Surgical training in the 48 hours week: From amateur golfer to professional pilot.

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Introduction: Surgical trainee selection, assessment of progress of surgical trainees, and revalidation of established consultant surgeons are issues that raise debate between their protagonists and antagonists.

The operating theatre, similar to a flight deck, is an environment at risk of error which can lead to disaster. The healthcare sector has been slow to appreciate this but it is now being taken seriously.

We propose the PAR matrix as an objective surgical training tool that aims to provide the trainee not only with the ergonomics but also with the crew resource management skills of an independent operator. Similar to pilots being trained to 'plan the flight' and 'fly the plan' it could be argued that surgical trainees could be taught to 'plan the operation' and 'operate the plan'.

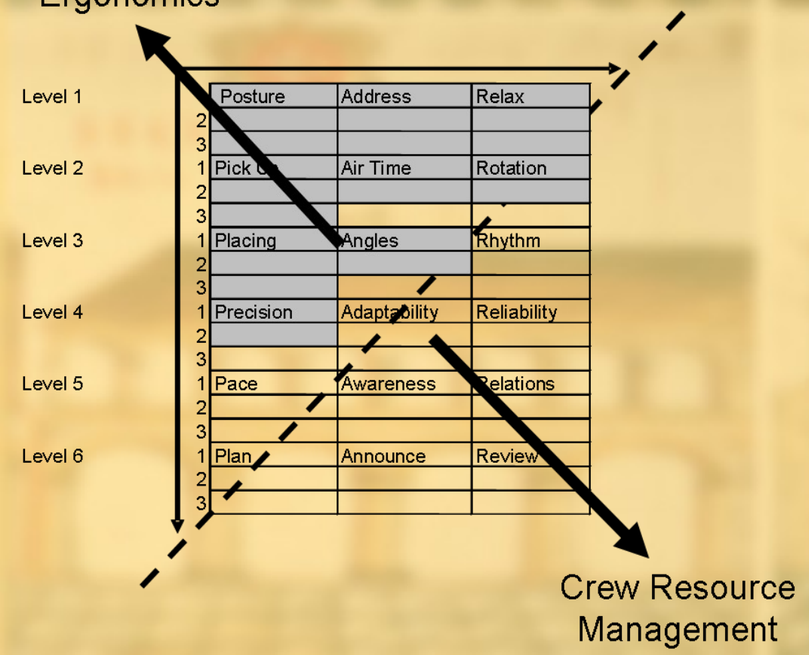


Figure 1. The PAR matrix. Progress (highlighted squares) is made in a diagonal fashion from ergonomics towards crew resource management skills.

08/07/08	P	A	R
	1	1	1
Level 1	Posture 2	Address 2	Relax 2
	3	3	3
	1	1	1
Level 2	Pickup 2	Airtime 2	Rotation2
	3	3	3
	1	1	1
Level 3	Placing 2	Angles 2	Rhythm 2
	3	3	3

Table 1. Initial assessment of trainee at wetlab.

The initial assessment of ergonomic skills was performed in the wetlab at the beginning of the training period. On Table 1 the trainee's ergonomic skills are highlighted, ranging from unsatisfactory (score 1) in some respects (rotation, rhythm, angles), to competent (score 2) in others. Non highlighted squares denote skills that do not exist. Crew resource management skills (levels 5, 6) are assessed in theatre once the trainer is satisfied with trainee's ergonomic competency.

10/08/08	P	A	R
	1	1	1
Level 1	Posture 2	Address 2	Relax 2
	3	3	3
	1	1	1
Level 2	Pickup 2	Airtime 2	Rotation 2
	3	3	3
	1	1	1
Level 3	Placing 2	Angles 2	Rhythm 2
	3	3	3
	1	1	1
Level 4	Precision 2	Adaptable 2	Reproducible 2
	3	3	3

Table 2. Progress after 4 weeks deliberate practice.

After 4 weeks deliberate practice, including once weekly wetlab sessions with the trainer, the trainee has achieved almost full marks on levels 1, 2, 3 and has progressed to level 4 (crew resource management) skills. At this stage trainee's skills were deemed suitable to be employed in theatre.

Ergonomics: The PAR matrix is the cornerstone of a set of activities that constitute what Ericson refers to as 'deliberate practice'. They differ from others in that they are highly structured, require effort, are not inherently enjoyable, do not generate any immediate monetary reward and involve costs associated with access to teachers and training environments.

Crew Resource Management: Error can be an indicator of incompetence but all humans commit error, and by itself an error does not necessarily mean that a physician is incompetent. Many errors occur as a result of faults in the complex system by which medical care is provided, and can be prevented by addressing those systems issues.

Levels 5 and 6 of the PAR matrix aim specifically to improve the ability of the trainee to manage his theatre team while maintaining patient safety and addressing system shortcomings.

Conclusion: By increasing our accountability the PAR matrix can be used as an adjunct to clinical governance and play a significant role in restoring patients' confidence in the quality of health care provision.

The major difference between skills acquisition and human performance improvement in aviation and surgery is the mindset and not the simulator; why should the development of an aviator be more carefully monitored and mentored than that of a surgeon?

Reference

Ericsson KA. Deliberate practice and acquisition of expert performance: a general overview. Acad Emerg Med. 2008 ;15(11):988-94.