

Training the military surgeon: Definitive Surgical Trauma Course (DSTC) and the development of a military module

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GENERAL SURGEONS and anaesthetists form the keystone of level 3 (surgical) support for military operations. Orthopaedic surgeons also deploy to a Field Hospital or Forward Surgical Troop (FST), where there is likely to be significant extremity trauma. This model has been used by the ADF Health Service in the recent deployments to Rwanda, Bougainville and East Timor. Supplementation of this specialist team with an intensivist/physician has also been invaluable, particularly in peacekeeping operations where humanitarian medical aid is provided as a component of the mission.

Many general surgeons today have not had substantial trauma experience or have undertaken minimal trauma training. They may also be practising within a subspecialty of general surgery and not encounter any significant volume of trauma, particularly trauma in regions of the body other than the abdomen. Trauma surgery has already become a separate subspecialty within general surgery in North America, and the training of the Australasian surgeon is also moving in this direction, with the curriculum for a trauma fellowship being developed by the Royal Australasian College of Surgeons.

How will we continue to supply the ADF with military surgeons? What skills and knowledge does the military surgeon need in addition to civilian general surgery and trauma surgery training?

Managing the acute trauma victim in war or on military operations follows the same principles as in the civilian setting. Control of the airway and ventilation are the first priorities of treatment. Prompt and adequate resuscitation is essential. Initial wound surgery, with the goal of controlling major haemorrhage, is the prime task of the military surgeon, who must be able to cope with significant trauma to any part of the body.¹

The Definitive Surgical Trauma Course (DSTC)

The DSTC is the principal educational vehicle for continuing education of surgeons in the management of major trauma. The course rapidly builds the participants' knowledge base to enable them to operate in any body cavity with greater confidence. The

Synopsis

- ◆ The Definitive Surgical Trauma Course (DSTC) delivers continuing education for surgeons in the management of major trauma. A military module was developed to supplement the DSTC. The course content includes a military orientation, the current practice of war surgery and humanitarian surgery required on military deployments. It is recommended that the DSTC and the military module become a prerequisite for surgeons deploying on ADF operations and that the military module of the DSTC be adapted for other specialist groups such as anaesthetists and physicians.

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Tri-service involvement of medical and nursing personnel will demand greater flexibility. Military surgeons may therefore be required to operate on a ship with surgical facilities and an intensive care unit.

surgical anatomy and practical aspects of operating in the head, neck, chest, abdomen, pelvis and limbs are all emphasised in the course. The theory and practice of trauma surgery has changed significantly in the last decade, and it is appropriate to bring general surgeons who are not greatly involved in trauma management in their civilian practice up-to-date with current practice. This particularly relates to damage control surgery, which is emphasised throughout the course. The DSTC is thus a comprehensive course which is designed to improve the knowledge base, judgement and skills of general and military surgeons.

The DSTC was piloted in 1996 in Sydney and the first full courses were held in 1999 in both Sydney and Melbourne. The DSTC has continued in Sydney and Melbourne each year since then. The International Association for Trauma and Surgical

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Intensive Care (IATSIC) is loosely coordinating and promoting the development of the DSTC worldwide. The DSTC is a hands-on course with a high ratio of instructors to participants. The DSTC includes a manual which is read by the participants before the course. There are didactic presentations from national and international experts, discussion of challenging cases, human cadaver dissection (in Melbourne), video presentation of procedures, animal laboratory surgery and multiple choice questions following the course.²

The operative approaches included in the DSTC course are thoracotomy, craniotomy, laparotomy and pelvic surgery; exposure of the major blood vessels in the neck, chest and abdomen; and peripheral limb surgery, including fasciotomy. The neurosurgical component of the DSTC course emphasises liaison with a neurosurgeon, the advantages of teleradiology, and damage control neurosurgery (ie, basic emergency surgery necessary to save lives, with secondary surgery possibly being performed by a neurosurgeon in a more advanced [Level 4] facility). The neurosurgery course content includes clinical assessment and decision making, the principles of operative neurosurgery, a video demonstration of burr hole and craniotomy, and practical experience of burr holes and craniotomy/craniectomy with cadavers.

The course content of the military module

Military surgery

- principles of military surgery including military triage, command and control
- surges and troughs in patient admissions
- common medical illnesses encountered on operations
- ballistics
- the management of penetrating missile trauma, landmine and blast injuries
- chemical agent injuries
- working with restricted resources, including instruments, investigations and facilities
- the principles and scope of humanitarian surgery.

Personal issues and the preparation for deployment

Including immunisation requirements and medical and dental standards; fitness/Army Individual Readiness Notice requirements; aspects of life insurance and making a will; pay issues; uniform and equipment requirements; personal safety issues; personal health threats; pre-deployment blood tests; psychological support and social welfare issues



Military surgeons and anaesthetist working in a Forward Surgical Troop in an air-conditioned Trelborg tent. The location is remote, the external environment hostile, the equipment limited and the conditions cramped.

Training the military surgeon

Military surgery is a distinct surgical discipline which requires a broad knowledge of surgery, with some aspects of practice specific to the military environment. Although the DSTC is an excellent introduction or refresher for the military surgeon, there are many aspects of surgical practice and of the working environment which are peculiar to military operations. Military surgery also includes a broader range of subspecialties than the general surgeon would normally encounter. The general surgical fellowship may not necessarily equip the general surgeon to deal with this broader range of subspecialties within military surgery. It was for this reason that a one-day military module for the DSTC was developed in 2000 by Lieutenant Colonel Glen Farrow, Lieutenant Colonel Jeffrey Rosenfeld, Lieutenant Colonel John Crozier (ADF members) and Associate Professor Peter Danne and Associate Professor Michael Sugrue (developers of the DSTC).³ The course content is outlined in the Box.

The DSTC and the military module are designed for the general surgeon, but the orthopaedic surgeon embarking on a military deployment would also find these courses beneficial. Reaccreditation and maintenance of competence are essential components of any standardised postgraduate practical course; it is envisaged that a refresher course and reaccreditation for the DSTC and military module would be required every five years.

The surgeon about to undertake humanitarian surgery in a developing country needs to understand that the patients are usually delayed in presentation and the pathology is often advanced. Patient and family expectations are very different from those of patients in Australia and what can be done

depends on the mandate of the mission. The surgeon deploying on recent ADF operations has had to manage obstetrics (particularly complicated obstetrics), gynaecology, paediatric surgery, and surgery for pathology in the tropics not usually encountered in Australia (eg, amoebic liver abscess, typhoid bowel perforation, and abdominal tuberculosis).^{4,5}

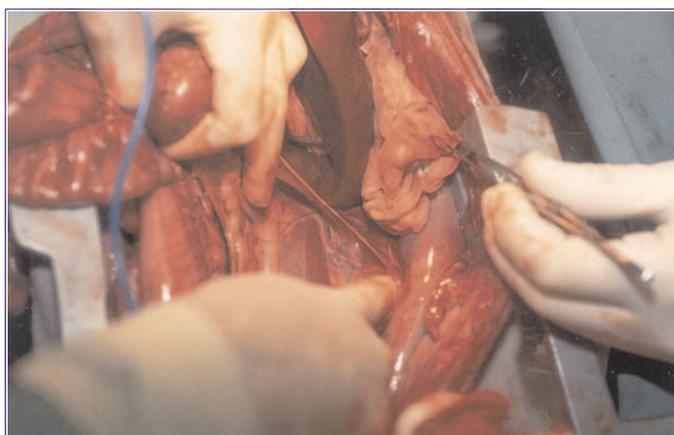
The obstetrics and gynaecology course content is based on the common clinical situations encountered in the developing world, and includes the management of pre-eclampsia, prolonged obstructed labour, the complicated caesarean section, malpresentation and ruptured uterus, pelvic sepsis, retained placenta, vaginal laceration, fetal death *in utero*, ectopic pregnancy, gynaecological malignancy and pelvic inflammatory disease. The recent obstetrics and gynaecology book by ADF members (reviewed on page 85) is an ideal practical aid for the generalist.⁶

The military surgeon also needs to be flexible and able to work with the limited available equipment. The surgeon will also need to conform to the operational constraints of the mission, which may mean a limited trial of treatment, or no treatment, for some civilian patients, particularly if the chance of survival is likely to be poor and there is no ongoing care or follow-up.

Surgeons will not be able to practise military surgery unless serving in a war zone or on a peacekeeping mission. Recent ADF operations have involved the military surgeon in a wide range of surgery, including humanitarian aid to the civilian population.^{4,5} Clearly, the military module alone cannot provide the military surgeon with a complete insight into military surgery. It is worthwhile for the generalist to spend some time in the operating room observing caesarean sections, neurosurgery, paediatric surgery or other relevant disciplines which might benefit that individual.

For the surgeon who wishes to make a career of military surgery, it is the rural surgery training program which comes closest to matching the range of surgery likely to be encountered on military deployments. Working in a busy trauma service also provides the prospective military surgeon with valuable experience. The ultimate extension of this would be to obtain a staff position in a busy Level 1 trauma centre in the USA or South Africa, where there is a large volume of penetrating trauma. Today's military surgeon who has not experienced the horrors of the major burns, missile and blast injuries encountered frequently in war needs to learn the lessons of previous wars by studying manuals of war surgery and by learning from Australian surgeons who served in Korea and Vietnam. Otherwise they will be forced to rediscover principles and techniques already learned by our forebears.

The military module could easily be adapted to become an orientation course for the military anaesthetist and the physician/intensivist. All the specialties could receive instruction together in the elements of common relevance, and then separate for course material pertinent to their own discipline. The military module, when delivered as a supplement to the DSTC, should also serve as a recruiting mechanism for the ADF Specialist Reserve.



DSTC participants are required to expose various structures in the chest and abdomen in a live animal model and manage various injuries. In this case the participants have widely exposed the retroperitoneum to gain access to the major blood vessels, the pancreas and part of the duodenum.

Conclusion

The DSTC and the military module should become a prerequisite for surgeons deploying on ADF operations. It is recommended that the military module be adapted for other specialist groups, such as the anaesthetists and physicians. It behoves us to keep the embers of military surgery burning so that we are well prepared as a nation to care for our comrades fallen in battle. Australian military surgeons have taken this initiative.

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