

PGY2 CRITICAL CARE PHARMACY RESIDENCY MEDICAL UNIVERSITY OF SOUTH CAROLINA

Purpose of the PGY2 Critical Care Pharmacy Residency at MUSC

The MUSC Medical Center is a 775-bed tertiary care academic medical center providing care for patients of Charleston and throughout the state of South Carolina. MUSC is the #1 ranked hospital in South Carolina and nationally ranked in 10 specialties. In addition to general medical and surgical services, MUSC offers a variety of specialty services including emergency medicine/toxicology, cardiology/cardiothoracic, neurology/neurosurgery (comprehensive stroke center), transplant (kidney, pancreas, liver, heart, lung), trauma (level 1), psychiatry, and numerous pediatric services. The medical center is comprised of four hospitals- University Hospital, Ashley River Tower, Children's Hospital, and the Institute of Psychiatry. Outpatient facilities include the Hollings Cancer, Ashley River Tower Clinics, Rutledge Tower Clinics, Family Medicine Center and affiliated faculty practice ambulatory care centers. The Department of Pharmacy Services provides service to patients on a 24-hour basis through multiple inpatient and ambulatory pharmacies to fulfill the department's mission, vision, and goals of providing optimal pharmaceutical care to all patients.

The PGY2 Critical Care Pharmacy residency program at MUSC is a one-year post-graduate training program designed to prepare critical care specialists. Residents who complete the program are qualified to accept a position and practice in a variety of critical care environments including, but not limited to: medical, surgical-trauma, neurosurgical, cardiothoracic, emergency medicine, and transplant. As part of the extensive training residents will receive, they will be able to identify, prevent, and resolve medication-related problems, participate as active members of a multidisciplinary healthcare team, demonstrate leadership skills, and provide education to various healthcare providers and patients.

Intended Outcomes

Graduating PGY2 Critical Care residents who successfully complete the one year program will:

- Be able to effectively manage all of the pharmaceutical care needs of a complex critically ill medical or surgical patient in an academic medical center or advanced community hospital.
- Residents will also obtain the skill set required to precept PharmD candidates on rotation, develop and modify protocols/guidelines, present educational series to healthcare staff, and actively participate as part of a multidisciplinary team.

Residency Program Structure

The Critical Care residency program is designed to provide the flexibility to adapt to the resident's specific learning needs and career goals. The training is provided through concentrated clinical rotations and longitudinal experiences.

There are **7 required** learning experiences plus a mandatory orientation month for residents coming from PGY1 programs outside of MUSC:

Learning Experience	Rotation Length
Orientation (July of each year)	1 month
Medical Intensive Care Unit (MICU)	2 months
Cardiothoracic Intensive Care Unit (CTICU)	1 month
Surgical Trauma Intensive Care Unit (STICU)	1 month
Transplant (Inpatient) which entails either abdominal or heart-lung transplant	1 month
Neurosciences Intensive Care Unit (NSICU)	1 month
Medical Surgical Intensive Care Unit (MSICU)	1 month
Clinical On-call	Longitudinal
Operational Staffing	Longitudinal
Journal Club	Longitudinal
Education series	Longitudinal
Research and Medication Use Evaluation	Longitudinal
Seminar	Longitudinal
Hospital or Pharmacy Committee Involvement	Longitudinal

The program is flexible in its design to offer the following elective rotations all of one month in duration:

Elective Learning Experiences	Rotation Length
Emergency Medicine	1 month
Cardiac Intensive Care Unit (CICU)	1 month
Antimicrobial Stewardship	1 month
Infectious Diseases Consult	1 month
Benign Hematology Consult	2 weeks – 1 month
Malignant Hematology	1 month
Pediatric Intensive Care Unit (PICU)	1 month
Pediatric Cardiac Intensive Care Unit (PCICU)	1 month

PGY2 Critical Care Preceptors – all with affiliations with the Medical University of South Carolina College of Pharmacy

Required Rotation Preceptors	Additional Elective Preceptors
<p>Joe Mazur, PharmD, BCPS B.S. Pharmacy: University of Manitoba 1990 PharmD: Wayne State University 1995 Fellowship Critical Care/ID: Henry Ford Hospital 1996 Medical Intensive Care Unit mazurj@musc.edu</p>	<p>Barbara S. Wiggins, PharmD, CLS, BCPS, BCCCP, FNLA, FAHA, FCCP, FACC B.S. Pharmacy: St. Louis College of Pharmacy 1993 PharmD: Medical College of Virginia 1998 Fellowship Cardiology and Emergency Medicine: Virginia Commonwealth University 1999 Cardiovascular Intensive Care Unit wiggib@musc.edu</p>
<p>Jaelyn M. Hawn, PharmD PharmD: The Ohio State University 2016 PGY1: Cleveland Clinic 2017 PGY2 Critical Care: Cleveland Clinic 2018 Cardiovascular Intensive Care Unit/ CT Surgery hawnj@musc.edu</p>	<p>Chara Calhoun, PharmD, BCPS PharmD: Purdue University College of Pharmacy 2013 PGY1: Mission Hospital 2014 PGY2 Emergency Medicine: Mission Hospital 2015 Emergency Medicine calhouncd@musc.edu</p>
<p>Carolyn A. Magee, PharmD, BCCCP PharmD: University of Kansas 2015 PGY1: University of Kentucky Health Care 2016 PGY2 Critical Care: University of Kentucky Health Care 2017 Medical Surgical Intensive Care Unit mageeca@musc.edu</p>	<p>Kyle Weant, PharmD, BCPS, BCCCP, FCCP PharmD: University of North Carolina – Chapel Hill 2003 PGY1: University of Kentucky HealthCare 2004 PGY2 Critical Care: University of Kentucky HealthCare 2005 Emergency Medicine weant@musc.edu</p>
<p>Ron Neyens, PharmD PharmD: South Dakota State University 2004 PGY1: University of Utah 2005 PGY2 Critical Care: University of Florida Shands Jacksonville 2006 Neurocritical Care Unit neyens@musc.edu</p>	<p>Krutika N. Mediwala, PharmD, BCPS PharmD: South Carolina College of Pharmacy, USC 2015 PGY1: University of Kentucky HealthCare 2016 PG2 Infectious Diseases: University of Kentucky HealthCare 2017 Antimicrobial Stewardship/ID Consult mediwala@musc.edu</p>
<p>Melanie N. Smith, PharmD, BCPS, BCCCP PharmD: University of Arkansas for Medical Sciences 2015 PGY1: University of Florida Health Jacksonville 2016 PGY2 Critical Care: Medical University of South Carolina 2017 Surgical-Trauma Intensive Care Unit smitmela@musc.edu</p>	<p>Brian R. Raux, PharmD, BCPS PharmD: Northeastern University 2016 PGY1: Medical University of South Carolina 2017 PGY2 Infectious Diseases: Medical University of South Carolina 2018 Antimicrobial Stewardship/ID Consult raux@musc.edu</p>

<p>Holly B. Meadows, PharmD, BCPS PharmD: University of North Carolina Eschelman School of Pharmacy 2009 PGY1: Medical University of South Carolina 2010 PGY2 Transplant: Medical University of South Carolina 2011 Solid Organ Transplant barrier@musc.edu</p>	<p>Lauren Haney, PharmD, BCPS, BCPPS PharmD: Medical University of South Carolina 2007 PGY1: Medical University of South Carolina 2008 PGY2 Pediatrics: Medical University of South Carolina 2009 Pediatric Cardiac Intensive Care Unit haneyl@musc.edu</p>
<p>Neha Patel, PharmD, BCPS PharmD: St. Louis College of Pharmacy 2007 PGY1: Medical University of South Carolina 2008 PGY2 Transplant: Medical University of South Carolina 2009 Solid Organ Transplant paten@musc.edu</p>	<p>Jill Thompson, PharmD, BCPPS PharmD: University of Tennessee Health Science Center 2001 PGY1: University of Tennessee Health Science Center & Le Bonheur Children’s Medical Center 2002 PGY2 Pediatric Critical Care: University of Tennessee Health Science Center & Le Bonheur Children’s Medical Center 2003 Pediatric Intensive Care Unit thompsam@musc.edu</p>
<p>Caroline Perez, PharmD. BCPS PharmD: University of North Carolina-Chapel Hill 2015 PGY1: Virginia Commonwealth University Health System 2016 PGY2 Transplant: Medical University of South Carolina 2017 Solid Organ Transplant perezca@musc.edu</p>	<p>Andy Maldonado, PharmD, BCOP PharmD: University of Georgia 2010 PGY1: Grady Health System 2011 PGY2 Oncology: Grady Health System 2012 Malignant Hematology/BMT perand@musc.edu</p> <p>Charles Greenberg, MD - Benign Hematology</p>

Preceptors (Expectations by the RPD)

Each preceptor will be responsible for the coordination of their own learning experience. The learning experience will be modified accordingly, with the assistance of the RPD, to ensure the resident achieves assigned goals. The preceptor is expected to exhibit the characteristics and aptitude necessary for residency training, including the four key preceptor roles when teaching clinical problem solving (instruction, modeling, coaching and facilitation). The resident’s activities will be monitored and they will be provided formative and summative evaluations, with the over-arching goal of advancing the resident’s competency on the specific assigned learning objectives.

The specific preceptor responsibilities are as follows:

- Understand the resident’s responsibilities to the residency teaching experience and to ongoing activities such as projects, presentations, student discussions, manuscript preparation.
- Develop and maintain goals and objectives for the specific residency teaching learning experience(s).

- Review the resident's training plan and resident's previous performance and modify the learning experience accordingly.
- Orient the resident to the rotation's setting and monitor/evaluate/critique the resident's performance during the experience.
- Provide the resident a midpoint in written and verbal format, and be able to complete the final summary PharmAcademic™ evaluation by month's end as outlined in the residency manual.
- Advise the RPD of any appropriate interventions that may be needed relevant to the resident's performance.
- Actively participate in an annual feedback session in which preceptors and the RPD consider overall program changes based on evaluations, observations, and direct resident feedback and surveys.

Residency Advisor Role

The Residency Advisor(s) are appointed by the Residency Program Director (RPD) and are responsible for the supervision, guidance and on-going evaluation of the resident's progress throughout the residency. Advisors also provide an informal professional mentoring role (examples include preparation for future career planning roles, advice on other issues that maybe impacting on the resident's performance).

Specific Resident Responsibilities

The residents' role is that of a student, novice practitioner, and emerging clinician and/or administrator. The resident is to participate in ongoing clinical and administrative services with the assistance of the residency preceptor and develop their skill set into a competent clinical practitioner and/or future administrator. The resident must accept and apply qualitative feedback in addition to performing self-evaluations on their performance.

In order to promote an effective and productive residency experience, the relationship between a resident and rotation preceptor must be highly communicative, and a meaningful dialogue must be achieved. Specifically, the resident will:

- Sign off on the learning experience orientation form on the first day of each new clinical rotation.
- Maintain strict deadlines as far as PharmAcademic™ requirements are concerned – outlined in the MUSC residency manual – see table for specific deadlines. This involves project work, mini-MUE work, seminar preparation, and any other talk or in-service/presentation that will require preceptor feedback.
- Understand the preceptor's expectations for daily activities, services provided and preceptor contact.
- Maintain the disease-state appendix for review each quarter discussion with the advisor and RPD.

- Participate in pharmacy functions (eg. rounds, patient care conferences, lectures, departmental meetings, clinical staff meetings, assigned committee meetings, journal clubs, critical care educational series, seminars, and RITEs) in accordance to the MUSC residency manual.
- As outlined by the clinical preceptor, provide a detailed account of activities as they relate to the goals and objectives of the learning experience.
- Maintain active communication with the preceptor, advisor and/or RPD concerning any planned off-service activities (eg. meetings, seminars, projects, staffing, on-call commitments) that the resident will be participating in during the rotation.

Adult Inpatient On-Call Learning Experience Expectations

Each critical care resident will participate in a Pharmacy On-Call Service. Call begins Friday at 0800 and ends the following Friday at 0759. Residents must be present on site for 8 hours of Saturday and Sunday during their call week. When on-call, the resident is responsible for ensuring all consultations and follow-up are completed. Critical Care residents will serve as the primary backup for PGY1 Pharmacy Residents after completion of clinical competencies.

Operational Staffing Learning Experience Expectations

Each critical care resident will participate in operational staffing at either Ashley River Tower or Main Hospital. Staffing will consist of one weekend (16 hours) per month in the designated area. During this experience, residents will function as a clinical pharmacist providing pharmaceutical care for patients admitted to the designated service line. This experience will consist of order verification, pharmacokinetics, anticoagulation monitoring, medication reconciliation, discharge medication review, patient counseling, and emergency response.

Critical Care Journal Club Learning Experience Expectations

Each critical care resident is expected to plan and participate in the monthly critical care journal club. These journal club experiences will be attended by critical care, emergency medicine, and transplant preceptors as well as critical care, emergency medicine, transplant, interested PGY1 residents, and students on critical care rotations. Planning each journal club will be rotated monthly between each critical care resident. Residents are responsible for the following:

- Presenting an article during the first journal club of the year.
- Reserving a room each month.
- Identifying 3 presenters no later than the end of the 1st week of each month and communicate expectations to presenters.
- Identifying 3 articles and seeking preceptor approval of all chosen articles no later than the end of the 1st week of each month.
- Sending calendar invites to all preceptors and interested residents with attached articles no later than the end of the 1st week of each month.
- **Leading** discussions for each journal club presented during the month they are responsible for planning. Both critical care residents are expected to read articles and prepare discussion

points prior to journal club. Preceptors will be available to facilitate and clarify points of contention.

- Any deviation from scheduled journal club dates should be discussed with RPD and/or residency advisor PRIOR to rescheduling or cancelling.

Critical Care Education Series Learning Experience Expectations

Each critical care resident is expected to participate in the weekly critical care education series. These educational experiences will be attended by critical care preceptors (and other preceptors as appropriate) and physicians depending on topics. These experiences are designed to cover basic critical care topics considered essential to the development of a well-rounded critical care practitioner and will prepare the residents to sit for the BCCCP exam immediately upon completion of the residency program. Residents are responsible for the following:

- Attending all weekly education series meetings. Any missed meetings should be discussed with the RPD and/or residency advisory PRIOR to meeting time.
- Being prepared to discuss each weekly topic by reading assigned articles and reviewing appropriate disease states.
- Presenting 3 topics throughout the residency year. Topics should be identified at the beginning of the year. Residents are encouraged to consider timing when picking topics to prevent overlap with seminar or RITE preparation. Topics should be presented in a formal fashion with Power-point slides and should encourage audience participation and engagement.
- Residents should identify the assigned preceptor for the topic they would like to present. They should work with said preceptor to identify appropriate articles for dissemination to the group and should establish an appropriate timeline for review of presentation with the preceptor prior to meeting time.

Research Learning Experience Expectations

Each critical care resident is expected to complete a longitudinal research project fit for publication with the mentorship of one or more research advisor. The residents may select a project provided by the critical care preceptors or create their own project with approval from the RPD, residency advisor, and research project mentor. Residents are required to participate in all steps in the research process and will be expected to:

- Submit an IRB
- Participate in data collection
- Participate in statistical design and analysis
- Prepare a manuscript suitable for publication
- Present research at a national critical care meeting and/or pharmacy research showcase
- Adhere to all deadlines as established by the resident and research advisor at the beginning of the residency year

Medication Use Evaluation Learning Experience Expectations

Each critical care resident is expected to participate in a medication use evaluation relevant to care of ICU patients with a focus on cost savings and/or quality improvement related. The medication use evaluation should:

- Identify problems and opportunities for improvement and analyze relevant background data.
- Evaluate data generated by health information technology or automated systems to identify opportunities for improvement.
- Utilize best practices to identify opportunities for improvements.
- When needed, make medication-use policy recommendations based on a review of practice standards, guidelines, and other evidence (e.g., National Quality Measures, Institute for Safe Medication Practices alerts, Joint Commission sentinel alerts.)

Each resident should contribute equally to the medication use evaluation. Residents will be responsible for:

- Arranging meetings with preceptor mentors
- Data collection and analysis
- Presenting MUE data to pharmacy administration and appropriate committees (i.e. Critical Care Quality)
- Adhering to all deadlines established by the critical care preceptors

Seminar Learning Experience Expectations

Each critical care resident is expected to participate in the MUSC Resident seminar series to complete outcome R4: teaching, education, and dissemination of knowledge. The resident is expected to:

- Identify a subject related to critical care pharmacotherapy for appropriate dissemination of knowledge to pharmacists and pharmacy residents.
- Identify a preceptor mentor in the area of interest.
- Meet all deadlines for preparation and evaluation of subject matter as established by the resident and preceptor mentor.
- Notify all critical care preceptors of date, time, and location of seminar presentation in a timely manner.
- Identify preceptors to evaluate presentation style/technique

Committee Involvement Expectations

Each critical care resident is expected to participate in pharmacy or Integrated Centers of Clinical Excellence (ICCE) committee to complete outcome R3: leadership and management. The resident is expected to:

- With the help of the RPD and/or residency advisor, identify an appropriate committee for participation at the beginning of the residency year.
- Attend all committee meetings throughout the year.
- Actively participate in committee proceedings (i.e. agenda and minute preparation, sub-committee participation, protocol development, medication use evaluation, communication within the pharmacy department regarding committee activities).
- Institutional committee participation may be substituted with active involvement with national or international critical care or pharmacy organization committees at the discretion of the RPD and residency advisor.

Individual Learning Experience Evaluations and Grading

The resident is expected to successfully complete and achieve **all** of the required outcomes according to ASHP Educational Outcomes, Goals and Objectives for PGY2 Pharmacy Residencies in Critical Care. This will include the following under the “achieved category”:

- Outcome R1: Patient care
- Outcome R2: Advancing practice and improving patient care
- Outcome R3: Leadership and management
- Outcome R4: Teaching, education, and dissemination of knowledge

The resident is expected to demonstrate proficiency in 90% or above of all activities linked to these specific outcomes via the various goals and objectives assigned from the learning experiences to successfully complete the MUSC program. The resident will observe, learn, act, and then master a particular activity which will deem the resident as achieving that goal. This again will be highly individualized and not applied to every resident exactly the same.

For the various elective outcomes, goals, and objectives for PGY2 Pharmacy Residencies in Critical Care, the resident will have to select a minimum of one outcome and demonstrate proficiency in all assigned activities linked to these specific outcomes via the various goals and objectives assigned from the learning experiences to successfully complete the MUSC program. These include the following outcomes:

- Outcome E1: Academia
- Outcome E2: Added leadership and practice management skills
- Outcome E3: Mass casualty

Selection of Residency Candidates

- Invitation for on-site interview
 - Following receipt of full application packet as outlined on http://academicdepartments.musc.edu/pharmacy_services/residency/ candidates will be screened using the critical care residency screening tool
 - The top 5 to 7 candidates based on objective scores from the critical care residency screening tool and midyear interviews for off-site candidates and internal discussions for internal candidates. Candidates brought in for an interview will be decided on collaboratively by the Critical Care/Transplant PharmD group (Joe Mazur –RPD, Ron Neyens, Barbara Wiggins, Carolyn Magee, Melanie Smith, Jaclyn Hawn, Neha Patel, Caroline Perez, Holly Meadows)
 - Internal candidates are screened once their application is received and the Critical Care /Transplant PharmD group determines if an interview should take place prior to midyear
- On-site interviews
 - Include interviews with the multidisciplinary team including behavioral based questions and each interviewer will provide an interview score
 - Interview scores are collated and added to the pre-interview screening score
 - Candidates are then ranked and discussed by the Critical Care/Transplant PharmD group to determine the final ranking of candidates
- Criteria for selection
 - Following internal candidate interviews prior to midyear the Critical Care/Transplant PharmD group meets and determines if an offer for the PGY2 position should be made prior to midyear or if they would like to wait until all candidates are evaluated at midyear
 - For external and internal candidates wishing to partake in the match, final ranking is determined by the combined score of the pre-interview screening tool and on-site interview score along with expert opinion from the Critical Care/Transplant PharmD group

Joe Mazur, PharmD,BCPS

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