Four easy ways to register:
Phone: +1-706-542-3537 or 800-811-6640 (toll free in the USA)
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ONLINE CE COURSE FROM THE UNIVERSITY OF GEORGIA

Learning Objectives

Lesson 1 — Introduction to Pharmacokinetics
Upon completion of this lesson, you should be able to:
• Describe the concept of tolerance.
• Describe the process of therapeutic drug monitoring.
• Calculate a patient’s volume of distribution for a drug from the dose administered and the plasma concentration achieved from that dose.
• Define elimination rate.

Lesson 2 — Basic Pharmacokinetics
Upon completion of this lesson, you should be able to:
• Describe the concept of volume of distribution of a drug.
• Describe the concept of clearance.
• Identify common antimicrobial agents that follow first order elimination.

Lesson 3 — Half-Life, Elimination Rate Constant and AUC
Upon completion of this lesson, you should be able to:
• Recognize the components of the natural log of plasma concentration versus time curve.
• Identify the general equation for calculating drug’s half-life.
• Identify the basic equation for calculating clearance.

Lesson 4 — Intravenous Bolus Administration, Multiple Drug Administration and stead-State Average Concentrations
Upon completion of this lesson, you should be able to:
• Identify the equation that determines the non-steady state accumulation factor.
• State the time period which must elapse before steady state serum concentrations of a drug are achieved.
• Identify the equation for calculating a steady-state serum peak concentration.
• Recognize the relationship between the dosing interval Tau and the elimination rate constant for a drug.
Lesson 5 — Relationships of Pharmacokinetic Parameters and Intravenous Intermittent and Continuous Infusions

Upon completion of this lesson, you should be able to:

• Recognize how changes in a drug’s pharmacokinetic variables alter steady state plasma concentrations.
• Identify the two factors that determine the plasma concentration of a drug administered by continuous intravenous infusion.
• State the purpose for administering a loading dose of a drug.
• Calculate the steady-state plasma concentration of a drug administered by continuous intravenous infusion.
• Calculate the steady-state peak plasma concentration of a drug administered by intermittent intravenous infusion.
• Calculate the steady-state trough plasma concentration of a drug administered by intermittent intravenous infusion.

Lesson 6 — Two-Compartment Models

Upon completion of this lesson, you should be able to:

• Describe situation in which two compartment models ideally describe the pharmacokinetics of drugs.
• Describe the Method of Residuals and its importance.
• Identify the equation for calculating volume of distribution at steady state of a drug following the two compartment model.
• Recognize the number of plasma concentration data points required for calculating parameters of a two compartment model.

Lesson 7 — Biopharmaceutics: Absorption

Upon completion of this lesson, you should be able to:

• Define Biopharmaceutics.
• Identify factors that may affect a drug’s oral bioavailability.
• Define $K_a$.
• Describe the components of the equation for calculating $F$ for oral formulations of a drug.
• Identify the equation for calculating total body clearance of a drug administered as a controlled-release formulation.

Lesson 8 — Drug Distribution and Protein Binding

Upon completion of this lesson, you should be able to:

• Identify the type of body weight that should be used for calculating the volume of distribution of a drug in a given patient.
• Identify the types of plasma proteins responsible for protein binding of most drugs.
• Recognize the effects that renal failure can have on concentrations of plasma binding proteins.
• Recognize the relationship between volume of distribution and a drug’s tissue volume, unbound plasma and tissue fractions and plasma volume.

Lesson 9 — Drug Elimination Processes

Upon completion of this lesson, you should be able to:

• Define extraction ratio and recognize its significance.
• Define “$F$” mathematically.
• What factors determine total body elimination of a drug?
• Recognize the most important routes of excretion of many drugs.
• Identify the equation for calculating renal clearance of a drug.
Lesson 10 — Nonlinear Processes
Upon completion of this lesson, you should be able to:
• Describe the concept of non-linear pharmacokinetics.
• List examples of drugs that follow non-linear pharmacokinetics.
• Define $V_{\text{max}}$.
• Identify the components of the Michaelis-Menten equation.
• Define $K_m$.
• Calculate the $t_{90\%}$ in a given patient situation.
• Calculate $V_{\text{max}}$ in a given patient situation.

Lesson 11 — Pharmacokinetic Variation and Model Independent Relationships
Upon completion of this lesson, you should be able to:
• Identify age related changes that may affect drug distribution and use.
• State the goals of pharmacogenetics/pharmacogenomics.
• Identify factors which must be considered when utilizing measured serum drug concentration data for drug dosing determinations.
• Define Mean Residence Time.
• Define Formation Clearance.
• Describe the relationship between steady-state volume of distribution and Mean Residence Time.

APPLICATION-BASED Concepts in Clinical Pharmacokinetics Web-Based Continuing Education Course
Prerequisite: There are no formal prerequisites. It is recommended that you have previous training or experience in pharmacy and that you are comfortable working with mathematics at a pre-calculus level. Technical Requirements: PC or MAC; your web browser will need Adobe® Flash Player in order to view and make use of all of the media presented in this course.
Contact Hours:* 20
ACPE Number: 0014-9999-17-039-H01-P
Activity Type: Application-Based
Release Date: September 1, 2017
Expiration Date: August 31, 2020

The University of Georgia College of Pharmacy is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.

For more information about the Concepts in Clinical Pharmacokinetics contact questions@georgiacenter.uga.edu or dial +1-706-542-3537.

*Continuing pharmacy education credits are available only to licensed pharmacists; all others (i.e., non-pharmacists) will earn University of Georgia Continuing Education Units (CEUs).