THE GOVERNMENT OF THE REPUBLIC OF THE UNION OF MYANMAR

MINISTRY OF HEALTH AND SPORTS

DEPARTMENT OF MEDICAL SERVICES

Clinical Management Guidelines for 2019 Novel Coronavirus (2019-nCoV) infection

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Surveillance case definitions for 2019-nCoV

Suspect case

A. Patient with severe acute respiratory infection (fever, cough, and requiring admission to hospital),

AND

with no other etiology that fully explains the clinical presentation

AND

a history of travel to or residence in China during the 14 days prior to symptom onset,

OR

B. Patient with any acute respiratory illness

AND

at least one of the following during the 14 days prior to symptom onset:

a) contact with a confirmed or probable case of 2019-nCoV infection, **or**

b) worked in or attended a health care facility where patients with confirmed or probable 2019-nCoV acute respiratory disease patients were being treated.

Probable case

A suspect case for whom testing for 2019-nCoV is inconclusive or is tested positive using a pan-coronavirus assay and without laboratory evidence of other respiratory pathogens.

Confirmed case

A person with laboratory confirmation of 2019-nCoV infection, irrespective of clinical signs and symptoms.

*see *https://www.who.int/health-topics/coronavirus* for latest case definitions

Contact is defined as:

- Providing direct care for 2019-nCoV patients, working with health care workers infected with novel coronavirus, visiting patients or staying in the same close environment as a 2019-nCoV patient.
- Working together in close proximity or sharing the same classroom environment with a 2019-nCoV patient
- Traveling together with a 2019-nCoV patient in any kind of conveyance
- Living in the same household as a 2019-nCoV patient within a 14-day period after the onset of symptoms in the case under consideration.

Monitoring of contacts of probable and confirmed cases :

- Contacts should be monitored for 14 days from the last unprotected contact.
- Contracts should self-limit travel and movements.
- Monitoring by public health authorities can be done through household or virtual visits or by telephone to check for symptoms.
- Any contact who becomes ill and meets the case definition becomes a suspect case and 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

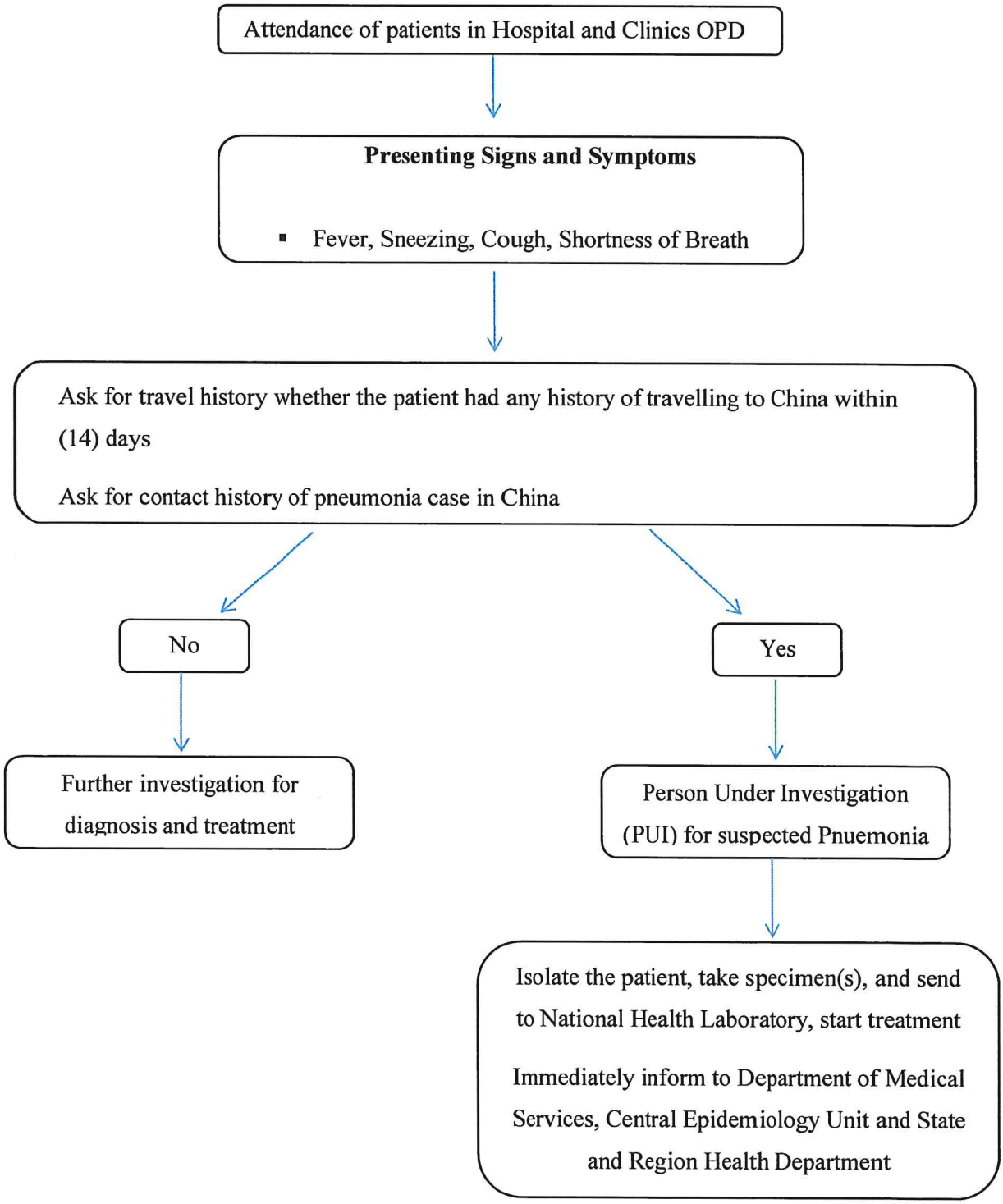
Fever .....Cough ..... Sorethroat.....Headache.....Muscle pain.....Shortness of breath.....Diarrhoea.....Reduced urine output etc.....

II. Physical Examination

Vital signs: GCS: ..... Temperature..... Cyanosis..... BP: .... HR: ..... SPO_2: ..... RR: ..... Lungs: .....

Features of Septic shock, Acute kidney injury

Triage of Patients



III. Categorization of Patients

Uncomplicated illness

Patients with non-specific symptoms such as fever, cough, sore throat, nasal congestion, malaise, headache, muscle pain without any signs of dehydration, sepsis or shortness of breath. Elderly and immunosuppressed may present with atypical symptoms.

Mild pneumonia

Patient with pneumonia and no signs of severe pneumonia.

Severe pneumonia

Patients with fever or suspected respiratory infection, plus one of respiratory rate >30 breaths/min, severe respiratory distress, or SpO_2 <90% 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, $\times 10^3/\mu L$	≥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 specimens – Nasopharyngeal and Oropharyngeal swab in ambulatory patient, Endotracheal or Bronchoalveolar lavage aspirate in severely ill for nCoV testing by RT-PCR.
- Clinicians may elect to collect only LRT samples when these are readily available (for example, in mechanically ventilated patients).
- Serology for diagnostic purposes is recommended only when RT-PCR is not available.
- Use appropriate PPE for specimen collection (droplet and contact precautions for URT specimens; airborne precautions for LRT specimens). When collecting URT samples, use viral swabs (sterile Dacron or rayon, not cotton) and viral transport media.
- Sample collection technique & frequency will be follow NHL sample collection guidance. Samples will be sent to NHL.
- CP, ESR, CRP, RBS, ECG, U&E, Creatinine, LFT with Enzymes, Blood C&S, ABG, , CXR (PA)

V. Treatment

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

At triage

- Give suspect patient a medical mask and direct patient to separate area, an isolation room if available.
- Keep at least 1meter 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 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 1-2 metres 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. Early supportive therapy and monitoring

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 7-14 days +

  IV Azithromycin 500 mg OD for 7 days

  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 can modify antibiotic regimen if necessary)

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

C. Treatment of complications

Respiratory Failure & ARDS	-	Mechanical ventilation
Septic shock	-	Fluid resuscitation with isotonic crystalloid 30ml/kg in 1st 3 hours, 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

D. 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
- 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

E. Specific anti novel CoV treatment

There is no current evidence from RCTs to recommend any specific anti-nCoV treatment for patients with suspected or confirmed 2019-nCoV infection.

Empiric antivial: Lopinavir or Ritonavir + Tamiflu or Remdesivir

F. Treatment of pregnant patients

- Pregnant women with suspected or confirmed 2019-nCoV should be treated with supportive therapies as described above.
- Use of investigational therapeutic agents outside of a research study should be guided by individual risk-benefit analysis based on potential benefit for mother and safety to fetus, with consultation from an obstetric specialist and ethics committee.
- Emergency delivery and pregnancy termination decisions are challenging and based on many factors: gestational age, maternal condition, and fetal stability.
- Consultations with obstetric, neonatal, and intensive care specialists (depending on the condition of the mother) are essential.

G. Management of hypoxemic respiratory failure and ARDS (For ICU Setting)

Recognize severe hypoxemic respiratory failure when a patient with respiratory distress is failing standard oxygen therapy.

Remarks: Patients may continue to have increased work of breathing or hypoxemia even when oxygen is delivered via a face mask with reservoir bag (flow rates of 10-15 L/min, which is typically the minimum flow required to maintain bag inflation; FiO2 0.60-0.95). Hypoxemic respiratory failure in ARDS commonly results from intrapulmonary ventilation-perfusion mismatch or shunt and usually requires mechanical ventilation.

High-flow nasal oxygen (HFNO) or non-invasive ventilation (NIV) should only be used in selected patients with hypoxemic respiratory failure. The risk of treatment failure is high in patients with MERS treated with NIV, and patients treated with either HFNO or NIV should be closely monitored for clinical deterioration.

Remark 1: HFNO systems can deliver 60 L/min of gas flow and FiO2 up to 1.0; paediatric circuits generally only handle up to 15 L/min, and many children will require an adult circuit to deliver adequate flow. Compared to standard oxygen therapy, HFNO reduces the need for intubation. Patients with hypercapnia (exacerbation of obstructive lung disease, cardiogenic pulmonary oedema), hemodynamic instability, multi-organ failure, or abnormal

mental status should generally not receive HFNO, although emerging data suggest that HFNO may be safe in patients with mild-moderate and non-worsening hypercapnia. Patients receiving HFNO should be in a monitored setting and cared for by experienced personnel capable of endotracheal intubation in case the patient acutely deteriorates or does not improve after a short trial (about 1 hr). Evidence-based guidelines on HFNO do not exist, and reports on HFNO in MERS patients are limited.

Remark 2: NIV guidelines make no recommendation on use in hypoxemic respiratory failure (apart from cardiogenic pulmonary oedema and post-operative respiratory failure) or pandemic viral illness (referring to studies of SARS and pandemic influenza). Risks include delayed intubation, large tidal volumes, and injurious transpulmonary pressures. Limited data suggest a high failure rate when MERS patients receive NIV.28 Patients receiving a trial of NIV should be in a monitored setting and cared for by experienced personnel capable of endotracheal intubation in case the patient acutely deteriorates or does not improve after a short trial (about 1 hr). Patients with hemodynamic instability, multiorgan failure, or abnormal mental status should not receive NIV.

Remark 3: Recent publications suggest that newer HFNO and NIV systems with good interface fitting do not create widespread dispersion of exhaled air and therefore should be associated with low risk of airborne transmission.

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

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, via a face mask with reservoir bag, bag-valve mask, HFNO, or NIV. Rapid sequence intubation is appropriate after an airway assessment that identifies no signs of difficult intubation32. The following recommendations in this section pertain to mechanically ventilated patients with ARDS. These focus on adults; consensus- based recommendations for children are available.

Implement mechanical ventilation using lower tidal volumes (4–8 ml/kg predicted

body weight, PBW) and lower inspiratory pressures (plateau pressure <30 cmH2O).

Remarks: This is a strong recommendation from a clinical guideline for patients with ARDS,33 and is suggested for patients with sepsis-induced respiratory failure who do not meet ARDS criteria.17 The initial tidal volume is 6 ml/kg PBW; tidal volume up to 8 ml/kg PBW is allowed if undesirable side effects occur (e.g. dyssynchrony, pH <7.15). Hypercapnia is permitted if meeting the pH goal of 7.30-7.45. Ventilator protocols are available.35 The use of deep sedation may be required to control respiratory drive and achieve tidal volume targets. Although high driving pressure (plateau pressure–PEEP) may more accurately predict increased mortality in ARDS compared to high tidal volume or plateau pressure,36 RCTs of ventilation strategies that target driving pressure are not currently available.

In patients with severe ARDS, prone ventilation for >12 hours per day is recommended.

Remarks: Application of prone ventilation is strongly recommended for adult and paediatric patients with severe ARD but requires sufficient human resources and expertise to be performed safely.

Use a conservative fluid management strategy for ARDS patients without tissue hypoperfusion.

Remarks: This is a strong guideline recommendation; the main effect is to shorten the duration of ventilation. See reference [39] for details of a sample protocol.

In patients with moderate or severe ARDS, higher PEEP instead of lower PEEP is suggested.

Remarks: PEEP titration requires consideration of benefits (reducing atelectrauma and improving alveolar recruitment) vs. risks (end-inspiratory overdistension leading to lung injury and higher pulmonary vascular resistance). Tables are available to guide PEEP titration based on the FiO2 required to maintain SpO2.35 A related intervention of recruitment manoeuvres (RMs) is delivered as episodic periods of high continuous positive

airway pressure [30–40 cm H2O], progressive incremental increases in PEEP with constant driving pressure, or high driving pressure; considerations of benefits vs. risks are similar. Higher PEEP and RMs were both conditionally recommended in a clinical practice guideline.33 For PEEP, the guideline considered an individual patient data meta-analysis40 of 3 RCTs. However, a subsequent RCT of high PEEP and prolonged high-pressure RMs showed harm, suggesting that the protocol in this RCT should be avoided.41 Monitoring of patients to identify those who respond to the initial application of higher PEEP or a different RM protocol, and stopping these interventions in non-responders, is suggested.

In patients with moderate-severe ARDS (PaO2/FiO2 <150), neuromuscular blockade by continuous infusion should not be routinely used.

Remarks: One trial found that this strategy improved survival in patients with severe ARDS (PaO2/FiO2 <150) without causing significant weakness,43 but results of a recent larger trial found that use of neuromuscular blockage with high PEEP strategy was not associated with survival when compared to a light sedation strategy without neuromuscular blockade44. Continuous neuromuscular blockade may still be considered in patients with ARDS in certain situations: ventilator dyssnchony despite sedation, such that tidal volume limitation cannot be reliably achieved; or refractory hypoxemia or hypercapnia.

In settings with access to expertise in extracorporeal life support (ECLS), consider referral of patients with refractory hypoxemia despite lung protective ventilation.
Remarks: A recent guideline made no recommendation about ECLS in patients with ARDS.33 Since then, an RCT of ECLS for patients with ARDS was stopped early and found no statistically significant difference in the primary outcome of 60-day mortality between ECLS and standard medical management (including prone positioning and neuromuscular blockade).45 However, ECLS was associated with a reduced risk of the composite outcome of mortality and crossover to ECLS,45 and a post hoc Bayesian analysis of this RCT showed that ECLS is very likely to reduce mortality across a range of prior assumptions.46 In patients with MERS-CoV infection, ECLS vs. conventional treatment was associated with reduced mortality in a cohort study.47 ECLS should only be offered in expert centres with a sufficient case volume to maintain expertise and that can apply the IPC measures required for nCoV patients.48

Avoid disconnecting the patient from the ventilator, which results in loss of PEEP and atelectasis. Use in-line catheters for airway suctioning and clamp endotracheal tube when disconnection is required (for example, transfer to a transport ventilator).

VIII. References:

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