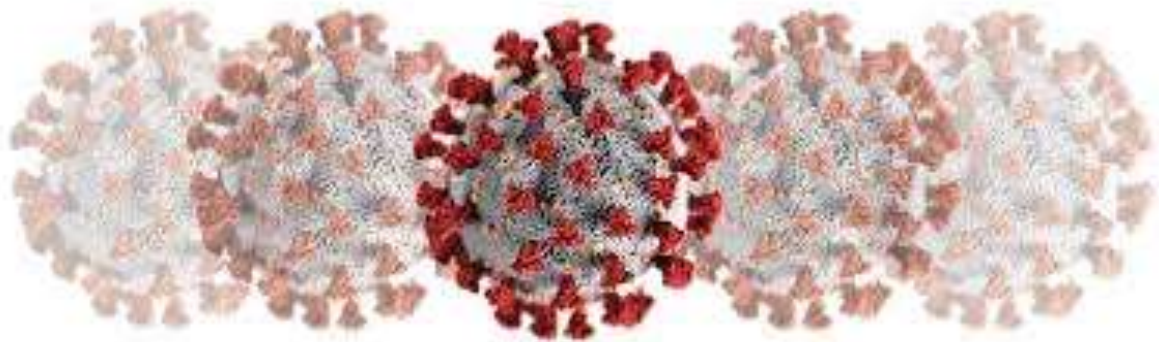




**CCSN**

**Critical Care Society of Namibia**

## **COVID-19 Protocol Version 1.2**



E-mail: [wch.icu19@gmail.com](mailto:wch.icu19@gmail.com)

## Forward

This is the first COVID-19 treatment protocol created by the Critical Care Society of Namibia (CCSNA) based on the latest internationally validated data research. It is adjusted to the local Namibian needs and drug availability.

The protocol consists of two parts. First, specific treatment plan for when patients are critically ill or when patients are not showing improvement and treatment must be escalated promptly and adequately.

The second part consists of basic critical care management (NATURES FILMS approach) which might be useful for doctors who are not experienced with critical care.

The CCSNA protocol is not replacing the MOHSS guideline, but rather aiming to help medical practitioners in making the right decision in the treatment of critically ill or rapidly deteriorating patients.

We would like to express special thanks to Prof R. Lichtman and Specialist Consultant Dr A. Muhamedrahimov for their corrections and comments to this protocol.

The protocol will be updated as new scientific information becomes available. The protocol will be posted on the CCSNA and MAN websites. Kindly forward any comments or inputs to Intensive Care Unit Windhoek Central Hospital ([wch.icu19@gmail.com](mailto:wch.icu19@gmail.com))

Head of Windhoek Central Hospital ICU

Dr Alex Polishchuk and WCH ICU team (2021)

**Changes in V1.2:** Actemra and Antibiotics cover (p.11)



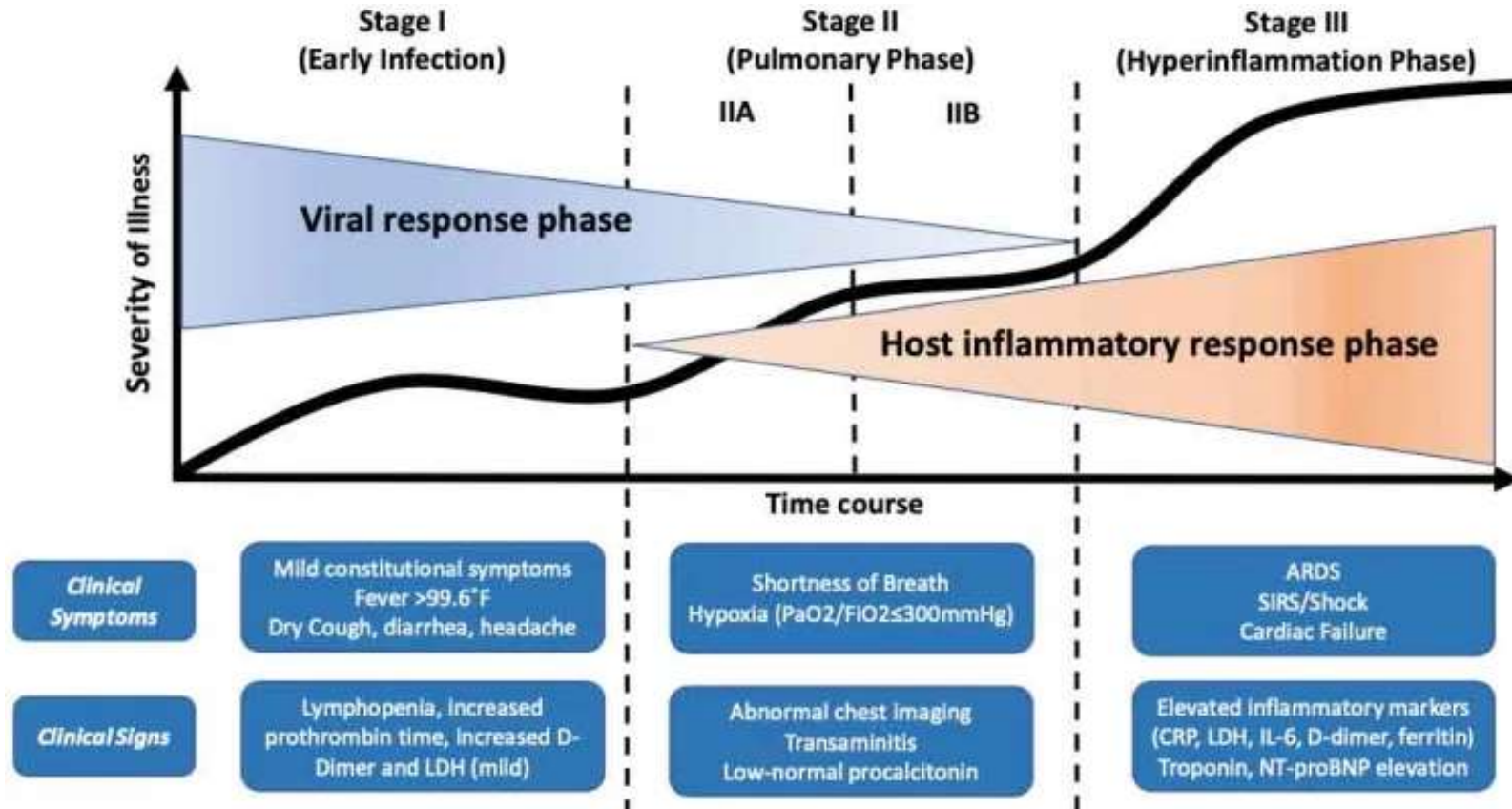
**TABLE OF CONTENT**

1. Stages of COVID-19.....4  
2. Investigations.....5  
3. Prognostic scoring.....6  
4. Treatment recommendations (COVID guideline document).....7  
    I Therapy guideline  
    II Guideline for critically ill  
    III Respiratory Support

*Tables*

1. Therapy guidelines.....14  
2. Oxygenation and respiratory support.....15  
3. Sedation Recommendations.....19  
4. Feeding Protocol.....21  
5. Glucose control and bridging.....22  
6. Initial ventilator settings.....23  
7. Preparation for Intubation.....24  
8. Drugs for Intubation.....25  
9. Initial Steroids Dose.....26  
10. NHS University Hospitals of North Midlands Guideline.....27

## Stages of COVID-19



Viral Replication

Primary immune response

Poly-segmental Infarct Pneumonia

“Cytokine Storm” / ARDS

Thromboembolic complications / MODS

Bacterial complications



CCSN

## COVID 19-TREATMENT GUIDELINES

### Essential investigations

- FBC, U&E and LFT on admission, then if indicated
- **LDH, CRP, PCT** on admission and daily. PCT later if indicated
- D-dimers and ferritin
- Chest X-Ray
- Lung sonar

| MORBIDITY   | INVESTIGATION  | TREATMENT APPROACH   |
|---|--|--|
| <b>Viral replication</b><br>(D0 – D7)                       | Lymphopenia<br>Absolute lymphocyte count <0.8<br>Absolute Neutrophil/lymphocyte ratio (NLR) >3   | - Antiviral within first 72hrs of symptoms 5/7<br>- No effect after 10 days<br>- Spironolactone (TMPRSS inhibitor) 2/52  |
| <b>Inflammatory response</b><br>“cytokine storm”<br>From D6 | CRP, Ferritin, Interleukins  | - Steroids in adequate dose if CRP > 20 or if patient still symptomatic with increased O <sub>2</sub> demand, dyspnea (from D6)<br>- Tocilizumab can be considered if no sepsis  |
| <b>Septic Markers</b>                                       | ↑ Neutrophils, ↓ Eosinophils, ↓ Platelets,<br>↑ PCT, ↑ CRP (if Actemra not given)  | - Antibacterial treatment from D3  |
| <b>Coagulation disorder</b>                                 | Platelets, D-dimers, Coagulation profile<br>Suspect PE: Transient ↓ SpO <sub>2</sub> with unexplained tachycardia or Platelets and HB ↓ together   | - Anti-thrombotic drugs<br>- D0-7: Prophylactic dose<br>>D7: increased prophylactic dose if “cytokine storm” and increased XDP: consider CTPA  |
| <b>Lung tissue damage</b><br>- V/Q mismatch<br>- ARDS       | ↑ LDH (LDH3), Lung ultrasound, CXR,<br>Poly-segmental Infarct Pneumonia (PIP) --- > ARDS<br>Compliance Normal ----- > ↓ Compliance<br>Resp failure Type I ----- > Type II<br>↑ “shunt”: ↑ O <sub>2</sub> demand to keep same SpO <sub>2</sub><br>: ↓ P/F (S/F) <300 -- <200 -- <100<br>: ↑ A-a gradient, ↓ a/A ratio<br>↑ Dead space: PCO <sub>2</sub> – EtCO <sub>2</sub> >15 mm Hg | D0 – D5<br>- Antiviral ASAP<br>From D6<br>- Adequate dose of steroids if CRP > 20, ↑ O <sub>2</sub> demand<br>- O <sub>2</sub> → Rebreather Mask → High Flow O <sub>2</sub> → CPAP<br>→ Invasive Ventilation<br>- CPAP better than PSV |

## Prognostic Scores

| <b>Epidemiological risk factors</b>  | <b>Vital signs</b>   | <b>Labs</b>   |
|--|--|---|
| Age above ~55-60 years old<br>Diabetes, Hypertension<br>Morbid obesity, CKD,CCF<br>Coronary artery disease,<br>Chronic pulmonary disease<br>Transplant or other form of immunosuppression, HIV<br>Cancer | Respiratory rate >24 breaths/min<br><br>Heart rate > 125 b/m<br><br>Oxygen saturation <90% on room air<br><br>High self-generated V <sub>T</sub> on CPAP | Neutrophil/Lymphocyte ratio (NLR)>3-5.<br>(superior prognosticator when compared to lymphopenia or CRP)<br>Absolute lymphocyte count <0.8.<br>(prolonged or worsening lymphopenia)<br>LDH >245-300 IU/L.<br>CRP>100-125 mg/L. |

## Scoring system

### 1. 4C Mortality COVID 19 score

<https://www.mdcalc.com/4c-mortality-score-covid-19>

### 2. SOFA Score and admission and 48hrs re-evaluation

| <b>SOFA Score</b> | <b>Mortality initial score</b> | <b>Mortality on 48hrs re-evaluation</b> |
|-------------------|--------------------------------|---|
| <9                | <33.3%                         | <26.3%                                  |
| 10-11             | 50.0%                          | 45.8%                                   |
| >12               | 95.2%                          | >80.0%                                  |

<https://www.mdcalc.com/sequential-organ-failure-assessment-sofa-score>

### 3. Mean SOFA Score: (SOFA Admission + 48hrs + 120hrs) / 3

| <b>Mean SOFA Score</b> | <b>Mortality</b> |
|------------------------|------------------|
| 0-1.0                  | 1.2%             |
| 1.1-2.0                | 5.4%             |
| 2.1-3.0                | 20.0%            |
| <b>3.1-4.0</b>         | <b>36.1%</b>     |
| <b>4.1-5.0</b>         | <b>73.1%</b>     |
| >5.1                   | 84.4%            |

<https://www.mdcalc.com/sequential-organ-failure-assessment-sofa-score#evidence>



## D0 – D5

- Viral Replication
  - Primary immune response
  - Poly-segmental Infarct Pneumonia
- 

- **Antiviral medicine**

Within 72hrs of symptoms duration up to 5 days

For **high risk** patients: Age > 65, DM, HBP, Obesity, Co-morbidity

- Remdesevir 200mg stat, then 100mg IV OD

- **Reduce affinity to ACE2**

- Spironolactone 50mg PO OD 2/52

- **Antithrombotic**

**Low risk:**

- Aspirin 300mg PO OD

or

- Clopidogrel (Plavix) 75mg or Clopiwin 75/75 PO OD

**High risk:**

- Clexane 40 - 60mg s/c OD

or

- Xarelto 10 – 15mg PO OD

- **Antibacterial**

If signs of bacterial complications – follow Community-acquired pneumonia protocol

- Augmentin 1000mg PO BD ± Azithromycin 500g PO OD 3/7

**AVOID STERIODS DURING FIRST 5 DAYS**

**OR IF CRP < 10**

## Adjuvant therapy (Optional)

| Drug   | Dose   | Comment   |
|--|--|---|
| Colchicine   | 1mg PO stat then<br>0.5mg PO BD 5/7<br>then 0.5mg PO OD<br>5/7 | Reduce chemotaxis of neutrophils, inhibit inflammation signaling and decrease production of cytokines (e.g. interleukin-1-beta) |
| Omeprazole   | 40mg PO/IVI OD   | Ulcer Prophylaxis   |
| Vitamin C  | 1g PO OD 2/52  | Antioxidant (ARDS generates free radicals and cytokines leading to cell damage and organ failure)                               |
| Vitamin D  | 50 000IU PO weekly<br>OR 4000IU PO OD                          | Down regulate immune/inflammatory reaction  |
| Zinc   | 20mg PO OD 2/52  | Anti-inflammatory and antioxidant properties  |
| ACC 200<br>(Effervescent)<br>Bisolvin,<br>Dilinct, Benylin | 1 tab (200mg) PO<br>TDS  | Mucolytic   |
| Thiamine<br>(Vit B1)                                       | 100mg PO OD  |   |
| Immune<br>Boosters   | MVA, Immuenza,<br>Airmune etc.                                 | Not indicated after D5 if in "Cytokine storm"   |





## From D5

- “Cytokine STORM” ARDS
- Thromboembolic complications (MODS)
- Bacterial complications

### Steroids

From D5 if no improvement or deterioration:

#### “Golden window” for steroids

- From D5 if still symptomatic ( $+>38^{\circ}\text{C}$ )
- CRP 20 – 50 PCT < 0.5
- Saturation 88 – 92 on room air

Initial steroid dose will depend from:

1. **Clinical presentation** (Oxygen mask; CPAP)
2. **Lab results** (CRP and LDH level (exclude infection with PCT))
3. **Age** (Younger patients might require high dose due to stronger immune response and overwhelming “cytokine” storm compared to elderlies)

|                            |   |   |  |
|----------------------------|---|---|--|
| <b>MILD</b>                | CRP 20 – 75<br>LDH < 300<br>Dyspnea<br>Minimal hypoxia on room air (SpO <sub>2</sub> 88-93%)  | <b>Dexamethasone</b><br>- 6-12mg OD/BD<br><i>or</i><br><b>Methylprednisolone</b><br>- 80mg IV bolus, then 40mg IV BD<br><i>or</i><br><b>Prednisolone</b><br>- 30-40mg PO BD 3/7, then 40mg OD. Tap down by 10mg every 3 days till 20mg then by 5mg every 3 days | - For 10 days<br>- Increase to 20mg OD if:<br>- CRP rising; (excl. sepsis)<br>- LDH increase or<br>- increase in O <sub>2</sub> demand<br><br>- If no improvement in CRP and LDH trends (excl. sepsis) - double dose to 160mg/daily  |
| <b>MODERATE AND SEVERE</b> | Increase in O <sub>2</sub> demand (“Happy hypoxic”)<br>CRP > 75<br>LDH > 300<br>Respiratory distress<br>Non-bacterial fever (PCT < 0.5) | <b>Dexamethasone</b><br>- 20mg IV OD 5/7 then 10mg OD 5/7 <i>or</i><br>- 8mg IVI TDS <i>or</i><br><br><b>Methylprednisolone</b><br>- 160mg/day 3/7 or<br><br><b>Tocilizumab (Actemra)</b><br><b>600 - 800mg IV stat + Dexamethasone 8mg OD 10/7</b>             | Wean by 4mg every 3 days till 10mg<br>Change to “Pulse therapy” or Tocilizumab if no response<br><br>Reduce by 50% every 3 days if improving otherwise consider “Pulse therapy” or Tocilizumab<br><br>Only if PCT < 0.5 (see p.27)<br>Antibiotic covers for 2/52 (Use LDH and WCC as septic markers; NOT CRP or PCT) |



## From D5

- “Cytokine STORM” ARDS
- Thromboembolic complications (MODS)
- Bacterial complications

### Initial Steroids Dose

ICU Windhoek Central Hospital

| Presentation |             | Lab results CRP (excl. sepsis) |          |          | Age      |          |
|--------------|-------------|--------------------------------|----------|----------|----------|----------|
| On O2 mask   | CPAP needed | 20 - 75                        | 75 - 125 | > 125    | < 65     | > 65     |
| <b>1</b>     | <b>2</b>    | <b>1</b>                       | <b>2</b> | <b>3</b> | <b>2</b> | <b>1</b> |

| Total score              | ≤ 3                          | 4 – 5                         | ≥ 6  |
|--------------------------|------------------------------|-------------------------------|--|
| Recommended initial dose | Dexamethasone<br>6 - 12mg or | Dexamethasone<br>16 - 24mg or | Actemra 600 - 800mg IV stat +<br>Dexamethasone 8 -12mg |
|                          | Methylprednisolone<br>40mg   | Methylprednisolone<br>160mg   | Methylprednisolone<br>500 - 1000mg                     |

(ref Alexandr Polishchuk and ICU WCH team 2021)

- 1) Good response consider if about 50% reduction in CRP after first dose of steroids.  
Maintain the same dose for 3days
- 2) Re-evaluate after 24hrs: increase the dose if no response.
- 3) Consider higher dose in young patients

### Methylprednisolone “Pulse therapy”

500 - 1000mg IV OD 3/7, tap down by 50% every 3 days.

This dose is as effective as Tocilizumab, however less immuno-suppressive, inexpensive but takes longer to improve on saturation.

Side effects: Hypertension, Hyperglycaemia, leucocytosis, elevated creatinine level

### **Taping steroids to prevent rebound:**

- Long acting (Dexamethasone) “auto-taper”: Reduce by 4mg daily till 10mg then stop
- Shorter acting (Methylprednisolone, Prednisolone): High dose tap by 50% every 3 days till 60mg then by 25% every 3 days till 20mg, then by 5mg every 3 days.



- **Tocilizumab (Actemra)**

**“Golden window”:**

- PCT < 0.3 CRP > 100
- Patient not on invasive ventilation (ideally before or just placed on CPAP)
- No renal or hepatic failure

**Dose:** 600 – 800mg (8mg/kg) in 100 ml NS **intravenous** over 1 hour stat as a single dose.

In emergency state subcutaneous formulation of Tocilizumab (Actemra) (162 mg/0.9ml) can be diluted in 100 ml NS (4-5 pre-filled syringes) and administer intravenously over 1hr

<https://www.sciencedirect.com/science/article/pii/S2095177920304895>

Continue Dexamethasone 8 mg -12 mg daily for 10 days,

Escalate antibiotics and antifungal to maximum before 1<sup>st</sup> day and continue for at least 10 days

**NB:** Blocks LH6 receptors for 6 weeks increasing risk of severe sepsis, despite initial saturation improvement. (see page 27). Patient becoming immuno-compromised.

- **CRP and PCT are no longer septic markers after Tocilizumab administration**
- **Early septic markers after Tocilizumab : LDH , WCC and Clinical signs** (intensity of frequent, short cough ( irritation of interstitial J receptors) and increasing oxygen demand)
- **Antibiotics must be escalated to high level for 10-14 days, than deescalated.**

- **Thromboprophylaxis**

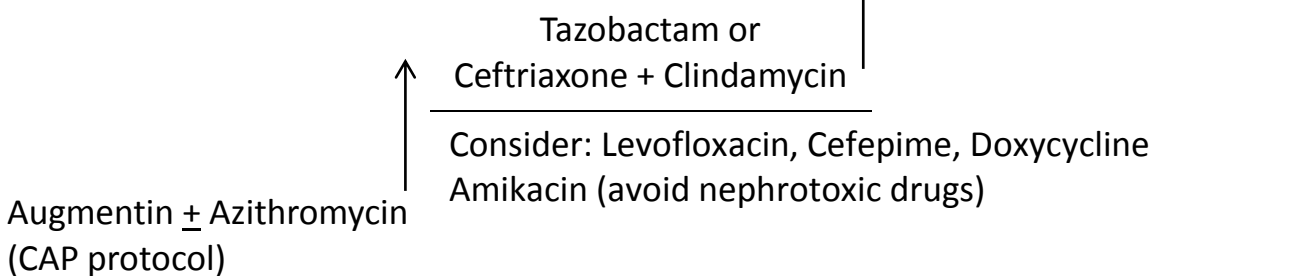
Xarelto 15 – 20mg PO OD (avoid together with Methylprednisolone)

Clexane 0.5mg/kg BD or 1mg/kg OD, reduce to 20 – 30mg s/c OD if eGFR < 30ml/m<sup>2</sup>

Heparin 5000-7500 IU s/c BD/TDS

- **Antibacterial and Antifungal cover**

PCT, beta-D-glucan, CD4  
and culture-guided



**IF Actemra not given:** Escalate antibiotics guided by PCT, CRP and culture

**IF Actemra given:** Escalate immediately, than deescalate guided by WCC, LDH and culture

## Treatment Guideline in Critically Ill Covid-19 Patient (NATURES FILMS)

|                              |  |
|------------------------------|--|
| <u>Nutrition</u>             | <ul style="list-style-type: none"> <li>- Enteral or Parenteral</li> <li>- Requirement: 25 – 30 kCal/kg/day.</li> <li>- Start with 20 ml/hour and increase by 10ml every 4 hours, after aspiration. Until kCal requirement is achieved. Possible to change 250-350 ml 5 times a day.</li> <li>- If not tolerating add prokinetics: Metoclopramide 10mg IV TDS AND/OR Erythromycin 250mg IV BD and Pancreatic enzymes Creon 10000 with each meal. Naloxone (amp) 2mg PO TDS if on opioids.</li> <li>- Consider TPN if feeding intolerance &gt; 3 days (last resort)</li> </ul>   |
| <u>Analgesia</u>             | <ul style="list-style-type: none"> <li>- PERFULGAN 1g IVI QID (reduce or omit in hepatic impairment) ALTERNATING WITH:</li> <li>- Tramadol 50 – 100mg PO/IV 4-6hrly or Infusion 10-15 mg/hr (increase dose interval to 12 hourly in hepatic or renal impairment)</li> <li>- Morphine infusion 45mg in NS up to 50ml at 1-3 mg/h OR Morphine bolus 1-2mg IVI hourly OR 4-6mg/4-6 hourly IV OR 10mg IM QID</li> <li>- Morphine 45mg+Ketamine 100mg NS up to 50ml @ 1-5 ml/hr</li> <li>- Ketamine 0.3 mg bolus, then 0.3 mg/kg/hr</li> <li>- Fentanyl infusion (1000mcg/10 ampoules in 30mL N/S at 2.5 – 5ml/h</li> </ul> |
| <u>Thrombo-phylaxis</u>      | <ul style="list-style-type: none"> <li>- Clexane 0.5mg/kg S/C BD or 1mg/kg OD, renal adjustment in case of AKI/CKD 20 mg OD (omit if severe thrombocytopenia &lt; 30 x10<sup>9</sup> or high INR or bleeding disorders)</li> <li>- Alternatively: Heparin 5000- 7500IU S/C BD/TDS s/c</li> </ul>   |
| <u>Ulcer prophylaxis</u>     | <ul style="list-style-type: none"> <li>- Omeprazole 40mg IVI/PO OD or BD in high risk situation (steroids+Renal Failure) (reduce dose in hepatic impairment to 10-20mg) OR</li> <li>- Ranitidine 50mg IVI TDS or 150mg PO BD (renal adjust dose according to GFR)</li> <li>- Other: Aluminium hydroxide 10ml PO TDS, Sucralfate 1g PO QID</li> </ul>   |
| <u>Respiratory Support</u>   | <ul style="list-style-type: none"> <li>- Room Air → O<sub>2</sub> Nasal prongs → Simple face mask → Rebreather Mask → HFNP → CPAP → Invasive ventilation (see full guideline)</li> </ul>   |
| <u>Elevation (Head)</u>      | <ul style="list-style-type: none"> <li>- Head elevation 30 degree</li> <li>- Prone positioning in early ARDS</li> </ul>  |
| <u>Sedation</u>              | <p>See full guideline</p> <p><b><u>Do not confuse sedation and synchronization with ventilator</u></b></p>   |
| <u>Fluids</u>                | <p><b><u>Restrict IV fluids (Lung injury 1 ml/kg/hrIBW ) AVOID BOLUSES.</u></b></p> <p>All fluids PO or NGT avoid IV fluids. IV - KVO rate only if tolerating enteral feeding<br/>IVC collapse can mislead if on ventilator with high PEEP</p>   |
| <u>Infection control</u>     | <ul style="list-style-type: none"> <li>- Anti-viral: Remdesevir 200mg IVI stat then 100mg IVI OD before D5 for 5/7</li> <li>- Antibiotic: Based on clinical status, infective markers and culture guided</li> <li>- Take note of resident microbes in unit when considering empirical treatment</li> <li>- Antifungal cover if risk factors OR if disproportionate ↑CRP AND ↓PCT in setting of sepsis</li> </ul>   |
| <u>Lines Local Infection</u> | <ul style="list-style-type: none"> <li>- Change central lines on day 7, peripheral line 3/7</li> <li>- monitor all lines for sepsis: peripheral lines, central lines, vascular catheters, urethral catheters (UTI), Nasogastric tubes (sinusitis)</li> </ul>   |

| <b><u>M</u>edications</b>     | <ul style="list-style-type: none"> <li>- Specific treatment (see full guideline)</li> <li>- Higher Steroids dose might be needed in young patients</li> </ul>   |             |                    |        |   |          |   |       |   |
|-------------------------------|---|-------------|--------------------|--------|---|----------|---|-------|---|
| <b><u>S</u>ugar Control</b>   | <ul style="list-style-type: none"> <li>- In uncontrolled Hyperglycemia: Start Actrapid Infusion</li> <li>- Prepare: 250IU Actrapid in 250ml 5% Albumin OR 200IU in 200ml N/S</li> <li>- Monitor HGT 2 hrly <table border="1" data-bbox="467 268 1107 487"> <thead> <tr> <th>HGT (2hrly)</th> <th>Infusion rate ml/h</th> </tr> </thead> <tbody> <tr> <td>&gt; 10.1</td> <td>6</td> </tr> <tr> <td>6.1-10.0</td> <td>3</td> </tr> <tr> <td>&lt; 6.0</td> <td>2</td> </tr> </tbody> </table> </li> <li>- For DKA See protocol</li> </ul> <p><b>When to Bridge from IV to S/C</b></p> <ul style="list-style-type: none"> <li>- precipitating factor must be controlled e.g. no sepsis, on appropriate treatment etc., no ketonuria, Hgt stable on infusion, Tolerating feeds</li> </ul> <p><b>Dose Calculation</b></p> <p>Sum up Actrapid requirements in last 24 hours</p> <ul style="list-style-type: none"> <li>- If patient newly diabetic = 0.8 x dose</li> <li>- If known diabetic = full dose</li> </ul> <p>Bridge to S/C Actraphane</p> <ul style="list-style-type: none"> <li>- If on ward diet: 2/3 dose in morning, 1/3 dose in evening</li> <li>- If on continuous/hourly feeds: ½ dose in morning, ½ dose in evening</li> </ul> <p>Stop IV Actrapid 1 hr after S/C injection of Actraphen</p> | HGT (2hrly) | Infusion rate ml/h | > 10.1 | 6 | 6.1-10.0 | 3 | < 6.0 | 2 |
| HGT (2hrly)                   | Infusion rate ml/h  |             |                    |        |   |          |   |       |   |
| > 10.1                        | 6   |             |                    |        |   |          |   |       |   |
| 6.1-10.0                      | 3   |             |                    |        |   |          |   |       |   |
| < 6.0                         | 2   |             |                    |        |   |          |   |       |   |
| <b><u>S</u>eizure Control</b> | As indicated  |             |                    |        |   |          |   |       |   |



CCSN

Critical Care Society of Namibia

| <b>D0----- &gt; D5</b><br><b>Lymphocytes (abs &lt; 0.8)</b><br><b>Neutrophil to Lymphocyte Ratio (NLR) &gt; 3</b> |  | <b>D7----- &gt;</b><br><b>Increased O<sub>2</sub> demand (reduced SpO<sub>2</sub>)</b><br><b>Increased LDH; increased CRP; increased PCT</b>   |  |     |                                       |             |         |                    |  |      |              |  |
|---|--|--|--|-----|---------------------------------------|-------------|---------|--------------------|--|------|--------------|--|
| <b>Antiviral</b><br>Reduce initial viral replication<br><br>Reduce affinity to receptors                          | <u>High risk</u><br>- Remdesivir 200mg stat then 100mg IV OD 5/7<br><br>- Spironolactone 50mg PO OD 2/52   | Start within first 72hrs of symptoms. Duration up to 5 days<br>High risk group<br>- Age > 65 y.o.<br>- DM, HBP, Obesity<br>- Other comorbidities<br><br>Inhibits TMPRSS2 and ACE2 Receptors<br>↓ Testosterone level<br>↓ Lungs congestion (diuretic) | - <b>Steroids</b><br>From > Day 5 if deterioration: increase in O <sub>2</sub> demand / decrease in SpO <sub>2</sub> ; CRP > 20; LDH > 250<br><br><table border="1"> <thead> <tr> <th>CRP</th> <th>Dexamethasone OD (Methylprednisolone)</th> <th>Adjustments</th> </tr> </thead> <tbody> <tr> <td>20 – 75</td> <td>6 – 12mg (30-60mg)</td> <td>- For 10 days<br/>- Increase to 20mg OD if CRP increase ; LDH increase or increase in O<sub>2</sub> demand</td> </tr> <tr> <td>&gt; 75</td> <td>20mg (160mg)</td> <td>Wean by 4mg every 3 days till 10mg<br/>Change to “Pulse therapy” if CRP and LDH not responding <b>or consider Tocilizumab + Dexamethasone 8-12mg</b> (exclude sepsis)</td> </tr> </tbody> </table>   | CRP | Dexamethasone OD (Methylprednisolone) | Adjustments | 20 – 75 | 6 – 12mg (30-60mg) | - For 10 days<br>- Increase to 20mg OD if CRP increase ; LDH increase or increase in O <sub>2</sub> demand | > 75 | 20mg (160mg) | Wean by 4mg every 3 days till 10mg<br>Change to “Pulse therapy” if CRP and LDH not responding <b>or consider Tocilizumab + Dexamethasone 8-12mg</b> (exclude sepsis) |
| CRP   | Dexamethasone OD (Methylprednisolone)  | Adjustments  |  |     |                                       |             |         |                    |  |      |              |  |
| 20 – 75   | 6 – 12mg (30-60mg)   | - For 10 days<br>- Increase to 20mg OD if CRP increase ; LDH increase or increase in O <sub>2</sub> demand   |  |     |                                       |             |         |                    |  |      |              |  |
| > 75  | 20mg (160mg)   | Wean by 4mg every 3 days till 10mg<br>Change to “Pulse therapy” if CRP and LDH not responding <b>or consider Tocilizumab + Dexamethasone 8-12mg</b> (exclude sepsis)   |  |     |                                       |             |         |                    |  |      |              |  |
| <b>Antithrombotic</b>   | <u>Low risk</u><br>- ASA 300mg PO OD<br>or<br>- Clopiwin 75/75 PO OD<br><u>High risk</u><br>- Clexane 40 – 60mg s/c OD<br>or<br>- Xarelto 10 – 15mg PO OD  | Correction in renal failure if eGFR< 30ml/m <sup>2</sup><br>Clexane 20-30mg OD<br>or<br>Heparin 5000-7500 IU s/c BD/TDS  | <b>Good response if about 50% reduction in CRP after first dose of steroids</b><br><b>If no improvement within 24hrs or deterioration:</b><br>- <b>Methylprednisolone</b> (Pulse therapy)<br>Elderly: 500mg IV OD Young: 1000mg IV OD 3/7, tap down by 50% every 3 days<br>Young patients requiring higher steroids dose than elderly OR<br>- <b>Tocilizumab ( Actemra)</b> 8mg/kg (600 – 800mg) IV in 100ml NS stat +<br><b>Dexamethasone</b> 8 -12 mg OD for 10 days<br>- PCT must be < 0.3, CRP >100<br>- Patient not on invasive ventilation<br>- No renal or Hepatic failure<br>Blocks LH6 receptors for 6/52 – risk of severe sepsis, despite SpO <sub>2</sub> improvement.<br><b>LDH and WCC are septic markers after Actemra treatment NOT CRP and PCT</b><br>Antibiotics to be escalated to maximum and continue for 2 weeks.<br>- <b>Antithrombotic</b><br>- Clexane 0.5mg/kg BD or 1mg/kg OD (increase to 1mg/kg BD if thrombotic) or<br>- Xarelto 15-20mg PO OD<br>- Heparin 5000 – 7500 IU s/c TDS if eGFR< 30ml/m <sup>2</sup><br>- <b>Antibacterial and Antifungal cover</b><br>PCT, β D glucan,CD <sub>4</sub> and culture guided<br>- <b>Respiratory support</b><br>Face mask - Rebreathing mask – HFNC – CPAP - Vent |     |                                       |             |         |                    |  |      |              |  |
| <b>Antibiotics</b>  | - Augmentin 1000mg PO BD 7/7<br>- Azithromycin 500mg PO OD 3/7   | From Day 3 if signs of bacterial infection   |  |     |                                       |             |         |                    |  |      |              |  |
| <b>General treatment</b>  | - Colchicine 1mg stat then 0.5mg PO BD 5/7<br>- Vitamin C 1g PO OD 2/52<br>- Vitamin D 50 000IU PO weekly or 4000IU PO OD<br>- Zinc 20mg PO OD 2/52<br>- ACC 200 (Effervescent) 1 tab (200mg) PO TDS | Reduces symptoms but not mortality<br>Stop all immune boosters from D6 if “cytokine storm”<br>Avoid nephrotoxic drugs, re-consider Colchicine after D7   |  |     |                                       |             |         |                    |  |      |              |  |



**Oxygen Therapy and Respiratory Support for Covid 19****Targets**

- a. **Oxygenation: SpO<sub>2</sub> 88 – 90%**
- b. **Ventilation: Permissive hypercapnia provided pH > 7.2**
- c. **Reduced Work of Breathing**

**1. “Silent” or “Happy Hypoxic”**

- SpO<sub>2</sub> < 90% on Room Air
- Start adequate dose of steroids with daily CRP, LDH and PCT if indicated
- Motivate patient for “Self Proning”

| Oxygen at 10 l/min           | Approximate FiO <sub>2</sub> |
|------------------------------|------------------------------|
| Nasal prongs                 | 0.3 - 0.4                    |
| Face mask                    | 0.4 - 0.6                    |
| Face mask with reservoir bag | 0.6 - 0.8                    |
| CPAP, intubation             | 1.0                          |

| ARDS Severity | PaO <sub>2</sub> /FiO <sub>2</sub> | SpO <sub>2</sub> /FiO <sub>2</sub> |
|---------------|------------------------------------|------------------------------------|
| Mild          | <300                               | <253                               |
| Moderate      | <200                               | <212                               |
| Severe        | <100                               | <120                               |

**2. Non-invasive ventilation: CPAP/BiPAP**

- **Indications**
  - o Sats < 86% on 15L rebreather
  - o Increased work of breathing or tiredness
- **CPAP:** produces recruitment without over-distension (the closest to physiological)
- **BiPAP:** might lead to lung over-distension (support during inspiration) but reduces work of breathing. Beneficial in obese patients
- Self-generated high V<sub>T</sub> – poor prognostic sign
- **Initial Settings**
  - o FiO<sub>2</sub> 1.0 – reduce when adequate saturation achieved (SpO<sub>2</sub> 88-96%)
  - o PEEP 7 → 10 → 12 → 15
  - o P<sub>sup</sub> 0 – 5cmH<sub>2</sub>O (to achieve V<sub>t</sub> 6-8ml/kg IBW)
  - o Flow Trigger 1 – 4 cmH<sub>2</sub>O
- **Escalate steroids and antibiotics at this point**
- **IBW Calculation: Height (cm) – 100 = IBW**



**Sedation (keep patients comfortable but not over sedated)**

- a. Lorazepam 1-2mg PO + Sulpiride 400mg
- b. Melatonin 10mg PO nocte
- c. Tramadol 50mg IVI/IMI BD to TDS
- d. Morphine 1mg IVI PRN or 1-2mg/hr IV infusion
- e. Zolpidem 5-10 mg

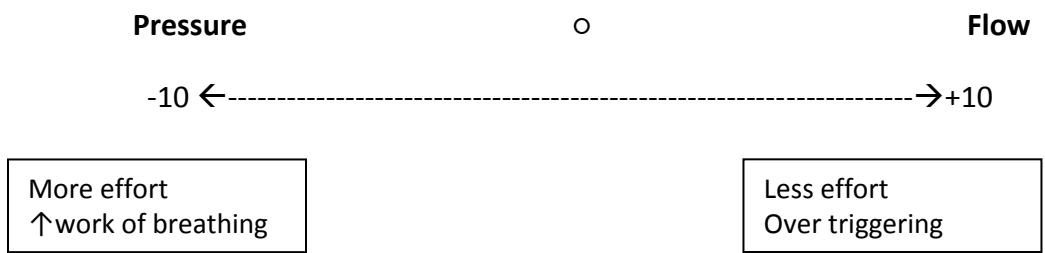
For more options see *Sedation Guideline*

Consider

- Ketamine 20mg S/C OD (Antidepressant short-acting)
- Fluoxetine (anxiolytic and antidepressant, long-acting)

**Synchronization**

- Trigger adjustment



Might consider de-escalating to HFNC when:

- PEEP 8 and FiO<sub>2</sub> 0.6 on CPAP;
- Initial HFNC settings: Flow 60 l/min FiO<sub>2</sub> 1.0 reduce according to SpO<sub>2</sub>.





### **3. Invasive Ventilation**

#### **Indication for intubation**

- a. SpO<sub>2</sub> < 80% on CPAP (not absolute indication, consider “happy hypoxic”)
- b. Respiratory distress with increased work of breathing, patient exhaustion
- c. Reduced level of consciousness, confused state, significant agitation

#### **Initial settings**

##### **PC-SIMV**

- Peak pressure 30 (up to 34 in obesity), V<sub>T</sub> 4-6 mL/kg IBW
- PEEP 10 → 12 → 15 → 20 cmH<sub>2</sub>O (C<sub>static</sub> and SpO<sub>2</sub> guided)  
Optimal PEEP obtained when the best Cstat and SpO<sub>2</sub> are achieved
- Driving pressure ΔP <15 (ΔP = Peak pressure – PEEP)
- FiO<sub>2</sub> as low as possible to keep SpO<sub>2</sub> 86 – 96% with High PEEP
- I:E ratio 1:2 → 1:1.5 → 2:1
- RR 15, Tins 1.5 sec
- Lung recruitment (only works in early ARDS) PEEP 40cmH<sub>2</sub> for 40 sec (make sure pressure support 0)

##### **Sedation**

- Keep patient deeply sedated for 48 – 72 hrs with RASS -3
  - o For haemodynamically unstable patient up to 3 days
    - Ketamine + Propofol (Midazolam or Morphine)
    - Fentanyl + Dormicum
- For haemodynamically stable
  - o Standard sedation, Dormicum, Propofol, Precedex 3/7
  - o Lorazepam, Clonazepam, Droperidol, Phenobarbital for > 3 days

##### **Muscle relaxants**

- **Synchronization for 48 – 72 HRS**
  - o Keep patient flat with muscle relaxants for 48-72 hrs
  - o Atracurium: Bolus: 0.3 – 0.6mg/kg; infusion: 0.3 – 0.6mg/kg/hr
  - o Rocuronium: Bolus: 0.4 – 0.6mg/kg; infusion: 0.6mg/kg/hr  
Infusion Rate for neat solution of Rocuronium or Atracurium  
Rate (ml/h) = Wt / 10 ÷ 2

##### **Prone ventilation >16hrs at a time**

##### **Early tracheostomy on day 3**

|                         | Oxygen Therapy  | Non-invasive CPAP/ BiPAP  | Invasive Ventilation   |
|-------------------------|---|---|--|
| <b>Indications</b>      | <ul style="list-style-type: none"> <li>- "Silent" or "happy hypoxic"</li> <li>- Sats &lt; 90% on room air</li> </ul>  | <ul style="list-style-type: none"> <li>- Sats &lt; 86% on 15L Rebreather</li> <li>- Increased Work of Breathing and tiredness</li> </ul>  | <ul style="list-style-type: none"> <li>- Reduced level of consciousness</li> <li>- Confused state or agitation</li> </ul>  |
| <b>Initial Settings</b> | <p>FiO<sub>2</sub></p> <p>Facemask oxygen = 0.4</p> <p>Rebreather = 0.8</p> <p>(at 15L/min)</p> <p>Encourage self-proning</p>   | <ul style="list-style-type: none"> <li>- PEEP 7 → 10 → 12cm H<sub>2</sub>O</li> <li>- FiO<sub>2</sub> 1.0 → reduce when SpO<sub>2</sub> improving</li> <li>- P<sub>sup</sub> 0-5 (V<sub>t</sub> 6-8ml/kg)</li> <li>- Trigger 1 – 4</li> <li>- "Self-proning"</li> </ul>   | <ul style="list-style-type: none"> <li>- Peak 30 (34 in obese)</li> <li>- ΔP = Peak – PEEP &lt; 15 (keep V<sub>t</sub> 4-6ml/kg IBW)</li> <li>- PEEP 7-20 Cstatic / ARDS Not protocol guided</li> <li>- FiO<sub>2</sub> 1.0 → reduce when SpO<sub>2</sub> improving</li> <li>- RR 15 I:E 1:1.5</li> <li>- Trigger 1-4L</li> </ul>  |
| <b>Sedation</b>         | Melatonin 10mg nocte  | <ul style="list-style-type: none"> <li>- "Comfort Sedation"</li> <li>(see sedation recommendation)</li> <li>Lorazepam 1-2mg + Sulpiride 400mg PO</li> <li>Tramadol 50mg IV/ IMI BD to TDS</li> <li>Phenergan 25-50 mg PO/IM</li> <li>Morphine 1mg IV PRN or 1-2mg/hr IV infusion</li> <li>Zolpidem 5 - 10mg OD/BD</li> <li>Risperidon 2 - 4mg OD/BD</li> <li>Amitriptillin 25mg OD/BD</li> <li>Psychological support</li> </ul> | <p>&lt;3 days</p> <ul style="list-style-type: none"> <li>- Standard sedation or "Ketofol"</li> <li>- Precedex or Clonidine</li> </ul> <p>&gt;3 days</p> <p>Keep RASS-1 – 3</p> <p>Lorazepam NGT/IVI and Sulpiride</p> <p>Phenobarbital Load 5 - 10mg/kg</p> <p>Maintain 1 - 2mg/kg/day PO/IV BD</p> <p><b>See sedation protocol</b></p> <p><b>Sedation might not provide synchronization</b></p> |
| <b>Synchronization</b>  |   | With Trigger<br>(pressure or flow)  | <p><b>Keep on muscle relaxants first 48 - 72hrs</b><br/>(to avoid self-inflicted lung injury)</p> <ul style="list-style-type: none"> <li>- Rocuronium / Atracurium</li> <li>- Bolus 0.5mg/kg (slowly)</li> <li>- Infusion 0.5mg/kg/hr</li> </ul> <p>Neat solution (Weight/10) ÷ 2 = ml/hr</p>  |
| <b>Target</b>           | <p style="text-align: center;"><b>SpO<sub>2</sub> &gt; 88%</b></p> <p style="text-align: center;"><b>pCO<sub>2</sub> - permissive hypercapnia providing pH &gt; 7.2</b></p> <p style="text-align: center;"><b>ESCALATE STEROIDS!!!</b></p> <p style="text-align: center;"><b>Young patients requiring higher steroids dose than elderly</b></p> |   |  |

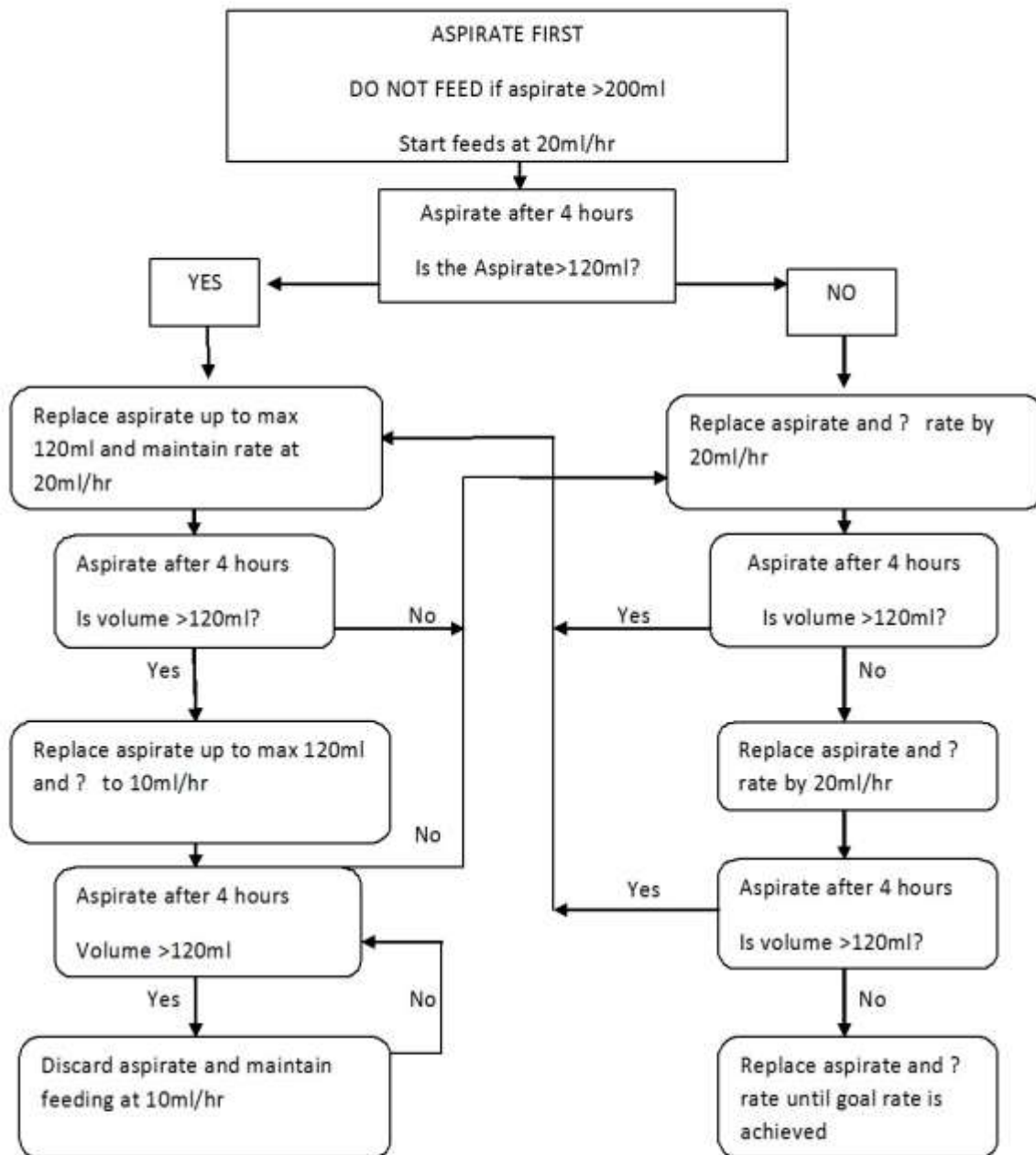


**Sedation and Synchronization in Covid-19**

|                       | Oxygen therapy  | CPAP/BiPAP   | Invasive ventilation  |
|-----------------------|---|--|---|
| <b>Goals</b>          | Keep patient comfortable and pain free  |  | <ul style="list-style-type: none"> <li>- Target RASS -1 to -2</li> <li>- In practice very difficult to sedate: sedation depends on patient condition and availability of drugs</li> <li>- If ventilator dyssynchrony despite advanced ventilator adjustments, a RASS of -2 to -3</li> <li>- severe dyssynchrony and those requiring neuromuscular blockade, RASS -4 to -5</li> <li>- quickly transition to oral medications, provided that fluid resuscitation is adequate (i.e. &gt;D3)</li> </ul>   |
| <b>Drug of Choice</b> | <p>Opioids to keep pain free</p> <ul style="list-style-type: none"> <li>- Tramadol/Tramacet PO 1-2 tabs PO TDS</li> <li>- Paracetamol/Codeine (Betacod) 2 tabs PO TDS</li> </ul> <p>Melatonin 10mg PO nocte if needed</p> | <p>Opioids can be escalated</p> <ul style="list-style-type: none"> <li>- Tramadol 50-100mg IVI 6hrly</li> <li>- Morphine 1mg IVI hourly/PRN</li> <li>- TarginAct 10/5mg PO BD</li> <li>- Phenergan 25 mg PO/IM</li> <li>- Paracetamol 1g IVI QID</li> <li>- Dexmedetomidine 200mcg in 48 ml N/S infusion <u>or</u></li> </ul> <p>Clonidine 25-50 mcg PO TDS-QID<br/>Zolpidem 5-10 mg PO OD/BD<br/>Risperidone 2-4mg PO nocte<br/>Amitriptyline 25-50mg PO nocte<br/>Lorazepam 2-4mg PO/IV TDS and/or Sulpiride 400-800mg PO nocte</p> <p>Melatonin 10mg PO nocte</p> | <p><b><u>Keep patient deeply sedated and paralyzed for first 72hours</u></b></p> <ol style="list-style-type: none"> <li>1. Morphine 45mg + Dormicum 90mg in 200ml N/S 5-15 ml/hr (<b>start at rate Wt/10 ml/hr</b>) titrate to effect</li> <li>- Consider enhancing sedation by adding 30mg of Dormicum</li> <li>2. Propofol infusion: 0.3-3mg/kg/hr, Rate ml/hr= mg/kg/hr x Wt/10 of Neat 1%Propofol change bag and line every 12 hours</li> <li><b><u>Haemodynamically unstable patients</u></b></li> <li>3. Ketamine 1g in 200ml N/S (5mg/ml) @0.1- 0.4 mg/kg/hour± Morphine 45mg or Dormicum 45 mg</li> <li>4. "Ketofol" infusion: Propofol 400mg (40ml) + 1g Ketamine (20ml) in 140 ml N/S@5 – 15ml/hr</li> <li>5. Fentanyl 1000mcg (10 amps) in 30ml N/S [20mcg/ml] @ 2.5 – 5 ml/hr</li> <li>6. Precedex 0.2mg in 48 ml N/S load 1mcg/kg over 10 min maint. 0.2 – 0.7 mcg/kg/h</li> <li>7. Clonidine 5 amps/750mcg in 45ml N/S @ 1-5ml/hr</li> <li>- (monitor 6 and 7 for hypotension and bradycardia)</li> </ol> |

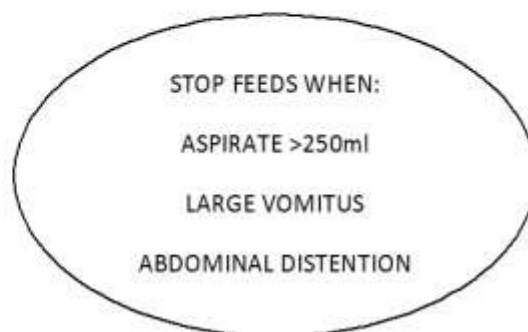
|  |  |  |  |
|--|--|--|--|
| <p><b>Muscle Relaxants</b></p>         | <p>Contra-indicated</p>  | <p>Contra-indicated</p>  | <ul style="list-style-type: none"> <li>- <b>Keep on muscle relaxants 72hrs (to avoid self-inflicted lung injury)</b></li> <li>- Rocuronium / Atracurium</li> <li>- Bolus 0.5mg/kg (slowly)</li> <li>- Infusion 0.5mg/kg/hr</li> <li>- Infusion rate = (Weight/10)÷2 = ml/hr</li> </ul> |
| <p><b>Long term sedative drugs</b></p> | <p>Wean off drugs as soon as patient improves</p>  | <ol style="list-style-type: none"> <li>1. <u>Benzodiazepines</u> <ul style="list-style-type: none"> <li>- Lorazepam 2-4mg PO TDS</li> <li>- Diazepam 2.5 – 10mg PO q6-12hr</li> <li>- Clobazam (Urbanol) 5 -10mg PO BD</li> <li>- Alprazolam (Alzam) 0.25 – 0.5mg PO q6-8hr</li> <li>- Clonazepam (Klonapin) 0.25 – 0.5mg BD</li> </ul> </li> <li>2. <u>Antipsychotics</u> <ul style="list-style-type: none"> <li>- Haloperidol 0.03 to 0.15 mg/kg IVI every 30 minutes to six hours <u>or</u> 10mg IVI stat (fast acting with minimal cardiorespiratory effects)</li> <li>- Risperidone 2-4mg PO nocte</li> <li>- Quetiapine Initially 50 mg every 12 hours; increase every 24 hours as needed up to 400 mg/day</li> <li>- Olanzapine Initially 5 to 10 mg once daily; increase every 24 hours as needed by 5mg increments up to 20 mg/day</li> <li>- Amitriptyline 25-50mg PO nocte</li> </ul> </li> <li>3. <u>Barbiturates</u> <ul style="list-style-type: none"> <li>- Phenobarbital Load 10-15 mg/kg Maintain 1-2 mg/kg/day PO/IV BD</li> </ul> </li> </ol> |  |
| <p><b>Other drugs to consider</b></p>  | <ol style="list-style-type: none"> <li>1. Fluoxetine 20mg PO OD give with Benzodiazepine for first week</li> <li>2. Ketamine 20mg S/C once a day</li> </ol> <p><b><u>Consider opioids addiction, panic disorders and depression in post COVID patients</u></b></p> |  |  |

**ENTERAL FEEDING PROTOCOL**



Consider the following if feed intolerance

1. Pro-kinetics
2. Placement of nasojejunal tube



## IVI Actrapid infusion

Actrapid 200 IU add into 4% 200ml Albumin

(Concentration 1IU in 1ml)

### Simplified scale for DKA and HONK

| HGT             | Initial infusion rate |       | Comments   |
|-----------------|-----------------------|-------|--|
|                 | IU/hr                 | ml/hr |  |
| >10.1           | 6<br>(0.1IU/kg/hr)    | 6     | - Start 0.9%NaCl as a 1 <sup>st</sup> line of rehydration fluid. Check HGT after 1liter of 0.9%NaCl, and then commence Actrapid infusion. HGT 2hourly. <u>BG level to fall above 5mmol/hr</u><br><br>- Start Dextrose containing fluids or oral feeding      |
| <b>6.1-10.0</b> | 3<br>(0.05IU/kg/hr)   | 3     | Reassess HGT 30mins after starting Dextrose containing fluids; adjust Actrapid accordingly. HGT hourly until stable, then 2hourly. <u>Maintain BG 6-10mmol/l</u><br><br>-Continue GRF / D5W or oral feeding.<br><br>(0.03IU/kg/hr ketogenesis clamping dose) |
| <6.0            | 2<br>(0.03IU/kg/hr)   | 2     | <u>Correct BG with rate or concentration of Dextrose containing fluids.</u><br><u>Do not stop Actrapid or go below 1IU/hr.</u> HGT every 30mins, then hourly until stable.   |

#### Footnotes:

- If at any time, HGT has not responded and remains at the same level above target (6-10mmol/l in 2 consecutive readings), Actrapid infusion should be increased by 2ml/hr (considering patient body weight).
- When goal of BG level achieved, acidosis resolved, no ketonuria and Actrapid infusion rate remained constant for the last 24hrs, IVI can be changed to s/c.

Calculate 24hr dose and give as following:

- If patient newly diabetic = 0.8 x 24hr dose
- If known diabetic = full 24hr dose given as s/c intermediate or long-lasting insulin

If on ward diet: 2/3 dose in morning, 1/3 dose in evening

If on continuous/hourly feeds: ½ dose in morning, ½ dose in evening

- Stop IVI Actrapid not earlier than 1hour after s/c injection has been given

## Initial respiratory support COVID-19 patient Preparation for intubation

### 4M + 4S + (MALES)

| <u>4M</u>            | <u>4S</u>              | <u>MALES</u>                       |
|----------------------|------------------------|------------------------------------|
| Machine (ventilator) | Suction                | - Mask, Magill forceps             |
| Monitor              | Syringes               | - Airway, Ambu bag with a/b filter |
| Medicines*           | System (IVI)           | - Laryngoscope, LMA                |
| Medical assistant    | Small equipment: MALES | - ET tube                          |
|                      |                        | - Stylet, syringe (air)            |

### \*MEDICINES

|           |          |          |   |          |            |           |
|-----------|----------|----------|---|----------|------------|-----------|
| Etomidate | 0.2mg/kg | Fentanyl | } | 1mcg/kg  | Scoline    | 1.5mg/kg  |
| Ketamine  | 2mg/kg   | Dormicum |   | 0.1mg/kg | Rocuronium | 1.2 mg/kg |
| Propofol  | 1.5mg/kg |          |   |          |            |           |

Video Assisted Laryngoscope eg. Glide- Scope very useful. Reduces doctors exposure

## Primary ventilator settings

### 1. Initial ventilator settings

Ventilation mode: - PC - SIMV (PSIMV+)

- Peak 30cm (Obese patient 34cm) Vt 4-6ml/kg IBW Ideal Body Weight (IBW) ~ Height (cm) – 100
- PEEP 10-12cm H<sub>2</sub>O Guided by Static Compliance and Saturation
- RR 15 b/min; Insp TIME 2.5 (I:E = 1:1.5) Insp Time = 60/RR ÷ (I + E)
- FiO<sub>2</sub> 1.0 (reduce ASAP to 0.6)

### 2. Targets

- SpO<sub>2</sub> 88 - 93% or PaO<sub>2</sub> > 60mmHg
- Permissive hypercapnia providing pH > 7.2

### 3. Adjustments

#### Improve oxygenation by (WOB)

- Aim (SpO<sub>2</sub> > 88 PaO<sub>2</sub> > 65)
- ↑ PEEP
  - ↑ Insp Time I:E Ratio
  - Prone position
  - Recruiting manoeuvre
  - ↑ FiO<sub>2</sub> or Insp Flow

#### Improve ventilation by

- Aim (PaCO<sub>2</sub> < 80 pH > 7.2)
- ↑ RR (not more than 20)
  - ↑ Max Vt (6ml/kg) or PIP 30 (34)
  - ↓ Insp Time and Trigger

#### Reduce Work of Breathing

- ↓ Trigger
- ↑ Sedation + Analgesia
- Start muscle relaxants



# Preparation for Intubation

## Cardiopulmonary Resuscitation (CPR)



### CPR (DEAD)

D
E
A
D  
 DEFIBRILATOR      EQUIPMENT (PPE)      AMBUBAG      DRUGS



### INTUBATION: 4M + 4S + (MALES)

#### 4M

Machine (anaesthetic/ventilator)  
 Monitor  
 Medicines\*  
 Medical assistant

#### 4S

Suction  
 Syringes  
 System (IVI)  
 Small equipment: MALES

- Mask, Magill forceps
- Airway, Ambubag
- Laryngoscope, LMA
- ET tube
- Stylet (bougie), syringe (air)

#### \*MEDICINES

|            |           |
|------------|-----------|
| Etomidate  | 0.2mg/kg  |
| Ketamine   | 1.5mg/kg  |
| Propofol   | 1.5mg/kg  |
| “Ketofol”  | 0.5mg/kg  |
| Scoline    | 1.5mg/kg  |
| Rocuronium | 1.2 mg/kg |

#### QUICK REFERENCE TO TUBE SIZES

|         |  |
|---------|--|
| ETT X 2 | Size of NGT and Foley catheter               |
| ETT X 3 | Depth of ETT insertion (distance from teeth) |
| ETT X 4 | Max size of ICD                              |



## Drugs for intubation and reversals

| SEDATIVES                                       | DOSE (mg/kg)                               | Comments   |
|---|--|--|
| Etomidate                                       | <b>0,3</b><br>(0,2 - 0,4)                  | <u>Most recommended</u><br>Avoid in severe septic shock.<br>Peak effect at 60 sec  |
| Ketamine  | <b>2</b><br>(1,5 - 2,5)                    | <u>Most recommended</u><br>Avoid in head injury, unless hypotensive.<br>Have analgesic properties.<br>Peak effect at 90 sec  |
| “Ketofol”<br>(Ketamine + Propofol)<br>Ratio 1:1 | <b>0,5</b><br><i>mL = body weight ÷ 10</i> | <u>Recommended</u><br>Has an analgesic and hypnotic property of both components, with minimal haemodynamic instability.<br><u>Mix:</u> Propofol 1% 10ml + Ketamine (10mg/ml) 10ml<br>or<br>Propofol 1% 10ml + Ketamine (50mg/ml) 2ml + H <sub>2</sub> O 8ml<br>Concentration 5mg/ml of each drug |
| Propofol  | <b>1,5</b><br>(1 - 2)                      | Avoid in hypovolemic, hypotensive patient.<br>Peak effect at 60 sec  |
| Midazolam                                       | <b>0,1</b><br>(0,05 - 0,15)                | Avoid in hypovolemic, hypotensive patient<br>(Benzodiazepine).<br>Peak effect at 60 sec  |
| Fentanyl  | <b>1,5 (mcg/kg)</b><br>(1 - 2)             | Avoid if respiratory compromised (Opioid).<br>Peak effect at 60 sec  |
| RELAXANTS                                       | DOSE (mg/kg)                               | Comments   |
| Succinylcholine                                 | <b>1,5</b><br>(1 - 2)                      | Avoid if hyper K-anaemia or malignant hyperthermia expected  |
| Rocuronium                                      | <b>1</b><br>(0,8 - 1,2)                    | If contra-indication to Scoline only   |
| REVERSALS                                       | DOSE ( mg/kg)                              | Comments   |
| Naloxone  | 0.01                                       | Opioid reversal<br>Repeat dose @ 3mins interval<br>Max 10mg  |
| Anexate<br>(Flumazenil)                         | 0.01                                       | Benzodiazepines reversal<br>Give over 15sec<br>Max single dose 0,2mg<br>Max total dose 2mg   |
| Sugammadex<br>(Bridion)                         | Up to 16mg/kg                              | Immediate Rocuronium reversal  |

## From D5

- “Cytokine STORM” ARDS

- Thromboembolic complications (MODS)

- Bacterial complications

### Initial Steroids Dose

ICU Windhoek Central Hospital

| Presentation |             | Lab results CRP (excl. sepsis) |          |          | Age      |          |
|--------------|-------------|--------------------------------|----------|----------|----------|----------|
| On O2 mask   | CPAP needed | 20 - 75                        | 75 - 125 | > 125    | < 65     | > 65     |
| <b>1</b>     | <b>2</b>    | <b>1</b>                       | <b>2</b> | <b>3</b> | <b>2</b> | <b>1</b> |

| Total score              | ≤ 3                          | 4 – 5                         | ≥ 6   |
|--------------------------|------------------------------|-------------------------------|---|
| Recommended initial dose | Dexamethasone<br>6 - 12mg or | Dexamethasone<br>16 - 24mg or | Actemra 600 - 800mg IV stat +<br>Dexamethasone 8mg or |
|                          | Methylprednisolone<br>40mg   | Methylprednisolone<br>160mg   | Methylprednisolone<br>500 - 1000mg                    |

(ref Alexandr Polishchuk and ICU WCH team 2021)

- 1) Good response consider if about 50% reduction in CRP after first dose of steroids. Maintain the same dose for 3days
- 2) Re-evaluate after 24hrs: increase the dose if no response
- 3) Consider higher dose in young patients

## NHS University Hospitals of North Midlands guideline

Name: ..... DOB: ..... Unit Number: .....

### COVID-19 Care Plan

#### TREATMENT PROTOCOL FOR COVID-19

#### 7) Guidance on new IL-6 inhibiting therapies

As of February 2021, the Department of Health has supported the use of two new IL-6 inhibiting drugs for the treatment of COVID-19; **TOCILIZUMAB** and **SARILUMAB\***.

**TOCILIZUMAB** is suitable for adult inpatients who meet **ALL** of the following criteria:

- Patient has confirmed COVID-19 on PCR
- Patient is already receiving dexamethasone
- Patient has a CRP result of  $\geq 75\text{mg/L}$
- Patient is requiring  $\geq 40\%$  oxygen to maintain saturations  $\geq 92\%$   
OR is within first 24-48 hours of starting invasive ventilation, CPAP or NIV
- Decision to prescribe is made only by a Medical Consultant

*If patient does not meet above oxygen criteria but Medical consultant believes potential benefits of Tocilizumab outweigh risk please contact Infectious Diseases Consultant (on call for referrals 9-5 Mon – Fri and 9-1 Sat and Sun) to discuss. Please ensure that patient is not considered to have serious underlying bacterial infection and is not prescribed intravenous antibiotics prior to discussing.*

#### Dose and prescribing Information:

Dose is **8mg/kg IV** up to a **maximum dose of 800mg**, given as a **SINGLE ONE-OFF DOSE**.

This should be diluted in 100mls of 0.9% sodium chloride (expelling any excess 0.9% sodium chloride to make 100mls volume total) given over 1 hour. Dexamethasone should be continued as usual. Tocilizumab should not be infused through an IV line at the same time as any other medications.

#### Cautions, considerations and contra-indications:

- Tocilizumab is contra-indicated if ANY of the following biochemical abnormalities; ALT or AST  $> 5\times$  upper limit of normal, neutropenia ( $< 2.0$ ) or thrombocytopenia ( $< 50$ )
- Caution should be used in patients who may otherwise be immunosuppressed
- Caution should be used if clear evidence of a bacterial, fungal, viral or other infection besides COVID-19, including active tuberculosis, HIV or Viral Hepatitis
- Tocilizumab should be avoided in pregnancy, and used with extreme caution if patient breast-feeding (in which case, patient should not breast-feed for a period of 7 weeks after dose)
- Be aware hypersensitivity/allergic reactions are possible, and any adverse events should be reported to the MHRA by the dedicated COVID-19 Yellow Card Reporting Site.

TOCILIZUMAB given? Yes  No  Pending

Note: Because of its immunosuppressant effects, any patient who receives TOCILIZUMAB should have this specifically communicated to the GP in their discharge letter. For example: "This patient was given Tocilizumab to treat COVID-19 on [date]. This may make them more prone to other infections, and falsely depress CRP levels, in the short term".

\*SARILUMAB is not yet available at UHNM.