

## DERBYSHIRE JOINT AREA PRESCRIBING COMMITTEE (JAPC)

### Management of Lower UTI in Chronic Kidney Disease (CKD) For males and non-pregnant females, who are not catheterised

Urinary tract infection (UTI) is a common occurrence. The presence of CKD is significant when managing suspected UTI as it can affect selection of appropriate antibiotic treatment and effective infection management is important to prevent further kidney injury. In the case of renal transplant, dialysis or eGFR <10ml/min, seek advice from renal service.

Patients with renal impairment are possibly more likely to have a resistant strain<sup>1</sup> so always send urine for culture when UTI is suspected and be guided by sensitivities in the first instance. However, where immediate treatment is required, the following table gives guidance for empiric management of UTI where CKD co-exists. It may be necessary to contact microbiology to obtain the full range of sensitivities.

<u>eGFR ml /min/ 1.73 / m<sup>2</sup>, description &amp; range<sup>2</sup></u>	<u>1<sup>st</sup> Line<sup>3,7</sup></u>	<u>2<sup>nd</sup> Line<sup>3,7</sup> (or as per sensitivities) Please see comments a, b &amp; c below this table</u>
<b>45 - 59 female Mild – mod.reduction (G3a)</b>	Nitrofurantoin**100mg m/r bd for 3 days	Pivmecillinam**** 400mg stat then 200mg tds for 3 days OR Fosfomycin***** 3g stat OR Trimethoprim* 200mg bd for 3 days
<b>30 - 44 female Mod. - severe reduction (G3b)</b>	Pivmecillinam**** 400mg stat then 200mg tds for 3 days	Fosfomycin***** 3g stat OR Trimethoprim* 200mg bd for 3 days
<b>&lt;30 female Severe reduction to kidney failure (G4-5)</b>	Pivmecillinam**** 400mg stat then 200mg tds for 3 days	Fosfomycin***** 3g stat (C/I in CrCl<10ml/min) OR Ciprofloxacin*** -500mg bd for 3 days <sup>8</sup> (only if other antibiotics considered inappropriate- prescribe with special caution due to risk of tendon injury see cautions)
<b>45 - 59 male Mild – mod.reduction (G3a)</b>	Nitrofurantoin**100mg m/r bd for 7 days	Pivmecillinam**** 400mg stat then 200mg tds for 7 days OR Fosfomycin***** 3g every 2 days for 3 doses OR Trimethoprim* 200mg bd for 7 days
<b>30 - 44 male Mod - severe reduction (G3b)</b>	Pivmecillinam**** 400mg stat then 200mg tds for 7 days	Fosfomycin***** 3g every 3 days for 2 doses OR Ciprofloxacin*** 500mg bd for 7 days <sup>8</sup> (only if other antibiotics considered inappropriate- prescribe with special caution due to risk of tendon injury see cautions)
<b>&lt;30 male Severe reduction to kidney failure (G4-5)</b>	Pivmecillinam**** 400mg stat then 200mg tds for 7 days	Fosfomycin***** 3 G every 3 days for 2 doses (C/I in CrCl<10ml/min) OR Ciprofloxacin*** 500mg bd for 7 days <sup>8</sup> (only if other antibiotics considered inappropriate- prescribe with special caution due to risk of tendon injury see cautions)

- a. Pivmecillinam is a penicillin. Avoid in penicillin allergy. See BNF / SPC for more details on Pivmecillinam.
- b. The different 2<sup>nd</sup> line options have been agreed with local specialists in the absence of national guidelines. As there is increasing resistance to trimethoprim and there are cautions\* with trimethoprim in renal impairment, use sensitivities & clinical judgement to guide treatment.
- c. Amoxicillin: due to high levels of resistance, Amoxicillin is not suitable for empirical treatment of UTIs; however, it is a good option for both upper and lower UTIs once sensitivity has been confirmed.<sup>7</sup>

Send pre-treatment MSU for culture for all patients with renal impairment (as outlined above) but for men also consider prostatitis<sup>9</sup>

## Risk of resistance<sup>1</sup>

Low Risk: Younger women with acute UTI with no other risk factors for resistance

Risk factors for increased resistance include:

- (a) >65yrs age              (b) Care home resident              (c) Recurrent UTI
- (d) Hospitalisation for >7 days in last 6 months              (e) Unresolving urinary symptoms
- (f) Recent travel to a country with ↑ antimicrobial resistance              (g) Previous UTI resistant

If risk of resistance; send urine for culture and susceptibilities, provide safety netting advice (patient information leaflets are available on the Royal College of General Practitioners TARGET Antibiotic Toolkit [website](#)).

## Cautions

\*Due to the risk of hyperkalaemia, **trimethoprim** should be avoided:

- With co-prescription of **spironolactone<sup>4</sup>**
- With co-prescription of **ACEI or ARB**

However, it is unlikely that 3 days of trimethoprim for uncomplicated UTI in females with CKD 3a will cause any significant problems, even with spironolactone or ACE / ARB, so this can be considered as a treatment option.

Trimethoprim should also be considered only if there are culture and sensitivities available – due to the high risk of resistance

\*\***Nitrofurantoin** is C/I in patients with an estimated glomerular filtration rate (eGFR) of less than 45 ml/min/1.73m<sup>2</sup>. Consider checking renal function when choosing to treat with nitrofurantoin, especially in the elderly. Closely monitor for signs of pulmonary, hepatic, neurological, haematological, and gastrointestinal side effects during treatment, as previously advised in the SPC<sup>5</sup>.

**Note.** Prescribing of nitrofurantoin for certain patients (with an eGFR of 30 to 44 ml/min/1.73m<sup>2</sup>) is only allowed ‘after microbiologist consultation’. A short course (3 - 7 days) may be used with caution in certain patients. See [MHRA & Nitrofurantoin](#)

\*\*\***Ciprofloxacin** is not usually an appropriate empiric choice for UTI due to the significantly increased risk of *Clostridium difficile* infection in renal impairment. However, due to the limited options available when managing UTI in patients with CKD 4 and 5 (also 3b in men) it may be used with caution. If Pseudomonas is isolated, dose should be increased to 750mg BD, however, this is indicated only for patients where eGFR >30ml/min. Patients with eGFR 10-30mls/min should be capped at 500mg BD (**as advised by local specialist**). Relevant situations in which Ciprofloxacin may be considered appropriate are resistance or contraindication to the other 1st line antibiotics, significant side effects to or failure of 1<sup>st</sup> line antibiotics or failed 1st line antibiotics treatment.

\*\*\*\***Pivmecillinam** for 7 days is ‘off label’ for UTI (and for use in men). A 14 day regime is licensed for some forms of salmonellosis so there is some experience in the use of longer regimes. It should only be used in lower uncomplicated UTI with no signs of systemic illness. If E Coli ESBL is isolated, only use if no other oral options are available and use the higher dose of 400mg tds<sup>7</sup>. Pivmecillinam is unlikely to work in people with little residual kidney function as works by renal excretion into the bladder – for patients on dialysis d/w renal consultant before using.

\*\*\*\*\***Fosfomycin** should not be used if eGFR is <10ml/min or patient on dialysis. Although included here, it is unlicensed for UTI in men.

## References

1. Public Health England (PHE) *Urinary tract infection: diagnosis guide for primary care*: accessed online at <https://www.gov.uk/government/publications/urinary-tract-infection-diagnosis>
2. NICE. *Chronic Kidney disease: assessment and management*, NICE clinical guideline NG203 (August 2021) – last updated November 2021. Available at: <https://www.nice.org.uk/guidance/ng203> January 2022
3. NICE/ PHE (January 2022) *Summary of antimicrobial prescribing guidance – managing common infections* This guideline can be found at the weblink [here](#).
4. Antoniou et al. Trimethoprim-sulfamethoxazole induced hyperkalaemia in elderly patients receiving spironolactone: nested case-control study. *BMJ* 2011;343: d5228
5. MHRA Drug Safety Update (September 2014). *Nitrofurantoin is now C/I in most patients with eGFR of less than 45 ml/min/1.73m<sup>2</sup>*. Available at : [MHRA](#) & [Nitrofurantoin summary of product characteristics](#)
6. British National Formulary (BNF) – available at <https://www.medicinescomplete.com/mc/bnf/current/>
7. University hospitals Derby and Burton (December 2020) *Urinary tract infection – Antibiotic guidance*. Available at : <https://derby.koha-ptfs.co.uk/cgi-bin/koha/opac-retrieve-file.pl?id=f7c9261944fb0ee7ab62c9b42c3b41bf>

8. Renal Drug Database (May 2021) *Ciprofloxacin drug monograph* available at :  
<https://renaldrugdatabase.com/monographs/ciprofloxacin>
9. NHS Tayside (January 2021). *Management of Lower UTI in Chronic Kidney disease* Available at:  
<https://www.nhstaysideadtc.scot.nhs.uk/Antibiotic%20site/pdf%20docs/UTI%20in%20CKD%20Dec%202013%20final.pdf>

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