HANDBY HINTS FOR HAEMOFILTRATION

The treatment mode used for Continuous Renal Replacement Therapy on the Cardiff PICU is Continuous Veno-Venous Haemofiltration (CVVH). CVVH facilitates the continuous convective removal of waste products (small and large molecules) utilizing a substitution solution.

Preparation and Priming

- There are 6.5f, 8f and 11f vascaths available for use on the Cardiff PICU. The consultant inserting the vascath will decide upon the most appropriate size to use. The general principle is the bigger the better.
  * There are larger sizes of vascath available on the AICU.

- To Hep-lock the vascath use 1,000 units of Heparin in 1 ml. The amount of Heparin that you put into each lumen of the vascath is written on the side of each lumen.
  * Remember to remove the Heparin from the lumens before flushing for attachment so that the patient does not receive a bolus of Heparin.

- An aseptic technique should ALWAYS be used when accessing the vascath.

- The consultant will prescribe the:
  - Blood Flow rate (ml/min)
  - Predilution (ml/h)
  - Postdilution (ml/hr)
  - Heparin (units/50ml) and rate (ml/hr)
  - Fluid Loss rate (ml/h)

  The calculations used to obtain these figures are in the CVVH folder with the prescription chart so that the nurse programming the haemofilter can check that the prescription is correct.

- The two types of substitution fluid used on the Cardiff PICU are:
  - Baxter Monosol S solution
  - Baxter lactate free solution.

  The solution required will be prescribed by the consultant.

- For children < 40kg: the Aqualine S (paediatric) line set and the HF 07 filter should be used.
  - For children > 40kg: the Aqualine (adult) line set and the HF 12 filter should be used.

- The haemofiltration circuit is initially primed with a 1litre bag of Normal Saline containing 5,000 units of Heparin.
Once the circuit has been primed with Hep-Saline it is then re-primed with either Human Albumin or Normal Saline. The consultant will prescribe the priming solution. Generally, Human Albumin is used for infants < 10kg and Normal Saline is used to re-prime all other circuits.

After priming, the haemofilter should be left in re-circulation mode for at least 5 – 15 minutes for optimal preparation of the filter membrane (the maximum amount of time that the haemofilter can be left in re-circulation mode is 24hrs).
* The haemofilter can ONLY be switched off and moved when in re-circulation mode.

**Commencing Haemofiltration**

- A baseline Activated Clotting Time (ACT) should be done before the child is put on to the haemofilter. ACT’s should then be done at least hourly once treatment has commenced and the Heparin should be adjusted accordingly.
  * The bedside nurse or the nurse in charge should also ask the consultant to specify the ACT regime for each individual patient as some vascaths may be fragile and may clot easily.

- Baseline measures of Hb, U&E, Cr, Phosphate, APTT, Platelets and an ABG need to be taken before attaching the patient to the haemofiltration circuit.

- When attaching the patient to the circuit there should be an adequate supply of volume expanders available. The patient should have been in 100% oxygen for 10 minutes (this should have been discussed with the consultant). Drug doses should have been adjusted accordingly. Heparin should have been removed from the vascath lumens.

- When the patient is attached to the haemofilter start the Blood Flow rate at about half of the prescribed rate.
  * As long as the patient remains stable increase the blood flow rate to the prescribed rate as quickly as possible to help prevent the filter from clotting.

- The Aquarius needs to be programmed to run for a set amount of time. This can be done by programming the Time h. min parameter OR the Total Fluid Loss mL parameter. It is important to only set ONE of these parameters. The bedside nurse can decide which parameter to set and decide upon the length of time the haemofilter should run for before it needs programming again.
  * The maximum amount of time we usually set the haemofilter to run for on the Cardiff PICU is 4 hours.

**Care During Haemofiltration**

- Blood for ACT’s can be taken pre or post filter. It is important to record where the blood for the ACT is being taken from so that the same site is used
throughout treatment because the ACT’s will vary according to the site used.

* It is common practice on Cardiff PICU to measure the ACT post filter.

- Only use the clear lid bottles (G-act) to do the ACT’s. You will need to put 0.4mls of blood into the tube. When putting the blood into the tube hold it vertically then tap the bottom of the tube sideways five times. Insert the tube into the ACT machine and rotate the tube clockwise, the green detector light will illuminate when accepted.

- Record the following observations hourly on the yellow observation chart:

  - Blood Flow ml/min
  - Substitution ml (pre and post dilution fluid combined)
  - Access (pressure) mmHg
  - Return (pressure) mmHg
  - TMP mmHg
  - Pr. Drop mmHg

- The volume of Heparin; Sodium Bicarbonate (if being infused) and the Fluid Loss Total should be recorded on the green fluid balance charts and included in the patient’s fluid balance.

  * The volume of substitution solution infused is automatically removed by the machine so this volume does not need to be included in the fluid balance.

- All prescriptions and prescription changes for drugs added to the substitution fluid or the haemofiltration circuit should be prescribed by the doctor on the yellow fluid prescription chart.

- Complications of haemofiltration include:

  - Haemorrhage
  - Anaemia
  - Hypotension/hypertension
  - Hypovolaemia/hypervolaemia
  - Psychological trauma
  - Systemic infection
  - Thrombus/emboli
  - Hypothermia/temperature instability
  - Electrolyte imbalance

  The bedside nurse/doctor should observe for and try to prevent any of these complications from occurring. 4–6 hourly FBC, U&E, Cr, Ca, Mg, Phosphate, Glucose, blood gases and daily LFT’s need to be done.

- In cases where the haemofilter is alarming due to high access/return pressures the access and return lumens/lines can be swapped. This should only be done when re-positioning of the vas cath/patient has been tried and the lines have been checked.