GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR

MINISTRY OF HEALTH AND SPORTS

DEPARTMENT OF MEDICAL SERVICES

Clinical Management Guidelines for COVID-19 Acute Respiratory Disease

Version - DoMS/COVID-19/clinical/Version 05-2020

Date - 13th April 2020

Clinical Management Guidelines for Corona Virus Disease (COVID-19)

Version (5/2020) (updated as of 13th April 2020)

Department of Medical Services

Surveillance case definitions for COVID-19

Suspect case

1) A patient with acute respiratory illness (fever **and** at least one sign/symptom of respiratory disease (e.g., cough, shortness 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.

OR

2) A patient with any acute respiratory illness

AND

having been in *contact* with a confirmed or probable COVID-19 case in the last 14 days prior to onset of symptoms

OR

3) A patient with severe acute respiratory infection (fever and at least one sign/symptom of respiratory disease, e.g., cough, shortness breath; requiring hospitalization)

AND

in the absence of an alternative diagnosis that fully explains the clinical presentation

***Note: "Reporting community transmission of COVID-19 disease" should be checked in WHO updated situation report**

Probable case

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

a. Inconclusive being the result of the test reported by the laboratory.

OR

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.

*see *https://www.who.int/emergencies/diseases/novel-coronavirus-2019/technicalguidance/laboratory-guidance* for latest case definitions

Criteria for severe acute respiratory infection requiring hospital admission

Anyone of the following parameters:

- Respiratory rate > 30 breaths/min
- Severe respiratory distress
- SpO2 ≤ 93% on room air
- Systolic blood pressure ≤ 100 mmHg
- Altered mental status (GCS < 15)

Definition of contact

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

- Face-to-face contact with a probable or confirmed case within 1 meter 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 personal protective equipment;

  (For asymptomatic cases, the period of contact is measured as the 2 days before through the 14 days after the date on which the sample was taken which led to confirmation)

Monitoring of contacts of probable and confirmed cases:

- Contacts should be monitored for 21 days from the last unprotected contact.
- All contacts should be kept in facility quarantine arranged by government.
- Any contact of confirmed cases should be tested.
- Any newly identified probable or confirmed cases should have their own contacts identified and monitored

I. History taking

Name: ---------- Age: ----------

Sex: ---------- R/N: ----------

Address: ----------

Detail of Travel History----------

Contact History----------

Complaints

Fever ……Cough …… Sore throat……..Headache…….Muscle pain……Shortness of breath…….Diarrhoea……Reduced urine output etc……..

II. Physical Examination

Vital signs: GCS: …… Temperature……. Cyanosis……. BP: ….. ……

HR: …… SpO_2: …… RR: …….. Lungs: ……..

Features of Septic shock, Acute kidney injury

Updated as of 13 April 2020

Management Protocol for Covid-19 Acute Respiratory Disease (*Version 05*)

Attendance of patients in hospital, OPD and community clinics

↓ At triage area

A	**History of travel to or residence in a location reporting community transmission within past 14 days Or History of close contact with a confirmed or probable COVID-19 case within past 14 days**
B	**Presenting fever, symptoms of acute respiratory disease (e.g., cough, shortness of breath)**
C	**Presenting fever, symptoms of severe acute respiratory disease with no other clear aetiology**

A

- Home or facility quarantine (Close contact) for 21 days
- Report to State and Regional Health Department
- Take specimen on 3 days or 5 days before completion of quarantine

For close contact

- Take specimen on 5th day of last exposure
- Take specimen on 3 days or 5 days before completion of quarantine if first specimen is negative

B **C**

- Isolate the patient in a separate room (e.g., Fever room)
- Take strict IPC measures depending on severity
- Take complete and detail history and physical examination
- Inform immediately to DoMS [09 449621202], CEU [067 3420268], State and Regional Health Department
- Inform Regional/ Facility Level Clinical Management Committee

Person Under Investigation (PUI) for suspected pneumonia

- Move the patient to isolation room
- Take specimen and send to NHL (To follow specimen collection guidelines)
- If clinician strongly suspect possibility of COVID-19 infection, second swab should be considered
- Follow "**Clinical Management Guidelines for Corona virus disease (COVID-19)**"

Mild pneumonia (PUI)

Symptomatic treatment

Pneumonia (Suspected)

Symptomatic treatment
Oral antibiotics

Severe Pneumonia (Suspected)
(If any of following signs/symptoms is present)

- Respiratory rate > 30 breaths/min
- Severe respiratory distress
- $SpO_2 \leq 93\%$ on room air
- Systolic Blood Pressure ≤ 100 mmHg
- Altered mental status (GCS <15)

Result (–)

Discharge
Discharge criteria
Discharge message

Recover

Result (+)

Result (+)

- High flow O_2 5L/min
- Supportive treatment including fluid therapy
- IV antibiotics
- Treatment of complications
- Assess for ventilator & specialist care

Confirmed case

- Supportive treatment including fluid therapy
- Antibiotic
- Antiviral/HCQ should be considered
- Treatment of complications
- Refer to designated hospital with standard precaution and considering risk and benefit
- Isolate patients for 21 days (after last exposure)

→ Death – proper disposal of the dead person

III. Categorization of Patients

Mild illness

Patients uncomplicated upper respiratory tract viral infection may have non-specific symptoms such as fever, fatigue, cough (with or without sputum production), anorexia, malaise, muscle pain, sore throat, dyspnea, nasal congestion, or headache. Rarely, patients may also present with diarrhoea, nausea, and vomiting. The elderly and immunosuppressed may present with atypical symptoms.

Pneumonia

Adult with pneumonia but no signs of severe pneumonia and no need for supplemental oxygen.

Severe pneumonia

Fever or suspected respiratory infection, plus one of the following: respiratory rate > 30 breaths/min; severe respiratory distress; or SpO2 ≤ 93% on room air.

Acute Respiratory Distress Syndrome

- New or worsening respiratory symptoms within one week of known clinical insult.
- Bilateral opacities on CXR, not fully explained by effusions, lobar or lung, collapse, or nodules.
- Respiratory failure not fully explained by cardiac failure or fluid overload.

Sepsis

- 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, or laboratory evidence of coagulopathy, thrombocytopenia, acidosis, high lactate or hyperbilirubinemia.

Septic shock

- Patients with persisting hypotension despite volume resuscitation, requiring vasopressors to maintain MAP ≥65 mmHg and serum lactate level >2 mmol/L.

The SOFA score ranges from 0 to 24 and includes points related to 6 organ systems: respiratory (hypoxemia defined by low PaO_2/FiO_2),
coagulation (low platelets), liver (high bilirubin),
cardiovascular (hypotension),
central nervous system (low level of consciousness defined by Glasgow Coma Scale), renal (low urine output or high creatinine).

Sepsis is defined by an increase in the Sequential [Sepsis-related] Organ Failure Assessment (SOFA) score of ≥2 points. Assume the baseline score is zero if data are not available

SOFA Score (Sequential (Sepsis related) Organ Failure Assessment Score)

System or organ and measure	SOFA score				
	0	1	2	3	4
Respiratory:					
P_aO_2/FiO_2, mmHg	≥400	300-399	200-299	100-199 with respiratory support	<100 with respiratory support
Coagulation:					
Platelets, × 10^3/µL	≥150	100-149	50-99	20-49	<20
Liver:					
Bilirubin, µmol/L (mg/dL)	<20 (1.2)	20-32 (1.2-1.9)	33-101 (2.0-5.9)	102-204 (6.0-11.9)	>204 (12.0)
Circulatory:					
Mean arterial pressure, mm Hg	≥70	<70	Low dose dopamine or any dose dobutamine	Low-medium dose noradrenalin or adrenalin; medium dose dopamine	High dose noradrenalin, adrenalin, or dopamine
Central nervous system:					
Glasgow Coma Scale score	15	13-14	10-12	6-9	<6
Renal:					
Creatinine, µmol/L (mg/dL)	<110 (1.2)	110-170 (1.2-1.9)	171-299 (2.0-3.4)	300-440 (3.5-4.9)	>440 (5.0)
Urine output, mL/day	–	–	–	<500	<200

*Our recommendation applies to patients with an infection and a SOFA score of ≥2.
P_aO_2 = partial pressure of oxygen (arterial). F_iO_2 = fraction of inspired oxygen.

IV. Investigations

- Collection of blood cultures (if possible)– for bacteria that cause pneumonia and sepsis, ideally before antimicrobial therapy. Do not delay antimicrobial therapy to collect blood cultures.
- Collection of specimens – from the upper respiratory tract (nasopharyngeal and oropharyngeal) **AND**, where clinical suspicion remains and URT specimens are negative, collect specimens from the lower respiratory tract when readily available (expectorated sputum, endotracheal aspirate, or bronchoalveolar lavage in ventilated patient) for COVID-19 virus testing by RT-PCR and bacterial stains/cultures.
- In hospitalized patients with confirmed COVID-19, repeated URT and LRT samples can be collected to demonstrate viral clearance. The frequency of specimen collection will depend on local epidemic characteristics and resources.
- Detection of malaria parasites – by RDT or blood film for patients with fever in malarial endemic areas should be considered.
- Detection of dengue/chikungunya - may also be considered in the differential diagnosis of undifferentiated febrile illness, particularly when thrombocytopenia is present.
- CP, ESR, RBS, U&E, Creatinine, LFT with Enzymes,
- If possible CRP, D-Dimer, LDH, ABG,
- ECG, CXR (PA)

Recommendations for laboratory testing

- Any suspected case should be tested for COVID-19 infection using available molecular tests.
- Based on clinical judgment, clinicians may opt to order a test for COVID-19 in a patient not strictly meeting the case definition, for example, if there are patients involved in a cluster of acute respiratory illness among healthcare workers or of severe acute respiratory infection (SARI) or pneumonia in families, workplaces or social network.
- If clinicians strongly suspect possibility of covid-19 infection, 2nd swab should be considered in PUI cases (if 1st swab test is negative).

V. Treatment

A. Immediate implementation of IPC measures (Should start at the point of entry to hospitals)

At triage

- Screening should be done at first point of contact at the emergency department or outpatient department.
- Give suspect patient a medical mask and direct patient to separate area, an isolation room if available.
- Keep at least 1 meter distance between suspected patients and other patients.
- Instruct all patients to cover nose and mouth during coughing or sneezing with tissue or flexed elbow for others.
- Perform hand hygiene after contact with respiratory secretions.

Apply standard precaution

- hand hygiene (alcohol based hand rub/water and soap), use of PPE to avoid indirect and direct contact with patients' blood, body fluids, secretions and non-intact skin.
- prevention of needle-stick or sharps injury; safe waste management; cleaning and disinfection of equipment; and cleaning of the environment.

Apply droplet precaution

- Use medical mask if working within 1 metre of the patient.
- Use eye protection (face-mask or goggles)
- Limit patient movement within the institution and ensure that patients wear medical masks when outside their rooms.

Apply contact precaution

- Use PPE (medical mask, eye protection, gloves and gown) when entering room and remove PPE when leaving.
- If possible, use either disposable or dedicated equipment (e.g. stethoscopes, blood pressure cuffs and thermometers).
- If equipment needs to be shared among patients, clean and disinfect between each patient use.
- Minimal movement of patients or transport as much as possible.

Apply air-borne precaution

- Use PPE, including gloves, long-sleeved gowns, eye protection, and fit-tested particulate respirators (N95 or equivalent, or higher level of protection) when healthcare workers performing aerosol-generating procedures **(i.e. open suctioning of respiratory tract, intubation, bronchoscopy, cardiopulmonary resuscitation).**
- Avoid the presence of unnecessary individuals in the room.
- Care for the patient in the same type of room after mechanical ventilation commences.

B. Management of mild COVID-19

- Patients with mild disease should be admitted to hospital.
- Isolation can be done in hospital.
- Symptomatic treatment such as antipyretics (paracetamol) for fever.

C. Management of severe COVID-19

Supplemental oxygen therapy

- For patients with SARI and respiratory distress, hypoxaemia, or shock.
- Target $SpO_2 \geq 90\%$ in non-pregnant adults and $SpO_2 \geq 92\text{-}95\%$ in pregnant patients.

Fluid management

- Use conservative fluid management in patients with SARI when there is no evidence of shock.

* Patients with SARI should be treated cautiously with intravenous fluids, because aggressive fluid resuscitation may worsen oxygenation

Empirical antimicrobial treatment

- Give antimicrobials within one hour of identification of sepsis.
- Neuraminidase inhibitor when there is local circulation or other risk factors, including travel history or exposure to animal influenza viruses.
- Mild pneumonia PO Augmentin 625 mg tds + PO Azithromycin 500mg od x 5 days
- Severe pneumonia (community acquired)

  IV Augmentin 1.2 g 8h (ATD) for 7 days +
  IV Azithromycin 500 mg OD for 7 days

Followed by extend or change other antibiotics according to clinical and lab results.

OR

IV Cefoperazone + sulbactam 2g 12hrly **plus**

PO Clarithromycin 500mg bd or IV Azithromycin 500mg infusion od x 5 days

- Severe pneumonia (hospital acquired)

  IV Cefepime 1g 8h (ATD) + IV Meropenem 1g in N/S 100 ml (ATD) 8h, if needed add IV Moxifloxacin 400mg OD (ATD) for 7-14 days

(Attending physician should modify empirical antibiotic on the basis of microbiology result and clinical judgement)

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

Understand the patient's co-morbid condition(s) to tailor the management of critical illness and appreciate the prognosis. Communicate early with patient and family

D. Treatment of complications

Respiratory Failure & ARDS	-	Mechanical ventilation
Septic shock	-	Fluid resuscitation with 250–500 mL crystalloid fluid as rapid bolus in first 15–30 minutes and reassess for signs of fluid overload after each bolus. Administer Noradrenalin if shock persists during or after fluid resuscitation, consider dobutamine if not responded to fluid and noradrenalin, etc.

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

Fluid resuscitation may lead to volume overload, including respiratory failure. If there is no response to fluid loading and signs of volume overload appear (for example, jugular venous distension, crackles on lung auscultation, pulmonary oedema on imaging, or hepatomegaly in children)

Administer vasopressors when shock persists during or after fluid resuscitation. Norepinephrine is considered first-line in adult patients

Noradernaline Infusion

Rate	ml/hr				
	40kg	45kg	50kg	55kg	60 kg
0.05ug/kg/min	0.6	0.7	0.8	0.8	0.9
0.1 ug/kg/min	1.2	1.4	1.5	1.7	1.8
0.15 ug/kg/min	1.8	2	2.3	2.5	2.7
0.2 ug/kg/min	2.4	2.7	3	3.3	3.6
0.25 ug/kg/min	3	3.4	3.8	4.1	4.5

E. Prevention of complications

- For prophylaxis of venous-thromboembolism, consider LMWH (low molecular-weight heparin**)** OD or unfractionated heparin 5000 units subcutaneously twice daily) in adolescents and adults without contraindications. For those with contraindications, use mechanical prophylaxis (intermittent pneumatic compression devices).
- Turn patient every two hours
- Awake proning position may reduce ICU admission (see attached photo)
- Give early enteral nutrition (within 24–48 hours of admission)
- Administer H_2 blockers or PPI in patients with risk factors for GI bleeding.
- Actively mobilize the patient early in the course of illness when safe to do so

F. Therapeutic Option for COVID-19 Disease

This option is needed to consult with central level clinical management committee before starting it.

- For patients with confirmed **COVID-19 Disease (mild, moderate and severe disease)**, start hydroxychloroquine (HCQ) if there are no contraindications.
    - 400 mg BD for 1 day followed by
    - 200 mg BD for 4 days

Contra-indications to HCQ

- QTc > 500 msec
- drug interaction

- Myasthenia gravis
- Porphyria
- Retinal pathology
- Epilepsy

➢ For patients with confirmed **COVID-19 Critical disease** (≥ 1 of the following: Acute Respiratory Distress Syndrome Sepsis Altered consciousness Multi-organ failure), start hydroxychloroquine, crushed in nasogastric tube at the same dosage and monitor as above.

Important side effects of HCQ

- ➢ Prolonged QT interval
- ➢ Haemolysis with G6PD deficiency
- ➢ Retinopathy with retinal pigmentation changes

Alternative therapy

If HCQ is not available, consider

- Chloroquine base 600mg (4 tabs) stat,
- 300mg (2 tabs) after 12h , followed by
- 300mg (2 tabs) BD for 4 days

Note:

***Pregnancy is not a contraindication as such. Perform basic biochemistry daily and ECG daily if initial QTc > 450 msec. Avoid quinolones if possible, or monitor closely the QT if these antibiotics are needed.*

***Attending physician decision should be taken into account for use of HCQ.*

***Caution is required in cardiac, liver and renal failure when using HCQ.*

***Counseling should be done before administering Hydroxychloroquine or Chloroquine to patients and consent should be taken.*

***Patients should be monitored for side effects and to give appropriate prompt action if present.*

G. Adjunctive therapies for COVID-19: corticosteroids

- IV Methylprednisolone 40mg 12 hrly for 5 days (1-2mg/kg/day), if indicated e.g. severe pneumonia.

H. Treatment of pregnant patients

- Considering asymptomatic transmission of COVID-19 may be possible in pregnant or recently pregnant women, all women with epidemiologic history of contact should be carefully monitored.
- Pregnant women with suspected, probable, or confirmed COVID-19 should have access to woman-centred, respectful skilled care, including obstetric, fetal medicine and neonatal care, as well as mental health and psychosocial support, with readiness to care for maternal and neonatal complications.
- Pregnant and recently pregnant women who have recovered from COVID-19 should be enabled and encouraged to attend routine antenatal, postpartum, or postabortion care as appropriate. counselling on safe infant feeding and appropriate IPC measures to prevent COVID-19 virus transmission should also be done.
- Emergency delivery and pregnancy termination decisions are challenging and based on many factors: gestational age, maternal condition, and fetal stability.
- Consultations with obstetric, neonatal, and intensive care specialists (depending on the condition of the mother) are essential.

I. Monitoring

- Signs of clinical deterioration, such as rapidly progressive respiratory failure and sepsis and respond immediately with supportive care interventions.

J. Management of critical COVID-19: acute respiratory distress syndrome (ARDS)

ICU Management Guideline

Criteria for ICU Admission (If any of one)

1. Respiratory rate ≥ 30/min
2. SpO2 <90% with standard Oxygen Therapy (face mask with reservoir bag 10-15 L/min)
3. SpO2/FiO2 < 315
4. PaO2/FiO2 < 200 (If ABG available) (Moderate ARDS)
5. Severe pneumonia with sepsis/ septic shock

Closed observation and monitoring, optimization of oxygenation to maintain SpO2 > 90%

Criteria for endotracheal intubation should be based on individual situation. The followings are red signs;

1. Respiratory rate > 35/min, severe respiratory distress with increased work of breathing
2. PaO2/ FiO2 < 200 (If ABG available) or SpO2/FiO2 <150
3. Severe acidosis pH <7.25 (If ABG available)
4. Altered mental status
5. Haemodynamic instability (MAP ≤ 65 mmHg) after fluid resuscitation and vasopressor/inotrope support) (according to updated SSC guideline Hour 1 bundle)

Endotracheal intubation must be followed the COVID-19 Airway management principles, WFSA guideline.

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

Remarks: Patients with ARDS, especially young children or those who are obese or pregnant, may desaturate quickly during intubation. Pre-oxygenate with 100% FiO2 for 5 minutes. Rapid sequence intubation is appropriate after an airway assessment.

VENTILATOR SETUP AND ADJUSTMENT

1. Calculate predicted body weight (PBW)
    a. Males = 50 + 2.3 [height (inches) - 60]
    b. Females = 45.5 + 2.3 [height (inches) -60]
2. Select any ventilator mode, AC or SIMV mode
3. Initial tidal volume is 6 ml/kg PBW; tidal volume up to 8 ml/kg PBW
4. Set initial rate to approximate baseline minute ventilation (not > 35 bpm).
5. Adjust PEEP (5-15) and FiO2 to achieve SpO2 88-92% (PaO2- 55-80 mmHg) lower inspiratory pressures (plateau pressure <30 cmH2O).
6. The use of deep sedation may be required to control respiratory drive and to reduce the patient-ventilator dys-synchrony.
7. Use a conservative fluid management strategy for ARDS patients without tissue hypoperfusion.
8. In patients with moderate-severe ARDS (PaO2/FiO2 <150), neuromuscular blockade by continuous infusion should not be routinely used.

Discharge Criteria

For PUI case came out COVID-19 negative result from Swab

1) Move from isolation ward to cohort room (so call room to meet others plan for DC)
2) Need to explore DC parade and counseling in 2 days stay in cohort room.
3) Afebrile and resolving respiratory symptoms for at least 48 hours, and, stable on co-morbid conditions for at least 48 hours (if co-morbid condition is not stable, refer to appropriate specialist for consultation)
4) Follow-up on 2 weeks after discharge (if anything happens, return to hospital anytime)

Discharge Criteria for confirmed COVID-19 patients

Confirmed COVID-19 Cases

1. Afebrile for at least 48 hours
2. Resolving respiratory symptoms
3. Improving radiological signs
4. Improved well-being
5. Having had at least 2 consecutive, 48-hours apart, tests negative results of nasopharyngeal or oropharyngeal swab
6. Testing of nasopharyngeal or oropharyngeal swabs:
    a. Conduct the test on day 11: if negative the next test will be conducted on day 13 and if negative, discharge on day 14. After discharge, transfer the patient to ensure stay of 7 more days in facility isolation, and then 7 more days in home isolation.
    b. If positive on day 11: conduct another test after 6 days, and repeat after 6 more days until the test becomes negative, e.g. day 11, day 17, day 23, day 29, etc. When test becomes negative one more test will be conducted 48 hours later. If negative again, discharge on the next day. Manage as appropriate to have a total of 28 days in isolation.

NB: In any case, confirmed COVID-19 patients should be kept in a hospital isolation for at least 14 days.

COVID-19 Airway management principles according to WFSA guideline

High Risk Procedures – Tracheal Intubation and other Aerosol-generating medical procedures

- Limit staff present at tracheal intubation: one intubator, one assistant and one to administer drugs/monitor patient.
- Preferably, the most experienced anaesthesiologist should perform the intubation.
- Create a COVID-19 tracheal intubation trolley that can be used in ICU or elsewhere.
- PPE is effective and must be worn. Wear full PPE at all times. Consider double gloving. Defog goggles and/or eye wear if possible. Touch as little as possible in the room to avoid fomites.
- Everyone should know the plan before entering the room – use a checklist to achieve this.
- Plan how to communicate before entering the room.
- All preparations of airway equipment and drugs that can take place outside the room should do.
- Before the procedure begins, ensure all equipment is ready: standard monitoring equipment, iv access, drugs. Ensure ventilator and suction equipment is functional.
- Focus on safety, promptness and reliability. Aim to succeed at the first attempt because multiple attempts increase risk to sick patients and staff. Do not rush but make each attempt the best it can be.
- Place an HME with viral filter between the catheter mount and the circuit at all times. Keep it dry to avoid blocking.
- Avoid aerosol-generating procedure, including high-flow nasal oxygen, non-invasive ventilation, bronchoscopy and tracheal suction unless an in-line suction system is in place.
- Use RSI with cricoid force where a trained assistant can apply it. Take it off if it causes difficulty. Five minutes of preoxygenation with oxygen 100% and RSI in order to avoid manual ventilation and potential aerosolization of infectious respiratory droplets. If manual ventilation is required, apply small tidal volumes only.
- To avoid cardiovascular collapse, use ketamine 1–2 $mg.kg^{-1}$, suxamethonium 1.5 $mg.kg^{-1}$.
- Have a vasopressor for bolus or infusion (noradrenalin 0.05-1 µg/kg/min) immediately available for managing hypotension.
- Communicate clearly: simple instructions, closed loop communication (repeat instructions back), adequate volume without shouting.
- Place a nasogastric tube after tracheal intubation is completed and ventilation established safely.
- Discard disposable equipment safely after use. Decontaminate reusable equipment fully and according to manufacturer's instructions.
- After leaving the room ensure doffing of PPE is meticulous.

Emergency tracheal intubation checklist COVID-19

Personal Protective Equipment → Prepare Equipment → Prepare for Difficulty → In the Room → Post-procedure and Safety

OUTSIDE ROOM

Personal Protective Equipment

PPE – be thorough, don't rush
- ❑ Wash hands
- ❑ Put on PPE
  - ❑ Long sleeved gown
  - ❑ FFP3 mask
  - ❑ Gloves
  - ❑ Eyewear
  - ❑ Wipeable shoes
  - ❑ ± Headwear
- ❑ Check fully by buddy with checklist
- ❑ Names on visors

Prepare Equipment

- ❑ Check kit
  - ❑ BMV or Mapleson C with HME attached
  - ❑ Guedel
  - ❑ Working suction
  - ❑ Videolaryngoscope
  - ❑ Bougie/stylet
  - ❑ Two tracheal tubes, ties and syringe
  - ❑ 2nd generation SGA
  - ❑ eFONA set
- ❑ Do you have all the drugs required?
  - ❑Ketamine
  - ❑Relaxant
  - ❑Vasopressor
  - ❑Maintenance sedation
- ❑ Weight?
- ❑ Allergies?

Prepare for Difficulty

- ❑ If the airway is difficult, could we wake the patient up?
- ❑ What is the plan for a difficult intubation?
  - ❑Plan A: RSI
  - ❑Plan B/C: 2-handed 2-person BMV & 2nd generation SGA

  - ❑Plan D: e.g. Front of neck airway: scalpel bougie tube
- ❑ Confirm agreed plan
- ❑ Does anyone have any concerns?

INSIDE ROOM

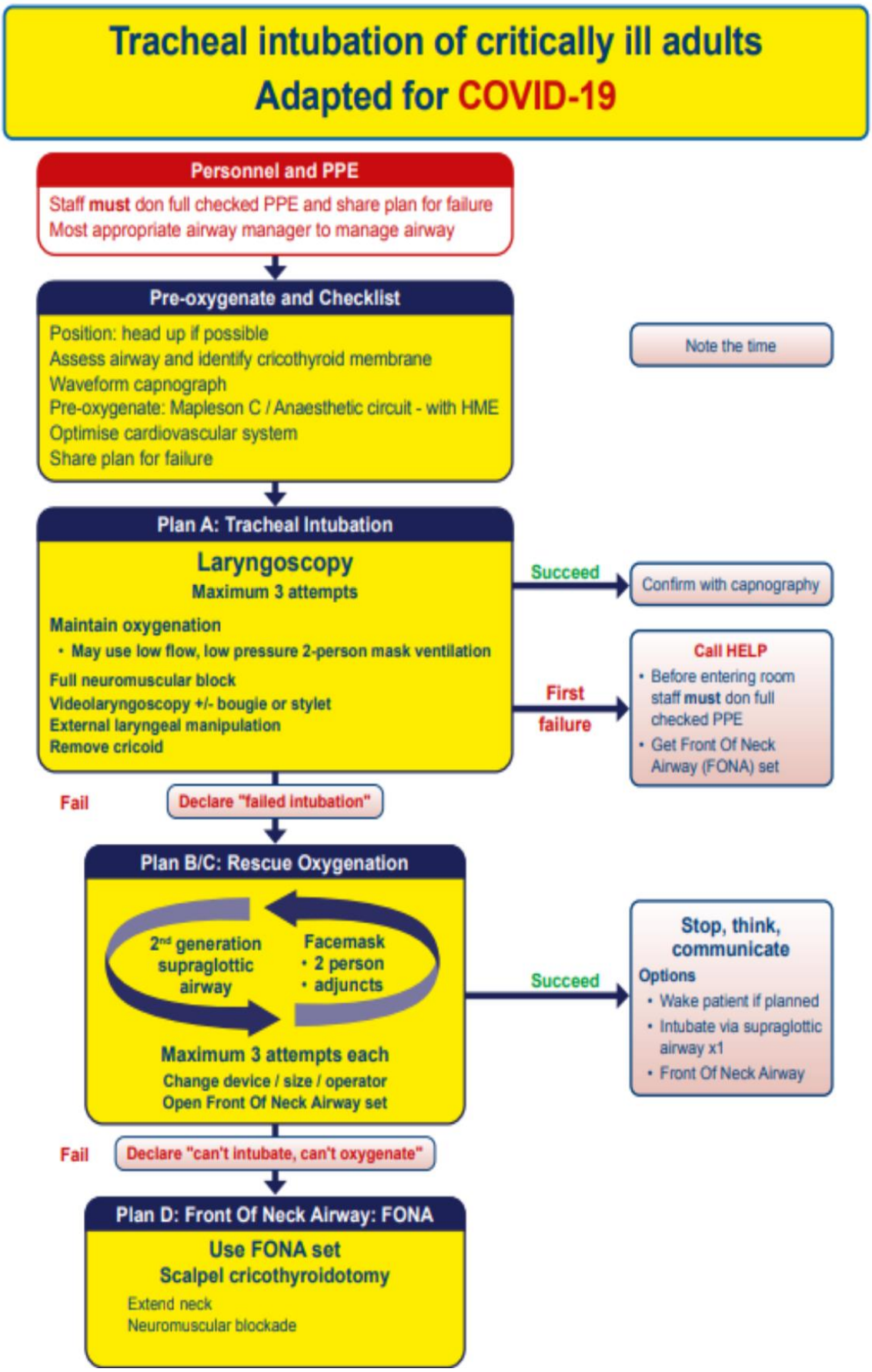
In the Room

- ❑ Airway assessment
  - ❑Identify CTM
  - ❑MACOCHA
- ❑ Apply monitors
  - ❑Waveform capnography
  - ❑SpO_2 probe
  - ❑ECG
  - ❑Blood pressure
- ❑ Checked IV access (x2)
- ❑ Optimise position
  - ❑Consider ramping or reverse Trendelenburg
- ❑ Optimal preoxygenation
  - ❑3 mins
  - ❑ETO_2 > 85%
  - ❑Low flow nasal O_2
- ❑ Optimise patient condition be optimised any further before intubation?
  - ❑Fluid/pressor/ inotrope
  - ❑Aspirate NGT
  - ❑Delayed sequence induction?

AFTER AND LEAVING

Post-procedure and Safety

- ❑ Airway management
  - ❑Establish ventilation after cuff inflation
  - ❑Check waveform capnography
  - ❑Clamp tracheal tube before each disconnection
  - ❑Avoid unnecessary disconnections
- ❑ Other
  - ❑Insert NGT
  - ❑Consider deep tracheal viral sample
- ❑ Careful equipment disposal
- ❑ Decontamination of reusable
- ❑ Remove PPE
  - ❑Observed by buddy
  - ❑Use checklist
  - ❑Meticulous disposal
  - ❑Wash hands


Tracheal intubation of critically ill adults
Adapted for COVID-19
Personnel and PPE
Staff must don full checked PPE and share plan for failure
Most appropriate airway manager to manage airway
Pre-oxygenate and Checklist
Position: head up if possible
Assess airway and identify cricothyroid membrane
Waveform capnograph
Pre-oxygenate: Mapleson C / Anaesthetic circuit - with HME
Optimise cardiovascular system
Share plan for failure
Note the time
Plan A: Tracheal Intubation
Laryngoscopy
Maximum 3 attempts
Maintain oxygenation
• May use low flow, low pressure 2-person mask ventilation
Full neuromuscular block
Videolaryngoscopy +/- bougie or stylet
External laryngeal manipulation
Remove cricoid
Succeed
Confirm with capnography
First failure
Call HELP
• Before entering room staff must don full checked PPE
• Get Front Of Neck Airway (FONA) set
Fail
Declare "failed intubation"
Plan B/C: Rescue Oxygenation
2nd generation supraglottic airway
Facemask
• 2 person
• adjuncts
Maximum 3 attempts each
Change device / size / operator
Open Front Of Neck Airway set
Succeed
Stop, think, communicate
Options
• Wake patient if planned
• Intubate via supraglottic airway x1
• Front Of Neck Airway
Fail
Declare "can't intubate, can't oxygenate"
Plan D: Front Of Neck Airway: FONA
Use FONA set
Scalpel cricothyroidotomy
Extend neck
Neuromuscular blockade

Rational use of PPE

ပူးတွဲ 'ခ'

COVID-19 Acute Respiratory Disease နှင့် ပတ်သက်၍ Personal Protective Equipment ဝတ်ဆင်ရန် လုပ်ငန်းလမ်းညွှန်

အကြောင်းအရာ	Medical Mask	N95 mask	Gown	Gloves	Eyes protection (Goggles or face shield)	Boots/ closed shoes
ပြင်ပလူနာ ဌာနဒွါရ Screening ပြုလုပ်ခြင်း	(+) အသက်ရှူလမ်းကြောင်းဆိုင်ရာ လက္ခဏာများ (Respiratory symptoms) ရှိသူတိုင်း အတွက် အသုံးပြုရန်	(-)	(-)	(-)	(-)	(-)
လူနာများအား သံသယရှိပါက သီးခြား စမ်းသပ်ခန်း (Fever room/ Temporary isolation room) ၌ စမ်းသပ်ခြင်း	(+)	(-)	(+)	(+)	(-)	(-)
သံသယလူနာများ (Person under investigation/ suspected) လူနာခန်း၌ စမ်းသပ်ခြင်း/ ကုသခြင်း	(+)	(-)	(+)	(+)	(+)	(-)
ဓာတ်ခွဲစစ်ဆေးမှုပြုလုပ်သူများ/ Sample ယူခြင်း	(-)	(+)	(+)	(+)	(+)	(-)
Aerosol-generating procedures များ (e.g; tracheal incubation, non-invasive ventilation, tracheostomy, cardio pulmonary resuscitation, manual ventilation, bronchoscopy) ပြုလုပ်ခြင်း	(-)	(+)	(+) Apron ပါ ဝတ်ဆင်ရန်	(+)	(+)	(-)
လူနာများအား လူနာတင်ယာဉ်ဖြင့် သယ်ပို့ ရာတွင် အသက်ကယ်ကုသမှု ပြုလုပ်မည့် အထောက်အကူပြု	(+)	(-)	(+)	(+)	(+)	(-)

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အကြောင်းအရာ	Medical Mask	N95 mask	Gown	Gloves	Eyes protection (Goggles or face shield)	Boots/ closed shoes
ဝန်ထမ်းများ/ လူနာအား ထိတွေ့ကိုင်တွယ်မည့်သူများ						
လူနာခန်းအား သန့်ရှင်းရေးပြုလုပ်သူများ	(+)	(-)	(+)	(+) (Heavy duty gloves)	(+)	(+)
လူနာခန်းသို့ ဝင်ရောက်မည့် ဧည့်သည်များ	(+)	(-)	(+)	(+)	(-)	(-)

Reference : Rational Use of Personal Protective Equipment for Coronavirus Disease 2019 (WHO)

မှတ်ချက်

- ကျန်းမာရေးဝန်ထမ်းများသည် လူနာများအား ထိတွေ့ကိုင်တွယ်ခြင်း မပြုမီ နှင့် ထိတွေ့ကိုင်တွယ်ပြီးနောက် လက်ကို (Alcohol hand sanitizer/ ဆပ်ပြာနှင့် ရေဆေးခြင်းဖြင့်) စနစ်တကျ ဆေးကြောရမည်။
- သံသယလူနာများအား စစ်းသပ်စစ်ဆေးရန် မလိုအပ်သူသည် (ဥပမာ - Screening ပြုလုပ်ခြင်း/မေးမြန်းခြင်း၊ လူနာတင်ယာဉ် ယာဉ်မောင်း) လူနာနှင့် အနည်းဆုံး တစ်မီတာ သို့မဟုတ် သုံးပေ ခွာ၍ သတိပြု နေထိုင်ရပါမည်။
- လူနာများတွင် အသက်ရှူလမ်းကြောင်းဆိုင်ရာ ရောဂါလက္ခဏာများ ရှိပါက လူနာအား Medical Mask တပ်ဆင်ပေးရမည်။ အသက်ရှူလမ်းကြောင်းဆိုင်ရာ ရောဂါလက္ခဏာများ မရှိပါက Mask တပ်ဆင်ပေးရန် မလိုအပ်ပါ။

မလိုအပ်ဘဲ PPE များ အသုံးပြုခြင်းကို တတ်နိုင်သမျှ ရှောင်ကြည်ရပါမည်။

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Awake proning guide

Aims

Awake proning **may reduce** ICU admissions. Intubation in COVID19 has a high mortality. Patient **must** be **awake** and willing to **comply**.

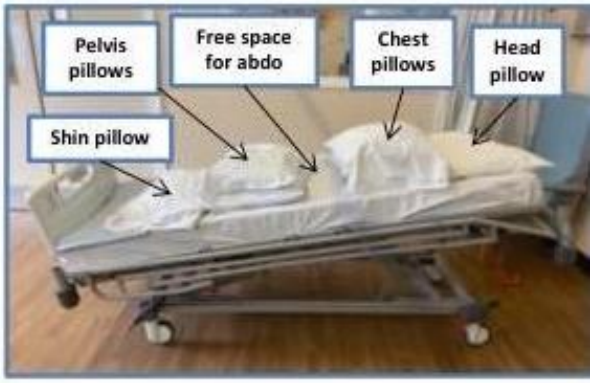
Duration

Aim to remain prone for **4 hours periods**. Allow **1 hour comfort breaks** between periods of proning for eating, drinking, toilet and general comfort.

Placement for patient positioning

-**1** soft pillow for the **head**
-**2** substantial pillows for under the **chest**
-**2** substantial pillows for under the **pelvis**
-**1** pillow for under the **shins**

NB: The abdomen should hang free and not be compressed. This is even more important in obese patients.



Bed position

Steep head up (at least **30 degrees**).

Head position

Leave oxygen mask in place – do not try and wean down immediately. Improvement of oxygenation with proning may take many hours to manifest.
Head turned to left or right – **whatever is comfortable** for the patient.

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