UPMC McKeesport Internal Medicine Residency Program

Curriculum for Critical Care Medicine

I. Faculty Representatives – Subspecialty Education Coordinators

Michael Donahoe, MD, Educational Coordinator
Dr. Ihsan H. Awan, MD, Subspecialty Education Coordinator
Khaled Fernainy, MD
Matthew Harinstein, MD
Frances Ergina, MD
Avinash Linganna, MD
Nadine Dandachi, MD
Syed Haider, MD

II. Educational Purpose / Objectives:

The Critical medicine rotation is designed to provide the residents with an opportunity to diagnose and treat severely ill patients who warrant admission to the intensive care unit. The unit has fully staffed and equipped 12 beds.

A. Clinical:

- Achieving competency in implementing initial life support measures for patients with immediate life threatening problems.
- Achieving competency in clinical evaluation of critically ill patients which entails obtaining medical history utilizing all available resources: patient interview if patient is capable of proving history, electronic and paper records, family members and caregivers, and physical examination.
- Achieving competency in initial airway and ventilator management.
- Achieving competency in communicating and coordinating patient care with all physicians involved, as well as the patient and family members.
- Excellent and complete communication with nursing staff, respiratory therapists, social workers and case managers is essential.
- Achieving competency in understanding and utilizing complicated pharmacologic regimens, drug interaction, altered pharmacodynamics in patients with multiple organ failure.
- Achieving competency in dealing with complicated ethical issues: autonomy, privacy, futility of care, end of life care, etc.
- Achieving competency in creating a safe environment for patient care, with special attention to areas of medication errors, falls, delirium, hospital acquired infections, etc.
- Achieving competency in caring for the family of the critically ill and the dying.
- Achieving competency in documentation that thorough, systematic, legible, and reflective of a thought process and ability to manage multiple medical problems.

B. Interpretation of test results:

- ABGs
- Electrolyte
- CXR
- EKG
- Cultures
- Drug levels
- Emergency CT scan findings: Pulmonary embolism, pneumonia, bowel perforation, obstructions, etc.

C. Procedures:

- Central venous line placement
- Arterial line placement
- Endo-tracheal intubation
- Nasogastric and orogastric tube placement
- Others: lumbar puncture, thoracentesis, paracentesis, cardioversion

Guidelines:

- All residents must be supervised a minimum number of times for a given procedure.
- The supervising physician determines the competency and final certification for the procedure.
- Residents are responsible for recording the number of procedures (logbook/online) and reporting their competency (attending's letter) to the administrative staff to complete the certification process.
- Resident certification for a procedure is entered on the intranet and this information is available to the clinical nursing units.
- Critical care attending physicians **MUST** be notified if there is a change of condition of their patients & prior to procedures. Even if you have another in-house physician who can supervise the procedure, the critical care attending must be part of the decision making.
- The table below summarizes which procedures residents can do independently if certified and which ones residents will continue to need supervision even after certification.

Procedure	Can do independently if certified	Can supervise independently if certified
IJ vein line insertion	No	No
Subclavian vein line insertion	No	No
Femoral vein line insertion	Yes	Yes
Radial artery line insertion	Yes	Yes
Femoral artery line insertion	No	No
Thoracentesis	No	No
Endotracheal intubation	No	No
Bone Marrow biopsy	No	No
Lumbar puncture	No	No

In addition, ABIM knowledge competency videos are available on

The resident must understand and practice the process of informed consent.
All procedures are to be promptly documented and signed by the supervising physician.

D. Decision management skills:

- Emergency management of life threatening conditions
- Consultation with the appropriate attending physicians and consultants whenever there is a significant change of the patient's condition.
- Discharge of patients from the ICU to the appropriate level of care.
- Bed utilization in consultation with the ICU nursing and physician leadership.
- Establishing medical care guidelines, in consultation with the patient, family, attending physicians, and nursing.

III. Teaching Methods:

- Patient care teaching rounds with the intensivist and the attending as well as the consulting physicians.
- Patient management rounds with the entire team: including nurses and Pharm D.
- Morning 8am-9am Case-based educational conferences
- Topic review and presentation
- Noon conferences

IV. Educational Resources / Reading list:

A- Established set of core topics to review before daily conferences (see Appendix B)
B- Appropriate sections in the latest editions of Up-to-date, Harrison Textbook, MKSAP, and Paul Marino: the ICU book.
C- Identified individual articles and landmark studies selected by the faculty and residents are available on Share Point
D- Central Line training session and Code training session will take place the first week of the rotation. Please review the didactic video available in SharePoint prior to the training session

V. Method of Evaluation:

Both residents and faculty are expected to provide and seek meaningful feedback from evaluations as follows:

A- Daily feedback
B- Weekly feedback
C- End or rotation evaluation and nursing feedback
D- Mini CEX

P.S. The resident will evaluate the individual faculty member and the rotation using an anonymous standardized rating form. This form includes a section for reporting of actual or perceived duty hour violations

The feedback is conducted in a respectful, constructive, and non-threatening format that promotes good practice.

VI. Patient Safety:

A. Residents can only adjust ventilator setting in the presence of an intensivist or a respiratory therapist unless it is to increase FI in a hypoxic patient. If a patient is in distress and the ventilator is alarming or the resident believes that is miss-set or malfunctioning, he / she is to remove the patient from the ventilator, bag and urgently call the therapist/attending.

B. Vent orders MUST be promptly entered into the computer.

C. Transfer Dictations/Documentation:

- Required on all transfers from ICU/CVU to the regular floor. The resident who writes the transfer order is the resident who will dictate/write the transfer note. The senior resident will monitor the quality and content of the transfer note. Besides a transfer note, there must be a verbal sign out to the floor team at the time of transfer.

D. The Family Medicine residents are responsible for the admission H&P of Latterman clinic patients, unassigned patient to the FM team, and FM private attending physicians patients admitted to the unit Monday to Thursday from 8:00am until 12:00pm, and from 6:30pm until 6:30am, and Friday from 8:00am until 12:00pm, and from 4:30pm until 6:30am Monday morning. Adequate verbal sign out is mandatory to the team covering the unit.

E. Tagging unassigned admissions to Critical Care beds: Unassigned patients admitted to a critical care bed get admitted under the intensivist group, and **tagged to a teaching service** (which will be the receiving team upon transfer out of the unit) at the point of admission. This tagging is done by **placing a consult to the receiving team at the point of admission**, then canceling the consult (to eliminate the need for dictating unnecessary consults). The patient's name will then appear on the receiving team's list all the time. The primary responsibility for the tagging and the consult is with the admitting resident, then by the AM rounding unit team to confirm the presence of this consult or add if not done.

F. An accepting note is required on all patient transferred to the units. This note is to be completed by the resident in the unit who receives the patient. The team transferring the patient should also provide a verbal sign out the unit team accepting the patient.

G. The intensivist and the appropriate consultants on the case must be informed of any significant change of any patient's status. Adequate documentation in the chart is required for any changes in patient's status or major treatment modifications. Failing to do so is considered violation of professionalism and patient safety expectations. Remediation policies will be enforced.

H. Teaching patients who are discharged directly from the critical care units, will have the discharge summary completed by the resident of the corresponding unit. For clarification, the residents do NOT dictate/write discharge summaries on patients that are considered non-teaching, .e.g., surgical cases with no consult to intensivists or cardiologists.

I. Also for clarification, patients who are transferred directly from critical care beds to the following divisions are considered discharges: Psychiatry units, Transitional Care Unit, Rehab, Select Specialty (LTAC).

J. Patients who are transferred to other Hospital floors, will have the discharge summaries dictated/written by the receiving team regardless of the interval between transfer out of the critical care unit and the final discharge.
K. For clarification, if a patient is transferred from a critical care bed to a private non-teaching physician, the responsibility for the discharge summary lies with the private physician, not the residents, again, regardless of the time interval from transfer to discharge.
L. Notes dictated/written at end of life are treated the same as discharge summaries.
M. The resident teams on the Critical care unit sign out to the Night Medicine team at 7 p.m. The resident teams on the House Medicine and Step Down rotations will sign out select patients to the respective R1 responsible for their floor prior to leaving for the day at 5:00 p.m.
N. Central Line Placement in the Internal Jugular and Subclavian vein can only be performed under direct supervision of an attending physician present in the room and gown. Before any line placement, the indications, contraindications, and steps should be reviewed (Instructional Video)

Clinic schedules:
During this rotation the residents do not attend continuity clinic

Weekend rounds:
The weekend rounds are divided evenly between the senior residents and the PGY-1 residents. This will respect the duty hours, allowing 1 day off in 7 averaged over a 4 week period. The residents are responsible of providing the Internal Medicine Program with a copy of their weekend round scheduled at the end of the first week of the rotation. See table below.

Appendix A:
Specific goals for each level of training:

R1:
Main focus starts with data collection
Recognizing, and treating emergencies in close contact with the senior resident and the attending physician(s)
Interpretation of basic lab tests
Generating a reasonable differential diagnosis, and an assessment and plan.
Order writing, with emphasis on legibility and clarity to avoid errors
Calling for help early
Each R1 carried up to 6 patients at a time
Helping medical students on ICU assignments
Admit unit patients from 12 pm to 6:30 pm

R2/R3:
Management and supervisory role
Setting priorities
Immediate resource for R1 and Medical students
Supervise procedures, only if certified to do so

Communication with attending physicians and family members
Dealing with emergencies and Running the codes.
Code Team Leader will complete the PowerNote entitled **Rapid Response Team Note.**

H&P, Progress Note, Initial Consult: see Resident Handbook in SharePoint page 15

Daily Round Schedule:

7 – 7:30am:	Sign out
7:30 – 8am	CCU teaching
8-9am	Residents see their patients, address nursing needs, seniors coach the interns on presentations, etc.
9-10am	Cardiology rounding
10-11am	UPP rounding
11- 12pm	Chaudhry's group rounding

If UPP is still rounding by 11 AM (due to delays caused by codes, emergency procedures, etc.), the team must split to provide rounding with 1 member of the Chaudhry's group.

Transfer of care and communication:
In order to increase patient safety, the sign out process and communication with the different care teams is extremely important.
All patients admitted to the critical care unit from any other unit in the hospital need a receiving or code note on arrival to the unit. Adequate verbal or personal sign out is expected when a patient is transferred into or out of the unit. The senior resident is responsible for ensuring that adequate communication takes place.

Senior resident will attend the Critical Care Committee Meeting which takes place every 3rd Wednesday at 8:00 am in the 2 Shaw Conference Room. If the ICU senior resident is not able to attend, he or she will coordinate with the CVU senior to attend instead.

Appendix B: Daily Conference topics

Monday	Tuesday	Wednesday	Thursday	Friday
2 Code training-1 Code training-2	3 Code training-3 clinic	4 Central line PFTs-1	5 Shock PFTs-2	6 Sepsis COPD
9 Introduction to respiratory failure Asthma	10 Mechanical ventilation-1 clinic	11 Mechanical ventilation-2 Pulmonary embolism	12 Noninvasive ventilation and Weaning Pulmonary hypertension	13 ARDS Lung cancer
16 Acid base and ABG interpretation Hemoptysis	17 Post arrest care clinic	18 GI bleed Lung nodules	19 Critical care US Pneumonia	20 Pleural effusion Lung transplant
23 Sedation and Delirium Sarcoidosis	24 Toxicology clinic	25 HTN emergencies Interstitial lung	26 ICU renal failure and electrolytes Bronchiectasis	27 Hematological issues in ICU Pneumoconiosis

Central line

When to choose what site
Go over ultrasound guidance principles, finding the needle tip and being aware of the depth of the needle and staying away from the lung
How to prevent air embolism
http://www.nejm.org/doi/full/10.1056/NEJMvcm0810156
http://www.nejm.org/doi/full/10.1056/NEJMvcm0801006
http://www.nejm.org/doi/full/10.1056/NEJMvcm074357
http://www.nejm.org/doi/full/10.1056/NEJMvcm055053

Shock

Recognition
Types of Shock
Monitoring and reversal
Volume resuscitation and tracking
Pressors
http://www.nejm.org/doi/full/10.1056/NEJMra1208943

http://www.ncbi.nlm.nih.gov/pubmed/?term=vasoactive+drugs+in+circulatory+shock+AND+hollenberg
http://emcrit.org/podcasts/vasopressor---basics/

Sepsis
Surviving sepsis guidelines and evaluation of prior antibiotic exposure and prior resistant organisms using the chart
Early goal directed therapy and PROCESS trial
Source investigations and control
http://www.nejm.org/doi/full/10.1056/NEJMra1208623
http://www.nejm.org/doi/full/10.1056/NEJMra043632

Introduction to respiratory failure
Respiratory failure (hypoxic and hypercapnic)
Mechanisms of hypoxia
VQ mismatch, shunt and dead space
How to correct hypoxia
How to correct hypercapnia

Mechanical ventilation 1 and 2
Types of breaths (triggers, target, timing)
Modes of ventilator
Peak pressure/Plateau pressure concepts
Ventilator graphics (pressure/volume/flow vs. time)
Auto PEEP and ways to correct
Patient ventilator dyssynchrony (autocycling, flow dyssynchrony, failure to trigger)

Non---invasive ventilation
Indications and contraindications
Difference between CPAP and BiPAP
How to choose settings and titrate based on ABGs

Weaning
Modes of weaning
When to extubate
Postextubation failure

ARDS
Definition and diagnosis
Ventilator management
ARDS net studies on tidal volumes, fluid management, PEEP
Recruitement and rescue maneouvers
Proning
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3198645/
http://emcrit.org/podcasts/logistics---proning/

Acid base and ABG interpretation
http://www.nejm.org/doi/full/10.1056/NEJMra1003327
http://www.nejm.org/doi/full/10.1056/NEJMra1215672
how to interpret ABGs
causes of different acid base disorders
differentiate between acute and chronic respiratory acidosis
can also use few online sample cases for residents to interpret ABGs

Post arrest care
Principles of hypothermia protocol
Need for cardiac cath in these patients
Neuroprognostication
Basics of brain death and organ donation
http://www.uptodate.com/contents/post---cardiac---arrest---management---in---adults
http://emcrit.org/podcasts/post---arrest---care---2013---i/

GI bleed
Upper vs lower
Causes
Management

Critical care ultrasound
Cardiac
Lung
http://www.critcaresono.com/page.php?page=19
http://www.critcaresono.com/page.php?page=26
http://www.yale.edu/imaging/echo_atlas/views/index.html

Pleural effusion
Exudate vs transudate

Causes of effusion
Thoracentesis

Sedation and delirium

Agents and when to use what
Importance of analgesia
Delirium: prevention and treatment
http://www.nejm.org/doi/full/10.1056/NEJMra1208705
http://crashingpatient.com/resuscitation/sedation/icu---sedation.htm/

Toxicology

Basic testing in all patients with changes in mental status and possible overdose (asa, tylenol, pregnancy, abg, EKG, chest xray, drug screen)
Thiamine, Dextrose (if needed), ?naloxone (low dose if breathing)
Important: Basic questions (before the family disappears)
Recognize the common toxidromes
Adrenergic
(Amphetamine/Bupropion/Cocaine/EtOH or BZD withdrawal)
Cholinergic
Anti Cholinergic
Sedate (Opioid and Benzo)
Serotonergic (every couple of months)
Tylenol: If you suspect APAP ingestion give NAC, no need to wait for levels
TCA overdose
Osmolal gap, the toxic alcohols and the use of Fomepizole
Salicylate overdose, look for need for HD
Talk to Tox and look for antidotes to ingestions.

HTN emergencies

Urgency vs emergency
Types of agents and how to choose
Secondary hypertension
Drug overdose, cocaine and betablockers

ICU Renal failure and Electrolyte disturbances

Types of acute renal failure and workup
Hypo and Hyper---Natremia
HyperKalemia
Phosphate
Magnesium

Hematological issues in ICU

Anemia
Thrombocytopenia
Guidelines for transfusion

Appendix C:
Self assessed goals (what do you want to get out of this rotation?)

Curriculum Review Signature Page
I reviewed the curriculum including the work hours, rounding schedule, weekend rounds, as well as my call schedule and I do not foresee any violations of the duty hours.
Please return/fax (412-664-2164) to the residency office after review.

Attending Signature: _____ Date _____

Resident Signature: _____ Date _____

Weekend Rounds

Please complete with the person/team rounding each weekend.

	Saturday	Sunday
Weekend 1		
Weekend 2		
Weekend 3		
Weekend 4		