

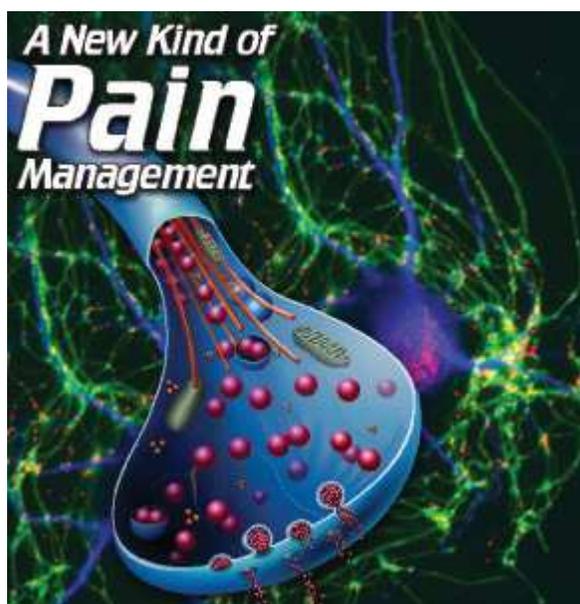
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Military Medical Technology

ONLINE EDITION

A New Kind of Pain Management



Treating pain locally is better for the patient and gives the health care provider more options as well.

By Kenya McCullum

In the last few years, we have been bombarded with messages about the safety of our nation—we are up against a new kind of enemy and fighting a new kind of war, so we need to utilize new tactics to protect ourselves. It all sounds so vague and nefarious that it leaves us with an uneasy uncertainty about the state of our future.

In previous conflicts, the most common injuries were those sustained to the head or chest, but with advancements to body armor have come fewer fatalities and more injuries to limbs. Over time, improved techniques—including delivering trauma care closer to the point of injury—and employment of better medical technologies has meant that more casualties are surviving what in the past would have been a fatal wound. This has meant a focused effort to treat pain—some of it excruciating pain.

“In Vietnam and the Korean War, they had a lot of chest and abdominal trauma, not as much

extremity trauma," said Air Force Lieutenant Colonel Todd E. Carter, an anesthesia flight commander who treats wounded soldiers as they leave Iraq for Landstuhl Regional Medical Center in Germany and then back to the United States. "Now, because of the body armor that everybody has, we still get a lot of head injuries, but a lot of the injuries are occurring because soldiers don't have body armor protecting their arms and the legs."

A New Kind of Military Medicine

Traditionally, soldiers who have suffered wartime injuries would receive general anesthesia, which suppresses the entire nervous system and leaves the patient completely sedated. While this makes sense when treating head or chest injuries, it's not necessarily the most prudent option when treating patients with injuries to their arms or legs.

So with the new wound trend comes a new method of treating soldiers on the battlefield: regional anesthesia. Regional anesthesia, known as a continuous peripheral nerve block, is a targeted approach to pain management that shuts off only the pain signals from the portion of the body that is afflicted. This option, unlike general anesthesia, does not leave the patient completely narcotized and can help speed up patient recovery time by controlling the pain early.

Although regional anesthesia is not a new procedure—it was used during the Vietnam War in the form of spinal and epidural anesthesia, which rendered the entire lower region of the body numb—new technology has made it possible to treat the kind of injuries soldiers now face. Specifically, small, microprocessor controlled pumps have been invented that prevent the transmission of pain signals through a continuous infusion of drugs, such as mepivacaine, to the injured region of the body.

One of many advantages to regional anesthesia relates to the aeromedical evacuation of patients. Patients are being transported so fast and are so uncomfortable traveling from Iraq to Landstuhl, that a nerve block makes the trip a lot less traumatic.

"If I get my leg traumatized in Iraq, I'm going to get it operated on, but just because I get it operated on doesn't mean that my pain has gone away," said Carter. "I'm going to be taken on an airplane from Iraq to Germany, which is about a seven- or eight-hour flight and sometimes it's a little turbulent. Then I'm going to be on a bus in a bumpy environment, then I'm going to be at Landstuhl for a day or two, then I'm going to get back on an airplane and fly nine hours back to the states, then get on a bus and go to Walter Reed Army Medical Center. That whole experience can be extremely traumatic and painful. These guys are making sacrifices for their country; they don't need to be in pain while they're traveling back."

A New Kind of Anesthesia

The use of regional anesthesia on the battlefield began as a hypothetical idea in the minds of two colleagues with similar medical interests back in 2000. Colonel Jack Chiles was a consultant to the Army's Surgeon General for Anesthesia and Lieutenant Colonel Chester "Trip" Buckenmaier, a medical resident at Walter Reed Army Medical Center in Washington, DC.

"What I like to say in my speeches is that we were kind of sitting around over a beer talking about the Desert [Storm] war in the 90s. I had an interest in regional anesthesia and so did Jack," said Buckenmaier. "We both felt that it could have a role in battlefield medicine that was not being fulfilled. It was a very exciting time and Jack, to his credit, saw that this was a real opportunity. He talked to me about it and I was already interested, and the rest is kind of history from there."

With that, the Regional Anesthesia and Pain Management Initiative at Walter Reed was founded and military medical history was in the making. Chiles and Buckenmaier successfully lobbied for the support of their colleagues, who became convinced that using regional anesthesia on the battlefield could become much more than the brainchild of two colleagues pontificating over a few beers.

"We really convinced a lot of surgeons that this had promise, and it kind of changed the way we were doing business at Walter Reed overnight," said Buckenmaier. "I wrote a proposal on the ideas that Chiles and myself had about improving anesthesia and pain management. At the time, we were just trying to get regional anesthesia on the battlefield and of course all these ideas were well before we even had a concept of 9/11 and the war."

Support for the initiative gained momentum as more and more physicians heard, and agreed with, the ideas proposed by Buckenmaier. But like anything else in the federal government, there was a certain amount of red tape that needed to be cut in order to implement the idea. Air Force Lieutenant Colonel Joseph Legan was part of the process and a cheerleader for what Buckenmaier sought to accomplish.

"Any type of equipment used on an airplane has to be pre-approved to make sure that it will not disrupt the plane's navigational and electrical systems," said Legan. "These things are always tested ahead of time to make sure that the plane will still be safe to operate and that these objects themselves will be hardened enough to operate in the air since these planes are bouncing around."

Legan was instrumental in getting the regional anesthesia procedure approved for air evac use, and he prepared a brief that was submitted to the deputy surgeon general for approval. Legan found that the military was receptive to the idea and was able to get the proposal accepted within three months, which is lightening speed for a bureaucratic environment like the military.

Additionally, the initiative gained the support of Congressman, and Vietnam veteran, John Murtha (D-PA). Murtha initially secured \$1.2 million in funding for the program when it first began, and over the years the amount has grown to the current \$6.9 million that the initiative has received for 2006.

"This is one of the most exciting medical developments for our troops because it can be applied in the field and instantly removes the pain, even for such severe trauma as amputations," said Murtha. "The procedure then follows the patient through surgeries or other treatments, keeping the patient free of pain. So it spares people from tremendous suffering and, in so doing, for many people it can dramatically improve their recovery time."

A New Kind of Patient

Although Buckenmaier successfully convinced many of his colleagues of the benefits of regional anesthesia on the battlefield, it was not until October 7, 2003 that he actually got the opportunity to prove them. Brian Wilhelm, a 21-year-old soldier stationed northwest of Baghdad. Wilhelm suffered a severe injury to his left calf after being hit with a rocket propelled grenade. When he reached the hospital, Buckenmaier asked him to quantify his pain on a scale of 0 to 10, with 0 being no pain at all and 10 being the worst pain imaginable. Wilhelm described his pain as a 10, even after being given 15 to 18 milligrams of morphine.

When Buckenmaier began to explain to Wilhelm what procedure the surgical team was about to perform and how it worked, Wilhelm told him, "Doc, I don't care what you do, just make this pain go away!"

And with that, all of Buckenmaier's hard work came to fruition as Wilhelm became the first soldier to receive a nerve block on the battlefield. Wilhelm's pain was alleviated in a matter of minutes, so much so that when his tibia audibly snapped during the operation, he asked Buckenmaier what the sound was because he felt nothing. Within 10 minutes of receiving the nerve block, Wilhelm's pain had decreased from a 10 to a 0.

As Buckenmaier explained to National Public Radio's Terri Gross on "Fresh Air," "What was so profoundly important to me about this anesthetic was what happened after the operation. If you've been in this environment before or after a general anesthetic, it's usually a very somber meeting between the soldier's friends from his unit because they're kind of sedated and not feeling very well, so the soldiers come in and touch the bedside and whisper things in their ears. When Brian came out, he was alert, awake, pain free and they had a party going on in there. They were excited about the fact that he was going home, that he felt good and he was pain free."

A New Way of Looking at Pain

With Wilhelm's treatment, Buckenmaier's ideas about pain management on the battlefield became a reality. But Buckenmaier is not only seeking to change the way pain is managed in the military theater—he wants to change the way physicians view pain itself. Pain has traditionally been viewed as a symptom, but Buckenmaier would like the medical community to view pain as a disease.

"For centuries we have always thought of pain as just a consequence of injury and surgery and nothing could be done about it," said Buckenmaier. "The blessing of the 21st century is that we now know that that's not the case and in fact we're now learning that not only is pain a very important thing to protect ourselves, but in situations that the body was never designed to take care of—like your foot being blown off or your leg being amputated—pain can really become a detrimental force that is working against a patient's recovery, like a disease. We're trying to impress upon the community that it really is a disease and there's more evidence that that indeed is the case. Uncontrolled pain depresses the immune system so it increases your susceptibility to infections and it certainly affects your psyche. It increases your stress response, which leads to systemic inflammation and a whole host of things like heart disease and stroke. The list of the detrimental effects that the body incurs from uncontrolled pain continues to grow."

Buckenmaier's new ideas about pain and pain management are becoming more widespread in both the military and civilian world. "For the trauma patient, a lot of techniques that we've now demonstrated very well in these horribly injured war traumas have tremendous application in civilian medicine," said Buckenmaier, who frequently lectures to civilian doctors. "The popularity of the courses that my colleagues and I teach have just exploded recently," Buckenmaier added. "I really see regional anesthesia as sort of a train that is coming down the tracks, and you either get on it as an anesthesiologist or you're going to be hit by it."