7th College of Physicians Lecture — The Changing Face of Medicine, Medicine – Past, Present and Future

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Introduction

When we think about medicine, just like we do about other things in life in the past and the present, we usually reflect on the good old days. On hindsight, the past always seems brighter than the present. Sometimes, it is worth looking back to see how things have changed. There may be many elements in the past that are worth bringing back to the present and carrying into the future.

In this paper, I will first discuss some of the changes that we have seen in our lifetime. I will then outline new opportunities and challenges we face with the practice of medicine in the 21st century.

Changes over the Past 30 years

Just about 20 to 30 years ago, the family doctor was the mainstay of our physicians' practice. The family doctor knew the patient, his family, his upbringing and his community. The doctor-patient relationship was one that lasted a lifetime.

The environment in which physicians worked gave them considerable freedom. The doctor was king, his word was gospel and no one questioned his actions. Doctors were seen as independent and highly trusted, and were often placed on a pedestal by those they treated. In many ways, the doctors deserved the honour — as many of them worked long hours and put patients before their family.

In those times, the doctors showed that they excelled in the art of medicine. They worked based on their clinical experience, despite the relatively modest evidence based on research for many of the treatments. Clinical skills were the most valued; and many patients appreciated the great bedside manner of the doctors, and took comfort in them. From the patients' perspectives, caring was the calling card.

In addition, everything that physicians needed to know was kept mostly in their memory. There was no expiry date for how long physicians could practice. Doctors kept up-to-date through their personal journal subscriptions, going to libraries (if available), and occasional continuing medical education meetings. But there was no formal need for upgrading.

Current Trends and What They Mean for the Practice of Medicine

Time, however, has changed the way physicians serve the public. First, the knowledge base in medicine has greatly expanded. It is no longer possible for a single physician to stay current in medicine as a whole, may be not even in his or her own speciality. As the knowledge base and the technical skills developed, there has been an inevitable specialisation (fragmentation) of medicine. The increasing sub-specialisation is here to stay. This increased sub-specialisation has changed the practice of medicine.

The second factor that has changed is the model of payment systems in medicine. In the past, there was, in essence, a direct contract between the patient and the physician wherein the patient directly paid the physician for the services rendered. Physicians often provided free care when patients were unable to pay. Now, there are intermediaries like insurance entities and government agencies etc that set and drive the systems of care. Physicians now work in increasingly specialised settings, in teams and in healthcare clusters, and in an environment that is greatly driven by technology. Moreover, the doctor is no longer a free agent in the management of patients, but is constrained by compliance requirements enforced by government agencies and health insurance organisations. In this new environment, the doctor is a cog in a complex web of the healthcare system. In addition, the new generation of physicians are beginning to look more at a work-life balance. There are new priorities — family over work life and they live in an era of increasing accountability.

This has led to the patient and the doctor becoming "strangers". One patient sees many specialists and when you ask the patient, he doesn't quite know who his main doctor is. In this sense, the treasured special doctor-patient relationship seems to have diminished.

While clinical skills still remain valued, they are now closely audited and managed — doctors always have someone looking over his or her shoulder, almost like a big brother looking over their practice. The clinical approach has become more technical, guideline focused,

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This is a summary of the presentation made at the 7th College of Physicians Lecture: The Changing Face of Medicine. The Lecture was part of the College of Physicians Medicine Review Course 2010 held on 23 to 25 July 2010 at Tan Tock Seng Hospital.

and anchored on evidence-based management (EBM). Evidence-based management when applied properly integrates the evidence from the clinical trials and other literature and then extrapolates that evidence as best as possible to the individual patient. When improperly utilised, it can become impersonal.

Physicians have also become highly accountable to the public, to hospitals and have to be performing evidence-based medicine. The rapid expansion of evidence-based medicine and systematic review of evidence has slowly begun to transform our healthcare practice. It is no longer the length of time or experience that are the sole factors predicting a physician's competence. It is the ability to constantly adapt and manage in an ever-changing evidence-based environment that has become a hallmark of physicians in recent times. Doctors now are required to continually upgrade their knowledge via Continuing Medical Education (CME). In many countries, for example, in the United States, specialty certification has become time-limited. And there are examinations and other requirements to maintain certification.

Knowing science, appreciating science and understanding science are critical and this is the basis for the medical profession. But the medical profession is more than knowing science (information) and must include the "art" of medicine: the ability to empathise, care, work with and communicate with patients and their families.

The one thing that physicians and patients do not appreciate is the Black Swan — the unpredictable consequences which have far-reaching effects. Many events which we think of as rare may seem to be of higher frequency — the so-called Fat Tail. And therefore, physicians should be humble, and acknowledge that they do not possess all the knowledge to treat everyone all the time.

What does this New Era Mean for Patients?

For the patients, there is a feeling that the bedside manner has become less warm, less personal. In addition, the way in which patients approach doctors and medicine has also changed. With Google and the Internet, knowledge is now just a finger touch away for everyone. Patients can access rapidly changing information and knowledge, even while this is constantly being updated. With this, the asymmetry of information in doctors' favour has decreased, and undermines the separation that has traditionally existed in healthcare.

The easy access to information has brought the democratisation of information. Access to knowledge or context continues to best reside within the doctor. However, there is the potential danger of those outside the healthcare world interpreting information without knowledge and context. This has actually led to less trust placed in physicians and greater expectations on the part of patients and, in patients wanting to participate and actively getting involved in decision-making.

What does this New Era Mean for Medical Education?

Medicine and healing are complex and adaptive. The skills that are needed by doctors are not only technical skills which we can teach very well but also adaptive skills, the ability to change, the ability to understand and to adapt to the situation. This is not taught formally but with the help of a wise mentor, it can be learnt effectively on the job.

With the establishment of the Duke-NUS Graduate Medical School in Singapore, we have a unique opportunity to examine how medical education should work in the changing era set in the context of Google and the Internet.

Traditionally, medicine started as a study of the natural sciences—anatomy, physiology, and biochemistry, pathology, followed by the application of these natural sciences to solve medical problems. What has become evident with the rapid change of knowledge is the two are not well connected. In many instances, in the minds of trainees, they are independent and many often forget the first before they go to the second.

The School's approach is to set a lifelong pattern of learning to heal, which is inculcated in our students. Our Education Office is helmed by a team of senior clinical and educational leaders, who joined our school from the United States: Dr Robert Kamei is our Vice-Dean for Education; Dr Sandy Cook is Senior Associate Dean (Curriculum) and Dr Frank Starmer, an early pioneer of medical Information Technology at Duke, is Associate Dean (Office of Innovative Solutions).

The Duke-NUS Medical School's mission is not only to train physicians to practice medicine, but also to play a role in improving medical practice. Thus, we impart skills beyond just medical knowledge, and these include critical thinking, team work, leadership, professionalism, communications and in our context, the ability to understand and conduct research. People are more than the sum of diseases, parts and specialties. Patients are part of a larger social world and so are doctors.

The Duke-NUS curriculum structure is the same as that in Duke's in Durham, US. All students can be admitted to this school after completing a basic degree.

In both schools, the first year basic sciences are taught in an integrated fashion. In the second year, they enter the clinical arena (do clinical rotations/clerkships). Students then devote their third year to research. And their fourth and final year is a clinical year, in preparation for residency.

The programmes differ, though, in the mode of curriculum delivery. Duke-NUS uses a team-based learning method, we call TeamLEAD, to deliver much of the first year.

Why teamwork? Physicians are no longer solo practitioners and researchers, so teamwork is a very important skill. Why the approach?

It is now impossible to master all of medicine in medical school. It is also difficult to keep up with the changing and ever growing new discoveries. The key to current education is to understand and introduce content so physicians will know how to search, sort, critically analyse as well as to know when to use this information, and to become skilled at self-directed learning.

Most medical schools use traditional lectures to deliver content; however, we know that lectures do not work very well and there are a number of factors that can affect recall of content. Giles et al[1] tested both immediate and long-term (4-month delay) recall of lecture information in a group of preclinical medical students. They compared the recall of visually and verbally presented lecture information and of information presented during different time periods in the lecture. Recall of visual information was superior to verbal information both in the immediate and long-term duration. Information presented between the 15th and 30th minutes of the lecture was recalled best whereas the worst recall was found for information presented in the first 15 minutes. Seating position of the student in the lecture theatre was associated with the level of immediate recall.[1] Many of these factors are probably related to attention.[2]

The data are clear: passive education does not work effectively. Cognitive learning theory has emphasised combining group learning and individual activity. Active learning, in which new information is used, is retained longer.

Our first year students have to understand the language and science of medicine. There is both information acquisition through guided independent learning (i.e. no live lectures but instead, self-directed review of a variety of modalities (readings, recorded lectures, articles, websites, etc.) that are provided beforehand). Class time is spent in conceptual reinforcement of that content using problem solving, explaining to others and most importantly, repetition.

This approach at Duke-NUS is dubbed TeamLEAD. TeamLEAD starts off with clear-cut goals and objectives being stated. We do not have formal lectures. Consequently, most of the time is spent in individual and group learning.

The principles of the approach are:

1. Students do independent preparation, guided by the faculty on core concepts.
2. Students are held accountable individually for this learning through an individual test.
3. Further learning is emphasised through team assessment (on the same test).
4. Faculty conducts debrief to ensure students understood and got to the right answer for the right reason.
5. Then students are given problems to solve, using the content learned.

So what this encourages is learning for performance, promoting cooperation and teaching students to learn to work in teams. These are all based on the concept of adult learning.

The initial performance data here seem to suggest students do indeed learn better. So this is one step in how medical education can evolve to fit the changing times. The same approach can be extended into learning in the postgraduate setting and further on into lifelong learning of physicians. We hope that over time in Singapore, we can gradually extend this approach into the lifelong learning of physicians.

The values that matter in the 21st century and those that one begins to learn and live with are key skills: sorting, analysing information, creative thinking and teamwork. But at the same time, retaining the art and soul of medicine, empathy and caring are also important.

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