

Future Directions in Medical Education: New Models of Medical Education

Linda Snell MD MHPE FRCPC MACP
Kimitaka Kaga Visiting Professor, Tokyo University
Professor of Medicine, McGill University



In this four-lecture series we will examine the challenges to our current models of teaching and assessment at the medical student and resident level. We will critically appraise current approaches and the reasons for a need to change. Using examples from Canada we will look at new models, innovative curricula, novel approaches to assessment, and methods to evaluate effectiveness.

"I hope that, taken together, these four lectures will stimulate a positive change in medical education in Japan"



Future Directions in Medical Education

Lecture series:

1. New Models of Medical Education
2. Designing and Delivering Innovative Curricula
3. Novel Approaches to Assessment
4. Do the New Education Models Really Work?



New Models of Medical Education: Outline

- A. Are there problems with our current education models?
- B. Do we need to change?
- C. Are there newer models of medical education?
- D. Will competency-based medical education (CBME) be able to address the challenges?
- E. Are there global CBME models and innovations?
- F. Can this apply to the Japanese context?



A. Are there problems with our current medical education models?

“What are we doing now that works, and that does not work?”



‘Traditional’ models of medical education

- 4 year ‘graduate entry’ or 5-7 year ‘direct entry’
- Pre-clinical → Clinical

- Preclinical – classroom and laboratory
 - Large classes, didactic, written exams
- Clinical
 - In large academic teaching hospitals
 - Role: observer
 - Written exams, knowledge-based



Flexner, Harden ... and beyond

- | | |
|----------------------------------|-----------------------------|
| A. Flexner – 1911 | B. Harden – 1984 (SPICES) |
| □ Teacher-centered | □ Student-centered |
| □ Knowledge transmission | □ Problem-based |
| □ Discipline-based | □ Integrated |
| □ Hospital oriented | □ Community oriented |
| □ Standard program | □ Systematic |
| □ Core + electives | |
| □ Opportunistic (apprenticeship) | C. GPEP report AAMC - 1990s |



Harden R et al Med Educ 1984



Current models used in *undergraduate* education

Preclinical

- Problem-based learning
- Case-based learning
- Peer learning
- Team-based learning
- Active learning, groups
- Integrated curricula
- Spiral curricula
- Early clinical exposure

Clinical

- Clerkship involves 'doing'
- Outpatient & community
- Interprofessional education
- Electives
- Simulation
- OSCE



Current models of *postgraduate* education

- Apprenticeship – 'work-based learning'
- Assigned to a 'rotation' for a period of time
- Supervised care of patients with 'graduated responsibility'
- +/- a formal curriculum
- 'Core competencies'
- Assessment and advancement based on performance and time spent
- Exit examination: written, clinical



B. Do we need to change?

*"I went through the current system,
and I turned out all right."*



But still ...

The medical curriculum should be designed so as to provide adequate opportunities to acquire *independent learning skills*, while *developing clinical competence* to a level appropriate to a new pre-registration house officer. Experiential learning arising from extensive periods of *direct patient contact is an essential* component of the course, which may be supported by *contributions made by skills laboratories and learning activities using simulated patients*. Adequate numbers of patients in *primary, secondary and tertiary care* settings need to be available for *face-to-face student contact*.



Medicine Benchmark Subject Statement, OAA UK, 2002

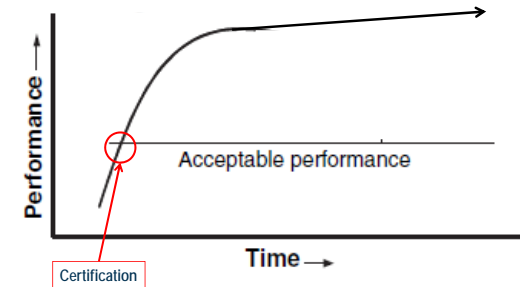


Challenges and problems with current models

- Rapidly evolving knowledge & technology
- Concern about patient safety & medical error
- Quality care
 - Poor care coordination
 - Inappropriate use of tests
 - Dysfunctional collaboration
- Heterogeneous exposure and patient 'mix' result in gaps in training
- Transitions not addressed
- Patient concerns about
 - Compassion
 - Communication skills
 - Professionalism & ethics
- Uneven 'product': too many graduates with deficiencies
- Inflexible training models



The practice outcome of our current model: Competence drops over time



Klass Acad Med 2007



Competency Gaps

Office-based Practice
Competencies: skills in...

- Working in inter-professional teams
- Clinical IT
- Population management
- Reflective practice
- CQI
- Care Coordination
- Continuity of Care
- Leadership & management
- Systems thinking
- Procedural Skills



Crosson Health Affairs 2011



We need doctors who ...

- Are optimally prepared for today's practice
- Can safely provide complex care
- Can work in and lead health care teams
- Maintain / improve their competence in changing contexts
- Possess skills and abilities beyond knowledge



In summary: Why we need to consider a change

- Public concerns about accountability
- Concern over an increasing gap between graduate's performance and the requirement for graduates to meet the needs of society and possess abilities for complex practice
- Desire to improve educational and clinical outcomes



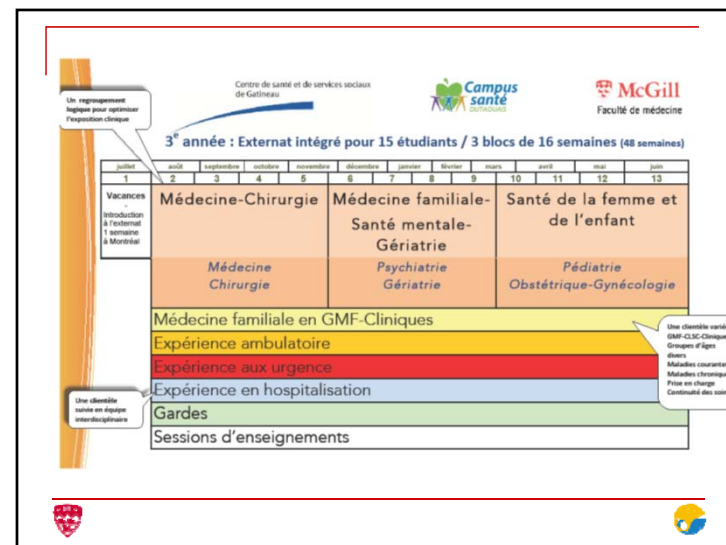
C. Are there newer models of medical education to address these challenges?

*“What’s new?
We have seen this before.”*



Addressing the challenges:
New(er) Models of Medical Education

- Longitudinal models e.g.
 - Longitudinal integrated clerkships
 - Longitudinal resident clinics
- Technology enhanced
- Social media and learning
- Competency-based medical education (CBME)



Longitudinal integrated clerkships

Model Weekly Schedules

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Surgery Rounds 6-7am	<i>If surgical patient in hospital</i>						
Medicine Rounds 7-8am	<i>If medicine patient in hospital</i>						
AM Clinic 8-12am	Internal Medicine	OB/GYN	Surgery Clinic or OR	Neurology	Pediatrics	One weekend day/month: call in ED, Pediatric ER/Urgent Care or discipline-specific call 8 hours.	
PM Clinic 1-5pm	Cohort Time	DIDACTICS	Cohort Time	Psychiatry	Urology Skills Session		
Evening/Night 6pm-7am	One evening/week: call in ED, Pediatric ER/Urgent Care or discipline-specific call 4 hours.						



Technology enhanced learning



Social media for learning



“Digital connection to the cooperative world of EM. We strive to reshape medical education and academia in their evolution beyond the traditional classroom.”



D. Will competency-based medical education (CBME) be able to address the challenges?

“It seems very complicated...”



Competency-based medical education: What is it?

An outcomes-based approach to the design, implementation, assessment, and evaluation of medical education programs, using an organizing framework of competencies* ¹

*derived from an analysis of societal and patient needs ²



1. Frank, Snell et al, Med Teacher 2010, 2. Frank et al, Med Teacher 2010



Define **Competence**:

The array of abilities (knowledge, skills, and attitudes) across multiple domains or aspects of performance in a certain context.

- require descriptive qualifiers to define the relevant abilities, context, stage of training.
- multi-dimensional and dynamic
- changes with time, experience, and setting.



Frank, Snell. Med Teacher 2010



Define **Competency**:

An observable ability of a health professional related to a specific activity that integrates knowledge, skills, values, and attitudes.

- Since competencies are observable, they can be measured and assessed to ensure their acquisition.
- Competencies can be assembled like building blocks to facilitate progressive development.



Frank, Snell. Med Teacher 2010



Fundamental principles of CBME

- Education must be based on the health needs of the populations served
- Primary focus of education & training should be desired outcomes for learners rather than structure and process of the education system
- The formation of a physician should be integrated across the continuum – UGME → PGME → practice



Caraccio, Frank, Snell et al CBME Charter. Acad Med 2016



History of CBME – it's not new!

- 1950s-1960s: outcomes based education in industry
- 1970s: rationale for medical education based on acquisition of competencies¹
- 1990s: first iteration of a competency framework based on what patients expect from their doctors²
- 2000s: national competency frameworks adopted^{3,4} (Canada, USA, UK, Australia, Netherlands,)
- 2010: publications (Med Teacher, Lancet, Carnegie Report)
- 2010's: implementation – postgraduate, medical school (Canada, USA, Netherlands, Australia, Singapore)

1. McGaghie, 1978; 2. Frank J et al, CanMEDS; 3. Frank, Snell, Sherbino, 2015; 4. ACGME



TRIPLE C
Access the toolkit for more information.
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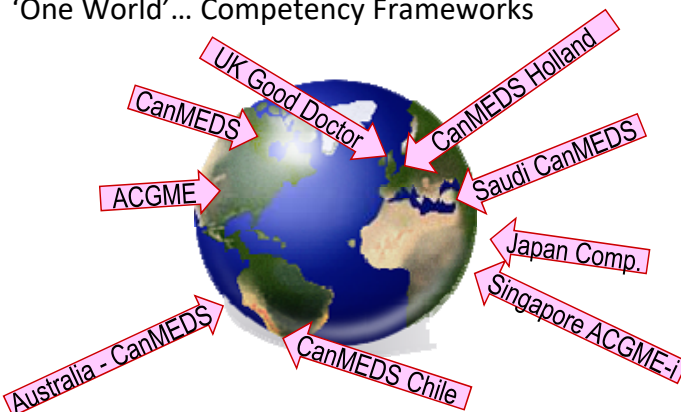
CANMEDS

Outcome Project
Enhancing residency education through outcomes assessment

ACGME



'One World'... Competency Frameworks



Common competencies within frameworks: Can you name some?

- (Clinical) expertise
- Problem solving
- Health advocacy / prevention
- Communication skills
- Teamwork / collaboration
- Leadership and management
- Teaching skills
- Life-long learning
- Critical appraisal
- Professionalism



Characteristics of CBME (1)

- Graduate outcomes in the form of attainment of predefined desired competencies are the goal.
- Competencies are derived from the needs of patients, organized into a coherent guiding framework.
- Teaching and learning experiences are sequenced to facilitate a defined progression of ability in stages.
- Learning is tailored to the individual learner's progression in some manner.



Slide adapted from E Holmboe



Characteristics of CBME (2)

- Time is a resource for learning, not the basis of progression of competence.
- Numerous direct observations and focused feedback contribute to effective learner development of expertise.
- Assessment is planned, systematic, systemic, and integrative ('programmatic')



Slide adapted from E Holmboe



E. Are there global CBME models and innovations?

*"This seems very theoretical ...
Is anyone actually doing it?"*



Global Examples



- U Toronto Orthopedics
- USA: ACGME
- Netherlands
- Canada: CFPC Triple-C (Family Med)
- Canada: Specialist "Competence by Design" (RCPSC)
- Canadian med school competencies
- Singapore
- Texas consortium
- Queens University
- ...others



The CBME model shifts the emphasis of training from one focused on time-based learning and measurement to one based on competency in the skills required. Instead of requiring learners to complete a pre-determined period of time at one level before moving on to the next, they will instead be promoted once they have demonstrated competency in a particular field. The CBME training model also calls for more frequent and meaningful assessments, ensuring that competent residents will move through training in a more individualized and efficient manner, saving valuable resources and promoting excellence in their paths to independent practice.



Globe & Mail Jan 20, 2016



CBME - Where We Are...

- Competencies make what has been *implicit* in medical education *explicit*.
 - Shared understanding and mental models
- Competencies enable an examination of what it takes and means to be a proficient healthcare professional
- The ability to sequence learning of abilities helps *operationalize* the competencies in more practical terms



Slide from Holmboe, E, AMEE 2016



How CBME may help address challenges

- Is based on explicit outcomes needed by graduates
- Transparent to learners, teachers, assessors
- Focuses on individual learner needs
- Promotes life-long learning
- Provides time needed to learn
- Better prepared to progress to next level or for practice
- Provides public accountability



We believe that in the future, expertise rather than experience will underlie competency-based practice and...certification.



Aggarwal & Darzi, NEJM 2006



F. Can this apply to the Japanese context?

There is work to do !

Now: Sample Curriculum Map

3rd year (M1)												
April	May	June	July	August	September	October	November	December	January	February	March	
Microbiology Anatomy (Mass, development), Immunology, Microbiology	Psychology Anatomy exercise (Mass, Ingu)	Psychology Microbiology	Psychology Microbiology	Basic science Microbiology	Basic science Microbiology	Pharmacology Medical English	Pharmacology Medical English	Pathology Medical English	Pathology Medical English	Pathology Medical English	Pathology Medical English	Final exam

4th year (M2)												
April	May	June	July	August	September	October	November	December	January	February	March	
Microbiology Anatomy (Mass, development), Immunology, Microbiology	Psychology Anatomy exercise (Mass, Ingu)	Psychology Microbiology	Psychology Microbiology	Basic science Microbiology	Basic science Microbiology	Pharmacology Medical English	Pharmacology Medical English	Pathology Medical English	Pathology Medical English	Pathology Medical English	Pathology Medical English	Final exam

5th year (M3)												
April	May	June	July	August	September	October	November	December	January	February	March	
Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology

6th year (M4)												
April	May	June	July	August	September	October	November	December	January	February	March	
Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology	Clinical clerkship Psychology

What can be done (relatively) easily?

- Develop a concise competency framework
 - National level if possible
 - Derived from abilities needed by graduates
- Sequence competencies across the continuum:
UGME → PGME → practice
- Reconsider assessment methods and systems
 - Formative – assessment *for* learning
 - Summative – assessment *of* learning
- Start faculty development



1,5 cm

Key messages

- There are problems with our current education models;
- We need to change;
- Newer models of medical education have evolved;
- Competency-based medical education (CBME) be able to address the challenges;
- CBME models and innovations are being implemented globally;
- These concepts can be applied in Japanese context

