**Introduction:**
In ECCO2R-CRRT, efficiency of CO2 removal is higher positioning the oxygenator (OXY) up-stream than down-stream the haemofilter due to higher blood flow (BF) [1]. We tested whether this effect was due to lower pre-filter pressure (PFP).

**Methods:**
ECCO2R-CRRT circuit was tested in-vitro (n=10) with the following settings: 5 L bovine blood; BF 450 ml/min; OXY 1.81 m2 (Euroset); CVVH post mode; substitution flow 2500 ml/h; UF rate function off; 1.5 m2 haemofilter (Diapact®, B.Braun Avitum); sweep air flow 4.5 l/min. PFP was evaluated at baseline, 24, 48 and 72 hours. CO2 extraction was measured at BF of 100, 300 and 500 ml/min. Sweep air flow/blood ratio was 1:10. CO2 was add to obtain PaCO2 of 80 mmHg. CO2 removal rate calculation (2): CO2 removal rate = (CO2 ECCO2R inlet– CO2 ECCO2R outlet)* blood flow (Eq.1)

CO2 molar volume at 25 °C [l/mol] = 24; solubility of CO2 at 37 °C = 0.03 mmol/(l*mmHg); HCO3i = inlet HCO3 concentration [mmol/l]; HCO3o = outlet HCO3 concentration [mmol/l]; Pi CO2 = inlet CO2 partial pressure [mmHg]; PoCO2 = outlet CO2 partial pressure [mmHg] equation1 becomes: CO2 removal rate=24 x ((HCO3i + 0.03 x PiCO2) - (HCO3o + 0.03 x PoCO2)) x blood flow (Eq.2)

**Results:**
BF of 450 ml/min was always reached with the up-stream configuration. BF was reduced to 400 ml/min with the down-stream configuration due to high PFP alarm. CO2 removal increased to 34.5±13.9 to 69.1±29.5, and 126.0±28.4 ml/min, at BF of 100, 300 and 500 ml/min (p<0.05).

**Conclusion:**
BF of 500 ml/min can be reached only with the up-stream configuration due to lower circuit PFPs. BF directly correlates to CO2 removal efficiency. We may speculate that simultaneous use of CRRT and LF-ECCO2R and activation of the UF rate function with the down-stream setting may further increase PFP thus forcing to more enhanced reduction of BF and less effective CO2-removal.

**References:**

**Table 1:**

<table>
<thead>
<tr>
<th>Setting</th>
<th>baseline</th>
<th>24 h</th>
<th>48 h</th>
<th>72 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>up-stream PFP (mmHg)</td>
<td>278.4 ± 9.4</td>
<td>370.0 ± 7.6</td>
<td>415.0 ± 5.2</td>
<td>451.4 ± 7.6</td>
</tr>
<tr>
<td>down-stream PFP (mmHg)</td>
<td>380.8 ± 7.2</td>
<td>447.0 ± 4.7</td>
<td>488.2 ± 5.1</td>
<td>481.8 ± 6.0</td>
</tr>
</tbody>
</table>

*pre-filter pressures dependent on OXY position (ANOVA, p<0.001)*