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### Forward Surgical Teams in Iraq and Afghanistan

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This article is an overview of the role of Forward Surgical Teams in support of American soldiers in Iraq and Afghanistan.

#### Introduction

As of February 2006, there were 2,247 deaths and 16,653 wounded among American soldiers in Iraq. Critical care medicine has played a significant role in the management of these patients. This review focuses on the role of the US Army's Forward Surgical Teams (FST) in the care of these combat-wounded casualties.

#### FST Development

During Operations Desert Shield and Desert Storm, it became clear that the mobile army surgical hospitals (MASH) and combat support hospitals (CSH) were not agile enough for modern warfare (Place et al. 2003). The speed at which the front moved during these operations prolonged transportation times to these more traditional medical units. The FST was conceived as a highly mobile surgical unit that could perform damage control surgery near the front line. It is intended to provide a rapid response to the 10-15% of patients that need surgical stabilization of their condition (generally involving hemorrhagic shock) before transportation to a higher level of care, such as a CSH.

The FST generally consists of a 20-person team, which ideally includes an orthopedic surgeon, three general surgeons and two nurse anesthetists. It is designed to be deployed and operational within one hour of arrival in the combat zone. The FST is intended to have two operating tables with resources for up to 30 operations and the required post-operative care. This includes the ability to provide six hours of intensive care for up to eight patients. Given the limited quantity of supplies necessary to keep the FST mobile, resupply is required after 72 hours of operations (DOD, USA 2004).

#### FSTs in Action

Recently, the 555th FST detailed their experience providing forward surgical care during the main assault phase of Operation Iraqi Freedom (Patel et al. 2004). Over the period described, the unit was moved to multiple locations and was able to "open for business" within 30 minutes of reaching a new site. Over 23 days, the unit evaluated 154 patients and performed 25 major operations. Of note, US soldiers comprised only 51% of their patients; the rest were Iraqi prisoners of war and civilians.

The 250th FST was deployed in both Afghanistan and Iraq, during which time it performed 127 surgical procedures (Rush et al. 2005). In Iraq, the unit had a remarkable average time to operative intervention of 1.5 hours after injury, lending support to the FST concept. The 250th FST also played a significant role in combat-related humanitarian missions. The 250th FST performed 105 operations with local surgeons (more than

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the number of combat operations). Their other humanitarian projects included revamping the local emergency medical system, re-establishing surgical grand rounds at local hospitals and forming the Iraqi-American Surgical Association (Rush et al. 2005).

The US Marine Corps has a smaller version of the FST, called the Forward Resuscitation Surgery System (FRSS). During the first month of the Iraqi conflict, six FRSS teams performed 149 procedures on 90 casualties (Chambers et al. 2005). Two-thirds of their patients were Iraqi (Chambers et al. 2005). The FRSS teams' patients were received within a median of one hour of injury, and the critically injured were received within 30 minutes. The FRSS teams deemed that 8 of their 21 most critical patients would have died without the Forward Surgical Team in the combat theater.

Although FSTs offer life-saving, rapid-response medical care, they do have some limitations. For example, the 250<sup>th</sup> FST reported that thoracic injuries are almost 67% more likely if the patient was not wearing body armor at the time of injury (Rush et al. 2005). Unfortunately, civilians (including children), who do not benefit from advances in body armor, have suffered injuries requiring FST treatment in both Iraq and Afghanistan. Because of FSTs' limited equipment capacity, however, the FSTs often lacked the pediatric equipment necessary to care for the children that were brought to them. Operating within several kilometers of the front line also carries inherent danger. The FST is lightly armed and is occasionally responsible for its own defense. The 555<sup>th</sup> FST was fired upon on multiple occasions and was actually involved in taking several prisoners of war (Patel et al. 2004).

## **Conclusion**

The Forward Surgical Team is a relatively new concept. American FSTs have recently had their first real combat test in Iraq and Afghanistan. Initial published reports support that the concept is feasible: quality surgery and critical care can be rapidly provided in austere conditions. It will be important to the future of far-forward surgery to evaluate results from the Iraq conflict to determine if this concept results in improved combat mortality.

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