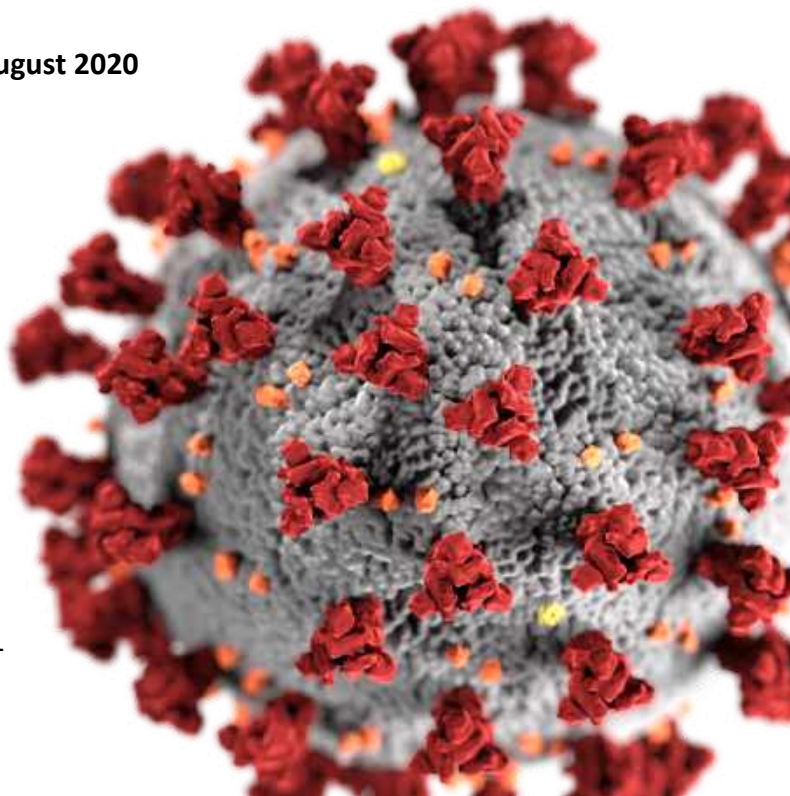
Case Management

Standard Operating Procedure

Version 4.0

Date: 25 August 2020



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Acronyms

ACTT-1 Trial	Adaptive Covid-19 Treatment Trial
AGP	Aerosol Generating Procedure
ALT	Alanine Amino Transferase
ARDS	Acute Respiratory Distress Syndrome
AST	Aspartate Amino Transferase
BMI	Body Mass Index
BNP	Brain Natriuretic Peptide
CICO	Can't Intubate Can't oxygenate
COVID-19	Coronavirus disease 2019
CPAP	Continuous Positive Airway Pressure
CRCL	Creatinine Clearance
CRP	C-reactive Protein
CT	Computerized tomography
CXR	Chest X-ray
DVT	Deep Vein Thrombosis
ECMO	Extra Corporeal Membrane Oxygenation
ENT	Ear Nose and Throat
ET CO2	End Tidal Carbon Dioxide
ETT	endotracheal tube
FIO2	Fraction of Inspired Oxygen
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
HFNO	High Flow Nasal Oxygen

HH	Hand Hygiene
HIV	Human Immunodeficiency Virus
HR	Heart rate
ICU	Intensive Care Unit
IPC	Infection Prevention and Control
LDH	Lactate Dehydrogenase
LFT	Liver Function Tests
LMWH	Low Molecular Weight Heparin
LOC	Level of consciousness
MAP	Mean Arterial Pressure
MISC-C	Multisystem Inflammatory Syndrome in Children
MoHSS	Ministry of Health and Social Services
MRSA	Methicillin Resistant Staph Aureus
NIV	Non-Invasive Ventilation
OI	Oxygen Impairment
OR	Odds Ratio
OSI	Oxygen Saturation Index
PEEP	Positive End Expiratory Pressure
PO	Per OS
PPE	Personal Protective Equipment
QD	Once Daily
RCT	Randomised Control Trial
RECOVERY Trial	Results of Controlled open-label Randomised Evaluation of COVID-19 therapy
RR	Respiratory rate

RTI	Respiratory tract infection
RT-PCR	Reverse transcription polymerase chain reaction
SARI	Severe Acute Respiratory Infection
SD	Standard Deviation
WHO	World Health Organisation

Purpose

The Standard Operating Procedure (SOP) is a guide to the workflow for the Case Management Pillar of the National COVID-19 Response in Namibia. It is complementary to the National Response Plan on COVID-19 in Namibia. **The guide is for use by all health care workers in both state and all private institutions in Namibia**. It replaces all current and previous COVID-19 guidance. It provides guidance on timely, effective and safe supportive management of patients with suspected and confirmed COVID-19 at community and health facility level (clinic, health centre, hospital) for both private and public facilities. It is being constantly updated as new information is available and providers should always ensure that they are using the most up to date guideline version.

Responsibilities

The goal in clinical management of cases is to reduce morbidity and mortality and minimise transmission to uninfected contacts. Triaging patients and early identification of patients who are severely or critically ill that require hospital or ICU admission will be essential in reducing morbidity and mortality.

Scope

The procedures herein can be applied at national, regional, district (health facility) and community level.

Introduction

Patients with confirmed COVID-19 who need hospitalization can be managed at either state or private hospitals depending on where the patient presented. This is to minimize referrals which further expose more healthcare workers to COVID-19.
According to WHO, about 81% of patients with COVID-19 may have mild disease; 14% of patients will have severe disease that requires oxygen therapy or other inpatient interventions; and about 5% have critical disease that requires mechanical ventilation.

Clinical Signs and Symptoms

Symptoms that may be seen in patients with COVID-19
Fever
Cough
Dyspnoea (new or worsening over baseline)
Anosmia or other smell abnormalities
Ageusia or other taste abnormalities
Sore throat
Myalgias
Chills/rigors
Headache
Rhinorrhoea and/or nasal congestion
Nausea/vomiting
Diarrhoea
Fatigue
Confusion
Chest pain or pressure

Risk factors for Severe Disease Table 1

Risk Factors for COVID-19 Disease Progression		
Epidemiological	***Vital Signs***	***Laboratory***
Age >50	Respiratory rate > 24	D-dimer > 1000 ng/Ml
Cardiovascular disease	Heart rate > 125 beat/min	CPK > twice upper limit of normal
Chronic lung disease	SpO2 ≤ 94% on room air	CRP > 100
Diabetes mellitus	PaO2/FiO2 < 300 mmHg	LDH > 245 U/L
Hypertension		Elevated troponin
Chronic kidney disease		Admission absolute lymphocyte count < 0.8
Obesity (BMI > 30)		Ferritin > 500 ug/L
Smoking		
Cancer (hematologic malignancies, lung cancer, metastatic disease)		

COVID-19 Disease Severity Table 2

Disease Severity Classification	Criteria	Treatment Recommendations
Mild disease	Symptomatic patients without evidence of viral pneumonia or hypoxia	Supportive care
Moderate disease (Pneumonia)	**Adolescent or adult** with clinical signs of pneumonia (fever, cough, dyspnoea, fast breathing) but no signs of severe pneumonia. **Child** with clinical signs of non-severe pneumonia (cough or difficulty breathing + fast breathing and/or chest indrawing) and no sign of severe pneumonia. Fast breathing (in breaths/min): <2 months: ≥60; 2-11 months: ≥50; 1-5 years: ≥40. While the diagnosis can be made on clinical grounds; chest imaging (radiograph, CT scan, ultrasound) may assist in diagnosis and identify or exclude pulmonary complications.	Supportive care Remdesivir for up to 5 days **only** for patients >50 or with comorbidities
Severe disease (Severe Pneumonia)	**Adolescent or adult** with clinical signs of pneumonia (fever, cough, dyspnea, fast breathing) plus one of the following: respiratory rate >30 breaths/min; or SpO2 ≤94 on room air. **Child** with clinical signs of pneumonia (cough or difficulty in breathing) + at least one of the following: • Central cyanosis or SpO2 <90%; severe respiratory distress (e.g. fast breathing, grunting, very severe chest indrawing; general danger sign: inability to breastfeed or drink, lethargy or unconsciousness, or convulsions • Fast breathing (in breaths/min: <2 months: ≥60; 2-11 months: ≥ 50; 1-5 years: ≥40 While the diagnosis can be made on clinical grounds: chest imaging (radiograph, CT scan, ultrasound) may assist in diagnosis and identify or exclude pulmonary complications	Supportive care **Plus** Remdesivir for up to 5 days **Plus** Dexamethasone for up to 10 days
Critical disease **Acute respiratory distress syndrome (ARDS)**	**Onset:** within 1 week of a known clinical insult (i.e. pneumonia) or new or worsening respiratory symptoms. **Chest imaging:** (radiograph, CT scan, or lung ultrasound): bilateral opacities, not fully explained by volume overload, lobar or lung collapse, or nodules. **Origin of pulmonary infiltrates:** respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g. echocardiography) to exclude hydrostatic cause of infiltrates/oedema if no risk factor present. **Oxygenation impairment in adults:** • Mild ARDS: 200 mmHg < PaO2/FiO2a ≤ 300 mmHg (with PEEP or CPAP ≥ 5 cmH2O). • Moderate ARDS: 100 mmHg < PaO2/FiO2 ≤ 200 mmHg (with PEEP ≥ 5 cmH2O). • Severe ARDS: PaO2/FiO2 ≤ 100 mmHg (with PEEP ≥ 5 cmH2O).	Complication specific supportive care **Plus** Dexamethasone for up to 10 days

	Oxygenation impairment in children: note OI and OSI.c Use OI when available. If PaO2 not available, wean FiO2 to maintain SpO2 ≤ 97% to calculate OSI or SpO2/FiO2 ratio: • Bilevel (NIV or CPAP) ≥ 5 cmH2O via full face mask: PaO2/FiO2 ≤ 300 mmHg or SpO2/FiO2 ≤ 264. • Mild ARDS (invasively ventilated): 4 ≤ OI < 8 or 5 ≤ OSI < 7.5. • Moderate ARDS (invasively ventilated): 8 ≤ OI < 16 or 7.5 ≤ OSI< 12.3. • Severe ARDS (invasively ventilated): OI ≥ 16 or OSI ≥ 12.3.	
Sepsis	**Adults:** acute life-threatening organ dysfunction caused by a dysregulated host response to suspected or proven infection. Signs of organ dysfunction include: altered mental status, difficult or fast breathing, low oxygen saturation, reduced urine output, fast heart rate, weak pulse, cold extremities or low blood pressure, skin mottling, laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate, or hyperbilirubinemia. **Children:** suspected or proven infection and ≥ 2 age-based systemic inflammatory response syndrome (SIRS) criteria of which one must be abnormal temperature or white blood cell count.	
Septic shock	**Adults:** persistent hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥ 65 mmHg and serum lactate level > 2 mmol/L. **Children:** any hypotension (SBP < 5th centile or > 2 SD below normal for age) or two or three of the following: altered mental status; bradycardia or tachycardia (HR < 90 bpm or > 160 bpm in infants and heart rate < 70 bpm or > 150 bpm in children); prolonged capillary refill (> 2 sec) or weak pulse; fast breathing; mottled or cool skin or petechial or purpuric rash; high lactate; reduced urine output; hyperthermia or hypothermia.	

Admission Criteria

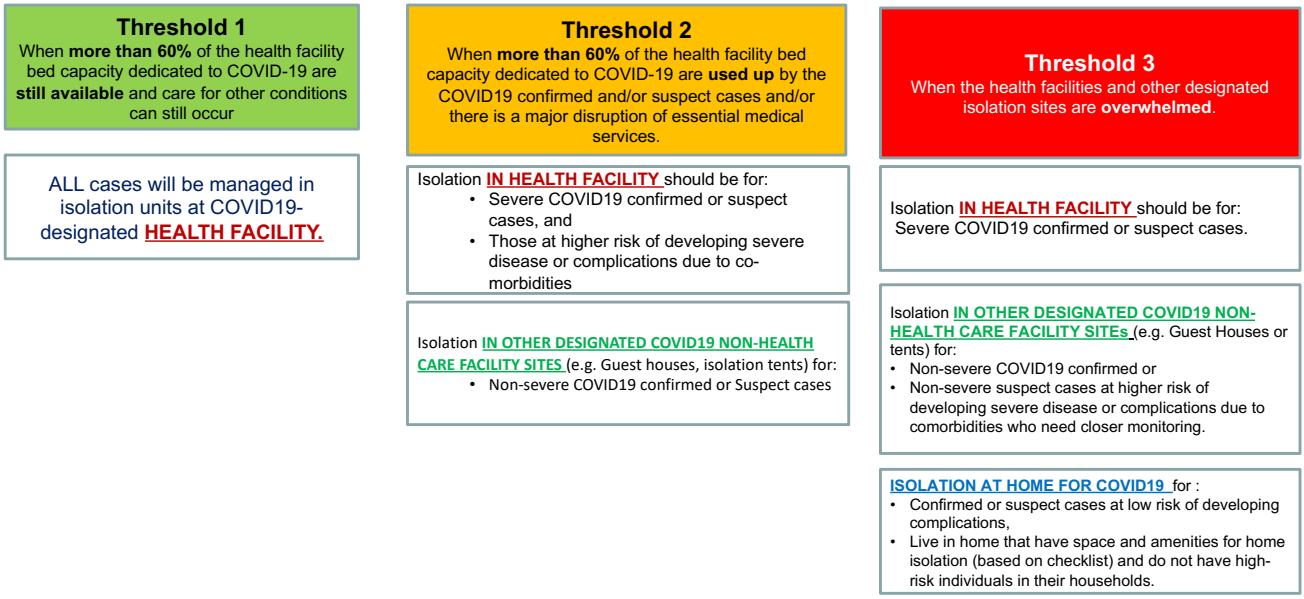
Patients with a mild clinical disease (absence of viral pneumonia and hypoxia) may not initially require hospitalization, and they can be managed at non-healthcare isolation facilities. Patients with moderate, severe and critical disease should be managed in healthcare isolation facilities. Patients with critical disease will be managed in ICUs designated for COVID-19 care. Consider de-escalating from healthcare to non-healthcare isolation facility when patient is clinically stable and meeting following criteria:

- Oxygen saturation ≥ 94%
- Respiratory rate < 22
- BP > 90/60
- No signs of increased work of breathing, respiratory distress
- Asymptomatic for > 72 hours

Table 3

Disease Severity	Admission
Mild disease	Non-healthcare isolation facility or home (see criteria below)
Moderate disease	Healthcare isolation facility
Severe disease	Healthcare isolation facility with oxygen
Critical disease	Healthcare isolation facility (ICU)

Isolation Criteria Table 4



Referral Guide for Patients Suspected or Confirmed

COVID-19 is a highly infectious disease thus it is best managed at local facilities if adequate care is available. Minimizing movement of the patient will ensure that few health care workers and other support staff are potentially exposed to the virus. There are however instances when there are no options but to refer the patient to the next level. Familiarize yourself with the medical response teams in your districts. Please see below for guidance.

Table 4

Type	Level of Care	Guide
Mild Disease *(See management of mild disease)*	Primary level Can be managed at specific isolating facilities in your districts or home	**Seek guidance** from local consultants if patient is a high risk *(See table on classification)* **Refer to next level** if patient develops shortness of breath and or reduced oxygen saturation <93% in room air. Before referral to an isolation facility with oxygen services always call the facility first. This will ensure that they prepare. **Call the medical response team** in your district or region to arrange for safe referral.
Moderate Disease	Primary level	**Seek guidance** from local consultants if patient is a high risk *(See table on classification)* **Refer to next level** if patient develops shortness of breath and or reduced oxygen saturation <93% in room air. Before referral to an isolation facility with oxygen services always call the facility first. This will ensure that they prepare. **Call the medical response team** in your district or region to arrange for safe referral.
Severe *(See management of severe disease)*	District level Facility needs isolation rooms and oxygen supply	**Refer to Intermediate Hospital** if patient deteriorates despite provision of oxygen and other support services. This patient will need ICU services. Before referral, **call first to get more guidance**.

Note only refer out of a district or region if there is no facility, private and public not able to manage the patient and after consultation with Case Management consultants.

Transportation and Patient Handover

If the patient requires transportation it is important to follow recommended channels as stipulated by the MOHSS. The Regional Case Management chair should be aware of the transportation of such patients, inquire to confirm location and direction well in advance. The guidelines below are aimed at reducing contamination:

- Ensure that the vehicle partition is closed or sealed throughout the incident to avoid exposure t
- o the driver.
- Consider the removal of non-essential equipment from the vehicle or moving non-essential equipment to a closed compartment in provided clear plastic bags prior to loading the patient in the vehicle.

- Avoid opening cupboards and compartments unless essential, if equipment is likely to be required then remove from the cupboard prior to loading patient.
- Air conditioning/ ventilation on vehicles, MUST be set to extract and NOT recirculate the air within the vehicle.
- Family members and relatives of these patients must be asked to remain at home and not attend the hospital as they will likely not be allowed in (Liaise with the Surveillance team).
- Only essential persons are to travel to hospital with the patient. e.g. career for vulnerable adult or a parent/ guardian for a child. (they should also be given a surgical mask for use in the ambulance and thereafter).
- Patients should only take essential items with them e.g. phone, money, keys and medication.
- These should be in normal patient bag and sealed and then in a clear plastic bag.
- Pre-alert: Crews are required to notify the receiving unit through the set channel of communication to the fact that they are transporting a possible COVID-19 patient to ensure the receiving unit can prepare for arrival and patient isolation. The receiving unit will advise the crew where the patient should be brought.
- On arrival the driver is to inform the receiving unit of their arrival prior to off-loading the patient.

Management of Mild Cases

- In Namibia, all confirmed mild COVID-19 cases can be managed at home if home facilities allow for proper isolation. Designated non-healthcare isolation facilities identified by the MoHSS are available for mild cases as needed.

Home Isolation:

- Home isolation is allowed for patients with asymptomatic or mild disease
- Criteria for acceptable home for isolation
    - Patient is clinically stable
    - Appropriate caregivers are available at home
    - Separate bedroom available
    - Resources for access to food and other necessities are available
    - Patient and other household members are capable of adhering to cloth face covering and hand hygiene and distancing >2 meters
    - Household members at risk for severe disease can be safely separated

Virtual Visits:

- Frequency of virtual visits:
    - Routine follow up for low risk patients: Day 5 of symptoms
    - Routine follow up for high risk patients: Day 4, 7, and 10 of symptoms
        - More frequent follow up may be needed for patients with particularly high risk, concerning symptoms or concerns about reliability
    - Instruct patient to call if worsening or Development of new symptoms
    - Follow up after discharge for inpatients: 2 days
- Virtual evaluation: if patient has warning signs (below) should be brought to healthcare facility
    - Dyspnoea
        - Assess whether dyspnoea interferes with activities of daily living
        - Does the patient have difficulty speaking full sentences?
    - Mental status
        - Decline in change in alertness, memory, behaviour and attention
        - Patient with recent falls or near falls

- Chest pain
- Leg and calf swelling
- Fever
    - Very high fevers

Management of Moderate/Severe COVID-19

Patients with severe COVID-19 require urgent care with oxygen therapy. These patients will require hospitalization.

Evaluations for hospitalized patients Table 5

Recommended daily labs: • FBC with differential • Complete metabolic panel • CPK • CRP (first 2 weeks of hospitalization) Recommended every other day (if in ICU or elevated check daily): • PT/PTT/fibrinogen • D-dimer	For acute kidney injury (creatinine >0.3 above baseline): • Urinalysis and spot urine protein: creatinine When macrophage activation syndrome (MAS) or cytokine storm / secondary haemophagocytic lymph histiocytosis (sHLH) suspected: • ESR If elevated LFTs: • HBV serologies (sAb, cAb, sAg) • HCV antibody, unless positive in past • HIV
For risk stratification: • LDH (repeat daily if elevated) • Troponin (repeat q2-3d if elevated) • Baseline ECG (Qtc monitoring)	If clinically indicated: • Blood cultures (2 sets) if bacteria suspected • B-HCG for women of childbearing age
Radiology: • Portable CXR at admission • If CXR not available, ultrasound may be used • PA/lateral only if low suspicion for COVID-19 and result would change management • Non-contrast CT is of limited utility and should only be considered if it is likely to change management	Following IPC/PPE guidelines: • SARS-COV-2 test, if not already performed • Other respiratory viral tests not recommended • Routine sputum for bacterial gram stain and culture, Legionella/Strep pneumo urinary antigen not recommended

Oxygen therapy and monitoring

- Give supplemental oxygen therapy immediately to patients with SARI and respiratory distress, hypoxaemia or shock and target SpO2 92-96%. Goal respiratory rate <24 breaths per minute
- Closely monitor patients with COVID-19 for signs of clinical deterioration, such as rapidly progressive respiratory failure and sepsis and respond immediately with supportive care interventions.
- Application of timely, effective and safe supportive therapies is the cornerstone of therapy for patients that develop severe manifestations of COVID-19.
- Understand the patient's co-morbid condition(s) to tailor the management of critical illness.
- Monitor for drug-drug interactions.
- Use conservative fluid management in patients with SARI when there is no evidence of shock.

Aerosol generating procedures

- All aerosol generating procedures (AGP) should be performed cautiously and avoided if possible. All AGP require the healthcare provider to don N95 mask and face shield or goggles as well as gloves and gown.
- Only essential AGP should be performed for patients with respiratory illness and only those healthcare providers who are needed to perform the procedure should be present in the immediate vicinity.
- Aerosol-generating procedures include, but are not limited to:
    - Intubation, extubation and related procedures such as manual ventilation and open suctioning
    - Tracheotomy/tracheostomy procedures (insertion/open suctioning/decannulation)
    - Bronchoscopy or BAL
    - Non-invasive ventilation (NIV) such as bi-level positive airway pressure (BiPAP) and continuous positive airway pressure ventilation (CPAP)
    - High-flow nasal oxygen (HFNO), also called high-flow nasal cannula (HFNC)
    - Induction of sputum
    - Medication administration via continuous nebulizer

Treatment of co-infections

- Routine empiric antibiotics are not recommended except if a patient has peripheral/bilateral infiltrates on CXR.
- Empiric antibiotics can be given if COVID-19 is not yet established and patient with lobar infiltrate on CXR and/or ICU care.
- Empiric therapy should be de-escalated based on microbiology results and clinical judgment. If started, usual course is 5 days.
- Recommend ceftriaxone 1 gm IV QD + doxycycline 100 mg po bid (azithromycin is alternative to doxycycline);
- ICU/sepsis: consider MRSA / multi-drug resistance coverage (alternative is amoxicillin/clavulanate)
- Due to low rates of coinfection reported, we do not recommend starting oseltamivir on most patients with COVID-19

Management of Critical COVID-19

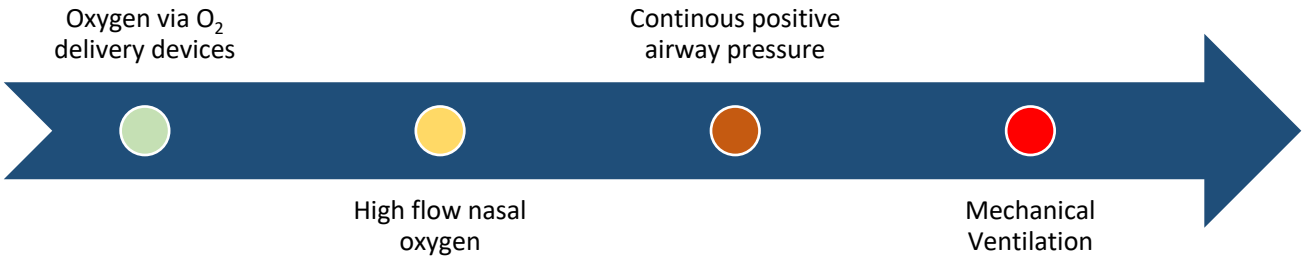
COVID 19 Airway Standard Operation Procedures

Objective: To establish an airway safely and timeously without compromising patient's clinical condition whilst the health care worker adheres to the National IPC Guidelines to limit transmission.

Clinical criteria for intubation:

- Persistent hypoxaemic respiratory failure (PaO_2 < 60mmHg) despite non-invasive ventilatory support
- Low level of consciousness (Glasgow Coma Scale < 8)
- SpO2<85%
- PaO2/FiO2< 200mmHg or SpO2/FiO2<315
- Lactate >3.0 mmol

In Namibia, we recommend the following stepwise approach.
Non- invasive ventilatory support: Supplementary oxygen via oxygen delivery devices> high flow nasal oxygen (HFNO)>Continuous positive airway pressure (CPAP)> mechanical ventilation.



SAFE AIRWAY SOCIETY

COVID-19 AIRWAY MANAGEMENT

1. Intensive training
2. Early intervention
3. Meticulous planning
4. Vigilant infection control
5. Efficient airway management
6. Clear communication

USE A 'BUDDY CHECK' FOR CORRECT PPE FITTING

Planning

Intervene early - aim to avoid emergency intubation.
Negative Pressure room or Normal pressure with strict door policy.
Senior clinician involvement. Is Anaesthetist needed?
Early airway assessment documented by senior clinician.

Prepare

Assemble 5-6 person Airway Team (see reverse).
Use COVID-19 Intubation Tray (see reverse).
Ensure Viral Filter and ETCO2 in ventilation circuit.
Share Airway Strategy. Use a dedicated COVID intubation checklist.

PPE

Hand Hygiene (HH).
Donning: HH > Gown > Mask > Eye-protection > Hat > HH > Gloves.
Spotter to perform "Buddy Check" to ensure correct PPE fit.
Airway operator to consider double gloves.

Pre-Ox

45 degree head up position.
Pre-oxygenate with Face Mask using 2 hands, Vice-grip and PEEP for full 5 minutes.
Ensure a square ETCO2 waveform, to be confident of no leaks.
Avoid Apnoeic Oxygenation techniques due to aerosolization risk.

Perform

Use VL; use the screen (indirect view) to maximise operator distance from airway.
Modified RSI technique (1.5mg/kg IBW Roc OR 1.5mg/kg TBW Sux).
Careful 2-person ventilation with Vice-grip and PEEP during onset of NMB.
Wait 60 seconds for paralysis to take effect - avoid triggering cough.

Post-ETT

Inflate cuff BEFORE initiating ventilation and monitor cuff pressures to minimise leak.
Remove outer gloves (if on), dispose of airway equipment in sealed bag.
Doffing: Gloves > Gown > HH > Hat > Eye Protection > Mask > HH. Use a Spotter.
Debrief and share lessons.

Awake Intubation

Risk of aerosolization. Involve Senior Anaesthetist if this airway technique is indicated.

Connection / Disconnection

Apply the viral filter directly to the ETT.
Only disconnect the circuit on the ventilator side of the viral filter.

CICO Rescue

Scalpel-bougie technique to avoid aerosolization.

Acute Respiratory Distress Syndrome (ARDS)

- Recognize severe hypoxemic respiratory failure when a patient with respiratory distress is failing standard oxygen therapy and prepare to provide advanced oxygen/ventilatory support.
- Endotracheal intubation should be performed by a trained and experienced provider using airborne precautions.
- Rapid sequence intubation is appropriate after an airway assessment that identifies no signs of difficult intubation.
- Happy hypoxic patient – Oxygen mask or plastic bag with PEEP
- Avoid intubation if saturation is more than 70% unless decreased LOC or aggressively hypoxic and septic shock.
- Avoid high PEEP, aim for PEEP of 5 – 10 cmH_20.
- Early use of muscle relaxants improves outcome.

For intubated patients with ARDS use lung-protective ventilation strategies

- Aim for an initial tidal volume of 6mg/kg.16 Tidal volume up to 8 ml/kg predicted body weight is allowed if undesirable side effects occur (e.g. dyssynchrony, pH <7.15).
- Use lower inspiratory pressures (plateau pressure <30 cmH2O).16
- Hypercapnia is permitted if meeting the pH goal of 7.30-7.45.
- In patients with moderate or severe ARDS, moderately higher PEEP instead of lower PEEP is 16 targets.
- In patients with moderate-severe ARDS (PaO2/FiO2 <150), neuromuscular blockade by continuous infusion should not be routinely used.
- Risk factors for ARDS in COVID patients
    - Age >65
    - Higher temperature at time of admission >39°C
    - Presenting with dyspnoea
    - Co-morbid disease (hypertension, diabetes)
    - Lymphopenia
    - Neutrophilia
    - High LDH levels
    - High D-dimer

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 two or more 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 feeble pulses; tachypnoea; mottled or cold skin or petechial or purpuric rash
    - Increased lactate; oliguria; hyperthermia or hypothermia.

Anticoagulation

About 20% to 55% of patients admitted to hospitals for COVID-19 have laboratory evidence of coagulopathy. Elevated d-dimer concentration is associated with poor clinical outcomes. COVID-19-associated coagulopathy appears to be prothrombotic. In the absence of a contraindication, patients admitted to the hospital should receive thromboembolism prophylaxis as per standard of care.

Administration of Anticoagulation Table 5

Standard Risk Patients (DVT prophylaxis)	
Indications: • Hospitalized with moderate severe and critical COVID-19	• For CrCl >30 mL/min: enoxaparin 40 mg SC once daily • For CrCl 15-30 mL/min: 40 mg SC once daily ○ For high risk of bleeding or <50 kg, use 30 mg SC once daily • For CrCl <15 mL/min: enoxaparin 30 mg SC once daily
Intermediate Risk Patients (Increased DVT prophylaxis)	
Indications: Inflammatory features present, such as rising D-dimer, CRP, or Ferritin	• For CrCl >30 mL/min: enoxaparin 40 mg SC once daily • For CrCl 15-30 mL/min: 40 mg SC once daily ○ For high risk of bleeding or <50 kg, use 30 mg SC once daily • For CrCl <15 mL/min: enoxaparin 30 mg SC once daily
High Risk Patients (Therapeutic Anticoagulation)	
Indications: 1. Patients with high D-Dimer (>1000 ng/mL) with or without clinical evidence of thrombosis including but not limited to: • Frequent clotting of vascular access sites • Clinical exam of vascular beds, paying attention to poorly perfused extremities or punctate lesions similar to cardioembolic disease. Many COVID patients have demonstrated ischemic features in hands and feet • Troponin elevation disproportionate to shock or hypoxia • Clinical syndrome consistent with cardiogenic shock (Cool, clammy extremities) that is not due to hypovolemic or haemorrhagic shock • Hypoxia or hypercarbia not otherwise explained by underlying process • Clinical features consistent with sub-massive pulmonary embolism, where confirmatory imaging cannot be obtained 2. Thrombosis confirmed by imaging Studies 3. Comorbidities warranting full dose anticoagulation (e.g. atrial fibrillation)	• Therapeutic Heparin is preferable to LMWH. • High heparin dosing may be required due to the degree of inflammation during SARS-CoV-2 infection. • Initial dose in patients with documented thrombosis should be 18 units/kg/hr.

Special Populations

Children

- Children have similar rates of contracting COVID-19. They however tend to present with milder symptoms and have very low fatality.
- Children are likely to shed the virus even though they have mild symptoms
- There have however, been reports of ARDS and organ failure described in those who are < 12 months
- Observational data is showing that children with malnutrition are at an increased risk of developing severe to critical forms of COVID-19.

Multisystem inflammatory syndrome in children (MIS-C)

Multisystem inflammatory syndrome in children (MIS-C) is a rare but serious condition associated with COVID-19 that has been reported in children from Europe and North America.
The clinical features of MIS-C are similar to those of Kawasaki disease, Kawasaki disease shock syndrome, and toxic shock syndrome.
They include persistent fever, hypotension, gastrointestinal symptoms, rash, myocarditis, and laboratory findings associated with increased inflammation; respiratory symptoms may be lacking.

Case Definition

All 6 criteria must be met:

1. **Age 0 to 19 years**
2. **Fever for ≥3 days (>38.0°C)**
3. **Clinical signs of multisystem involvement (**at least 2 **of the following):**
    - Rash, bilateral non-purulent conjunctivitis, or mucocutaneous inflammation signs (oral, hands, or feet)
    - Hypotension or shock (refractory to fluid resuscitation)
    - Cardiac dysfunction, pericarditis, valvulitis, or coronary abnormalities (including echocardiographic findings or elevated troponin/BNP)
    - Respiratory (e.g. tachypnoea, laboured breathing)
    - Neurologic (e.g. seizure/syncope, stroke, aseptic meningitis, headache, confusion/irritable, altered LOC)
    - Evidence of coagulopathy (prolonged PT or PTT; elevated D-dimer, Elevated LDH)
    - Acute gastrointestinal symptoms (diarrhoea, vomiting, or abdominal pain, may mimic an appendicitis and may have hepato-splenomegaly)
4. **Elevated markers of inflammation (e.g., ESR (can be inappropriately low), CRP, or procalcitonin, Elevated ferritin, Neutrophilia, Lymphocytopenia, Hypoalbuminemia)**
5. **No other obvious microbial cause of inflammation, including bacterial sepsis and staphylococcal/streptococcal toxic shock syndromes**
6. **Evidence of SARS-CoV-2 infection**

    Any of the following:
    - Positive SARS-CoV-2 RT-PCR
    - Positive SARS-CoV-2 Serology (anti-bodies)
    - Contact with an individual with COVID-19

This table outlines the WHO's case definitions of MIS-C. Patients who meet these criteria and who also fulfil full or partial criteria for Kawasaki disease should be considered to have MIS-C and should be reported. In addition, MIS-C should be considered in any paediatric death with evidence of SARS-CoV-2 infection.

Evaluation

Laboratory testing — Table 6 the initial laboratory evaluation of a child with suspected MIS-C depends on the presentation.

Moderate to severe – For children with moderate to severe symptoms of MIS-C: • Full blood count with differential (Neutrophilia, Lymphopenia) • C-reactive protein and erythrocyte sedimentation rate (optional: pro-calcitonin) • Ferritin level • Liver function tests (Liver enzymes: Raised ALT and AST and lactate dehydrogenase) • Serum electrolytes and renal function tests (features of acute kidney injury) • Urinalysis (Proteinuria and Haematuria) • Coagulation studies (prothrombin time/international normalized ratio, activated partial thromboplastin time, D-dimer, fibrinogen, antithrombin-3) • Troponin and creatine kinase-MB (raised) • Cytokine panel (if available)
Mild – For patients presenting with fever for ≥3 days and who are well-appearing with only mild symptoms suggestive of MIS-C, it is reasonable to perform a more limited evaluation initially: • Full blood count • C-reactive protein and then obtain additional testing only if these are abnormal.

Inflammatory markers (C-reactive protein, erythrocyte sedimentation rate, procalcitonin, ferritin) are measured at the time of admission and then daily in the acute phase to closely monitor progression.

Testing for other pathogens

This testing is appropriate for children with moderate to severe MIS-C (e.g. children who require hospitalization)

Table 7

Testing for other viral and bacterial pathogens includes:
• Blood culture (specifically look for gram positive cocci: suggestive of staph or strep) • Urine culture • Throat culture (Herpes viral panel PCR) • Stool culture (Entero-virus PCR) • Nasopharyngeal aspirate or throat swab for respiratory viral panel • Epstein-Barr virus serology and PCR • Cytomegalovirus serology and PCR (PCR on throat swab or NPA and on urine) • Enterovirus PCR (on stool) • Adenovirus PCR (on any respiratory specimen)

Imaging Modalities in Severe COVID-19 in Children

Chest Xray:

- Maybe normal. Or may have small pleural effusions, consolidation and atelectasis.

Abdominal Ultrasound:

- Look for features of acute appendicitis. May have free fluid or mesenteric adenitis.

Echocardiography - *if available.*

<u>Management of Multisystem Inflammatory Syndrome in Children</u>

- Children with moderate to severe signs and symptoms should be admitted to the hospital. The level of care is determined by the severity of illness.
- Admission to a paediatric intensive care unit is appropriate for children presenting with hemodynamic instability (shock, arrhythmia), significant respiratory compromise, or other potentially life-threatening complications. (see paediatric SOP for management of haemodynamic instability and cardiac dysfunction)
- ***All stable children should be discussed as soon as possible with specialist services to ensure prompt treatment (paediatric cardiology included).***
- Close cardiorespiratory monitoring including continuous saturations and ECG, with BP monitoring.
- Early 12-lead ECG / echocardiography are indicated if possible (timing determined by clinical picture)
- ***There should be a low threshold for referral to the Intensive Care Unit.***

Antibiotic therapy

- Patients presenting with severe multisystem involvement, particularly those with shock, should receive prompt empiric broad-spectrum antibiotic therapy pending culture results.
- An appropriate empiric regimen consists of ceftriaxone plus vancomycin.
- Clindamycin is added if there are features consistent with toxin-mediated illness (e.g., erythroderma).
- **NB:** Antibiotics should be discontinued once bacterial infection has been excluded if the child's clinical status has stabilized.

Consider additional treatment in consultation with the specialist:

- Immunoglobulins 2g/kg IV over 8 to 12hrs (single dose)
- Inotropic support (see paediatric SOP; with support from the cardiologist)
- Aspirin 80-100mg/kg/day in 4 divided doses (until fever subsides)
- Prednisone 2mg/kg for 5 days

Monitoring:

• Hourly full set of observations initially until stable > 12 hours
• Monitor closely for signs of respiratory or cardiovascular deterioration
• Monitor for clinical signs of worsening inflammation:

- Worsening fever
- Cardiorespiratory deterioration
- Worsening gastrointestinal symptoms
- Increasing hepatosplenomegaly or lymphadenopathy
- Extending rash
- Worsening neurological symptoms
- Laboratory signs of increasing inflammation
- Falling blood cell counts
- Rising ferritin
- Unexpectedly low or falling ESR
- Rising fibrinogen or new onset low fibrinogen
- Rising ALT, AST or LDH

- Rising triglycerides
- Rising D-dimers
- Low serum sodium with worsening renal function

Case Reporting Form:

MISC is a WHO notifiable illness . *Health care providers who are caring for patients younger than 21 years of age meeting MIS-C criteria should report suspected cases to their local or state health facility*

Management of household members and family units in terms of isolation

Scenarios:

1. Care giver tests positive for Covid-19 with dependents that test negative.
2. Household member tests positive for Covid-19. Other family members with risk factors for severe disease in the household.
3. Dependent tests positive for Covid-19 with caregivers testing negative.

If a caregiver tests positive for Covid-19 and the dependents in the home all test negative an assessment should be made as whether the family should keep as a unit or separated. A complete history should be taken focusing on co-morbidities, other available caregivers and the ability to self-quarantine/isolate in their home. The risk of transmission should be explained to all individuals involved and they should be given an opportunity to decide whether to be separated or kept together after all risks have been clearly explained.

The current guide recommends families/households to be kept together as much as possible if possible. If the household meets the criteria for self-isolation, they should be allowed to isolate together. Separation has been shown to cause major anxiety and psychological unrest for the involved parties.

If unit quarantine/isolation is not possible and dependents need to be separated from caregivers, a psychosocial team should be closely involved to assess the individuals and manage any anxiety and unrest that may arise. Efforts should be put in place to ensure the caregivers and dependents communicate regularly, they're safety and security should also be insured. Separation of families should really be the last option.

Pregnant women with COVID-19

- Considering asymptomatic transmission of COVID-19 may be possible in pregnant or recently pregnant women, as with the general population all women with epidemiologic history of contact should be carefully monitored.
- Currently no evidence that pregnant women present with increased risk of severe illness or fetal compromise.
- Pregnant and recently pregnant women who have recovered from COVID-19 should be enabled and encouraged to attend routine antenatal or postpartum care as appropriate.

Infants and Mothers with COVID-19

- Infants born to mothers with suspected, probable or confirmed COVID-19 infection, should be fed according to standard infant feeding guidelines, while applying necessary precautions for IPC.
- As with all confirmed or suspected COVID-19 cases, symptomatic mothers who are breastfeeding or practising skin-to-skin contact or kangaroo mother care should practice respiratory hygiene, including

during feeding (for example, use of a medical mask when near a child if with respiratory symptoms), perform hand hygiene before and after contact with the child, and routinely clean and disinfect surfaces which the symptomatic mother has been in contact with.

- Breastfeeding counselling, basic psychosocial support and practical feeding support should be provided to all pregnant women and mothers with infants and young children, whether they or their infants and young children have suspected or confirmed COVID-19.
- In situations when severe illness in a mother due to COVID-19 or other complications prevent her from caring for her infant or prevent her from continuing direct breastfeeding, mothers should be encouraged and supported to express milk, and safely provide breastmilk to the infant, while applying appropriate IPC measures.

Discharge and Deisolation Criteria

Scientific data shows there is no evidence of risk that somebody can infect another person with the virus after 10 days of infection, if their symptoms have gone away. Recovery should be based on resolving symptoms and counting at least 10 days after infection started. It has been proven that a person may test positive for COVID-19 on RT PCR, for many more weeks after the symptoms have resolved. However, this does not mean such a person is still infective or poses a risk to infect others.

Table 8: Symptom and Time-based Approach

Initially Symptomatic Patients	**10 days** after symptom onset At least **3 additional days** without symptoms (including without fever and without respiratory symptoms)	**If patient meets criteria:** **Do RT PCR test.** If the test is positive, the patient will be instructed to exercise additional caution with physical distancing, wearing of mask, and hand hygiene for the next 10 days. **Deisolate patient and record as recovered**.
Initially Asymptomatic Patients	**10 days** after positive test for SARS-CoV-2	

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

After discharge, patients **should be called after 7 days by a healthcare provider to assess clinical improvement.** The importance of infection control and counselling on warning symptoms (new onset dyspnoea, worsening dyspnoea, dizziness, and mental status changes such as confusion) should be provided.

Drugs and Information

Namibia COVID-19 Case Management Group recommends the use of Remdesivir for treatment of suspected or laboratory confirmed COVID-19 in adults and children with severe disease (SpO2 ≤94% on room air or requiring supplemental oxygen or required mechanical ventilation or requiring extracorporeal membrane oxygenation (ECMO). The recommended course of treatment is for 5-10 days depending on severity of illness. The recommendation is for the drug to be used as a **Specialist Only prescription.**

Table 9

Therapeutic agent	Dosing & Duration	Comments
<u>Remdesivir</u>	**Adult dosing:** 200 mg IV load, then 100 mg IV q24 **Paediatric dosing:** <40kg: 5 mg/kg IV load, then 2.5 mg/kg q24 ≥40 kg: 200 mg IV load, then 100 mg IV q24	Adverse event: Increased liver enzymes and daily monitoring of hepatic function is recommended Remdesivir should NOT be initiated or should be stopped if ALT is ≥5x upper limit of normal. For patients with eGFR <30 ml/min, Remdesivir may be considered on an individual basis considering risk/benefit
<u>Dexamethasone</u> Adult patients 1. Recommended in patients with COVID-19 who require mechanical ventilation 2. Recommended in most patients on supplemental oxygen. The benefit is uncertain in patients with <7 days of symptoms. Decision should be individualized in such patients with consideration of disease severity in conjunction with risks and benefits of glucocorticoid therapy Paediatric patients It is reasonable to consider dexamethasone for children who require mechanical ventilation, or high levels of oxygen support, particularly if they are rapidly progressing towards mechanical ventilation	**Adult dosing:** 6 mg PO or IV q24 Paediatric dosing: 0.15 mg/kg/dose IV q24 (max: 6 mg/dose) Duration: Maximum 10 days, or until discharge Shorter duration is reasonable to consider in patients who have improved rapidly or are experiencing adverse events from steroids. The median duration of therapy in the RECOVERY trial was 6 days.	Weigh risks/benefits of use on a case-by-case basis in patients with:" • Active bacterial infection or fungal infection • Diabetic ketoacidosis • Baseline immunosuppression Nor recommended in the following patients: • Not requiring supplemental oxygen. (In RECOVERY, those had a trend towards worse outcomes) • No longer COVID-19 PCR positive but remain intubated. (In RECOVERY, patients were randomized after admission; the risk/benefit of alternative approaches later in the disease course is unknown) Pregnancy, breastfeeding: Dexamethasone has foetal effects. Alternatives may be prednisone 40 mg po daily, methylprednisolone 32 mg IV daily, or hydrocortisone 80 mg IV BID Potential adverse events: • Increased risk for infection • Hyperglycaemia • Peripheral oedema • Increased appetite • Insomnia, irritability, delirium

		In the setting of dexamethasone shortage, an equivalent total daily dose of an alternative glucocorticoid to dexamethasone 6 mg daily can be used (e.g. methylprednisolone 30 mg (<40 kg: 0.8 mg/kg) daily or prednisone 40 mg (<40 kg: 1 mg/kg) daily or Hydrocortisone 50 mg every 8 hours

No data are available for the combination of Dexamethasone and Remdesivir at this time.
Co-administration of Dexamethasone and Remdesivir is allowable

Non-Steroidal Anti-inflammatory Drugs (NSAIDs)

No evidence exists to support its use in mitigating the inflammatory response associated with COVID-19. There have been concerns voiced regarding clinical worsening of COVID-19 in patients taking ibuprofen but these are unsubstantiated at this time. **At this time, insufficient evidence exists to specifically avoid NSAIDs in all COVID patients, but we do recommend avoiding in patients with pre-existing kidney disease or those with developing sepsis to avoid renal injury.**

Table 10 Medications NOT currently recommended for the treatment of SARS-CoV-2 (COVID-19)

Medication	Recommendation
ACE Inhibitors and ARBs	**It is strongly recommended that those patients prescribed ACE inhibitors and ARBs for pre-existing conditions should be continued on their ACE inhibitor and ARB therapy.** Currently, there is no scientific or clinical evidence that taking ACE inhibitors or ARBs increases the risk of acquiring COVID-19 or that use may increase the severity of illness for those acquiring infections.
Azithromycin	Azithromycin with or without hydroxychloroquine is NOT recommended to treat COVID-19.
Hydroxychloroquine	Hydroxychloroquine is NOT recommended for pre-exposure and or post-exposure prophylaxis or in patients with a confirmed diagnosis of SARS-CoV-2 infection. There is insufficient data to support any benefit in persons with COVID-19 and potential harms include cardiac arrhythmias and methemoglobinemia. Several double-blind randomized placebo controlled trials have demonstrated lack of benefit in use of hydroxychloroquine. 1. Outpatient, mild disease: Ann Intern Med online 16 Jul 2020. https://www.acpjournals.org/doi/10.7326/M20-4207 2. Post-exposure prophylaxis: NEJM 3 June 2020. https://www.nejm.org/doi/full/10.1056/NEJMoa2016638 3. Mild-to-moderate disease: NEJM 23 July 2020. https://www.nejm.org/doi/full/10.1056/NEJMoa2019014 4. Hospitalized, severe disease: https://www.recoverytrial.net/news/statement-from-the-chief-investigators-of-the-randomised-evaluation-of-covid-19-therapy-recovery-trial-on-hydroxychloroquine-5-june-2020-no-clinical-benefit-from-use-of-hydroxychloroquine-in-hospitalised-patients-with-covid-19 Patients prescribed hydroxychloroquine for pre-existing rheumatologic conditions should be continued on their current dose.

Ivermectin	Displays inhibitory activity against virus in vitro however no clinical data in humans exist.
IVIG	There is insufficient evidence to recommend the use of IVIG for COVID-19 outside of labelled indications.
Lopinavir/ritonavir	Lopinavir inhibits the protease activity of coronavirus in SARS. Two retrospective matched cohorts of lopinavir/ritonavir (used in combination with ribavirin and corticosteroids) in SARS demonstrated a potential role in clinical outcomes, especially when used in the early stages of diseases. Due to the risk of adverse events and drug-drug interactions, along with lack of data in SARS-CoV-2 at present time, not currently recommended.
Nitazoxanide	Displays inhibitory activity against the virus in vitro however no clinical data in humans exist.
Oseltamivir	SARS-CoV-2 does NOT use neuraminidase as part of the viral replication cycle so oseltamivir is unlikely to be of therapeutic value.
Ribavirin	Role unclear, doses required for optimal antiviral activity often exceed limit of patient tolerability. Risk of toxicity outweighs potential clinical benefit.
Zinc	There are no clinical data suggesting zinc improves outcomes in patients with COVID-19.

Guidance on Surgical and Medical Procedures during COVID-19

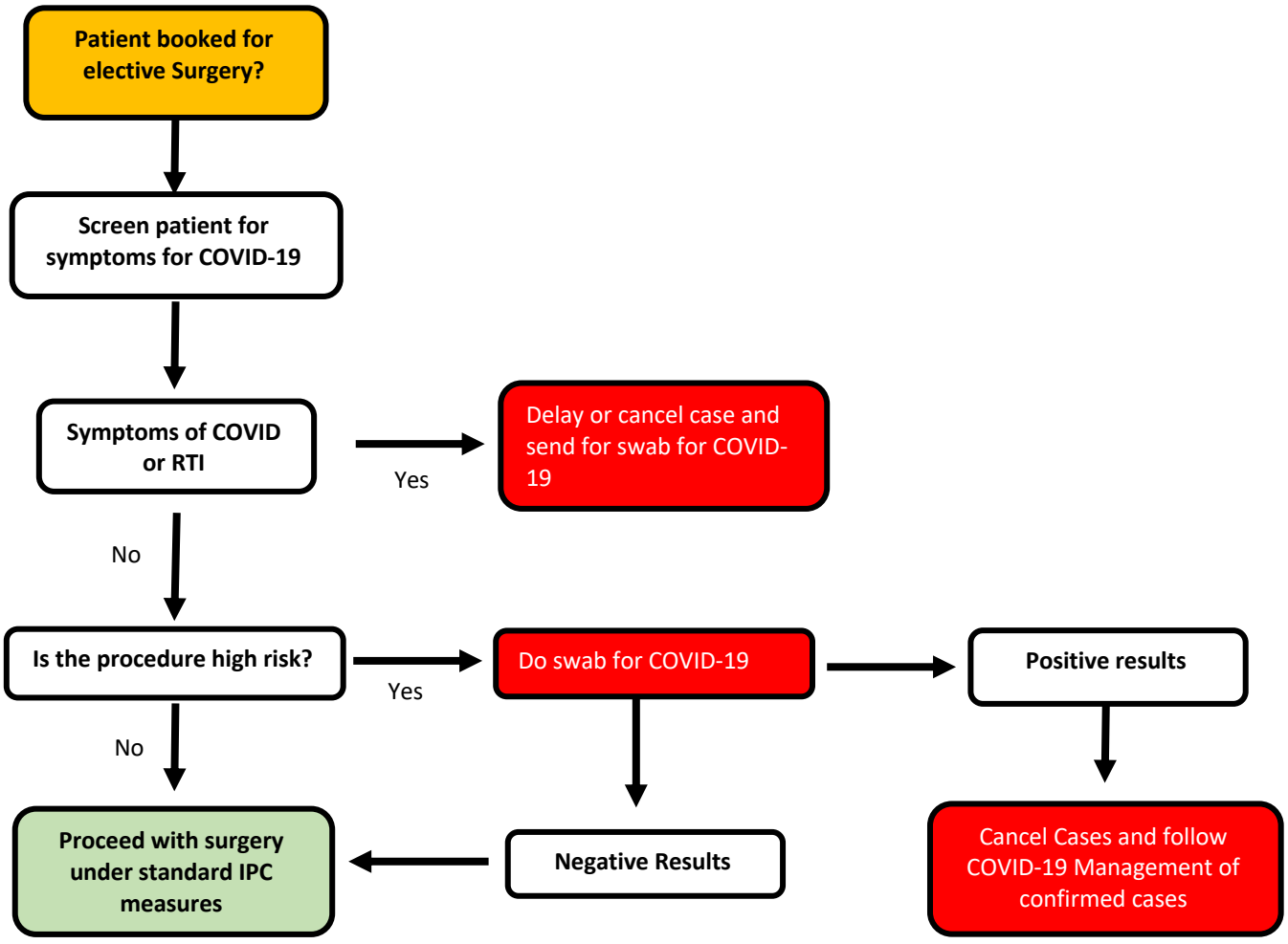
Elective surgeries may be performed however the following should be noted:

1. COVID-19 testing within a facility should be conducted according to National guidance
2. Personal protective equipment:
    a. Facilities must have adequate PPE, including supplies for potential second wave of COVID-19 cases
3. Case prioritization and scheduling:
    a. Facilities should establish a prioritization committee consisting of surgery, anaesthesia and nursing leadership to develop prioritization strategy
    b. Strategy should include phased opening of operating rooms

High Risk Procedures:

Upper airway procedures
Gastroscopy
ENT
Endoscopy
Colonoscopy
Cardiothoracic
Dental
Maxillofacial

Flow Chart on Handling Elective Surgical Procedures



Certification and Classification of COVID-19 as Cause of Death

Definition for deaths due to COVID-19

A death due to COVID-19 is defined for surveillance purposes as a death resulting from a clinically compatible illness, in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID disease (e.g. trauma). There should be no period of complete recovery from COVID-19 between illness and death.

A death due to COVID-19 may not be attributed to another disease (e.g. cancer) and should be counted independently of pre-existing conditions that are suspected of triggering a severe course of COVID-19. *(WHO International Guidelines for Certification and Classification (Coding) of COVID-19 as Cause of Death, 16 April 2020)*

Annexes/Additional Information

1. **Other MoHSS SOPs - https://bit.ly/NamCOVID**
   Departmental SOPs such as Paediatric, Dental and EMS
   The SOPs will be added as they are available.
2. **WHO guidelines**
3. **CDC Covid-19 guidelines**
4. **Demonstration videos on airway management:**
   COVID 19 Intubation Demonstration:
   https://www.thegurneyroom.com/covid/intubation-approach

   An example of a COVID Airway Response Team
   interanest.org Airway Management in SARS Cov-2 Positive Patients
   https://www.youtube.com/watch?v=iIGAmdyZr4Y

5. **Remdesivir**
   Remdesivir is an inhibitor of the viral RNA-dependent, RNA polymerase with inhibitory activity against SARS-CoV-2. Remdesivir has been evaluated in two independent trials for the treatment of COVID-19 pneumonia. The ACTT-1 trial is a placebo-controlled double-blind randomized trial of Remdesivir for hospitalized adults with COVID-19 pneumonia.7 Subjects received Remdesivir 200 mg IV on day 1 followed by 100 mg daily for up to 10 days or placebo. Preliminary analysis demonstrated shortened time to recovery of 11 days in those receiving Remdesivir vs. 15 days in those receiving placebo (Rate ratio 1.32, 95% CI 1.12-1.55, p<0.01). This finding was more pronounced among patients requiring supplemental oxygen, including mechanical and non-invasive ventilation, or ECMO (recovery rate ratio 1.47, 95% CI 1.17-1.84). There was no statistically significant difference in 14-day mortality, occurring 7.1% in those receiving Remdesivir vs. 11.9% in those receiving placebo (HR 0.7, 95% CI 0.47-1.04).
   The SIMPLE trial evaluated Remdesivir 5-day course vs. 10-day course for patients with severe COVID-19 pneumonia.8 Of the 397 patients randomized, clinical improvement occurred in 64% of the patients who received 5 days of therapy vs. 54% of those randomized to 10 days of therapy. After adjustment for baseline clinical status, patients in the 10-day group had a distribution in clinical status at day 14 that was similar to that among patients in the 5-day group (P = 0.14). At day 14, a total of 16 patients (8%) in the 5-day group and 21 patients (11%) in the 10-day group had died, and 120 (60%) and 103 (52%), respectively, had been discharged.
   Phase 3 SIMPLE trial in hospitalized patients with moderate COVID-19 pneumonia not requiring oxygen evaluated 5-day and 10-day courses of Remdesivir vs standard of care alone. This study demonstrated that patients in the 5-day Remdesivir treatment group were 65 percent more likely to have clinical improvement at day 11 compared to the standard of care group (OR 1.65 [95% CI 1.09-2.48]; p=0.017). (press release)

6. **Dexamethasone**
   A preliminary report from the RECOVERY RCT in the UK indicates survival benefit of low dose dexamethasone for patients with severe or critical COVID-19, but no benefit in those not requiring oxygen support. Specifically, the mortality benefit was greater in a pre-specified subgroup of patients receiving mechanical ventilation (RR 0.65, p < 0.001) than in those on supplemental oxygen (RR 0.80, p = 0.002), with a non-statistically significant trend towards harm in those not on oxygen (RR 1.22, p = 0.14).