NHS
Greater Glasgow and Clyde

CLINICAL GUIDELINE

eGFRsupport: Renal Support: Patients receiving dialysis

A guideline is intended to assist healthcare professionals in the choice of disease-specific treatments.

Clinical judgement should be exercised on the applicability of any guideline, influenced by individual patient characteristics. Clinicians should be mindful of the potential for harmful polypharmacy and increased susceptibility to adverse drug reactions in patients with multiple morbidities or frailty.

If, after discussion with the patient or carer, there are good reasons for not following a guideline, it is good practice to record these and communicate them to others involved in the care of the patient.

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Important Note:

The Intranet version of this document is the only version that is maintained.
Any printed copies should therefore be viewed as 'Uncontrolled' and as such, may not necessarily contain the latest updates and amendments.

Electronic Guidelines for Renal Support (eGFRsupport): Patients receiving dialysis

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Introduction

There are approximately 600 patients who receive dialysis for end-stage renal disease (ESRD) within the catchment of the Glasgow renal and transplant unit. Most undergo hospital haemodialysis (HD) three times a week at any one of our seven out-patient dialysis units throughout the city and its extended areas, and the remainder dialyse at home, most commonly via peritoneal dialysis (PD). On admission to hospital, all patients receiving dialysis should be immediately highlighted to the renal on-call as an emergency so as to allow uninterrupted dialysis, but where possible patients should be treated by the primary clinical team (e.g. on a vascular ward if the problem is vascular) and dialysis facilitated through the renal unit.

Assessment / Monitoring

Haemodialysis

- Inpatient dialysis may take time to organise - early renal involvement is paramount. Transfer of care to the renal unit is not always in the best interest of the patient (e.g. broken limb). All cases must be discussed.
- Clinical history:
    - Ask about timing of last dialysis session, symptoms of fluid overload and if they still pass urine i.e. do they have residual renal function?
    - Breathlessness in a dialysis patient is pulmonary oedema until proven otherwise.

- Clinical examination:
  - Review patient observations
  - Examine for evidence of fluid overload ; peripheral oedema/JVP and pulmonary oedema
  - In suspected sepsis examine dialysis access: line sepsis may have erythema or pus at the exit site, or be tender over the tunnelled portion. Fistulae infection is uncommon, presenting as thrombophlebitis/cellulitis.
- Investigations:
  - Be wary of AV access; do not perform venepuncture or take BP measurements from that limb.
  - Obtain bloods early in all admissions, an ECG is essential if potassium >5.5mmol/L
  - Peripheral blood cultures must be obtained in suspected sepsis. We do not advise accessing patient dialysis lines for purposes of blood sampling or cultures unless appropriately trained.
  - Do not catheterise dialysis patients for the purposes of monitoring urine output – the rate of urine production is meaningless and many are anuric

Peritoneal dialysis

- Peritoneal dialysis is a home-based treatment carried out by the patient or their nominated carer/partner. We do not provide an outreach service and thus patients unable to continue PD independently may require early transfer.
- Clinical history:
  - Ask about timing of last dialysis session, if they still have PD fluid in situ, if their fluid has recently appeared cloudy or clear, symptoms of fluid overload and if they still pass urine i.e. do they have residual renal function?
- Clinical examination:
  - Review patient observations
  - Examine for evidence of fluid overload ; peripheral oedema/JVP and pulmonary oedema
  - Suspect PD peritonitis in those with abdominal pain, cloudy effluent or pyrexia

- Investigations:
  - If indicated, examine the PD catheter exit site for erythema, pus, crusting or pain.
  - Obtain bloods early in all admissions, an ECG is essential if potassium >5.5mmol/L
  - Do not catheterise dialysis patients for the purposes of monitoring urine output – the rate of urine production is meaningless and many are anuric
  - In suspected PD peritonitis ask the patient to drain out the fluid and send for effluent white cell count, gram-stain, microscopy, culture and sensitivity. If no fluid is in situ or the patient is unable to perform a PD exchange DO NOT delay antibiotics.
  - Sub-diaphragmatic air may be a normal finding in those on PD. If in doubt seek a senior opinion.

Management

General principles

- Dialysis patients usually follow a low potassium diet. Ensure this is requested during IP stays
- Dialysis patients are commonly prescribed a phosphate binder (e.g. calcium acetate, lanthanum, sevelamer) which should be given with meals to bind dietary phosphate. Patients do not require taking these whilst fasting.

Fluid and electrolytes

- Many patients on dialysis are anuric and on a fluid restriction. Further, diuretics are ineffective in anuric patients.
- This does not mean they cannot be given boluses of fluid in the context of acute illness or in attempt to return low blood pressure to their normal. We advise 250ml boluses with immediate reassessment. It is unusual to require >2000mL.
- Routine use of maintenance fluids is discouraged, even in fasting patients.
- IV drug administration can provide a large cumulative volume. Discuss each case with a local pharmacist to ensure a safe lowest-possible volume is used

- Potassium levels can be transiently low up to 4 hours following haemodialysis and increase briskly following (‘rebound hyperkalaemia’). Do not replace potassium without discussing with renal.

Blood transfusion

- Blood transfusion may be necessary in those on dialysis. In the short term it is associated with a risk of fluid overload and hyperkalaemia and, longer term, can induce formation of cytotoxic antibodies making renal transplantation more difficult.
- To minimise the risk of hyperkalaemia and fluid overload, blood can be given during a scheduled dialysis session e.g. preoperatively. Ensure blood is available and the renal team are aware to facilitate this.
- Out-with the scenario of life-saving emergences, we advise discussing blood transfusion renal on-call.

Post-op care

- All dialysis patients should have a repeat set of U&Es and FBC immediately following surgery due to the greater risk of anaesthetic induced hyperkalaemia and increased bleeding risk.
- Remember: routine use of maintenance fluids is discouraged, even in fasting patients.

Drug therapy/treatment options

General Advice

- Incorrect or inappropriate prescribing in end-stage renal disease (ESRD) can lead to significant morbidity. Often the advice in the BNF is non-specific. If you do not have access to the online renal drug database email *ann.lees@nes.scot.nhs.uk* to organise access. All newly prescribed drugs should be adjusted where appropriate.
- In more complex cases we recommend discussing drug related issues/interactions with a renal pharmacist
- Important drug considerations are listed in box 1.

Drug	Issues	Advice
Analgesia	Increased risk of opioid toxicity particularly with codeine, morphine or long-acting opioid preparations Increased risk of GI ulceration, bleeding, hyperkalaemia and loss of residual renal function with NSAID use	Dose reduce and extend period between doses Use of alfentanil 50-200mcg subcut hourly for acute pain. Minimise or avoid of NSAID
Antibiotics	Trimethoprim induced hyperkalaemia Increased risk of penicillin neuro-toxicity Persistence of vancomycin/gentamicin with repeated doses Intraperitoneal antibiotic use for PD peritonitis	Avoid trimethoprim (and nitrofurantoin, ineffective at GFR <30ml/min) Dose adjust penicillin Vancomycin and gentamicin are dialysed. Levels should be monitored pre-dialysis and dosed following dialysis Intravenous antibiotics is an appropriate alternative in the absence of PD training
Contrast based imaging	Iodinated (CT) contrast is nephrotoxic. This has the potential to reduce residual renal function. It is essentially harmless in those without residual function Gadolinium-based (MRI) contrast is toxic in those with GFR <30ml/min and capable of cause nephrogenic systemic fibrosis, which can be fatal	If residual function remains, follow guidance given in AKI section. Completely avoid gadolinium administration in ESRD.

Box 1 – Important drug considerations

Other information

Discharging dialysis patients

Contact the renal-on call on discharge to ensure follow-up and ongoing dialysis (including transport) is re-established.