CE Activity Announcement

Pharmacokinetics Certificate

ACPE Activity Number(s): 0204-0000-19-794-H04-P thru to 0204-0000-19-800-H04-P
Release Date: November 13, 2019
Expiration Date: November 13, 2022
Activity Type: Application-based
CE Credit Hour(s): 15.0 hours (*no partial credit*)
Activity Fee: $445.00/$545.00 member/non-member

Accreditation for Pharmacists

The American Society of Health-System Pharmacists is accredited by the Accreditation Council for Pharmacy Education as a provider of continuing pharmacy education.

Target Audience

This continuing pharmacy education activity is intended for pharmacists seeking to expand their knowledge and skills in the clinical application of pharmacokinetics and subsequent management of patients' medication therapy.

Activity Overview

These modules are designed for participants to increase their knowledge and skills necessary to use pharmacokinetics concepts to improve medication use in a variety of patient care settings. The curriculum addresses key pharmacokinetic concepts and corresponding applications in drug therapy. Upon completion of all the modules, participants should be proficient in applying pharmacokinetic parameters into the process of monitoring, evaluating and adjusting dosing for patients.

Learning Objectives and Schedule of Activities

CE Information	Title, Description and Learning Objectives
ACPE #: 0204-0000-19-794-H04-P **CE Hours:** 1.5 **Activity Type:** Application-based	**Title:** Pharmacokinetics Principles Primer **Description:** This activity discusses the key pharmacokinetic concepts, calculations, and a primer on drug dosing. **Learning Objectives:** • Restate the definitions of half-life, elimination rate constant, volume of distribution, clearance, and steady state. • Describe first-order, Michaelis-Menten, and zero-order elimination. • Recognize multi-compartment and one-compartment distribution from plots of log concentration vs. time. • Calculate half-life, volume of distribution, and clearance from one or more measured drug concentrations. • Use half-life, volume of distribution, and clearance to predict drug concentrations from administered doses. • Use half-life to estimate time to steady state and how much time must elapse for a concentration to decrease to a new concentration. • Discuss population pharmacokinetic values and dosing strategies for select drugs that take into account patient characteristics. • Identify the appropriate equations that describe how doses are administered. • Use population pharmacokinetic values and appropriate equations to determine dosing regimens to produce desired drug concentrations.

ACPE #: 0204-0000-19-795-H04-P **CE Hours:** 2.5 **Activity Type:** Application-based	**Title:** Therapeutic Drug Monitoring and Renal Dosing Issues **Description:** This activity explains the challenges associated with therapeutic drug monitoring, important considerations in estimating renal function, and approaches to adjusting doses of renally excreted drugs in the face of diminished renal function. **Learning Objectives:** • Recognize issues that reduce the quality of the therapeutic drug monitoring system. • Describe issues that enhance the risk of making inappropriate dosage regimen decisions. • Identify opportunities to improve therapeutic drug monitoring systems. • Use formulas to estimate renal function in adults and children based on serum creatinine and patient characteristics. • Adjust the dose and/or interval of drugs with significant renal elimination based on estimates of diminished renal function.
ACPE #: 0204-0000-19-796-H04-P **CE Hours:** 2.25 **Activity Type:** Application-based	**Title:** Aminoglycoside Pharmacokinetics **Description:** This activity describes the necessary steps to design or adjust aminoglycoside dosing regimens based on calculated and estimated pharmacokinetic parameters. **Learning Objectives:** • Calculate elimination rate constant, half-life, and volume of distribution from measured concentrations. • Recommend dosing regimens based on calculated pharmacokinetic parameters. • Design dosing regimens using elimination rate constant, half-life, volume of distribution, and clearance estimated from population pharmacokinetic data and patient characteristics. • Apply variables to design a large dose, extended interval dosing regimens, including such things as age, creatinine clearance, and the best patient weight to use for dose recommendations.

ACPE #: 0204-0000-19-797-H04-P **CE Hours:** 2.25 **Activity Type:** Application-based	**Title:** Anticonvulsant Pharmacokinetics: Part 1 **Description:** This activity describes the necessary steps to design or adjust phenobarbital or valproic acid dosing regimens based on calculated and estimated pharmacokinetic parameters. **Learning Objectives:** • Calculate phenobarbital pharmacokinetic parameters using population-based dosing strategies and table data or from measured concentration(s). • Use estimated or calculated phenobarbital pharmacokinetic values to predict doses to achieve desired steady state concentrations or concentrations from a dosing schedule being administered. • Calculate valproic acid pharmacokinetic parameters using population-based dosing strategies and table data or from measured concentration(s). • Use estimated or calculated valproic acid pharmacokinetic values to predict doses to achieve desired steady state concentrations or concentrations from a dosing schedule being administered.

ACPE #: 0204-0000-19-798-H04-P **CE Hours:** 2.25 **Activity Type:** Application-based	**Title:** Anticonvulsant Pharmacokinetics: Part 2 **Description:** This activity describes the necessary steps to design or adjust carbamazepine or phenytoin dosing regimens based on calculated and estimated pharmacokinetic parameters. **Learning Objectives:** • Calculate carbamazepine pharmacokinetic parameters using population-based dosing strategies and table data or from measured concentration(s). • Use estimated or calculated carbamazepine pharmacokinetic values to predict doses to achieve desired steady state concentrations or concentrations from a dosing schedule being administered. • Calculate phenytoin pharmacokinetic parameters using population-based dosing strategies and table data or from measured concentration(s). • Use estimated or calculated phenytoin pharmacokinetic values to predict doses to achieve desired steady state concentrations or concentrations from a dosing schedule being administered.

ACPE #: 0204-0000-19-799-H04-P **CE Hours:** 2.25 **Activity Type:** Application-based	**Title:** Digoxin and Lithium Pharmacokinetics **Description:** This activity describes the necessary steps to design or adjust digoxin or lithium dosing regimens based on calculated and estimated pharmacokinetic parameters. **Learning Objectives:** • Calculate digoxin pharmacokinetic parameters using population-based dosing strategies and table data or from measured concentration(s). • Use estimated or calculated digoxin pharmacokinetic values to predict doses to achieve desired steady state concentrations or concentrations from a dosing schedule being administered. • Calculate lithium pharmacokinetic parameters using population-based dosing strategies and table data or from measured concentration(s). • Use estimated or calculated lithium pharmacokinetic values to predict doses to achieve desired steady state concentrations or concentrations from a dosing schedule being administered.

ACPE #: 0204-0000-19-800-H04-P **CE Hours:** 2 **Activity Type:** Application-based	**Title:** Vancomycin Pharmacokinetics **Description:** This activity explains how to design or adjust vancomycin dosing regimens based on calculated and estimated pharmacokinetic parameters including how to estimate or determine vancomycin area under the curve / minimum inhibitory concentration (AUC/MIC). **Learning Objectives:** • Calculate vancomycin pharmacokinetic parameters using population-based dosing strategies and table data or from measured concentration(s). • Use estimated or calculated vancomycin pharmacokinetic values to predict doses to achieve desired steady state concentrations or to predict concentrations from a dosing schedule being administered. • Use estimated or calculated vancomycin pharmacokinetic values to predict doses to achieve desired area under the curve / minimum inhibitory concentration (AUC/MIC) ratios or to predict AUC/MIC from a dosing schedule being administered.

Faculty Information

John E. Murphy, Pharm.D., FASHP, FCCP
Professor Emeritus
The University of Arizona College of Pharmacy
Tucson, Arizona

Disclosures

In accordance with the ACPE's and ACCME's Standards for Commercial Support, all those in a position to control the content of an educational activity is required to disclose to the accredited provider their relevant financial relationships. *An individual has a **relevant financial relationship** if he or she (or spouse/domestic partner) has a financial relationship in any amount occurring in the last 12 months with a commercial interest whose products or services are discussed in the activity content over which the individual has control.* In accordance with these Standards, all potential conflicts of interest have been resolved.

- All planners, presenters, reviewers, and ASHP staff report no financial relationships relevant to this activity.

Methods and CE Requirements

This online activity consists of a combined total of 7 learning modules. Pharmacists are eligible to receive a total of 15.0 hours of continuing education credit by completing all 7 modules within this certificate program.

Participants must participate in the entire activity, complete the evaluation and all required components to claim continuing pharmacy education credit online at ASHP eLearning Portal. Follow the prompts to claim credit and view your statement of credit within 60 days after completing the activity.

Important Note – ACPE 60 Day Deadline:
Per ACPE requirements, CPE credit must be claimed within 60 days of being earned – no exceptions! To verify that you have completed the required steps and to ensure your credits have been reported to CPE Monitor, we encourage you to check your NABP eProfile account to validate your credits were transferred successfully before the ACPE 60-day deadline. After the 60 day deadline, ASHP will no longer be able to award credit for this activity.

System Technical Requirements

System Requirements Courses and learning activities are delivered via your Web browser and Acrobat PDF. Users should have a basic comfort level using a computer and navigating web sites.

View the minimum technical and system requirements for learning activities.