Canterbury District Health Board
Te Poari Hauora ō Waitaha

Antimicrobial Stewardship Bulletin

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Ciprofloxacin – limit use to preserve effectiveness

PHARMAC - Hospital Medicines List (HML)

Ciprofloxacin is a valuable broad-spectrum antimicrobial to which bacteria are becoming increasingly resistant. To preserve its effectiveness, the use of ciprofloxacin is now restricted by the HML and it may only be given to hospitalised patients if it is prescribed:

(a) by an Infectious Diseases (ID) physician or Clinical Microbiologist *OR*
(b) after consultation (patient-specific) with an ID physician or Clinical Microbiologist. The name of the specialist consulted must be documented in the clinical notes *OR*
(c) in accordance with a guideline endorsed by CDHB* – Antimicrobial Guidelines, Pink Book, 2014 *OR*
(d) in an emergency provided that there has been an appropriate attempt to meet (a) or (b) above and if ongoing treatment is required (a) or (b) are subsequently met

CDHB guidelines that include ciprofloxacin* – Pink Book (18th ed) 2014

- **Diarrhoea (infection associated)** – empiric treatment only if the patient is immunocompromised or is very unwell (change to roxithromycin if campylobacter is confirmed as resistance to ciprofloxacin is increasing).
- **Epiglottitis (acute)** – in patients with severe penicillin allergy (give with clindamycin).
- **Gonorrhoea** – only if known to be sensitive to ciprofloxacin (give with azithromycin).
- **Meningitis** – empiric treatment in patients with severe penicillin allergy (give with vancomycin); also used for clearance of nasopharyngeal *N. meningitidis* from patients and contacts.
- **Pyelonephritis (acute) or complicated UTI** – after a single dose of gentamicin (empiric treatment) if resistant to trimethoprim (urine sensitivities to guide treatment are usually available within 24 hours)
- **Sinusitis (chronic)** – only when due to *P. aeruginosa.*

****For all other indications, approval should be sought from an ID physician or a Clinical Microbiologist****

Resistance

Ciprofloxacin is a bactericidal fluoroquinolone with a broad spectrum of action, favourable tissue penetration and good oral availability. It is active against many Gram-negative organisms (including *P. aeruginosa* and *E. coli)* and has limited activity against Gram-positive pathogens (eg. *S. aureus*). It is not useful against *S. pyogenes, S. pneumoniae* and anaerobes.

Extensive use of fluoroquinolones worldwide has lead to an increase in the proportion of resistant strains of many bacterial species including *E. coli, S. aureus* and *P. aeruginosa.* Use of fluoroquinolones also facilitates the emergence of multi-drug resistant organisms such as methicillin resistant *S. aureus*, and increases the occurrence of *C. difficile* infections. These issues can be minimised by using:

a) **alternative narrow spectrum agents** as appropriate
b) **shorter courses** – long courses promote resistance
c) **doses sufficient to treat the infection** – sub-therapeutic concentrations encourage resistance

Clinical notes

Dose adjust in renal impairment – Pink Book p164

Ciprofloxacin is 50% excreted unchanged renally (fu=0.5). Consider dose reduction in renal impairment.

Prescribe ciprofloxacin orally where possible

- ciprofloxacin has good oral availability (F=0.7).
- iv therapy is only available for patients who are very unwell and for those who may not absorb drugs orally.
- switch early to oral (400 mg iv bd ≈ 500 mg po bd).
- refer to the ID dept if > 48 hours of iv therapy is required.

Adverse effects

- *CNS effects* include insomnia, dizziness and seizures.
- *Peripheral neuropathy* occurs rarely and may last for months to years and is sometimes permanent.
- *Tendonitis/tendon rupture* are more common in patients who are > 60 yrs, female or on glucocorticoids.
- *QT prolongation/Torsades de Pointes* are more likely in patients with risk factors (Pink Book, p174).
- *Crystalluria* – ensure adequate hydration.

Drug interactions

- *Cations* eg. iron, calcium and antacids decrease ciprofloxacin absorption and compromise treatment. Give ciprofloxacin > 2 h before or 4 h after these.
- *Cytochrome P450 1A2:* ciprofloxacin inhibits this enzyme and may increase the concentrations of substrates like caffeine, clozapine and theophylline (Pink Book, p191).
- *QT prolongation/Torsades de Pointes* are more likely when ciprofloxacin is used with other drugs that also prolong the QT interval (Pink Book p174).
- *Warfarin:* ciprofloxacin may increase the INR in some patients on warfarin. Closer INR monitoring is required.
- *Phenytoin* concentrations may change (usually decrease) with ciprofloxacin. Ciprofloxacin also causes seizures rarely and is best avoided in patients with epilepsy.
- *Methotrexate:* ciprofloxacin may increase methotrexate concentrations through competition for renal secretion. Avoid the combination where possible.

Key points

❖ Only use ciprofloxacin within guidelines or with ID/Clinical Microbiology support.
❖ Prescribe ciprofloxacin orally where able.
❖ Watch for toxicities and interactions.

**There may be other departmental guidelines that include ciprofloxacin. These can be applied only if they have been developed with the ID department.*