Content

• 4 Clinical cases
• Proning experience
• Trying out proning in non ventilated patients
• ”Flip-flop” phenomena in ICU patients and de-isolation strategy
Case 1: 36 year old, saw GP 3X over 1 week

<table>
<thead>
<tr>
<th>Day of Illness</th>
<th>KALETRA</th>
<th>POSITIVE PCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>D6</td>
<td>IFN</td>
<td>D6</td>
</tr>
<tr>
<td>D7</td>
<td>IFN</td>
<td>D7</td>
</tr>
<tr>
<td>D8</td>
<td></td>
<td>D8</td>
</tr>
<tr>
<td>D9</td>
<td></td>
<td>D9</td>
</tr>
<tr>
<td>D10</td>
<td></td>
<td>D10</td>
</tr>
<tr>
<td>D11</td>
<td></td>
<td>D11</td>
</tr>
<tr>
<td>D12</td>
<td></td>
<td>D12</td>
</tr>
<tr>
<td>D13</td>
<td></td>
<td>D13</td>
</tr>
<tr>
<td>D14</td>
<td></td>
<td>D14</td>
</tr>
</tbody>
</table>

19 Feb KTPH
- SOB++
- HR: 150
- Lungs: creps
- SPO2: 86% RA
- PH: 7.50
- CO2: 26.7
- O2: 74 (VM50%)
- CXR: bilateral pneumonia
- TWC: 2.68, plt: 227
- Lymph: 0.13
- CRP: 294
- LDH: 396
- PCT: 9.79
- Bil:15, ALT: 36, AST: 58

20 Feb NCID
- PRVC,
- PEEP: 14
- FiO2: 0.6 to 0.8
- PH: 7.36
- CO2: 43
- O2: 195(0.8)

22 Feb
- Proned
- PEEP: 12 to 14
- FiO2: 0.7 to 1.0
- PH: 7.28
- CO2: 77
- O2: 86 (1.0)

23 Feb
- Proned
- PEEP: 12
- FiO2: 0.4
- PH: 7.43
- CO2: 60
- O2: 128(0.4)

25 Feb
- PEEP: 12
- PSV5/10
- FiO2: 0.4
- PH: 7.46
- CO2: 40
- O2: 107
- LDH: 1255
- ETT CS:
- CRP: 60
- E aerogenes
- PCT: 1.94

26 Feb
- PEEP: 12 PSV5/10
- FiO2: 0.35
- PH: 7.5
- CO2: 44
- O2: 121

27 Feb
- PSV 5/10
- -> extubated 3L O2
- FiO2: 0.35
- PH: 7.49
- CO2: 38
- O2: 88

POSITIVE PCR
20 Feb, day 7 illness

22 Feb

26 Feb, day 13 illness
Case 2: first 2 weeks of admission

5/2
Fever, cough, haemoptysis
CXR: small lower zone
CRP: 76.8
PCT: 0.22
TWC: 7, plt: 103K
Lymph: 0.8

7/2 – Intubation
Tachypnoeic, SpO2: 87% RA
Lungs: creps
PH: 7.4
CO2: 32
O2: 55 to 67
CRP: 89
Bil: 6 ALT: 89
AST: 160

9/2
10 -12/2
13/2 – 14/2
T: 39
PCV, PEEP: 16
FiO2: 0.6-0.7
LDH: 1137
CRP: 220
Bil: 159
ALT: 52 AST: 78

15/2 - 18/2
Probed 16 feb 18 hours
Septic shock
ARF (anuric) → CRRT
Dual inotropes
17/2 to 22/2:
Hydrocortisone
PH: 7.29, CO2: 72, O2: 78(0.7)

C. Krusei in blood cs
All lines removed except vas cath (RIJ)

Bil: 116 –> 176
PCT: 6.5

19/2 to 22/2
General improvement
Tropes off
CRRT withheld
Urine output 5 to 10 mls/hr
PSV, FiO2: 0.4, PEEP: 15
PRVC, PEEP: 8,
FiO2: 0.4
PH: 7.36, CO2: 51,
O2: 104 (0.5)
LDH: 1138
CRP: 46.8
Peak Bil: 292 (20 Feb)

23 Feb
Vas Cath Off

KALETRA 10 days, due to elevated bilirubin
Meropenem
Anidulafungin

5/2
Fever, No
fever
3rd/4th week of ICU admission

24 Feb
- Proned
- CRRT
- PRVC
- FiO2: 0.7 → 1.0,
- FiO2: 0.5
- PEEP: 10 → 15
- PEEP12: Nor A: 0.08
- Nor A: 0.02
- PH: 7.13, CO2: 70, O2: 291
- ETT cs: S maltophilia
- LDH: 1363
- CRP: 193
- Bil: 96 ALT: 72, AST: 58, Cr: 425

26 Feb
- Proned
- PRVC
- FiO2: 0.7
- PEEP: 10
- Nor A: 0.05
- PH: 7.31
- CO2: 101
- ETT cs: S maltophilia

28 Feb
- PRVC
- FiO2: 0.7
- PEEP: 12
- Nor A: 0.05
- PH: 7.31
- CO2: 101
- Possible early necrotizing pancreatitis
- ETT cs: S maltophilia
- LDH: 913
- CRP: 73
- Amylase: 1138

3 March
- PRVC
- FiO2: 0.6
- PEEP: 12
- Nor A: 0.06
- PH: 7.09
- CO2: 66
- ETT cs: S maltophilia
- LDH: 595
- CRP: 77
- Amylase: 227

5 March
- not tolerating feeds diarrhea
- PRoned/CRRT
- PRVC
- FiO2: 0.6 → 0.8
- PEEP: 12
- Nor A: 0.2 /Vaso/Adren
- PH: 7.24
- CO2: 222
- ETT cs: S maltophilia
- LDH: 784
- CRP: 54
- Amylase: 229

10 March
- started on TPN, diarrhea
- PRoned/CRRT
- ventiler dyssynchrony
- PRVC, PRVC
- FiO2: 0.7
- FiO2: 0.6
- Urine output improves: 30-60ml/h
- Off tropes
- PEEP: 14, FiO2: 0.7
- PH: 7.24
- CO2: 58, O2: 222
<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 Mar</td>
<td>Diarrhoea</td>
<td>14 Mar Diarrhoea CVVHDF</td>
</tr>
<tr>
<td></td>
<td>Cytopenia</td>
<td>PRVC FiO2: 0.5 PEEP: 14 NorA: 0.05 ETT change (3rd time) ETT cs: S maltophilia R to levofloxacin</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LDH: 1376 CRP: 74 Bil:96 ALT: 72, AST: 58, Cr: 425</td>
</tr>
<tr>
<td>16 Mar</td>
<td>Diarrhoea</td>
<td>Tracheostomy</td>
</tr>
<tr>
<td></td>
<td>Cytopenia resolving,</td>
<td>urine output: 40 to 50 mls/hour</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PRVC, FiO2: 0.35 PEEP: 9 NorA: 0.05 PH: 7.39 CO2: 37, O2: 78</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LDH: 1286 CRP: 24</td>
</tr>
<tr>
<td>21/22 March</td>
<td>Faecal fluid- 30 ml -&gt; 1250ml → 275 ml</td>
<td>Tension PTX (right)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PRVC FiO2: 0.3 PEEP: 5 NorA: 0.15 PH: 7.31, CO2: 42, O2: 153</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LDH: 574 CRP: 193</td>
</tr>
<tr>
<td>24 to 26 March</td>
<td>2385ml/24H</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Bactrim day 7
- Mero day 5
- Oral vancomycin and IV flagl
- Anidula
8 Feb, day 4 illness
10 Feb, day 6 illness
15 Feb, day 11 illness
20 Feb, day 16 illness

24 Feb, day 20 illness
At day 53 illness, 29 MARCH 2020
# Cytopenias

<table>
<thead>
<tr>
<th></th>
<th>09-Feb</th>
<th>10-Feb</th>
<th>11-Feb</th>
<th>12-Feb</th>
<th>15-Feb</th>
<th>17-Feb</th>
<th>20-Feb</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Haemoglobin</strong></td>
<td>12.5</td>
<td>12.6</td>
<td>11.7</td>
<td>12.5</td>
<td>9.1</td>
<td>7.3</td>
<td>8.0</td>
</tr>
<tr>
<td><strong>Neutrophils</strong></td>
<td>6.91</td>
<td>9.28</td>
<td>7.81</td>
<td>9.75</td>
<td>11.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Platelets</strong></td>
<td>120</td>
<td>70</td>
<td>53</td>
<td>48</td>
<td>67</td>
<td>150</td>
<td>250</td>
</tr>
<tr>
<td><strong>ALP</strong></td>
<td>170</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>138</td>
</tr>
<tr>
<td><strong>ALT</strong></td>
<td>98</td>
<td></td>
<td></td>
<td></td>
<td>50</td>
<td></td>
<td>70</td>
</tr>
<tr>
<td><strong>AST</strong></td>
<td>146</td>
<td></td>
<td></td>
<td></td>
<td>55</td>
<td></td>
<td>148</td>
</tr>
<tr>
<td><strong>Bil</strong></td>
<td>24</td>
<td></td>
<td></td>
<td></td>
<td>121</td>
<td></td>
<td>292</td>
</tr>
</tbody>
</table>
# Cytopenias

<table>
<thead>
<tr>
<th></th>
<th>25-Feb</th>
<th>27-Feb</th>
<th>29-Feb</th>
<th>02-Mar</th>
<th>03-Mar</th>
<th>05-Mar</th>
<th>06-Mar</th>
<th>09-Mar</th>
<th>10-Mar</th>
<th>11-Mar</th>
<th>16 Mar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haemoglobin</td>
<td>7.3</td>
<td>6.9</td>
<td>6.6</td>
<td>7.2</td>
<td>8.1</td>
<td>7.1</td>
<td>7.2</td>
<td>6.7</td>
<td>7.1</td>
<td>9.0</td>
<td>9.2</td>
</tr>
<tr>
<td>Neutrophils</td>
<td>13.52</td>
<td>8.21</td>
<td>15.43</td>
<td>17.15</td>
<td>16.32</td>
<td>10.32</td>
<td>9.88</td>
<td>2.63</td>
<td>1.35</td>
<td>5.59</td>
<td>6.33</td>
</tr>
<tr>
<td>Platelets</td>
<td>122</td>
<td>168</td>
<td>92</td>
<td>154</td>
<td>120</td>
<td>75</td>
<td>48</td>
<td>28</td>
<td>12</td>
<td>43</td>
<td>115</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>25 Feb</th>
<th>29 Feb</th>
<th>9 Mar</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALP</td>
<td>156</td>
<td>400</td>
<td>175</td>
</tr>
<tr>
<td>ALT</td>
<td>72</td>
<td>102</td>
<td>57</td>
</tr>
<tr>
<td>AST</td>
<td>58</td>
<td>136</td>
<td>113</td>
</tr>
<tr>
<td>Bil</td>
<td>96</td>
<td>68</td>
<td>52</td>
</tr>
</tbody>
</table>
First week of admission:
- HIV screen negative
- PBF: stomacytes/target cells 1+, myelocytes, meta-myelocytes
- Fibrinogen: 7.6g/L (760mg/dL)
- AST: 72
- TRG: 5.4 mmol/L (478mg/dL)

2nd week:
- PBF: stomacytes/target cells 1+, toxic vacuolations of neutrophils
- Fibrinogen: 7.1g/L
- Ferritin: 850ug/L (24 Feb)
HLH score (15 FEB): 121 (5 TO 9 %)

4th week:
- PBF: occasional target cells, thrombocytopenia, no significant abnormality
- TRG: 4.5 mmol/L ➞ 3.3 mmol/L
- Fibrinogen: 4.3 to 4.1 g/L
- Ferritin: 1145ug/L (6 March)
- AST: 113
HLH score: 97 (1 %)

Others:
- Malaria thin and thick film: negative (18 Feb/6 March)
- LDH: 1908 ➞ 595
- CT AP with contrast (29 Feb)
- Liver and spleen: unremarkable
- Bone marrow: normal marrow populations, increased erythropoiesis and megakaryopoiesis
Case 3: 75 yo, with HT/HLD/IHD, church 29 Jan, Fever 8/9 Feb, then resp symptoms and fever 19 Feb onwards

Day of illness

23 Feb
Optiflow 60%
PRVC, PEEP: 10
FiO2: 0.65
Nor A: 0.1

PH: 7.44, CO2: 35, O2: 62
LDH: 2194
CRP: 176
PCT: 0.19

25 and 26 Feb
Proned
PRVC, PEEP: 12
FiO2: 0.5
Nor A: off
Dusky pheripheries
Decline in urine output

PH: 7.21, CO2: 52, O2: 163 (0.4, prone)
LDH: 2002
CRP 318
PCT: 2.45

28 Feb
PRVC, PEEP: 10,
FiO2: 0.4
Nor A restarted

PH: 7.33, CO2: 42, O2: 123
CRP: 132
PCT: 2.33

1st March
PEEP: 12
FiO2: 0.5
CVVHDF

PH: 7.34, CO2: 43, O2: 129
CRP: 132
PCT: 2.38

5 March
PEEP: 10
FiO2: 0.5
Tropes off
UO: 800mls /24hours

Day of illness

D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16
Case 3: 3rd/4th week in ICU

Day of illness

<table>
<thead>
<tr>
<th>D17</th>
<th>D18</th>
<th>D19</th>
<th>D20</th>
<th>D21</th>
<th>D22</th>
<th>D23</th>
<th>D24</th>
<th>D25</th>
<th>D26</th>
<th>D27</th>
<th>D28</th>
<th>D29</th>
<th>D30</th>
<th>D31</th>
</tr>
</thead>
</table>

- **Kaletra**
- **piptazo**
- **Mero**
- **ETT negative PCR**

**6 March**
- PRVC, PEEP: 10, FiO2: 0.5
- UO: >30mls/hour

**PH: 7.33, CO2: 42, O2: 123**

- Gangrene hands/Feet
- Left peroneal vein DVT
- CRP: 132
- PCT: 2.33

**10 March**
- PRVC, PEEP: 10
- FiO2: 0.6
- UO: >40mls/hour


- LDH: 1879, CRP: 167

**12 / 13 March**
- Proned
- PRVC, PEEP: 12
- FiO2: 0.7

**14 Mar**
- melaena (Scopes: Severe gastritis/Duodenitis)
- Declining UO: 10 to 20 mls/hour
- Nor A: 0.05

**16 Mar**
- AF
- PRVC, PEEP: 8
- FiO2: 0.4

**PH: 7.23, CO2: 51, O2:86, bicarb: 21**

- Areas of wet gangrene/blistering/ulcers

**19 Mar**
### Cytopenias

<table>
<thead>
<tr>
<th></th>
<th>23 Feb</th>
<th>27 Feb</th>
<th>2 Mar</th>
<th>6 Mar</th>
<th>9 Mar</th>
<th>10 Mar</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALP</td>
<td>92</td>
<td>113</td>
<td>102</td>
<td></td>
<td>116</td>
<td></td>
</tr>
<tr>
<td>ALT</td>
<td>40</td>
<td>22</td>
<td>24</td>
<td></td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>AST</td>
<td>63</td>
<td>59</td>
<td>67</td>
<td></td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>Bil</td>
<td>18</td>
<td>17</td>
<td>19</td>
<td></td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>hb</td>
<td>14.6</td>
<td>12.2</td>
<td>7.2</td>
<td>9.5</td>
<td>7.1</td>
<td>8.3</td>
</tr>
<tr>
<td>plt</td>
<td>385</td>
<td>77</td>
<td>60</td>
<td>84</td>
<td>120</td>
<td>143</td>
</tr>
<tr>
<td>twc</td>
<td>14.9</td>
<td>19.9</td>
<td>20.5</td>
<td>23.4</td>
<td>21.2</td>
<td>16.1</td>
</tr>
</tbody>
</table>

Ferritin: 4973  
TRG: 5.8  
Fibrinogen: 3.2 → 5.9

HLH: 175
Social services and palliative care referral

• Designated medical social worker (MSW) for COVID-19 ICU
• Engaged the family last week of ICU stay ➔ flagged up to the medical team about the stress they faced
• Palliative care referral options with family explored
• Non escalation, keeping patient comfortable
• Allowing them to spend time in the room with patient in full PPE
Case 4: 64 year old man, fever and cough with breathlessness for 1 week, HT, lipids, IHD, asthma, on Plavix

13 Mar, ED:
BP: ok
4LO2->50% VM
Lungs: bilateral creps
Lymphocytes: 0.52
Platelets: 183
TWC: 14.7
PCT: 0.12
CRP: 50
LDH: 621
Cr: 110

15 Mar
Proned
PEEP: 8, FiO2: 0.8

16 Mar
Proned
PEEP: 15, FiO2: 0.8

18 Mar
CVVHDF
1800: ECMO
FiO2: 100%

19 Mar
6H
PE: 7.08 → 7.29 → 7.23
CO2: 75 → 48 → 63
O2: 84 → 135 → 115

12H
Cr: 1600
Plt: 87
APTT: 78.2, INR: 1.1

1900: unequal pupils
CT brain: multi-focal ICH with Hydrocephalus and generalized Cerebral edema

Passed away 20 March
13 March, Day 7 illness

18 March, Day 12 illness
Observations:

Patient
• Younger ones, despite MOF on admission seems to be able to overcome odds
• Cytopenias common
• SIRS frequent
• Timed ETT exchange and proning seems to work
• Resources are able to cope with patient numbers

Pre-intubation:
• Once patient on VM ≥ 35% rapid decline

Post-extubation:
• Postural related hypoxia

Healthcare worker:
• Patient’s family
• Keeping updated with all the rapidly changing protocols
Prone ventilation

• Till 19 March, 14/31 patients who needed mechanical ventilation was at ICU, NCID.
• 6 received prone ventilation
• All patients had moderate-to-severe ARDS with median PEEP :13.0 cmH$_2$O (IQR 11.5 -14.3) and the median PaO$_2$:FiO$_2$ ratio was 98mmHg (IQR 85 – 106).
• 4 were turned prone within 72 hours of endotracheal intubation and the remaining patients at day 6 and day 8 of intensive care unit (ICU) stay respectively.
• Prone ventilation was performed with a median of 3 (IQR 1.8 – 6) times at a median duration of 16.2 hours (IQR 15.1 – 17.5).
• Four patients were on vasopressors during the procedure, of whom one required 2 agents to support her blood pressure. 3 patients received intravenous hydrocortisone for septic shock.

Lee RM, Tan GP, Puah SH, Ling LM, Wong Yu Lin, unpublished data
<table>
<thead>
<tr>
<th>Case</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, years</td>
<td>73</td>
<td>39</td>
<td>75</td>
<td>54</td>
<td>36</td>
<td>64</td>
</tr>
<tr>
<td>Sex</td>
<td>Male</td>
<td>Male</td>
<td>Female</td>
<td>Male</td>
<td>Male</td>
<td>Male</td>
</tr>
<tr>
<td>Body mass index, kg/m²</td>
<td>14.2</td>
<td>27.6</td>
<td>19.6</td>
<td>24.7</td>
<td>25.4</td>
<td>26.6</td>
</tr>
<tr>
<td>APACHE score</td>
<td>7</td>
<td>10</td>
<td>16</td>
<td>9</td>
<td>22</td>
<td>20</td>
</tr>
<tr>
<td>SOFA score</td>
<td>4</td>
<td>10</td>
<td>3</td>
<td>2</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Medical therapy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lopinavir/ritonavir</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Interferon 1B</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td><strong>Other interventions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vasopressors – no.</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Neuromuscular blockade</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Renal replacement therapy</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>Glucocorticoid therapy</td>
<td>-</td>
<td>+</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td><strong>Ventilator setting</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Set volume, ml per Kg IBW</td>
<td>7.0</td>
<td>7.5</td>
<td>7.3</td>
<td>7.1</td>
<td>6.0</td>
<td>7.0</td>
</tr>
<tr>
<td>Respiratory rate, breaths per min</td>
<td>22</td>
<td>20</td>
<td>30</td>
<td>20</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>FiO₂</td>
<td>1.00</td>
<td>1.00</td>
<td>0.70</td>
<td>0.60</td>
<td>1.00</td>
<td>0.95</td>
</tr>
<tr>
<td>PEEP, cmH₂O</td>
<td>12</td>
<td>14</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>15</td>
</tr>
<tr>
<td><strong>Respiratory system mechanics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plateau pressure, cmH₂O</td>
<td>26</td>
<td>26</td>
<td>24</td>
<td>27</td>
<td>22</td>
<td>28</td>
</tr>
<tr>
<td>Static compliance, mL/cmH₂O</td>
<td>32</td>
<td>32</td>
<td>25</td>
<td>32</td>
<td>56</td>
<td>35</td>
</tr>
<tr>
<td><strong>Arterial blood gas</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PaO₂, mmHg</td>
<td>97</td>
<td>99</td>
<td>73</td>
<td>67</td>
<td>86</td>
<td>81</td>
</tr>
<tr>
<td>PaO₂/FiO₂, mmHg</td>
<td>97</td>
<td>99</td>
<td>104</td>
<td>111</td>
<td>86</td>
<td>81</td>
</tr>
<tr>
<td>PaCO₂, mmHg</td>
<td>66</td>
<td>69</td>
<td>61</td>
<td>49</td>
<td>77</td>
<td>70</td>
</tr>
<tr>
<td>Arterial pH</td>
<td>7.24</td>
<td>7.24</td>
<td>7.15</td>
<td>7.41</td>
<td>7.28</td>
<td>7.14</td>
</tr>
<tr>
<td><strong>Prone positioning</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of session(s)</td>
<td>2</td>
<td>9</td>
<td>5</td>
<td>1</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Average duration per session (h)</td>
<td>15.5</td>
<td>16.0</td>
<td>18.0</td>
<td>14</td>
<td>13.7</td>
<td>17.3</td>
</tr>
<tr>
<td><strong>Adverse events</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure necrosis</td>
<td>-</td>
<td>-</td>
<td>+, Limb</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Haemodynamic instability</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>-</td>
<td>+, Vomit</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tracheostomy</td>
<td>-</td>
<td>+</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Length of ICU stay, days</td>
<td>NA</td>
<td>NA</td>
<td>26</td>
<td>18</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>Extracorporeal membrane oxygenation</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Survival status</td>
<td>Survive</td>
<td>Survive</td>
<td>Demise</td>
<td>Survive</td>
<td>Survive</td>
<td>Demise</td>
</tr>
</tbody>
</table>
Figure 1: Timeline of PaO2:FiO2 ratio trend and PaCO2 trend
Going to trial: Proning in non ventilated patients

**Indication**
- Positive for COVID-19 infection or high suspicion of COVID-19 infection
- Chest imaging changes suggestive of pneumonia
- Oxygen supplementation of 2L/min or more, but less than Venturi mask with FiO2 50%

**Contraindications**
- Drowsy or uncooperative patients
- Glaucoma or recent ophthalmological surgery
- Spinal instability (especially cervical spine)
- Intra-abdominal hypertension or recent abdominal surgery
- Pregnancy
- Oxygen supplementation requiring Venturi mask with FiO2 50% and above (consider escalation of care to the intensive care unit team)
• Instruct patients to adopt prone position **5 times a day**, for **60 minutes each time** at 10am, 1pm, 4pm, 7pm, 10pm. Please provide patients with additional pillow(s) if required.

• Arms are either positioned at the patient’s side or abducted to less than 90 degrees at shoulder and flexed at the elbow ("prone superman" position). The head should be turned to face either side.

• Measure and document SpO2 and oxygen supplementation before and 30 minutes after adopting prone position.

**When to stop prone positioning?**

• Consider cessation of prone positioning when patient is on room air for at least 24 hours.
Patient 1

73 year old, day 10 of illness

- was on kaletra/IFN for 1 day
- Breathless on exertion
- 4L O2 : Sp02: 85% (sitting up) to 95/96% (supine position)

Pre proning:

- PH: 7.45, CO2: 30, O2: 84 (supine)

1 hour post proning:

- PH: 7.46, CO2: 31, O2: 111 (prone)

- Did this for 1 to 2 days, transferred out of HD
Patient 2

68 year old, HT, DM,

- Day 7 of illness
- 3L of O2: 93 to 94 % RA ➔ 4L O2 (87% to 92%)
- Proned from 24 to 26 March 2020
- Proned for 1h at 8am, 11am, 5pm, 9pm

ABG pre and post proning on 25/3

- pre pH 7.48, CO2 26, O2 63 bicarb 19
- post pH 7.43 CO2 23, O2 69 bicarb 16

Intubated 26 March 2020
SARS-CoV-2 viral shedding in ICU

• Past 2 months, ETT for COVID 19 PCR twice weekly so long as they are intubated
• Until 20 March 2020
• Total 14 intubated patients
<table>
<thead>
<tr>
<th>NAME</th>
<th>First Negative</th>
<th>Interim Positive Results</th>
<th>Persistent Negative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Date</td>
<td>Day of Illness</td>
<td>Subsequent Positive PCR</td>
</tr>
<tr>
<td>LL</td>
<td>3/02/2020</td>
<td>3</td>
<td>4/2/20, 5/2/20, 6/2/20, 7/2/20, 8/2/20, 9/2/20</td>
</tr>
<tr>
<td>WAHV</td>
<td>19/02/2020</td>
<td>15</td>
<td>NIL</td>
</tr>
<tr>
<td>SK</td>
<td>19/02/2020</td>
<td>15</td>
<td>20/2/20, 21/2/20, 22/2/20</td>
</tr>
<tr>
<td>WSL</td>
<td>20/02/2020</td>
<td>20</td>
<td>2/3/20, 4/3/20</td>
</tr>
<tr>
<td>FYF</td>
<td>27/02/2020</td>
<td>29</td>
<td>28/02/2020</td>
</tr>
<tr>
<td>OTLJ</td>
<td>27/02/2020</td>
<td>17</td>
<td>2/3/20, 5/3/20, 9/3/20</td>
</tr>
<tr>
<td>LJL</td>
<td>02/03/2020</td>
<td>5</td>
<td>09/03/2020</td>
</tr>
<tr>
<td>LCF</td>
<td>02/03/2020</td>
<td>18</td>
<td>03/03/2020</td>
</tr>
<tr>
<td>LKE</td>
<td>06/03/2020</td>
<td>17</td>
<td>07/03/2020</td>
</tr>
<tr>
<td>AHKY</td>
<td>Still positive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CH</td>
<td>Still positive at D16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HSS</td>
<td>Still positive at D18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAH</td>
<td>Still positive at D19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>KW</td>
<td>Still positive at D7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Tay Woo Chiao, Teh Yuan Kai, NHG internal medicine residency
<table>
<thead>
<tr>
<th>Day of Illness</th>
<th>FYF</th>
<th>LCF</th>
<th>36 year old Male</th>
<th>LL</th>
<th>48 year Female</th>
<th>LJI</th>
<th>73 year Male</th>
<th>LKE</th>
<th>75 year Female</th>
<th>OTLJ</th>
<th>54 year Male</th>
<th>SR</th>
<th>39 year Male</th>
<th>WAHV</th>
<th>62 year Male</th>
<th>WSL</th>
<th>71 year Male</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PCR Results</td>
<td>Events</td>
<td>PCR Results</td>
<td>Events</td>
<td>PCR Results</td>
<td>Events</td>
<td>PCR Results</td>
<td>Events</td>
<td>PCR Results</td>
<td>Events</td>
<td>PCR Results</td>
<td>Events</td>
<td>PCR Results</td>
<td>Events</td>
<td>PCR Results</td>
<td>Events</td>
<td>PCR Results</td>
</tr>
<tr>
<td></td>
<td>1 1 1 1</td>
<td></td>
<td>1 1 1 1 1 1 1</td>
<td></td>
<td>1 1 1 0 1 0 0</td>
<td></td>
<td>0 0 0 0 0 0 0</td>
<td></td>
<td>1 1 1 1 1 1 1</td>
<td></td>
<td>1 1 1 1 0 1 1</td>
<td></td>
<td>1 1 1 1 1 1 1</td>
<td></td>
<td>1 1 1 1 1 1 1</td>
<td></td>
<td>1 1 1 1 1 1 1</td>
</tr>
<tr>
<td></td>
<td>Intubated</td>
<td></td>
<td>Intubated</td>
<td></td>
<td>Intubated</td>
<td></td>
<td>Intubated</td>
<td></td>
<td>Intubated</td>
<td></td>
<td>Intubated</td>
<td></td>
<td>Intubated</td>
<td></td>
<td>Intubated</td>
<td></td>
<td>Intubated</td>
</tr>
<tr>
<td></td>
<td>Ex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ex</td>
<td></td>
<td></td>
<td></td>
<td>Ex</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Tay Woo Chiao, NHG internal medicine residency**
Review of Full Precautions Status for COVID-19 Positive Patient requiring further Inpatient Care in ICU or General Wards

Fulfil ALL 3 criteria:
1) Two (2) consecutive negative respiratory specimens (preferably ETT Aspirate or BAL) at least 24 hours apart
2) Two (2) consecutive negative stool Polymerase Chain Reaction (PCR) at least 24 hours apart
3) Patient is >28 days from onset of illness (i.e. from 29th day onwards)

Collective decision made by Primary Team Dr & ID to review off Full Precautions status Nurse to inform ICN regarding decision made

Institute **Droplets and Contact Precautions** if no other conditions requiring transmission based precautions

Transfer to **non** Outbreak ICU or GW

Jointly by Infectious Disease, RCCM & Department of Infection Prevention & Control updated 26 March 2020
THANK YOU