

ASSOCIATION OF UPPER GASTROINTESTINAL SURGEONS
OF GREAT BRITAIN AND IRELAND

GUIDANCE ON MINIMUM SURGEON VOLUMES

Introduction

A request was issued by the Department of Health in England for a recommendation on a minimum surgeon volume for major cancer resections carried out by 'in-reach' surgeons (surgeons who come in to operate in a major centre but do the main part of their practice in another hospital). AUGIS was asked to take this forward for major oesophago-gastric (OG) and hepato-pancreato-biliary (HPB) resections. The world literature was reviewed in detail after two major literature searches which included meta-analyses, review articles, other peer-reviewed papers and clinical guidelines along with any reports from working parties. The AUGIS working party is very grateful to the Clinical Effectiveness Unit at the Royal College of Surgeons of England for their assistance. Professor John Birkmeyer of the University of Michigan was also consulted. The initiative has received strong support from Sir Bruce Keogh, NHS Medical Director. An initial draft document was discussed at the AUGIS AGM in Nottingham on 02.09.09 and this final document has been produced following several further discussions and drafts.

Literature Review

The European and North American literature overwhelmingly supports the view that there is a strong relationship between increasing hospital (institutional) volume and reduced operative mortality in major oesophago-gastric and hepato-pancreato-biliary resections. There is also evidence that some long term outcomes are improved. Recent data now demonstrate that, not only are outcomes also improved by increasing individual surgeon volumes, but that specialisation of the surgeon and the unit also has an important role to play. With regard to both hospital and individual surgeon data, there is a wide variation in what constitutes a small, medium and large volume, although there is also clear evidence that the improvement in outcome with increasing volume continues substantially above that figure which many papers might consider a 'minimum' figure. As a result the AUGIS working party considers that the absolute individual minimum volume for individual surgeons cannot be divorced from unit volumes and must also take into account 'specialisation of the surgeon and unit'.

Other factors to be taken into consideration

AUGIS represents members from across the UK and Ireland and any recommendations should be applicable to the whole membership, taking into account geographical variations, current and future training issues and differences in health care systems. The working party also considered it appropriate to consider an in-reach surgeon as an integral part of any designated upper GI surgical institution and someone who should therefore be assessed in the same manner as all other surgeons within that unit.

The recommendations of the working party therefore also took into account:

- a) The guidance on populations for upper GI cancer resection from the Upper GI Improving Outcomes Guidance Document (England and Wales). For oesophago-gastric resection a centre should draw from a population of 1-2 million and for pancreatic resections from a population of 2-4 million. It is also advised that teams should aim for populations from the upper ends of these population ranges. The DoH Cancer Action Team in England has determined that liver surgery should draw from a similar population as pancreatic surgery.
- b) It is however also recognised that at present units which serve a smaller catchment area/population may carry out large numbers of resections due to referral patterns which cross boundaries. These referral patterns often exist for historical reasons and surgical excellence.
- c) It is becoming increasingly common for some major upper GI resections to be carried out by two consultants, thereby altering the dynamics of 'surgeon volumes'.
- d) The introduction of the European Working Time directive (EWTD) must also be considered when deciding the minimum number of surgeons required to staff a specialist unit, not only for resectional surgery, but also to look after these patients 7 days per week and provide an additional out of hours sub-specialty service for other complex upper gastro-intestinal problems such as ruptured oesophagus, liver trauma and severe pancreatitis, either arising 'de novo', or as complications from other procedures. The ideal number of surgeons to cover this type of rota would therefore be somewhere between 4-6, with lower numbers only being acceptable in areas of geographical isolation. This in turn might have a knock-on effect on other on-call rotas and needs to be considered in conjunction with the size of hospital and surrounding population served, along with other hospitals in that region which might contribute to the on-call rota. In many areas this is likely to lead to some form of service re-configuration around populations from the upper ends of the recommended population ranges which should be strongly encouraged.
- e) Although there will be some variation across the UK in on-call commitments, and accepting that some HPB surgeons will take part in transplant rather than general surgical on-call rotas, when annual leave and study leave are also taken into account each Upper GI surgeon is likely to only be available for significantly less than the 'available 42 weeks per year. In addition to resectional surgery for cancer, most upper GI surgeons will also have a 'benign' workload which will clearly further reduce the available time for cancer surgery.

Recommendations (Minimum volumes)

1. Oesophago-gastric resections

Cancer Research UK cancer statistics 2006 show that the incidence of OG cancer (all forms, men and women) is around 260 patients per 1 million population. (This is calculated from an average UK incidence of oesophageal cancer in men of 17/100,000 and women of 9.0/100,000; and for gastric cancer in men of 16.7/100,000 and 8.9/100,000 for women. OGI tumours are not specifically mentioned. The first and

second annual report of the National Oesophago-gastric cancer audit (2008 and 2009), suggested that the overall resection rate for all OG cancers has fallen over the last decade and is now around 20% (10% oesophagus, 24% OGJ and 23% stomach). These statistics would suggest that for a population of one million approximately 52 patients would require surgical resection. The incidence in Scotland, the NE of England and Wales is higher than the rest of England and Northern Ireland. Recent improvements in pre-operative staging and the more widespread use of CT-PET scanning are likely to lead to a further fall in the resectability rate, certainly for oesophageal cancer. However with the increasing incidence of oesophageal and OG junction tumours seen over the last decade and improved public awareness which in turn will hopefully lead to earlier diagnosis, it is likely that the overall number of resections within a given population will not change significantly. These figures of course do not include the requirement for gastric resections and mobilisation for a variety of benign conditions, in addition to head and neck cancer. An ideal OG unit would therefore consist of 4-6 surgeons each carrying out a minimum of 15-20 resections per year serving a population of 1-2 million.

2. Pancreatic and liver resections

Pancreatic cancer (with a surgical resection rate of 15-20%) has an annual incidence of 100/million. In addition 35 patients/million present with related tumours such as periampullary, lower bile duct, duodenal and pancreatic cystic tumours, which combined have a resection rate of 40-50%. The overall pancreatic resection rate for neoplasia is therefore approximately 35-40 per million population. Resection rates have doubled in the UK in the last 10 years and are expected to rise further with full implementation of IOG and more acceptance of pancreatic resection as a safe procedure in the elderly.

The indication for liver resection is colorectal metastases in 60-70% of patients and with the increases in resection rates due to more effective chemotherapy agents it is expected that 7-8% of colorectal cancer patients would undergo liver resection which equates to 40 resections per million population. An additional 20 resections per million would be carried out for other indications including primary tumours of the liver making a total of 60 liver resections per million per year, 30 of which would be expected to be 'major' that is 3 segments or more.

The majority of Hepato-Pancreato-Biliary (HPB) Units provides a pancreatic and liver resection service with a single surgical team. Liver transplant is carried out in seven UK HPB Units and there is overlap between HPB and transplant surgery. Within the framework of IOG, working from a population of 2 – 4 million, at least 80-100 pancreatic resections and 150 liver resections (75 major) would be carried out. A team of 6 surgeons would carry out 12-16 pancreatic resections per year per surgeon and 15-25 liver resections (10-15 major) per year per surgeon or more in areas of high population.

For those highly specialised and infrequent procedures (examples might include Klatskin tumour resection and resection for chronic pancreatitis), it would be expected that only two nominated members of the surgical team would be involved.

3. Team-working and in-reach surgeons

It is expected that any surgeon working in a designated centre and undertaking major resectional surgery must be an integral member of the team and this also applies to surgeons doing in-reach surgery. This means full participation as a core member of the MDT, equal access to facilities, cross covering of patients and shared care of all patients. In order to maintain excellence within the surgical team, all members of the team should be performing roughly equal numbers of major resections, although it is recognised that there are those less common procedures which are best performed by a limited number of consultants within the surgical team (see above). It is clear that with cancer waiting time requirements, on call commitments and other reasons for absence, consultants within units are increasingly sharing patients and the workload. The in-reach surgeon should be part of this process. The outcome measurements for each unit should therefore reflect this practice and the in-reach surgeon's results considered together with all other members of that unit.

4. Audit

AUGIS expects all surgeons undertaking major resections to participate fully in national audit and to undertake regular internal review in order to ensure the best possible clinical outcomes. Unit results should take into account the results of all participating surgeons as a whole, including all 'in-reach' surgeons.

Summary

This document has been written as guidance for those involved in commissioning of services for major upper GI resectional surgery. It is based on current evidence and surgical practice. Changes in healthcare commissioning, surgical manpower and advances in treatment are likely to influence these recommendations which should therefore be reviewed on a regular basis.

Key References

Allum WM et al. Guidelines for the management of oesophageal and gastric cancer. GUT 2002; 50(Suppl V):v1-v23

Bachmann MO et al. Cohort study in South and West England of the influence of specialisation on the management and outcome of patients with oesophageal and gastric cancers. Br J Surg 2002; 89:914-22

Begg C et al. Impact of hospital volume on operative mortality for major cancer surgery. JAMA 1998; 280:1747-51

Birkmeyer JD et al. Hospital volume and surgical mortality in the United States N Engl J Med 2002; 346:1128-37

Birkmeyer JD et al. Hospital volume and late survival after cancer surgery Ann Surg 2007; 245: 777-83

Chowdhury MM et al. A systematic review of the impact of volume of surgery and specialization on patient outcome. Br J Surg 2007; 94: 145-161

Eppsteiner RW et al. Surgeon volume impacts hospital mortality for pancreatic resection. Ann Surg 2009; 249: 635 – 640

Gruen RL et al. The effect of provider case volume on cancer mortality: systematic review and meta-analysis. CA Cancer J Clin 2009; 59:192-211

Hall B et al. The impact of surgeon specialisation on patient mortality: examination of a continuous Herfindahl-Hirschmann index.
Ann Surg 2009;249:708-716

Parikh D et al. D2 gastrectomy: lessons from a prospective audit of the learning curve. Br J Surg 1996; 83: 1595-9

Sutton DN et al. Learning curve for oesophageal cancer surgery. Br J Surg 1998; 85: 1399-1402

Wouters MWJM, Jansen-Landheer MLEA, van de Velde CJH.
The quality of cancer care initiative in the Netherlands
EJSO 2010; 36: S3-S13

The Leapfrog Group
Surgeon Volume
www.leapfroggroup.org

Department of Health. Guidance on Commissioning Cancer Services: Improving Outcomes in Upper Gastrointestinal Cancers. London 2001

Scottish Intercollegiate Guidelines Network
Management of Oesophageal and Gastric Cancer 2006
<http://www.sign.ac.uk>

Clinical Resource Audit Group (CRAG). Scottish Audit of Gastro-Oesophageal Cancer: Report 1997-2000. Edinburgh: CRAG 2002.
<http://www.show.scot.nhs.uk/crag/>

The National oesophago-gastric cancer audit. First annual report 2008 and 2nd Annual report 2009. NHS Information centre
http://www.augis.org/clinical_audits/clinical_audits_og_cancer.htm

<http://info.cancerresearchuk.org/cancerstats/types/oesophagus/index.htm>

<http://info.cancerresearchuk.org/cancerstats/types/stomach/index.htm>

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