

# chapter 35

## Aminoglycosides and Fluoroquinolones

### Objectives

AFTER STUDYING THIS CHAPTER, THE STUDENT WILL BE ABLE TO:

1. Describe characteristics of aminoglycosides in relation to effectiveness, safety, spectrum of antimicrobial activity, indications for use, administration, and observation of client responses.
2. Discuss factors influencing selection and dosage of aminoglycosides.
3. State the rationale for the increasing use of single daily doses.
4. Discuss the importance of serum drug levels during aminoglycoside therapy.
5. Describe measures to decrease nephrotoxicity and ototoxicity with aminoglycosides.
6. Describe characteristics, uses, adverse effects, and nursing process implications of fluoroquinolones.
7. Discuss principles of using aminoglycosides in renal impairment and critical illness.

### Critical Thinking Scenario

George Masury, accompanied by his wife Jennie, visits his primary care provider complaining of upper respiratory symptoms. George and Jennie have been married for 52 years and Jennie has always cared for George when he was sick and helped make decisions for him. George is hard of hearing, has some “forgetfulness,” and does not talk very much. His physician prescribes ciprofloxacin (Cipro) 250 mg bid for 10 days.

### Reflect on:

- ▶ How you will include George and Jennie in the teaching session.
- ▶ Essential information to teach about Cipro.
- ▶ Teaching strategies to individualize for hearing deficits and memory deficits.
- ▶ How you will evaluate George and Jennie’s learning and their ability to comply with the newly prescribed medication.

### OVERVIEW

The aminoglycosides have been widely used to treat serious gram-negative infections for many years. The quinolones are also older drugs originally used only for treatment of urinary tract infections (see Chap. 36). The fluoroquinolones are synthesized by adding a fluorine molecule to the quinolone structure. This addition increases drug activity against gram-negative microorganisms, broadens the antimicrobial spectrum to include several other microorganisms, and allows use of the drugs in treating systemic infections. General characteristics, mechanisms of action, indications for and contraindications to use, nursing process implications, and principles of therapy for these drugs are described in this chapter. Individ-

ual drugs, with routes of administration and dosage ranges, are listed in the Drugs at a Glance tables.

### AMINOGLYCOSIDES

Aminoglycosides are bactericidal agents with similar pharmacologic, antimicrobial, and toxicologic characteristics. They are used to treat infections caused by gram-negative microorganisms such as *Pseudomonas* and *Proteus* species, *Escherichia coli*, and *Klebsiella*, *Enterobacter*, and *Serratia* species.

These drugs are poorly absorbed from the gastrointestinal (GI) tract. Thus, when given orally, they exert local effects in the GI tract. They are well absorbed from intramuscular injection sites and reach peak effects in 30 to 90 minutes if circula-