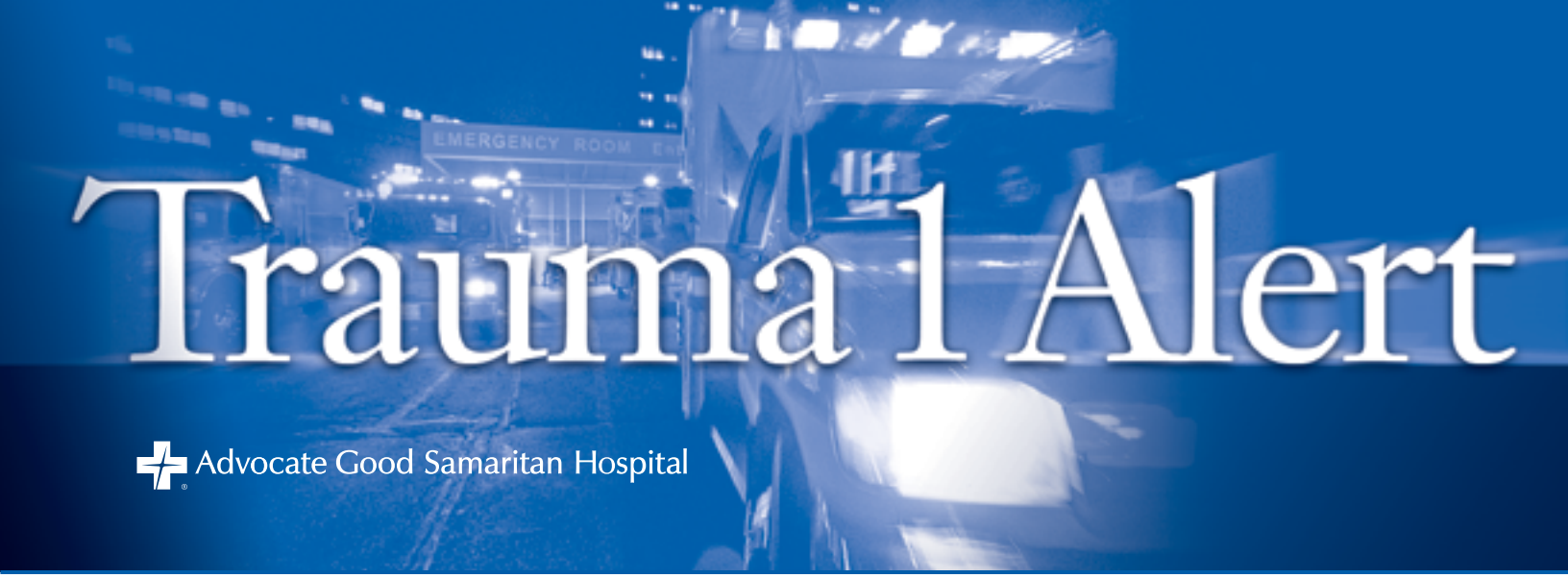


# Trauma 1 Alert

Advocate Good Samaritan Hospital



## *Medical Advances as a Result of War*

War is not glamorous. Let me set the record straight before I continue. Throughout history more than one million Americans have given their lives in defense of this nation, and countless more have suffered wounds of great magnitude. War creates great suffering on both the battlefield and on the home front. But as horrendous as war is and always has been, war has also been a great inspiration for medical and surgical advancement.

Over 623,000 Americans perished in the Civil War and countless others fell wounded and ill. World War I resulted in 117,000 American deaths, and the Second World War generated over 407,000 U.S. fatalities. The American death toll in the Korean War was 37,000, and nearly 58,000 Americans perished during the fifteen years of the Vietnam War. And to date, over 4,500 Americans have given their lives in the ongoing Global War on Terrorism being waged in both Afghanistan and Iraq. But because of American resolve to combat the wounds of war, great innovation has lead to significant advances in both medicine and surgery, perhaps the greatest benefactor being the art and science of Trauma Surgery.

Not only has war resulted in improvements in battlefield casualty care, many advances made have been adopted by the civilian medical community. And many of these advances have evolved into current standards of care. Prior to the American Civil War, open extremity fractures requiring amputation often resulted in life-threatening hemorrhage, as damaged or cut vessels were left open to bleed so as to prevent “bad humors” from re-entering the body. Civil War surgeons, frustrated by the morbidity – and frankly the mess – of the massive blood loss, reintroduced the concept of ligating the bleeding vessels, as once had been done by the 16th Century French surgeon, Ambroise Paré.

Trench warfare of World War I, waged throughout the European farm lands of the early decades of the 1900s, resulted in numerous gas gangrene infections. Field surgeons quickly realized the need for thorough wound debridement and delaying wound closure. At the Inter-Allied Surgical Conference of 1917, surgeons of all

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allied nations established that management of contaminated war wounds would include debridement and delayed closure – a now basic, surgical tenant of wound management which minimizes the risk of necrotizing soft tissue infections. It was also during World War I that hypovolemia became recognized as one of the causes of shock. Early war-time experimentation with intravenous volume replacement using sea water and human plasma lead to our current use of I.V. fluid and blood products resuscitation.

The bloodiest war of the 20th Century was the Second World War. Penetrating abdominal wounds causing colonic injury were associated with a 66% mortality, regardless of the meticulousness of the colonic repair. Contamination as a result of injury resulted in a prohibitively high rate of anastomosis breakdown, intra-abdominal abscess, sepsis, and death. However, observant military surgeons realized that by diverting the fecal flow via ileostomies and colostomies without performing immediate bowel anastomosis greatly improved outcomes, and became widely adopted as the standard of care not only for penetrating abdominal injuries, but for spontaneously perforated colonic disease as well.

During the Korean War, an effort was made to minimize the time between when a casualty was wounded and when he received care at a military hospital. The goal was to get the wounded casualties into the hands of most-skilled professionals as quickly as possible. Rapid casualty transport with helicopters to forward positioned MASH units staffed with waiting surgical teams greatly improved outcomes. This might be considered the prototype for modern aeromedical transport to the closest Level I Trauma Center. Perhaps the greatest medical contribution of the Korean War came from World War II era surgeons, like Army Surgeon Michael DeBakey, who had dabbled with repair of damaged arteries during the previous war so as to minimize the need for amputation. During the Korean War, military surgeons like DeBakey began repairing even complex arterial wounds of the extremities and abdomen preventing countless amputations and deaths. The Vietnam War gave rise to modern pre-hospital care, pushing more advanced, life-saving treatment of battlefield casualties into the hands of medics and corpsmen. Surgical airways, thoracic needle decompressions, and aggressive shock resuscitation, all performed by para-medical personnel prior to movement to a military field hospital is what gave rise to our modern pre-hospital, Emergency Medical System.

Casualties from the ongoing Global War on Terrorism have also inspired physicians and surgeons to embrace new concepts of trauma management resulting in the lowest, war-time casualty death rate in history. “Damage Control Surgery” – introduced in 1995 by Dr. Ken Mattox – was initially scoffed at by surgical critics, but has become the standard of care in the present combat zones. By design, gravely wounded personnel with uncontrolled hemorrhage and uncontrolled internal spillage from multiple fragment wounds or gunshots receive expeditious, surgical exploration with the goal of doing only that which is necessary to control ongoing bleeding and to control ongoing intestinal spillage. This may be accomplished via several methods including surgical ligation of vessels, shunting of critical vessels which cannot be safely ligated, simple packing of the wounded cavity, resection of injured bowel without anastomosis or ostomy, or simple ligation of wounded intestine with umbilical tape. The operative cavity is then left open, covered only with surgical towels and adhesive plastic, and the patient is then aggressively resuscitated in an ICU setting – often in a field hospital remote from the operative facility – where coagulopathy, acidosis, and hypothermia are aggressively treated. Once the metabolic derangements have been corrected (often several days later), definitive surgery is then performed, and the abdomen is closed.

“Damage Control Surgery” has become the standard of care in the combat zones, and over the past seven years has become a widely adopted surgical technique in U.S. Level I Trauma Centers. Topical, hemostatic agents,

such as Quik-Clot™ and Chitosan, have now been used extensively in the war zones of Iraq and Afghanistan, and have allowed many gravely wounded service members to arrive alive at a forward, military, surgical facility. It is likely that some variation of the Chitosan dressing will eventually find its way into the kitbags of our civilian EMS personnel. Tourniquets – for decades blackballed by physicians – have without question saved countless lives of casualties whose limbs were blown apart by enemy explosive devices. The Combat Applications Tourniquet, version two (CAT-2), has been successfully applied perhaps thousands of times by corpsmen and medics, as well as military infantrymen. Post-use analysis of these tourniquets by researchers at the Army Institute of Surgical Research at Fort Sam Houston, Texas, has determined that the benefits of tourniquet use greatly outweigh any adverse effects of their use. Modern availability of immediate trauma care at our Level I Trauma Centers minimizes the likelihood that tourniquet use will catch on in our urban and suburban communities. However, in remote rural areas where trauma care access is limited, tourniquet use may re-emerge as a method to prevent severe blood loss in select, devastating extremity injuries.

***Despite all the death, suffering, and financial losses incurred during war, inspired and motivated military medical personnel have pioneered advances in American Healthcare since the Civil War.***

Decompressive craniectomy for massive head trauma – a rarely used technique prior to 2001 – has been employed by neurosurgeons (and a few general surgeons) in large numbers in both Iraq and Afghanistan, resulting in an unprecedented casualty salvage rate from otherwise fatal head trauma associated with life-threatening, intracranial hypertension. Famed news reporter Bob Woodward's life was saved by this very technique, and has become more acceptable in our civilian trauma centers.

Modern blood banks just aren't available in the far forward combat zones where mobile surgical units often work. This is opposed to the robust, U.S. military facilities in Baghdad and Balad where modern blood banks are established, but due to the huge trauma volume, component blood products are often in limited supply. The "Walking Blood Bank" – where service members donate fresh, warm, whole blood directly to wounded casualties providing the necessary platelets, clotting factors and red cells, otherwise unavailable as component products in the austere environment of the far forward combat zone – allows for treatment of the consumptive coagulopathy that often accompanies the complex wounds seen on today's battlefield. The "Walking Blood Bank" has collected and transfused thousands of units of blood, and has saved as many lives. This concept could find its way into our civilian healthcare system if a natural disaster on a massive scale drained our regional supplies of available blood products.

Long range transport of critically ill casualties, from the combat zone hospitals of Iraq and Afghanistan, to safe, robust facilities in Germany and the United States, has been facilitated by the routine use of the Air Force's "Flying ICU" Critical Care Air Transport (CCATT) Teams. Enormous military aircraft, fitted with patient-carrying litters, equipped with modern ICU devices, and staffed with Critical Care physicians, Nurses, and Respiratory Therapists, routinely transport critically ill casualties out of harm's way with amazing safety and success. This will undoubtedly raise the bar for civilian aeromedical transport in the future.

Despite all the death, suffering, and financial losses incurred during war, inspired and motivated military medical personnel have pioneered advances in American Healthcare since the Civil War. Perhaps our nation's history of nearly a dozen major wars in its two hundred and thirty two year history – and the necessity to heal the wounds of its countless casualties – has a silver lining. Trauma care has improved – greatly.

James P. Cole, Jr., D.O., F.A.C.S.

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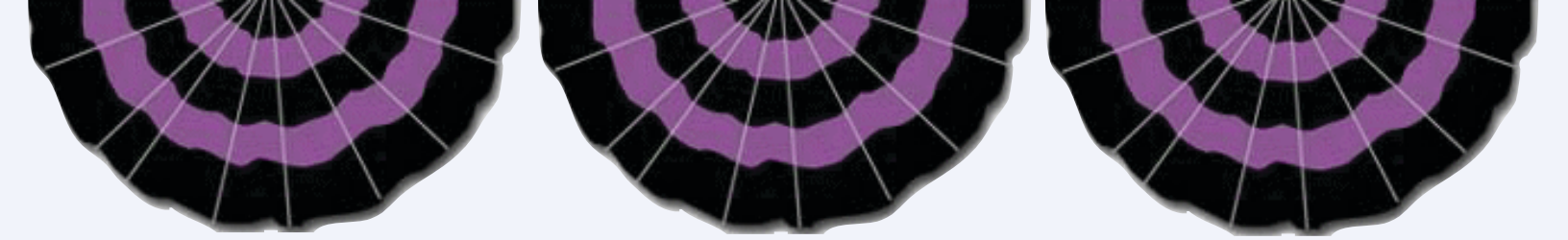
Level I Trauma Center

Advocate Good Samaritan Hospital



## Reflections on Air Angels Crash

On October 15th, during the night time air transport of an intubated, seizing infant, the Air Angels Bell 222 medical helicopter known as "Angel One" clipped an allegedly unlit, 750 foot radio tower, bringing down the three member air crew and the young infant girl to their untimely deaths. This is a tragedy to not only the four casualties, but also to all of us who worked with and knew the pilot, flight nurse, and flight medic of that fateful flight. I knew those men who died in that crash, and I am personally saddened by their premature loss of life. But I am also disappointed in some of the reactions I have heard from regional hospitals who have decided to abruptly cancel any future use of the Air Angels helicopter medevac services. I feel that such reactions are irrational.

For the record, I have no financial, managerial, or consultant ties to the Air Angels organization. But I know air transport well. As a trauma surgeon practicing at a Level I Trauma Center, I have safely received hundreds of severely injured casualties from various Air Angels crews. And I have also flown on dozens of helicopter medevac missions during the Global War on Terrorism overseas. Helicopter medevac does play a distinct and important role in the regional management of the critically wounded and the critically ill.

I believe that Air Angels has flown over 5,000 flight missions since its inception. And this recent crash has resulted in its one and only patient death due to a helicopter crash. This translates to a mortality of 0.02%. Whereas some may argue that even one death is too many, I would counter by stating that the many lives saved by Air Angels due to rapid air ambulance transport surely outweigh the tragedy of this one, terrible patient death.

Helicopter transport is not without its potential risks. But numerous aspects of healthcare share substantially higher risks of injury and death, yet we continue to employ them for the many benefits they provide. Examples include blood transfusions, cardiac catheterization, carotid artery surgery, and even chemotherapy. And patients have died hospitals around the country as a result of ventilator associated pneumonia, medication reactions, or even surgical bleeding. Yet these hospitals continue to treat patients despite an imperfect record.

As a surgeon, I decide for each individual patient whether or not to perform a particular procedure based on the risk to benefit ratio. If the benefits of the procedure outweigh the potential risks to that patient, I proceed with the operation. I believe that with respect to air ambulance casualty transport, the same approach must be used. Emergency department physicians and consultants as well as those in receiving hospitals must both carefully take a few moments to reflect on whether air transport is absolutely in the patient's best interest. If not, ground transport should be utilized. But if the nature of the patient's injuries or illness favor transport to a higher level of care by the fastest means of transportation possible, then air transport should be used.

I strongly believe that hospitals that sever ties with Air Angels as a result of this crash are making an error in judgment. Without reservation, I will continue to support the brave men and women who put themselves in harm's way each and every time they answer the call to rescue or transport a critically ill or wounded patient. Doing anything less would be a dishonor to pilot Dell Waugh, flight nurse Bill Mann, and flight medic Ron Battiato. May they rest in peace, and may they never be forgotten.

Dr. Jim Cole

## Upcoming Events

As part of our ongoing commitment to continuing education, we have offerings applicable to all health care providers caring for trauma patients.

***Contact our Outreach Office at: 630.275.3540***

***December 11-12, 2008—***

**5th Annual Advocate Injury Institute Symposium: "Trauma 2008: A Risky Business"**

**3rd Annual Nursing Poster Competition**

For more information, go to www.advocatehealth.com/trauma

***Trauma Grand Rounds—***

**February 24, 2009**

**June 23, 2009**

**October 27, 2009**

***To register online, go to www.advocatehealth.com/goodsam and click on Emergency Service/Trauma.***

## Transfer to a Level I Trauma Center with one phone call

We are committed to serving our regional hospitals and Level II Trauma Centers by accepting any trauma patient needing a higher level of trauma care with one simple phone call. To transfer a trauma patient to Good Samaritan Hospital, please call 630-275-5900. At the prompt, say "Operator." When the hospital operator answers the line, ask to speak directly to the Trauma Surgeon. The Trauma Surgeon will pick up, and in almost all cases he will accept your patient in transfer. You will not have to call the bed board or any other physician. We will coordinate the entire acceptance. Alternatively, you may call our hotline at

***1-800-URGENT-5***

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Downers Grove, IL 60515

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Advocate Good Samaritan Hospital

Visit www.advocatehealth.com/goodsam and click on Emergency Services/Trauma

***Direct Transfer Line 1-800-URGENT-5***