

LESSONS FROM THE BATTLEFIELD

Last month the UK government announced it wanted non-military doctors to work in Afghanistan and Iraq.

Anne Gulland investigates what they might learn



Army doctors from Britain's 1st Battalion operate on an Iraqi teenager inside their aid post in Al Qurna in April 2003

War is a very efficient schoolmaster, said an unnamed US surgeon general quoted in historian Roger Cooter's study on the effects of war on medicine.¹ That phrase could have been uttered by Colonel Tim Hodgetts, defence consultant adviser in emergency medicine and honorary professor of emergency medicine at Birmingham University. He has been nurturing the specialty of emergency medicine since its introduction to the armed forces in Kosovo in 1999.

Emergency medicine's importance and influence has risen exponentially since then, says Colonel Hodgetts. So much so that: "In terms of managing serious injury we are several steps ahead of what the NHS does."

First class care

A soldier injured in Afghanistan or Iraq will get treatment that a pedestrian knocked down by a car on a high street in the United Kingdom could only dream of. To start with, he will be surrounded by soldiers who are trained and tested in first aid annually—a quarter of whom will have advanced first aid training and carry extra equipment including a Hem-Con bandage made of a positively charged material that attracts negatively charged red blood cells and rapidly stops blood flow, a tourniquet that can be applied with one hand, and a suction device for clearing the airway. This first aid kit shows how the military has changed the model of treatment of severely injured patients from airway, breathing, and circulation to chronic haemorrhage, airway, breathing, and circulation. Care is embedded at the point of wounding, says Colonel Hodgetts.

The soldier will then be picked up by a helicopter carrying a crew of emergency medics, one of whom will either be a consultant anaesthetist or a consultant emergency specialist.

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JAMES VELLACOTT/AP/PA

“The difference with the military model is that there is a high level of consultant input right from the word go”

A British soldier is evacuated with a leg injury from a forward operating base in southern Iraq to a field hospital

“We are projecting the emergency department forward onto the helicopter,” says Colonel Hodgetts.

Back at the field hospital the soldier is met and managed by a consultant led team and, if the seriousness of the wounds warrants it, he will be airlifted to Selly Oak Hospital in Birmingham, where Colonel Hodgetts is based.

Colonel Hodgetts says that since 1999 outcomes for the seriously injured have improved considerably. Outcomes are measured using the standardised mortality ratio—the number of observed deaths divided by the number of expected deaths derived from trauma injury severity scores. He attributes improvements to a range of measures. Firstly, he says his clinical audit is far more extensive than in any civilian hospital. Every week he chairs a clinical case conference which links up Selly Oak, the field hospitals in Iraq and Afghanistan, the airbase at Brize Norton, Oxfordshire, that receives the military casualties, and the rehabilitation centre at Headley Court in Surrey.

“We look very carefully and scrutinise our outcomes. We give feedback on the patients we have received in Birmingham and we say what their definitive treatment has been. We look at the treatment given in theatre [of operations] and where necessary we make suggestions for improvement. I don’t think there’s anywhere in the country on a week by week basis looking in such detail at the quality of care from the point of wounding all the way to rehabilitation. That has been such a driver for change,” he says. He says the Ministry of Defence is supportive of any recommendations—whether for equipment or education and training—and action is taken within a week. This case conference is underpinned by the joint theatre trauma registry, a 10 year database of injuries that has driven changes in personal and vehicle protection. And a member of his team attends all military postmortem examinations.

In his book *Better: A Surgeon’s Notes on Performance*, Atul Gawande notes US military surgeons’ commitment to collecting data, inputting more than 75 pieces of information on each casualty.² This is an impressive feat when you consider that, for example, 1100 US soldiers were injured during the battle of Fallujah in November 2004.

Innovation

The military’s policy of haemostatic resuscitation has also been yielding results, says Colonel Hodgetts. In Iraq and Afghanistan patients presenting with major haemorrhage are given one unit of packed red blood cells and one unit of fresh frozen plasma with supplementary platelets. Keith Porter, professor of clinical traumatology at Selly Oak Hospital, says that there is clear evidence that this reduces clotting problems in trauma patients and improves outcomes. And he calls for all NHS hospitals to adopt the guidelines on treating major transfusion.³

Colonel Hodgetts says: “If you have someone who is likely to develop clotting problems and all you are doing is replacing the blood cells, it’s not enough. The Americans have had very positive outcomes using packed red blood cells and fresh frozen plasma since May 2007.”⁴

Doctors in Afghanistan and Iraq also have access to fresh platelets. In conjunction with the National Blood Service, they have set up apheresis to collect platelets from a willing bank of screened donors among the military population.

The hostile environment has necessitated another innovation—the introduction of intraosseous needles for use when inserting into a vein is difficult. These have proved invaluable on moving helicopters, an environment comparable to working on a rollercoaster, says Colonel Hodgetts.

And the complexity of soldiers’ injuries

has also seen the introduction of topical negative pressure, where a suction device is connected to the dressing to suck out the wound exudate. The technique also controls bacterial colonisation and reduces the swelling associated with injury, says consultant in burns and plastic surgery Lieutenant Colonel Steve Jeffrey. The wounds he sees in military practice are often much more extensive than in civilian practice, with stripping of the soft tissues, and, because of explosive devices, foreign material is driven a large distance into the wound.

Colonel Hodgetts describes the military’s practice as “horizon scanning” for the latest developments. “Many advances in medicine are made during conflict. There’s a huge imperative. We are taking cutting edge technology and using it for the purpose for which it has been developed.

“The system [MoD] is very supportive—it can take just a few days or weeks to get new things into service so long as we have the evidence. It’s become a very reactive and dynamic system out of necessity,” he says.

While UK soldiers in Iraq and Afghanistan are receiving cutting edge treatment, what about the local people whose medical services have been decimated? Colonel Hodgetts says there is a North Atlantic Treaty Organisation principle of universal emergency care. “It doesn’t matter who they are—civilian, enemy forces—if they present to our military medical facility with a life threatening problem they will be treated,” he says.

Sharing knowledge

Although the NHS and military model are not directly comparable, civilian doctors can learn from the military. The defence select committee report, *Medical Care for the Armed Forces*, published in February, called for more structured sharing of best practice between military and civilian clinicians.⁵ A



A young boy is carried into the hospital in Camp Bastion in Afghanistan to receive treatment from British army doctors in December last year

DANNY LAWSON/PA

Department of Health initiative, announced last month, will give NHS specialists who are not reservists or part of the armed forces the opportunity to deploy on short operations to Afghanistan and Iraq. The principal aim is to plug the skills gap, particularly in emergency medicine, neurosurgery, and intensive care. However, doctors will gain valuable trauma skills—the health department calculates that during a three month tour in Iraq or Afghanistan, a doctor will typically deal with more trauma than during 15 years working for the NHS.

Professor Porter, one of Colonel Hodgetts's civilian colleagues at Selly Oak, is impressed with the military system, which he witnessed on a trip to Afghanistan. "It was quite a humbling visit—no one has any idea of what the care out there is like. The clinicians do a phenomenal job."

Professor Porter adds that soldiers evacuated to Selly Oak for their definitive treatment are in much better shape than similar patients treated in the NHS.

For Colonel Hodgetts one of the most important lessons the NHS can learn is the involvement of consultants much earlier on in the treatment of trauma.

"Our patients are managed by a consultant team 24/7. That doesn't happen in the NHS. The most vulnerable patients are not always treated by the most experienced people. Senior people make decisions quickly. In the military setting, a patient will go straight into the operating theatre with no delays. That's not always the case with the NHS," he says.

All the doctors I spoke to agreed on this point. Professor Porter says: "The difference with the military model is that there is a high level of consultant input right from the word go. In the UK most of that care would be done by juniors."

The 2007 report of the National Confidential Enquiry into Patient Outcome and Death said that a consultant "must be the

team leader for the management of the severely injured patient."⁶ Some 42% of patients were not seen by a consultant in accident and emergency and a consultant was the team leader in just 40% of cases. The report said that the patient's initial management was inappropriate in 24% of cases where a senior house officer was the team leader, compared with 3% of cases where a consultant was the team leader.

Given that the majority (91%) of hospitals studied in the report receive fewer than one severely injured patient a week, it is unlikely that they will ever be able to offer the quality of care that Colonel Hodgetts and his team can offer; severe trauma, says Colonel Hodgetts, is his "core business."

All the more reason says Major Nigel Tai, consultant trauma and vascular surgeon, to have regional trauma centres. Unusually for a military doctor Major Tai chose to work at the Royal London Hospital because of the high volume of major trauma patients admitted there every year—almost 400, a quarter of whom have penetrating injuries. It is probably the nearest the NHS gets to a military style situation. The Royal London has a specialist trauma service led by a team of consultant trauma surgeons, of which Major Tai is one. All patients admitted to the trauma service are managed by this consultant team who coordinate the care that they need.

Major Tai says: "This is completely different from any other model in the UK. We are the coordinating glue or oversight service which takes charge. We are not doing the surgery—we make sure that our colleagues from across the multidisciplinary team get in there at the right time."

As in Colonel Hodgetts's practice, regular audit is a cornerstone of the trauma service at the Royal London. "Every month we scrutinise all the deaths of trauma patients and we work out how we could have done things better. We depend on this data to inform our future practice."

Figures published by the Trauma Audit and Research Network (TARN) last August showed that the Royal London saved 15 patients in 2005-6 who had a 0-25% chance of survival; only six would have been expected to survive according to national averages.⁷

Major Tai acknowledges the difference between the military and civilian experience. Military doctors only have to worry about the clinical job in hand, unlike the NHS with its attendant administrative and bureaucratic burden. However, he adds, military doctors do not have a large team of specialists to call on in a difficult situation or an inexhaustible supply of kit.

"The military experience is very much in terms of the first 48 to 56 hours of care because injured service men and women are promptly evacuated back to Selly Oak. The focus in military trauma care is essentially on the immediate circumstances of managing injury, resuscitation, and surgery to save life and limb," he says.

Major Tai runs the definitive surgical trauma skills course at the Royal College of Surgeons, teaching trauma skills to civilian surgeons. He teaches damage control surgery techniques—developed in the US by surgeons who had served in Vietnam—so that life threatening bleeding can be rapidly stopped. The goal is to ensure that the initial surgery takes no more than an hour, to get the patient to intensive care, and to prevent the frequently fatal coagulopathy, hypothermia, and acidosis that accompany overlong or inadequate surgery.

"When they are more stable you take them back to theatre and do the anatomically perfect, reconstructive surgery you need to do on them. It's about curtailing the level of surgical insult you deliver to the patient," he says.

Major Tai acknowledges that, like all major trauma surgery, this is expensive. "But the gains to be made in saving a young life, someone who has the potential to recover and play a productive role, are also huge."

But though the NHS can learn from its defence counterparts, military doctors owe a debt of gratitude to the NHS. Wing

Commander Ian Sargeant, consultant in trauma and orthopaedics at Selly Oak Hospital, says: "All our doctors and nurses are working in busy NHS centres where they're used to dealing with major injury. The best model for working on a blown-up soldier is treating a biker who's come off his bike at 100 miles an hour, skidded along the muddy road, and crashed into a lamp post. Fifteen years ago we would have been based at a military hospital, treating bunions."

Anne Gulland is a freelance journalist, London annegulland@yahoo.co.uk

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