Has surgical subspecialization gone too far?

John Black

Subspecialization is currently fashionable, but with present hospital organization, the need to cover emergencies and the lack of convincing evidence for its superiority, the tide is on the ebb and the place of the general surgeon is secure.

Where does general surgery stand as the century approaches its end? With its pejorative title, is it merely the rump left behind by the desertion of the 'real' specialties, its existence justified only by the need to provide a service for abdominal emergencies, doomed to further erosion and ultimate extinction by the inexorable development of the subspecialties (*Table 1*)? How far will this process go, is it beneficial, is it inevitable, and has general surgery got a future?

WHY HAS SUBSPECIALIZATION HAPPENED?

Why has subspecialization arisen (*Table 2*)? Most surgeons have special interests and aptitudes but find some areas such as breast surgery less attractive and will readily leave them to an interested colleague. Competence in some fields requires advanced training, as with oesophageal and pancreatic surgery which have never been practised by all general surgeons. Enthusiasm for a subspeciality may alter referral patterns such that an individual has no time for anything else. Organization may lead to subspecialization, for example by concentrating endoscopies into lists done by a few consultants.

An institution may flourish by encouraging subspecialization, as may individuals in the private sector. For Calman–Hine implementation teams the superiority of the site specialist surgeon is an article of faith. In breast surgery, there has been public demand for dedicated clinics and specialist surgeons, orchestrated by the politically correct media. Another factor in the progress of subspecialization is expansion of consultant numbers achieved by sharing existing sessions. Some may now feel that their workload is insufficient to retain competence across the whole field of general surgery.

DISADVANTAGES OF SUBSPECIALIZATION

Some disadvantages of subspecialization are listed in *Table 3*. Most surgeons will be familiar

TABLE 1.
General surgical subspecialties

Vascular	
Breast	
Coloproctology	
Endocrine	
Transplantation	
Upper gastrointestinal	Oesophageal
	Pancreatic
	Hepatic
Endoscopic	

TABLE 2.
Reasons for subspecialization

Individual inclination	
Special training	
Clinical overload	
Organizational	
Economic	Hospital
	Individual
Cancer services implementation teams	
Public demand	
Lower individual workload	

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with the individual who, having achieved competence in a particular subspecialist area, feels that only he/she in that hospital should practice it and by corollary should not practice anything else. This approach will distress the successful generalist. It is observed fact that many surgeons change their subspeciality interest in mid-career, often away from the more physically demanding areas. Ossification of subspeciality boundaries would preclude this.

FUTURE OF SUBSPECIALIZATION

Some subspecialties may not have a long-term future. Twenty-five years ago it would have been appropriate for each district general hospital (DGH) to have a consultant with particular expertise in surgery for peptic ulcers, a branch of surgery now virtually redundant. Which of the existing subspecialties are vulnerable? Surely it is inevitable that the treatment of vascular disease will move from the invasive surgical approach to the more elegant endovascular. Will vascular surgeons be replaced by vascular radiologists?

In breast cancer, where prognosis depends on adjunctive therapy and not the type of surgery (Early Breast Cancer Triallists' Collaborative Group, 1992), suggestions are being made that operations should be withheld to allow the primary tumour to monitor adjunctive treatment (Epstein, 1996), and effective prevention might soon become available (Fisher et al, 1998). A surgical career, from appointment as specialist registrar to retirement, lasts for 30 years, and one wonders how many cases of breast cancer will be managed by surgeons in the year 2030.

Should inflammatory bowel disease be caused by a transmissible agent it will become curable, and screening for colon cancer significantly reduces the incidence of the disease (Towler et al, 1998). Hence it is possible that coloproctology will lose a significant part of its workload. Such predictions are speculative, and might appear far-fetched, but would it have been easy 25 years ago to convince a surgical audience that peptic ulcers were the result of bacterial infection and would be cured by a short course of medical treatment?

NEW SUBSPECIALITY

The 1990s have seen the development of the new subspeciality of endoscopic surgery, totally unpredicted by the surgical community (Smith, 1991) and made possible by developments in optics and television camera technology. Already one quarter of general surgeons practice endoscopic surgery as a subspeciality (unpublished author's survey, 1997). Other new subspecialities are inevitable as technology advances.

Increasing subspecialization may have adverse effects upon trainee surgeons, particularly if a considerable proportion of their time is spent in a single sub-speciality. With only 5 clinical years required at specialist registrar level to obtain the certificate of completion of specialist training (CCST) in general surgery, smaller subspecialties may be missed entirely. Subspecialization lacks attraction for many trainees, who are fascinated by the totality of surgery. Anecdotally, breast and vascular surgery are becoming less popular, probably because of the relatively narrow range of surgical procedures.

In surgical real life a large volume of surgery does not fit neatly into subspecialist pigeonholes (*Table 4*). The humble hernia will always be with us. Vascular surgeons cannot be expected to deal with all the varicose veins in the community. As urologists become even more endoscopically-orientated it is likely that scrotal surgery will continue to be sent to general surgeons. It will be a long time, if ever, before all skin lesions are dealt with by plastic surgeons. Except in very large centres there is not enough endocrine surgery to justify a subspecialist, and

TABLE 3.
Disadvantages of subspecialization

Exclusivity
Professional discomfort
Changes of subspecialty
Disappearing subspecialty
New subspecialty
Restricted training
Surgical misfits
Difficulty with emergency cover

TABLE 4.
Non-specialist general surgery

Hernias
Varicose veins
Scrotum
Skin tumours
Lumps and bumps
Thyroid surgery
Children's surgery
Haematological diagnosis

inevitably thyroid surgery will be carried out by the surgical generalist. There will always be a need for non-neonatal paediatric surgery in a DGH and haematologists are unlikely to send their patients requiring splenectomy and node biopsy to a regional centre. Such non-subspecialist work dominates the workload in most hospitals, particularly in the private sector.

PLACE OF GENERAL SURGERY

It is the management of unsorted emergencies that defines the speciality of general surgery, as there is no better definition of a general surgeon than a consultant who is on the emergency call rota. *Table 5* lists the range of general surgical emergencies in approximate descending order of frequency seen in a DGH, based on the author's personal audits. The variety is truly protean and in the foreseeable future only vascular emergencies are likely to transfer to specialists.

It seemed at one stage that organization of the NHS into large hospitals serving a catchment population of 450 000 to 500 000 with adequate surgical staffing was the appropriate model for the UK, and would be able to provide a full range of subspecialist teams (Senate of Surgery, 1997). However, subsequent reflection (British Medical Association, Royal College of Physicians, Royal College of Surgeons, 1998) accepts that in reality most acute services for medicine and surgery will be provided by hospitals serving a population of approximately half that.

Now that consultants may by European Community regulation work only 48 hours per week, they are unlikely to accept being on call more frequently than their juniors, so the requisite number needed in each hospital for separate emergency rotas in each subspecialty is unachievable. Hence consultant general surgeons must continue to be competent to cover all the subspecialties of general surgery on an emergency basis.

TABLE 5.
General surgical emergencies

Non-specific abdominal pain
Perianal and external abscess
Appendicitis
Biliary colic/cholecystitis
Colonic obstruction and perforation
Small bowel obstruction
Ruptured aortic aneurysm
Strangulated hernia
Abdominal and chest trauma
Perforated and bleeding peptic ulcer

In general medicine, subspecialization has already advanced to the point where some consultants have declared themselves incapable of coping with general medical emergencies (Taylor et al, 1996). With clinical governance imminent, general surgeons will not wish to hear similar confessions from their own specialty. However, one suspects that the heavy exclusive workload of the breast subspecialist has already de-skilled some to the point where they no longer feel comfortable on the emergency take rota.

EVIDENCE FOR SUBSPECIALIZATION

All debate on the advantages and disadvantages of subspecialization would be irrelevant if there were irrefutable evidence that subspecialization and increased case volumes lead to improved outcomes. In that event it would be the clear duty of the surgical community, whatever the organizational difficulties, to develop along subspecialist lines. However, no such evidence exists. The situation was summarized by the University of York NHS Centre for Reviews and Dissemination (Effective Health Care, 1997), reviewing outcomes in colorectal cancer, in the statement:

> **'There is contradictory evidence that specialisation and increased patient throughput improves outcomes.'**

Indeed in a recent large review of two English NHS regions (Mella et al, 1997), those consultants describing themselves as general surgeons had the lowest postoperative mortality, albeit by a narrow margin. In a Scottish review (McArdle and Hole, 1991) results were not related to case volume. Galland and Wolfe (1998) have recently reviewed mortality after elective abdominal aortic aneurysm repair and make a case for larger vascular units while acknowledging the satisfactory results obtained by some low volume surgeons. However, in Edinburgh, the UK flagship of vascular centralization, operative mortality has increased steadily over the last 15 years (Bradbury et al, 1998): hardly the expected outcome and requiring explanation. In breast surgery, a single retrospective survey that did not compare treatments is hardly compelling evidence for the superiority of subspecialization (Gillis and Hole, 1996).

Of course the literature contains many case series from subspecialized individuals reporting results apparently superior to those found on general audit. Dent (1998), looking at cancer surgery, has emphasized the dangers of

comparing data from such uncontrolled series to results in routine practice, concluding that randomized comparison is the only robust test for new variations in the surgical treatment of cancer. Subspecialization and increase in case volumes are such new variations but it is difficult to imagine them ever being assessed properly by randomized prospective controlled trial. Without such trials there will never be conclusive evidence.

At first sight it is surprising that increasing case volumes does not seem to improve surgical results. Common sense dictates that the more often a surgeon carries out an operation the more competent he/she should become and indeed few surgeons will feel at ease performing an operation they only do rarely. However, major operations are highly complicated procedures and it is likely that different rules apply to surgeons carrying out such activity than to simple mechanical tasks.

One might speculate that there is an optimum level for the number of operations needing to be performed each year to achieve best results. Above this number, boredom and over-confidence may well produce inferior results and perhaps to retain technical skill and mental awareness the surgeon needs to be stimulated by a wide range of procedures. The lower volume limit may turn out to be surprisingly low with skills being supported by abilities acquired in other fields. Are the techniques involved in manipulating the upper gastrointestinal tract so very different from those used at the other end of the abdomen? Also, surgeons carrying out small numbers of operations are likely to be selective in what they undertake.

Assailed by press and politicians the beleaguered general surgeon may easily forget that he/she is a highly trained professional, fully capable of deciding the limits of his/her own competence, but nevertheless able to function satisfactorily across a wide range of procedures. The individual who takes on anything regardless of results probably does not exist and the generalist approach is not incompatible with state of the art outcomes.

CONCLUSIONS

Historically subspecialties transmute into specialties (Watkin, 1998), but clearly this process cannot continue indefinitely. In the absence of convincing evidence that subspecialization improves surgical outcomes, the general surgeon is secure in those institutions with a DGH function. The place of the narrow subspecialist is in true tertiary referral centres dealing with areas such as pancreatico-biliary surgery and transplants and with the unusual difficult problem. General surgical consultants and trainees should feel free to develop particular interests but not to exclusivity. They should keep their general surgical roots and remember that their favourite subspeciality may disappear. Trainers must ensure that surgical education is emergency based and sufficiently wide for future consultants to be able to move between subspecialties and indeed into new ones.

'What's in a name? That which we call a rose by any other name would smell as sweet'. If only there were a better name than 'general surgery'. HM

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KEY POINTS

- Subspecialization is fashionable but the evidence base for it is poor.
- Subspecialties disappear and new ones emerge.
- Care of emergencies requires surgeons to maintain generalist skills.
- Surgical training must be wide-based and produce flexible surgeons.
- General surgery needs a more attractive title.