



SURGERY NEWS

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COURTESY DR. DAVID BURRIS

Inside a C-17 plane are stanchions that hold up to three litter patients each, plus power, suction, and oxygen for patient care.

Critical Care Transport Has Gotten Up to Speed

BY LESLIE SABBAGH
Elsevier Global Medical News

In the early days of Desert Shield/Desert Storm, no one—including the military—knew how many casualties to anticipate.

Once the ground war started, “we were told to expect 15,000 killed in action or died of wounds, and 45,000 casualties total,” said Col. Donald Trunkey, MC, USA, chief of professional services and chief of surgery at the U.S. Army’s 50th General Hospital, the largest in-theater hospital in Riyadh, Saudi Arabia.

Those numbers, fortunately, were far off the mark. By the end of that conflict, 250 U.S. combat casualties received care at the hospital, mostly for wounds that

were not serious. Like the conflicts in Iraq and Afghanistan, Desert Storm casualties commonly consisted of penetrating wounds to the extremities. But unlike today’s conflicts, the wounds were fairly straightforward.

“Body armor made a big difference in the wounds we saw. Blunt trauma was severe, especially traumatic brain injury,” said Dr. Trunkey, professor of surgery at Oregon Health and Science University, Portland, in an interview.

The biggest problem during Desert Storm wasn’t wounds or the number of casualties; it was the logistics involved in safely and quickly transporting casualties out of theater to the U.S. military hospitals in Landstuhl,

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Rethink Volume Cutoff as Mark of Surgical Excellence

Other measures may yield a truer picture.

BY BRUCE JANCIN
Elsevier Global Medical News

PHOENIX — Using surgical volume cutoffs to define centers of excellence for pancreatic resection is arbitrary and inappropriate, because volume accounts for only a tiny portion of the variability in hospital mortality rates, Dr. Robert A. Meguid said at a congress sponsored by the Association for Academic Surgery and the Society of University Surgeons.

“Although volume has an important impact on mortality, volume cutoff is necessary but not sufficient to define centers of excellence. Volume appears to function as an imperfect surrogate for other variables that may better define centers of excellence,” explained Dr. Meguid of Johns Hopkins University, Baltimore.

Designating centers of excellence on the basis of institutional volume thresholds is a matter of great practical significance for surgeons and hospi-

tals. It affects patient referral patterns. Moreover, there is a movement to limit reimbursement for surgery performed at hospitals that do not carry the center-of-excellence rating, he noted.

Various volume cutoffs to define centers of excellence for pancreatic resection have been proposed. One that has garnered much attention is the standard of 11 or more resections per year. That standard was put forth by the Leapfrog Group, the influential health policy consortium of more than 150 Fortune 500 companies and other large health care payers founded by The Business Roundtable.

To scrutinize the relationship between pancreatic resection volume and outcomes, Dr. Meguid retrospectively studied 5,110 pancreatic resections for pancreatic cancer performed at 923 U.S. hospitals during 1998-2003. The data came from the

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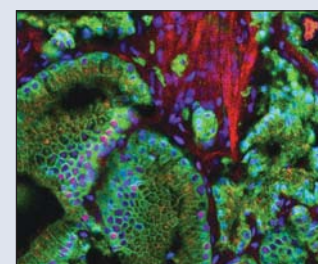
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SGR Fix Won’t Come Cheap or Easy

BY JOEL B. FINKELSTEIN
Elsevier Global Medical News

WASHINGTON — It won’t be cheap to fix Medicare’s problematic physician pay formula, but lawmakers aren’t saving any money by waiting to replace it either, experts testified at a hearing of the Senate Finance Committee.

Congress has been putting off a fix for many years already, leading to diminishing physician reimbursement. Inflation-adjusted pay for common surgical procedures has dropped between 25% and nearly 70% since 1989. That, in turn, is causing a crisis in many of the nation’s emergency departments.

“Congress has studied this problem, asked for and received reports, and heard hours of tes-

timony,” said Dr. Thomas Russell, executive director of the American College of Surgeons and an ACS Fellow. “It is now time to take action. Medicare’s unstable and unpredictable payment system is causing a crisis in American health care, and we cannot continue to punt this problem to another year.”

The rising cost of health care is one of the biggest problems facing the government. At the

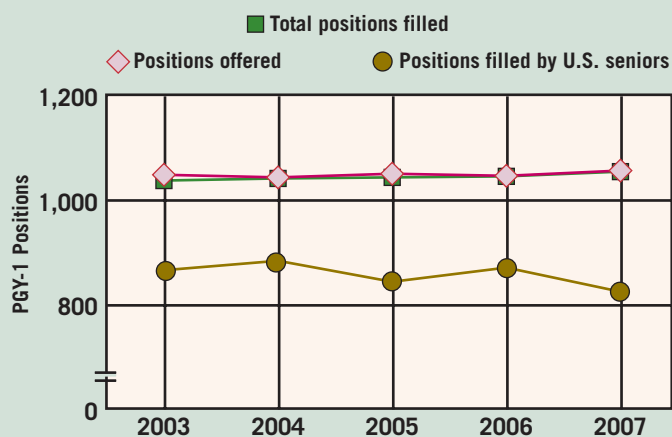
current rate of growth, federal spending on Medicare and Medicaid will eventually consume 20% of the U.S. economy, according to Peter Orszag, Ph.D., director of the Congressional Budget Office.

“In health care, we get what we provide incentives for. We currently provide lots of incentives for advanced technologies

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VITAL SIGNS

General Surgery Residency Positions Filled By U.S. Seniors Drop



Source: National Resident Matching Program

Resourceful Surgeons Rescue the War's Wounded

BY LESLIE SABBAGH
Elsevier Global Medical News

Advances in technology have increased the number of survivors in the Iraq war, compared with previous conflicts. Better body armor has reduced torso wounds, Kevlar helmets have prevented many head wounds, and tourniquets have helped keep troops alive. Soldiers who in the past would have died now survive, often with grievous wounds. And surgeons are treating not only combat casualties but also civilian injuries, typically with limited resources.

At least 60% of combat wounds are extremity related, according to Col. James Ficke, MC, USA, orthopedic consultant to the U.S. Army Surgeon General and assistant chair of orthopedics, Brooke Army Medical Center, Fort Sam Houston, Tex. As deputy commander of the 228th combat support hospital (CSH) in Mosul, Iraq, in 2005, Dr. Ficke was in charge of the daily clinical operations of the 44-bed hospital that served coalition military operations in northern Iraq.

What's been most impressive, he said, is the high degree of limb salvage, given that these patients are "surviving amazing extremity trauma" as well as significant head and abdominal injuries (*J. Am. Acad. Orthop. Surg.* 2006;14[suppl. 10]:S142-3). Thanks to whole-blood transfusions, hemostatic agents, and early use of tourniquets, more soldiers are being brought into CSHs alive than in previous wars.

Combat Casualty vs. Civilian Care

In September 2005, Lt. Col. Art Chasen, MC, USA, served as deputy commander of the medical task force in Afghanistan and was responsible for the U.S. forces' medical care at three level III facilities, with OR and ICU capacity, and four forward surgical teams throughout Afghanistan.

In Bagram, Afghanistan, where he served as a general surgeon, Dr. Chasen

and his staff treated patients with 40%-60% of their bodies burned. Some of these were young girls whose job was to keep oil lamps and stoves burning.

Conditions were dirty, and the ICUs were open bay. Limited staff and resources forced Dr. Chasen to make difficult life-and-death decisions. "We finally decided that the patient with 60% burns would not get intubated. We simply couldn't do U.S. standard of care for these burn patients," said Dr. Chasen, a general surgeon and chief of bariatric surgery at Eisenhower Army Medical Center, Fort Gordon, Ga.

"We see a lot of compartment syn-

BATTLEFIELD SURGERY HAS ITS OWN LAWS, GOVERNED BY MASSIVELY CONTAMINATED WOUNDS AND RUTHLESS BUGS SUCH AS ACINETOBACTER.

dromes," Dr. Ficke said. Because of massive soft tissue injury, surgeons in theater do fasciotomies "on anyone we anticipate will have circulation problems during transport. If the potential for compartment syndrome exists, then we encourage preemptive fasciotomy," said Dr. Ficke.

Combat casualty care uses the same principles as civilian trauma care: debridement and maintenance of circulation to limbs. The use of an external fixation device (ExFix) has improved definitive care.

"ExFix is the biggest advance in this conflict in terms of early long-bone fracture management. We don't perform any internal fixation," said Dr. Ficke. Surgeons ensure the vascular supply, clean the wound, and externally fixate the fracture. Casualties are sent to the Balad CSH, then to Landstuhl (Germany) Regional Medical Center, and finally to the United States.

The availability and quality of chronic

care dictate a different treatment course for civilians in countries like Afghanistan, said Dr. Chasen. In a U.S. soldier, he explained, "if you could preserve blood flow, you knew someone else could maybe rehab the limb. You would [amputate only] when there was absolutely no way you could keep the limb alive or if the limb put [the soldier's] life at risk." But for Afghan nationals, there's no physical therapy, plastic surgery, or reconstruction. Surgeons amputated because "there was no way [nationals] could survive the injury and save the limb," he said.

When Lt. Col. Peter Armstrong, MC, USA, wondered whether to salvage a limb, he had a different set of criteria for U.S. and Iraqi casualties. Dr. Armstrong, chief of vascular surgery and program director for general surgery at Eisenhower Army Medical Center, served on a forward surgical team and in a CSH in Iraq in 2005. "If the nerve was gone and there was extensive soft tissue injury, I know the U.S. casualty could get a good prosthesis, so I amputated." But in Iraq, prostheses and care are much less sophisticated. In Iraqi patients, he sometimes left an insensate limb because that was a better option than a wooden peg would have been.

Dr. Armstrong, an ACS Fellow, treated civilian casualties. For him, the most difficult challenges were resources. The CSHs are "well situated and have very good equipment, but the resources aren't endless and the supply chain is a long way" from the United States, he said.

Damage Control

Even though military surgeons do rotations in some of the busier civilian trauma centers, their training in civilian trauma does little to prepare them for combat casualties, according to Maj. Eric Johnson, MC, USA, who served in Baghdad. "[It's hard] if you're not a trauma surgeon to leave the mind-set of general surgery, where you have to fix everything, and enter into damage control

mode," said Dr. Johnson, a general surgeon specializing in colorectal surgery at Eisenhower Army Medical Center.

In combat surgery, damage control is the Holy Grail, said Dr. Ficke. "Orthopedic surgeons learn how to assist the general surgeons for damage control. We teach general surgeons how to use ExFixes. Every one of my surgeons was in the OR debriding and assisting, if not doing primary ExFixes," he said. "Damage control was something we didn't know in previous conflicts."

Their DOW (died of wounds, referring to those who die after receiving physician treatment) rate was lower than 4%—certainly impressive, yet no better than any other CSH, he noted. "Every doctor in our CSH was ATLS [Advanced Trauma Life Support] qualified and ATLS proficient. Even our psychiatrist could run a trauma code," said Dr. Ficke.

The Laws of Battlefield Surgery

Surgeons also learned to manage the open abdomen, using the vacuum-assisted closure dressing for temporary closure. They were more likely to leave U.S. troops' abdomens open because those soldiers "would get explored at the next echelon of care," Dr. Johnson explained.

Each time a casualty is evacuated, the receiving surgeon starts over. "They don't assume everything is necessarily taken care of. Certainly we miss things in a mass casualty, including bowel injury and bleeding from injuries.

"Everybody got empiric antibiotic, and we always covered more broadly than in the States," said Dr. Johnson, adding that they used imipenem.

Battlefield surgery has its own laws, governed by massively contaminated wounds and ruthless bugs. *Acinetobacter* bacteria thrive in Iraqi soil, and their resistance patterns and biology are very different from those in the United States, Dr. Johnson said.

Another challenge confronted by combat casualty surgeons is managing multiple injuries. Orthopedic wounds, for example, often include massive soft tissue injury and a fracture with a big segmental defect that must be joined. The conflict lies in keeping the patient stable enough to heal the fracture, while at the same time needing to move the person to treat the soft tissue injury, Dr. Ficke explained. Suppose you have a patient with 6 inches of femoral bone loss who can still feel his foot. You don't want to amputate, but it can be months before the bone heals, and during that time he may be unable to move his knee.

The challenge is whether to save the leg because "you know it will [take] months of rehab, and the knee is stiffening and may be chronically painful; . . . the difficulty in long-term reconstruction is predicting whether limb salvage or amputation will leave [the patient] with the best function," he said.

Like most combat surgeons, Dr. Armstrong found that extensive debridement and contamination control were of paramount importance.

And he discovered that "even though there's a learning curve, it's actually pretty quick, in that most Army surgeons are well trained and can readily adapt." ■

Learning From Desert Storm

Transport • from page 1

Nürnberg, and Frankfurt, Germany. The Air Force, charged with evacuating casualties from combat support hospitals to large, tertiary care U.S. military hospitals throughout the world and then back to the United States, “didn’t have its act together as far as critical care air transport. The first casualty I sent, we had to hand ventilate,” Dr. Trunkey recalled.

During Desert Storm, delivering critical care air transport was a hard-learned lesson. Since then, that situation has “changed 180 degrees. I was so impressed with in-theater care, and the critical care provided from Iraq to Landstuhl and then from Landstuhl to Walter Reed Army Medical Center [in Washington],” said Dr. Trunkey, who recently served at Landstuhl. After the conflict in Somalia, he said, the Air Force made a “1,000% effort to provide this critical care.”

The shock and awe success of Desert Storm led the military to believe that future wars would be conducted that way: in and out of theater quickly with a small footprint. It was felt that the logistical challenges of the large number of medical resources used in theater would be incompatible with a conflict situation.

During Desert Storm, “we weren’t prepared to evacuate [the casualties] out. Don [Trunkey] was dissatisfied with the level of

preparation, and he asked to upgrade the care,” Col. David Burris, MC, USA, said in an interview. Dr. Burris, a professor and chair of the surgery department at the Uniformed Services University of the Health Sciences, Bethesda, Md., served at a receiving hospital in Nürnberg during Desert Storm and in Iraq in 2003 during Operation Iraqi Freedom.

The need for better care generated the formation of the Combat Trauma Surgical Committee, a triservice body to oversee training of military physicians and write policy.

In the past, getting casualties home was a prolonged process, said Dr. Burris, a member of the American College of Surgeons Committee on Trauma. The Air Force would transport only reasonably stable casualties to Landstuhl. During Vietnam, for example, patients were kept in war zones for about a month, then sent to Japan or the Philippines, and finally to the United States for chronic care.

When Operation Iraqi Freedom began, the military had only small medical teams moving with the troops because after Desert Storm, the line officers had asked that hospitals be scaled down to keep pace with the smaller, more rapidly deployable fighting forces. That approach required working without much specialty support. To make the small foot-

print work, the military needed small surgical teams. To make them light and mobile (each forward surgical team averages 20 people), they couldn’t provide much postop care. The need for smaller hospitals coincided with improved medical training requirements. Only small, extensively trained surgical teams would go into war. Once they hit the ground, they’d have no chance to learn on the job, Dr. Burris explained.

At the same time, it became clear that the Air Force couldn’t transport stable people only. To support the small surgical teams, they had to shift critically ill patients who needed ICUs. Patients requiring more care were taken first to Kuwait City and then to Landstuhl. Detainees or local nationals went to the U.S.S. Comfort, a mobile, flexible, and rapid-response medical treatment facility. By the end of 2003, as the theater matured, larger hospitals were moved into Baghdad, Balad, and other Iraqi sites, and neurologists, vascular surgeons, and other specialists were brought in.

Dr. Burris, who recently returned from a tour in Balad and Landstuhl, explained the current process in an interview. The casualties are evacuated to the closest appropriate hospital. Once stabilized, all are flown out of Balad. Before leaving Balad for Landstuhl, the patients are reevaluated and prepared for flight.

One challenge is discontinuous

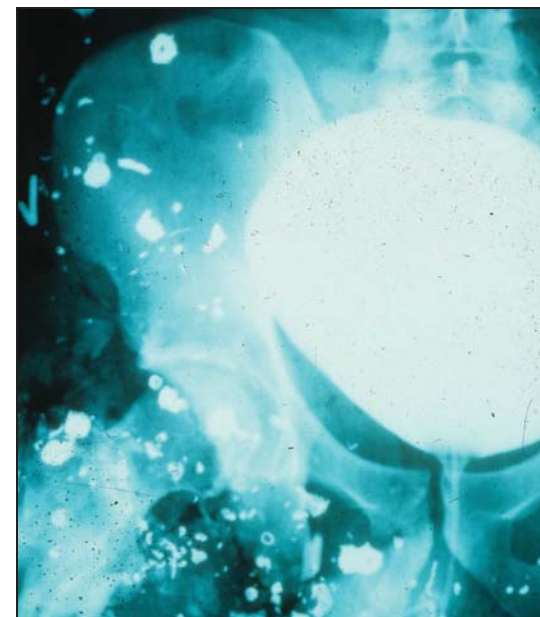
locations for care. “As a surgeon, I want to follow my patients’ care from start to finish. In [combat care], you only do a piece, and you have to trust and send your patient on,” Dr. Burris said.

Working under the auspices of the Combat Trauma Surgical Committee, the weekly Video Trauma Teleconferences and monthly Continuum of Care

Systemwide Video Teleconferences, which function like morbidity and mortality conferences, allow surgeons from various countries to discuss individual patients and give feedback to those who did the first care and follow-up.

One result of the teleconference is that critical-care transport planes now have appropriate pain control equipment. Surgeons continue to work on improving patient care.

And the flight out of danger is more comfortable now, Dr. Burris noted. “The C-17s used for transport are a nice ride compared to the C-130 and C-141. These workhorses are less noisy and have better temperature control. They were designed from the ground



A hand grenade exploded beneath a Humvee seat, wounding the pelvis of a Desert Storm G.I.

PHOTOS COURTESY DR. DONALD D. TRUNKEY

up for air [evacuations].”

The C-17s take patients out of Balad to Landstuhl two or three times a week. On average, U.S. troops arrive in Landstuhl in 72 hours. The trip may be longer if they are unstable. Sometimes, burn patients bypass Landstuhl and are flown directly to the burn center at Brooke Army Medical Center in San Antonio.

About 50% of the injured can stay in theater, Dr. Burris said. Patients with big wounds attract attention, but are a small percentage of all wounded.

“Proper wound care and preventing infection saves lives as well. A lot of the less glamorous behind-the-scenes work is doing routine things consistently and doing them well,” he added. ■

Fast Adaptation Aided Military Surgeons in Afghanistan

BY DAMIAN McNAMARA
Elsevier Global Medical News

FORT MYERS, FLA. — American surgeons stationed in Afghanistan during the early phase of the U.S. military operation in 2002 quickly learned to expect the unexpected, according to a presentation at the annual meeting of the Eastern Association for the Surgery of Trauma.

For example, a U.S. Air Force field transfer hospital established solely for stabilizing U.S. military personnel had to accommodate local Afghans needing surgical care, forcing surgeons like Dr. Henry J. Schiller to quickly do more with less.

“We were not outfitted to take care of indigenous personnel,” said Dr. Schiller, an ACS Fellow who is now on the surgery faculty at the Mayo Clinic in Rochester, Minn. Because of the minimal health care structure in that country, however, “we ended up taking care of everyone,” he said.

Surgical management of injuries from

land mine explosions was not what surgeons initially expected, either. “We dealt with a lot of kids who stepped on a land mine. The foot that steps on the land mine often gets blown off,” Dr. Schiller said at the meeting, which was jointly sponsored by Wake Forest University. Surgeons soon learned that although most entry point wounds were small and rather innocent looking, they often masked a great deal of debris. X-rays were of limited value because most debris was not metallic.

“The force of the explosion blows grass, dirt, and other debris up into the leg, so there is a large level of contamination. The contralateral limb would be affected as well,” Dr. Schiller explained.

“Battlefields are very contaminated places,” said Dr. Donald Jenkins, a U.S. Air Force colonel and trauma medical director at Lackland Air Force Base, Texas, in a separate presentation at the meeting. In some cases, infection already is disseminated when a patient arrives. “In Afghanistan,

there can be hours or days before they present, versus the typical 30 minutes in Iraq.”

Initial surgical management consisted of limited debridement and wound closure, but many patients developed infections from the extensive contamination. Experience taught the surgeons to make linear extensions to expand the wounds for debridement, to debride often, and to leave wounds open whenever possible. For example, one Afghani man presented as acidotic with a gunshot wound to his groin. His wound was closed two or three times, Dr. Schiller said. “Finally, we left the wound open and it healed with secondary intention.”

“Open wounds are safe. It was a difficult question when to close, if to close,” said Dr. Schiller.

Open wound management was adopted for most land mine injuries. “Circular amputation is pretty common with land mine injuries,” Dr. Schiller said. “We leave skin and muscle flaps and let it heal by sec-

ondary intention.” But it is not foolproof— one land mine patient who seemed to be doing well developed necrotizing fasciitis and ultimately was lost to multiorgan failure.

“We did sharp debridement,” Dr. Schiller said. “Even saline was in short supply.” Surgeons debrided wounds each day in the operating room, the most sterile area of the hospital, and used analgesia liberally.

Responding to a question about antibiotic therapy for these patients, Dr. Schiller said, “We used Bactrim—we had a fairly good supply.”

Dr. Jenkins, an ACS Fellow, agreed with Dr. Schiller that the reality was not what he expected. “Our phrase was, ‘we knew what it was supposed to be like with blast injuries, but we didn’t know what it was like,’” he said. “It would be akin to [people] without kids reading a Dr. Spock book and watching a nephew for a weekend, and saying they know what it’s like to be a parent.” ■