

Reducing Gram Negative Bloodstream Infections (GNBSIs)

Background

- Healthcare-associated Gram-negative bacteraemias (bloodstream infections) pose a significant health risk and threat to patient safety. They include infections caused by *Escherichia coli* (E.coli), and *Pseudomonas aeruginosa*.
- The most commonly reported probable source of *E. coli* bacteraemia in England is urinary tract infection (UTI), with approximately 48% of *E. coli* bacteraemia suspected of originating from a UTI.
- *E. coli* are very common bacteria that normally live harmlessly in the gut. Extended spectrum betalactamase (ESBL)-producing *E. coli* producing strains are bacteria that produce an enzyme called an extended spectrum betalactamase, which makes them more resistant to antibiotics and makes the infections harder to treat.
- *E. coli* are one of the most common bacteria causing infections in humans, particularly urinary tract infections (UTIs). These infections can sometimes progress to cause more serious infections such as blood poisoning which can be life threatening. ESBL-producing strains are more difficult to treat because of their antibiotic resistance, also the number of ESBL-producing *E. coli* infections is increasing.
- Most ESBL-producing *E. coli* are resistant to cephalosporins, penicillins, fluoroquinolones, trimethoprim, tetracycline and some other antibiotics, leaving very limited options for oral treatment in the community, usually only nitrofurantoin and fosfomycin*.

* [Oral fosfomycin](#) (3g sachets) is an option for patients with urinary tract infection, to be prescribed on the recommendation of a consultant microbiologist for an individual named patient, when all licensed options have been considered and are not clinically appropriate for the patient

Overview

- New indicators to monitor trimethoprim vs. nitrofurantoin will be available January 2017 through ePACT.
- Public Health England provides an antibiotic dashboard '[AMR Finger tips](#)'. AMR Fingertips which is available to the general public. A number of indicators around antibiotic prescribing are available including the proportion of trimethoprim class prescribed antibiotic items as a ratio of trimethoprim to nitrofurantoin at practice level (**Figure 1**).

Compared with benchmark Better Similar Worse Lower Similar Higher Low High Not compared



- Greater than 96% of isolates from GP practices and acute trusts were tested for susceptibility to trimethoprim and nitrofurantoin, while 83% of isolates from other community sources were also tested against these antibiotics. It is reassuring to note that 97% of isolates from all three settings were susceptible to nitrofurantoin. By contrast, resistance to trimethoprim was seen in over a third (35–37%) of isolates, in all three settings. ([ESPAUR 2015](#))
- Nitrofurantoin is generally well tolerated ([CKS](#))

Action

- Nitrofurantoin **first line**. Trimethoprim and pivmecillinam are alternative agents
- Nitrofurantoin contraindicated if eGFR less than 45 mL/min or G6PD deficiency. A short course (3-7 days) may be used with caution if eGFR 30-44 mL/min and multi-resistant isolate with no alternative. **Note Nitrofurantoin suspension expensive use capsules where possible.**
- If increased resistance risk send culture for susceptibility & give safety net advice
- If increased resistance risk and GFR<45mL/min consider pivmecillinam **400mg** tds **Note stated dose of pivmecillinam is higher than BNF. This is a PHE recommendation**
- If increased resistance risk and elderly consider pivmecillinam

Bibliography:

[Extended-spectrum beta-lactamases \(ESBLs\): FAQs](#) Accessed 23/11/16

[Doncaster Antibiotic Guidelines](#) Nov 2015

[Doncaster MMT Process for the prescribing and dispensing of Fosfomycin 3g](#) Accessed 23/11/16

(PHE) AMR local indicators - Public Health Profiles Accessed 23/11/16

MHRA Drug Safety Update 5 September 2014 [Nitrofurantoin now contraindicated in most patients with an estimated glomerular filtration rate \(eGFR\) of less than 45 ml/min/1.73m²](#)

<https://www.gov.uk/drug-safety-update/nitrofurantoin-now-contraindicated-in-most-patients-with-an-estimated-glomerular-filtration-rate-egfr-of-less-than-45-ml-min-1-73m2>

The Quality Premium Guidance 2016/17 <https://www.england.nhs.uk/wp-content/uploads/2015/12/ann-b-quality-prem.pdf>

[English surveillance programme for antimicrobial utilisation and resistance \(ESPAUR\) 2010 to 2014](#)

[CKS urinary-tract-infection-lower-women](#) Accessed 23/11/16