

**\*\* Materials for this course will release 09/22/2021 \*\***

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**Critical Care Pharmacy Specialty Review Course for Recertification, Core Therapeutic Modules + RECERT EXAMS Package (Cert # L219197)**

**Teaser:** This online course will help you earn BCCCP recertification credit. With this course, get comprehensive, practical guidance, with a variety of complex cases, including references for further study.

**Tag:** Certifications; Critical Care

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**ACPE Numbers:** Various – see listing below

**Pre-Sale Date:** 09/01/2021

**Content Release Date:** 09/22/2021

**Expiration Date:** 09/20/2022

**Activity Type:** Application-based

**CE Credits:** 19.25 (BPS and ACPE) contact hours

**Activity Fee:** \$475 (ASHP member); \$675 (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**

These recertification activities are intended for board certified pharmacists seeking to update their knowledge and skills in critical care pharmacy.

**Activity Overview**

This course is intended for BCCCPs in need of recertification credit and is designed based on the content outline developed by the Board of Pharmacy Specialties (BPS) to provide an overview of recent standards and guidelines that specialists should be familiar with in practice. The course uses a case-based approach to discuss patient care issues. In this series, faculty will:

- Review pertinent clinical topics and practice skills
- List valuable resources for further self-study

This online course consists of 14 activities (see tables below) and provides up to 19.25 contact hours of continuing pharmacy education credit and/or recertification credit.

**Recertification Credit\***

Board certified pharmacists are eligible to receive up to 19.25 contact hours of recertification credit for completing this course. To earn recertification credit, learners must review the course content and successfully complete the online assessments by the deadline. Only completed assessments will be eligible for credit; no partial or incomplete assessments will be processed. You are allowed only one attempt to successfully complete this assessment.

This course is not intended for those preparing to take the BPS Critical Care Pharmacy Specialty Examination for Certification. To prepare for the examination, please see courses here: <http://elearning.ashp.org/catalog/Crit-care-review>

These activities are part of the ASHP professional development program for BCCCP recertification approved by the BPS.

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*\* Please note: Review Course for Recertification may only be completed for recertification credit up to two times, in nonconsecutive years, during the 7-year recertification cycle.*

### **REVIEW COURSE:**

The review course for recertification consists of 11 activities (see table below). In each activity, faculty review clinical topics and practice skills using a case-based approach. This package is intended for board certified pharmacists in need of recertification credit; the activities were designed based on the content outline developed by the Board of Pharmacy Specialties (BPS).

Learning Activity	ACPE Number	Contact Hours	*Assessment Pass Point
Complex Case: Complications after Cardiac Surgery - Glucose, Sedation, and Thrombocytopenia	0204-0000-21-987-H01-P	1.50	75%
Complex Case: Acute Coronary Syndrome	0204-0000-21-988-H01-P	1.50	
Complex Case: Antithrombotic-Associated Intracerebral Hemorrhage	0204-0000-21-989-H01-P	1.50	
Complex Case: Sepsis	0204-0000-21-990-H01-P	1.50	
	<b>Group 1 Assessment</b>	<b>6.0</b>	
Complex Case: Hyperglycemic Emergency and Community-Acquired Pneumonia	0204-0000-21-991-H01-P	1.50	76%
Complex Case: Pneumonia	0204-0000-21-992-H01-P	1.50	
Complex Case: Oncologic Emergencies: Febrile Neutropenia, Tumor Lysis Syndrome, and Hypercalcemia of Malignancy	0204-0000-21-993-H01-P	1.50	
Complex Case: GI Bleeding and Acute Renal Failure	0204-0000-21-994-H01-P	1.50	
	<b>Group 2 Assessment</b>	<b>6.0</b>	
Statistics, Evidence-Based Medicine, and Clinical Trial Design	0204-0000-21-985-H04-P	2.00	77%
Practice Administration and Development Part 1	0204-0000-21-995-H04-P	1.00	
Practice Administration and Development Part 2	0204-0000-21-996-H04-P	1.00	
	<b>Group 3 Assessment</b>	<b>4.0</b>	

### **Learning Objectives**

After participating in this CPE activity, learners should be able to:

#### **Complex Case: Complications after Cardiac Surgery - Glucose, Sedation, and Thrombocytopenia**

ACPE #: 0204-0000-21-987-H01-P

- Develop treatment and monitoring plans for a complex post-cardiac surgery patient to include pain, agitation and delirium, glucose management, and heparin-induced thrombocytopenia.
- Evaluate the impact of critical illness on pre-existing conditions (e.g., endocrine disorders, pain).
- Summarize quality assurance and process improvement methods relevant to critical care.
- Assess the relationship between institutional guideline development and evidence-based critical care literature.

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### **Complex Case: Acute Coronary Syndrome**

ACPE #: 0204-0000-21-988-H01-P

- Develop treatment and monitoring plans for a complex critical care patient with acute coronary syndrome.
- Modify treatment and monitoring plans related to alterations of pharmacodynamics and pharmacokinetics in the critically ill.
- Select devices required for treatment and monitoring of a critical care patient.
- Select fluid, electrolyte and acid/base management and monitoring based on patient-specific factors.

### **Complex Case: Antithrombotic-Associated Intracerebral Hemorrhage**

ACPE #: 0204-0000-21-989-H01-P

- Develop treatment and monitoring plans for a complex critical care patient with antithrombotic-associated intracerebral hemorrhage (ICH).
- Select appropriate neurologic monitoring techniques.
- Recommend agents for acute volume resuscitation and hemostasis (e.g., blood products, hemostatic agents).
- Evaluate the impact of critical illness on preexisting conditions (e.g., cardiovascular diseases).
- Recommend fluid and electrolyte management based on patient-specific factors.

### **Complex Case: Sepsis**

ACPE #: 0204-0000-21-990-H01-P

- Develop treatment and monitoring plans for a complex critical care patient with an intra-abdominal infection, sepsis/SIRS, and shock.
- Select appropriate routes of administration for medications in critically ill patients.
- Modify treatment and monitoring plans related to alterations of pharmacodynamics and pharmacokinetics in the critically ill.
- Recommend agents for acute volume resuscitation and hemostasis (e.g., crystalloids, colloids).

### **Complex Case: Hyperglycemic Emergency and Community-Acquired Pneumonia**

ACPE #: 0204-0000-21-991-H01-P

- Develop treatment and monitoring plans for a complex critical care patient with hyperglycemic emergency and community-acquired pneumonia.
- Select appropriate routes and methods of administration for medications in critically ill patients.
- Select fluid, electrolyte and acid/base management and monitoring based on patient-specific factors.
- Choose agents for acute volume resuscitation.
- Identify medication safety issues patients requiring care in the ICU.
- Explain nutrition support in the critically ill patient.

### **Complex Case: Pneumonia**

ACPE #: 0204-0000-21-992-H01-P

- Develop treatment and monitoring plans for a complex critical care patient with multiple conditions, including pneumonia and acute respiratory distress syndrome (ARDS).
- Identify drug interactions and adverse drug events common in critical care and methods to document.

### **Complex Case: Oncologic Emergencies: Febrile Neutropenia, Tumor Lysis Syndrome, and Hypercalcemia of Malignancy**

ACPE #: 0204-0000-21-993-H01-P

- Develop treatment and monitoring plans for a complex critical care patient with febrile neutropenia, tumor lysis syndrome, or hypercalcemia of malignancy.
  - Select fluid, electrolyte and acid/base management and monitoring based on patient-specific factors.
  - Evaluate the impact of critical illness on pre-existing conditions (e.g., cancer).
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### Complex Case: GI Bleeding and Acute Renal Failure

ACPE #: 0204-0000-21-994-H01-P

- Develop treatment and monitoring plans for a complex critical care patient with gastrointestinal bleeding, alcohol withdrawal, refeeding syndrome, hepatorenal syndrome, cirrhosis, and acute renal failure with renal replacement therapy.
- Modify treatment and monitoring plans related to alterations of pharmacodynamics and pharmacokinetics in the critically ill.
- Select appropriate routes of administration for medications in critically ill patients.
- Recommend agents for acute volume resuscitation and hemostasis (e.g., blood products, hemostatic agents).

### Statistics, Evidence-Based Medicine, and Clinical Trial Design

ACPE #: 0204-0000-21-985-H04-P

- Determine quality and appropriateness of a study by examining study design, statistical analysis, sources of bias, quality of conclusions, and interpretation of graphs.
- Determine clinical and statistical significance of a study outcome.
- Determine whether the study applies to a specified patient population.

### Practice Administration and Development Part 1

ACPE #: 0204-0000-21-995-H04-P

- Develop a plan to monitor and evaluate compliance with, and impact of, policies and guidelines (e.g., institutional, evidence based).
- Describe the application and integration of evidence-based critical care literature into institutional guidelines and processes.
- Evaluate regulatory/IRB requirements relative to conducting critical care research.
- Select quality assurance methods and improvement activities, including needs assessment techniques, aimed at enhancing the safety and effectiveness of medication-use processes in the critical care area.

### Practice Administration and Development Part 2

ACPE #: 0204-0000-21-996-H04-P

- Identify metrics for evaluating the quality of critical care pharmacy services (e.g., lengths of ICU stay, mortality, cost-effectiveness, ROI).
- Examine the evidence-based literature that supports the value of critical care pharmacy.
- Summarize the factors that enhance the education and training of critical care pharmacists available in published documents from relevant professional societies (e.g., ASHP, ACCP, SCCM).

### CORE THERAPEUTIC MODULES:

The Core Therapeutic Modules for Recertification Package consists of 3 activities (see table below). In each activity, faculty review clinical topics and practice skills using a case-based approach. This package is intended for board certified pharmacists in need of recertification credit; the activities were designed based on the content outline developed by the Board of Pharmacy Specialties (BPS).

Learning Activity	ACPE Number	Contact Hours	*Assessment Pass Point
Select Topics in Acid-Base Disorders	0204-0000-21-610-H01-P	1.25	76%
Alterations in Pharmacokinetics and Pharmacodynamics in Critical Care	0204-0000-21-611-H01-P	1.00	
Select Topics in Toxicology	0204-0000-21-612-H01-P	1.00	
<b>Total contact hours</b>		<b>3.25</b>	

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### Learning Objectives

After participating in these CPE activities, learners should be able to:

#### Select Topics in Acid-Base Disorders

ACPE #: 0204-0000-21-610-H01-P

For the following specific acid/base disorders - respiratory, metabolic acid base disorders including anion gap/non-anion gap acidosis, renal tubular acidosis, as well as delta gap equation:

- Interpret laboratory and diagnostic tests.
- Recommend the most appropriate treatment and monitoring plans based on patient-specific information and current guidelines

#### Alterations in Pharmacokinetics and Pharmacodynamics in Critical Care

ACPE #: 0204-0000-21-611-H01-P

- Identify pharmacokinetic and pharmacodynamic (PK/PD) changes that occur in critical illness, and the impact on commonly administered medications in this setting.
- Apply knowledge of general PK/PD changes in critical illness to the following patient-specific factors that further complicate drug dosing:
  - Burns
  - Obesity
  - Pregnancy
  - Continuous renal replacement therapy (CRRT)
  - Extracorporeal membrane oxygenation (ECMO)
- Develop a therapeutic strategy to optimize PK/PD for commonly used medications in the intensive care unit.

#### Select Topics in Toxicology

ACPE #: 0204-0000-21-612-H01-P

For the following specific toxicology topics: acetaminophen, toxic alcohols, calcium channel blockers, beta blockers, opioids, and ecstasy:

- Interpret laboratory and diagnostic tests
- Recommend the most appropriate treatment and monitoring plans based on patient-specific information and current guidelines

### **REVIEW COURSE:**

**Faculty** (<https://www.ashp.org/Professional-Development/Board-Certification-Resources/Critical-Care-Pharmacy/Critical-Care-Pharmacy-Review-Course-Faculty>)

Angela Bingham, Pharm.D., BCPS, BCNSP, BCCCP, FASPEN, FCCP\*

Interim Vice Chair and Associate Professor of Clinical Pharmacy, PGY2 Critical Care Pharmacy Residency Program Director, Residency Programs Coordinator

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Brian Dee, Pharm.D., BCCCP, BCNSP, FCCM

Clinical Pharmacy Specialist - Critical Care/Nutrition Support

The University of Texas MD Anderson Cancer Center

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- **Brian Dee:** Spouse employed by Pfizer
- **Patricia Kienle:** Cardinal Health (employee), CriticalPoint LLC (instructor), USP (volunteer, ASHP (author))

All other planners, presenters, reviewers, ASHP and others with an opportunity to control content report no financial relationships relevant to this activity.

### Methods and CE Requirements

Activities can be completed in any order. Each activity consists of audio, video, and/or PDFs and evaluations. Learners must review all content and complete the evaluations to receive continuing pharmacy education credit for each activity.

Follow the prompts to claim, view, or print the statement of credit within 60 days after completing the activity.

### System Technical Requirements

Learning activities are delivered via your Web browser and Acrobat PDF. For all activities you should have a basic comfort level using a computer and navigating web sites.

View the [minimum technical and system requirements](#) for learning activities.

### Development

These activities were developed by ASHP.