

General surgery: allow its extinction or begin its revival?

Surgery is rapidly evolving. New tools and techniques have widened our surgical capabilities to unforeseen horizons. In recent times, however, the future of general surgery has been questioned with many suggesting that its fragmentation into subspecialties is both inevitable and essential for procedure optimization. Such arguments, although strong, only effectively apply to the developed world. When a global perspective is adopted it becomes clear that there is a significant shortage of surgeons with, for example, only one surgeon per million people in Africa (World Health Organization, 2006). Here the need for general surgeons is increasing rather than diminishing.

The extinction of general surgery?

Over 30 years ago, Earl Smith posed the question 'Is general surgery a dying specialty?' (Smith, 1979). He proposed that because general surgery was broad and elusive in its definition it was susceptible to fragmentation. Indeed, although in this article a general surgeon is assumed to be one who is competent in all the subspecialty components as defined in the Integrated Surgical Curriculum Programme, this definition varies internationally, lending general surgery to division.

Vascular surgery provides an example of this. It is currently a subspecialty of general surgery, but through its expansion in procedure repertoire and increased patient demand, it has recently been successful in the first stage of formal separation from general surgery as approved by the Department of Health, with the target of achieving independent specialty status. Is it therefore possible that in the future hepatobiliary and colorectal surgery will also develop into their own specialities? Complementing this argument is the fact that fragmentation and specialization enable increased procedure volume, allowing optimization and improved patient outcomes (Holt et al, 2007).

Further fuelling the argument for extinction is a decline in the popularity of general surgery. In 1981, 12.1% of medical students selected general surgery as their first choice specialty, but this figure halved to 6.1% in 2001 (Association of American Medical Colleges, 2001). Polls in the UK have also shown a strong current disinterest of medical students in general surgery (Tambyraja et al, 2008).

Finally, general surgery is being threatened by technological advancement. The advent of new diagnostic tests and robotics has increased the necessity for surgeons who are specialized in using this technology, limiting the role of the generalist (Way, 1996).

Based upon these notions a number of new systems have been proposed. These include the introduction of 'emergency surgery' for acute cases, alongside which will lie other general surgery subspecialties such as vascular, hepatobiliary, colorectal, breast and endocrine surgery (Søreide, 2009).

Rationale for revival

Although the aforementioned arguments may be applicable to a modern city hospital setting, they cannot be applied beyond this. In rural areas, for example, there are insufficient numbers of surgeons to host specialists in every generalist subdivision (Zuckerman et al, 2006). This is accentuated when considering out-of-hours work; where rather than having a small number of generalists an entire team of specialist surgeons would be required. Such a possibility could have health-economic ramifications and could drive centralization of care to large units with a sufficient number of surgeons to staff specialist surgery on-call rotas.

Additionally, further specialization combined with constraints on doctors' working hours will make it increasingly difficult for trainee surgeons to gain experience and hence competence for safe independent operating (White et al, 2005). Thus although specialization may not seem

immediately harmful, its utility in a number of contexts such as rural hospitals is questionable.

In a global setting the demand for generalists becomes very clear. The burden of surgical disease on global health care is growing. It has been estimated that surgically treatable disease accounts for up to 11% (164 000 000) of the world's disability-adjusted life years (Debas et al, 2006). In this context the requirement for generalist skills supersedes the necessity for specialization. Indeed, if the majority of surgeons in the world are specializing who will be able to address this global need?

A final setting that must also be considered is the armed forces. Military surgeons need to be able to operate with limited resources, using diverse skills rather than the specialized skills defined by current general surgical subspecialties.

How do we balance the need for subspecialists against the need to support each of these settings? Based on these proposals, modification of surgical training schemes could be considered to provide surgeons with the opportunity to work in alternative settings such as rural and military areas, but in particular developing countries (all with appropriate safety considerations). These may be offered as options within the surgical training curriculum, or as out of programme or post-training experience. This could potentially circumvent the recently imposed time restrictions on domestic surgical training and provide trainees with an opportunity to gain 'general' surgical skills before, or while specializing, in addition to contributing to the improvement of global health care.

In Boston's Brigham and Women's Hospital, an internal medicine residency programme prioritizing global health equity has been introduced, aimed to educate clinicians in inequalities of health access and outcome (Farmer et al, 2004). The authors agree with this and argue that doctors of the developed world have a moral obligation to address this burden

and that the advancement of surgery cannot occur in isolation or while disregarding the surgical needs of the poorer nations of the world.

In support of this, surgical trainees often have expressed a strong desire to gain experience abroad and humanitarian organizations such as Médecins Sans Frontières have indicated increased demand for generalists in the afflicted areas they serve (Chu, 2009). Currently partnerships have started to be forged between surgical centres in developed and developing nations to address this, and offer valuable training when this occurs with adequate supervision (Ozgediz et al, 2008). Provided these educational partnerships are developed with appropriate foresight and are integrated into local health systems with a long-term vision and adequate resources to maintain their sustainability, the potential exists for the developing nation to make significant gains.

Conclusions

General surgery lies at the core of surgical education and training. At present a tension exists between promoting specialization to improve outcomes and retaining general surgical skills to be able to deal with the breadth of surgical disease in emergency, military and developing nation settings. Surgeons of the future, while accepting that further fragmentation of general surgery in the city setting will occur, must consider the impact of this on the global need for surgery. **BJHM**

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KEY POINTS

- Changes in both the nature of surgery and challenges in surgical training have raised questions over the future of UK general surgery in its current form.
- The important focus on outcomes is one of a number of drivers for the separation of general surgery's current subspecialties into independent specialties capable of performing critical volumes of complex operations.
- This is balanced by the demand for general surgeons in the context of a rural, military or developing world setting.
- Surgeons must consider this balance as it will undoubtedly be of importance in the near future.