fortune Journals

Review Article

JOURNAL OF SURGERY AND RESEARCH

ISSN: 2640-1002

Cross-Specialty Training and Education for Surgical Trainees: A Review

Arad Khodarahmi[1*] and Rahdakrishnan Nair[2]

Abstract

Introduction: Cross-specialty exposure within the training and education of surgical trainees has been suggested as a way to address the needs of increasingly complex patients driven by an aging population. As training pathways diverge early, enhancing cross-specialty understanding fosters improved teamwork, a core component of surgical practice. The aim of this study was to review current and emerging practices in cross-specialty exposure within surgical training and their benefits, as well as challenges, for trainees.

Method: For this review, PubMed (Medline), EMBASE, Google Scholar, Cochrane Central, and Web of Science were searched, from 2004 to 2024, for English articles pertaining to "cross-disciplinary" or "cross-specialty" and "surgical training" or "surgical education."

Results: Several structured approaches, including attachments, rotations, team training, and simulation methods have demonstrated the potential to integrate technical and non-technical skills effectively for surgical trainees. Adaptations for emergency and rural general practitioners also highlight versatility in application. Importantly, these opportunities are usually received positively by both trainees and training providers. Key benefits include enhanced exposure to diverse practices, expanded knowledge bases, strengthened teamwork, and potential cost efficiencies. However, challenges remain, such as increasing already lengthy training periods, risks of burnout, and limited operative opportunities in certain specialties, particularly exacerbated post-COVID. Addressing compatibility with international training standards is complex given already significant global variability in surgical training.

Conclusions: Despite challenges, the demonstrated benefits of cross-specialty training suggest its inclusion in more surgical programs merits exploration to better prepare surgeons for collaborative, multi-disciplinary care environments and complex patient care.

Keywords: Cross-disciplinary; Cross-specialty; Off-service; Multi-disciplinary; Surgical training; Surgical education; Surgical programs

Introduction

The demands on surgical practice are evolving due to the aging population and the increasing complexity of patient conditions. Studies find that while there has been success in increasing life expectancies throughout the developed world in the last half-century, the issues of multi-morbidity associated with age are showing in their impacts on our healthcare systems [1]. Estimations show that 38% of Australians (9.7 million people) had ≥2 selected long-term health conditions in 2022, with multi-morbidity being

Affiliation:

[1]Department of General Surgery, Austin Health, Victoria, Australia

[2]Department of General Surgery, Central Gippsland Health Service, Victoria, Australia

***Corresponding author:**

Arad Khodarahmi, Department of General Surgery, Austin Health, Victoria, Australia.

Citation: Arad Khodarahmi, Rahdakrishnan Nair. Cross-Specialty Training and Education for Surgical Trainees: A Review. Journal of Surgery and Research. 8 (2025): 106-110.

Received: January 27, 2025
Accepted: February 03, 2025
Published: February 14, 2025

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DOI:10.26502/jsr.10020425

more common in females than males [2]. This problem is particularly startling in the subset of patients requiring surgery, with one in eight patients undergoing surgery in countries like England shown to have multi-morbidity, with this factor accounting for more than half of all postoperative deaths.[3] Similar studies show increasing impacts on hospital costs, disability, poorer functional status, and poorer quality of life in such perioperative patients [1-4].

To address these current and future challenges in complex patient care, a multi-disciplinary approach to patient care in a collaborative environment has been shown to be essential in improving patient outcomes [5]. This is contradictory to current practice as training pathways in surgery diverge early, with an increasing trend towards sub-specialisation and super-specialisation and less time spent in a different surgical specialty rotation [6,7]. Such sub-specialisation trends have not always shown improved outcomes for patients either and even impaired surgical services in developing countries [8].

In the surgical field, it is suggested enhancing cross-specialty understanding fosters improved teamwork, a core component of surgical practice [9]. Based on this, cross-specialty exposure within surgical training has often been proposed as a solution to prepare trainees for these multi-disciplinary environments. Previous studies show trainees and surgeons already recognise a broad training pathway, particularly early in training, to be superior to a specialised one, hence further review of such exposure is warranted [10,11].

This paper aims to provide a review of the literature regarding the current and emerging practices in cross-specialty exposure within surgical training and their benefits, as well as challenges, for trainees.

Methods

To conduct this review, an electronic search of five databases-PubMed (Medline), EMBASE, Google Scholar, Cochrane Central, and Web of Science-was performed. The search spanned 2004 to 2024 and included English-language articles with keywords such as “cross-disciplinary,” or “cross-specialty,” or “off-service” and “surgical training,” or “surgical education” utilised.

Articles were selected based on relevance to structured approaches and outcomes related to cross-specialty training for surgical trainees. These results were presented in narrative form without quality appraisal of articles conducted in this review.

Results

Multiple approaches to integrating cross-specialty training have been explored, including structured attachments, rotations, team-based training, and simulation methods. These strategies aim to enhance both technical and non-technical skills in surgical trainees.

Structured attachments to and rotations in other surgical specialties (ie. Different from the speciality the trainee is specialising in) expose trainees to practices in other specialties, fostering a broader understanding of surgical principles and techniques. Simply studying the material of other specialties is often not enough to provide the same benefits as clinical exposure. These “off-service” rotations have often become integrated into many training programs already [7,12-15]. Aside from exposure benefits, such rotations have been proven to improve clinical knowledge, procedural skill set, and perioperative care across specialties [12,13]. Such rotations provide an opportunity for trainees to appreciate the interconnectivity of surgical disciplines and to learn from the diverse approaches used in other specialties. While rotations between different surgical specialties already exist and have been adopted to varying degrees, there have been programs suggested for surgical trainees to rotate to specialties outside surgery also (with the other services rotating trainees to surgery also). These include fields that work closely with surgeons, such as emergency medicine and anaesthetics [16,17].

Team-based training is another avenue of cross-specialty exposure that has been trialled in various units, particularly in the field of trauma care. Interprofessional trauma team training leverages the expertise of various specialties to teach procedural and decision-making skills in high-risk scenarios. This form of training has also been shown to increase confidence in the clinical management of trauma and improve trainee procedural skills to be harnessed in the trauma bay. Participants in such programs also reported an appreciation of learning from other specialties’ perspectives, with greater than 95% of all participants reporting improved comfort and willingness to collaborate across disciplines when caring for future trauma patients [18].

Simulation methods have proven effective for cross-disciplinary education, particularly in emergency and rural settings Simulation rooms are also not limited to the trauma bay, and can conduct scenarios in various settings, including the operating room, intensive care unit, emergency department, and ward. These programs teach skills like safe sedation and advanced life support in controlled, replicable scenarios, ensuring high levels of competency. Simulation-based training offers the additional benefit of allowing trainees to make mistakes and learn from them in a safe environment, ultimately enhancing their confidence and decision-making skills [19,20]. Such programs improve teamwork and patient safety outcomes. By working in multi-disciplinary teams in such simulations, trainees can gain a deeper understanding of the roles and responsibilities of other healthcare professionals, which enhances communication and collaboration. These

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DOI:10.26502/jsr.10020425

skills have been shown time and time again to be crucial to providing quality patient care [21].

Cross-specialty exposure is not only the realm of surgical training programs alone. Various emergency and rural general practitioners (GPs) have also explored starting the process of exposing their trainees to such experiences. Such programs argue that enhancing surgical skills for emergency physicians and GPs would mean they could provide improved surgical care for patients in remote locations, where surgeons may not be based. Tailored cross-disciplinary programs could help meet these unique demands [22-24].

Importantly, feedback from both trainees and providers indicates a generally positive reception toward cross-specialty opportunities. Trainees report increased confidence and competence, while providers highlight the benefits of interdisciplinary collaboration and knowledge sharing [14,15,25]. Some trainees even find they have increased operative opportunities on their off-service rotations.[14][15][26] Having positive trainee engagement and feedback to such programs, is vital to their survival and success [27].

Key benefits have been shown to exist in cross-speciality or off- rotation specialty exposure. Early exposure to a range of specialties allows trainees to develop a comprehensive understanding of surgical principles and techniques. This broadens their skill set and prepares them for multi-disciplinary care environments [12,13,18]. Exposure to diverse practices also encourages flexibility and adaptability, which are crucial skills in the dynamic field of surgery. Such exposure also provides the opportunity to expand trainees' clinical base of knowledge. Cross-specialty training provides insights into how different specialties approach similar problems, fostering innovative thinking and holistic patient care. By understanding the perspectives and techniques of other specialties, trainees can develop more nuanced approaches to patient care, leading to better outcomes [13]. By collaborating with professionals from other disciplines, trainees develop critical communication and teamwork skills essential for patient safety and effective care delivery. The ability to work effectively in a team is particularly important in high-stakes situations, such as trauma care or complex surgical procedures [18-20]. Interdisciplinary training programs can reduce overall training costs by sharing resources and infrastructure across specialties. Shared facilities, faculty, and equipment can lead to significant savings for training institutions, making cross-specialty programs an economically viable option [28].

Challenges and barriers also exist with such lofty ventures. Adding cross-specialty elements to already lengthy surgical training programs may prolong the pathway to qualification, potentially deterring trainees.[29] Prolonged training can also lead to financial strain and delayed entry into independent practice, which may discourage some individuals from pursuing a surgical career [30]. The increased workload and demands associated with cross-specialty rotations could also exacerbate trainee burnout, a concern that has grown post-COVID-19. Burnout can negatively impact both the mental health of trainees and the quality of care they provide. Institutions must implement measures to monitor and address burnout effectively [29]. Limited access to operative cases in certain specialties remains a significant barrier. Ensuring adequate hands-on experience across disciplines is crucial to maintaining training quality [14,15,26]. Additionally, surgical training standards vary significantly worldwide, complicating the integration of cross-specialty elements. Compatibility with international frameworks must be addressed to ensure consistent outcomes. Collaborative efforts among global training institutions could help establish standardized guidelines for cross-specialty training [31].

Conclusion

The increasing complexity of surgical care, and the need for multi-disciplinary patient management, underscores the need for cross-specialty training in surgical education. Some programs already have adopted off-service rotations as a core training requirement, while some are still broaching the topic. Alternatives and adjuncts, such as team-based training and simulation training, also show benefits. Outside surgical training, other fields such as emergency medicine, anaesthetics, and general practice have also started looking to inter-disciplinary rotations to improve training programs.

Despite challenges such as extended training periods, burnout risk, limited operative opportunities, and standardisation, the demonstrated benefits-including enhanced teamwork, broader knowledge bases, improved skillsets, and cost efficiencies-warrant its further exploration and integration into training programs. Perhaps most notably, these opportunities to rotate and be exposed to other surgical specialties have been received positively by both trainees and training providers.

Cross-specialty training represents a paradigm shift in surgical education, offering a pathway to more holistic, flexible, and collaborative care models. By embracing this approach, training institutions can equip future surgeons with the skills and knowledge needed to navigate the complexities of modern healthcare effectively. With thoughtful implementation and ongoing evaluation, cross-specialty training has the potential to transform surgical education and improve patient outcomes on a global scale.

Funding: None

Conflict of interest

All authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as potential conflicts of interest.

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DOI:10.26502/jsr.10020425

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