Duty Hours Symposium: Solutions Across Borders
Considerations for Surgical Programs

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Disclosures

None
Overview

- Surgeons & Surgery
- Frame Discussion
  - a sampling of the literature
  - what can be drawn from it?
- US vs Cdn Surgical Training
- Random relevant thoughts!
- Options going forward
Surgeons & Surgery

• Arguably the complete physician
• Uniquely combines the art & science of medicine
• Deals regularly with life & death situations
• Regular daily encounters – seminal in the lives of others
• Sacred bond of trust between patient & surgeon
• Unique & intimate knowledge of another human being—corresponding responsibility
Bureau of Labor & Statistics on Surgeons

- “...treat injury, disease & deformity through operations...examine patients, perform & interpret diagnostic tests & counsel patients on preventive health care.”
So how do we teach/train all this (in less time)?

- knowledge
- technical skills
- judgment
- professionalism, leadership
- patient ownership, continuity of care...
A Sampling of the Literature

Effect of the 80-Hour Work Week on Resident Case Coverage: Corrected Article
Shin, Britt et al, JACS (207) 1 July 08

Operative Experience of Residents in US General Surgery Programs
A Gap Between Expectation and Experience
Bell, Lewis et al, Ann Surg May 09

Attitudes, Training Experiences, and Professional Expectations of US General Surgery Residents
A National Survey
Yeo, Bell et al JAMA, Sept, 2009

Residency program models, implications, and evaluation: Results of a think tank consortium on resident work hours
DaRosa et al, Surgery Jan 2003
A Comparison of Faculty and Resident Perception of Resident Learning Needs in the Operating Room
Pugh et al, J Surg Ed Sept/Oct 07

Cumulative Operative Experience Is Decreasing During General Surgery Residency: A Worrisome Trend for Surgical Trainees?
Kairys, Yeo et al, JACS May 08

Duty-Hour Restrictions and the Work of Surgical Faculty: Results of a Multi-Institutional Study
Coverdill, Mellinger et al, Academic Medicine, January 2006

National Efforts to Reform Residency Education in Surgery
Sachdeva et al, Academic Medicine Dec 2007
Making Sense of the Literature

- Resident & faculty perceptions of impact of DHR differ
- PD’s land somewhere between other faculty & residents
- Most residents satisfied with their training & feel QOL better
- Strong majority of residents favor DHR: interns most, chief residents least!
- Faculty feel overlooked. Main concern re: residents is patient ownership
“Give me the dedicated surgery resident who reevaluates the elderly man with a SDH, only he or she knows if the right hand grip is stronger or weaker. You can’t pass along that information on a crib sheet to some poor soul covering 6 other services that night…. Evolving peritoneal signs in an 8 year old boy happen on the job…not between on call...[physicians].

D. Farley (Rochester, Minn)
Ann Surg, June 2003
“…we are probably near a tipping point, where further reductions in work hours may begin to take a toll on what is already a marginal level of resident operative experience.”

_D. Bell Ann Surg Feb 2010_
Making Sense of the Literature(II):

- OR case numbers overall not significantly different. Composition of cases **is** different. (F. Lewis ABS)
- Cases (& learning) from 1st asst & Teaching asst dramatically decreased
- ABSITE scores ↔
- No significant difference in patient outcomes
• Indeed the reallocation of work to teaching attendings, fellows, hospitalists, may be an important factor to consider in understanding any changes in patient outcomes following duty hour reforms….especially improvements….those clinicians may often be more experienced than residents.

Meltzer, Arora “Involuntary Resident Duty Hour Reforms” JAMA September 2007
Making Sense of the Literature(III):

- Continued concerning resident (esp GS) attrition: 1 in 5, unaffected by DHR
- Among those who stay, almost 25% would NOT choose surgery again
- ♂ and ♀ differences
A View from the (ABS) Trenches

- Overall case numbers stable
- Emergency & on call cases down by 50%

- “There is a huge dichotomy between the last day of residency and the first day of practice”

(Frank Lewis)
• We shouldn’t offer up a training regimen that is easier than their final task.

* D. Farley  * Ann Surg  , June 2003
Comparing/Contrasting US & Cdn Surg Residency Training (General)

- Broad spectrum of quality (best to ??! ) vs. narrow spectrum (shifted to higher end)
- Mix of academic or community vs. all academic
- Resourcing of education more variable in US
- Both strive to protect academic ½ day & other resident focused activities on surgical academic calendar
US vs Cdn Residency Training: Cultural Differences

- More hierarchical & formal in US (no 1st names!)
- Can’t reinvent self in Canada!
- Greater focus on trauma & CC in US
- Broader (& more “off”) service coverage in US – service vs education debate lagging
- Medical Malpractice!
US vs Cdn Residency Training: Numbers & Exams

- Operative & Flex Endo experience generally greater in Canada
- ABSITE performance expectations vs ITER confidentiality
- POS exams early in training & fellowship written & orals upon completion
- ABS written & oral “boards” only upon completion of all training
Hidden Cost of DHR...?

- “…..these changes carry costs whether explicit (hiring new staff) or implicit (taking time of attendings from other activities). One study suggested it would require a substantial decline in adverse events (between 5.1% and 8.5%) to make duty hour reforms cost neutral from a societal perspective (and even larger up to 30% to be cost neutral for teaching hospitals.)”

- *Meltzer, A*  *JAMA*  *September 2007*
Options (Solutions?!)

- Simulation
- Streaming
- Individualized training, tailored residencies
- Increased length of training
- Other?
Simulation

- The greatest power of (Simulation) is the ability to try and fail without consequence to an animal or patient. It is only through failure and learning the cause of failure that the true pathway to success lies. (Satava)

- Surgical simulation may have the ability to “train out” the learning curve for technical skills. (Seymour, 2002)
Fundamental Issues in Sim:

- Fidelity
- Validation
- Reliability
- Cost
- Transfer of training
Fidelity and Learning

• Maximum effectiveness of a simulation trainer may only occur when the fidelity level of the training matches the proficiency level of the trainee. (Noble)
Relationship between Fidelity and Learning

Virtual Reality Neurosurgery: Training the Next Generation of Surgeons

David B. Clarke, MDCM PhD
Division of Neurosurgery
Dalhousie University
Halifax, NS
• EW: Pre-op MRI; T1 + Gd
• Bipolar
• First Case
• Patient-Specific Simulation
• (Halifax 2009)
What is Cognitive Simulation?

It is the simulation of human thinking

- Use of knowledge, prior experiences—memory
- Use of preferences, goals—personal traits
- Use of initiative to obtain additional needed knowledge—learn
- Use of language—listen, attach meaning and speak
- Use of generalizations, reasoning, and decision-making—solve a problem
Simulation to practice thinking—Training clinical decision making—The Maryland Virtual Patient

- Integrates knowledge about medicine, best clinical practices, patient behavior, the world, language, mentoring.
- Centers around the virtual patient (VP): an intelligent agent that realistically simulates physiology as well as human-level capabilities of perception, reasoning and action.
• Designed the management of the knowledge

The Double Agent: A Physiological Agent Coupled with a Cognitive Agent

Physiological Agent

Engine: Simulator

Working Memory

Cognitive Agent

Working Memory

Engines: Planner NL Processor

Some knowledge is shared between the two agents

The Virtual Patient is modeled as a "double agent" -- a combination of two interacting agents, physiological and cognitive, representing the organism and the model of the mind, respectively.
Two Medical Application Domains that Use Cognitive Simulation

1. Simulation to practice thinking—
   Training clinical decision making

2. Simulation of human advising—
   Providing expert assistance in real-time, real-world diagnosis and treatment tasks
Surgical Sim: the Bottom Line
Simulation- Reality Check?

“Simulation is the Holy Grail of surgical training we’ve been talking about for 20 years. Still no simulator or simulation comes close to normal tissue characteristics and responses other than some of the endoscopic and endovascular trainers/simulators.”

Frank Lewis  (personal communication)
Surgical Streaming

- Year 1 - final 12 months
- Year 2 - final 18 months
- Year 3 – final 24 months (move to “4 & 2”?)
- In concert with ASCRS, AHPBA, SSO..?
Tailored Residency Training

- Individualized programs:
  - needs assessment
  - “prescription for learning”
  - proficiency based progression
  - fluid timelines
  - U of T Orthopedics “expt”

- Resource intensive++, logistical nightmare?
Unattractive Unavoidable Reality?

- Add a year to residency training:
  - already difficulty attracting our historic crop of the “best & brightest”
  - already unacceptable attrition
  - increased opportunity costs to residents
  - who will fund?
• “Everyone wants progress. No one likes change.”

Dr A Padmos