LEARNING OBJECTIVES

On completion of the chapter, the reader will be able to:

1. Define the following terms: clinical pharmacokinetics, pharmacodynamics, clearance, volume of distribution, half-life, bioavailability, linear pharmacokinetics, and nonlinear pharmacokinetics.

2. Calculate a maintenance dose, loading dose, and dosage interval for a patient given values of clearance, volume of distribution, and half-life.

3. Compare the attributes of linear pharmacokinetics and nonlinear pharmacokinetics.

4. List patient characteristics needed to decide on the best drug dose for an individual.

5. Discuss the various drug metabolism enzymes and drug transport proteins and their importance in drug bioavailability and elimination.

6. Calculate the estimated creatinine clearance and Child-Pugh score for a patient.

7. Recommend when drug doses should be modified for patients with renal or hepatic dysfunction.

8. Calculate a modified drug dosage regimen for an agent that follows linear pharmacokinetics given a steady-state drug concentration and current drug dose.

9. Identify when a patient would benefit from the determination of pharmacokinetic constants for the use of dosage adjustment using drug-specific techniques or Bayesian computer dosing programs.

10. Calculate an initial dose for a patient for the following medications: aminoglycoside antibiotics, vancomycin, digoxin, theophylline, phenytoin, and cyclosporine.