and cultural, social and sports events.

What is Shielding?

- Shielding refers to a strategy whereby people at high risk of developing severe COVID-19 disease are specifically protected through a variety of community-led arrangements that are meant to reduce their exposure risk to SARS-CoV2.
- Interventions that can constitute a shielding strategy include neighborhood-level house swaps, to create 'green zones' wherein high-risk residents are physically isolated for an extended period but supported to live safely and with dignity.
- Epidemiologically, this option seeks to reduce transmission within the high-risk groups that may otherwise contribute a large amount of hospitalization and mortality.

4. HANDLING OF CONTACTS OF COVID-19 CASES

What is contact tracing?

Contact tracing is the process of systematically identifying anybody who has had social, family, household, work or health care contact with a probable or confirmed case of COVID-19 from 2 days prior to onset of symptoms in confirmed/probable case and up to 14 days after symptoms onset.
Has 3 basic elements:

- Contact identification
- Contact listing
- Contact follow-up

Who is a COVID-19 contact?

A contact is a person who experienced any one of the following exposures during the **2 days before and up to 14 days after the onset of symptoms** of a probable or confirmed (index) case:

- Face-to-face contact with a probable or confirmed case within 1 metre and for more than 15 minutes
- Direct physical contact with a probable or confirmed case
- Direct care for a patient with probable or confirmed COVID-19 disease **without using proper PPE**
- Other situations as indicated by local risk assessments.
- **Definition of Healthcare worker COVID-19 contact (**Refer WHO Risk assessment and management of exposure of health care workers in the context of COVID-19: Interim guidance 19 March 2020)

When is a healthcare worker a "contact"?

- Use above criteria plus also ask the following questions:
    - If the Healthcare worker responds "yes" to any of the questions in the Table below, the HCW should be considered as being exposed to COVID-19 virus and treated as a "contact".

Table 3: Definition of Healthcare worker COVID-19 contact (Refer to WHO Risk assessment and management of exposure of health care workers in the context of COVID-19: Interim guidance 19 March 2020) (Also see Annex 5)

Question to be asked?	**Responses**
1. Did you provide **direct care** to a confirmed COVID-19 patient?	Yes/No
2. Did you have a **face-to-face contact (within 1 metre)** with a confirmed COVID-19 patient in a health care facility?	Yes/No

3. Were you present when any **aerosol-generating procedures** were performed on the patient? *E.g. tracheal intubation, nebulization, open airway suctioning, sputum collection, tracheostomy, bronchoscopy, CPR etc*	Yes/No
4. Did you have direct contact with the environment where the confirmed COVID-19 patient was cared for? *E.g. bed linen, medical equipment, bathroom etc*	Yes/No
5. Were you involved in health care interactions (paid or unpaid) in another health care facility during the period above?	Yes/No

Follow up of contacts:

- Contacts should be identified and followed up closely as soon as possible.
- Follow up contacts for the full incubation period i.e. 14 days to monitor for the development of symptoms
- During this follow up, the contact should practice self-quarantine
- Those who develop symptoms /fall sick should also stay home and self-isolate if symptoms seem mild.

5. HANDLING OF PATIENTS AT DIFFERENT LEVELS OF CARE (ABCS)

Our healthcare delivery system uses the ABCS classification for level of care i.e. A - Central/ Provincial level, B – District level, C – Primary Care level, S – Specialist level

At Community level/Home:

What should people at home do when they think they may have COVID-19?

- They should phone the Call Centre on **2019** for more information or contact their village health worker / community health worker or doctor
- Prevent transmitting coronavirus to other people or catching the virus from others
    - Wash hands frequently and thoroughly with soap and water or use an alcohol-based hand sanitizer (>60% alcohol)
    - Practice social/physical distancing, sit / stand at least 1 metre away from other people
    - Avoid gatherings and crowded places
    - Staying at home if not feeling well

If they develop the following symptoms e.g. fever, persistent dry cough, fatigue, sore throat, difficulty breathing, gastrointestinal symptoms, loss of smell, loss of taste:

- Phone the call centre (2019) to request someone to come home to assess the patient and collect samples for testing
- In case one cannot reach the call centre, one should directly contact their Village Health Worker/Community Health Worker/doctor for advice
- The person should only go to the nearest clinic/health centre if advised to do so by the healthcare worker. This is to avoid exposing other people to the infection during the travel to the health centre especially if using public transport

What should the Community Health Worker do?

- Put on your PPE (mask, gloves, gown, apron)
- Assess the patient
- How unwell does the person look?

Table 4: Categorization of COVID-19 symptoms

Category of COVID-19 symptoms	***Temp(^{0}C)***	***Pulse/min***	***Respiratory Rate/min***	***Oxygen saturation (%)***	***Systolic BP(mmHg)***
Mild	*<38*	*<120*	*<24*	*>95*	*>100*
Moderate/Severe	*≥38*	*>120*	*>24*	*<90*	*<100*

- **? Mild symptoms or ? Moderate/Severe COVID-19 symptoms**
- **Do they have high risk factors?** e.g. age above 60 years, hypertension, other heart condition, diabetes, asthma or other chronic lung disease, chronic kidney disease, or immunocompromised. Where pulse oximeter is available, SpO_2 <90%

- **If mild COVID-19** symptoms and no known high risk factors
    - Can advise person to stay at home
    - And contact call centre to dispatch a Rapid Response Team (RRT) to come and test the client i.e. collect nasopharyngeal samples for COVID-19 testing.
    - Assess household factors to determine suitability for home isolation. If unsuitable, arrange for isolation at community isolation centre or nearest appropriate isolation centre

- **If moderate/ severe symptoms or has high risk factors**
    - Contact call centre to dispatch ambulance for referral to district COVID-19 treatment isolation centre for testing and further assessment.

- **Monitoring of COVID-19 case at home:**
    - If client is worsening:
        - contact call centre to dispatch ambulance for referral to next level of care
    - In towns/ cities:
        - **roving teams** will also visit home twice a week and can help monitor clients
    - In rural areas:
        - will use the community health worker/ village health worker who will conduct daily checks on the home managed patient
    - Indicators suggestive of need for referral to a COVID-19 treatment centre (see Table above) include
        - Reduced energy/decreased activity, dizziness, passing less urine
        - Increasing breathing difficulties, bloody or coloured sputum, chest pain
        - Confusion, lethargy, unconscious, severe weakness, convulsions (seizures)
        - Where pulse oximeter is available, SpO_2 dropping below 90%
        - Persistent high fever and other symptoms beyond 3 days without signs of resolution
        - Children can also present with stridor, poor feeding, and excessive diarrhoea and vomiting

At Primary Health care level/Clinic:

What should the healthcare worker do?

Are you in a rural or urban clinic?

- Wear your PPE i.e. minimum surgical mask, goggles, gloves, gown and/or scrub, apron
- Spacesuits are for HDU / ICU service delivery or when you are having to do an aerosol generating procedure. So generally you do not need a spacesuit.

Is this a walk-in client or has the client been referred?

- Note that all people coming to any health facility must always be screened before they enter the main facility building.

- The screening point will identify walk-in patients who are suspected of having symptoms of COVID-19 as well as those not specifically reporting suggestive symptoms.
- If referred client, proceed as per suspected diagnosis in the referral letter/note.

? COVID-19 or non-COVID-19 case

- Triage to the appropriate space/tent

For walk-in clients:

- Establish a special area for screening for suspected COVID-19 patients E.g. a tent
- Manage your queues so that your visitors stand or sit at least 1 -2 metres from each other
- **Screen and triage your clients**
    - Screen all your visitors/patients to exclude COVID-19.
    - Triaging:
        - Separate into COVID-19 suspects and non-COVID-19 suspects
        - Staff covering the screening station must have on appropriate PPE whenever seeing patients
- **Non-COVID-19 patients**
    - To be referred for care as per need
    - We need to continue to give our usual care to these other patients.

- **COVID-19 suspects**:
    - Give them a mask. Put on your PPE if not already wearing it. Then assess patient.
    - Do they fit the COVID-19 case definition? (*See Case Definition Table above)*
        - *Symptoms e.g. fever, dry cough, tiredness, sore throat, breathlessness etc*
    - Check for fever, respiratory rate, pulse rate, oxygen saturation?
        - ? Fever >38^{0}C, ? Respiratory rate> 24, ?Pulse >120,
        - Systolic BP<100, oxygen saturation less than 90% (**suggest moderate to severe disease, will need admission)** See Table above on Categorization of COVID-19 symptoms.
        - Use appropriate levels for babies, children and pregnant women. e.g. for babies/younger children monitor for use of accessory muscles, respiratory rate > 40, pulse 140 etc.
        - For pregnant women the O_2 saturation should be above 94%

    - Is there suggestion or evidence of respiratory distress or sepsis? These patients should be classified as moderate/severe COVID-19 cases and will need to be admitted.
    - Exclude other causes of fever e.g. malaria. Can you do a malaria rapid diagnostic test (RDT)? What else might the patient have? Exclude other possible diagnoses.

- **Refer for admission** if RR>24, pulse >120, oxygen saturation less than 90%. ***Start oxygen supplementation as soon as possible.***
- **For children, admit all showing respiratory distress.**
- **If mild symptoms with no risk factors**, proceed to contact the district call centre for dispatch of the RRT to test the patient and move to a designated isolation facility if home conditions do not allow for self-isolation.
- **If mild symptoms with risk factors or moderate to severe disease**, contact the call centre for ambulance dispatch to refer to appropriate COVID19 treatment isolation centre.

- **If COVID-19 is suspected, probable or confirmed**:
  - Assess as above
  - Can you test for COVID-19? Can you collect the nasopharyngeal samples?
  - Can you call the Rapid Response Team?

- **If confirmed COVID-19**, try and classify into Mild or Moderate/Severe (see Table above)
  - **? Mild symptoms**
  - **Assess for home-based care.**
    - If mild symptoms, can they be managed at home or does the patient need admission? Are there any high risk factors?
  - If going home, can they self-isolate for 14 -21 days
    - Do they live alone or are there many people at home?
    - Do they have a caregiver at home?
    - Can they be in their room alone without exposing other people?
    - Can they sleep in their own bed alone?

  - Should they be sent to a health associated Isolation centre?
  - If going home, inform patients that if their condition worsens they should call the local Rapid Response Team for further advice. (Or Phone 2019 or call you i.e. clinic, VHW, Community healthworker).
  - If you feel they are likely to expose others to coronavirus at home, refer to facility for self-isolation rather than allowing them to go home.

- **? Moderate/Severe symptoms**
- **Arrange for admission to your nearest isolation centre/hospital**
  - Evidence of severe acute respiratory infection (SARI) e.g. respiratory distress signs, RR >24, pulse >120, systolic BP<100, low oxygen saturation<90% etc. Use appropriate levels for babies/children (refer to EDLIZ)
  - Give oxygen via nasal prongs (Maximum O_2 flow rate 5L/min)
  - AVOID OXYGEN FLOW RATES ABOVE 5L/min when using nasal prongs.
  - If oxygen saturations remain below 90% upgrade to a face-mask with a reservoir bag**.**

*******Call Rapid Response Team / Ambulance and transfer to next level of care.***

At District Hospital level:

Clients may present directly to your setting and hence need to be managed as expected at a primary care clinic (*See above*)

- Establish a special area for screening for suspected COVID-19 patients E.g. a tent
- Manage your queues so that your visitors stand or sit at least 1 -2 metres from each other
- **Screen and triage your clients**
    - Screen all your visitors/patients to exclude COVID-19.
    - Triaging:
        - separate into COVID-19 suspects and non-COVID-19 suspects
        - Staff covering the screening station must have on appropriate PPE whenever seeing patients
- **Non-COVID-19 patients**
    - To be referred for care as per need
    - We need to continue to give our usual care to these patients.
- **COVID-19 suspects**:
    - Give them a mask. Put on your PPE if not already wearing it. Then assess patient.
    - Do they fit the COVID-19 case definition? (*See Case Definition Table above)*
        - *Symptoms e.g. fever, dry cough, tiredness, sore throat, breathlessness etc*
    - Check for fever, respiratory rate, pulse rate, oxygen saturation?
        - ? Fever >38^{0}C, ? Respiratory rate> 24,? Pulse >120,
        - Systolic BP<100, oxygen saturation less than 90% (**suggest moderate to severe disease, will need admission)** See Table above on Categorization of COVID-19 symptoms.
        - Use appropriate levels for babies, children and pregnant women. e.g. for babies/younger children monitor for use of accessory muscles, respiratory rate > 40, pulse 140 etc.
        - For pregnant women the O_2 saturation should be above 94% levels for babies, children and pregnant women
    - Exclude other causes of fever e.g. malaria.
        - Can you do a malaria rapid diagnostic test (RDT)?
        - What else might the patient have?
        - Exclude other possible diagnoses e.g. other bacterial pneumonias/ pulmonary embolism/ PCP/cardiac failure/other lung diseases
    - **Refer for admission** if RR>24, pulse >120, oxygen saturation less than 90%. Start oxygen supplementation.

- **If COVID-19 is suspected, probable or confirmed:**
- Assess as above
  - Can you test for COVID-19? Can you collect the nasopharyngeal samples?
- Can you call for the Rapid Response Team?

Confirmed COVID-19

- **? Mild symptoms**
  - **Assess for home-based care.**
  - **Exclude high risk factors e.g. hypertension, diabetes, age >60 years, CKD, chronic lung disease etc**
  - If mild symptoms and no high-risk factors, can they be managed at home or does the patient need admission?
  - If going home, can they self-isolate for 14 - 21 days?
    - Do they live alone or are there many people at home?
    - Do they have a caregiver at home?
    - Can they be in their room alone without exposing other people?
    - Can they sleep in their own bed alone?
  - Should they be sent to a health associated Isolation centre?
  - If going home, inform patients that if their condition worsens they should call the local Rapid Response Team for further advice. (Or Phone 2019 or call you i.e. clinic, VHW, Community healthworker).
  - If you feel they are likely to expose others to coronavirus at home, refer to facility for self-isolation rather than allowing them to go home.
- **? Moderate/Severe symptoms-**
  - Arrange for admission into your isolation centre/ward.
  - Start oxygen supplementation via nasal prongs(Max 5L/min)
  - AVOID OXYGEN FLOW RATES ABOVE 5L/min with nasal prongs.
  - If oxygen saturations remain below 90% upgrade to a face-mask with a reservoir bag**.**
- Give empiric antibiotics as soon as possible
  - **Adults/ Adolescents- Ceftriaxone 2gram IV stat then 1gm bd for 7 days/ Azithromycin 500mg oral stat and then 250mg daily for 4 days**
  - **Children- Ceftriaxone 50-80mg /kg and Azithromycin 10mg/kg**
- Paracetamol 500mg -1gram orally every 6-8 hours for fever and fever-related symptoms
- Continue oxygen supplementation via nasal prongs or via face-mask with reservoir bag
  - Aim to increase oxygen saturation to above 90% (>94% for pregnant women and children)
  - Severe COVID-19 patients may require 10-15L/min of oxygen via a mask and reservoir bag
- Avoid nebulization as that generates aerosols and thus increasing risk of infection
  - COVID-19 positive asthmatic patients requiring salbutamol can use an inhaler but if nebulization is required it can be offered in a well-ventilated room or outside the room using an oxygen tank.

- Ensure adequate hydration. Keep patient euvolaemic all the time. Do not overload with intravenous fluids.
    - Allow patient to drink fluids as required
    - Avoid intravenous fluid if patient is not dehydrated
    - If patient is dehydrated, give preferably Ringer's Lactate (can also give Normal Saline if Ringer's Lactate is not available) at 1L 8-12hrly for 24 hours and then review
    - Do strict fluid input and output monitoring

CAUTION: *Patients with COVID-19 easily get pulmonary oedema.*
Avoid fluid overload. If they develop basal crackles and continue to desaturate, stop intravenous fluids.

At Provincial Level/ Central Hospital level

Clients may present directly to your setting and hence need to be managed as expected at a primary care clinic as above.

- Have you established a special area for screening for suspected COVID-19 patients? E.g. a tent
- Manage your queues so that your visitors stand or sit at least 1 -2 metres from each other
- **Screen and triage your clients**
    - Screen all your visitors/patients to exclude COVID-19.
    - Triaging:
        - Separate into COVID-19 suspects and non-COVID-19 suspects
        - Staff covering the screening station must have on appropriate PPE whenever seeing patients
- **Non-COVID-19 patients**
    - To be referred for care as per need
    - We need to continue to give our usual care to these patients.

- **COVID-19 suspects**:
    - Give them a mask. Put on your PPE if not already wearing it. Then assess patient.
    - Do they fit the COVID-19 case definition? (*See Case Definition Table above)*
        - *Symptoms e.g. fever, dry cough, tiredness, sore throat, breathlessness etc*
    - Check for fever, respiratory rate, pulse rate, oxygen saturation?
        - ? Fever >38^0C, ? Respiratory rate> 24, ? Pulse >120,
        - Systolic BP<100, oxygen saturation less than 90% (**suggest moderate to severe disease, will need admission)** See Table above on Categorization of COVID-19 symptoms.
        - Use appropriate levels for babies, children and pregnant women. e.g. for babies/younger children monitor for use of accessory muscles, respiratory rate > 40, pulse 140 etc.

- For pregnant women the O_2 saturation should be above 94% levels for babies, children and pregnant women

  - Exclude other causes of fever e.g. malaria.
    - Can you do a malaria rapid diagnostic test (RDT)?
    - What else might the patient have?
    - Exclude other possible diagnoses e.g. other bacterial pneumonias/ pulmonary embolism/ PCP/cardiac failure/other lung diseases
  - **Admit** if RR>24, pulse >120, oxygen saturation less than 90%. Start oxygen supplementation.

- **If COVID-19 is suspected, probable or confirmed:**
- Assess as above
  - Can you test for COVID-19? Can you collect the nasopharyngeal samples?
- Do you need to call for the Rapid Response Team?

- **Confirmed COVID-19**
- **? Mild symptoms**
  - **Assess for home-based care.**
  - **Exclude high risk factors e.g. hypertension, diabetes, age >60 years, chronic lung disease etc**
  - If mild symptoms and no high-risk factors, can they be managed at home or does the patient need admission?
  - If going home, can they self-isolate for 14 - 21 days?
    - Do they live alone or are there many people at home?
    - Do they have a caregiver at home?
    - Can they be in their room alone without exposing other people?
    - Can they sleep in their own bed alone?
  - Should they be sent to a health associated Isolation centre?
  - If going home, inform patients that if their condition worsens they should call the local Rapid Response Team for further advice. (Or Phone 2019 or call you i.e. clinic, VHW, Community healthworker).
  - If you feel they are likely to expose others to coronavirus at home, refer to facility for self-isolation rather than allowing them to go home.
  - **Admit** if RR>24, pulse >120, oxygen saturation less than 90% (**suggests moderate/severe disease).**
    - Start oxygen therapy via nasal prongs (Max 5l/min)
- **Moderate/Severe symptoms:**
  - Arrange for admission into your isolation centre/ward
  - Exclude other diagnoses e.g. other bacterial pneumonias/ pulmonary embolism/ PCP/cardiac failure/other lung diseases
  - Does the patient fall into the high risk group for poor outcome if COVID-19?
  - E.g. hypertension, chronic lung/heart disease/ diabetes, chronic kidney disease, under 1 year of age

Managing your moderate/severe COVID-19 Case:

- Admit to your isolation ward/centre
- Do portable CXR ?peripheral ground glass opacities and/or consolidation
- Conduct at a minimum the following blood tests e.g. FBC, U & Es, glucose, LFTs, blood cultures
- Give empiric antibiotics as soon as possible
    - **Adults/ Adolescents- Ceftriaxone 2gram IV stat then 1gm bd for 7 days/ Azithromycin 500mg oral stat and then 250mg daily for 4 days**
    - **Children- Ceftriaxone 50-80mg /kg and Azithromycin 10mg/kg**
- Paracetamol 500mg-1gm orally every 6-8 hours for fever and fever-related symptoms
- Continue oxygen supplementation using nasal prongs or mask and/or reservoir bag
    - aim to increase oxygen saturation to above 90% (>94% for pregnant women and children)
- Severe COVID-19 patients may require 10-15L/min of oxygen via mask and a reservoir bag.
- Avoid nebulization as that generates aerosols and thus increasing risk of infection
    - COVID-19 positive asthmatic patients requiring salbutamol can use an inhaler. If nebulization is required it can be offered in a well-ventilated room or outside the room using an oxygen tank.
- Ensure adequate hydration. Keep patient euvolaemic all the time.
    - Allow patient to drink fluids as required.
    - Avoid intravenous fluids if patient is not dehydrated.
    - If patient is dehydrated, give Ringer's Lactate) can use Normal Saline if Ringers Lactate not available) at 1L 8-12hrly. Aim for at least 40-60ml of urine every hour(i.e. at least 1-1.5L urine daily)
    - Do strict fluid input and output monitoring.

CAUTION: *Patients with COVID-19 easily get pulmonary oedema.*

6. ADMISSION OF PATIENTS INTO WARDS/HDU/ICU SETTINGS

General Notes:

- Aim to put COVID-19 patients in an isolation room, ideally a room with negative pressure ventilation or good ventilation system.
- To be managed by staff with full PPE
- If unable to isolate patient in their own room, avoid cross contamination by "cohorting" i.e. grouping patients according to their diagnosis/provisional diagnosis as follows,
    - Patient under investigation (suspected COVID-19) case
    - Negative COVID-19 case
    - Confirmed COVID-19 case
- Social visitors to these COVID-19 wards **should not be** allowed.

Managing Critical Cases

(Refer to HDU/ICU guidelines)

Such cases are likely to have underlying Sepsis/Septic Shock/Multi-organ failure. Investigate and treat accordingly.

- Does your patient have evidence of severe acute respiratory infection (SARI)?
    - Is the Systolic BP less than 100? O_2 saturation?
    - Check FBC, U&Es, LFTs, glucose.
    - What else do you need to do?
- Admit into HDU/ICU setting
- Continue oxygen therapy
    - Aim for oxygen saturation above 90%
- Continue antibiotics and supportive care
- Ensure patient is well hydrated
- ? Need for vasopressors/Inotropes
- Treat with support from Intensivists

Management of 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; tachypnoea; mottled skin or petechial or purpuric rash; increased lactate; oliguria; hyperthermia or hypothermia.
- For adults, give at least 30 ml/kg of isotonic crystalloid in 3 hours. 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 gelatines for resuscitation.
- Fluid resuscitation may lead to volume overload, including respiratory failure. If no response discontinue. This step is particularly important where mechanical ventilation is not available.
- 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.
- Vasopressors (VPs) can be given through a peripheral IV if a central line is not available but use a large vein and closely monitor for signs of extravasation and local tissue necrosis. If extravasation occurs, stop infusion. **VPs 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 inotropes e.g. dobutamine.

Respiratory support in severe respiratory distress

- Fortunately < 5% of all cases (adults included) will be critically ill requiring respiratory support.
- Children are generally asymptomatic with mild symptoms but they can still spread the infection.

Non-invasive respiratory support

Please note: CPAP/BiPAP should be avoided in patients with COVID-19 and should never be used outside of appropriate airborne /droplet isolation rooms with negative/neutral pressure.

- Humidified oxygen in the absence of appropriate airborne isolation potentially increases viral spread and must be avoided.
- A surgical face mask should be worn by the patient on nasal prongs to reduce droplet spread.
- Nebulizations of medications should be avoided because of the risk of viral aerosolization and spread. Bronchodilators should be administered using metered-dose inhalers.
- Nasal cannula (Oxygen Flow rate1-6 L/min)
- Hudson face mask
- Nonrebreather face mask(flow rates of 10-15L/min),which is typically minimum flow required to maintain bag inflation(FiO2 0.60-0.95).
- High flow nasal cannula (HFNC) up to 60-80L/min, FiO2 up to 1.0. This should only be used in selected patients with hypoxic respiratory failure. Patients with hypercapnia (exacerbation of chronic obstructive airways disease(COPD),cardiogenic pulmonary oedema), haemodynamic instability, multi-organ failure or abnormal mental status should generally not receive HFNO, although it might be safe in patients with mild to moderate and non-worsening hypercapnia.
- NIPPV should only be used in selected patients with hypoxemic respiratory failure. Risks of NIPPV include delayed intubation, large tidal volumes and injurious transpulmonary pressures.

Criteria for invasive respiratory support (intubation)

The decision to intubate is a multidisciplinary team (MDT) decision. Identify early warning scores for intubation to avoid emergency intubations.

Look for:

1. Increasing work of breathing despite non-invasive support
2. Haemodynamic instability requiring inotropes
3. Failure to maintain mentation.

Team for intubation

1. Laryngoscopy by most experienced intubator (Airway operator).
2. Use a “intubating box” or plastic shield when intubating patient
3. Assistant (doctor or nurse) to assist at bed side and keep mask seal in case of manual ventilation
4. Team leader (nurse or doctor) to administer medicines, document procedure and to ensure safety and infection control is being adhered to.
5. Warm zone runner
6. Cold zone runner
7. All team members to be in full PPE

Equipment preparation for intubation

1. ECG monitor
2. BP cuff (appropriate size)
3. Saturation monitor
4. Laryngoscope with appropriate blade and spare batteries
5. Video laryngoscopy if available
6. AMBU bag with filter between bag and mask
7. Endotracheal tube (ETT) -appropriate size plus one size above and one below
8. Introducer
9. Suctioning equipment, Yankauer and inline suctioning tube
10. Intubating medicines
11. End-Tidal Carbon dioxide ($ETCO_2$) monitor if available

Intubation procedure:

1. Ensure you have functioning intravenous access
2. Preoxygenate patient with 100% oxygen:
    a. Switch off oxygen to patient before removing face mask or nasal prongs.
    b. Apply the face mask using 2 HANDED VICE GRIP. Turn on oxygen and preoxygenate for 5 minutes.
    c. Avoid manual ventilation unless for rescue breaths (<20cmH_2O). Manually ventilating the patient has the risk of increasing droplet spread.
    d. If manually ventilating the patient with an AMBU bag, a filter between the bag and mask is required with patient under the clear plastic. If using a T-piece resuscitator, a filter is crucial.
3. Place clear plastic over patient to limit droplet spread

4. When giving manual ventilation use small tidal volumes and 2-person technique to optimise seal
5. If you have access to video laryngoscopy, intubate using video laryngoscope, if you have no access to video laryngoscopy utilize RSI intubation with the most skilled personnel carrying out the intubation
6. Assess ETT position using clinical parameters (check chest rise, avoid auscultation) and if available use $ETC0_2$ monitoring
7. Connect to ventilator
8. If available, utilize inline suctioning and gas scavengers on ventilator.
9. If available, use dual (bacterial and viral) filters between ETT and ventilator
10. Limit suctioning to only when it is necessary and utilise inline suctioning

Post intubation:

1. Clean surfaces and non-disposable items
2. Dispose disposable items in designated bins
3. Maintain strict infection control and use of PPE
4. Doff one person at a time to ensure safety under supervision of nurse documenting procedure

General patient management once on ventilator:

1. Fluid – in order to prevent flooding the lungs, be conservative with fluid, aiming for between 60% - 80% of daily requirements. Readjust total fluid intake daily according to previous day's fluid balance.
2. Utilize lung protective measures as for ARDS
    i. Tidal volume 4-8ml/kg predicted body weight.
    ii. Lowest driving pressure and lowest PEEP as possible. Keep driving pressures <15cm H_2O.
    iii. Consider high PEEP strategy if PaO_2/FiO_2 ratio is <150. There is need to monitor for baroterauma if using a high PEEP strategy. PEEP titration requires consideration of benefits.
    iv. Plateau pressure below 30cm H_2O
    v. Lower PIP < 30cmH20,
    vi. Permissive hypercapnia (accept higher CO_2 as long as pH on arterial blood gas (ABG) > 7.25)
    vii. PaO_2 60 mmHg
    viii. Permissive hypoxia (accept lower oxygen saturations (88 – 95%) as long as lactate < 2.5 on gas)
3. Avoid unnecessary disconnections of the patient from the ventilator, which results in loss of PEEP and atelectasis. If necessary the ventilator must be put on standby and the ETT clamped before any disconnections (e.g. transfer to a transport ventilator).
4. Prone patient. Consider early proning for 12-16 hours/day in patients with PaO_2/FiO_2 ratio <150**.(*Only if there are enough human resources and expertise to perform it safely***)
5. Sedation +/- paralysis (ensure patient is well sedated before paralysing as you do not want to paralyse an awake patient)

6. Avoid HFOV (high frequency oscillatory ventilation) because of increased risk of aerosolization

Cardiopulmonary resuscitation

1. Ensure staff safety first with full PPE
2. No PPE, no CPR
3. Do not carry out prolonged CPR if no return of spontaneous circulation
4. Consider Do Not Resuscitate (DNR) orders is certain circumstances.

7. PRIVATE SECTOR HOSPITALS / PRACTICE

All practice staff should be provided and instructed on the appropriate use of PPE. Strict adherence to good infection prevention and control practices is essential for protection of the staff and attending patients.

In General practice- encourage your patients to call you for advice if they have respiratory symptoms before coming to see you physically i.e. enciurage use of telemedicine.

At the point of arrival, screening should include at least the following:

- Ideally a surgical mask should be provided to all who enter the hospital/practice
- Inform clients/visitors that they should keep the face mask on at all times
- A surgical mask should be worn at all times including during transfer by ambulance.
- Establish a well-ventilated triage area for coughing patients e.g. place a tent in front of hospital/practice outside practice in a shaded area or in the practice car-park. Or find a separate room for isolation purposes
- Establish quarantine areas for managing patients who are potentially infectious (e.g. > 1 metre rule for physical /social distancing)
- Implement layout changes in waiting and consultation rooms to limit the spread of infection by allowing social/physical distancing (e.g. reception area, doctor's desk and chairs at least 1 metre away from client)
- Provide hand-washing signs and soap dispensers over sinks and/or alcohol based hand rub(>60% alcohol) in waiting room
- Provide tissues and non-touch waste bins
- Providing a "hygiene station" at the entrance to the hospital/practice with supplies of tissues, surgical masks and alcohol hand rub
- Remove all toy boxes and magazines.

Specific Case management notes:

- Refer to the recommendations in the previous sections as per public sector care.
- You should only admit potential COVID-19 cases in a designated isolation centre nearest to you.

*******Call Rapid Response Team / Ambulance and transfer to next level of care if you are not able to admit the client.***

8. HOSPITAL/ COMMUNITY DISCHARGE PROCESS

How do we decide when to discharge a COVID-19 case from care be in a hospital or at home?

- This decision will be based on clinical improvement as normally applied to e.g. other pneumonias/other clinical problems.
    - Are the symptoms resolving?
    - Has the fever settled? You need at least 3 days post fever resolution before discharging the patient
- Re-test the patient for COVID-19 before discharging or "de-isolating" the patient. "De-isolation" applies to those cases that have been managed at home or a community isolation centre
    - Re-test for COVID-19 using PCR at least 24-48 hours apart and discharge if the patient has been shown to be PCR negative twice.
- Recommend isolation for 7-14 days after discharge if not PCR tested prior to discharge to prove they have a negative COVID-19 test.
- How will the patient get home after discharge if still PCR positive?
    - Provide patient with face mask and hand sanitizer
    - Ensure they are aware of how to minimize transmission of coronavirus to others at home
    - Link them up with other service providers in their community for continuing support

Post –discharge in the community:

How does the patient behave or what should they do to prevent getting infected again?

- We have no concrete evidence that those infected with SARS-CoV-2 will develop immunity and if so, for how long they will be immune. We extrapolate that information from other viral infections where immunity develops but if this new coronavirus mutates, it is likely that one might get re-infected as happens with e.g. influenza.
- If a patient has been discharged on the basis of two negative COVID-19 tests, there will be no need for additional isolation post-discharge.
- If the patient has been discharged on the basis of clinical improvement and not had a confirmatory PCR test, the patient should self-isolate at home for 7-14 days after resolution of fever and shortness of breath

9. PSYCHOSOCIAL SUPPORT GUIDELINES

Psychosocial support guidelines are going to be targeted at different groups (Healthcare workers, people who test positive for COVID-19, are in quarantine/isolation and caregivers).

PSYCHOSOCIAL SUPPORT For Frontline Healthcare workers:

Selfcare

Frontline healthcare workers (including nurses, doctors, ambulance drivers, case identifiers, workers involved in dead body management and others) are at risk of developing psychological distress which may develop into panic disorder, anxiety and depression (Qiu et al., 2020). They need to be trained in personal self-care and managing COVID-19 -related stress/anxiety. It is recommended that they schedule regular debriefing sessions with a mental health specialist to prevent them from developing Post-Traumatic Stress Disorder.

Psychological First Aid

Frontline healthcare workers need to be trained on the WHO recommended Psychological First Aid (PFA) to support patients in trauma. Psychological First Aid is an evidence based modular intervention designed to help people during and after a crisis. Psychological First Aid will equip them with skills to provide support to people who are affected by COVID-19 and know how to link them with available mental health and psychosocial support resources.

Stigmatisation

Some healthcare workers handling patients with COVID-19 may face stigmatisation and experience avoidance by their family or community owing to fear of infection. This can make an already challenging situation far more difficult. Healthcare workers need to be trained to handle stigma around COVID-19. In addition, as people offer service, it is important to separate a person from having an identity defined by COVID-19, in order to reduce stigma. Do not refer to people with the disease as “COVID-19 cases”, “victims” “COVID-19 families” or “the diseased”. They are “people who have COVID-19”, “people who are being treated for COVID-19”, or “people who are recovering from COVID-19”.

PSYCHOSOCIAL SUPPORT for people with COVID-19, the bereaved and those in quarantine/isolation:

These people should be referred for counselling as soon as they are diagnosed or informed of isolation and quarantine. Attention should be paid to special/vulnerable groups (e.g. children, older adults, pregnant and lactating women, people at risk of and exposed to gender-based violence and people with disabilities). They should be followed up by a mental health specialist for psychosocial support together with their significant caregivers. The basic psychosocial support offered to include:

- Assessment of fear and stress
- Psychoeducation about fear, stress responses and COVID-19
- Normalizing physical and somatic symptoms

- Assessment of other COVID-19 related mental health problems such as generalized anxiety and depression
- Conducting relaxation and calming techniques
- Equipping client with self-help skills
- Addressing misconceptions about COVID-19 and mental illness
- Addressing issues of stigma
- Assess for negative coping strategies (e.g. substance abuse)
- Psychoeducation on accurate facts about COVID-19
- Referring for stepped up mental health care and other services
- For People in quarantine
    - Cognitive exercises
    - Relaxation exercises (breathing, meditation, mindfulness)
- For Bereaved people
    - Grief counselling
    - Family counselling

Available Psychosocial Support Resources

The following people should be referred for counselling/psychosocial support where they will be attended by mental health specialists who have been further trained to handle COVID-19 specific mental health issues:

- Those who test positive for COVID-19
- Those in quarantine/isolation
- Those who have been bereaved

The Department of Mental Health has mobilised mental health practitioners who have been divided to service all the 10 provinces in the country. The Provincial Mental Health Officers are the lead people and they each work with a team of at least ten mental health experts per province. The mental health experts can give free online services. Severe cases will be referred for stepped up care to a Psychiatrist and Clinical Psychologist dedicated to a specific province via online referral.

Table 5: Provincial Mental Health Coordinators 2020

PROVINCE	NAME	CONTACTS	
Matabeleland North	Chiratidzo Dube	077266861	duberatidzo@gmail.com
Matabeleland South	Maxmillion Mudeyi	0717401604	Maxmudeyi5@gmail.com
Manicaland	John Mhlanga	0773853040	mhlangaaku@gmail.com
Masvingo	Martina Nyazenga	0718727808	Mnyazeng21@gmail.com
Mashonaland Central	Yolanda Tapfumaneyi	0772616188	Ytapfumaneyi80@gmail.com

Mashonaland East	Priscah Matamva	0773426401	matambapriscah@gmail.com
Mashonaland West	Tichaona Mahachi	0773523657	tichmahachi@gmail.com
Midlands	Stella Khumalo	0772600778	Stellagaihai70@yahoo.com
Bulawayo	Dr Mawere	0773215281	docmawere@yahoo.com
Harare	Harare Hospital Psychiatric Unit & Parirenyatwa Annexe & Crisis Support Centre		

The MoHCC COVID-19 psychosocial support response team has developed mental health resources, i.e. self-help videos and material made for Zimbabwean by Zimbabweans, some in local languages. These self-help material are available online on the following platforms:

Website: www.soundmind.org.zw
Facebook: www.facebook.com/soundmindzim
Twitter: www.twitter.com/soundmindzim
Instagram: www.instagram.com/soundmindzim
YouTube: www.youtube.com/soundmindzim

A WhatsApp chatbot and mobile app are also under development to make services more accessible. It is a service powered by rules and sometimes artificial intelligence that runs on a **WhatsApp** platform. Users communicate with a **chatbot** via the chat interface, like how they would talk to a real person.

https://www.who.int/buruli/information/iec/en/

Information, Education and Communication materials are being developed and will be circulated through various social media platforms. Posters, pamphlets and fliers with contact details will be distributed to all clinical departments including mortuaries to increase visibility and awareness of mental health issues and available services.

Key messages that have been published to date include:

- Calming techniques
- Causes, symptoms and management of Stress, Anxiety and Depression
- How to deal with bereavement
- 20 signs that you could be abusing substances
- Psychological support for healthcare workers
- Substance abuse awareness
- Psychosocial support for parents (Guide on parent-led interventions for common behavioural problems)

Psychotropic drugs

There is need to support with base line medication for anxiety, depression and insomnia for severe cases. The following drugs should be made available:

- Amitriptyline
- Fluoxetine
- Lorazepam

Tools to be used by non-specialists

- Shona Symptoms Questionnaire (SSQ-14)
- Patient Health Questionnaire (PHQ-9)
- Generalized Anxiety Disorder (GAD-7)
- Post-Traumatic Stress Disorders Checklist (PCL 5)
- Child and Adolescent Trauma Scale (CATS)
- Alcohol Use Disorders Identification Test (AUDIT)
- Drug Use Disorder Identification Test (DUDIT)

Referral Pathway for the stepped-up care

- Psychosocial counseling provided by primary counselors
- Refer complicated cases to trained Nurse/ Psychiatric Nurse
- Sister in Charge for possible diagnosis (MhGap trained)
- Specialist for specialized services (Psychiatrist and Clinical Psychologist).

NB: Attention should be paid to special/vulnerable groups (e.g. children, older adults, pregnant and lactating women, people at risk of and exposed to gender-based violence and people with disabilities).

10. MANAGEMENT OF CHILDREN

Mother to child transmission of COVID-19 infection

- Pregnant women do not appear to be more susceptible to COVID-19
- No data yet suggesting vertical transmission from mother to child. A case series tested amniotic fluid, cord blood and neonatal throat swabs from COVID-19 infected mothers and the exposed neonates and all samples tested negative for the virus.
- As there is no evidence of intrauterine foetal infection with COVID-19, it is therefore currently considered unlikely that there will be congenital effects of the virus on foetal development.

Maternal admissions and neonatal resuscitation

- Women with proven/suspected COVID-19 who require admission should be admitted to a dedicated room in the labour suite.
- The neonatal team should be informed as soon as possible of this admission. All health personnel working in maternity units should be trained and educated in the use of PPE and standard infection control principles
- Appropriate PPE must be worn by any person entering the room.
- To minimize staff exposure, only essential staff should be present in the delivery room.
    - Neonatal resuscitation should proceed as per current guidelines.

Postnatal management of the neonate born to a mother with confirmed or suspected COVID-19 infection

- Transmission after birth via contact with infectious respiratory secretions is a concern. All babies born to COVID-19 positive mothers should have appropriate close monitoring and early involvement of neonatal care.
- We recommend that well babies born to women who test positive for COVID-19 should not be separated from their mothers.
- Standard precautionary measures must be taken by the mother in order to avoid transmitting the infection to the infant. This includes use of a face mask and handwashing before and after handling the infant.
- Babies born to COVID-19 positive mothers should only be tested if they become unwell.
- Unwell babies requiring admission into the neonatal unit should be nursed in isolation preferably in an incubator with only essential staff entering the room.
- COVID-19 positive parents **should not visit** their baby on the neonatal unit until they are no longer infectious (a minimum of 14 days from onset of symptoms).

Infant feeding

- There is limited evidence about transmission of coronavirus through breast milk. The benefits of breastfeeding far outweigh any potential risks.

- COVID-19 positive mothers well enough to breastfeed can continue breastfeeding while applying all the necessary precautions (face mask, handwashing before and after handling child, disinfection of surfaces).
- If the mother is not well enough to breastfeed she can be encouraged to express breast milk and the baby can be fed via a cup or spoon.
- If the mother is too unwell to breastfeed or express breast milk, an appropriate breast milk substitute acceptable to the mother that is available within the health service should be provided.
- There should be no promotion of breast milk substitutes, donation of feeding bottles and teats, in any part of the facilities giving maternity and newborn care.

Neonatal discharge and follow up

- All measures aimed at early discharge from the neonatal unit should be up-scaled.
- The infant may be discharged to mum if she is well enough to take care of the baby and standard precautionary measures to reduce transmission must be exercised.
- Consider telephone follow up where possible to avoid vulnerable infants attending clinics.
- Parents should be advised about reducing risk of infection (reduce social contact, increase hand-washing) and interventions aimed at preventing other diseases for example exclusive breastfeeding and immunizations should be optimized.

Flowchart: Neonate of suspected or confirmed COVID-19 Mother

Infant with suspected or confirmed COVID-19 infection

- Based on current literature most children are likely to have milder illness than adults.
- Keep children out of the healthcare system, hence infants with mild coughs or colds must stay at home.
- If an infant with possible COVID-19 presents to the emergency department they should be redirected to COVID-19 isolation area.
- The mother must be encouraged to continue breastfeeding. The infant and mother must be tested for COVID-19, if they are both well home quarantine must be advised whilst awaiting results.
- If the child is severely unwell they should be immediately admitted into an isolation cubicle were oxygen and resuscitation equipment is available.
- Only one parent /caregiver may accompany the infant to the isolation room and they must wear a face mask.
- Staff caring for the infant must be kept to the minimum possible and must wear appropriate PPE whenever they enter the room.
- Currently there is no definitive treatment for COVID-19 infection.
- Possible interventions in addition to COVID-19 testing may include;
    - Naso-gastric feeding of expressed breast milk
    - Supplemental oxygen to maintain saturation > 90%
    - Intravenous fluids
    - Antipyretics
    - Monitoring of vital signs
    - Severely ill infants may require intensive care admission for mechanical ventilation or critical care support.

11. MANAGEMENT OF PREGNANCY

Pregnant women do not seem to be at increased risk of severe disease; however, vigilance is required in this special group of women. Designated facilities should be established throughout the country to take care of pregnant women with COVID-19. COVID-19 response team (medical doctors, midwives, anaesthetists, physicians and neonatologists) should be established and trained to deal with this special group of women. Staff assigned to such facilities should be adequately trained and protected through use of the correct PPE.

Screening for COVID-19

- All pregnant women who visit health institutions should be asked/checked for the following:
    - Fever ≥ 38°C / cough / shortness of breath / sore throat/gastrointestinal symptoms etc
    - If answers to the above assessments are negative, routine pregnancy care should be continued.
    - If the answer to any of the above question is positive, the woman should be isolated and infection control measures should be practised. Give the patient a mask and staff to wear appropriate PPE. The COVID-19 Rapid Response Team(RRT) must be notified, and a sample collected (nasopharyngeal swab) to test for COVID-19 infection.

Management of suspected pregnant cases:

- **Assessment of severity:**
    - Clinical assessment of severity, which include physical examination, pulse oximetry (O_2 saturation should be kept above 94%)
- **Stable cases:**
    - Symptomatic treatment is recommended under self-isolation and remote surveillance by a designated health worker.(*Refer to section on primary care level management*)
    - Routine obstetric care is continued in designated facility adapted to look after COVID-19 cases.
- **Unstable cases**
    - Women with severe respiratory symptoms should be admitted for inpatient care in designated hospitals. Respiratory support is offered depending on the clinical severity.
    - Women with severe symptoms will need supportive treatment such as:
        - Oxygen support: SpO_2 to be maintained above >94%
        - Give empirical antibiotics:
        - Conservative fluid management
        - High dependency / ICU care when needed

Antenatal Care of women with COVID-19

- There is currently insufficient evidence to alter the antenatal care plan based on COVID-19 infection.
- As part of infection control, women with COVID-19 should be advised to skip antenatal care visit during the isolation period.
- If an antenatal care visit is needed, this should be done in a designated centre where infection control measures are strictly adhered to.

Delivery option

- There is currently no evidence that either delivery mode (NVD or Caesarean section) is advantageous in limiting disease severity or neonatal transmission of the virus.
- We recommend that delivery be guided by obstetric indication.
- The delivery should be done in a designated facility where infection control measures are strictly adhered to.
- The ideal theatre should have negative pressure ventilation facility and aseptic techniques should be applied before and after theatre.

Neonatal transmission

- There is currently no evidence of neonatal transmission hence routine testing of newborns is not recommended.
- Testing of symptomatic neonates is recommended. COVID-19 positive mothers well enough to breastfeed can continue breastfeeding while applying all the necessary precautions (face mask, handwashing before and after handling child, disinfection of surfaces).
- If the mother is not well enough to breastfeed, she can be encouraged to express breast milk and the baby can be fed via a cup or spoon.
- All babies born to COVID-19 positive mothers should have appropriate close monitoring and early involvement of neonatal care.
- Unwell babies requiring admission into the neonatal unit should be nursed in isolation.
- All infants born to COVID-19 positive mothers should have appropriate neonatal follow-up and ongoing surveillance after discharge. Family members should be educated about the steps to take in order to reduce the risk of transmission to the infant (reduce social contact, regular hand-washing) and interventions aimed at preventing other diseases (e.g. immunizations)

12. MANAGEMENT OF SURGICAL CASES

These recommendations are aimed at minimizing the adverse impact on surgical services and protect our members and patients while complementing efforts by government in halting the outbreak. The situation is rapidly evolving and requires a rapid responses and frequent reappraisal of existing guidelines as new evidence becomes available.

- Not meant to replace sound clinical judgment and pragmatism in specific clinical situations.
- Aim to achieve a balance between surgeon and patient safety.

Three principles to be observed:

- Protection of health care workers
- Protection of patients
- Maintenance of the appropriate safe level of surgical care that will minimize both surgical and COVID-19 related mortality and morbidity.

RECOMMENDATIONS

Rationing of surgical services. (Refer to NCEPOD Table below).

- All non-essential surgical activity should be postponed to minimize the chance of transmission between patients and health workers.
- Category 1 procedures (i.e. **Life-threatening/Limb-threatening)** should take precedence over Category 2 procedures
    - all decisions about allocation to a list should be made at the most senior level possible by both surgical and anaesthetic teams
- Surgical procedures in Category 3 and 4 are considered non-essential.
- Where surgical intervention is time-sensitive e.g. for a malignancy, the decision for surgery should be made by a multidisciplinary team

The urgency of surgical procedures should be categorised according to the NCEPOD Classification of Intervention as shown below:

Table 6: NCEPOD Classification of Intervention

NCEPOD Category	Definition	Examples
1. Immediate	Immediate life, limb or organ-saving intervention – resuscitation simultaneous with intervention. *Ideally surgery and anaesthesia within minutes of decision to operate*	Ruptured abdominal aortic aneurysm Necrotising fasciitis in a limb Laparotomy for perforated viscus
2. Urgent	Intervention for acute-onset or clinical deterioration of potentially life-threatening conditions, for those conditions that may threaten the survival of limb or organ, for fixation of many fractures and for relief of pain or other distressing symptoms. *Normally within hours of decision to operate*	Fixation of fractured neck of femur
3. Expedited	Patient requiring early treatment where the condition is not an immediate threat to life, limb or organ survival. Normally within days of decision to operate	Repair of tendon or nerve injuries, malignancy

4. Elective	Intervention planned or booked in advance of routine admission to hospital. Timing to suit patient, hospital and staff	Total hip replacement

13. MANAGEMENT IN DENTAL PRACTICE

To date globally, clusters of healthcare workers positive for COVID-19 have been identified in hospital settings and long-term care facilities, but no clusters have yet been reported in dental settings or personnel. Dental Health Care Professionals are classified in the ***very high exposure risk*** category, as their jobs have high potential for exposure to known or suspected sources of the virus that causes COVID-19 during specific procedures. Hence the following guidelines are recommended;

Dental setting increases the risk of exposure to microorganisms that infect the oral cavity and respiratory tract. Dental care settings invariably carry the risk of COVID-19 infection due to the specificity of its procedures and processes, which involves:

- face-to-face communication with patients,
- frequent exposure to saliva, blood, and other body fluids,
- the handling of sharp instruments
- contact with contaminated surfaces.
- generation of aerosols by dental equipment (hand pieces, scalers and triple syringes)

The pathogenic microorganisms can be transmitted through contact of conjunctival, nasal, or oral mucosa with droplets and aerosols containing microorganisms generated from an infected individual and propelled a short distance by coughing and talking without a mask and indirect contact with contaminated instruments and/or environmental surfaces.

Postpone Elective Procedures, Surgeries, and Non-Urgent Dental Visits

- Dental facilities to **postpone** elective procedures, surgeries, non-urgent dental visits and prioritize urgent, emergency visits and procedures for now until further guidance is issued.

Screening over the phone or before emergency treatment

- Assess the patient's dental condition over the phone and determine whether the patient needs to be seen in the dental clinic.

- If dental treatment can be delayed, provide patients with detailed instructions about self-care and options of medication they may use.

- If urgent treatment is necessary, pharmacological management with antibiotics and analgesics can be instituted.

Triage:

- Telephone triage all patients in need of emergency dental care, enquire about the COVID-19 risk by asking about the following:
- History of respiratory symptoms in the past 14 days including the following:
    - Temp ≥38^{0}C, cough, muscle aches, difficulty breathing, abdominal disturbances

- Date of onset of symptoms

- If the patient answers no to all the questions, proceed and see the patient.
- If they say yes to any of the above questions, investigate further so that treatment can be deferred or the patient referred to seek medical advice/ care through the nearest COVID-19 treatment facility.

Handling of emergency dental cases

- Treat every patient as if they are infected.
- Some infected patients may not show symptoms.
- Treat **under the strict screening and infection control protocols**
- Confirm again the above questions at the reception, and look out for visible symptoms which include coughing, fever and respiratory distress before they enter into the clinic. If there are signs of any form of acute respiratory infection, isolate the patient.
- There must be a room dedicated for isolation for any suspected or probable case of the COVID-19 infection that walks into the dental setting.
- Remove all literature/toys from the waiting area
- Disinfect all surfaces that the patient might have come into contact with eg chairs, tables, reception area
- Sanitize on entry and exit of any personnel using alcohol-based sanitizer.
- Social distancing should be observed. Make sure the waiting area is not crowded and a distance of more than 1 metre can be maintained among patients.
- Ideally space your patients' appointments to maintaining physical/social distancing.
- If patient is a suspected case
  - patient should be taken into the isolation room
  - offered a face mask
  - refer the patient to a COVID-19 treatment facility
  - Or call Rapid Response Team
- Follow the proper safety precautions as guided by the standard precautions on infection control and have the correct PPE for use and infection control protocol in place. Follow the routine practice and contact/droplets precautions wearing (N95 ideally, gloves, goggles, face shield and protective gowns).
- Do your best to manage the emergency without the generation of aerosol (high speed hand piece, triple syringe and scaler use).
- If doing an aerosol generation procedure, ensure you apply the highest level of infection prevention and control.

For suspected or confirmed COVID-19 patients:

Patients with active COVID-19 infection ***should not be*** seen in dental settings

- Give the patient a mask
- Postpone dental treatment but however manage pain
- Contact Rapid Response Team or refer to nearest COVID-19 using appropriate ambulance transfer.

Dental emergency definition:

The urgency of a procedure is a decision based on clinical judgment and should be made on a case-by-case basis.

Table 7: Classification of some common dental procedures

Dental emergencies *These are potentially life threatening and require immediate treatment to stop ongoing tissue bleeding, alleviate severe pain or infection,* • Oral facial trauma involving facial bones • Significant infection (cellulitis) that has a chance of progressing • Bleeding or pain that cannot be managed by over the counter medicine	**Urgent dental treatment** *These are done to relieve pain and or infection to reduce burden to emergency rooms and should be treated as minimally invasively as possible*. • Severe dental pain from pulpits • Pericoronitis • Dry socket • Localized abscess • Painful fractured tooth • Avulsion/luxation from trauma • Dental treatment prior to critical medical procedures • Crown or bridge cementation • Biopsy
Other urgent dental treatment • Extensive caries or open dentine causing pain • Suture removal • Denture adjustment • Replacing temporary filling on RCT access giving pain • Cutting wires on broken orthodontic wire/appliances causing pain or laceration	**Routine or non-urgent dental procedures includes but are not limited to:** • Initial or periodic oral examinations and recall visits, including routine radiographs • Routine dental cleaning and preventive therapies • Orthodontic procedures other than those to address acute issues (e.g. pain, infection, trauma) or other issues critically necessary to prevent harm to the patient • Extraction of asymptomatic teeth • Restorative dentistry including treatment of asymptomatic carious lesions • Aesthetic dental procedures

Protecting oral health workers

This will depend on emphasizing basic infection prevention measures. All employers should continue to implement good hygiene and infection control practices, including:

- Promote frequent and thorough hand washing protocol by providing workers, patients, visitors with a place to wash their hands
- Promote ease of access to hand sanitizers (>60% alcohol based)
- Encourage workers to stay home if they are sick.
- Encourage respiratory etiquette, including providing clients with tissues and trash receptacles.
- Discourage workers from using other workers' phones, desks, offices, or other work tools and equipment, when possible.

Infection Control Measures for Treatment

- Use of required protective wear correctly for every patient.
- Mandatory use of hydrogen peroxide mouth rinse before dental procedures and rubber dam and anti-retraction handpieces during dental procedures.
- Hand wash and hand sanitizing protocol to be adhered to before and after every procedure. Hand wash: Ethanol Alcohol based 60 % or Isopropyl Alcohol above 60%
- Disinfectants should have alcohol content (> 60 %, or Hypochlorite 0.1% or Glutaraldehyde solution 2.0%)

14. ROLE OF REHABILITATION SERVICES

Rehabilitation (physiotherapy & occupational therapy) plays critical roles in:

1. Primary care - provide education to avoid transmission
2. Community home care- recommendations for patients, families and carers
3. Acute hospital care
4. Post discharge care and follow up
5. Psychosocial management of patients and close relatives of patients

The following are guidelines of physiotherapy & occupational therapy management of potential and confirmed cases of COVID-19. It covers inpatients, critical care/ICU patients, quarantined and/or isolated patients, discharged patients, and relatives of affected patients.

[A] PHYSIOTHERAPY MANAGEMENT OF COVID-19 PATIENTS

Indications for physiotherapy

1. Ineffective cough
2. ICU acquired weakness (ICU-AW) which might indicate early rehabilitation post-acute phase
3. Comorbidities associated with hypersecretion and ineffective cough
4. Ventilated patients with inadequate airway clearance
5. Shortness of breath
6. Increased work of breathing
7. Severe respiratory failure
8. Weakness secondary to bed rest/prolonged hospital stay

PHYSIOTHERAPY INTERVENTION:

Respiratory care:

- **Airway clearance techniques** –
    - Positioning, (for example prone positioning)
    - Active cycle of breathing technique (ACBT),
    - Manual/ventilator hyperinflation
    - Percussions and vibrations
    - Positive expiratory pressure therapy (PEP)
    - Non-invasive ventilation (NIV) ie during respiratory failure, inspiratory pressure breathing (IPPB)
- **Facilitation of airway clearance**
    - Assisted cough stimulation
    - Cough stimulation manoeuvres eg trachea tickle.
    - Airway suctioning

Non-respiratory care:

- Passive movements & joint mobilizations
- Programmed turning & sitting sessions

- Muscle strengthening

Recommendations on Physiotherapy intervention:

1. Cough protocol
    - Educate patient on coughing, head should be turned away during coughing and expectoration
    - Able patient should catch cough with a tissue, dispose it and wash hands or assist if need be
    - Physiotherapist should stand >2m away from the cough /blast zone
2. The following are possible aerosol generating procedures (AGPs)if combined with airway clearance;
    - Huffing
    - Positioning/gravity assisted postural drainage, expiratory vibrations, percussions, manual/assisted coughing,
    - Use of positive pressure breathing devices eg IPPB
    - PEP
    - Nasopharyngeal or oropharyngeal suctioning
    - Manual hyperinflation
    - Open suctioning
    - Saline instillation via or open circuit/endotracheal tube
    - Inspiratory muscle training
    - Sputum inductions
    - Any mobilization that may result in expectoration

    Note: If these techniques are indicated they should be done in a negative-pressure room if available or a room with a single door with door closed
3. Where possible there should be single use respiratory equipment which should be disposable
4. Humidification or non-invasive ventilation (NIV) should be via agreement between the physiotherapists and the ICU doctors
5. Sputum induction should **not** be performed
6. If a sputum sample is required full airborne PPE precautions should be worn
7. Use ventilator hyperinflation more than manual
8. Positioning include gravity assisted drainage
9. Prone positioning including staff education on the goals of the treatment
10. Tracheostomy management - Close in-line suctioning is recommended since there are high chances of aerosolization. Airborne precautions are recommended for patients with COVID-19 with a tracheostomy

Recommendations on Mobilization, Exercises and Rehabilitation

1. There is passive, active assisted, active or resisted joint range of motion exercises to maintain or improve muscle strength, joint integrity and range of motion
2. Mobilization and Rehabilitation will include:
    - bed mobility,
    - sitting out of bed,

- sitting balance,
- sit to stand,
- walking,
- tilt table sitting/standing,
- standing hoists
- upper/lower limb ergometry

Important to note

1. During NIV, nasal cannulas should be avoided as they pose risk for droplet transmission during oxygen therapy. Therefore face masks are encouraged
2. Nebulisation and incentive spirometry are contraindicated during the acute phase
3. Focus should be paid on posture, sitting the patient passively using pillows and rolls; avoid active muscle contraction that may demand more on the respiratory system
4. Stethoscope use should be minimized. If required, use a dedicated stethoscope within isolation areas

Table 8: Indications For Physiotherapy

COVID-19 CONFIRMED or suspect	**Is Physiotherapy Needed?**
Mild symptoms	**No** intervention or contact
Pneumonia presenting with features; A low-level oxygen requirement eg oxygen flow <5L/min for SpO2>90% Non-productive cough or patient coughing and able to clear secretions independently	**No** intervention and contact
Mild symptoms and/ or pneumonia and co-existing respiratory or neuromuscular comorbidity e.g. cystic fibrosis, neuromuscular disease, spinal cord injury, bronchiectasis and COPD	**Yes:** • Staff use airborne precautions • Where possible patient should wear surgical mask during physiotherapy
Mild symptoms and/ or pneumonia and evidence of exudative consolidation with difficulty clearing or inability to clear secretions independently eg weak, ineffective and moist sounding cough, tactile fremitus on chest wall, moist/wet sounding voice, audible transmitted sounds	**Yes:** • Staff use airborne precautions • Where possible patient should wear surgical mask during physiotherapy
Severe symptoms suggestive of pneumonia/ lower respiratory tract infection e.g. increasing oxygen requirements, fever, difficulty breathing, frequent severe or productive coughing episode, chest X-ray /CT	**Yes:** • Consider physiotherapy for airway clearance • Physiotherapy may be indicated particularly if weak cough, productive and/ or evidence of pneumonia on imaging and/or secretion retention • Staff use airborne precautions

	• Where possible patient should wear surgical mask during physiotherapy
Any patient at significant risk of developing or with evidence of significant functional limitations e.g. frail, multiple comorbidities impacting on independence And mobilisation, exercise and rehabilitation in ICU patients with significant functional decline and ICU-AW	**Yes:** • Use droplet precautions • Use airborne precautions if close contact required or possible AGPs • If not ventilated patients should wear a surgical mask during any physiotherapy whenever possibe

Notes: Screening & Referral Guidelines On Indications For Physiotherapy (adopted from Thomas et al, 2020; Physiotherapy management of COVID-19 patients in the acute hospital setting, Journal of Physiotherapy)

Equipment related to physiotherapy respiratory care, per COVID-19 Treatment Unit:

- 6 Transmotion/Oxford chairs
- 10 high back seating chairs
- 3 Rollators
- 1 Tilt table
- 2 Cycle ergometers
- Steps/blocks

(These materials are in the patients' room)

[B] OCCUPATIONAL THERAPY MANAGEMENT IN COVID-19

Due to physical plus mental illness and confinement in isolation of the patient from his or her usual people and surroundings, the majority of COVID-19 patients will require occupational therapy.

The following issues will need to be addressed:

1. Health education about the condition. If a patient is informed about the condition he is better able to deal with it
2. Discussing with the patient their activity configuration so that they do not spend the whole day lying in bed
3. Reinforcing entertainment, television, radio, and internet access
4. Access to talking to family or friend- use of voice calls, video calls
5. Access to religious/spiritual leaders through phones or online sermons
6. Exercises, if patient can tolerate them, to enable for fitness
7. Helping patients in accessing resources
8. Adapting to new routines (constant washing, hygiene awareness, routine disposal of tissue and other material)
9. Supporting fellow health staff members adapt to new routines
10. Activities of daily living e.g. working, maintaining hygiene, disinfecting spaces
11. Communication - ensuring they have access to quality, scientific information.
12. Mobility re-education

13. Social isolation coping strategies
14. Mental health and wellbeing.
15. Vital need to access and use infection control measures
16. Reality orientation
17. Post-Traumatic Stress management
18. Grief management
19. Managing use of time as well as avoiding unhelpful coping strategies such as use of tobacco, alcohol or other drugs
20. Ensure availability of essential psychotropic medications at all levels of health care.
21. People living with long-term mental health conditions or epileptic seizures will need uninterrupted access to their medication, and sudden discontinuation should be avoided.
22. Older adults, especially those who are isolated and those with cognitive decline/dementia, may become more anxious, angry, stressed, agitated and withdrawn during the outbreak or while in quarantine. Provide practical and emotional support through informal networks (families) and health professionals.
23. Crafts; knitting crocheting, painting, drawing, depending with severity
24. Reinforcing reading
25. Where possible if they can continue with work for example use of internet
26. Some activities depend on the preference of the patient that we would have explored using role and interests checklists
27. Though sensitive, but for a dying patient, some may need to talk to their families before they die about e.g. inheritance plans, confessions. We should also be able to facilitate such activities even via online access.
28. Psychosocial support is needed for all healthcare workers involved in the management of COVID-19 patients since they may be separated from their families and also not used to wearing PPE.

Personal Protection Equipment needs for Rehabilitation Personnel:

All staff should be trained in donning and doffing of PPE including use of the N95 mask.

1. **BEARDS SHOULD BE REMOVED** to ensure proper mask fitting
2. Staff should wear the following in all suspected and confirmed cases (for droplet precautions):

    - surgical mask
    - fluid resistant long sleeve gown
    - goggles/face shield
    - gloves

3. When there is possible aerosolization, prolonged treated and close contact with the patient, the following should be prioritized (for airborne precautions):

    - an N95/P2 mask

- fluid resistant long sleeve gown
- goggles/face shield
- gloves
- Hair can be covered
- Wear shoes that are impermeable to fluids so that they can be wiped

4. Face mask should not be adjusted during patient care
5. Step by step donning and doffing should be supervised by an additional trained staff member
6. Personal items e.g. ear rings, necklaces, watches, mobile phones, pens, pages should be minimized in treatment areas
7. Avoid sharing equipment. Single use equipment encouraged
8. Wear an additional apron when there are high volumes of fluid exposure
9. There should be disinfection and cleaning of re-usable items such as goggles

15. PATIENT TRANSPORT BY AMBULANCE

(Details on transportation of patients See Annex 3)

- During the COVID-19 pandemic, strict procedures will be followed for the transportation of cases to one of the designated COVID-19 hospitals.
  - **Use designated ambulances for such transfers**
- Minimize transfer of admitted COVID-19 except for high care needs or referral to the next level of care from e.g. community/primary level care
- Need to practice strict adherence to infection prevention and control principles
- High level staff / full PPE (for both caring and transporting teams)
- Pre- arrival notification: bed to bed transfer if from another hospital. No need to go via Casualty

ANNEX 1: ASSESSMENT AND REFERRAL DOCUMENTATION

At every level of care, the following should be documented as much as possible.

Where have you referred the person?

? Home / Next level of care (Circle what applies)

A)Date of Review	
Name of patient: Date of Birth/Age: Sex: Home address:	
Is patient having mild or moderate/severe or critical symptoms?	
B) What are the patient's symptoms?	
1) Fever	
2) Cough	
3) Shortness of breath	
4) Sore throat	
5) Gastrointestinal	
6) loss of smell/taste	
7) Other symptoms:??	
C) Signs:	
1) Fever	
2) Pulse	
3) Blood Pressure	
4) Respiratory Rate	
5) Oxygen Saturation (%)	
6) Level of consciousness/Glasgow Coma Scale(GCS)	
7) Other signs:??	
D) Risk Factors	
1) Chronic heart disease	
2) Chronic lung disease	

3) Hypertension	
4) Diabetes	
5) HIV	
6) Other Conditions	
E) What is your assessment of the patient?	
8) Mild	
9) Moderate/Severe	
10) Critical	
F) Where are you referring the patient?	
1) Home	
2) Next level of care(Specify)	
3) How is the patient being transferred>	
Ambulance?	
4) Have you contacted the receiving facility to expect the patient?	Yes/No?
G) Has patient been collected?	
1) Time Ambulance/Rapid Response Team (RRT) called	
2) Time patient collected (Referring Facility)	
3) Time patient received (Receiving Facility)	

ANNEX 2: COVID-19 MANAGEMENT POSTER

Management of Patient Under Investigation for COVID-19 at entry to care
(Refer to latest Zimbabwe Guidelines for the management of COVID-19)

Infection Prevention and Control (IPC) measures to be applied throughout interactions with the patient

- Provide face-mask to the patient
- Health care worker to put on appropriate **Personal Protective Equipment as per PPE Policy & IPC Guidelines**
- Take a full history so that you can exclude other diagnoses e.g. PCP, bacterial pneumonia, pulmonary embolism, cardiac failure. Is there a travel history or contact with someone who recently travelled?
- Assess symptoms/signs -?Fever ≥ 38^0C ?Dry cough ?Shortness of breath ?Fatigue ?Gastrointestinal symptoms e.g. nausea, vomiting, diarrhea ?Loss of sense of smell/taste
- Measure respiratory rate? >24
- Oxygen saturation? <90%- **will need admission**
- Collect nasopharyngeal sample to test for COVID-19 infection. **(or Refer for testing)**

MILD CASE: *Room Air Oxygen >90%, Respiratory rate<24 breaths /min, Pulse<120 beats/min, Temperature<38^0C, Normal mental State.*

If symptoms are **mild**, patient can be advised on how to take care of themselves at home- practice good hand washing, cough etiquette, social distancing etc

MODERATE TO SEVERE CASE: *Room air saturation ≤90% at rest, respiratory rate >24 breaths / min Temp ≥ 38^0C, Abnormal mental state e.g. confusion*

If symptoms are **moderate/severe** and patient is in the high risk category i.e. elderly >60 years, has chronic conditions like HIV, diabetes, heart disease, hypertension, lung disease, CKD, cancers –**ADMIT**

As you prepare for admission:

- Give patient Oxygen via nasal prongs (max 5L/min) or via mask with non-rebreather(reservoir) bag (10-15L/min)
- Do the following tests: blood cultures, FBC, U &Es, Glucose, MPs/RDTs LFTS,? CXR
- Give **Ceftriaxone 2gm IV stat** and then Ceftriaxone 1gm twice a day for 7 days plus **Azithromycin 500mg orally stat** and then Azithromycin 250mg daily for 4 days (adults/adolescents)
- Give **Ceftriaxone (50-80mg/kg) plus Azithromycin (10mg/kg)** as above (for children)

ANNEX 3: PROPOSED TRANSPORTATION GUIDELINES FOR COVID-19 PATIENTS

INTRODUCTION

Any patient identified within the isolation centre or inpatient wards with suspected COVID-19 should be isolated in line with MOHCC policies and procedures. All care should be provided within the side room that the patient is isolated in.

If increased monitoring is required then consideration should be given to provide this where the patient is located; including, transfer of a HDU nurse or senior qualified nurse and core equipment to the patient. Consideration for transfer to HDU should only be in the situation where the care required cannot be delivered where the patient is isolated.

If the patient requires Level 2 care and this cannot be provided where the patient is isolated they should be transferred to the designated centres capable of taking care of the severity of the condition. The patient must wear a surgical mask in line with guidance during the transfer to HDU or ICU. Staff caring for the patient must wear PPE in line with MOHCC COVID-19 guidance.

If a patient is clinically deteriorating and potentially needs escalation to Level 3 care, then the following process MUST be followed. This decision will be made following clinical review by the on-call consultant anaesthetist and the involvement of the Rapid Response Team (RRT).

GENERAL GUIDELINES

- Minimize transfer except for high care needs
- Strict adherence to infection prevention control protocols
- Use of designated ambulance with strict disinfection protocols
- High level staff in PPE (caring and transporting teams)
- Pre- arrival notification: bed to bed transfer if from another hospital. No need to go via Casualty

IN-HOSPITAL/ISOLATION CENTRE TRANSFER

STAGE ONE

- Inform the senior nurse that a patient with suspected COVID-19 needs transfer to a level 2 or 3 due to deteriorating clinical condition.
- Receiving isolation ward will need to be vacated and prepared to receive the patient including the prepared COVID-19 equipment.
- Contact porters who will initiate the porter's procedure for discharge/transfer of COVID-19 patient.
- Transfer the patient to ICU-**isolation ward** using PPE in line with MOHCC COVID-19 guidance and ensuring the patient is wearing a surgical mask.

STAGE TWO

- Once the patient is in receiving isolation ward, access is to be restricted to key personnel; i.e. anaesthetist, OPD (Out-Patients Department practitioner) & RRT/HDU nurse. Out of hours the on call isolation team will need to be called in.
- Staff in isolation ward need to wear loose fitting hoods for all AGT((Aerosol Generating Treatment). Apply PPE as described in the MOHCC COVID-19 guidance.

STAGE THREE

- Whilst the patient is being intubated and stabilized, the HDU Nurse –in –Charge (NIC) needs to contact the Critical Care Network to identify a Level 3 bed
- Once a Level 3 bed has been identified, there needs to be a consultant to consultant and nurse to nurse handover.
- The command centre will need to be contacted to request a paramedic crew to transfer the patient to the receiving centre. **It is essential that command centre is informed the patient is suspected COVID-19 so that appropriate precautions and equipment can be put into place.**

STAGE FOUR

- Aerosol Generating Treatment (AGT) can cause the air and environment to become contaminated.
- Following intubation or Aerosol Generating Treatment (AGT) staff caring for the patient needs to continue to wear loose fitting hoods and PPE described in the MOHCC COVID-19 guidance.
- Follow donning and doffing technique for PPE.
- Access to isolation ward remains restricted.

STAGE FIVE

- Prior to transfer follow the referral policy and guidance from receiving centre on intravenous access and transfer clinical parameters.
- Follow the policy with regards to essential equipment required for the transfer of the patient. On every HDU there should be a **Disposable Level 3 Transfer Bag** specifically for use with a suspected COVID-19 patient.

STAGE SIX

- The core members of staff required to go on transfer with the patient are the anaesthetist, RRT / OPD (Out Patient Department Practitioner) and the paramedic crew.
- On transfer doffing of PPE must be completed and new PPE in line with MOHCC COVID-19 guidance should be worn.
- Contact porters who will initiate the porter's procedure for discharge/transfer of suspected COVID-19 patient.

STAGE SEVEN

- Once the patient has left the referring isolation centre, the isolation ward should be cleaned in line with MOHCC COVID-19 guidance. All non-cleanable equipment must be disposed of and stock replaced.
- Prior to leaving the receiving centre staff must decontaminate all wipe able equipment; i.e. pumps, ventilator. This equipment must be fully cleaned again on return to the referring isolation centre.

PRINCIPLES OF AIRWAY MANAGEMENT

BEFORE:
STAFF PROTECTION

- Hand Hygiene as per WHO guidelines
- Full recommended Personal protective equipment
- Minimise personnel during aerosol generating procedures

PREPARATION FOR TRANSPORT

- Early preparation of specific COVID-19 drugs and equipment
- Formulate plan early before transportation
- Meticulous airway assessment
- Used closed suctioning system
- Use video laryngoscopy if available and necessary

DURING:
TEAM DYNAMICS

- Clear delineation of roles among team members
- Clear communication of airway plan to team members
- Closed loop communication throughout
- Cross monitoring by all team members for potential contamination

TECHNICAL ASPECT

- Airway management by most experienced practitioners
- Tight fitting mask with two hand grip to minimize leak
- Ensure paralysis to avoid coughing
- Lowest gas flows possible to maintain oxygenation
- Rapid sequence induction and avoid bag mask ventilation where possible
- Possible pressure ventilation only after cuff inflated

PREPARATION FOR TRANSPORTATION

- Inform the receiving institution prior to arrival
- Confirm preparedness
- Confirm that isolation ward is ready including the COVID-19 equipment
- Make sure the porters for transport for transfer and receiving patients are ready
- Transfer the patient as per the following guidelines ensuing the patient is wearing a surgical mask:

SUSPECTED/CONFIRMED CASE TRANSPORTATION

- The core members of staff required to go on transfer with the patient are equipped and trained paramedic crews
- On transfer doffing of PPE must be completed and new PPE in line with COVID-19 guidance should be worn
- Give the patient a surgical mask
- Direct the patient into the ambulance
- Instruct the patient to cover his/her nose and mouth during coughing or sneezing with a tissue with a flexed elbow
- The patient should perform hand hygiene after contact with respiratory secretions (wash hands or use alcohol-based hand rub, must be readily available at the point of triage).

CONFIRMED CASE TRANSPORTATION

- Droplet and airborne precautions during transportation and care
- Careful intubation with minimal aerosol and minimum number of health workers guided by the clinical presentation
- Disposal of / disinfection of contaminated materials and surfaces
- Initiate Supportive care
- In case of death: handling of body as per guidelines

AFTERWARDS

- Avoid unnecessary circuit disconnection
- If disconnection needed wear PPE and standby ventilator +/- clamp tube
- Strick adherence to gowning steps
- Hand Hygiene
- Team debriefing

CLEANING THE AMBO AFTER TRANSPORTATION

- After transporting the patient, leave the rear doors of the transport vehicle open to allow for sufficient air changes to remove potentially infectious particles.
- The time to complete transfer of the patient to the receiving facility and complete all documentation should provide sufficient air changes.
- When cleaning the vehicle, EMS clinicians should wear a disposable gown and gloves. A face shield or facemask and goggles should also be worn if splashes or sprays during cleaning are anticipated.
- Ensure that environmental cleaning and disinfection procedures are followed consistently and correctly, to include the provision of adequate ventilation when chemicals are in use. Doors should remain open when cleaning the vehicle.
- Routine cleaning and disinfection procedures (e g, using cleaners and water to pre-clean surfaces prior to applying an EPA-registered, hospital-grade disinfectant to frequently touched surfaces or objects for appropriate contact times as indicated on the product's label) are appropriate for SARS-CoV-2 (the virus that causes COVID-19) in healthcare settings, including those patient-care areas in which aerosol-generating procedures are performed.
- Products with Environmental Protection Agency(EPA)-approved emerging viral pathogens claims are recommended for use against SARS-CoV-2.
- If there are no available Environmental Protection Agency(EPA)-registered products that have an approved emerging viral pathogen claim, products with

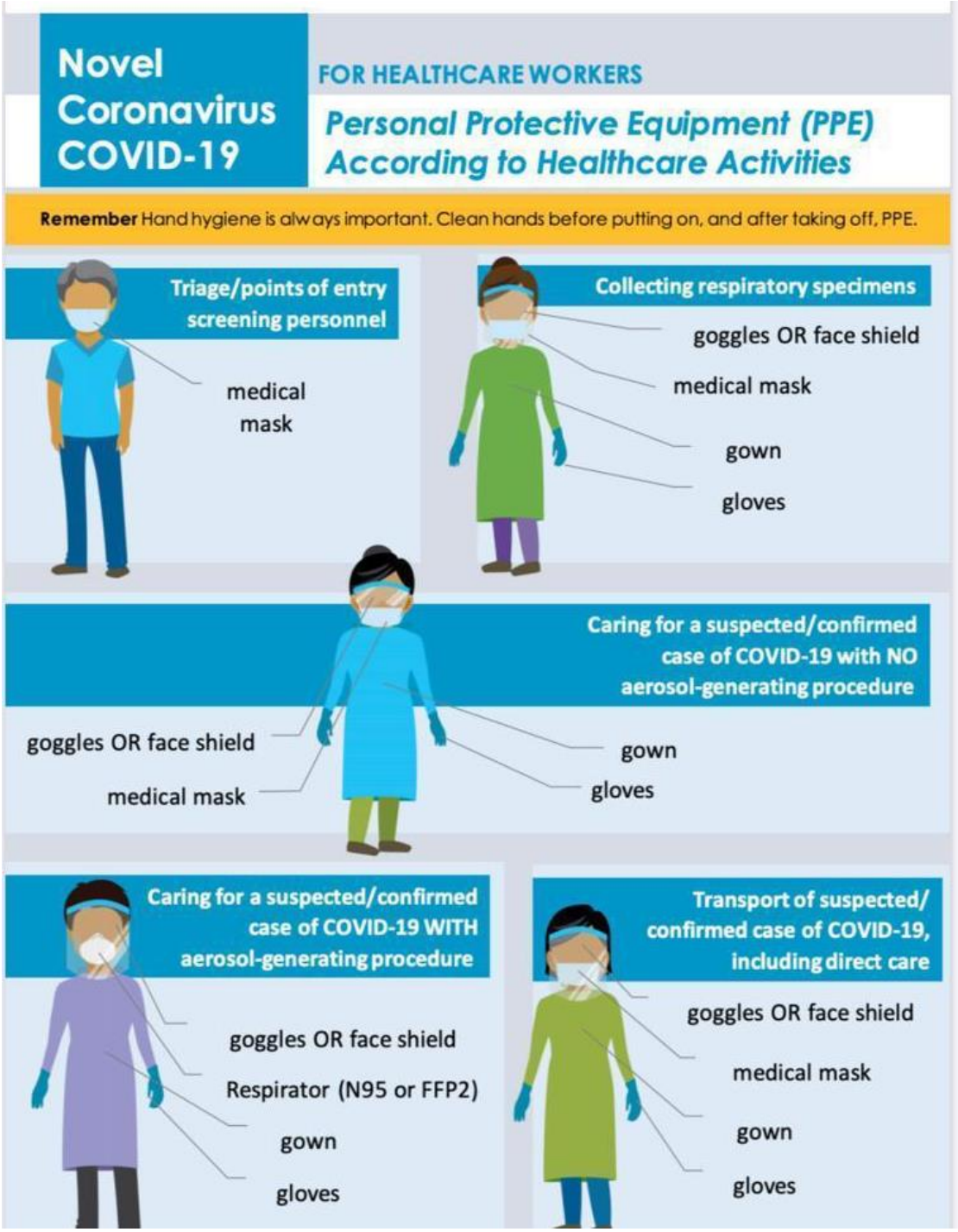
label claims against human corona viruses should be used according to label instructions.

- Clean and disinfect the vehicle in accordance with standard operating procedures. All surfaces that may have come in contact with the patient or materials contaminated during patient care (e.g., stretcher, rails, control panels, floors, walls, work surfaces) should be thoroughly cleaned and disinfected.
- Clean and disinfect reusable patient-care equipment before use on another patient, according to manufacturer's instructions.
- Follow standard operating procedures for the containment and disposal of used PPE and regulated medical waste.
- Follow standard operating procedures for containing and laundering used linen. Avoid shaking the linen.
- Principles of Airway Management of COVID-19 may apply to Operating Theatre, ICU, Emergency Department, and Ward Settings. Similar principles apply to extubation of COVID-19 patients.
- Aerosol Generating Treatment or Procedures (AGT/P): Tracheal Intubation, Non-Invasive Ventilation, Tracheostomy, Cardiopulmonary Resuscitation, Manual ventilation before Intubation, Bronchoscopy.
- PPE is according to the MOHCC recommendations, may include; Particulate respirator, Cap, Eye Protection, Long sleeved waterproof Gown, Gloves
- Definitions of suspected/ reportable case are as described in the MOHCC guidelines

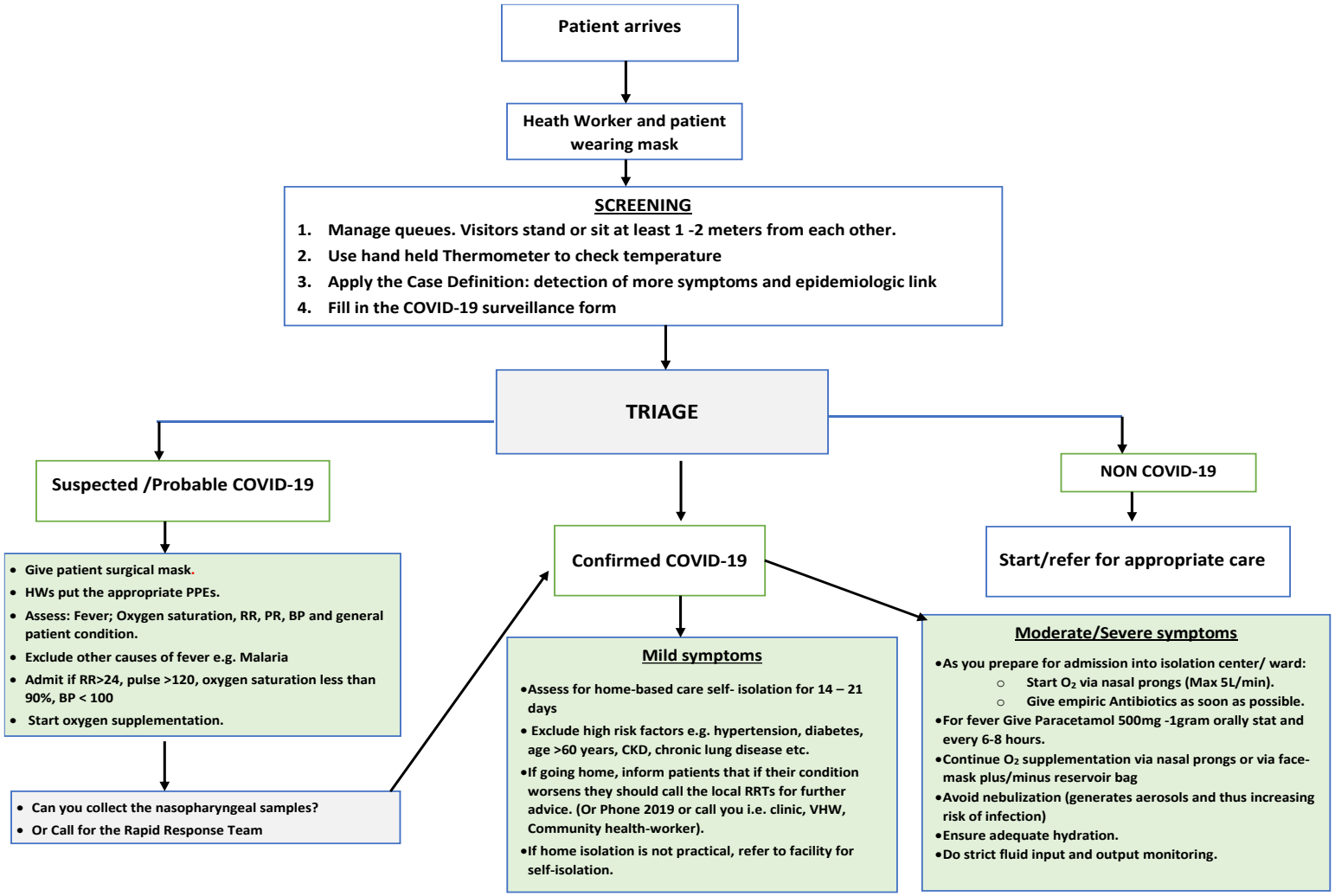
ANNEX 4: BASIC EQUIPMENT AND MEDICINES NEEDS AT VARIOUS LEVELS

- *Pulse oximeters*
- *Oxygen cylinders / Oxygen concentrators/ piped oxygen*
- *Nasal prongs/ "Venturi" masks with non-rebreather bags*
- *Infrared thermometers/temperature guns*
- *Glucometers*
- *Blood pressure machines/ sphygmanometers / with cleanable cuffs*
- *Stethoscopes- Able to decontaminate these. Keep these in room where they are being used*
- *Portable X-ray machines*
- *PPE- minimum surgical masks, gloves, goggles or face shield, gowns, aprons*
    - *N95 masks/Space suits for high risk areas e.g. HDU/ICU*
    - *Space suits for aerosol generating procedures*
    - *Head covers*
    - *Overshoes*
    - *Boots*
- *Hand sanitizers (>60% alcohol based)*
- *Home based care supplies- ? face masks, hand sanitizers, thermometers*
- *Medicines e.g. Paracetamol, Ceftriaxone, Azithromycin, IV fluids(Ringer's Lactate or equivalent fluid for children), Normal Saline, Dextrose 5%*
- *Lab testing services- e.g. FBC/U & Es/ Glucose/MPs/malaria RDTs/LFTs*
- *Other medicines as per national list of essential medicines and level of care*

ANNEX 5: ADAPTED FROM WHO PPE GUIDANCE



ANNEX 6: TRIAGING FLOWCHARTS



REFERENCES

1. MGH COVID treatment Guidance Version 1.03/17/2020
2. BMJ Visual Summary March 2020
3. WHO COVID-19 guidelines 2020
4. Red Cross War Memorial Children's Hospital, Cape Town Intubation of suspected Covid patient PICU guidelines
5. Red Cross War Memorial Children's Hospital, Cape Town, Intubation checklist
6. Albert Luthuli Central Hospital, Durban, Intubation of person under investigation or with confirmed COVID-19 guidelines
7. International pulmonologists consensus on COVID-19
8. Sarah Carr-Cave Head of Nursing Division 2 Stabilisation and Transfer of a critically ill patient with suspected Covid-19; The Royal Orthopaedic Hospital, NHS Foundation Trust.
9. http://roh-intranet/HDUReference
10. World Health Organization, Infection Prevention and Control during health care when novel coronavirus(nCoV) infection is suspected Interim guidance January 2020
11. Center for Disease Control and Infection Prevention and Control Recommendations for patients with confirmed 2019Novel Coronavirus(2019-nCoV) or Persons Under Investigation for 2019-nCoV in Healthcare Settings, February 2020.
12. Orloff KE, Turner DA, Rehder KJ. The current state of paediatric Acute Respiratory Distress Syndrome. Peadiatr Allergy Immunol Pulmonol. 2019;32(2): 35 - 44.doi:10.1089/ped.2019.0999
13. Royal College of Obstetricians and Gynaecologists. Coronavirus (COVID-19) Infection in Pregnancy. Published 18 the March 2020.
14. Royal College of Paediatrician and Child health. COVID-19 guidance for paediatric services. Accessed on the 20th of March 2020.
15. Infant and Young Child Feeding in the Context of the COVID-19 Pandemic Eastern, Central and Southern Africa.
16. Queensland Clinical Guideline: Perinatal care of suspected or confirmed COVID -19 pregnant women. Published 26 March 2020
17. RCOG. Coronavirus (COVID-19) infection and pregnancy [Internet]. 2020. Available from:
18. https://www.rcog.org.uk/globalassets/documents/guidelines/coronavirus-COVID-19-virusinfectionin-pregnancy-2020-03-09.pdf
19. Chen H, Guo J, Wang C, Luo F, Yu X, Zhang W, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. 2020;6736(20):1–7.
20. Wang X, Zhou Z, Jianping Z, Zhu F, Tang Y, Shen X. A case of 2019 Novel Coronavirus in a pregnant woman with preterm delivery. Clin Infect Dis. 2020.

21.
22. Zhu H, Wang L, Fang C, Peng S, Zhang L, Chang G, et al. Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia. 2020;9(1):51–60.
23. Liu Y, Chen H, Tang K, Guo Y. Clinical manifestations and outcome of SARS-CoV-2 infection during pregnancy. J Infect [Internet]. 2020; Available from: http://www.ncbi.nlm.nih.gov/pubmed/32145216
24. Schwartz D, Graham A. Potential Maternal and Infant Outcomes from Coronavirus 2019-nCoV (SARS-CoV-2) Infecting Pregnant Women: Lessons from SARS, MERS, and Other Human Coronavirus Infections. Viruses. 2020;1–16.
25. Shek CC, Ng PC, Fung GPG, Cheng FWT, Chan PKS, Peiris MJS, et al. Infants Born to Mothers with Severe Acute Respiratory Syndrome. 2020;112(4).
26. Wang L, Shi Y, Xiao T, Fu J, Feng X, Mu D, et al. Chinese expert consensus on the perinatal and neonatal management for the prevention and control of the 2019 novel coronavirus infection (First edition). 2020;8(3):1–8.
27. Poon et al. ISUOG Interim Guidance on 2019 novel coronavirus infection during pregnancy and puerperium: information for healthcare professionals. 2020.
28. Interim Considerations for Infection Prevention and Control of Coronavirus Disease 2019 (COVID-19) in Inpatient Obstetric Healthcare Settings.
29. www.cdph.ca.gov
30. www.cdc.gov
31. www.cda.org
32. www.ada.org