# Critical Care Management of Patient Confirmed with COVID-19

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CRITICAL CARE SOCIETY OF SOUTHERN AFRICA

## What do we know

- Patients may present with significant hypoxemia in the absence of dyspnoea or radiological abnormalities
- Hypercoagulability is common and manifests with thrombi particularly in the pulmonary vasculature
- A subset of patients develop a dysregulated immune response characterized by excessive cytokine production which in turn drives organ dysfunction
- Initially infiltrates are confined to alveolar walls (low elastance) and if a hyper inflammatory response ensues, the alveolar cavities become fluid filled resulting in a small percentage of patients manifesting with ARDS (high elastance)
- Patients may present primarily with non-pulmonary pathology (strokes, seizures, encephalitis, myocardial infarction, acute kidney injury)

## Respiratory Management of Patients unable to maintain a $SpO_2$ >90% with reservoir bag oxygen mask (15L/min)

- Self proning encouraged
- High flow nasal oxygen cannula (tape into position) under a surgical facemask
- Monitor clinical response and $SpO_2$
- Not recommended:
  - Venturi mask
  - Nebuliser mask
- Caution with Non-invasive ventilation

## Poor Outcomes Noted in:

- Late onset respiratory failure
- Two, or more organ failures
- Elderly patients (especially >65 years)
- Comorbidities (especially diabetes, hypertension or ischemic heart disease)
- Obesity
- Need for dialysis
- Immunocompromised

## Investigations

Refer to investigation guideline

## Consider Intubation

- Hypoxaemia with severe respiratory distress despite standard $O_2$ therapy
- Cardiac dysfunction
- Cytokine storm/Hyperinflammatory state

(Refer to separate guideline on how to conduct intubation)

## CPR

- Consider CPR if a rapidly reversible aetiology for cardiac arrest
- High risk with BVM
- If BVM:
  - Ensure good seal
  - Use high efficiency particulate filter
  - Hold mask with 2 hands (2 persons)

## High risk for viral transmission during

- Intubation
- Bronchoscopy
- Bag mask ventilation (BMV)
- CPR
- Nebulisation
- Transfer

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## Respiratory Management

- **Degree of lung elastance will influence ventilation strategy.**
  - **Low elastance (alveoli well aerated so good lung compliance )**
    - Will not significantly benefit from lung recruitment strategies
    - TV 6-8 ml/kg IBW with PEEP (initiate at 10 cm $H_2O$ and titrate)
  - **High elastance (atelectasis and poor lung compliance due to consolidation)**
    - Should benefit from small tidal volumes
    - TV 4-6 ml/kg IBW and lung recruitment strategies with PEEP (initiate at 10 cm $H_2O$ and titrate)
    - Consider Airway Pressure Release Ventilation early (if experienced)
- Limit plateau pressure to 30 cm $H_20$ and driving pressure to 15cm$H_20$
- Consider **prone ventilation** early if refractory hypoxemia
- Target $SaO_2$ of 88-90% and aim to reduce $F_iO_2$ to<0.6
- Permissive hypercapnia provided stable hemodynamically and pH>7.15
- Role of **ECMO** unclear: Consider V-V ECMO in young patients with single organ failure after discussion with ECMO centre

## General Management

- **Judicious fluid therapy:** ensure adequate intravascular volume as patients may be hypovolemic initially. Avoid fluid overload. Calculate daily fluid balance.
  In ARDS patients aim for a neutral to 500ml negative fluid balance.
- Initiate **thromboprophylaxis** in **ALL** patients (if no contraindication): 40-60mg s/c enoxaparin daily
- Use **therapeutic anticoagulation** (1mg/kg enoxaparin s/c 12 hourly - unless contra-indicated or requiring dosage adjustment for renal or hepatic dysfunction) for severely hypoxaemic patients with a hyperinflammatory state and elevated D Dimer (>1)
- Ulcer prophylaxis if at high risk for stress ulcers or unable to feed enterally
- **Vasopressor** use: Low threshold to initiate rather than excessive fluid loading
- Initiate **enteral feeding** if no contraindication
- For all suspected CAP patients: Amoxycilin-Clavulanate + Macrolide + Oseltamavir
- Corticosteroid Rx: Administer daily dexamethasone (*i.v.* 6-8mg) [or hydrocortisone (*i.v.*200mg) or methylprednisone (*i.v.* 30mg) or prednisone (*p.o.* 40mg)] for 10 days.

## Unproven but possibly beneficial therapies

- Several agents are currently being explored
- Includes: Remdesivir, Tocilizumab, Colchicine, Immunoglobulins
- There is currently insufficient evidence to support their inclusion as standard therapy.
- If considering these agents: seek expert opinion and use as per MEURI framework
- Additionally, Zinc, vitamin C, vitamin D supplementation may be considered.

* Dual anti-platelet therapy is not recommended



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