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US Air Force Neurosurgeons Deployed through Operation Enduring Freedom Help Save the Lives of Innocent Young Victims of War in Afghanistan

CHARLOTTESVILLE, Va. (July 16, 2010) – War inevitably takes a tragic toll on innocent bystanders including civilians and children. Military neurosurgeons have a long history of helping US and coalition troops and civilians overcome devastating and life-threatening neurological injuries incurred as a result of military strife. While stationed at US military facilities, neurosurgeons also contribute to invaluable humanitarian efforts, operating on patients with injuries and conditions unrelated to battle.

A compelling article published in the *Journal of Neurosurgery: Pediatrics*, entitled *Pediatric neurosurgery during Operation Enduring Freedom* details the experiences of a group of pediatric neurosurgeons over the course of a 2-year mission at Bagram Airfield/Heate N. Craig Joint Theater Hospital (CJTH), 27 miles north of Kabul. While there, they performed lifesaving procedures on innocent young bystanders of the military conflict in Afghanistan. Authors are Paul Klimo Jr., MD, MPH, 88th Medical Group, Wright-Patterson Air Force Base, Ohio; Brian T. Ragel, MD, Department of Neurological Surgery, Oregon Health & Science University, Portland, Oregon; William H. Scott Jr., DO, 99th Medical Operations Squadron, Nellis Air Force Base, Nevada, and Randall McCafferty, MD, Wilford Hall Medical Center, Lackland Air Force Base, Texas. The article is posted online at: <http://thejns.org/doi/full/10.3171/2010.3.PEDS109>.

Currently, the US Air Force deploys one neurosurgeon to Bagram Airfield/CJTH for a 4-6 month period. Delivery of neurosurgical care is clearly defined by medical rules of engagement. The top priority is to provide care to all US and coalition troops with battlefield injuries. Care is also provided to Afghan National Security Forces, contractors, and local nationals, including children and enemy combatants who are injured as a result of combat operations.

There are many factors to be considered when evaluating potential humanitarian cases, whether adult or pediatric. Rules of engagement prohibit taking on humanitarian cases if the hospital is on “amber” or “red” status, as determined by bed-space availability. This is typically the situation in the spring and summer months when the pace of warfare is intense, with a resulting high number of battlefield-related injuries. Additional considerations are availability of equipment and personnel to handle a large variety of cases, and the lack of resources in Afghanistan for pediatric follow-up care.

The authors provide more than a glimpse into the types of injuries incurred by innocent children – they include statistics on the types of injuries and neurosurgical procedures performed, including four illustrative case studies. From September 2007 to October 2009, 296 neurosurgical procedures were performed in adult and pediatric patients at CJTH. A summary of the procedures yielded the following statistics:

- Battlefield-related injuries: 215 procedures (73 percent)
- Humanitarian: 81 procedures (27 percent)
- Of the 215 procedures, the largest number were cranial 138 (47 percent)

Pediatric Patients

- Forty-three children (19 percent) underwent 57 of the 138 cranial procedures
- Gender: 16 girls, 27 boys

- Mean age 7.5 years, age range 11 days to 18 years
- Thirty-one (54 percent) of the 57 procedures were for battlefield-related trauma
- Twenty-six of the 57 procedures (46 percent) were humanitarian
- Forty-nine of the 57 procedures were cranial
- Craniotomies or craniectomies for penetrating brain injuries accounted for 15 of the 31 battlefield-related cases. Improvised explosive devices (IEDs) were the most frequent source of the projectile(s).

In Afghanistan, children are injured from the weapons of the current conflict; rockets, mortars, and IEDs, as well as weapons from prior conflicts, such as mines left by the Russians more than 20 years ago. Although just under half of all the children who were treated at CJTH by neurosurgeons were injured as result of these weapons, more than 50 percent of all neurosurgical procedures were for battlefield-related injuries. Penetrating injuries due to projectiles of various sources were the most common injuries. The most common type of humanitarian case was closed head injury incurred from a fall or motor vehicle accident.

The principles that dictated treatment of penetrating head injuries were to wash out extra- and intracranial wounds, debride any necrotic tissue, and retrieve any foreign objects that were easily accessible (such as, metallic fragments, debris, or bone), evacuate any intra- or extraaxial hematomas, and control any bleeding. In patients with little wound contamination and minimal intracranial injury, local scalp debridement and repair were performed.

“Fortunately, there were no deaths due to battlefield-related head injury, but a small number of children had scalp wounds that broke down after their initial surgery. Several factors contribute to children in Afghanistan being at higher risk of wound complications. Scalp injuries from penetrating brain trauma are often irregular, with the tissue being devitalized and contaminated. Moreover, most children in Afghanistan are malnourished, as evidenced by their much smaller size-for-age appearance – and virtually every child has intestinal roundworms that further contribute to malnourishment,” remarked Dr. Klimo.

“As the US involvement in Afghanistan deepens, there will undoubtedly be further combat and with this, more children will be harmed. We hope that this manuscript provides insight into what is being accomplished in Afghanistan – and the outcomes, albeit limited, that are being achieved. Although deployment was trying for us, the experience of caring for these children was highly satisfying both personally and professionally,” concluded Dr. Klimo.

The opinions and assertions contained herein are the private views of the authors and are not to be construed as official or reflecting the views of the US Air Force or the Department of Defense. The authors report no conflict of interest.

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