

# HAEMOFILTRATION GUIDELINES

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

- ❖ 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.

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**Remember** to label the lumen as Hep-locked and 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.
- ❖ For children 5-15kg: the Aqualine S (paediatric) line set and the HF 03 filter should be used.  
For children 15- 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 consultant will prescribe the:

Blood Flow rate (ml/min)  
Substitution Fluid Rate (ml/hour)  
Predilution (ml/h)  
Postdilution (ml/hr)  
Heparin (units/50ml) and rate (ml/hr)  
**Or** Epoprostenol (ng/kg/hr) and rate (ml/hr)  
Fluid Loss rate (ml/h)

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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 substitution fluid used on the Cardiff PICU is Accusol 35 (pink). The instructions for use of Accusol are in the CVVH folder.

## **Priming**

- ❖ The haemofiltration circuit is initially primed with a 1litre bag of Normal Saline containing 5,000 units of Heparin.
- ❖ If Heparin is used for anticoagulation, the prescribed dose (units/kg) should be made up in the 50 ml syringe and attached to the circuit during priming (the heparin line needs to be primed but the heparin does not need to run during priming and when in re-circulation mode).
- ❖ 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 (Infants <10kg may require a blood transfusion on or after commencement of CVVH. This should be discussed with the prescribing consultant).
- ❖ 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).

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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.

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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.

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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 Substitution Fluid (treatment) can be commenced **WHEN** the patient is stable on the Blood Pump.
- ❖ 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**

- ❖ 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.

- ❖ 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 in to 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 or Epoprostenol and the Fluid Loss Total should be recorded on the **green** fluid balance charts and included in the patient's fluid balance.

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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.

- ❖ **REMEMBER** to change the Fluid Loss rate in accordance with the patient's changing fluid requirements and the consultant prescription for 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.**

## Handy Hints

- ❖ 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 vascath/patient has been tried and the lines have been checked.
- ❖ If the vascath needs to be flushed, a bridge may be used for the blood circuit but for no longer than 2-5 minutes.
- ❖ When flushing the vascath the nurse should try to determine which lumen has the best flow and attach the access (red) line to this lumen.
- ❖ If the Pre-filter pressure is high and rising then the filter may be clotting so it may be advisable to prepare your Hep-lock for the vascath.
- ❖ In order to try to keep the blood circuit running whilst preparing your Hep-lock, the Blood Flow rate may be decreased or the Pre-dilution rate may be increased.

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**If you are changing the Pre or Post-dilution rates remember that the TOTAL rate of the Pre and Post dilution MUST equal to the prescribed Substitution Rate.**

- ❖ If the **BALANCE ALARM** goes off **DO NOT** ignore it – check everything i.e. the Substitution and Filtration bags, lines and connections and the Flow Rates of the pumps; continue, but if the alarm goes off more than 3 times in a row then **STOP** the substitution side, continue the blood pump side and ring the Edwards Rep. for advice. \* Excessive fluid removal or overload can occur if this alarm is ignored and the pumps are continuously re-started (please refer to the Edwards Lifesciences Aquarius Manual for more information).
- ❖ Do not re-use dialysate bags as waste bags.
- ❖ When disconnecting patients from the Aquarius it is possible to give the blood that is in the haemofiltration circuit back to the patient. However, there may be circumstances in which blood should **NOT** be returned to the patient (please refer to the Edwards Lifesciences Aquarius Manual). You should only carry out this procedure if you have been trained to do so and you should **ALWAYS** check with the prescribing consultant.

IF YOU HAVE ANY CONCERNS OR QUERIES YOU CAN CONTACT ONE OF THE BAXTER REPRESENTATIVES, THE NUMBERS FOR THEM ARE ON THE BUSINESS CARDS IN THE CVVH FOLDER. SOMEONE SHOULD BE AVAILABLE TO HELP YOU BOTH DAY AND NIGHT.