Osteopathic and Medical Student Education

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Preparing Graduates for the 21st Century Health Care System
Students coming out of medical schools using traditional methods for learning knew a great deal of information (excellent fund of facts) but were not excellent at information seeking and critical thinking. Important knowledge necessary for effective practice was not being covered in traditional ‘lecture learning’ used for teaching at most medical schools, eg. Weakness on considering and measuring effectiveness, defining and assessing health outcomes, medical error prevention, patient safety and the cost of care.

Interest in Method and Content:

20 years ago at UCLA --

We observed

* Students coming out of medical schools using traditional methods for learning knew a great deal of information (excellent fund of facts) but were not excellent at information seeking and critical thinking.

* Important knowledge necessary for effective practice was not being covered in traditional ‘lecture learning’ used for teaching at most medical schools, eg. Weakness on considering and measuring effectiveness, defining and assessing health outcomes, medical error prevention, patient safety and the cost of care.
Much of the current Health Care System was designed in the 1950s.

The Complexity of Health Care is increasing exponentially.

Education System that supports it may not be adapting as quickly as it should be in terms of both methods and content.

The Aviation Analogy (Safety comparison)

Eminence-Based vs. Evidence-Based Practice

The Disconnection of Value and Cost

‘Doctoring’ at UCLA (Describe)

Interactive learning at ACOG

Value-Based Health Care and teaching at HBS
Started in the mid-1990s in response to feedback from residency programs and health care organizations that students lacked some important information and skills to be good doctors.

Students met in small groups after reading case scenarios. ‘Standardized’ patients were heavily used—lots of unemployed actors in LA area!

Faculty acted as moderators, called ‘time-outs’ for teaching moments and gave occasional mini-lectures.
* Major aspects of ‘system’ were designed in the 1950s
* Average ‘episode of care’ took 2.5 FTEs in 1950
* System worked well and physicians and other providers were well trained to work within it
* Same episode of care required 19.5 FTEs in 1990 and >40 FTEs now
* The complexity of the system and of disease has grown exponentially--- ‘Too much for one person’s memory’ –> keep this thought!
Evolution of the Education System

* Has not advanced as much as it should to prepare students for the newer, highly complex delivery system
* Business Schools and Executive Education Programs have moved away from classical lectures to more case-based teaching and interactive techniques
* Students work in teams and even ‘share the grade’ based upon team performance
* Feedback from health plans and health care delivery systems such as Kaiser and HealthNet suggests that medical/osteopathic schools should emulate this method
WHO lists >68,000 diagnoses

There are > 6000 drugs

There are > 4000 Medical/Surgical Procedures

Innovations such as team-based care and checklists are increasingly necessary and effective

Care and protocol management by teams is important

These innovations are disruptive (to the status quo) and are therefore threatening to many

‘Will Disruptive Innovations Cure Health Care’, HBR, September-Oct, 2000 (I can send electronic pdf file on request)
The Aviation Analogy

- Started out as a ‘solo’ activity with only one individual ‘in charge’ in the cockpit
- Worked well until the systems and equipment became more and more complex
- The use of simulators (sound familiar?) began in the 1950s in aviation---only recently in health care
- Teamwork and Crew Resource Management adopted 30 years ago in aviation
- The story of the first aviation checklist
1934 and Army needed a new bomber--companies competed (Martin, Douglas and Boeing).

The Boeing model (299) was by far the best.

On the test day the plane took off, stalled and crashed—an investigation followed.

Pilot forgot to release the elevator lock.

The plane was very effective but very complex and too much ‘for one person’s memory’ (heard before).

Inferior Douglas Model was bought (B-18).

Rather than scrap this remarkable plane, checklists were devised (4 of them).

The plane became the B-17 bomber.
Boeing’s Model 299
The B-17, Flying Fortress
12,731 Bought
Aviation Safety: Checklists and Crew Resource Management

**Blue Skies**

Between 1959 and 2009, airline safety has improved dramatically. The red line indicates the number of fatal accidents per million departures. The number below the year indicates total fatalities.

* Aircraft of 15 passengers seats or more. Excludes acts of violence. † As of Aug. 25
Source: Boeing Co. (accident rate); Ascend Worldwide Ltd. (passenger fatalities); Getty Images (photo)
Patient Safety and Medical Error

- Since the IOM publication, ‘To Err is Human’ in 1999 medical error continues to be a major problem in the US (and Worldwide)
- Estimates range from 44,000 to 98,000 US deaths annually due to preventable medical error
- ACOG has a course on this topic and participants almost always comment that this should be taught earlier in their training---medical school/residency
Many Business and Management Schools (including UCLA) have emulated this method.

School of Public Health Experience

Cases allow for the transmission of facts in a way that encourages critical thinking, information seeking, participation and creative questioning.

Interactive nature of this method stimulates team-building for problem solving by requiring participation and reliance on others.

‘Harvard grads don’t look for jobs, they create them!’ Quote from the Social Network.
The case is made available and must be read prior to the class.

The professor (leader of case-discussion) does not answer any questions during the discussion.

A participant must be called upon (one never speaks before being called upon) and the goal should be that everyone participates.

Only the facts in the case are discussed initially.
The lecture by experts predominates, with opinion (authority) dominating the basis of decision-making in health care.

Trend is to substitute evidence (and evidence seeking) for opinion when it exists.

Rand’s and other studies show that expert opinion is often not evidence-based and is frequently wrong.

Life-long learning (and re-learning) will be essential for competent practice.
The Disconnection of Value and Cost

- Value and Cost are not adequately taught (or even considered) according to numerous studies and feedback from health plans and health systems.
- Third-party payment aggravates this situation.
- Direct to consumer advertising also aggravates this for drugs.
- Value-Analysis at UCLA Medical Center (sponsored by grants from the California Health Care Endowment and local health plans) – Describe.
- Value = health outcomes/resources used (cost).
- Michael Porter, HBS—Redefining Health Care.
A Disruptive Innovation: How do we teach and inspire this activity? Checklists

A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population

The WHO initiated this worldwide

There was a 47% decrease in surgical mortality and a 36% decrease for inpatient complications---both highly significant statistically.

If this was a drug the manufacturer would be making billions of dollars!

The checklist is simple and effective.

How do we teach students to think this creatively?
The WHO Surgical Checklist

Surgical Safety Checklist

Before induction of anaesthesia

- Has the patient confirmed his/her identity, site, procedure, and consent?
  - Yes

- Is the site marked?
  - Yes
  - Not applicable

- Is the anaesthesia machine and medication check complete?
  - Yes

- Is the pulse oximeter on the patient and functioning?
  - Yes

- Does the patient have a:
  - Known allergy?
    - No
    - Yes
  - Difficult airway or aspiration risk?
    - No
    - Yes, and equipment/assistance available
  - Risk of >500ml blood loss (7ml/kg in children)?
    - No
    - Yes, and two IVs/central access and fluids planned

Before skin incision

- Confirm all team members have introduced themselves by name and role.

- Confirm the patient’s name, procedure, and where the incision will be made.

- Has antibiotic prophylaxis been given within the last 60 minutes?
  - Yes
  - Not applicable

Anticipated Critical Events

To Surgeon:
- What are the critical or non-routine steps?
- How long will the case take?
- What is the anticipated blood loss?

To Anaesthetist:
- Are there any patient-specific concerns?

To Nursing Team:
- Has sterility (including indicator results) been confirmed?
- Are there any equipment issues or any concerns?

Is essential imaging displayed?
- Yes
- Not applicable

Before patient leaves operating room

Nurse Verbally Confirms:
- The name of the procedure
- Completion of instrument, sponge and needle counts
- Specimen labelling (read specimen labels aloud, including patient name)
- Whether there are any equipment problems to be addressed

To Surgeon, Anaesthetist and Nurse:
- What are the key concerns for recovery and management of this patient?

This checklist is not intended to be comprehensive. Additions and modifications to fit local practice are encouraged.

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Writes for the New Yorker, numerous
articles and books on health care
services.

“The Checklist Manefesto” and “The
Cost Condundrum” in the New
Yorker are among his notable
publications. He is part of the
“Value-Based Health Care” faculty
team.
How do we teach the value and the necessity of teamwork in health care?

* In a culture that has celebrated solo performance and individual excellence---similar to aviation in the distant past.

JAMA

Association Between Implementation of a Medical Team Training Program and Surgical Mortality

Julia Neily; Peter D. Mills; Yinong Young-Xu; et al.


http://jama.ama-assn.org/cgi/content/full/304/15/1693
Study reported the results from 74 VHA facilities that participated in the Medical Team Training Program

- 18% decrease in surgical mortality
- They used the Crew Resource Management theory adapted to health care
- Decisions are made with the involvement and agreement of team members
- Swiss Air Example—No Crew Resource Management

Results of Team-based Care
Swiss Air 111 -- 1998
MD-11, JFK to Geneva, 229 Died
No CRM
How do we get students ready for the health care system of the 21st Century?

- Learning by lecture and individual student reading about these innovations and process improvements is not enough to change behavior (Mittman)
- Teaching in smaller groups with information seeking activity and requiring student participation seems to be more effective
- Measurement of these skills along with self-efficacy evaluation for these behaviors and assessment of critical thinking is needed to guide improvements
Challenges when Making Changes

* The only human beings that like and ask for change are infants who want clean, dry diapers!
* Change is almost always difficult
* Keeping what still works well
* Incorporating mini-lectures into problem- and case-based teaching in smaller groups
* Making sure that all important content is covered and discussed
* Making sure that students are able to pass (do very well) in standardized tests
* We cannot just change what we teach, we must also improve how we teach.
What are the major issues and concerns about changing the way we teach?

* What are some positive effects?
* Should the fact that many students do not want the change prevent it from happening?
* What are the main faculty concerns?
* How will we know that any change is an improvement?
* Will we get all of the changes right the first time?
* After we change, will we have to change again?
A physician teaches us how to change and love it!
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