

Residents’ Curriculum
Specialty: Critical Care Medicine

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Description of Rotation.

At the Mercy Hospital, the Schairer Medical-Surgical ICU is a 14 bed, closed ICU, with patient overflow capacity into a 6 bed CCU. Residents will have the opportunity to learn about complicated critical care with residents in other fields of medicine. Close supervision by the ICU fellow and the attending physician will allow residents to learn how to manage very ill patients. Residents will be proactive about the care of their patients and will work with the attending physician and the fellow to develop a care plan that incorporates the patient’s wishes, as well as the patient’s functional status and severity of the disease.

Residents will be certified in basic critical care procedures and will acquire further expertise during this rotation. Residents will also appreciate when they should refrain from pursuing aggressive measures. Residents will feel comfortable discussing advanced directives and end-of-life issues with patients and their families.

Throughout the rotation, residents will hone their skills in procedures and in crucial discussions with patients and their families. The Critical Care Rotation is an intense experience, but should leave the resident well prepared for his career as a physician.

Floor Schedule.

On the first day of the rotation, an orientation meeting will be held at 9a with the attending physician on service to review goals and expectations. They will meet Janet Faulkner, RN, Nursing Director of the SICU at 12 noon in the SICU conference room.

Time	Monday	Tuesday	Wednesday	Thursday	Friday
9a-12p	Work and Teaching Rounds				
12p-1p	Teaching and Topic Discussion				

- Once in the rotation, there is a Surgical-Medical ICU conference from 12 noon to 1 pm. The residents are expected to prepare the topic of discussion with assistance from the ICU fellow and attending physician.

Competency-Based Rotation Goals and Objectives.

Residents will work on achieving the following objectives and be assessed by the indicated method: A, B, C, and/or D. Please refer to the legend directly below. The methods are re-stated in the section “[Assessment Methods \(Residents\)](#)”

Assessment Methods Legend.

- A. Attending physician observation in clinic and on the floors.
- B. Informal and/or formal questioning, verbal quizzes by the attending physician.
- C. Review of residents’ H&P, SOAP notes and consultation notes.
- D. Residents will give lectures on relevant subjects and on relevant journal articles.

Patient Care.

Goal. “Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.”³

Specialty-Specific Competencies and Objectives.

- Residents will collect vital information that is correct and meticulously obtained. They will accurately investigate the following complaints and define a treatment plan which uses current scientific assertions: (A, B, C, D)
 - Acute abdominal pain, acute asthma/COPD exacerbation, acute chest pain, acute intoxication, acute liver failure, acute renal failure, altered mental status, cerebrovascular accident, coma, end of

Residents' Curriculum

Specialty: Critical Care Medicine

life care and ethical decision making, hypotension, life-threatening arrhythmia, massive gastrointestinal bleeding, massive hemoptysis, metabolic and endocrine emergencies, multi-organ dysfunction, perioperative management of surgical patients (including CABG), respiratory distress or failure, severe hypertension, severe sepsis, shock, status epilepticus.²

- Residents will continue to administer personalized patient care and support at the end of life. (A, C)
- Residents will formulate a differential diagnosis based on their findings and study of the medical literature. (C)
- Residents will construct plans for further diagnostic evaluation and management. (C)
- Residents will provide the referring physician with a complete written assessment and recommend a plan of care tailored to the patient's situation and preferences. (C)
- Residents will competently perform the following essential medical procedures: (A, B)
 - Advanced cardiac life support, arterial puncture for arterial blood gas, bedside pulmonary function, care of chest tubes, lumbar puncture, mechanical ventilation (basic), paracentesis, placement of arterial and central venous lines, thoracentesis, insertion of temporary pacemaker (optional), placement of chest tubes (optional), placement of endotracheal tube (optional), placement of nasogastric tube, placement of pulmonary artery catheter (optional).^{1,2}
- Residents will gain experience in managing critically ill patients, utilizing mechanical ventilators, and interpreting hemodynamic monitoring. Residents will make appropriate use of subspecialty consultation in the intensive care setting. (A, C)
- Residents will use measures to avoid further complications and preventable illness. (A, C)

Medical Knowledge.

Goal. “Residents must demonstrate knowledge of established and evolving biomedical, clinical, epidemiological, and social-behavioral sciences, as well as the application of this knowledge to patient care.”³

Specialty-Specific Competencies and Objectives.

- Residents will know how to diagnose and manage the following diseases: (A, B, C, D)
 - Altitude illness, anaphylaxis, burns (including smoke inhalation), decompression illness (including air embolism), drug or alcohol overdose (including therapeutic drug overdoses), drug or alcohol withdrawal, hyperthermia, hypothermia (accidental, therapeutic), near drowning, nutrition.
 - Cardiac disease (acute myocardial infarction, acute pericarditis, acute valvular disruption, aortic dissection, cardiopulmonary arrest, congestive heart failure, dysrhythmias, hypertensive crisis, myocardial contusion, shock).
 - Endocrine disease (adrenal insufficiency, diabetic ketoacidosis, hyperosmolar nonketotic diabetic coma, myxedema coma, thyroid storm).
 - Gastrointestinal disease (acute pancreatitis, gastrointestinal bleeding, hepatic failure).
 - Hematologic disease (bleeding disorder, disseminated intravascular coagulation, thrombotic thrombocytopenic purpura).
 - Infectious disease (nosocomial infection, septic shock).
 - Management of critical illness (multi-organ failure, outcomes, prognosis, withdrawal of support).
 - Neurologic disease (acute spinal cord injury, coma, delirium, head trauma, meningitis, neuroleptic malignant syndrome, neuromuscular disease with respiratory failure, status epilepticus, stroke).
 - Poisonings (alcohols, amphetamines, carbon monoxide, cyanide).
 - Pulmonary disease (airway management [intubation, tracheostomy], status asthmaticus, upper airway obstruction, ventilator management, ventilator-associated pneumonia).
 - Renal disease (acid-base disturbances, acute renal failure, electrolyte imbalance, indications for dialysis).
 - Respiratory disease (adult respiratory distress syndrome, chest trauma, chronic obstructive pulmonary disease [exacerbated], hemoptysis, hypercapnia [obstructive lung disease, restrictive lung disease], hypoxia [acute lung injury], noninvasive mechanical ventilation [cardiogenic pulmonary edema, immunosuppressed patients, obstructive lung disease, postoperative patients], pneumonia, pneumothorax, pulmonary embolism, tuberculosis).
 - Supportive care in critical illness (anxiety, delirium, end-of-life care, nutrition, pain, prevention).^{1,2,4}
- Residents will interpret the following tests: (A, B, C, D)
 - Hemodynamic monitoring, pulse oximetry, telemetry monitoring.^{1,2}
- Residents will know when to order the following tests and why: (A, B, C)

Residents' Curriculum

Specialty: Critical Care Medicine

- Bronchoscopy, cardiac catheterization, echocardiography, electroencephalography, GI endoscopy, radiology imaging (computed tomography, magnetic resonance imaging, nuclear scans, radiographs, other scans of the body).^{1,2}

Practice-Based Learning and Improvement.

Goal. “Residents must demonstrate the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life long learning.”³

Specialty-Specific Competencies and Objectives.

- Residents will use information technology to justify medical decisions and to enhance learning. Residents will look for studies with inclusion criteria similar to their patients, evaluate the validity of the research and modify their treatment plans accordingly. (A, B, C)
- When synthesizing a medical regimen, residents will respect the requests of patients, incorporate the clinical situation of the patients and utilize applicable studies to bring the latest standard of care to the patient. (A, B, C)
- Residents will reflect upon their knowledge gaps and will work to improve these shortcomings. (A)
- Residents will make teaching a priority and will endeavor to foster a learning environment for students and other members of the health care team. (A)
- Residents are encouraged to create research projects and to present interesting cases in national and international conferences. (A)

Systems-Based Practice.

Goal. “Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care, as well as the ability to call effectively on other resources in the system to provide optimal health care.”³

Specialty-Specific Competencies and Objectives.

- Residents will comprehend the effect their patient care plans have upon others working in the health care profession, the system of health care and society as a whole. They must also recognize how these aspects in turn influence their manner of practicing medicine. (A, C)
- Residents will use resources efficiently and will work to eliminate unnecessary health care costs without diminishing any standards. They will also investigate the various types of environments available to practice medicine and the methods used to provide medical care. (A, C)
- Residents will work with case managers and other health care associates to evaluate, arrange and enhance the patient’s experience. (A)

Professionalism.

Goal. “Residents must demonstrate a commitment to carrying out professional responsibilities and an adherence to ethical principles.”³

Specialty-Specific Competencies and Objectives.

- Residents will show their dedication to unceasingly mature in their clinical practice and in their accountability to those they treat, to the art of medicine and to their community as a whole. (A)
- Residents will exhibit sympathy and courtesy to the requests of patients and society. They will address these petitions speedily and place them before their own aims. (A)
- Residents will be bound by a sound moral framework when addressing care or withdrawal of care, patient confidentiality rights and in giving informed consent. (A)
- Residents will be sensitive to the different cultures, religious beliefs and sexual orientations of patients. (A)
- Residents will be role models for the healthcare team and patients. (A)

Interpersonal and Communication Skills.

Goal. “Residents must demonstrate interpersonal and communication skills that result in the effective exchange of information and teaming with patients, their families, and professional associates.”³

Specialty-Specific Competencies and Objectives.

- In a respectful manner, residents will convey pertinent information to patients and their loved ones. Residents will use language that patients can understand. (A)

Residents' Curriculum
Specialty: Critical Care Medicine

- Residents will teach patients and their caretakers about their diseases and their treatment options. Residents are expected to be active participants in patient discussions and family conferences. (A)
- Residents will be cooperative and civil when working with other members of the health care team. (A, C)
- When documenting patient care, residents will use concise, intelligible wording to explain findings and decision-making. (C)

Teaching Methods.

- Bedside teaching, lectures and power point presentations will occur throughout the rotation.
- Work and teaching rounds are daily from 9 am to 12 noon.
- The ICU fellow or attending physician will do formal teaching and topic discussions between 12 noon to 1 pm.
- Once in the rotation, there is a monthly combined Surgical-Medical ICU conference from 12 noon to 1 pm. Residents are expected to prepare the topic of discussion with assistance from the ICU fellow and the attending physician.
- Residents will read handouts of current literature and a copy of the ICU curriculum.
- Residents interact with critical care nurses, critical care pharmacists, respiratory therapists, dietitians, social workers and chaplain during the rounds and throughout the working day.

Assessment Methods (Residents).

- Resident performance will be assessed using the methods below:
 - A. Attending physician observation in clinic and on the floors.
 - B. Informal and/or formal questioning, verbal quizzes by the attending physician.
 - C. Review of residents' H&P, SOAP notes and consultation notes.
 - D. Residents will give lectures on relevant subjects and on relevant journal articles.
- Residents' performance is broken down into different facets, based on ACGME recommendations. Please see [New Innovations](#) for details.
- The attending physician who evaluates the residents is expected to provide the feedback in person as well.

Assessment Method (Program Evaluation).

- The residents do a formal evaluation of the rotation and faculty through [New Innovations](#).
- Residents are encouraged to give non-formal evaluations and ideas to improve their experience throughout the rotation.

Level of Supervision.

- Residents are supervised by Pulmonary/Critical Care fellows and the attending physician.
- All the aspects of patient care, including history taking, physical examination, ordering and interpretation of investigations, are directly supervised.
- Critical care procedures and family interactions, especially discussion of advanced directives, are done with the fellow or the attending physician present.

Educational Resources.

Please review all of the following resources by the end of the rotation.

The following resources are freely available:

- Calfee, C. S., & Matthay, M. A. (2005). Recent advances in mechanical ventilation. *The American Journal of Medicine*, 118(6), 584-591. <http://www.amjmed.com/article/PIIS0002934304007557/fulltext>
- Erstad, B. L., Puntillo, K., Gilbert, H. C., Grap, M. J., Li, D., Medina, J., ... Sessler, C. N. (2009) Pain management principles in the critically ill. *CHEST*, 135(4), 1075-1086. <http://chestjournal.chestpubs.org/content/135/4/1075.full>
- Finfer, S., Chittock, D. R., Su, S. Y., Blair, D., Foster, D., Dhingra, V., ... Ronco, J. J. (2009). Intensive versus conventional glucose control in critically ill patients. *New England Journal of Medicine*, 360(13), 1283-1297. <http://content.nejm.org/cgi/content/short/360/13/1283>
- MacIntyre, N. R., Cook, D. J., Ely, Jr, E. W., Epstein, S. K., Fink, J. B., Heffner, J. E., ... Stoller, J. K. (2001). Evidence-based guidelines for weaning and discontinuing ventilatory support: A collective task force facilitated by the American College of Chest Physicians; the American Association for

Residents' Curriculum Specialty: Critical Care Medicine

- Respiratory Care; and the American College of Critical Care Medicine. *CHEST*, 120(6), S375-S396. http://chestjournal.chestpubs.org/content/120/6_suppl/375S.full
- Mandell, L. A., Wunderink, R. G., Anzueto, A., Bartlett, J. G., Campbell, G. D., Dean, N. C., ... Whitney, C. G. (2007). Infectious Disease Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. *Clinical Infectious Diseases*, 44, S27–S72. <http://www.journals.uchicago.edu/doi/full/10.1086/511159>
 - Marik, P. E., & Varon, J. (2007). Hypertensive crises: Challenges and management. *CHEST*, 131(6), 1949-1962. <http://chestjournal.chestpubs.org/content/131/6/1949.full>
 - Niederman, M. S., Craven, D. E., Bonten, M. J., Chastre, J., Craig, W. A., Fagon, J., ...Wunderink, R. G. (2005). Guidelines for the management of adults with hospital-acquired, ventilator-associated, and health-care associated pneumonia. *American Journal of Respiratory and Critical Care Medicine*, 171, 388-416. <http://ajrccm.atsjournals.org/cgi/content/full/171/4/388>
 - Sprung, C. L., Annane, D., Keh, D., Moreno, R., Singer, M., Freivogel, K., ...Briegel, J. (2008). Hydrocortisone therapy for patients with septic shock. *New England Journal of Medicine*, 358(2), 111-124. <http://content.nejm.org/cgi/content/short/358/2/111>
 - Sessler, C. N., & Varney, K. (2008). Patient-focused sedation and analgesia in the ICU. *CHEST*, 133(2), 552-565. <http://chestjournal.chestpubs.org/content/133/2/552.full>
 - Van den Berghe, G., Wouters, P., Weekers, F., Verwaest, C., Bruyninckx, F., Schetz, M., ...Bouillon, R. (2001). Intensive insulin therapy in critically ill patients. *New England Journal of Medicine*, 245(19), 1359-1367. <http://content.nejm.org/cgi/content/short/345/19/1359>

The following resources are available for free on other websites. The first URL will link directly to the original journal, and subsequent URLs will link to the website which allows direct access to the article free of charge:

- Briegel, J., Beishuizen, A., Dimopoulou, I., Tsagarakis, S., Singer, M., Chrousos, G. P., ...Keh, D. (2008). Recommendations for the diagnosis and management of corticosteroid insufficiency in critically ill adult patients: Consensus statements from an international task force by the American College of Critical Care Medicine. *Critical Care Medicine*, 36(6), 1937-1949. http://journals.lww.com/ccmjournal/Abstract/2008/06000/Recommendations_for_the_diagnosis_and_management.35.aspx Available for free at: <http://www.sccm.org/Documents/AdrenalInsufficiency.pdf>
- Dellinger, R. P., Levy, M. M., Carlet, J. M., Bion, J., Parker, M. M., Jaeschke, R., ... Vincent, J. (2008). Surviving Sepsis Campaign: International guidelines for management of severe sepsis and septic shock. *Critical Care Medicine*, 36, 296-327. http://journals.lww.com/ccmjournal/Abstract/2008/01000/Surviving_Sepsis_Campaign_International.43.aspx Available for free at: http://www.survivingsepsis.com/system/files/images/SCC_reprint.pdf or http://www.learnicu.org/Quick_Links/Documents/SCC%20guidelines%20with%20watermark.pdf
- Hollenberg, S. M., Ahrens, T. S., Annane, D., Astiz, M. E., Chalfin, D. B., Dasta, J. F., ...Zanotti-Cavazzoni, S. (2004). Practice parameters for hemodynamic support of sepsis in adult patients: 2004 update. *Critical Care Medicine*, 32(9), 1928-1948. http://journals.lww.com/ccmjournal/Abstract/2004/09000/Practice_parameters_for_hemodynamic_support_of.18.aspx Available for free at: http://www.sccm.org/professional_resources/guidelines/table_of_contents/Documents/Hemodynamicsupport.pdf
- Martindale, R., McClave, S. A., Vanek, V., McCarthy, M., Roberts, P., Taylor, B., ...Cresci, G. (2009). Guidelines for the provision and assessment of nutrition support therapy in the adult critically ill patient: Society of Critical Care Medicine and American Society for Parental and Enteral Nutrition: Executive summary. *Critical Care Medicine*, 37(5), 1757-1761. http://journals.lww.com/ccmjournal/Citation/2009/05000/Guidelines_for_the_provision_and_assessment_of.31.aspx Available for free at: http://www.learnicu.org/Quick_Links/Documents/NutritionExecutive%20Summary.pdf
- Peixoto, A. J. (2003). Critical issues in nephrology. *Clinics in Chest Medicine*, 24(4), 561-581. [http://www.chestmed.theclinics.com/article/S0272-5231\(03\)00090-X/fulltext](http://www.chestmed.theclinics.com/article/S0272-5231(03)00090-X/fulltext) Available for free at: <http://medicine.georgetown.edu/residency/ICUreadings/NephrologyCriticalcare.pdf>

The following resources are available for free on [Ovid](#) through Mercy's subscription. The first link will go directly to the original journal. Some links are also available for free through [UIC library access](#), **but the address must be cut and paste in the browser window to work properly**:

- Beale, R. J., Hollenberg, S. M., Vincent, J., & Parillo, J. E. (2004). Vasopressor and inotropic support in septic shock: An evidence-based review. *Critical Care Medicine*, 32(11), S455-S465.

Residents' Curriculum Specialty: Critical Care Medicine

- http://journals.lww.com/ccmjjournal/Abstract/2004/11001/Vasopressor_and_inotropic_support_in_septic_shock_4.aspx
- Gralnek, I. M., Barkun, A. N., & Bardou, M. (2008). Management of acute bleeding from a peptic ulcer. *New England Journal of Medicine*, 359(9), 928-937.
<http://content.nejm.org/cgi/content/short/359/9/928> Also available through UIC library access:
<http://content.nejm.org.proxy.cc.uic.edu/cgi/content/short/359/9/928>
 - Malhotra A. (2007). Low-tidal-volume ventilation in the acute respiratory distress syndrome. *New England Journal of Medicine*, 357, 1113-1120. <http://content.nejm.org/cgi/content/short/357/11/1113> Also available through UIC library access:
<http://content.nejm.org.proxy.cc.uic.edu/cgi/content/short/357/11/1113>
 - Selleng, K., Warkentin, T., & Greinacher, A. (2007). Heparin-induced thrombocytopenia in intensive care patients. *Critical Care Medicine*, 35(4), 1165-1176.
http://journals.lww.com/ccmjjournal/Abstract/2007/04000/Heparin_induced_thrombocytopenia_in_intensive_care.24.aspx Also available through UIC library access:
<http://www.mdconsult.com.proxy.cc.uic.edu/das/article/body/205682499-4/jorg=journal&source=&sp=18938611&sid=0/N/577065/1.html?issn=0090-3493>
 - St. André, A., & DelRossi, A. (2005). Hemodynamic management of patients in the first 24 hours after cardiac surgery. *Critical Care Medicine*, 33(9), 2082-2093.
http://journals.lww.com/ccmjjournal/Abstract/2005/09000/Hemodynamic_management_of_patients_in_the_first_24.28.aspx Also available through UIC library access:
<http://www.mdconsult.com.proxy.cc.uic.edu/das/article/body/205682499-4/jorg=journal&source=&sp=15741027&sid=0/N/494552/1.html?issn=0090-3493>
 - Vincent, J., & Gerlach, H. (2004). Fluid resuscitation in severe sepsis and septic shock: an evidence-based review. *Critical Care Medicine*, 32(11), S451-S454.
http://journals.lww.com/ccmjjournal/Abstract/2004/11001/Fluid_resuscitation_in_severe_sepsis_and_septic_shock.3.aspx Also available through UIC library access:
<http://www.mdconsult.com.proxy.cc.uic.edu/das/article/body/205682499-4/jorg=journal&source=&sp=15182565&sid=0/N/448052/1.html?issn=0090-3493>

The following resource is available for free through [UIC library access](#), **but the address must be cut and paste in the browser window to work properly:**

- DuBose, T. D. (2010). Chapter 48: Acidosis and alkalosis. In Kasper, D. L., Braunwald, E., Fauci, A. S., Hauser, S. L., Longo, D. L., Jameson, J. L., & Isselbacher, K. J. (Eds), *Harrison's principles of Internal Medicine, 17th Edition*. New York, NY: McGraw Hill Medical. Available through UIC library access:
http://www.accesspharmacy.com.proxy.cc.uic.edu/popup.aspx?aID=2866359&print=yes_chapter

For further reading, please consult the following reading list:

- <http://www.thoracic.org/education/career-development/residents/ats-reading-list/index.php>

The following resource is optional. The first link goes directly to the original article. It is available for free on [Ovid](#) through Mercy's subscription. It is also available for free through [UIC library access](#), **but the address must be cut and paste in the browser window to work properly:**

- Kellum, J. A. (2007). Disorders of acid-base balance. *Critical Care Medicine*, 35(11), 2630-2636.
http://journals.lww.com/ccmjjournal/Abstract/2007/11000/Disorders_of_acid_base_balance.23.aspx
Available on Ovid for free. Available through UIC library access:
<http://www.mdconsult.com.proxy.cc.uic.edu/das/article/body/207132309-4/jorg=journal&source=&sp=20104319&sid=0/N/615524/1.html?issn=0090-3493>

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References:

- ¹ Ende, J., Kelley, M. A., Ramsey, P. G., Sox, H. C., Abboud, F. M., Ruppert, R. D., ...Zuckerman, R. (1997). *Graduate education in Internal Medicine: A resource guide to curriculum development*. Philadelphia, PA: American College of Physicians.

Residents' Curriculum
Specialty: Critical Care Medicine

- ² Alguire, P., Broder, M., DeHoratius, R., Goroll, A., Kountz, D., Lynn, L., ... Yingling, K. (2002). *FCIM Internal Medicine curriculum: A resource guide to curriculum development, 2nd edition*. Retrieved from http://www.acponline.org/education_recertification/education/training/fcim
- ³ Curriculum template. (n.d.). Retrieved from http://www.acgme.org/outcome/e-learn/module4_CurriculumTemplate.doc
- ⁴ Davies, S. F., Eisenstaedt, R. S., Baldisseri, M. R., Daniels, C. E., Ely, E. W., Fiel, S. B., ... Murray, J. (2010). Pulmonary and Critical Care Medicine. In Weinberger, S. E., Kanya, D. T., McKinney, S., Wells, M., Rossi, C., Krumm, B., ... O'Sullivan, S., *Medical knowledge self-assessment program 15*. Philadelphia, PA: American College of Physicians.