Levels of Training

There are 3 distinct levels of those requiring education:-

Level 1	Training in basic skills
Level 2	Training of trainees in surgical rotations
Level 3	Training of those in independent professional practice

Level One involves teaching of generic enabling skills which are the bricks and mortar on which to build any surgical career. These include activities such as knot tying, suturing, the use of diathermy and endoscopic equipment, in particular emphasising respectful handling of tissues. They are taught in many countries through the medium of Basic Surgical Skills courses, using low cost, bench top and box simulations which have the advantage of allowing trainees to practice in a safe environment, overseen by trainers who are committed to their learning and not distracted by issues of patient safety. These courses also give an indication of the innate ability of the trainee and can be an aid to identify at an early stage those who cannot demonstrate the required aptitude for a surgical career.

In the surgical rotations at Level Two, laboratory based teaching involves more complex simulation including enhanced virtual reality programmes, with an increasing emphasis on on-the-job training. The objective is to become competent at least one safe method for approaching a surgical task, giving a sense of certainty to both the trainee and the trainer in the clinical setting.

Trainees are also expected to develop professionalism which is a combination of clinical judgement and ethics, and this is achieved through role modelling, peer influence and reflective practice. There is no substitute therefore for high quality, supervised clinical experience in the workplace. At the same time, the severe reduction in working hours means that the underpinning cognitive knowledge-base requires considerable personal commitment to learning outside of the formal working environment.

Senior trainees and those in independent surgical practice require life-long continuing professional development with specific training packages for new techniques and technologies. These need to be formalised, especially in terms of practical skills, in order to ensure competence so that the skill can be performed at a level of safe practice which the public has a right to expect. This represents the standard of performance for the purpose of assessment.

In contrast, surgical excellence is achieved through an ongoing process of experience and growth, driven by a continuing cycle of feedback and reflection which is the purpose of an

appraisal system. Experience of itself is a poor teacher. Practice makes permanent, not perfect, unless there is high quality reflective practice through the audit cycle.

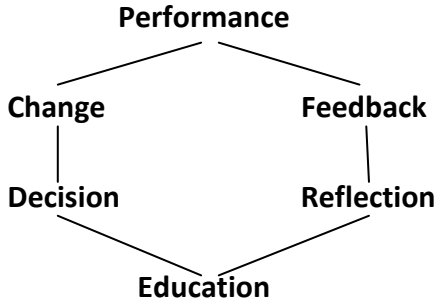


Figure 2 - The Audit Cycle

Underpinning all phases of learning therefore is feedback and reflection on experience, with a critical analysis against comparative outcome data. In the UK evidence of such reviews is discussed with peers during the annual appraisal, which in turn forms part of the five year specialist recertification process.

The Learning Environment

The traditional surgical route was dependent on total immersion with protracted mentorship. The trainee worked long and hard for the eventual reward of being regarded as fully trained and capable of independent practice. It was this notion that the learning period was finite that has been so radically disturbed over the last couple of decades. The recognition that over a 30 to 40 year working life, huge changes are required in both the knowledge and skills needed to remain competent as surgeons. Practitioners in their 60s may well treat the same conditions which they came across during their training but will utilise different investigative, non-operative and operative techniques in the management of their patients. Even the scalpel, that basic symbol of surgery, is being superseded by equipment such as Ultracision and the use of laparoscopic ports. It is possible ligation and suturing will also become obsolete, replaced by different methods of haemostasis such as laser technology, and tissue apposition using clips and glue. Many complex operations will either be significantly revised or consigned to the history books. New techniques have radically altered the approach to vascular and cardiac surgery, and medications have virtually replaced ulcer surgery. It is also probable that over the next 10 to 20 years most forms of cancer surgery will similarly be replaced by drugs or ablative techniques including the use of nano-technology.

Early learning, particularly if it is wide ranging, is characterised by being superficial in nature and tends to lack a depth of understanding. It does, however, quickly give rise to a feeling of certainty, positively anchoring the learning so that when a familiar situation arises the cognitive response becomes automatically triggered. The problem is when the learner meets a context which is similar but not the same, distinctions in management which arise from a depth of understanding are not made, and the habitual response occurs. This is a major basis for mistakes in surgical management. While experience can be gained from repetition without understanding, this is not the hallmark of an expert. A true expert requires both expertise (technical competence) and experience (repetition) coupled with a continual deepening of understanding gained from feedback during the audit cycle.

Another hallmark of an expert surgeon is to be able to make patient safe decisions in less than ideal situations. This takes time to accomplish, as true heuristic medicine depends on years of deliberate reflection on practice. This is why, although the best teachers are usually good practical surgeons, the most experienced and prolific technical surgeons may not necessarily be the best teachers or indeed the most expert in their field.

Motivation to Learn

Motivation in the workplace has been extensively studied in the last century, beginning with the seminal works of Elton Mayo[9] and followed up in the 1950s by Friedrich Herzberg[10].

When applied to individuals, and particularly here in the professional context, it narrows down to the six tenets of Human Needs Psychology[11].

Basic needs (hygiene factors) -	**Certainty** **Variety** **Significance** **Love/connection**
Higher order (motivators) -	**Growth/Development** **Contribution**

Figure 3 - The Six Human Needs

The real importance of these six needs is an understanding that if the four hygiene factors are not met in the mind of the individual, they will cause discomfort and tension requiring

them to be satisfied in some manner. However, providing much more than is required does not necessarily enhance motivation. The primary drive is therefore to satisfy these needs, giving a feeling of success. They are generally comparative in nature and so can be heavily context specific.

With the higher order needs, provided the four basic needs are satisfied, a feeling of personal growth and development coupled with contribution or "making a difference" are the main drives.

In the past, surgeons have achieved considerable significance by virtue of their position in society and certainty about having consultant status and a job which also gave them considerable variety on a day to day basis. Connection came through contact with patients and also in working with their teams at ward level, in outpatients and the operating room. A sense of fulfilment was achieved through their own growth and development and the respect given to their contribution.

In recent years these needs have been eroded, not just in professional practice but also during training. Changes instigated by government, insurance companies and hospital management have impacted radically on job security, income levels and the social status of consultants while the concept of team has been radically redefined. Multi-disciplinary working is perceived by many as undermining their control (significance) and the variety of work has been reduced due to the inherent complexity of sub-specialisation. Basic needs have to be met in different ways, perhaps even outside the profession, and for many there is less satisfaction as opportunities for growth, development and contribution are threatened. The consequence is that for many, surgery has become a job rather than a vocation.

Similar issues have occurred for trainees with the effects of the European Working Time Directive, particularly as implemented in the United Kingdom. The reduction to 48 hours per week has meant that staff in training are not as closely involved with patients and spend much less time in the operating room. Consequently, there has been a loss of continuity of care. Shift working patterns mean less contact with senior staff in the day to day working environment, and patient care has suffered as a result with inadequate handover arrangements between shifts.

In terms of Human Needs Psychology this leads to a loss of significance, reduced connection with the team and less certainty about job status. The nature of the trainee's contribution is more fragmented and impersonal and they may not have opportunity for the same level of growth and development experienced by previous generations of surgeons. Throughout Europe, dissatisfaction and lack of motivation is beginning to surface at all levels with considerable implications for professional practice.

Teaching Practical Skills

A surgical skill has both a cognitive and a psycho-motor component. In fact, in those with reasonable manual dexterity, the main instruction required to teach a skill centres on the cognitive process of chaining the steps of the operation in the mind, and ensuring this chaining has occurred before attempting the skill.

Basic techniques from suturing and knot tying to taking blood and insertion of a chest drain, may be most efficiently and effectively taught in the four stage procedure based on the work of Simpson[12].

Stage 1 -
a professional demonstration in real time

Stage 2 -
teacher explains the steps of the procedure whilst carrying it out

Stage 3 -
the trainee explains the steps and procedure whilst the teacher carries it out

Stage 4 -
trainee explains the steps and procedure whilst carrying it out

Figure 4 - Stages in Basic Skills Training

These stages allow the learner to quickly progress through the first three of the four levels of learning (figure 5).

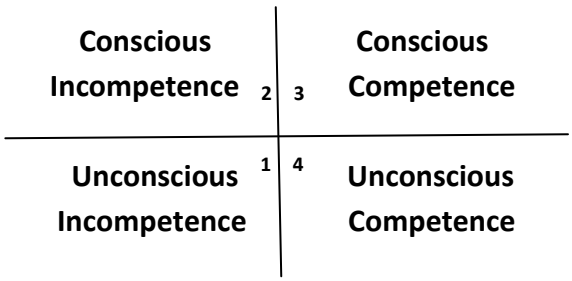


Figure 5 - Levels of Competence

The learner goes from unconscious incompetence (where they do not know the procedure), through conscious incompetence (where they realise what they do not know), to conscious competence (when they begin to understand and carry out the task to the required standard). The final phase to unconscious competence is achieved through experience until the task becomes a habit or routine.

It is fundamental during the first 3 stages of skills training that the procedure is carried out on each occasion in as close as possible to a uniform manner, without any bad practice in the demonstration of the skill, the explanation by the trainer or the description by the trainee. Similarly, in the fourth stage when the trainee both explains and carries out the procedure, any significant deviation from the pattern should be immediately corrected so that bad habits are not allowed to develop.

In the event that the trainee is unable to carry out stage four, then the process should be repeated from stage two through stage three to stage four. A common mistake in teaching is to continue to oscillate between stage two to stage four, missing out on stage three which is one of the most important parts of the process, particularly when it comes to more complex procedures which will be discussed later.

Training may therefore be compared to placing the software into a computer. Hardware is the psycho-motor element, whereas most of the training is guided towards the software which is the cognitive decision-making. Once the basics are known, small adjustments in the knowledge base can be made without going through the whole process (for instance a slightly different throw of a knot), but any more fundamental changes to the procedure need to utilise the whole system.

The science of Neuro-Linguistic Programming (NLP) shows that the human brain can only take in around six or seven entirely new pieces of information at any one time, and it then requires a period of reflection to organise the information. The more tentative the link between any new information and the previous experience, the fewer and less complex the new pieces of information or chunks can be.

With operative surgery, the more complex the procedure, the more it has to be broken down into easily managed segments called nodal points, with each being developed independently until competence is achieved. Only then the pieces can be put together to perform a whole operation. It is the skill of the teacher to break down an operative procedure into a number of simpler processes and then to gauge the rate of progress appropriate for each individual learner.

Different learners pick up information at different rates, dependant on their particular make-up and the context in which they are working, along with the extent of their

background experience. Feedback from the instructor during this time should be designed to encourage growth and development, emphasising good practice and areas which require further consideration and improvement.

The transfer of this process to the operating room was further refined by Peyton for the Training the Trainers Programme at the Royal College of Surgeons of England[13]. This included, not only the process of breaking down the procedure into component parts, but also the process of visualisation in step three which has recently been validated in studies by the European Surgical Institute in Hamburg[14].

The process of detailed visualisation with the help of the trainer prior to entering the operating room, has been shown to be a powerful method for enhancing surgical outcomes. Initially they should be *dissociated* with a description of the task, ie a listing of steps, and then *associated* with the trainee clearly imagining the task as if they were doing it and describing their actions. Visualisation may also include the use of a simulator before the procedure.

Visualisation is therefore anything which encourages the trainee to preview a successful outcome and in most practical situations involves a conversation describing the nodal points immediately before or during scrubbing up.

Away from the operating room, simulation has proven useful in providing a safe environment for learning where mistakes do not impact on patient safety. The problem has been the transfer of knowledge from the simulator to the real environment because training with a simulator can become functional and static, particularly in the absence of the emotional feedback which occurs with real patients, which is also the reason why the retention of learning is not as great.

The usefulness of simulators will undoubtedly improve as they become more complex in their approach to various forms of reality, and they can ensure a level of competence in trainees prior to undertaking a surgical task[15,16]. However, they do have a lack of flexibility and provide anchoring to one method of carrying out a procedure. The difficulty is the reflex behaviour which is evoked may not be appropriate in different circumstances.

An analogy has been made between training surgeons and pilots to suggest the increased use of simulation. The problem is that an air frame responds in a pre-defined way to manoeuvring, for instance push the column forward and the nose of the aircraft will come down, pull it back and the nose will elevate. An increased thrust will cause the plane to lift. Patients unfortunately do not respond in a textbook manner which is why evidence-based medicine and pure behaviourist type training, based on a statistical analysis of the population, can be very dangerous in managing an individual case for which there is no

substitute for a wide based experience of different contexts. Unfortunately it is this very experience which is being put at risk in the present drive to cut the hours available for training.

Assessment of Competence

Growth and development in a surgical career depends on continuous feedback and reflection which in turn leads to changes in practice. Major concerns have arisen over the last couple of decades with regard to the competence of surgeons in independent practice who have arranged and undertaken their own training without formal assessment.

It has been clearly shown that there is often a poor correlation between self-assessment and an expert assessment. Surgeons at the end of their training tend to give themselves an inaccurately high self-assessment and have difficulty in accepting that their performance may be sub-optimal. Similarly in examinations, candidates tend to rate themselves higher than examiners, particularly if the outcome is significant for their future progress[17]. It is therefore not unreasonable to assume that the same trends will be evident for those in independent practice, particularly with more specialisation and shorter training schemes, especially if practitioner have nothing against which to judge their performance.

Self-assessment is by definition subjective and this forms some of the biggest blocks to learning.

Figure 6 - Blocks to learning

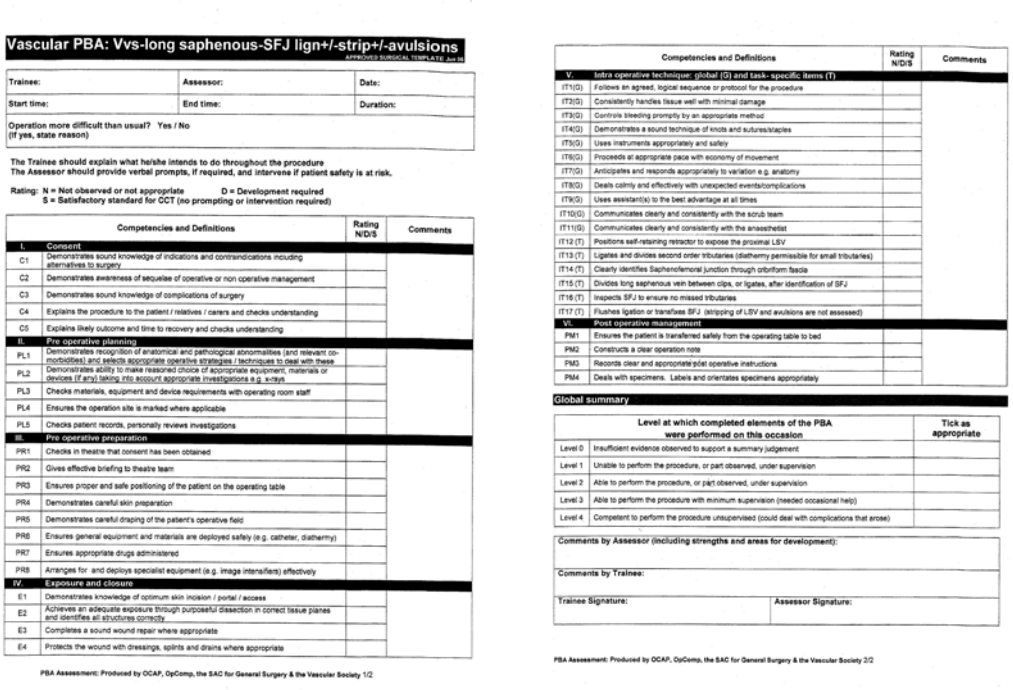
At a conscious level there is the IKT Syndrome (I Know That) which comes from a need for certainty usually coupled with repeated experience. Practitioners become fixed in their ways and are resistant to the uncertainty that change may bring. The earlier this syndrome develops in a career, the more difficult it is to shift.

The unconscious mind can be similarly hampered by an individual's sense of values and their beliefs, particularly in their own levels of competence. Beliefs and values develop and change over time as a product of relationships and life experience and become the filtering systems through which information from the outside world is judged, which is why two

individuals watching the same procedure can have entirely different opinions as to the nature and significance of the outcomes. While it has been suggested that a minimal number of cases per year could be sufficient to reach an agreed level of competence, numbers alone do not ensure competency and when assessed the technical skills of practitioners can vary enormously. Surgeons need the ability to be able to evaluate themselves against comparative data with the help of a trainer or peer group and this is the basis and value of a properly constructed appraisal system.

Trainees are already part of a managed system. In the UK and Europe, processes are evolving to allow objective assessment of knowledge and skills. Multi-source feedback has been used in relation to judgement and professionalism[18].

Low levels of knowledge and skill acquisition can easily be assessed through multiple choice or modified essay examinations, and basic skills are subject to criterion-based assessments such as Procedure Based Assessments (PBA) and Objective Structured Assessment of Trainees in Surgery (OSATS)[19].



Vascular PBA: Vvs-long saphenous-SFJ lign+/-strip+/-avulsions

APPROVED SURGICAL TEMPLATE: Jun 06

Trainee:	Assessor:	Date:
Start time:	End time:	Duration:
Operation more difficult than usual? Yes / No (If yes, state reason)		

The Trainee should explain what he/she intends to do throughout the procedure
The Assessor should provide verbal prompts, if required, and intervene if patient safety is at risk.

Rating: N = Not observed or not appropriate D = Development required
S = Satisfactory standard for CCT (no prompting or intervention required)

	Competencies and Definitions	Rating N/D/S	Comments
I.	**Consent**		
C1	Demonstrates sound knowledge of indications and contraindications including alternatives to surgery		
C2	Demonstrates awareness of sequelae of operative or non operative management		
C3	Demonstrates sound knowledge of complications of surgery		
C4	Explains the procedure to the patient / relatives / carers and checks understanding		
C5	Explains likely outcome and time to recovery and checks understanding		
II.	**Pre operative planning**		
PL1	Demonstrates recognition of anatomical and pathological abnormalities (and relevant co-morbidities) and selects appropriate operative strategies / techniques to deal with these		
PL2	Demonstrates ability to make reasoned choice of appropriate equipment, materials or devices (if any) taking into account appropriate investigations e.g. x-rays		
PL3	Checks materials, equipment and device requirements with operating room staff		
PL4	Ensures the operation site is marked where applicable		
PL5	Checks patient records, personally reviews investigations		
III.	**Pre operative preparation**		
PR1	Checks in theatre that consent has been obtained		
PR2	Gives effective briefing to theatre team		
PR3	Ensures proper and safe positioning of the patient on the operating table		
PR4	Demonstrates careful skin preparation		
PR5	Demonstrates careful draping of the patient's operative field		
PR6	Ensures general equipment and materials are deployed safely (e.g. catheter, diathermy)		
PR7	Ensures appropriate drugs administered		
PR8	Arranges for and deploys specialist equipment (e.g. image intensifiers) effectively		
IV.	**Exposure and closure**		
E1	Demonstrates knowledge of optimum skin incision / portal / access		
E2	Achieves an adequate exposure through purposeful dissection in correct tissue planes and identifies all structures correctly		
E3	Completes a sound wound repair where appropriate		
E4	Protects the wound with dressings, splints and drains where appropriate		

PBA Assessment: Produced by OCAP, OpComp, the SAC for General Surgery & the Vascular Society 1/2

	Competencies and Definitions	Rating N/D/S	Comments
V.	**Intra operative technique: global (G) and task- specific items (T)**		
IT1(G)	Follows an agreed, logical sequence or protocol for the procedure		
IT2(G)	Consistently handles tissue well with minimal damage		
IT3(G)	Controls bleeding promptly by an appropriate method		
IT4(G)	Demonstrates a sound technique of knots and sutures/staples		
IT5(G)	Uses instruments appropriately and safely		
IT6(G)	Proceeds at appropriate pace with economy of movement		
IT7(G)	Anticipates and responds appropriately to variation e.g. anatomy		
IT8(G)	Deals calmly and effectively with unexpected events/complications		
IT9(G)	Uses assistant(s) to the best advantage at all times		
IT10(G)	Communicates clearly and consistently with the scrub team		
IT11(G)	Communicates clearly and consistently with the anaesthetist		
IT12 (T)	Positions self-retaining retractor to expose the proximal LSV		
IT13 (T)	Ligates and divides second order tributaries (diathermy permissible for small tributaries)		
IT14 (T)	Clearly identifies Saphenofemoral junction through cribriform fascia		
IT15 (T)	Divides long saphenous vein between clips, or ligates, after identification of SFJ		
IT16 (T)	Inspects SFJ to ensure no missed tributaries		
IT17 (T)	Flushes ligation or transfixes SFJ (stripping of LSV and avulsions are not assessed)		
VI.	**Post operative management**		
PM1	Ensures the patient is transferred safely from the operating table to bed		
PM2	Constructs a clear operation note		
PM3	Records clear and appropriate post operative instructions		
PM4	Deals with specimens. Labels and orientates specimens appropriately		

Global summary

	Level at which completed elements of the PBA were performed on this occasion	Tick as appropriate
Level 0	Insufficient evidence observed to support a summary judgement	
Level 1	Unable to perform the procedure, or part observed, under supervision	
Level 2	Able to perform the procedure, or part observed, under supervision	
Level 3	Able to perform the procedure with minimum supervision (needed occasional help)	
Level 4	Competent to perform the procedure unsupervised (could deal with complications that arose)	

Comments by Assessor (including strengths and areas for development):	
Comments by Trainee:	
Trainee Signature:	Assessor Signature:

PBA Assessment: Produced by OCAP, OpComp, the SAC for General Surgery & the Vascular Society 2/2

Figure 7

Example of Intercollegiate Board Procedure Based Assessment (PBA) Form

Higher order thinking, including judgement and decision-making, are best assessed in the day to day work environment, with feedback from multiple sources to minimise the effect of any observer bias. Complex operative procedures are subject to multiple formal assessments by trainers in the operating environment until, in the view of the trainers and those overseeing the training programme, a satisfactory standard has been reached. In the UK this is achieved through the Annual Review of Competence to Progress (ARCP), which is overseen by the Dean and Faculty in one of the Regional Schools of Surgery, which have the responsibility for post graduate surgical education.

It is incongruous therefore that, given such close monitoring of competency development during the brief years of training, no such formal system exists for quality assuring the 30 to 40 years of independent practice. In the UK at present there is considerable dilemma about the way forward, for instance with laparoscopic surgery in general and colorectal surgery in particular, as well as with cutting edge technology such as NOTES. Although there has been a great resistance to the need for an ongoing review of competence, the absolute need for quality assurance to be continually demonstrated has led to the concept of recertification and revalidation, based on a system of annual appraisal. Major questions at the moment are around the identification of those who are competent to provide the training, what the exact process will be, and how competency can be assessed on an ongoing basis.

Transfer of Learning to the Clinical Situation

During the training rotations, and indeed any time a new technique has been learnt, there must be a smooth transition to the practical situation whereby experience can be gained under supervision. Skills may rapidly fade if there is a significant delay between the completion of a training course and opportunity to use the skills in practical situations, leading to difficulty in maintaining even a basic level of competence. Further, it is critically important that surgical skills training does not become a mechanistic and technical exercise, divorced from the holistic management of the patient.

Recently, there has been a lot of political pressure around the use of "safe surgery check lists" as advocated by the World Health Organisation. This is an attempt to minimise procedural mistakes in the transfer of a patient to and from the operating room and is rapidly gaining acceptance. Under such circumstances it is perhaps surprising that less political attention has been paid to assessing the level of competence of the surgeon

performing the procedure. Mistakes are an inevitable part of the learning process and patient safety would be better served by ensuring the surgeon was fully trained and assessed as competent in the technique.

Even when operative procedures have been fully learnt and assimilated, there are considerable difficulties with ongoing clinical practice because of the dynamic nature of surgery and the many twists that occur both during the procedure or indeed in the development of a treatment plan for a particular patient. This so-called single loop and double loop learning is illustrated below[21].

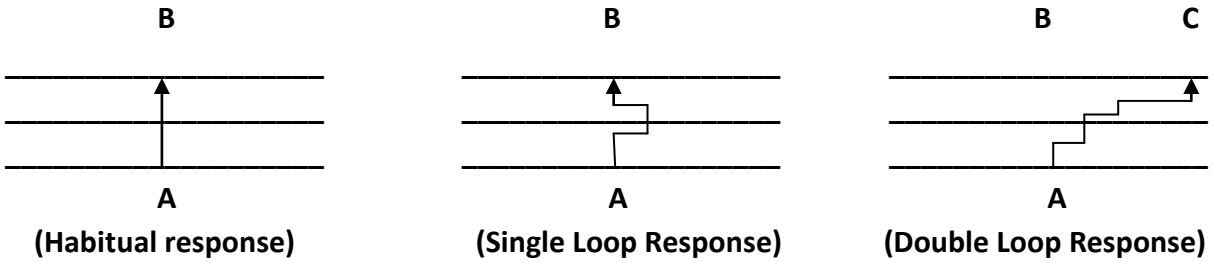


Figure 9 - Single Loop (A-B) and Double Loop (A-C) Dynamics

The path between A and B may be straightforward or, if difficulties arise blocking progress, various alternatives may be required to eventually get to B. This is single loop dynamics.

On the other hand, while taking into account the clinical situation and the treatment plan, it may become apparent that B is not the preferred outcome but that other procedures or modalities of treatment should be considered leading to a different end point, position C. This cycle is double loop learning.

Characteristic of good surgeons is therefore the amount of uncertainty they can live with, and their ability for flexibility and adaptability. They need a wide range of experiences, continually integrating new chunks of information combined with regular reflection and ongoing feedback. In this way they develop alternative ways of obtaining a particular outcome or indeed, in consultation with the patient, changing the nature of the outcome itself.

Most of the decision-making in surgery is heuristic in nature, ie the decisions are based on the best evidence available to the person making the decision at the time. This demands a deep understanding of a presenting condition and the possibilities for action, which requires

considerable experience and reflective practice as the more sparse the evidence available the more likely that decision-making will not be ideal.

Feedback and Appraisal of Practice

All growth and development requires a willingness to change. Patient safety requires participation in the appraisal process which is based on the audit cycle. Careful record keeping is necessary, not only of the operative procedure but also of subsequent patient progress both in and out of hospital to assess the overall quality of life post-operatively.

In Europe the increase in day surgery poses particular problems for audit due to the lack of continuity of care. The initial assessment is often not made by the surgeon in charge, and post-operative care in routine cases may be delegated to nursing staff or family practitioners. This has led to greater concentration on technical aspects of surgery, with less emphasis on patient communication for all levels of staff and has significantly impacted on the development of professionalism.

Standard setting and assessment by external bodies reflects the lowest level of acceptable practice, and usually represents less than an average performance. Logically, this is the case unless the failure rate of any assessment is going to be above 50%.

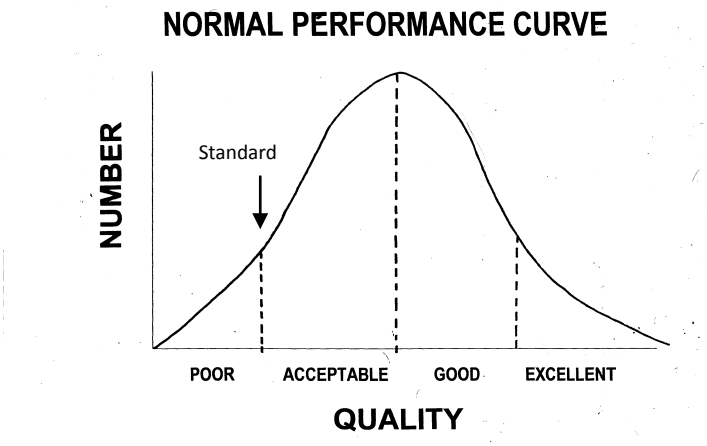


Figure 10 - Normal Performance Curve
Note that "standard" performance is less than average

This is why policing practice against standards does not tend to improve overall surgical outcomes. In fact, over emphasis on basic standards can have the opposite effect leading to de-motivation and is a recipe for mediocrity. Excellence is achieved by a commitment to

continuing and never ending improvement and it is this recognition which has led to the introduction of annual appraisal and a five year recertification of clinicians in the UK, with similar moves being made throughout the rest of Europe.

The key questions of appraisal are simply two-fold[22]:-

1 What went well?
2 What areas could be improved?

The areas for improvement may involve not just the practical skill, but any other aspect of the patient's journey through the treatment episode to make an impact on future performance.

Improvement in patient outcomes is therefore dependent, not on the policing of professional practice, but on the maintenance of a high level of internal motivation in the medical staff, again, it is one of the functions of the appraisal system to help generate and maintain the enthusiasm for continual improvement in practice.

The Role of Faculty Development

Evolution from the apprenticeship to an ongoing training module has highlighted the importance of professionalising surgical training. The requirement for teaching, assessment against standards and for ongoing accreditation is vital for patient safety. Trainers themselves need to be formally educated and accredited into the art and science of teaching through Training the Trainers Programmes such as those developed by the Royal College of Surgeons of England. These courses are intensely practical combining the principles of adult education with the practicalities of delivering cognitive based teaching episodes the teaching and assessment of surgical skills. Emphasis is placed on the role of the teacher at all levels of surgical training from role model, demonstrator and assessor roles in early surgical training, similar to those of the old apprenticeship model, to a more diverse set of training roles to include coach, mentor and peer reviewer, especially for senior trainees and independent practitioners.

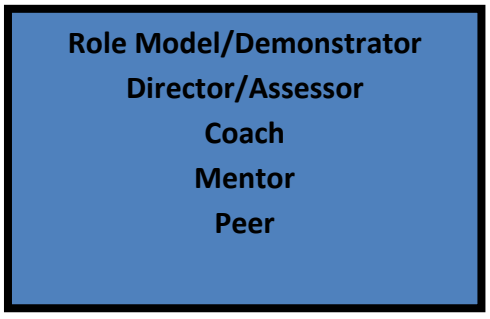


Figure 11 - Roles of the Teacher

In early surgical training, and in the learning of new techniques, the role model/demonstrator and the director roles are more appropriate. Gradually trainees are stretched outside their comfort zone and then giving support through teaching roles which become increasingly less directive in nature as they process from coaching through mentoring to peer group facilitation and feedback.

Perhaps the most important skills of the trainer are communication and motivation. Trainers must support the learning of each student as an individual, professionally assess competence and give empowering feedback, not only to younger colleagues in training but also to older, more experienced colleagues as they learn new techniques to keep up-to-date in their surgical practice.

An appreciation of the importance of teaching as a surgical skill in itself is vital for patient safety as the pace of innovation speeds up. The future of surgery depends on the acknowledgement that faculty development is one of the most important practical skills in the surgical armamentarium.

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