Department of Medicine: Grand Rounds

“Beyond competency: New Concepts in Surgical Education”

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CEO Southeastern Ontario Academic Medical Organization

“Big breakthroughs happen when what is suddenly possible meets what is desperately necessary.”

Thomas Friedman
May 15, 2012 New York Times

Truths and Assumptions

We will not revisit the past

Current training models are not based in evidence

Big challenges require creative solutions

We can no longer afford to work at the edges; rather we need to cut to the heart of the problem
We cannot go back

Mass. General surgery training program on probation

By Liz Keenan, Globe Staff

The surgery-training program at Massachusetts General Hospital has been put on probation by a national accrediting organization.

The unusual action carries no penalties, but candidates may have second thoughts about applying to a program on probation.

It doesn’t matter

Survey Finds Surgical Interns Concerned about Training Duty-Hour Restrictions

CHICAGO— About 20 percent of surgical interns say that new duty-hour restrictions will decrease their ability to care for patients, compromise their education and hinder their growth as surgeons, according to a survey published in the July 20 issue of Archives of Surgery, a JAMA Network publication.

It doesn’t matter

Could the ruling have implications across the country?

Quebec hospitals will have six months to reduce 24-hour medical resident shifts to a maximum of 18 hours, ruled an arbitrator in a grievance case led by the Federation des médecins residents du Q.
It may be possible issues are being confounded

We examine how a policy aimed at improving patient safety by limiting residents’ work hours brought with it an unintended and unexamined consequence: altered socialization due to modified rites of passage during residency that endangered the stereotypical “Surgical Personality” and created a potential rift between the occupational identities of surgical residents who train under duty hour regulations and those who trained before they were increased.

Fourteen or more years to make a specialist

- 5 years before medical school
- 4 years medical school
- 5 years residency
- 1-2 years fellowship
- 2 years academic training

Everything is predicated on this assumption

- clinical training
- theoretical foundation
Are practicing physicians becoming “too old, too smart and too expensive”?

Do interventional cardiologists really need 4 (or 6) years of medical school, 3 years of general internal medicine, then 3 years of cardiology fellowship and then 3 more years of training as an interventionalist before they are competent to practice?

Emil Petrusa

14 Years of Training to 10 – Emanuel and Fuchs

“Reduce premedical training from the typical 4 years of college to 2 or 3 years”

“Eliminate 1 year of medical School training (1/2 year of preclinical and 1/2 year of clinical training)”

“Reduce residency training by 1 year”

“Subspecialty training – 1 or 2 years of intensive clinical training instead of 3 to 4”
Winds of change

Focus on societal need
Make training more efficient
Develop and implement new models of training
Move beyond “the competencies”

Case in point: the airline industry

“More than 30,000 new commercial airplanes will be delivered to airlines in the next 20 years. A half million new pilots will be needed”

2010 Boeing Current Market Outlook

Novel training model to meet industry needs

“MPL provides graduates with an ICAO sanctioned license and is focused on the performance of the trainees and whether they achieve specific and job-related first officer competencies, rather than being focused simply on the hours that a trainee has flown.”

Roei Ganzarski, Chief Customer Officer for Training & Flight Services Boeing
Better use of technology

The 15-month-long MPL course emphasizes the principles of crew resource management, as well as threat and error management - from day one. Cadets meet the 240 hours mainly in flight simulator training devices.

Is competency based education the answer?

We think we have the answer
Competency-based education (CBE) is an approach to preparing physicians for practice that is fundamentally oriented to graduate outcome abilities and organized around competencies derived from an analysis of societal and patient needs. It deemphasizes time-based training and promises greater accountability, flexibility, and learner centredness.

“Competency-based education (CBE) is not only that the bar will continue to be set very high but that deliberate efforts (must) be made to raise it even further.

Bhatti and Cummings 2007; Academic Medicine: 82:569
Meet Joe

- Hofstee
- Angoff
- Nedelsky
- Contrasting Groups
- Ebel

The marginally competent, acceptably capable, bare pass, but a pass

Entrustable Professional Activities

<table>
<thead>
<tr>
<th>Competencies</th>
<th>EPAs</th>
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<tbody>
<tr>
<td>person-descriptors</td>
<td>work-descriptors</td>
</tr>
<tr>
<td>knowledge, skills, attitudes, values</td>
<td>essential parts of professional practice</td>
</tr>
<tr>
<td>• content expertise</td>
<td>• discharge patient</td>
</tr>
<tr>
<td>• collaboration ability</td>
<td>• counsel patient</td>
</tr>
<tr>
<td>• communication ability</td>
<td>• lead family meeting</td>
</tr>
<tr>
<td>• management ability</td>
<td>• design treatment plan</td>
</tr>
<tr>
<td>• professional attitude</td>
<td>• perform paracentesis</td>
</tr>
<tr>
<td>• scholarly approach</td>
<td>• resuscitate if needed</td>
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Accelerating Independence

Traditional model: Little guidance; much responsibility

New model: Much guidance; little responsibility
New Training Model

As of July 2012 14 supra-numery residents
Competency based, not time based

Essential Elements

Modular curriculum
Clearly outlined CanMEDS objectives
Must produce surgeons, not technicians
Longitudinal maintenance of skills
Competency-based progression
Comprehensive evaluation methods

Their training looks very different

Intensive two month boot camp
Their own secretary
Deployment of multiple environments
21 modules
Not assigned to a specific service
Intern as senior assistant or operator
Training to benchmark
All of the competencies (but not in every module)

<table>
<thead>
<tr>
<th>Module 1</th>
<th>Module 2</th>
<th>Module 3</th>
<th>Module 4</th>
<th>Module 5</th>
<th>Module 6</th>
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<tbody>
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<td>VR</td>
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<td>VR</td>
<td>OR</td>
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<td>OR</td>
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VR to OR established
Both VR and Box Trainers Work
OSATS=Checklists=Time

Both VR and Box Trainers Work

Six Repetitions to achieve benchmark

[Graph showing repetitions and benchmark]

The efficacy of virtual reality simulation training in laparoscopy: a systematic review of randomized trials

- 12 studies included
- 241 participants
- O.R. time reduced 17-51%
- Proficiency: Fixed number of repetitions
- Full/part


The minimal relationship between simulation fidelity and transfer of learning

High-fidelity simulator training produced a gain of 12% compared with no active treatment and a gain on 1% compared with LFS training

Norman G, Dow K, Grierson L. Medical Education 2012; 46:636-647
Junior Surgical Trainees

Many hours spent on a computer

A new balance

Opening the Toolbox

- PAME
- OSATS
- ICSAD
- VR Metrics
- OSCES
- Orals
- MCQ
- 360
- ITER
What you can’t measure, you can’t know

<table>
<thead>
<tr>
<th></th>
<th>YEAR 1</th>
<th>YEAR 2</th>
<th>YEAR 3</th>
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<tbody>
<tr>
<td>Oral examinations</td>
<td>Reg</td>
<td>CBC</td>
<td>Reg</td>
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<tr>
<td>Written examination</td>
<td>Short answer</td>
<td>Multiple choice</td>
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<tr>
<td>OSCE</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Formal observation of clinical skills</td>
<td>2</td>
<td>4</td>
<td>2</td>
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<tr>
<td>Multi-source feedback (MSF) assessment</td>
<td>1</td>
<td>6</td>
<td>1</td>
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<tr>
<td>Chart review</td>
<td>5</td>
<td>7</td>
<td>1</td>
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<td>Surgical STANZ</td>
<td>3.4</td>
<td>3.4</td>
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CBC Module 2: Hip fracture
Cases logged for regular 3m and 6m junior rotations vs CBC Module

Open Reduction, Internal Fixation of Trimalateral Ankle Fracture with Syndesmosis Disruption Evaluation of Performance

<table>
<thead>
<tr>
<th>Present</th>
<th>Staff</th>
<th>Date</th>
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<tbody>
<tr>
<td>Start</td>
<td>End</td>
<td>Location</td>
</tr>
<tr>
<td>Operation note (difficult, uncertain, etc.)</td>
<td>Yes</td>
<td>No</td>
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1. Preoperative planning
   a. Familiarity with patient’s medical history, co-morbidities, lab results, X-rays, CT scan, MRI
      b. Informed consent
      c. Knowledge of surgical technique
      d. Knowledge of postoperative care
      e. Knowledge of complications
      f. Knowledge of outcomes

2. Intraoperative management
   a. Ability to identify and manage complications
      i. Hemorrhage
      ii. Infection
      iii. Neurovascular injury
   b. Knowledge of postoperative care
   c. Knowledge of outcomes

3. Postoperative complications
   a. Knowledge of complications
      i. Infection
      ii. Non-union
      iii. Aseptic necrosis
   b. Knowledge of outcomes
CBC Residents outperform regular Residents on 9/9 technical skills

Overall 1 and 19 month scores for CBC and JR residents

CBC residents report more self-confidence
CBC Program Initial Results

<table>
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<tr>
<th>Resident</th>
<th>Months to completion</th>
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<tr>
<td>1</td>
<td>38</td>
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<tr>
<td>2</td>
<td>40</td>
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<tr>
<td>3</td>
<td>60</td>
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Two of three residents sat for certification exams one year early.

CBC Program Initial Results

<table>
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<tr>
<th>Year</th>
<th>Traditional Curriculum</th>
<th>CBC</th>
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<tbody>
<tr>
<td>2009-2010</td>
<td>8</td>
<td>3</td>
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<td>2010-2011</td>
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<td>6</td>
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<tr>
<td>2013-2014</td>
<td>0</td>
<td>11</td>
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Conventional curriculum cancelled for 2013-14
All PGY1’s in orthopaedics in competency-based curriculum

Tear down the continental divide
Imagine

Training a cardiologist

By combining medical school residency and fellowship

In so doing...

take precautions to reserve 10% of training spots for re-entry

and pose the question: does a psychiatrist need training in urology?
Agree on a select set of general competencies

All teaching related to career path

Learning in context of the job = sticks

Reach the finish line sooner

Finish when they're competent and skilled

We are accountable for approximately $1,000,000 per trainee

Rights skills

Right person

Right place

Right time

Right cost