THE DEVELOPMENT OF MEDICAL SYSTEMS

Before the end of the 19th century, medical training and education was haphazard and relegated to the responsibility of poorly paid consultants in institutions for the poor. Our present system of training was started with the establishment of regulatory bodies (the General Medical Council in the United Kingdom in 1893) and formalisation of residencies for training in the university hospitals (Johns Hopkins Institute at the end of the 19th century). This set the stage for the fusion of scientific development and best practice.

In the last three decades, added to this, has been the pressures imposed by providers for the financial structuring of training and clinical services. There has also been an increasing demand from the public for clinicians to take responsibility for the outcomes of their care. This has been highlighted by a number of high profile legal cases internationally². The more recent affirmations of the clinicians’ social responsibilities have had a significant impact on the way in which clinical processes are taught and practiced.

Traditionally, outcomes have been measured against the average, and a degree of poor outcome has been taken as the norm. The complexities of clinical care leading to a given clinical outcome have been individualised and medical care has therefore been considered an art to be passed on in an apprenticeship/internship model.

Fiscal and legal requirements have forced the medical world to re-evaluate the surrogates of clinical activity defining outcomes and to constantly look at improving the net result of care.
As in aviation and other high-risk industries, the average can no longer be the norm. Clinicians have to work towards processes that evaluate a predictable, favorable outcome on all occasions.

This has, and will, have an increasing impact on training, for instance: long hours at work have been identified as a cause for substandard care, the containment of time spent in the ward by trainees has meant that the time spent on the process of learning by apprenticeship has been challenged. New solutions have to be found.

STANDARDS OF ACCEPTED COLONOSCOPY
The practice of colonoscopy is an interesting teaching event, ideally suited to the scrutiny of surrogates that have an impact on outcome. Best practice will entail collection of key clinical data known to impact on the end point of. This will need to be analysed on an ongoing basis and linked by clinical audit to end points of care. These end points will increasingly be defined not only by the medical fraternity but also by financiers of the service as well as the patients’ themselves. This will require changes to the present infrastructure.

Colonoscopy is the commonest endoscopic procedure performed in the United States. Proficiency in the performance of screening colonoscopies has become an area of interest. The realisation that interval colorectal cancers occur as a consequence of low adenoma detection rate has driven this need to improve quality of colonoscopy. Adenoma detection rate is indirectly affected by caecal intubation rates, withdrawal times and ability to remove polyps once detected.

For this reason, the American Society for Gastrointestinal Endoscopy (ASGE) has defined adequacy of colonoscopy as:

1. Adenoma detection rate of \( \geq 30\% \) in males and \( 20\% \) in females
2. Successful caecal intubation rates of \( \geq 95\% \) in screening colonoscopies and \( \geq 90\% \) in routine colonoscopies
3. Successful removal of polyps \( \leq 2\, \text{cms} \)
4. Withdrawal times of \( \geq 6\, \text{minutes} \).
The Joint Advisory Group on Gastrointestinal Endoscopy, (JAG) a body hosted by the Royal College of Physicians who contribute to the quality and safety of patient care by defining and maintaining the standards by which endoscopy is practised, adds to this:

1. Completion of greater than 200 supervised colonoscopies
2. Attendance at an accredited training course.

These two additional requirements acknowledge nuances of training worthy of attention.

Several studies have shown that caecal intubation rates of \( \geq 90\% \) in routine colonoscopies are only achieved with total colonoscopy numbers exceeding 150-250. Just as pianists will only be proficient if they repeatedly practice chords, so to, clinicians will only attain motor proficiency by repeatedly performing the skills to be learnt. Feedback to the trainee and time spent on training, irrespective of the clinical burden or financial constraints, grows these complex skills.

JAG has formulated Direct Observation of Procedure or Skills (DOPS) and Direct Observation of Polypectomy Skills (DOPyS) which help the trainer to record and verify the trainee’s acquisition of clinical skills for colonoscopy. This is echoed in ASGE’s core curriculum for colonoscopy.

It is interesting to note that the acquisition of these skills and attainment of these stipulated standards are least frequently acquired in established endoscopists, highlighting the need for structured training to be introduced early in a clinicians’ development.

If adequacy of training is dependent on performing \( \geq 200 \) colonoscopies and preferably supervised by a trainer, then adequate training becomes more difficult in our pressurised, under-resourced environment. Similar constraints elsewhere in the world have driven the development of simulation-based training.
Although in its infancy, this area holds promise. Research has shown current methods of simulation for colonoscopy decrease the time to attain proficiency and so the trainee will have done fewer colonoscopies. Besides this, new technologies in live colonoscopy have aided teaching, these include:
1. Magnetic Endoscopic Imaging or Scope Guide
2. Water Immersion Colonoscopy

All of the surrogates of adequate colonoscopy can and should be recorded. In so doing, adequacy of skill acquisition will be more realistic.

**CONCLUSION: CERTIFICATION OF SKILLS**

Adopting teaching methods that embrace these ideas is likely to affect the way accreditation is ascribed. In South Africa, this is implicit in the various university and college exams. In the case of surgical and gastroenterological certificates, these have to be accompanied by a procedure logbook.

Certification of competency may slowly be driven by a more outcome-based platform, as is potential for colonoscopy.

The trauma community with the standardised Advanced Trauma and Life Support (ATLS) courses has realised similar training and assessment courses.

If regulatory bodies are to adopt this process of accreditation of cognitive and motor skills, it will be possible to achieve a better handle on the outcomes of certified skills.

Although this may be a long way off, a legally more literate population may well come to demand better outcomes from the health profession. The medical body may pay heed to this possibility for this reason.

The concept of outcome based education and accreditation may appear attractive in principle, in reality, it will necessitate a culture of data collection and a willingness to have that data interpreted. Change of this nature may be slow.
There is however a larger question to be answered for each and every skill that is taught. This pertains to the national relevance of that skill. This is amply illustrated in the case of colonoscopy. Colonoscopy is arguably the best tool for the screening of colorectal cancer. This being the case, should it be utilised in a South African screening programme? We don’t even know colorectal cancer’s incidence, let alone have a notion of projected numbers in the years ahead.

This uncertainty needs to be interrogated if we are to know how relevant teaching colonoscopy is in our context. A pre-requisite for any protocol requires clear and honest political leadership, to direct the focus of the clinical teachers. The emphasis and relevance of any taught skill should be pegged against its relevance for the South African population. This should be based on a true understanding of our population’s needs.

REFERENCES
1. KPMG cutting through complexity. Kpmg.com/healthcare