

LIFELONG LEARNING: LIFELONG COMPETENCE ASSESSMENT AND THE AGING SURGEON

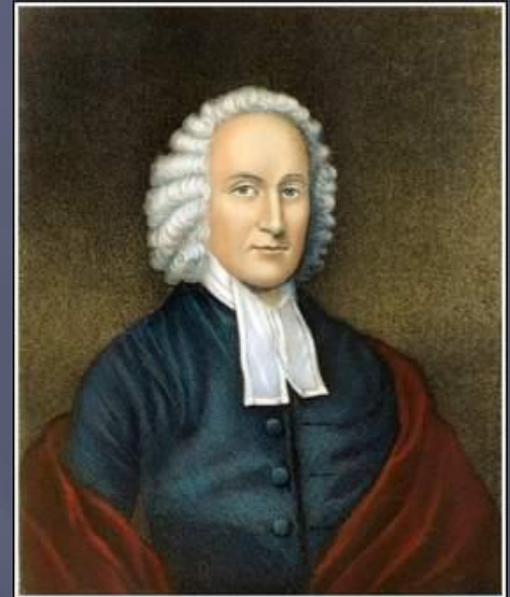
Arthur G. Felice, MD, MSc, FRCS Ed, FEBS.

University of Malta

President of the UEMS Division of General Surgery

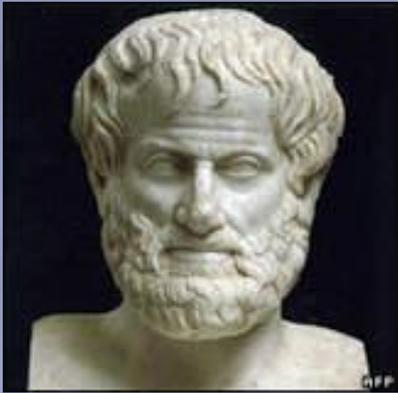
“Most controversies would soon be ended if those engaged would first *define* their terms”

Tyron Edwards – American theologian 1809-1894



“...Define...” So, what is a definition?

Aristotle 384 – 322 B.C.



“A definition is an account that signifies the essence”

Oscar Wilde 1854 - 1900



*“To define is to limit”
(exclude the non-essential)*

Some definitions:

- ▣ **'Lifelong learning'** is the on-going, voluntary, and self-motivated pursuit of knowledge for either personal or professional reasons.

Lifelong learning timeline

- ▣ 1971 - Concept introduced in Denmark
- ▣ 1993 - EU Commission introduces 'Lifelong learning' as an important objective.
- ▣ 1995 - EU Commission white paper: Teaching and learning: Towards the Learning Society
- ▣ 2000 - Socrates, Leonardo and ultimately the Grundtvig programmes focus on lifelong acquisition of skills and competencies
- ▣ 2001 - EU Commission memorandum on lifelong learning
- ▣ 2007 - Introduction of lifelong learning to Medicine in the USA

Competence Assessment

- ▣ Definition: A *competence assessment* measures how well a surgeon carries out his/her work in relation to performance standards.
- ▣ Competence is an individual trait that is task specific and inconstant

Need for competence assessment

- ▣ The improving understanding of disease
- ▣ New technologies
- ▣ The evolution of disease
- ▣ The introduction of patient electronic record and establishment of benchmarks
- ▣ An aging and more complex population
- ▣ New requirements to remain in practice
- ▣ Shorter working hours and shorter period of training
- ▣ The increasing mean age of surgeons
- ▣ To ensure patient safety

Goals of competence assessment

- ▣ Provide direction and motivation
- ▣ Narrowing the gap between desired and actual performance
- ▣ Patient safety (evidence of effectiveness indirect and scarce)
- ▣ Meet public expectation on self regulation
- ▣ Choosing the best material for further training

Lifelong assessment of patient outcomes

More evidence needed because of:

- ▣ The extensive and heterogeneous setting makes measurement difficult
- ▣ Measures of health outcomes mainly negative e.g. mortality and morbidity
- ▣ Patient health records not always accessible due to regulatory issues

Utility of competence assessment

- ▣ To judge when an individual becomes competent (summative)
- ▣ Track progress (formative and summative)
- ▣ To assure that competence is maintained (formative and summative)
- ▣ Implementation of new technologies (formative and summative)
- ▣ To provide evidence for selection of the best (summative)

5 main competencies to assess:

- ▣ Provide patient-centred care
- ▣ Ability to work in interdisciplinary teams
- ▣ Employ evidence-based practice
- ▣ Apply quality improvement
- ▣ Utilise information and other technologies

Assessment procedure must...

- ▣ Capture variation in performance
- ▣ Feasible
- ▣ Safe
- ▣ Reliable

Assessment calls for psychometric analysis to test:

- ▣ Accuracy – scores are a valid measure of the person's performance
- ▣ Reliability – a measure of its reproducibility and consistency:
 - i. Inter-rater reliability – consistency of rating by different assessors
 - ii. Inter-case reliability – variation from task to task
- ▣ Reproducibility – Estimates of measurement error if the same assessment is performed under similar conditions
- ▣ Validity – How well the assessment succeeds in assessing the competencies for which it was designed
- ▣ Predictive value – Limited, especially regarding non-technical skills

The objective

INDIVIDUAL FACTORS

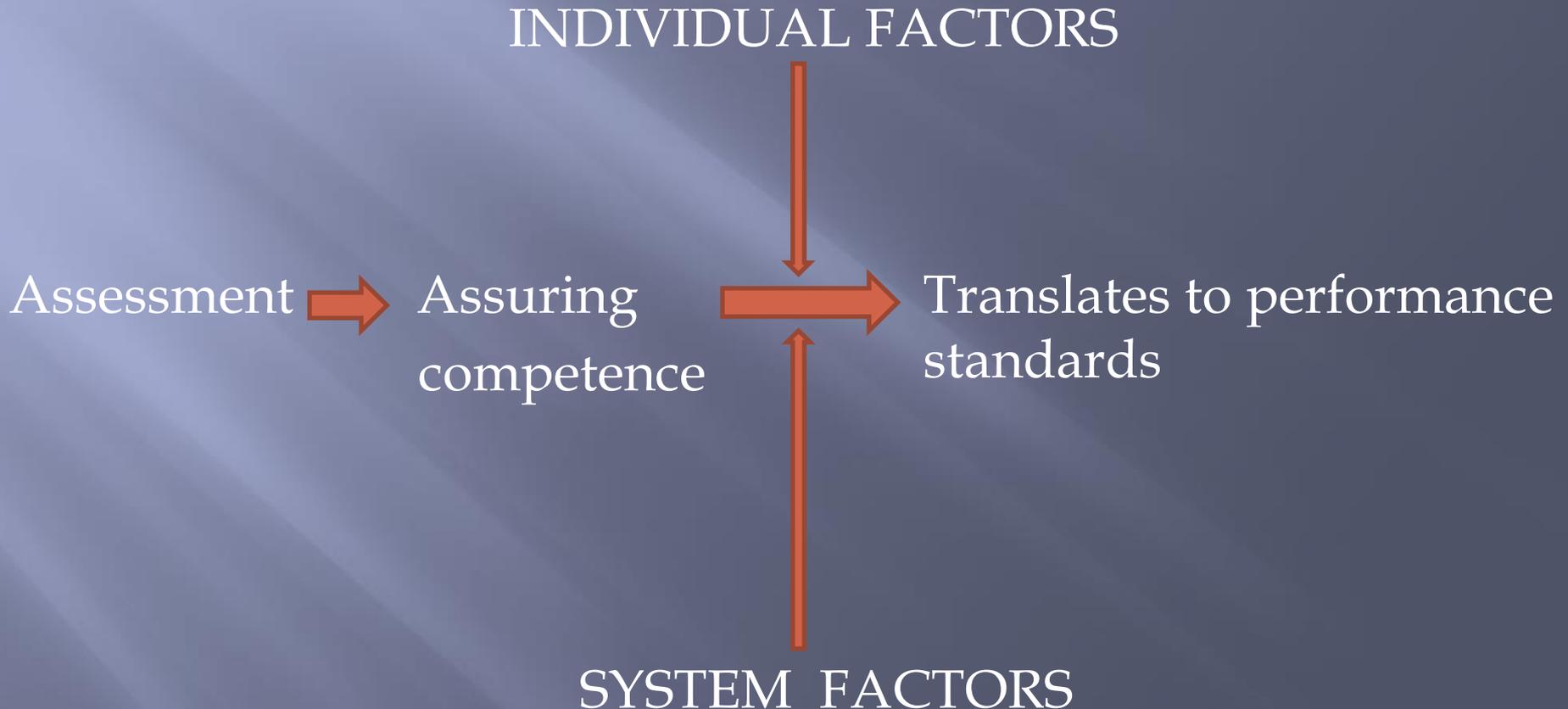
Assessment →

Assuring
competence



Translates to performance
standards

SYSTEM FACTORS



Entrustable Professional Activities (EPA)

- ▣ One assesses performance and not just competence
- ▣ Ready for legislation in the Netherlands soon

Difficulties in assessment of:

- ▣ Professionalism
- ▣ Teamwork
- ▣ Expertise (difficult to define)
- ▣ Communication (to some extent)
- ▣ Also, quantitative data, though giving an impression of accuracy, may not necessarily be more reliable and useful than qualitative data (*Not all that can be counted counts and not all that counts can be counted -A. Einstein*)

Unintended effects of assessment

- ▣ Inducing cramming
- ▣ Inducing superficial learning instead of reflection
- ▣ Impinging on the dignity of surgeons, especially experienced ones

Assessing performance of surgeons

- ▣ Self assessment – an aid to reflection and professional development. (Often inaccurate)
- ▣ Peer assessment – between surgical colleagues
- ▣ Multi-source feedback – 360 degree assessment involving colleagues, staff and patients

Assessment tools

- Competence scheme frameworks involving credits
- Objective Structured Assessment of Technical Skills (OSAT)
- Surgical audit
- Peer review
- Performance review
- Review of adverse events, complaints and incidents
- Case review – usually a number of cases, over a wide range or in a specific field
- Multimedia technology (integrating text, audio ,images, animation, video and interactive forms) – used in teaching as well as assessment.
- Multi source feedback
- Entrustable Professional Activities (EPA)

Measures that can help

- ▣ Inducing a cultural shift
- ▣ Planning meaningful, outcomes and teamwork-oriented assessments
- ▣ Implementing performance and data-tracking systems at individual and system level
- ▣ Collaboration amongst professional organisations, higher education organisations, healthcare organisations and regulatory bodies.

Objective assessment of surgeons' technical skills and decision-making

Using Clinical Skills labs, in addition to use for training:

- ▣ Live animal surgery or cadavers (not very practical – logistics problems)
- ▣ Computer-generated “virtual reality” simulation (very useful)
- ▣ Robotic systems involving haptics, telepresence and possibly telementoring (Futuristic assessment tool, but possible)



Holding the haptic device with pressure sensor

More definitions:

- ▣ **Haptics** is any form of interaction involving touch
- ▣ **Telepresence** – The surgeon's console may be any distance from the 'slave' robotic arm and is linked by a telecommunication system e.g. SOCRATES
- ▣ **Telementoring** – Both the expert surgeon and the other surgeon in the lab at any distance, share the same view of the surgical field, can both control the robotic system and are able to communicate verbally. There is clear potential for both training and assessment.

Shortcomings of robotic systems

- ▣ Still accumulating evidence of effectiveness
- ▣ Cost
- ▣ Technical drawbacks
- ▣ Need for specialised training
- ▣ The learning curve

The next definition:

The Aging Surgeon

- ▣ More difficult to define
- ▣ But to understand the implications of lifelong learning, the concept of **aging** requires further elaboration

Noddy's statistics

"If the combined age of the surgeon, patient, and anaesthetist is greater than 210, the mortality rate is 100%."



Pathophysiology of Aging

- ▣ Wear and tear - can include mechanical damage to structures that are only imperfectly repaired.
- ▣ Programmed cell death (Apoptosis) – somatic cells are limited to only approximately six to 15 generations of mitoses
- ▣ The brain remains flexible and adaptable across the lifespan, with many cognitive abilities being preserved.

Presumed effects

- ❑ Cognitive decline
- ❑ Physical decline
- ❑ Deterioration of skills

Mechanisms for age-related decline in memory search

- ▣ Reduced processing speed (**global slowing hypothesis**)
- ▣ Over-persistence on categories (**cluster-switching hypothesis**)
- ▣ The inability to maintain focus on local cues related to a decline in working memory (**cue-maintenance hypothesis**). This is backed by more evidence.
- ▣ ? Older surgeons take longer to retrieve the answers because of their richer memory stores (**Optimist's view**)

The cue-maintenance hypothesis

Working memory is related to goal perseveration and the ability to inhibit distracting information.

- ▣ Driver
- ▣ Lady (*goal perseveration and the ability to inhibit distracting information intact*)



American College of Surgeons (ACS)- CCRASS survey for *visual attention,* *reaction time, visual learning and memory*

- ▣ **>60 yrs:** 61% equal 45-59yrs
- ▣ **60 – 64 yrs:** 78% equal young surgeons
- ▣ **> 70 yrs:** 38% equal young surgeons
- ▣ **No** senior surgeon performed worse than young surgeons on all 3 tasks.

Factors impacting knowledge in the older surgeon

- ▣ Quantity of education
- ▣ Remoteness of education
- ▣ Obsolescence of the content of the education
- ▣ Rapid pace of 'progress' and information overload



The order of general deterioration

- ▣ Strength
- ▣ Eyesight
- ▣ Dexterity
- ▣ Reaction time – declines slowly
- ▣ Finally cognition

N.B. Knowledge, experience, and reputation can compensate for a long time.

Physical decline

- ▣ Maximum strength is generally achieved during the third decade of life, with a 25% loss of strength by age 65 years.
- ▣ As we age, visual acuity and accommodation decrease
- ▣ Optimal performance require 100% more illumination > 55 years
- ▣ University of Bath (UK): as long as older people are *in good health and have up-to-date skills* then their *performance and capacity for work* is roughly the same as younger counterparts. (? *Begging the question*)

In practice: Capacity for work

- ▣ The variation between individuals is large

- ▣ Can be affected by lifestyle factors:
 - i. Extraneous stress
 - ii. Availability of occupational health support.

Deterioration of skills: Studies

- ▣ 2005: a much higher rate of disciplinary actions against doctors out of medical school for 40 years compared with those out of school 10 years.
- ▣ 2005: performance on a range of outcomes declined as physicians' years in practice increased.
- ▣ 2006: Older surgeons, although competent in routine operations, performed more poorly in complicated procedures
- ▣ 2008 : "no notable relationship" between older physicians' own assessment of their cognitive skills and objective cognitive measures, indicating that the physicians may be unaware of their impairments.
- ▣ 2010: one third of surgeons in their 70s still matched younger surgeons in competence on a variety of tasks.

Thus, Competence Assessments
must be lifelong

Age-based testing – Arguments:

- ▣ *For:* It's no longer permissible to simply allow aging physicians to determine when they should retire, because many of them stay on after impairment sets in.

- ▣ *Against:*
 - i. One learns to compensate. Older surgeons tend to see fewer patients, focus on patients with less acuity and spend more time with them, which patients like.
 - ii. Younger surgeons are just as likely to be impaired through behavioural problems

Retiring age in different countries

- ▣ Malta: 62 years going to 65 years over a number of years
- ▣ Ireland: 65 years but possibility of extension
- ▣ UK: 65 years
- ▣ India: 65 years
- ▣ Pakistan: 70 years
- ▣ Italy Obligated to work: >65 years (Indication for retirement: Fixed, dilated pupils)
- ▣ Sweden: No fixed pension age. Lowest possible is 61 years, but there is no upper ceiling

Proposed periodic assessments

▣ **Modalities**

- i. Physical examination
- ii. Cognitive screening – Tests not validated for surgeons and results do not correlate with surgical performance.
- iii. Peer assessment of clinical performance

▣ **Threshold:** Range from 62 to 75 years

▣ **Utility:** May identify potential red flags in aging surgeons

Problems

- ▣ Assessments must be validated
- ▣ Balance patient safety and liability risk with respecting the dignity of surgeons and their value to society.
- ▣ Wide individual variation requiring an individualized approach
- ▣ There are no published best-practice guidelines on how to deal with poor performance
- ▣ Surgeon workforce sustainability may produce a bias

Increasing workload as a reason for retaining workforce

U.S. projections between 2000 and 2020 :

- ▣ Population growth expected to increase by 18%
- ▣ General Surgery workload expected increase by **31.5%**
- ▣ Increasing mean age of practicing surgeons and increasing workload may require better utilisation of senior surgeon expertise

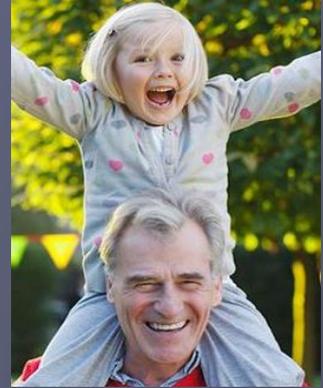
Follow-up on poor performance

- ▣ The solution is often to change the practice, rather than to end a career
- ▣ To opt for remedial training on their weaknesses
- ▣ Barring gross negligence or criminal behaviour, the decision to retire still rests in the hands of the surgeon

Facilitating the aging surgeon

- ▣ Proper definition of surgical and cognitive competence
- ▣ Legislative reforms to protect from unfair medico-legal consequences
- ▣ Sharing valuable knowledge and skills :
Volunteer work, mentoring, alternative occupations.

Conclusion



- ❑ Lifelong assessment of competencies is necessary, possible and desirable, because of the goals outlined.
- ❑ There are, however difficulties of accuracy and predictive value, even when results are presented quantitatively.
- ❑ Assessing performance rather than competence may be more useful (EPA)
- ❑ The impact of lifelong assessment on patient safety outcomes needs further and better investigation
- ❑ Lifelong assessment needs input from certified skills labs, the operating theatre and allied environments to maximise validity

If and when the surgeon makes his own decision to retire, it is a happy ending.

Question time

Thank you.

Cognition causing error

- ▣ The major reason for errors is not cognitive problems but behavioural ones, such as alcoholism, substance abuse, and failure to document, which may occur more frequently in younger physicians.



Cognitive Decline

- “MicroCog” - tests memory, visiospatial facility, reasoning, and mental calculation
- The decline is very rapid round age 60
- physicians by age 75 lose 25% of their starting score.
- MicroCog has not been shown to correlate with good performance of surgery
- Greenfield and Proctor: (1) the ability to focus attention; (2) the ability to process and correlate information; and (3) native intelligence, decline with age
- Cognitive tests haven't been validated for use on physicians. The baseline for the general population is known, but physicians should have to meet a higher baseline, which hasn't yet been identified.
- Older adults' performance on cognitive tests reflects the predictable consequences of learning on information-processing, and not cognitive decline.

Survey on transition to retirement

- ▣ 20% - Keeping busy was a challenge
- ▣ 30% - experience 'loss of role'
- ▣ Most feel a change in self-esteem

Statistics

A. RACS projections:

- ▣ By 2025 Australia will need >1224 surgeons more
- ▣ if surgeons retire at 65 years,
- ▣ due to increase in population
- ▣ decrease in working time of 5 hours / week
- ▣ 50% increase in demand as a result of aging population, new fields and physiological expansion

B. Association of American Medical Colleges statistics (2010):

- ▣ >55years old: 51% of Cardiothoracic surgeons; 49.7% of Orthopaedic and 49.3% of Urological surgeons
- ▣ 8.5 to 12% of US Surgeons are >70 years

B. AMA statistics:

- ▣ Consequent to the 'baby-boom', the proportion of physicians aged 65 years or older rose from 9.4% in 1985 to 15.1% in 2011.