An Operational Clinical Skill Set for the ADF General Surgeon: a proposal and proof of concept

K W Bender, E Smartt, A Mahoney, A Pearson

Background

Hippocrates recognised that civilian practice alone does not prepare military surgeons for the trauma they may treat while deployed. Similarly, many medical professionals acknowledge that the technical and non-technical skills required of military General Surgeons are unique to the combat environment. Civilian general surgery practice is increasingly characterised by subspecialisation and minimally invasive operative techniques. In contrast, combat surgery continues to rely upon a breadth of experience and traditional approaches that may be less familiar to contemporary surgeons.[1]

In order to evaluate and mitigate any consequences of this discrepancy, it is necessary to define the skills requirements of deployed military General Surgeons. Subsequently, a comparison may be made with the skill set surgeons derive from their usual practice, typically in a civilian non-combat setting. Coalition partners have defined these skill sets; however, they are yet to be formalised by the Australian Defence Force (ADF).

Purpose

The authors propose to develop an 'Operational Clinical Skill Set' (OCSS) for ADF General Surgeons. The OCSS will comprise a list of skills that could be meaningfully expected of deployed ADF General Surgeons, supported by analysis of historical caseload and extant trauma surgery curricula.

This paper aims to produce a draft OCSS, to scaffold a formal consultation process involving the wider ADF general surgery community. This draft represents a proof of concept, and in defining an OCSS in the Australian context, it will facilitate other deployable craft groups in establishing equivalent OCSSs.

The General Surgery OCSS aims to enhance ADF healthcare provision in three ways:

1. To guide the development of 'Operational Clinical Readiness Pathways' aimed at defining and rectifying any skill deficiencies of General Surgeons prior to operational deployment.
2. To serve as an aid to reflective practice by General Surgeons, outlining the expectations of their role and guiding them as they define their own learning needs following recruitment or prior to deployment.
3. To inform the chain-of-command of individual clinicians' skill profiles, measured against a standard and the potential risks and benefits of their nomination for specific tasks.

Method

A scoping review of the literature was undertaken to establish the characteristic case-mix of deployed general surgery services. Relevant studies were identified through a broad Medline search combined with a citations review. Inclusion criteria were: military or civilian Role 2E facility; warlike environment; case study, case series or review; numerical or fractional reporting of caseload and case-mix; English language; and published in the last two decades. Quantitative data were collated and analysed through descriptive statistics.

Having established the expected range of presentations that confront deployed General Surgeons, the authors then aimed to identify a list of core surgical skills that would permit successful management in a Role 2E setting. In the absence of a mature trauma general surgery subspecialty qualification in Australia, the skills outlined in the Definitive Surgical Trauma Care (DSTC) course manual[2] were used as a guide for what might be meaningfully expected of ADF General Surgeons at present. Skill sets developed and published by coalition partners were also reviewed for comparison. Finally, in order to generate a working list of skills, the published data were collated by body system/region in keeping with the skill training model for civilian General Surgeons in the DSTC.

Results

The initial Medline search and citation review identified 17 articles to consider. Full-text articles were reviewed against the inclusion criteria, and 10 studies were selected for analysis, representing data from a variety of organisations and regions. The content of these papers was categorised by body system, with an additional category of 'Trauma Management Principles' encompassing non-technical skills.

Collated data from recent deployed Role 2E hospitals shows that these facilities must manage a wide range of surgical presentations using damage control principles. Accordingly, the skills required of the deployed Role 2E General Surgeon are broad. The evidence identified for skills in each domain of the General Surgery OCSS is summarised below:

Trauma management principles

- Conflict zones generate complex surgical workloads, with approximately 22% of surgery being for violent injuries.[3]
- Damage control principles are often utilised.[4-6]
- The environment is austere with limited resources,[7] surgery different from civilian practice,[1] and with variable opportunities to learn on the job.[8]
- Workloads fluctuate, including multi/mass-casualty incidents.[6, 8]

Head:

- Head injuries are present in between 10% and 16% of trauma patients.[1, 6]
- About 1–2% of surgeries are performed for head injuries[1, 7].

Neck/face:

- Facial injuries are common.[7, 8]
- Non-traumatic facial pathology is also described, e.g. peritonsillar abscess.[6]

Chest:

- Chest injuries can be more common than abdominal injuries, and thoracotomies are as common as laparotomies or craniotomies.[1, 7]

Abdomen/pelvis:

- Abdominal trauma generates around 8.9% of surgeries and often requires damage control.[5, 9]
- Non-traumatic abdominal surgery comprises around 7.7% of the total surgical workload.[10]

Limbs/vascular:

- Amputations comprise 5% of operations for major trauma and can occur at a variety of anatomic levels.[7, 8]
- Most orthopaedic surgeries are closed reductions with less frequent open reduction internal fixation (ORIF).[7]
- Vascular shunts are used regularly as damage control devices.[5]

Burns/soft tissue:

- Burns are common in modern conflict.[5]
- Fasciotomies are common, comprising 5.7% of surgeries.[9]

Discussion

Considering the evidence regarding case-mix from Role 2E hospitals, we have compiled a draft OCSS for ADF General Surgeons, shown in Table 1. A deployed surgeon *competent* and *confident* in performing all of these skills would be able to manage the breadth of presentations they may expect to see on operations. This skill set shares many similarities with the 'Resuscitative Surgeon' as defined by the Royal College of Surgeons Major Trauma Workgroup position paper.[11] Future research should consider the potential utility of the General Surgery OCSS by evaluating its face validity among ADF surgeons, its acceptability as an aid to health planning by ADF commanders, and its impact upon the self-efficacy of deploying surgeons. Demonstrating changes in patient-centred outcomes, such as preventable mortality, will be difficult in the short term due to the low clinical tempo observed in contemporary ADF deployments; however, there is merit in a prospective analysis of the extent to which major trauma presentations to ADF facilities fall within the OCSS as it is presently defined.

OCSSs can ultimately be used to guide recruitment, shape individuals' professional development, select personnel for deployments and generate systematic training programs for capability optimisation. The authors do not consider that surgeons must necessarily possess all skills on the OCSS in order to be deployed. The OCSS may be adjusted over time and may vary for General Surgeons deployed to a facility with subspecialty surgeons. Moreover, some operations may not require certain elements of the OCSS; however, its existence will support command in adopting a risk management approach to the selection of a given clinician for deployment and aid individuals in preparing themselves in a more robust manner for military work.

Conclusion

Review of contemporary military surgical literature, combined with analysis of existing surgical trauma curricula, has resulted in the development of the first draft ADF OCSS for general surgery. The draft OCSS may now be formalised through a structured process seeking expert opinion from a wider group of clinicians to achieve consensus support from the ADF health community.

The present study has demonstrated the feasibility of developing an OCSS to fit ADF requirements for one surgical specialty. This process may be repeated for each of the ADF medical procedural specialist categories. Collectively, such OCSSs could provide a foundation for developing an Operational Clinical Readiness Pathway that links appraisal of skills against the OCSS with targeted learning experiences for individual specialists. This body of work will enhance the ADF's approach to the continuous professional development of its specialist workforce and will ensure that clinicians are confident and competent to undertake the duties the ADF requires of them on operations.

Conflicts of interest

MAJ Bender, MAJ Mahoney and WGCDR Pearson are all currently employed as medical specialists in the full-time ADF under the Medical Specialist Program (MSP).

None of the authors have any financial or other conflicts of interest to disclose.

The views expressed herein are those of the authors and do not represent the views of the ADF or any of the authors' affiliated organisations.

Corresponding author: Kyle William Bender, kyle.bender@gmail.com
Authors: K W Bender[1], E Smartt[2], A Mahoney[1], A Pearson[1]
Author Affiliations:
1 ADF – Medical Specialist Program
2 Northern Sydney Local Health District

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