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Acute Care Surgery Program: Mentoring Fellows and Patient Outcomes

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Background. **Acute care surgery programs have demonstrated that trauma patient outcomes have not changed with the addition of emergency general surgery (EGS) responsibilities. EGS patient outcomes and the mentoring of fellows on EGS service have not been previously studied. We hypothesize that EGS patient outcomes would not differ by provider on a service driven by evidence-based medicine (EBM) protocols.**

Patients and Methods. **Retrospective study of prospectively collected EGS repository. academic level I trauma center, and regional EGS referral center from 2003 to 2007. There were 14 faculty and seven fellows during the study period. EGS coverage is a full week, with weeknight coverage by the in-house trauma/EGS faculty. Fellows are mentored by designated faculty while on service, who discuss patients, assist in the OR, or assume care if necessary. Data collected included age, gender, LOS, ICU LOS, ventilator days, disposition (home/rehab), and infectious complications(IC) (VAP, BSI, UTI, SSI). Primary outcome was mortality.**

Results. **1769 patients met study criteria. The mean age was 47.1 (±18), 47% were males. The average ICU LOS was 2.9 d (±7.9), ventilator d 2.6 (±7.6); 82.1% were discharged home and 13.7% were referred to rehab. There was no statistical difference in mortality, LOS, ICU LOS, disposition, ventilator d, and IC between faculty and fellow providers.**

Conclusions. **An EGS service with EBM protocols assures consistency in patient outcomes independent of provider level: faculty or fellows. Our model for mentoring fellows did not decrease EGS patient outcomes.**

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Key Words: **acute care surgery; emergency general surgery; fellowship program; outcomes; mortality and complications.**

INTRODUCTION

During the last several years, trauma programs in the United States have been in evolution as they expand to add acute care surgery [1]. This evolution is in response to several factors that have arisen in U.S. health care. With the clinical success of nonoperative management, trauma surgeon case volume has steadily decreased [2, 3]. In addition, the Institute of Medicine recently reported on the critical status of the lack of adequate emergency department surgical coverage [4]. Academic trauma centers have responded with coverage of the emergency department by adding emergency general surgery as part of an evolving acute care surgery practice. Acute care surgery programs are providing care for trauma, surgical critical care, and emergency general surgery patients [5].

The addition of emergency general surgery to trauma programs has demonstrated that trauma patient outcomes (mortality) have not changed significantly [6]. Yet, other authors have described the limits in terms of patient coverage compared with available manpower as hospital length of stay, ventilator days, and certain complications increased due to increasing patient loads [7].

The American Association for the Surgery of Trauma has taken the lead role in creating a curriculum for training the future manpower needs of acute care surgery [8, 9]. What has yet to be defined is the actual model of how to train the clinical fellow beyond the residency years. There is no board certification or matriculation at this time. The only other measure of training is patient outcomes. Acute care surgery/emergency

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TABLE 1

Second Year Fellow - Service Experience over a 6-Month Period

	Total weeks (out of 26)	Total weekends	TICU (%)	Trauma (%)	EGS (%)
Fellow (WK) Weekend trauma (nights) – 9 Weekend EGS (Friday, Saturday, Sunday) – 2	14	11	4 (29)	5 (36)	4 (29)

TICU = trauma intensive care; EGS = emergency general surgery.

general surgery (EGS) patient outcomes and the mentoring of fellows on an EGS service have not been previously studied. As we developed our acute care surgery fellowship training program, we determined that fellows must be provided the opportunity to make decisions independently while still being mentored closely to ensure overall patient safety in the care of this complex and high acuity patient population. Our goal was to assess if EGS patient outcomes (morality and infections) would differ by provider (faculty or fellows) on a service driven by evidence-based medicine (EBM) protocols.

MATERIALS AND METHODS

We performed a retrospective study of a prospectively collected Emergency General Surgery service repository. The study was performed at an academic level I trauma center and a regional emergency general surgery referral center from 2003 to 2007. The Vanderbilt University Medical Center Internal Review Board approved the study.

Fellowship Structure

Our Surgical Critical Care and Acute Care surgery fellowship program is a 2-y program consisting of an ACGME accredited Surgical Critical Care residency and a second clinical year that provides additional training and mentorship in both the operative and nonoperative management of acutely injured trauma patients and emergency general surgery patients. A detailed description of the program can be found in the "Fellows Manual" at the following web site: http://www.traumaburn.com/Fellow/SCCFellowMan/FellowsManual2008-2009.pdf. In our program, the first year fellow is a Surgical Critical Care "resident" and does not operate independently. During this year, Surgical Critical Care residents participate in the care of all critically ill or injured patients on the Trauma and Surgical Intensive Care Unit services and have rotations on the Neurological, Burn, and Cardiac Intensive Care Unit services. They participate in both resuscitative and operative management of critically ill trauma patients and in all bedside surgical procedures in the ICUs.

During the second year of the training program, following successful matriculation from the critical care portion of their training, the fellow is promoted to the rank of Instructor of Surgery in the Department of Surgery with admitting and operative privileges. During this year, fellows rotate as faculty on the trauma or EGS services in the same call rotation as the faculty with structured mentorship (Table 1). Instructors of Surgery (i.e., second year fellows) are paired in the rotation with full time faculty while on the trauma services, or with a "backup" faculty mentor while on the EGS service. Backup faculty is designated on the monthly call schedule maintained on the web site. For the EGS service, the instructors discuss patient care of all patients daily during morning check report and with the Surgical Intensive Care unit faculty for those patients admitted to that unit. Additionally, instructors are mandated to call in backup faculty for any cases with a high likelihood of adverse outcome or death. The backup faculty mentor is to discuss patient care management, assist in the OR, or assume care if necessary.

Complex cases are discussed in a weekly Acute Care Surgery fellow's conference and a final layer of mentorship is provided by review by the director of the EGS service (JJD) and the program director (AKM). Patient care on the EGS service is standardized with nine categories of evidence-based medicine protocols to guide the care of the EGS patient. Each category of protocols has 6 to 16 individual protocols (http://traumaburn.com/egs/protocols.htm). Protocols are reviewed and updated every 2 y by all faculty and fellows.

The second year fellows have a "fellow clinic" where they see their trauma and EGS postoperative follow-ups and major nonoperative trauma admissions. The EGS service has a "chief resident clinic" and while on the EGS service they staff the clinic. During the second year of the fellowship, they follow their postoperative patients in their clinic and can schedule future elective operations (i.e.; colostomy takedown). For patient requiring long tern follow-up beyond their fellowship time, the fellows can either transfer the patient to a senior faculty or to one of the rising clinical fellows.

Patients

The patients were divided into two groups based on which provider performed the initial operative procedure: faculty *versus* fellow. Patients were included if they had an operative intervention and an EGS attending at the time of discharge (Fig.1). Patients who underwent an operative procedure, but were managed and discharged on another service, were excluded. All patients admitted to the EGS service are prospectively captured into an EGS database. Validated data fields are captured in the electronic medical record and electronic data warehouse. Data collected included age, gender, length of stay (LOS),

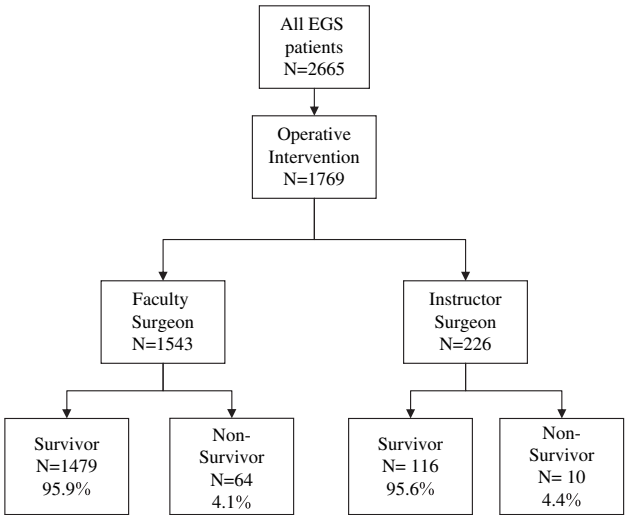

FIG. 1. Study design.