Analgesia in Patients with Impaired Renal Function – Formulary Guidance

Approved by Trust D&TC: January 2010

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1. **Aim**

The aim of this document is to enable health care professionals to assess the impact of renal function on treatment of pain and provide safe and effective analgesia for patients with impaired renal function. This guidance applies to adult patients (over 18 years).

2. **Introduction**

Analgesia is problematic in patients with chronic kidney disease for several reasons. Some drugs may accumulate as they are renally excreted, whilst others may have increased toxic effects in patients with renal disease. Drugs with nephrotoxic effects need to be used with particular caution. There is evidence that pain in patients with chronic kidney disease is undertreated with significant consequences for the patients\(^1\).

3. **Assessment of renal function**

To safely prescribe analgesia in renal failure an assessment needs to be made of the level of renal function. In patients with stable renal function this is best done by calculating the MDRD eGFR – this is an estimate of GFR derived from age, gender, ethnicity and serum creatinine. A calculator is available on the Trust intranet at: [www.dbh.nhs.uk/library/general_documents/egfr%20calculator.pdf](http://www.dbh.nhs.uk/library/general_documents/egfr%20calculator.pdf)

eGFR should be regarded with caution in extremes of size and patients with amputations. It is not validated in pregnancy and is not useful in children (under the age of 18). An eGFR > 60 can be considered as normal for prescribing purposes. eGFR is not helpful in acute renal failure which can be identified by a sudden rise in serum creatinine or oliguria.

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4. **Choice of Analgesics**

Pain severity should be assessed and treated following the World Health Organisation (WHO) pain ladder. Pain severity should be assessed on a scale of 0 to 3 and documented on the physiological observations chart.

**Stage 1 – Mild-moderate pain**
- Paracetamol: No dosage adjustment required. Can be given orally or IV (when the oral route is unavailable)
- Consider adjuvant analgesia (see below)

**Stage 2 – Moderate-severe pain**
- Paracetamol: No dosage adjustment required. Can be given orally or IV (when the oral route is unavailable)
- Weak opioid e.g. codeine phosphate or tramadol. Reduced doses are advisable in patients with eGFR<30, monitor closely for signs of toxicity.
- Consider adjuvant analgesia (see below)

**Stage 3 – Severe pain**
- Paracetamol: No dosage adjustment required. Can be given orally or IV (when the oral route is unavailable)
- Strong opioid
- Consider adjuvant analgesia (see below)

**Short term/initial management:**

Morphine sulphate is appropriate as a first choice in acute pain. Reduce dose in patients with eGFR<30 (e.g. 2.5mg initially and titrate according to response), monitor closely for signs of toxicity. Short acting preparations (e.g. IV or SC morphine, oramorph) should be used. Delayed release formulations (e.g. MST) should be avoided. In haemodialysis patients morphine is significantly cleared with haemodialysis sessions and therefore breakthrough analgesia is often needed towards the end of a dialysis treatment. Alfentanil is not significantly renally excreted and is a good alternative for parenteral analgesia where staff have experience with using this drug.

**Medium to long term use:**

Where a patient is likely to need longer term treatment (>3 days) risk of accumulation is higher with morphine. Transdermal fentanyl or buprenorphine should be considered. The lowest possible dose should be used initially unless the patient is already established on other opioids, in which case dose conversion can be undertaken as usual. Monitor closely for signs of toxicity. Patients with stage 5 CKD who have severe ongoing pain are at high risk of adverse events from analgesia and should usually be managed jointly by a nephrologist and pain specialist.
5. **Use of adjuvant analgesics**

Non steroidal anti-inflammatory drugs (NSAIDs)

NSAIDs are useful for nociceptive pain associated with tissue inflammation (e.g. arthritis). These drugs are usually contraindicated in patients with CKD who are not on dialysis due to the significant risk of causing deterioration in renal function. In patients with stable CKD stage 3 where there is a strong indication (e.g. severe arthritis) then a trial of NSAIDs with close monitoring of renal function may be appropriate. Ibuprofen 200 to 400mg TDS is a reasonable first line drug, with co-prescription of a proton-pump inhibitor where appropriate for gastric protection. NSAIDs may also be used in dialysis patients who are anuric (i.e. have no significant residual kidney function) although there is also an increased risk of gastrointestinal side effects.

Nefopam

Nefopam is an atypical analgesic which can be used as an adjuvant in mild-moderate pain. It is not renally excreted or nephrotoxic so can be used safely in patients with renal impairment. Side effects include gastrointestinal upset and confusion, and it should be avoided in patients with epilepsy. Efficacy is variable and some patients do not get substantial benefit, however it can be a useful adjuvant in some cases.

Gabapentin and Pregabalin

These anticonvulsants are effective in neuropathic pain (e.g. diabetic neuropathy). They are renally excreted and the dose should be adjusted accordingly. Information on dosage adjustment can be obtained from the renal drug handbook or renal pharmacist. Patients with severe renal failure taking gabapentin or pregabalin have a higher incidence of neurological side effects and should be monitored regularly.

Amitriptyline

Tricyclic antidepressants such as amitriptyline are used for relief of neuropathic pain (e.g. diabetic neuropathy). These drugs may be particularly beneficial at night where pain is disturbing the patient’s sleep. Amitriptyline is not renally excreted and can be used at normal doses (10-25mg daily, titrated up to 75mg daily according to response) in patients with renal impairment.

6. **References**