

9th College of Physicians Lecture: Medical Education and Professional Training— Changing the Trajectory

C Rajasoorya,^{1,2,3} *FAMS, FRCP (Edin), FRCP (London)*

I would like to thank the College of Physicians for the honour and privilege to deliver the 9th College of Physicians Lecture on “Medical Education and Professional Training—Changing the Trajectory”. I do feel that it is important at this occasion to thank many of my teachers who have unselfishly taught and trained me and continually inspire me. My students who continue to expose my gaps, and help me do better have remained an inspiration, particularly those who have outperformed me. My special thanks to those who have created the “milieu” for me to be exposed and involved in areas related to medical education stretching from ground to policy levels. I will give a glimpse overview of the changing scenario of medical education and professional training. I will cover 7 areas in this lecture and take you through some personal perspectives as I conclude my talk.

1. Role of Medical Education and Professional Training

Academic Medicine has been likened to the tripod standing on patient care, research and education. With increasing resources dedicated to patient care and research, the leg of education has perhaps been more neglected. This will become an unsustainable situation because it tends to destabilise medicine and the healthcare system.

Selecting students for medical schools is never an easy task. After medical school education, they graduate to professional training before practising as generalists or specialists. The outcome of medical education is strongly influenced by its 4 sequential subunits—Pre-Medical School, Medical School, Professional Training and Professional Practice.

Medical education and professional training has to fulfil certain specific curriculum goals¹ that include:

- Production of future doctors—the type of doctors (e.g. clinicians, scientists, clinician-scientists and clinician-teachers) may vary in different medical schools.

- Utilisation of modern educational methods.
- Compliance with governing and registration body regulations e.g. Singapore Medical Council, General Medical Council of the United Kingdom.
- Ensure that a significant number of students pass the course. Medical schools that have a high failure rate have been derided as having a training system that is inherently wrong and unfulfilling its targets.
- Medical Education has to meet “consumer expectations”—patients form the majority of the “consumers” but one cannot ignore the state, the system in place and the system financier.

Several schemes² have been described for knowledge, skills and attributes of the well-trained doctor. Although the terminology may vary slightly and there may be differing emphasis on certain qualities, there is a big overlap in the desired qualities of the final product of medical education and professional training. The Royal College of Physicians and Surgeons in Canada developed the Canadian Medical Education Directions for Specialists (CanMEDS) that defines competencies as being an expert, a communicator, a collaborator, manager, health advocate, scholar and professional. The General Medical Council (GMC) of the United Kingdom defines good medical practice as including the elements of good clinical care, maintenance of good practice, teaching and training, appraising and assessing, relationship with patients, working with colleagues, probity and health. The Accreditation Council for Graduate Medical Education (ACGME) and the American Board of Specialties (ABMS) embrace 6 competencies that include medical knowledge, interpersonal and communication skills, patient care, professionalism, practice based learning and improvement and system-based practice. The Institute of Medicine (IOM) holds the need to develop on evidence-based practice, inter-disciplinary team work, patient centred care, quality improvement initiatives and informatics utility.

¹Senior Consultant Physician and Endocrinologist, Alexandrahealth

²Clinical Professor Yong Loo Lin School of Medicine, National University of Singapore

³Adjunct Professor Duke NUS Graduate Medical School

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2. Historical Perspectives

A Brief Glimpse of Medical Education in Singapore³

Colonial powers brought western medicine to Asia and the first Medical School was established at Sepoy Lines on 3 July 1905. In 1910, the 1st seven medical students graduated with a Licentiate in Medicine and Surgery (LMS). The School was renamed the King Edward Medical School in 1913 and in 1916, the LMS was fully recognised by the GMC in the United Kingdom. In 1949, the Faculty of Medicine was established, and in 1969, the School of Post Graduate Medical Education in Singapore was formed. In 2001 the Medical Education Unit was formed at the National University of Singapore. April 2005 saw the establishment of the Duke -NUS Graduate Medical School, and in 2013, the first intake for the Lee Kong Chian Medical School is expected.

The International Scene

Medical Education may have originated⁴ with the ancient Greeks’ method of rational inquiry which introduced the practice of observation and reasoning regarding disease. It has been suggested that rational interpretation and discussion led to teaching and thus to formation of schools where Hippocrates and others taught in the 5th Century BC.

Abraham Flexner visiting 155 medical schools in US and Canada published a report in 1910 that brought a new conceptual model of how modern medical education should be conducted and suggested the need for prerequisites for medical schools, a solid grounding of training in the sciences, a structured and supervised clinical rotations and the need to affiliate medical schools with Universities. More so, he highlighted the need for commitment from faculty to patient care research and education.^{5,6}

Confucius highlighted the need on doing and understanding that goes beyond just hearing and seeing (“I hear and I forget, I see and I remember, I do and I understand”). Miller⁷ in 1990 outlined in his pyramid that knowledge alone is insufficient and highlighted on the need to use the knowledge, demonstrate that knowledge in a simulated environment and finally acting independently in applying that knowledge acquired. Many iterations of Miller’s pyramid have occurred over the years including the Cambridge Model⁸ which distinguishes competence (what a candidate demonstrates during an examination) and performance (what the candidate demonstrates in real practice). The Cambridge Model take into account system related factors such as government programmes, patient expectations and guidelines and individual factors like state of mind, physical and mental health, and relationship with peers and family.

3. Changes Sweeping Medicine and Medical Education

At least 15 reports⁹ have called for change in medical education in the last decade ending 2010. The problems facing medical education have been thoroughly elucidated. There is remarkable congruence in the recommendations of these reports. There reports have called for changes in terms of integrating the educational continuum, need for evaluation and research, new methods of financing, leadership importance, social accountability, use of technology, alignment with healthcare delivery and sets directions for the healthcare workforce reinforcing the recommendations of CanMEDS, GMC(UK), ACGME/ABMS and IOM highlighted earlier.

Figure 1 depicts the context of change in medical education highlighting some of the major factors that contribute the need for re-thinking medical education. Figure 2 illustrates some ways in which the medical education community has

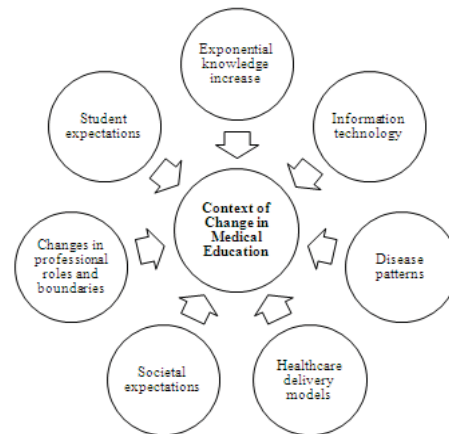


Fig. 1. Context of change in Medical Education.

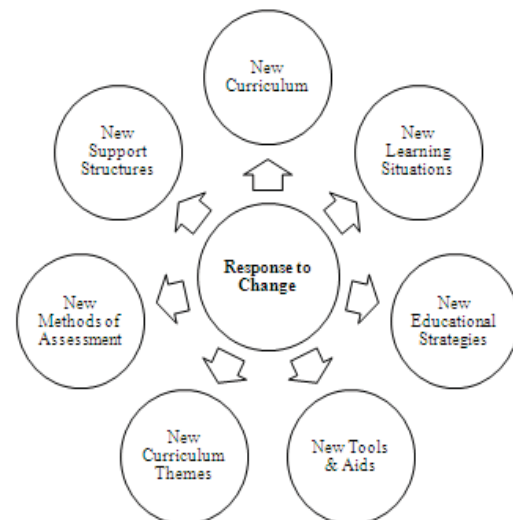


Fig. 2. Response to changes sweeping in Medical Education.

responded to these changes in recent years.

4. Challenges and Issues We Face Today in Medical Education

Teaching and Learning

What is taught is not necessarily learnt. As highlighted by Amin and Khoo,¹⁰ “when a teacher teaches there is no guarantee that the students learn”. The authors further suggest that “the goal of all medical teachers should not be merely excellence in teaching but rather excellence in ensuring that the students are good in learning.”

Good Teachers

The argument has often been raised that good clinical teaching makes a big difference in the final outcome for the majority. Getting committed teachers who teach for sheer passion and the will to impart knowledge and skills has increasingly become a difficult task over time due to increased clinical load, socio-economic, and financial pressures in the hospital setting. Important characteristics of excellent clinical teachers have been defined¹¹ and include those who

1. Share a passion for teaching.
2. Are clear, organised, accessible, supportive and compassionate.
3. Are able to establish rapport; provide direction and feedback; exhibit integrity and respect for others.
4. Demonstrate clinical competence.
5. Utilise planning and orienting strategies.
6. Possess a broad repertoire of teaching methods and scripts.
7. Engage in self-evaluation and reflection.
8. Draw upon multiple forms of knowledge, target their teaching to the learners' level of knowledge.

The Hidden Curriculum

A hidden curriculum¹² is a side effect of an education and refers to aspects of education which are learned but not openly intended. There lies a set of influences that function at the level of organisational structure that affects learning and professional interactions. These influences may often give one group advantages over another and sometimes reinforces the negative elements of rewards and recognition. Learning gets affected in a biased and sometimes negative manner.

The Discordant Curriculum

All medical schools have a declared curriculum. This however need not necessarily overlap with the taught

curriculum or the learnt curriculum. The challenge lies in trying to make the declared, taught and learnt curriculum essentially the same. Subgroups within a medical school may have different ideas on what is important. In the clinical setting, this is well highlighted in the degree of variability of methodological clinical examination taught to medical students.

Challenges of Clinical Teaching

Sir William Osler is often quoted as an introduction to clinical medical students to emphasise the learning of clinical medicine by the bedside by the patient. (“He who studies medicine without books sails an uncharted sea, but he who studies medicine without patients does not go to sea at all”). However, increasingly bedside teaching has moved towards classroom or tutorial room teaching. The challenges of teaching clinical medicine have been well elucidated and published recently.¹³ Identified challenges of clinical teaching include: time constraints, work demands, unpredictability and difficult preparation, engaging multiple levels of learners, patient related challenges and the physical and clinical comfort environment for teaching. The use of surrogates, trained actors, and simulated environments help partly overcome the problem but can never equate a real life patient encounter.

Assessment and Measurement of Outcomes

This area has seen one of the major changes in medical education. Summative assessments tended to dominate teaching because of importance given to results. The traditional approach of a summative assessment as the only means of assessment has been widely challenged for its validity and reliability in contrast to formative assessment. The summative assessment ideally should involve harvesting evidence from as many sources as possible and cover every aspect of the curriculum which is considered essential or which had significant teaching time and must be truly reflective of a student's ability. Formative assessment, on the other hand, should emanate from a wish to foster learning and understanding with opportunities for application of knowledge skills and attitudes. Formative assessment is less threatening and gives a clearer idea on goals for students and teachers. A formative assessment also gives a good opportunity to provide valuable feedback.

Traditionally, we have we have relied on the job grades as a surrogate of different levels of performance e.g. Year 3 medical students, Year 5 medical student, House-officer (intern), Medical Officer, Registrar and Consultant. In Professional Training, there has been a move to delineate job grades as distinct from performance abilities. Numerous models have been proposed including the “ORIME” model¹⁴

and the “Dreyfus” model.¹⁵ Competence is not an overnight process. Trainees progress after attaining sufficient knowledge, skills and attributes. It has been suggested that assessment has also to be tailored to progression through various levels in their acquisition of skills—the Dreyfus Model of categorising skills acquisition which was first used in studying US Air Force Pilots has been widely adopted in medical education where training has been staged from a novice state, progressing to advanced beginner, competent, proficient and finally reaching the expert state.

Figure 3 (also see acknowledgements) shows one example of how the different models can actually be unified and correlated in one organisation to reflect the same desired goals and targets.

5. The Basis for a Change in Trajectory

In 2007 to 2008, the Ministry of Health (MOH) in Singapore embarked on an in-depth examination of the postgraduate training system. The gradual erosion of the apprenticeship system due to service pressure was of concern. In August 2008, ACGME led by its Chairman Dr William Hartman and Chief Executive Officer (CEO) Dr Tom Nasca met with Ministry of Health (MOH) officials and visited various hospitals in Singapore. It was felt that our training system lacked a proper structure.

These findings are congruent with other concerns raised by trainees who feedback that there was not much advantage in being a trainee, protected time for learning eaten by service loads, infrequent supervisor meets, discordant expectations

vs delivery in National Training Programs, poor ratings of some supervisors and absence of clear training goals.

Based on all these MOH decided to revamp residency structure and training with 4 major parts to this structure that defined systems (accreditation process, oversight structures and committees) curriculum (defined learning objective and core competencies; graded responsibilities) people (designated core-faculty with protected time) and assessment (regular formative assessments). The system highlighted the need to attain the 6 competencies as defined by ACGME.

6. Change for Better or for Worse? Some Personal Perspectives

Educational Strategies

The strategy for medical education had started initially as Teacher-centred, Information-oriented, Discipline-based, Hospital-based, Uniform and Opportunistic. Over the years, there have been calls to move it along the lines of a SPICES model of Student-centred, Problem-based, Inter-professional, Community-based, Elective driven and Systematic approach. Deployment of these contrasting strategies as a continuum will help avoid polarising opinions and conflicts.¹⁶

American vs British Controversy

The American style medical education defines a clear structure and curriculum with progressive learning, has

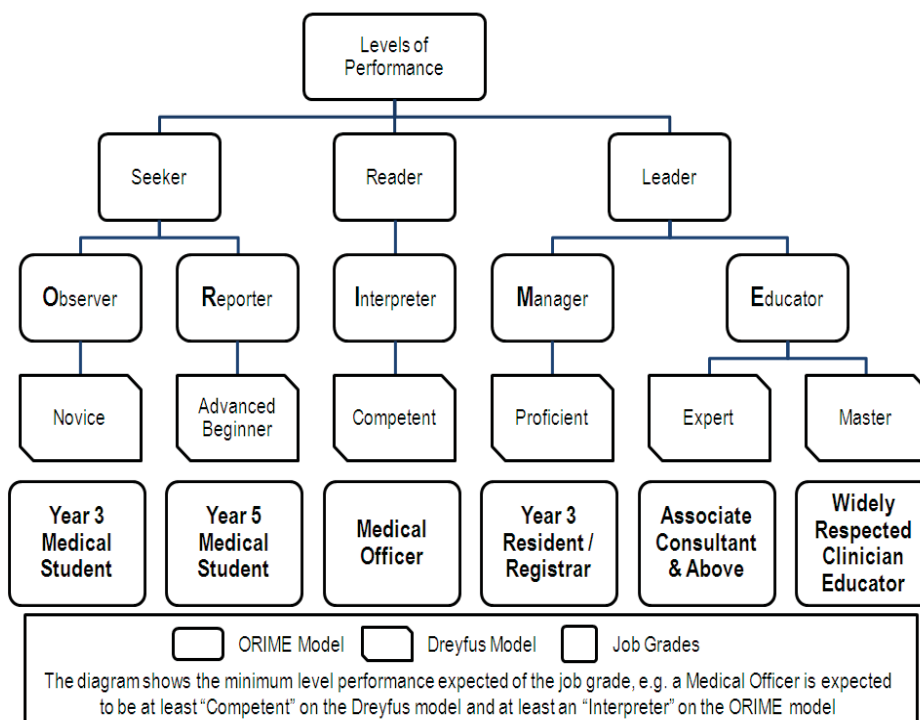


Fig. 3. Levels of performance—Integrating different models.

well-defined accountability, commits dedicated staff for jobs with protected time, dictates protected duty hours conducive to learning and makes sponsoring institutions have ownership of residents and builds on the principle of progressive learning. Conversely, the British system relies on a strong clinical emphasis, has exams with international recognition, well validated and reproducible examination success rates and traditionally relied on the principle that increased numbers of patients and longer duration of training provides greater exposure. Some however have argued that the American system of examinations has a very inconspicuous clinical component which negates the value of clinical aspects to assessment. The counter argument against the British system is the perceived less than optimal pass rates in examination.

Concerns

Hays¹⁷ and Grant¹⁸ have elucidated clearly some issues when educational system changes that may raise concerns that include

- When education changes the actual rationale should be made clear to the stake-holders, a clear distinction is necessary between political and professional agendas.
- Protection of adequate clinical experience is paramount.
- Competency models can deconstruct and instrumentalise medical education.
- Standards for medical education should be clear but not too specific.
- Changes in trainees' career structure must be accompanied by changes in career advice.
- Critical errors in implementation can happen if things move too fast or quick.

My Own Stance

I have been asked to articulate my own personal impressions on the changes sweeping medical education in particular context to the changes in the Singapore scene and I may like to emphasise these are personal opinions (uncensored) which are best summarised in the 9 points below.

1. Our medical education and postgraduate training can be further improved.
2. We need a good structure and accountability.
3. ACGME, ABMS offers us the tools for developing this structure and accountability.
4. It takes time to show results. Change is difficult.
5. But be it ACGME or ABMS, we have to tweak it to

our local context.

6. We cannot take everything wholesale from America—we cannot afford it nor are we Americans. A significant proportion of doctors practicing in America received their training elsewhere raising concerns that America is unable to train doctors enough for its own country needs.
7. But we cannot sit on our laurels entirely to say we need not change. Change is inevitable and we have to adapt to change.
8. There are no compromises to a collaborative approach—A dialogue is critical for all the stakeholders involved in medical education.
9. We need a cultural change in medical education—teaching must be independent of titles, or rewards (financial or otherwise). Teaching must be universal.

7. Some Further Exploratory Areas in Medical Education

I would like to conclude by touching on some areas that we should consider further exploration and emphasis in medical education. We get some of the best brains into medical school and tend to submerge them in facts that they cannot recall for practical use and in some instances diminish their interest and zeal over time. Areas that we could explore that may have impact in medical education and postgraduate training include:

- Increasing enthusiasm on the part of the teacher.
- Emphasising that communication skills are not an optional extra.
- Make lessons more “stickier” i.e. more comprehensible and memorable and embrace a learning strategy that boosts engagement.¹⁹
- Ensure that experts transmit knowledge effectively i.e. we need to work on the challenge of communicating complex knowledge to novices—those who can do this effectively have been called “teachers” and those who cannot are branded “experts”.
- We have to step back and re-look and tweak the utility of information technology in our practice. While there is little doubt that information technology has facilitated learning—we may have inadvertently fallen into the trap of diagnosing before the computer screen, putting the patient in the centre clothed in binary garments: the “iPatient”²⁰ where the patient is seen as a scanned and investigated entity, little emphasis being paid to history taking and clinical examination—the utility of which cannot be under-emphasised.

Conclusion

An object thrown into space follows a trajectory—defined as the path that a moving object follows through space as a function of time. When an object is thrown at a fixed angle, it follows the path of a parabola. How high and how far it goes is defined by Newtonian Physics. Drag forces determined by the speed and shape of the object can alter this path (Stoke's drag). In a similar fashion, professionals and governing bodies can be likened to Newtonian physics. How fast changes are done and how the changes are brought about and resistance or acceptance from the ground can alter this trajectory.

We certainly need to expand the pool of enthusiastic medical teachers. The teachers need to be conversant with modern medical education and convey knowledge in a comprehensive, interesting and simple manner that sticks in students. Medical education will require the continued support of all the stakeholders to flourish and reach its high and far set goals.

Acknowledgements

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