

HOME HAEMODIALYSIS PROTOCOL

Nocturnal Haemodialysis

Any patient who has been successfully trained to perform conventional haemodialysis at home may be considered for nocturnal haemodialysis. Patients who may derive particular benefit include those with:

- Poorly controlled phosphate and hyperparathyroidism
- Inadequate clearances (Such as may be seen in larger patients)
- Difficult fluid balance
- Working and other active patients
- Those who are not suitable for renal transplantation or those whose cardiac function (and subsequent transplantability) may be improved by more adequate dialysis

Patients already performing haemodialysis at home are trained in nocturnal haemodialysis techniques by the home visiting nurse. It is an SDC requirement that patients be competent at performing dialysis at home during the daytime before commencing nocturnal haemodialysis. Usually a period of 1 month of performing daytime HHD would be required to demonstrate competence.

Nocturnal dialysis prescription:

- 7-10 hours during sleep / 3-4 times per week
- Polysulfone High flux Dialyser 1.3-2.4m² surface area
- Blood flow rate 200-250ml/min
- Dialysate flow rate 500ml/min in patients who are dialysing 3 x per week. 300ml/min in patients who are dialysing >3 x per week and in some small patients.
- Heparin dosing. With the slower blood flow rate and longer therapy duration, most patients require an increased heparin dose on nocturnal dialysis. Unfractionated Sodium Heparin (Clexane or Fragmin) bolus dose needs to be increased on average by 1000-1500U. The hourly infusion rate of heparin does not usually need to be significantly increased.
- Dialysate. Electrolyte concentration is individualized to each patient's needs. Below is the most commonly prescribed dialysate for patients dialysing 3.5-4 times per week.
 - Calcium-1.5mmol (No change from 1.5 mmol on conventional prescription),

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- Potassium-2.0mmol (Increased from 1 mmol on conventional prescription)
- Bicarbonate 32 mmol (Decreased from 35 mmol on conventional prescription)
- Sodium 140mmol (No change from conventional prescription)
- Glucose 5 mmol (No change from conventional prescription)
- Magnesium 0.5 mmol (No change from conventional prescription)
- Phosphate Fleet added if post dialysis phosphate <0.8mmol/L (Not required on conventional prescription)

Medication:

- Requirements for phosphate binders will decrease after commencing nocturnal haemodialysis. Serum phosphate levels should be monitored 2nd weekly until stable and dosage of binders titrated to maintain pre dialysis phosphate levels in the normal range.
- Requirements for Vitamin D supplements may decrease after commencing nocturnal haemodialysis. Serum Calcium levels should be monitored 2nd weekly until stable and dosage of Vitamin D titrated to maintain pre-dialysis calcium levels in the normal range. Patients may continue to require Vitamin D supplements to maintain normal serum calcium levels or to control severe hyperparathyroidism.
- All patients should be taking Vitamin B complex one tablet daily and Folic acid 5mg daily orally.
- The requirements for erythropoietin stimulating agents (ESAs) may fall following commencement of nocturnal haemodialysis. Haemoglobin should be closely observed and doses adjusted according to individual patients.
- Requirements for antihypertensive agents may decrease in some patients after commencing nocturnal haemodialysis.

Diet:

As few dietary restrictions as possible should be applied to maintain the blood and fluid balance parameters within the target ranges.

- Generally no phosphate restriction is required.
- Potassium restriction is not required in most patients and is more lenient in almost all patients.
- Low salt, low sugar, low fat, high protein (1.2-1.4g/kg dry weight/day)
- Fluid restriction to maintain inter-dialytic weight gains under 3 kg and preferably under 2 kg.

Medical Review:

It is recommended that patients are reviewed by a nephrologist or medical registrar on a monthly basis for the first 2-3 months and thereafter as determined by the nephrologist.

Considerations:

- Patients may require a higher dialysate calcium concentration and many may have increased potassium requirements and requirement for the addition of phosphate fleet to the dialysate when on nocturnal haemodialysis .
- Adequacy: Urea Reduction Ratio is not an accurate indicator of clearance in these patients and should not be calculated.
 - Serum phosphate is maintained in the normal range
 - Predialysis serum creatinine is < 0.8 mmol/L
 - Postdialysis serum urea is in the low normal or below the normal range
- Parathyroid Hormone (PTH): PTH levels 1.5-3 times upper limit of normal range. Parathyroidectomy should not be performed in the 6 months prior to or 12 months after commencing nocturnal haemodialysis as PTH levels often fall dramatically in the 12 months after commencing nocturnal haemodialysis.

Machine Maintenance and water quality:

The frequency of machine and water quality maintenance review is dependent on the quality of the source water, the amount of water requiring treatment and the duration and frequency of dialysis. Contact SDC regarding their Machine and Water Protocol.

References:

Sydney Dialysis Centre Nocturnal Dialysis Protocol