



# SAVING THE GOLDEN HOUR

By Elise Steinberger

The ancient Greek physician Hippocrates once said, “War is the only proper school of the surgeon.” The past 15 years of combat in Iraq and Afghanistan have been that for us, said Brig. Gen. Kory Cornum, Air Mobility Command surgeon.

After all these years of war, Air Force medical professionals have gotten very good at evacuating, transporting, and treating traumatically injured troops in less than an hour, a concept known as the “golden hour.” This timeliness has come despite dealing with long distances, remote austere locations, and mountainous terrain, specifically in Afghanistan.

Much improved aeromedical evacuation (AE) techniques have led to higher survival rates in recent decades. The survival rate hovered between 70 and 80 percent in all of America’s 20th century wars. In the 1991 Persian Gulf War the survival rate was typical, at 76 percent.

Fast forward to the war on terror, and by the mid-2000s injured troop survival rates jumped to 90 percent, thanks to better AE, including faster

action and en route care. But survival rates for the traumatically injured continued to lag.

In 2009 in Afghanistan, the survival rate of critically injured troops was at 86 percent, according to a September 2015 study led by the Army Institute of Surgical Research. With a renewed focus on the golden hour, the traumatic injury survival rate has increased to 90 percent.

“The golden hour is great, the golden 50 minutes is better, the golden 40 minutes is better than that, the golden 30 minutes is better than that. ... The sooner you can take care of somebody, the better,” said Cornum. “Military medicine is set up from the beginning, when you go to combat, with getting care to the injured person as quickly as possible.”

According to the study, from the start of combat in Afghanistan, the military reduced median transport time from 90 to 43 minutes. Now that combat has

officially ended and operations have decreased in Afghanistan, maintaining readiness of these highly skilled units is key.

So now comes the hard part. “For much of US military history, after each conflict ends, the focus of care for [the] military medical corps transitioned to less acute care, and the lessons learned were not systematically preserved or formally passed on to inform military medicine during the next conflict,” stated a March 2015 Defense Health Board report. “In the recent conflicts in Afghanistan and Iraq, many lessons have been learned in trauma and injury care, providing an opportunity to amend past missed opportunities by documenting, validating, and disseminating this knowledge.”

“That’s why we wear the uniform,” said Lt. Gen. Mark A. Ediger, Air Force surgeon general. “We keep our readiness to meet the requirements for deployable capabilities at the level they need to be for the Air Force mission. That’s the top priority.”

Cornum said the Air Force uses a “multiprong approach” to ensure all

aspects of readiness, including working at home hospitals to keep clinical skills current. “You do as much as you can at home. You stay as busy as you can.”

Air Force medical professionals employ their medical skills in a civilian setting when not deployed. However, Cornum said, they must also prepare for the aspects of medicine that are unique to combat.

“Civilian trauma and war trauma are not quite the same—they’re similar. There’s no real place to [experience] war trauma,” Cornum said.

To give medical professionals experience with treating trauma, the Air Force embeds them in civilian trauma centers in Baltimore; St. Louis; Cincinnati; Las Vegas; Sacramento, Calif.; and Birmingham, Ala. These periodic rotations, for a week or two at a time, are part of predeployment and general readiness training.

“It’s a constant thing, plus the ‘just-in-time’ training,” Cornum said.

Maintaining uniformity of care with allies is also important. Ediger said that with allies in Afghanistan, “we were all using the same guidelines within the coalition, whether the team providing the care was German or British or Dutch or US.”

With the reduced operational tempo, Ediger said international allies periodically work together to maintain readiness. “We have an exercise every year with the British military health services where we actually exercise in stabilizing and moving trauma by air,” he said.

**Left: MSgt. Scott Wilkes (l) demonstrates a device that reads vital signs to an Iraqi air force captain during an aeromedical evacuation mission over Iraq in November 2008. USAF strives to maintain uniformity of care with allies.**

Care Evacuation Team personnel for unique in-flight medical scenarios.

“We have it set up so that it feels like you’re [in] the back of an airplane—there’s noise and vibration. We can make it dark or light, smoke, and all those kinds of things, so that you can get used to working in the back of an airplane,” Cornum said.

### LOOKING FORWARD

Col. Virginia Johnson, consultant for nurse anesthesia in the Office of the Air Force Surgeon General, has deployed three times with a Tactical Critical Care Evacuation Team and was part of the first TCCET in 2011. These units bring casualties to forward surgical teams on the ground or from forward surgical teams to sites of further medical care.

According to Johnson, having advanced medical providers on TCCETs offers care in the air, beyond “damage control and resuscitation”—such as managing noncompressible hemorrhage or “something you can’t put a tourniquet on,” giving blood, and administering certain drugs—during transport.

Johnson trained with an emergency room physician and another nurse anesthetist, who then deployed separately to Afghanistan. Cornum said

“We have the capability now in the US military to send critical care capability all the way to the point of injury, to move that patient—initially by rotary wing—and then to do the subsequent aeromedical movements and [air evacuation] with critical care capability in place,” Ediger said.

According to Cornum and Ediger, Air Force leadership is working on a strategy for implementing rapid medical response and air movement in logistically challenging regions, such as Africa and the Pacific.

“Unless you’re traveling in the space shuttle,” the traditional golden hour rule becomes difficult for especially long distances, without careful advanced planning. That’s why Air Mobility Command, Air Combat Command, and Air Force Special Operations Command are working together to ensure teams adapt as necessary and stay agile, ready, and capable, said Cornum.

Researchers are working on capabilities for pre-hospital surgical stabilization. Other factors such as operational scenario, geography, and security could impact the outcome, said Ediger. “Our interest is always in pushing more trauma stabilization capability into the pre-hospital environment because we know that will always be important, but there are a lot of factors that are weighed in terms of setting the medical lay-down in an operational theater.”

For example, as the way the forces are engaged changes, medical teams will also shift, said Ediger. “We’re working on an adaptation of the mo-

## The Air Force is working to ensure it preserves its lifesaving aeromedical evacuation skills.

The Air Force uses patient simulation technology to expose medical professionals to different scenarios and a broad spectrum of injuries. “The military is really heavily invested in simulation. All of our hospitals have really great simulation centers,” Cornum said.

The Cincinnati simulation center is outfitted to specifically train Critical Care Air Transport and Tactical Critical

future iterations will remain small, with three to six medical providers, while technology might eventually allow medical specialists at home to apply their expertise remotely.

Though the concept continues to evolve, Johnson said the more these units have the capability of “bringing the emergency room to the patient, instead of bringing the patient to the emergency room,” the more optimal they become.

bile surgical team so that we would combine the capability to do surgical stabilization with the capability to actually provide critical care support during the air movement.”

Johnson said she looks forward to seeing how the TCCETs evolve, and Cornum said innovating and adapting to new challenges is central. “You have to keep thinking and trying” to improve outcomes, Cornum said. ★