Sedation, Analgesia, Antibiotic & Paralysis Management of the ECLS Patient

Unlike most ICU patients we will aim for the ECLS patients to be heavily sedated at least initially. This is because cannula dislodgement can be life threatening and patient movement can lead to circuit flow interruption.

During Cannulation and Transfers
The patient should be anaesthetised and paralysed as dictated by their physiological status. The bolus paralytic agent of choice is rocuronium.

In the ICU
Sedation is required to be deep for the initial stages of ECLS therapy and due to the pharmacokinetics of sedative and muscle relaxants in the extracorporeal circuit, high doses of these agents may be required. Lipophilic agents may sequestrate in the circuit and may need to a change in drug choices. Our first line sedative agents remain propofol (should not exceed 150mg/hr) and alfentanil. Midazolam may be added as a third agent. Measurement of triglycerides may require to be checked especially if the patient is also on TPN. Other agents such as clonidine, dexmedetomidine or ketamine may also be used at the Consultants discretion. A weaning plan for ECLS patients with high doses of opiates and benzodiazepines needs to be in place during the recovery phase. Sedation should be titrated to a RASS of -3 to -4 when assessable, but will be bespoke to individual patients during a run.

Antibiotics
Unlike for other indwelling cannula it will be usual practice to give at the time of cannula insertion prophylactic antibiotics as a one off dose. Piperacillin/Tazobactam 4.5g for the non penicillin allergic plus teicoplanin 400mg if known MRSA. Alternative is teicoplanin 400mg + ciprofloxacin 400mg + metronidazole 500mg.

Muscle relaxants
Rocuronium is the bolus muscle relaxant of choice for ECLS patients undergoing procedures and transfers. Suxamethonium should not be used due to risks of hyperkalaemia. For continuous paralysis we will use atracurium, titrated to a train of four count of 2:4. Daily review by the ECLS Consultant should include the ongoing requirement for muscle relaxation. Normally continuous paralysis will be continued for a maximum of 48 hours.

<u>Suggested starting doses are: but individual titration is required</u>
Midazolam (1mg/ml) 0 to 10mls/hr
Morphine (2mg/ml) 0 to 10mls/hr
Propofol 1% (10mg/ml) 0 to 15mls/hr
Ketamine (10mg/ml) 0 to 5mls/hr
Rocuronium 10mg/ml as bolus 1mg/kg
Atracurium intial bolus 0.5mg/kg
Atracurium continuous infusion 0.3-0.6 mg/kg/hr