Norfloxacin
A Review of Its Antibacterial Activity, Pharmacokinetic
Properties and Therapeutic Use

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Summary:

Norfloxacin\(^1\) is one of the new 4-quinolone antibacterial agents. A fluorinated
piperazinyl-substituted congener of nalidixic acid, it demonstrates a much wider in vitro
antibacterial spectrum and greater potency than the parent compound. Its antibacterial
activity against most Gram-negative pathogens is enhanced in comparison to nalidixic
acid, but is similar to that of some of the other new 4-quinolones like enoxacin, and slightly
less than that of ciprofloxacin. Unlike nalidixic acid, norfloxacin is also active against
Pseudomonas aeruginosa and some Gram-positive organisms.

In acute or uncomplicated urinary tract infections, norfloxacin has repeatedly been
shown to be as effective as co-trimoxazole. Single studies have demonstrated a significantly
clearer cure rate with norfloxacin than with pipemidic acid, and similar
cure rates with norfloxacin and both a nalidixic acid/sodium citrate mixture and amoxycillin.
Similar results were found in a few studies comparing norfloxacin to pipemidic acid or amoxycillin in patients with chronic and/or complicated urinary tract infections.

Norfloxacin is as effective as spectinomycin in gonorrhoea due to penicillin-resistant
N. gonorrhoeae, and cures bacterial gastroenteritis caused by several gastrointestinal patho-
gen.

Norfloxacin appears to be well tolerated and may have a low propensity to select for
bacterial resistance during clinical use, although the latter needs further confirmation.

Antibacterial Activity: Norfloxacin is structurally related to nalidixic acid, but it has
a broader in vitro antibacterial spectrum and is generally more active. Most Gram-neg-
ative pathogens including Escherichia coli and Klebsiella, Enterobacter, Proteus and Cit-
trobacter species are susceptible to norfloxacin, and are inhibited by concentrations of 2
mg/L or less, with the exception of some strains of Acinetobacter, Providencia and Serrata
species which are slightly less sensitive [minimum inhibitory concentration for 90% of
tested strains (MIC\(_{90}\)): < 1 to 32 mg/L]. 90% of Pseudomonas aeruginosa isolates are
inhibited by norfloxacin 1 to 2 mg/L. Although several times more active than nalidixic
acid and some other quinolone antibacterial agents such as cinoxacin and oxolinic acid
against these pathogens, norfloxacin is usually of similar potency to enoxacin and gen-

1 'Barazan', 'Floxacain', 'Zoroxin' (Merck Sharp and Dohme); 'Baccidal Kyorin' (Kyorin); 'Bac-
cidal Torii' (Torii Yakuhin); 'Sebercim' (ISF); 'Fulgram' (ABC).