The ability to fashion technically excellent anastomoses is a fundamental part of the tool kit of most surgeons, including laparoscopic surgeons. Anastomotic leaks (ALs) after gastrointestinal surgery cause significant morbidity and mortality and poor long-term outcomes. Few studies have been published on leak rates and none has attempted to quantify the role of surgeon competence. Even the authoritative 2016 ASGO review of colorectal anastomotic leakage (1) stated “Due to low quality evidence across multiple studies of leak, assessment and management of ALs, it was agreed that formal grading/stratification of recommendation would be inappropriate, due to the lack of high quality evidence.”

A postoperative leak also negatively impacts oncologic outcome in patients undergoing curative resection for colorectal cancer. Studies report an increase in mortality rates of 20% and 30% and mortality increases of 10% to 20%.

The same principles underlie the fashioning of all anastomoses, whether laparoscopic or hand-sewn, and trainers must understand the principles of blood supply, tissue handling, knotting, suture placement and tissue tension. Many bowel anastomoses during laparoscopic surgery are performed outside the body cavity, as in open surgery. Increasingly gastrointestinal, urological and a few vascular anastomoses are performed wholly laparoscopically, but surgical trainees are gaining far less experience of carrying out anastomoses because of shortened training, shorter working hours, popular demands for consultant delivered care and increased laparoscopic surgery. We aim to show that realistic training simulations have a greater part to play in the laparoscopic era.

Continuing need for open surgery, particularly in emergency laparotomy

When laparoscopic surgeons have to revert to open surgery because of technical difficulty, haemorrhage or a hostile abdomen, hand-sewing skills are required. The second year report of the NELA audit (4) involving 23,000 operations showed that only 13% of emergency laparotomies were performed on the abdomen, hand-sewn and only 7% were completed laparoscopically. Nearly all emergency laparotomies in England and Wales remain primary open procedures (2), and operating surgeons must be trained and capable of performing such anastomoses.

Anastomotic leakage or dehiscence

• Anastomotic leaks are a major and under recognised cause of post-surgical morbidity as well as mortality
• They are expensive in terms of harm to patients and hospital expenditure and are often fatal
• The biggest factor in anastomotic leak rate is probably operator technique

Gaining far less experience is the consequence of shortened training, shorter working hours, popular demands for consultant delivered care and increased laparoscopic surgery. We aim to show that realistic training simulations have a greater part to play in the laparoscopic era.

How do surgeons learn appropriately high standards and how to implement them?

Traditionally surgical techniques are learnt by apprenticeship on live patients: watching and assisting a more senior surgeon, then performing part and later all of the operation under supervision, and repeating all of this several times with increasing responsibility being given to the trainee. During the last 20 years, four key principles and techniques should be demonstrated and explained. The disadvantages of this approach are:

• Lack of a structured, progressive learning programme
• Training in a number of surgical tasks may not be covered because of the vicissitudes of clinical practice
• Patients may be too ill to be ‘practised upon’
• Time constraints may mean the operation needs completing quickly to get the next patient on the table or to finish the list on time

• Not all trainers are good teachers and some have bad or inconsistent habits
• Trainers may not really understand their methods i.e. their ‘expert systems’ competencies.

The intercollegiate basic surgical skills course

This provides a ‘kick start’ to surgeons wishing to undertake anastomoses but gives them only basic competence; more training and experience is needed to undertake safe anastomoses. The Royal Colleges of Surgeons recognise the effectiveness of lap training for surgical skills and have made several such courses mandatory, including this one. However advanced practical anastomosis training is not yet mandatory and the number of advanced courses have declined since their high point 30 years ago.

What is needed to teach good, safe and precise advanced anastomosis techniques that can be learnt easily and reliably?

• The trainer must understand the importance of the kinesiology (i.e. studied movement) of surgical techniques
• The baseline principles behind making secure knots, tissue handling and manipulation and use of instruments need to be taught and monitored under controlled lab conditions
• Trainers need to practice a wide range of techniques on life-like animal material in a lab with formative assessment before entering further training during live operations

Training surgical techniques in a lab - the Cambridge Anastomosis Workshop (CAW)

The Cambridge Anastomosis Workshop has run annually since 1983. It is a progressive workshop and has shown its effectiveness in raising standards in surgeons in the era of open surgery, as evidenced by direct observation, formal and informal feedback, and latterly by pre- and post-workshop MCQs. The manual and a set of 4 DVDs is published by CLP and is used in the workshop to demonstrate techniques and to act as a source reference.

The CAW is an intensive 4-day workshop that has trained more than 700 surgical trainees and senior gynae-oncologists in a wide range of intermediate- to advanced open anastomoses of small and large bowel, oesophagus, stomach, blood vessels, bladder and ureter (see workshop programme, right). During the workshop, a range of basic skills and anastomoses is first demonstrated individually, then performed under close supervision, without time constraints and with real time feedback. More than 20 anastomoses are performed during the 4 days and a very large experience can be acquired in a short time.

Prepared pig material is a far better substitute for human material than synthetic material and gives a realistic “feel”. Completed anastomoses can be inspected in life in all the defects become mandatory during surgical training,岭systematically and with formative assessment.

Comment from participant: “You have made an indelible mark on surgery with this workshop”

References:
1. HARRISON, TRAINING AND MANAGEMENT OF COLORECTAL ANASTOMOTIC LEAKAGE ISSUES: PROFESSIONAL PRACTICE. 2016; 6: 1040-1044
3. Cambridge and Colchester UK
5. “You have made an indelible mark on surgery with this workshop”;
6. REFERENCES:
7. PROFESSIONAL PRACTICE. 2016; 6: 1040-1044
9. "You have made an indelible mark on surgery with this workshop"