The ninth dimension

Emergency General Surgery and teaching technical skills in regional Australia

The current surgical curriculum has been with us since 2007 and is now embedded in the practice of our surgical community. It is broken up into competencies: there are eight non-technical skills, with many courses provided by RACS that can be successfully mapped onto them. Having done many of these courses myself I can attest to the powerful impact they can have on personal values, perception, advocacy and performance.

What about the ninth competency, technical skills? Mentorship and repetition are crucial: muscle memory is as important to the surgeon as the concert pianist and the aviator. So in General Surgery, the answer should be straightforward. That is what five years of the training program should achieve! However, open surgery, particularly open emergency surgery, remains a problem.

In regional Australia there is a continuing need for the provision of emergency general surgery (EGS), much of it being open surgery. It takes a special Trainee with a lot of special training to prepare for this role. Figure 1 outlines the procedures associated with the majority of costs, complications and deaths in EGS. Although the data is from the US, it will be immediately recognizable to surgeons in Cairns or other regions.

However, this list does not include trauma or complex soft tissue infections, important contributors in our regions.

Meanwhile Figure 2, again from the US but similar to its local counterpart, suggests the enormity of the impact of EGS in the overall context of health service provision.

The regional general surgeon in Australia deals with a large volume of emergency surgery; much of this will be performed as open surgery. It makes sense that the training is provided regionally. All our surgical institutions understand that EGS goes to the heart of the contract between surgeons and communities. But how do we provide the necessary repetition, the volume, the muscle memory, in a regional setting?

We have good evidence in Australia that our Trainees progress through their five-year program acquiring operative experience in an appropriate fashion. It does appear that most of them gravitate to the metropolis doing Fellowships, and eventually into increasingly narrow specialist practice.

I joined James Cook University in 2011. I was already involved with some Anatomy teaching when I was challenged by Roxanne Wu (who specialises in Vascular surgery in Cairns) to show that we could teach the entire curriculum of operative General Surgery by cadaveric simulation.

Together with Andrew Hattam, then a medical student and now a vascular SET, we formed a study group, worked out a program, acquired instruments and, backed by our Dean Richard Murray, launched our first Anatomy of Surgical Exposure (ASE) course in 2013. Almost without exception we were supported by the Cairns surgical community.

The course has grown in complexity, but not in length or duration. We have maintained our commitment to teach an overall curriculum in operative General Surgery, highlighting emergency procedures and trauma. We teach the major vascular exposures, emphasizing Arnold K Henry's 'extensile' approach. Our tutor faculty now comes from around Australia, many of them regulars who have become experts, and also excellent surgeons from the National University of Singapore and universities in Colombo. We run the program as operating theatre simulations where every table has a full set of good instruments, and a registered nurse (RN). Our RN consultants run the Operating Room Nurse programs with RNs attending from around Australia. Our volunteers, mainly medical students but also interns and residents, help to run the programs and learn a lot of anatomy on the way. Many go on to pass the GSSE.

Figure 1:
Use of National Burden to Define Operative Emergency General Surgery. Scott et al
JAMA Surg. 2016;151(6):e160480. doi:10.1001/jamasurg.2016.0480

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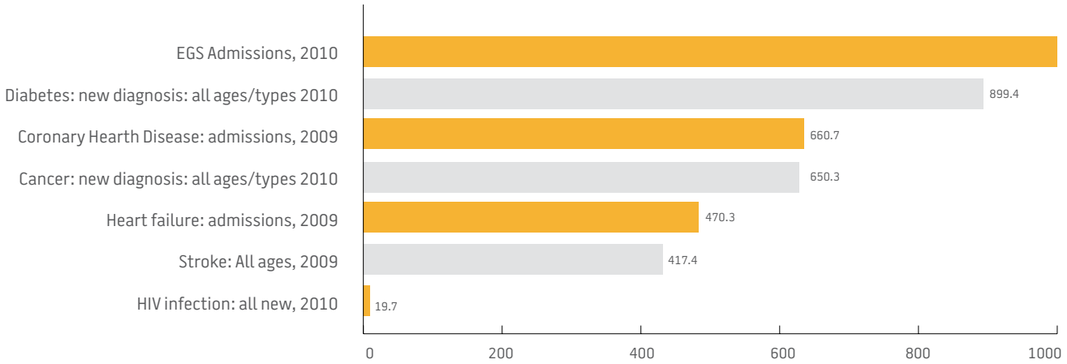
	Account for
Partial Colectomy	80% procedures
Small bowel resection	80% costs
Cholecysectomy	80% deaths
Operative management of peptuc ulcer disease	80% complications
Lysis of peritoneal adhesions	
Appendicectomy	
Laparotomy	

3 million EGS admissions yearly

More than the sum of all new cancer diagnoses

Figure 2: EGS Admissions vs Other Public Health Concerns
Incidence per 100,000 US population
Gale et al. J Trauma Acute Care Surg. Volume 77, Number 2



In 2015 the Orthopedic surgeons joined the ASE program, running an arthroscopy course and a separate orthopedic surgical exposure course over three days.

We now have a dedicated administrative staff and excellent anatomy staff in Smithfield, Cairns. We have developed Operation Manuals for all the courses we run, and a set of course videos to match the programs.

We take the simulation aspects of the course seriously. We primarily cater to SET Trainees but we are open to residents as well as younger consultants. We tailor the course to each participant's ability and interest and ensure that they have the manuals and videos for the course for preparation. A detailed debrief is carried out, based on an extended Pendleton Method and using numerical Objective Structured Assessment of Technical Skills (OSATS) data. We invite feedback on the course and send out questionnaires. The tutors have a separate manual and access to all the other course materials.

There have been some unexpected outcomes of this program. Similar programs have now been appearing elsewhere in Australia and overseas. Our tutor surgeons are among the greatest beneficiaries of the program. In Cairns, we no longer approach thoracotomies or craniotomies with dread as we have had continuous practice on cadavers every year; we are a much better team of surgeons for it. Our SET Trainees who have done the course have now returned as tutors post-Fellowship.

Our cadavers are formalin preserved and are stiff, if variable. Remarkably, we are able to complete all the exposures required as practice has provided us with the correct sequence, which is the key to getting them done. Our laboratory is brilliantly ventilated, and no one complains about formalin irritation.

We recognize that the ASE course is potentially a franchise that can be set up anywhere with a good laboratory and cadavers. We are open to suggestions from RACS, General Surgeons Australia, and other Universities as to where and how the courses may evolve. We are fortunate to have generous support from industry, which has helped us to get over the line every year. But it remains hard work.

The evidence we see is that Technical Skills in Open General Surgery can be taught and practiced by cadaveric simulation. The model we have developed works well.

Those of us in regional Australia, sustained as we are by many excellent overseas trained surgeons, are sensitive to evolving trends and see a danger to the role of General Surgeon. If regional surgery positions are expected to contract to fit the current zeitgeist, we may see failure of "rescue", inappropriate transfers, demarcation disputes and fragmented care, with enormous financial and other costs to our regions. The American approach to this crisis in evolution has been the development of the Acute Care Surgeon, with extra training and remuneration. This may be something to consider for regional Australia.

There is a role for government and health departments here to respond to this evolution. General Surgeons need to be carefully selected at a specialist level, with remuneration that reflects their training and responsibility. Our institutions and regulatory agencies must support this. Our General Surgeons need to be trained to the very high standard required: they need to maintain their skillset with regular access to simulation courses and formal short Fellowships in Specialist units like ASE. Good General Surgery should be developed not diminished.

Associate Professor
Alan DeCosta

For more information about the ASE course visit ase.training/