

1) Is there a need Nationally / Locally for these physicians? Do they go into academics or private practice?

Critical care can be defined as medical care to any patient who is physiologically unstable and requiring constant titration of therapy according to the evolution of the disease process. This definition extends to any location such that critical care is defined physiologically rather than geographically. The American College of Chest Physicians (ACCP), American Thoracic Society (ATS), and the Society of Critical Care Medicine (SCCM) predicted that the proportion of care provided by critical care physicians in the United States will fall below standards because of the growing disease burden created by the aging population. In 2004, along with the American Association of Critical Care Nurses, they published a white paper asking federal healthcare policy makers to address the compelling evidence that current trends predict that the demand for critical care services will exceed the supply of critical care physicians into the year 2030 (1). Angus et al also concluded that adoption of an intensivist model would require a large expansion of the critical care workforce, as only about one in three ICU patients is currently cared for by intensivists (2).

The Leapfrog Group, a consortium of major private and public organizations that studies ways to improve health care, has advocated the use of an “intensivist model” of critical care delivery, where all ICU patients are managed or co-managed by an intensivist. In its ICU physician staffing model, the Leapfrog Group defines “intensivist” as one of the following: 1) Critical Care Board-certified physician; 2) Board-certified emergency medicine (EM) physician who completed an Accreditation Council for Graduate Medical Education (ACGME) accredited Critical Care Fellowship; or 3) Board-certified physicians in medicine, anesthesiology, pediatrics, or surgery who completed training before the availability of Critical Care Fellowships (3-5). This model is also supported by the National Quality Forum, a nonprofit organization created to develop and implement a national strategy for health care quality measurement and reporting (6).

In 2005, a consensus paper endorsed by SCCM and multiple emergency medicine societies called for establishing access to formal critical care medicine (CCM) training and certification for emergency physicians (EPs) and noted that EM-CCM physicians would not only help address the intensivist shortage, but also strengthen critical care delivery in the emergency department (ED) and facilitate coordination between EDs and intensive care units (7). In a survey performed by Mayglothling et al (8), 49% of EPs who completed ICU fellowships practice both EM and CCM, and 62% practice in academic institutions. The number of EPs completing CCM fellowships has risen: 12 from 1974 to 1989; 15 from 1990 to 1999; and 43 from 2000 to 2007. This number may be under-

represented since there is no easy way to track EPs who choose to do critical care fellowships and there has been no certification process in the United States.

2) Is there sufficient patient volume and faculty expertise at University of Florida Health Shands to create a competitive program?

Yes, UF-Shands is a very busy tertiary care center that accepts many of the sickest and most complex patients in the region. With multiple sub-specialties such as vascular surgery, neurosurgery, urology, transplant, orthopedics, cardiovascular, and medical, many difficult cases in the region are transferred here. Currently there are three departments with adult critical care fellowship training (anesthesia, surgery, and medicine), with a total of 17 fellows. See below for statistics of individual units.

Units Available for rotation and number of faculty in each:

Medical ICU (24 ICU beds) - 20 faculty in the Pulmonary/Critical Care Division
Surgical ICU (48 ICU beds) - 7 trauma/CCM faculty; 7 anesthesia/CCM faculty
Neurosurgical ICU (30 ICU beds) - 7 anesthesia/CCM faculty
Burn ICU (12 ICU beds) - 7 anesthesia/CCM faculty, 2 Burn/trauma faculty
Emergency Department - 6 bed critical care area, 3 ED-ICU trained faculty; currently 3 Emergency Medicine trained fellows in the anesthesiology CCM training program (3 recent graduates)

Number of fellows in other programs:

Internal Medicine Pulm/CC fellowship: 9 Fellows
Surgical CC fellowship: 2 Fellows
Anesthesia CC fellowship: 6 Fellows
Emergency Medicine CC fellowship (with Anesthesia): 3 Fellows

Trauma Quality Management Committee Data at Shands:

Trauma Alerts + #Acute Care Surgery
2010: 1040 + 836 = **1876** total patients
2011: 1143 + 915 = **2058** total patients
2012: 1131 + 1069 = **2200** total patients

Most of the surgical patients in the trauma unit come from 'trauma alerts' and acute care surgery consult patients who may be very sick and need optimization of hemodynamic status prior to surgical intervention. Complex multi-trauma and head injured patients present to this unit.

Emergency Department "Alerts": The emergency department volume is around 65,000 per year (adult only) and sees a wide variety of emergencies. Strokes, sepsis, trauma, and STEMI are specific conditions that have an 'alert'

system in place and help identify and streamline care of the patient to the appropriate unit. Fellows have an opportunity to learn systems based approaches to complex and critical patient.

3) How does the program function in conjunction with the core program and other subspecialty training programs.

This program will function as part of a multi-disciplinary environment of critical care training. The Emergency Medicine critical care fellows will rotate through the individual ICU's with goals and objectives similar to other fellows in each particular program. The fellows will also be involved with the Emergency Medicine residency critical care teaching initiatives, which includes a lecture series as well as 'hands on' courses in areas such as airway, venous access, and ultrasound. See below for individual units the fellows will rotate and estimates of block time.

ED Critical Care lecture series for ED residents: fellows would be involved in the lecture series and involved in joint CCM conferences between ED and MICU/SICU/NeuroICU. Topics covered include hypertensive emergencies, intracranial hypertension, trauma, toxic overdoses, palliative care, ethics, vasopressor therapies, massive pulmonary embolism, massive gi bleeding, etc.

Critical Care Ultrasound: Ultrasound is a core requirement for ED resident graduates. This would be beneficial in certain applications for cross-training in ICU ultrasound curriculum (<http://ccm.anest.ufl.edu/education/ultrasound>)

Medical ICU: estimate of 4 total MICU rotation blocks (2 per year), with opportunity to do extra MICU time during elective

Surgical ICU: 4west (trauma ICU) and 4east (surgical ICU) would do according to anesthesiology ACGME requirements in first and second year (estimate 12 total blocks)

Neurosurgical ICU: would do according to anesthesiology ACGME requirements in first and second year (estimate 6 total blocks)

4) How does a critical care fellowship program enhance the institution?

This EM program allows a more multi-disciplinary training program in critical care for all programs involved. Some specific knowledge or skills that an EM applicant may bring to the fellowship include use of point of care ultrasound, toxicological patterns, acute arrhythmia interventions and ECG interpretation, procedural sedation, minor orthopedic procedures (reductions), and wide breadth of patient types and disease processes (obstetric, pediatric, ophthalmic, psychiatric).

Emergency physicians with additional critical care training would provide critical care expertise in the ED, facilitating earlier delivery of critical care and potentially reducing morbidity and mortality rates and cost (9). These fellows would also be ideally suited to improve coordination between the ED and ICU. As demonstrated with other fellowships available to EM physicians such as toxicology and pediatric emergency medicine, fellowship trained emergency physicians enhance ED care, system implementation, and education in their specific areas (9).

Also, the Department of Emergency Medicine would benefit with a better understanding and collaboration of intensive care unit best practices in the Emergency Department. For example, certain protocols in the units (traumatic brain injury, diabetic ketoacidosis, status epilepticus, sedation/analgesia, central venous line placement, etc) could be introduced in a transitional form to provide better care of our patients. Fromm et al have reported that during a one year study period in a teaching hospital, 154 patient days of ED critical care were provided in the ED with a length of stay up to 11 hours. Other studies have also confirmed that patients frequently stay for extended amounts of time in the ED and in one study found that 15% of all critical care was performed in the ED (10-11). We currently have an ED resident rotation in our 6 bed critical care/resuscitation area and may benefit from increased training of critical care through our fellowship program.

5) What are the goals and objectives of the program?

Goal: To offer a training program to the graduating emergency medicine resident that provides training in a multi-disciplinary intensive care unit practices. Topics would include complex medical ICU patients (such as obstructive lung disease, renal failure, septic shock, cardiogenic shock, pneumonia, etc.), complex surgical ICU patients (s/p transplant, complex vascular surgery patients, trauma, etc.), and neurological ICU patients (status epilepticus, stroke, intracranial bleeds, etc.).

It is difficult for an EM resident to find a true multi-disciplinary training/fellowship setting. Most EM residents have rotated through medicine, surgical, and pediatric type settings and search for programs that are able to provide all of these. It is also sometimes difficult for EM residents to find programs that will accept based on their emergency medicine training. CCM fellowship directors cite the lack of specific EM pathways to formal critical care certification and resultant concerns of criticism from their Residency Review Committee as major barriers to accepting EM physicians into their programs (12-13).

Objective: It would be expected for EM fellows to be able to have and pass board certification through the ABA-ABEM pathway recently approved (July 2013). Other institutions that have accepted EM residents over the past 10-15 years have provided information on ability of EM residents to successfully

complete fellowship and tested knowledge base compared to other specialties. For instance, Chiu et al recently published a comparison between surgery trained residents and emergency medicine at Shock-Trauma (University of Maryland). Surgeons and EPs performance scores on the MCCAP (testing guide by SCCM) were not different. The mean National Board Equivalent score was 419 +/- 61 for surgeons and 489 +/- for EP's. Since scores do not always equate to competency in management of a unit, all of the fellows at the same center also receive a formative interval based (9 point scale with 1 as most unsatisfactory and 9 as most superior) and narrative evaluations. The range of mean clinical evaluations was 7.2 for surgeons and 6.8 for EPs (14).

Other good FAQs:

ACEP: http://www.acep.org/_Critical-Care-Section-MicroSite/Critical-Care-Section---FAQs/

EMCrit: <http://emcrit.org/critical-care-fellowship-faq/>

University of Pittsburgh: <http://www.ccm.pitt.edu/frequently-asked-questions>

EMRA: <http://www.emra.org/criticalcaresdivision/>

EMCCM Fellowship: <http://www.emccmfellowship.org>

References:

1. Ewart GW, Marcus L, Gaba MM, Bradner RH, Medina JL, Chandler EB. The critical care medicine crisis: a call for federal action: a white paper from the critical care professional societies. *Chest*. 2004;125: 1518 –1521
2. Angus DC, Kelley MA, Schmitz RJ, et al: Current and projected workforce requirements for care of the critically ill and patients with pulmonary disease: Can we meet the requirements of an aging population? *JAMA* 2000; 284:2762–2770
3. (http://www.leapfroggroup.org/media/file/Leapfrog-ICU_Physician_Staffing_Fact_Sheet.pdf)
4. Milstein A, Galvin RS, Delbanco SF, et al. Intensive care unit physician staffing: the Leapfrog initiative. *Eff Clin Prac*. 2003; 3:313–6
5. Gutsche JT, Kohl BA. Who should care for intensive care unit patients? *Crit Care Med*. 2007;35:S18–S23
6. National Quality Forum. Available at: <http://www.qualityforum.org/>. Accessed August 5, 2013:
7. Huang DT, Osborn TM, Gunnerson KJ, et al. Critical care medicine training and certification for emergency physicians. *Ann Emerg Med*. 2005; 46:217–23
8. Mayglothling et al. *ACADAEMIC EMERGENCY MEDICINE* 2010; 17:325–329
9. Huang D: Impact of emergency department care on intensive care unit costs. *Crit Care* 2004; 8:498 –502
10. Fromm RE Jr, Gibbs LR, McCallum WG, et al: Critical care in the emergency department: A time-based study. *Crit Care Med* 1993; 21:970 –976
11. Nelson M, Waldrop RD, Jones J, et al: Critical care provided in an urban emergency department. *Am J Emerg Med* 1998; 16:56–59
12. Huang DT, Gunnerson KJ, Kimball EJ, et al: Emergency medicine residents' access to critical care fellowships. *Crit Care Med* 2003; 31(12 Suppl):A27
13. Milzman DP, Rubin S, Moskowitz L: Consideration of adult critical care training for emergency physicians. *Acad Emerg Med* 1999; 6:345–348
14. Chiu et al. *The Journal of TRAUMA® Injury, Infection, and Critical Care* • Volume 71, Number 1, July 2011