

Renal Replacement Therapy

General Indications:

- severe fluid overload
- severe electrolyte disturbance
- severe metabolic acidosis
- anuria/oliguria (non-obstructive)
- uraemic symptoms - uraemic encephalopathy, uraemic pericarditis
- azotaemia – urea > 30mmol/L
- creatinine > 300-600umol/L
- others: certain drug intoxications (salicylates, lithium, phenobarbitone, methanol, ethylene glycol), hyperthermia

Mode of renal replacement therapy offered in our unit:

CVVH (continuous veno-veno haemofiltration)

CVVHDF (continuous veno-veno haemodiafiltration)

PD (prescribed by renal physician)

HD (prescribed by renal physician)

Advantage of CVVH/CVVHDF over PD – mainly less diaphragmatic splinting
PD not suitable in post abdominal surgical patients

Advantage of CVVH/CVVHDF over HD – more haemodynamically stable

Circuit

Although CVVH/CVVHDF is commonly managed by ICU seniors, you may be required put in CVVH catheters and see patients on CVVH therapy.

- Catheter Placement
order of preference for vascular access: IJV >FV>SCV

- Anticoagulation

Heparin anticoagulation is employed in our unit

Heparin anticoagulation is not indicated if

1. active, recent bleeding
2. spontaneous INR >2
3. spontaneous APTT >60s
4. platelets <80

If heparin is used:

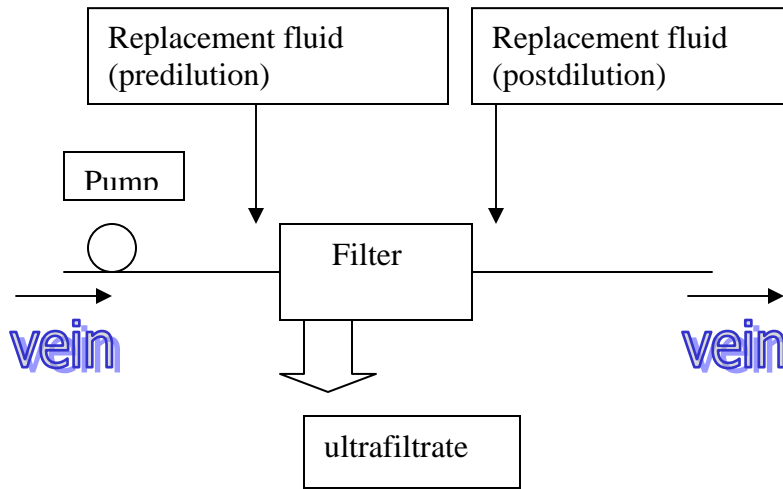
Check baseline ACT

Loading 1000 -5000 U depending on ACT

Maintenance 3-15u/kg/hour targeting a 50% prolongation in ACT
(usually 140 – 160)

if ACT >upper limit, nurses will decrease heparin by 100units/hr

if ACT <lower limit, nurses will increase heparin by 100 units/hr



CVVH circuit

- Replacement fluid

At present, our unit practices predilution fluid replacement only with the Prisma machines; this is because of limitation from the Prisma circuitry. Things may change with plans to introduce a different CRRT machine. Advantages of predilution fluid replacement – may reduce need for heparin

Replacement fluids available:

1. "home-made" cocktail solution (1/2 saline with added sodium bicarbonate and electrolytes)
2. commercial preparations (lactate or bicarbonate based). Avoid HF₄ if severe liver failure (unable to handle the lactate load) or hyperkalaemia. Note that liver can usually metabolize lactate at rate of 100 mmol/hour

	Haemosol	HF ₄
Na ⁺	140	135
Cl ⁻	109.5	109.5
Ca ⁺⁺	1.75	1.87
Mg ⁺⁺	0.5	0.75
Lactate	3	33.75
HCO ₃ ⁻	32	-
K ⁺	-	3

Aim for ultrafiltration rate of 35 ml/kg/hour. Usual rate between 1-2 L/h

Fluid balance: depends on patient clinical state

- Blood flow start at 100mls/min and increase to 180mls/min over 60 minutes if haemodynamically stable

- Dialysate flow rate (in CVVHDF). Prisma machines can handle dialysate rate of 0 - 2500mls/hour
- 1.5% PD fluid (low Ca or standard Ca), commercial replacement fluid eg Hemosol, HF₄
- Maintain MAP >70mmHg with fluids and vasopressors
- Check line site
- perform daily bloods – RFT, Ca, PO₄, Mg
- watch out for hypothermia
- review drug dose