

Operational Clinical Readiness Pathways – An individualised training model to prepare ADF general surgeons for deployment

A Pearson, A Mahoney, K W Bender

Abstract

Background: Modern developments in civilian surgical practice have driven a shift in general surgeons' experience towards subspecialised and minimally invasive approaches, while military surgery continues to rely on a breadth of skills and traditional open techniques. The authors have previously described an Operational Clinical Skill Set (OCSS) for deployable ADF General Surgeons. It is suggested that the ADF develop an Operational Clinical Readiness Pathway (OCRP) in order to provide optimal training for general surgeons prior to deployment.

Purpose: This paper drafts an OCRP that may be formalised through consultation with the wider ADF General Surgery Community. The OCRP aims to enhance ADF healthcare provision by:

- improving the competence and confidence of ADF General Surgeons in all aspects of austere trauma surgery
- improving recruitment and retention of suitable surgical clinicians
- strengthening coalition ties and interoperability with partner nations.

Conclusion: An OCRP has been drafted, proving the feasibility of this process for the ADF. It is envisaged that a General Surgery OCRP will enhance ADF surgical care and guide other health specialties through OCRP development.

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.

Background

The Australian Defence Force's (ADF) deployed surgical capability is built upon well-rounded and broadly skilled general and orthopaedic trauma surgeons. Modern surgical care in developed nations has progressed toward subspecialisation, minimally invasive surgery and a reliance on advanced diagnostic imaging. This has resulted in contemporary general surgical graduates possessing a skill set that only partially encompasses that required for the management of combat trauma in austere military environments. Consequently, our surgeons may not be clinically prepared for the task at hand,¹ a risk which has already seen mitigation strategies

proposed by several of our allies.^{2,3} The ADF must also look to develop a system that assists Australian General Surgeons in acquiring and maintaining the skills needed in the deployed environment. Any solution to this problem will need to consider the diversity and complexity of the environments in which our surgeons work. We propose one approach that we have termed 'Operational Clinical Readiness Pathways' (OCRP).

Intended end-state

ADF General Surgeons currently maintain their clinical skills exclusively in the civilian healthcare sector. Their exposure to trauma and surgical

techniques analogous to those required on deployment is not monitored and is likely to be highly variable. Any ADF approach to enhancing surgeons' suitability to deploy on operations must identify and remediate gaps between the skills required for a mission and the existing competencies of a given surgeon. Through this process, surgeons should become confident and competent in trauma resuscitation decision making and performing a wide range of damage control procedures and austere acute General Surgery, which they may not routinely perform in their civilian practice. In our previous work, we conducted a literature review and analysis of the general surgical case mix from recent conflicts to derive a skill set for deployable ADF General Surgeons that we have termed the Operational Clinical Skill Set (OCSS).

Determining a surgeon's suitability to deploy on operations is complex. Common factors considered important in previous studies include a surgeon's subspecialty, any formal trauma surgery training and the surgeon's usual case mix. A 2016 report commissioned by the Royal College of Surgeons into Major Trauma Workforce Sustainability, described and defined a 'resuscitative surgeon'.⁴ This surgeon has clinical grounding in gastrointestinal or vascular surgery with sufficient exposure to operative trauma management to become a competent trauma surgery provider. Similarly, Edwards and colleagues of the United States Army proposed the term 'trauma ready' to distinguish surgeons possessing the full range of requisite skills from surgeons with a narrower range of competencies, whom they designate as 'trauma assist'.⁵ Edwards' approach acknowledges that less experienced surgeons may still make valuable contributions in supporting more experienced surgeons on operations. Common to both the above works is the notion that civilian General Surgery or subspecialty practice alone is insufficient preparation for the demands of combat surgery. Indeed, some have condemned this belief as an unethical illusion.⁶ Consistent with international expert consensus, we argue that the ADF should augment surgeons' existing capabilities through targeted exposure to high-value learning opportunities to achieve competence and confidence in all domains of the OCSS. We have termed this approach 'Operational Clinical Readiness Pathways'.

What is it?

A surgeon's OCRP is an individualised plan for development arising from a process of facilitated reflection on their current skillset ('readiness review')

and supported by a compendium of recognised learning experiences. Every surgeon recruited to the ADF has valuable existing skills and knowledge, which overlap to a greater or lesser extent with the capabilities required in deployed environments. To produce an OCRP, individual surgeons and their mentors can use the General Surgery OCSS to highlight capability gaps. These gaps may then be remediated through predesignated or bespoke learning experiences, which may take the form of (1) coursework, (2) clinical placement or (3) military activities.

Experienced surgeons' OCRPs may be simple, reflecting only the requirement to enhance clinical currency of rarely used skills. In contrast, *ab initio* military surgeons may require extensive support to achieve peak operational readiness. Having an established OCRP framework reassures ADF health leaders that for those surgeons who have more ground to cover, a system exists that allows clinicians to reach the required standard.

1. Coursework

A number of militarily relevant surgical courses are conducted in Australia and overseas. At present, only the Emergency Management of Severe Trauma (EMST) course is a deployment requirement for ADF General Surgeons. Under the proposed model, the ADF would facilitate further training opportunities by endorsing and recognising participation in suitable civilian or military courses through logistic, administrative and financial support. When developing their OCRP, surgeons would be free to match these coursework opportunities against known skills shortfalls. The authors suggest that the following courses (both international and domestic) be included:

- EMST (Early Management of Severe Trauma)
- DSTC (Definitive Surgical Trauma Care)
- EMSB (Emergency Management of Severe Burns)
- ASSET (Advanced Surgical Skills for Exposure in Trauma [USA]) / ABSET (Anatomically Based Skills for Exposure in Trauma [Australia])
- EWSC (Emergency War Surgery Course-US Military)ⁱ
- STaRC (Strategic Trauma Readiness Course-US Military)ⁱⁱ
- STAE (Surgical Training for Austere Environments-UK Civilian)⁷

Additionally, relevant coursework would include:

- participation in Knowledge, Skills and Abilities testing and associated learning modules (US Military)ⁱⁱⁱ
- familiarisation with relevant Joint Trauma Service Clinical Practice Guidelines (US Military)⁸
- the development of an ADF approved and suggested reading list including, but not limited to:
 - Top Knife
 - Front line surgery
 - Emergency War Surgery Manual
 - First to Cut.

We propose that the OCRP should shape how permanent force specialists allocate their clinical time and that reservists would be afforded the opportunity to claim reserve days while attending courses that comprise a part of their authorised OCRP.

2. Clinical placements

Within the OCRP, high-yield clinical placements would be utilised to augment skills and provide exposure to procedures rarely encountered in Australian civilian practice. Even highly motivated clinicians regularly participating in on-call general and trauma rosters are unlikely to achieve significant exposure to cardiothoracic, neurosurgical and open vascular cases. Short-term placements under the supervision of clinicians who understand the requirements of deployed ADF surgeons are likely to be of most benefit. Primarily, these experiences would be in the elective setting, although, depending on timing and case availability, opportunities may emerge for exposure to acute trauma cases. Further, valuable opportunities to learn trauma surgery exposures and techniques may exist in organ retrieval teams, a model that has been proposed in the United Kingdom.⁹

The ADF has not historically provided technical training of medical specialists and relies on civilian training and certification. As such, it is suggested that the ADF collaborate with the Australian and New Zealand Association for Surgery in Trauma (ANZAST) to develop an ADF-specific training

continuum. Similarly, collaboration with the rural surgery section of the Royal Australasian College of Surgeons would seem prudent given the synergies and shared goals between the two organisations.

The work of Hall and colleagues suggests one approach to the identification of high-yield clinical placements. This US group recently defined the 'Combat Casualty Care Relevant Case (CCC-RC)' in their paper to quantify the 'real-world' as distinct from the simulated experience of US military general/trauma surgeons. Defining a CCC-RC as an open, urgent trauma case requiring a blood transfusion, this paper assessed health facilities based on CCC-RCs seen each year.¹⁰ Replication of this study at trauma centres in Australia would quantify their training value for military surgeons on short-term placements. Though data are not yet available to answer this question, discussion within the ADF surgical community suggests that Australian trauma centres are likely to lack the case load required to prepare ADF surgeons for deployment. Therefore, the ADF must look to international centres to fulfil this requirement.

Placements at high-volume trauma centres of excellence are valuable, resulting in improved competence and confidence for key trauma management skills.¹¹ To effectively bridge the gap from civilian gastrointestinal surgeon to deployable resuscitative/trauma surgeon, such a rotation at a high-volume international institution is immensely valuable, if not essential. Opportunities could be explored in our region through the Pacific Step-Up policy,¹² or further afield in institutions with mature international trauma rotations as utilised by NATO allies.¹³ These programs may achieve additional strategic goals when structured to mutual benefit;¹⁴ however, this is beyond the scope of this article.

3. Military activities

Participation in military activities, be they exercises or low-tempo deployments, remains an important aspect of any surgeon's involvement with the ADF. Although these activities afford limited opportunities to develop technical skills and skill degradation is likely with prolonged low-tempo deployments, surgeons benefit from familiarisation with the field environment and basic military skill training.

- i The Emergency War Surgery Course is mandated by US CENTCOM prior to surgeons deploying
- ii This course combines individual and team training culminating in the surgical team taking trauma on call at SAAMC prior to deployment
- iii KSA's are a speciality specific metric designed to assess competency & identify and address gaps in knowledge and ability prior to deployment

Interaction with coalition partners allows for appreciation of other nations' systems and an understanding of the joint deployed environment, particularly the role of the US Joint Trauma System. It also provides opportunities to discuss common problems and share solutions to improve our training systems and capability development. Ongoing relationships with coalition forces may allow the ADF to participate in future high-volume deployed clinical rosters if required.

Conclusion

OCRPs offer a method of bridging the gap between civilian general surgeon and deployable resuscitative/trauma surgeon. OCRPs offer the most practicable and effective method of upskilling well-trained surgeons in the requisite skills required for deployment. Many benefits of such a system exist. Such training would improve the cadre of ADF surgeons' trauma skills and undoubtedly improve the group's confidence in managing severe trauma in austere conditions. This system may also act as a recruitment and retention tool by attracting appropriate clinicians to the ADF to experience opportunities not readily available to

their civilian counterparts. The authors believe this is an important factor given the current period of low-tempo deployments.

Given that the ADF relies on civilian training and accreditation for surgical specialists, such a program would be best managed through a collaboration between ANZAST and the ADF. The ADF would be required to absorb some cost for this proposal to succeed; however, such a collaboration would likely maximise efficiency and minimise these costs. Given the cessation of high tempo operations and growing divergence between civilian and military surgical care, it is an opportune moment to develop the aforementioned training pathway. This will ensure the ADF health community continues to deliver optimal specialist surgical care in deployed health facilities.

Corresponding author: Andrew Pearson,
aafpearso@me.com

Authors: A Pearson¹, A Mahoney¹, K W Bender¹

Author Affiliations:

1 ADF - Medical Specialist Program

References

1. Strumwasser A, Grabo D, Inaba K, Matsushima K, Clark D, Benjamin E, Lam L, Demetriades D. Is your graduating general surgery resident qualified to take trauma call? A 15-year appraisal of the changes in general surgery education for trauma. *J Trauma Acute Care Surg.* 2017 Mar;82(3):470-480
2. Hoencamp R, Tan E, Idenburg F, Ramasamy A, van Egmond T, Leenen L, Hamming J. Challenges in the training of military surgeons: experiences from Dutch combat operations in southern Afghanistan. *Eur J Trauma Emerg Surg.* 2014. Available from: <https://doi.org/10.1007/s00068-014-0401-z>
3. Cant MR, Naumann DN, Konig TC, Bowley DM. How do deployed general surgeons acquire relevant skill sets and competencies and mitigate skill fade? *BMJ Mil Health.* 2020;0:1-5. doi:10.1136/bmjmilitary-2020-001641
4. Bircher M, Tai N, Brooks A, Ong T. Major Trauma Workforce Sustainability, Outcomes of the RCS Major Trauma Workgroup. Royal College of Surgeons. 2016 Jan.
5. Edwards MJ, Edwards KD, White C, Shepps C, Shackelford S. Saving the Military Surgeon: Maintaining Critical Clinical Skills in a Changing Military and Medical Environment. *J Am Coll Surg.* 2016 Jun;222(6):1258-64. doi: 10.1016/j.jamcollsurg.2016.03.031
6. Nessen SC, The Forgotten Surgeon Warriors. 2019 14 Oct.
7. Woolley T, Rounds JA, Ingram M. Global lessons: developing military trauma care and lessons for civilian practice. *British Journal of Anaesthesia.* 2017;119(S1):i135-i142
8. https://jts.amedd.army.mil/index.cfm/PI_CPGs/cpgs
9. O'Reilly D, Lordan J, Streets C, Midwinter M, Mirza D. Maintaining surgical skills for military general surgery: the potential role for multivisceral organ retrieval in military general surgery training and practice. *Journal of the Royal Army Medical Corps.* 2016 Aug;162(4):236.
10. Hall A, Qureshi I, Englert Z, Davis E. Variability of Value of Trauma Centres to General Surgery Combat Casualty Care Skill Sustainment. *Journal of Surgical Education.* 2021 July-August;78(4):1275-1279. Available from: <https://doi.org/10.1016/j.jsurg.2020.12.002>
11. Barmparas G, Navsaria P, Dhillon N, Edu S, Margulies D, Ley E, Gewertz B, Nicol A. The gap in operative exposure in trauma surgery: quantifying the benefits of an international rotation. *Surgery Open Science.* 2020 Jan; 2(1):46-50

12. Australian Government. 2017 Foreign Policy White Paper. 2017 Available from: <https://www.dfat.gov.au/publications/minisite/2017-foreign-policy-white-paper/fpwhitepaper/foreign-policy-white-paper.html>
13. Choufani C, Barbier O, Demoures T, et al. Evaluation of a fellowship abroad as part of the initial training of the French military surgeon. *BMJ Mil Health*. 2021;167:168-171 doi:10.1136/jramc-2019-001303.
14. Mahoney A, Squires S, Pearson A. Doing well by doing good: Mutual capacity building through strategic medical engagement. *Australian Journal of Defence and Strategic Studies*. 2020;2(1):ISSN 2652-3728