

Systems of medical education in India and abroad: A comparison

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With the increasing importance being placed recently on the education scenario in India by the government, international universities and private players, there is a belief in healthcare circles that a major restructuring is on the way. Public sentiment, too, has been mobilized on the issue of educational reform, and even Bollywood's latest superhit film (3 Idiots) deals with the subject. The role of the Medical Council of India (MCI) has also been under scrutiny and several plans are afoot—setting up new All India Institute of Medical Sciences (AIIMS)-like institutions, inviting international private players to set up branches, instituting rural service and changing the pattern of the MB,BS course.

We believe that we, as medical students, require a broad knowledge of how medicine is taught and learnt across the world. Only then can we actively participate in any potential debate regarding the restructuring of the education system in India. During our research for this article, we realized that there were 2 broad systems of medical education in place in the English-speaking world and in most other countries. One is the British model, which is followed by most Commonwealth countries, and the other the American, followed mainly in the Americas. There are several striking contrasts between these 2 systems, and for students of any one of them, knowledge of the other will serve as an eye-opener. Exposure to new ideas and ways of thought is a must for any change to occur, and we have noticed that both systems have their unique advantages and disadvantages. In this article, we aim to take an overview of the differences between the two systems, using India and the USA as examples.

MEDICINE AS IT IS TAUGHT IN INDIA

In India, education in modern medicine has mostly been handed down from the British Raj, with some modifications over the years. As a result, our present five-and-a-half year course structure closely resembles that in Britain and several other Commonwealth countries. Our entry into medical college occurs in most cases when we are 18 years of age, fresh out of high school. And by 23–24 years of age, most students are full-fledged doctors. While this may be suited to a competitive society where time is considered money, it does tend to put much decision-making pressure on schoolchildren. And often, the decisions are made (or pushed) by proud parents.

Bachelor of Medicine and Bachelor of Surgery (MB,BS)

The MB,BS course structure is well known to most of us. The broad framework consists of one year of preclinical, a year-and-

a-half of paraclinical and two years of clinical teaching, juxtaposed with regular clinical rotations starting from the second year. The rotatory internship year at the end may be spent in the same or in different hospitals. There are small variations, such as the system at AIIMS, where the Third professional MB,BS subjects are tested together in one long examination at the end of 2 years, unlike the yearly examination system in most other colleges. While several colleges boast of a 'semester' system, it is not really one in the true sense, since content from one semester is carried over to the next. A few government-run colleges across the country, as well as some private ones, have a compulsory rural stint tagged to the end of the course—this may be extended to all colleges soon. In some Commonwealth countries, it is possible to focus on a particular subject for one extra year—this would entitle the student to an intercalated BSc degree also.

Once the course and the internship is done, registering with the state medical council or the MCI will allow an MB,BS doctor the freedom to perform any procedure he is capable of.

Other medical degrees

Parallel to the medicine courses, there are Bachelor's degrees in Ayurveda (BAMS), Unani (BUMS) and Physiotherapy (BPT). However, there is limited cross-pollination between these worlds, and inter-course mobility is unheard of. It is possible that increased exposure to Ayurveda/Unani may encourage pharmaceutical research into their products, and may perhaps lead to something on the scale of artemisinin in importance (artemisinin was initially known as Qinghaosu in Chinese traditional medicine before it was discovered to be an antimalarial par excellence by the Chinese army). It is believed that people in most rural and urban slum clusters use the services of these doctors as their first choice.

A degree for rural doctors?

The new kid on the course block is BRMS—a recently-proposed Bachelor's course in Rural Medicine and Surgery. The course is aimed at addressing the paucity of trained doctors in rural India, and is expected to be of 4 years' duration. The curriculum would focus on the skills required for manning a primary health centre (PHC). Training will be provided by retired teachers, and licence to practise will be limited to rural areas. It is hoped that the course will end the discontent among MB,BS students at being sent for rural service.

THE AMERICAN SCENARIO

For an outsider, the most striking difference between the Indian and American models of medical education is that medicine there is a graduate-level course, unlike the undergraduate-level MB,BS in India. The basic medical degree there is called an MD (Doctor of Medicine). After an MD, specialization through residencies in various fields does not result in any new degree being gained.

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Entering a medical school

For entry into medical school, a student must have earned a Bachelor's degree. Pre-medical coursework is important. Pre-medical courses include mathematics, physics, organic and inorganic chemistry, and biology. Students of any educational background can enter medical school, as long as the aforementioned prerequisite courses are completed and a Bachelor's degree obtained. So, it is not a strange thing to see American doctors who have undergraduate degrees in Engineering or Literature. Some medical aspirants also do short duration degrees, such as a Masters in Public Health (MPH), which gives them a good grasp on epidemiology and makes them attractive applicants.

The standardized tests, called the Medical College Admission Tests (MCATs), serve the same role that pre-medical tests (PMTs) play in India, though they resemble the United States Medical Licensure Examination (USMLE) more—they are computer-based, and are designed to assess critical thinking, written analysis and problem-solving, in addition to concepts. Entry into medical school is highly selective and pre-medical students must have outstanding personal and education attributes—grade point average (GPA) and MCAT scores, essays, interviews and volunteer/leadership activity are all considered.

Rarely, some schools may offer pre-admittance to students directly from high school to a 7-year programme with an accelerated undergraduate degree (3 years), and then medical school. Some universities with campuses abroad, such as Weill Cornell in Qatar, may take in pre-medical students from these overseas campuses through direct transfers. Some schools allow students who have completed an undergraduate course from a different country, provided they can prove their financial stability. Likewise, there are some schools which insist upon a degree from the USA before admission to an MD course. Canadian students are, for all practical purposes, treated like American ones. Another international tie-up is the widespread network of accredited medical schools scattered across the Caribbean, which are generally cheaper and easier to get into, particularly for international students. Graduates from these schools are also treated like those from schools on the US mainland.

Highly motivated US doctors?

American high school graduates spend at least 4 years after school doing some course that interests them and that gives them a window of time in which to weigh their options regarding medical school. As a result of this, only highly motivated students enter medicine. Most entrants are around 23 years of age or older, since some students take a 'gap year' after school or college to work or go on tours. Further, parental monetary support is not always available and medical school education is expensive—a year at Ivy-League Columbia University costs nearly US\$ 65 000 (about Rs 30 lakh). Most medical school students are heavily in debt, sometimes owing up to US\$ 200 000 by the time they get their MD.

This long and difficult road to medical school makes American students workaholics who are deeply committed to their study. This is unlike the scenario in India, where several students keep re-evaluating their choices and wondering whether they are in the right place. A medical career is rather a daunting option for American students. The financial constraints alone would probably keep a fair number of interested applicants out of the entry pool, unlike in India, where government-funded medical education keeps alive the hopes of most middle-class parents to see their children become doctors.

Medical school structure

Medical school in the USA lasts 4 years. The first year is spent focusing on preclinical subjects, much like in India, but the curriculum also includes the study of behavioural sciences and neuroscience, two subjects which do not get much attention in Indian schools. In the second year, the students learn pathology, pharmacology and microbiology, based on an organ system approach. Clinical exposure starts during the first year of medical school and continues throughout. Again, this stands in contrast to the Indian system, in which serious rotations are held off until one-and-a-half years into the course. In addition, most schools in the USA have a required course during the first and second years that focuses on medical interviewing, physical examinations and other topics. In these settings, most students usually have a preceptor. Most schools strive to give the students clinical exposure as early as possible so that they are prepared well for rotations in the third year.

After the second year, students must compulsorily pass Step 1 of the USMLE examination to move into the third year. This system is a huge benefit to the students, since they are effectively clearing their requirements for specialist training while still in medical school. The USMLE serves as a kind of standardized examination for all students across the country. The third year is spent rotating through various hospitals and clinics, similar to the scene in India. It is during this year that basic procedures are usually taught. The duration of these rotations varies between institutions.

After the third year, students are required to take the USMLE Step 2 Clinical examination. This has a written part and a clinical part. The fourth year is devoted entirely to electives, so the student can explore different career options and gain a greater depth in specialties. Students sometimes go to other specialized hospitals for certain rotations, in order to vary their exposure. This is in contrast to the scene in India, where rotations are generally limited to the base institution.

Most American students and faculty do not feel that these 4 years should be modified. Everything that is essential for becoming a successful doctor is covered, and the students usually feel well prepared for making a decision on their future career path.

Grading and honours

Schools usually grade their students as honours, high pass, pass or fail. A handful of schools still use the traditional letter grade system, but this is uncommon. GPAs, too, are rarely used in American medical schools. One exceptional feature of American medical education is the Alpha Omega Alpha Medical Honours Society, which draws membership from the top students of medical schools across the country. The admission criteria cover internal assessments, USMLE scores, research work and other parameters, added up over the second and third years. The society seeks to promote scholarship and research in medical schools to encourage excellence. New members are elected every year, and by the end of the 4 years, nearly a quarter of every batch becomes members. The society even publishes its own non-technical medical journal, which highlights various issues of interest to the medical student fraternity (www.alphaomegaalpha.org).

In most schools, research is not mandatory. However, if students would like to tackle a research project, they can do so by taking a year off between the second and third years. Most academically inclined students manage to publish a few papers in association with some faculty members in their colleges by the time they complete their education.

Residency

After gaining an MD, residency training is a must for all doctors. This is essential for Board certification from any particular state's medical specialty board, which is a requirement for medical practice. This is in stark contrast to the pattern in India, where the MB,BS doctor has wide-ranging authority. The first year of a residency is generally known as 'internship' in the USA. In their final year, interested medical students may try to get a taste of life as a resident doctor by opting for 'subinternships' in various specialties. This allows an aspiring surgeon, for example, to know what a surgery residency entails before she/he makes a final choice. Shorter residency programmes, such as family practice, are easier to get into, while radiology and surgery are competitive. Step 3 of the USMLE must be passed.

Other associated degree programmes

Some schools also offer dual degree programmes, whereby a medical student can receive both a PhD and an MD. Of the nearly 17 000 medical students in the USA every year, around 1700 opt for a PhD simultaneously. Those opting for dual degrees obviously take longer than 4 years to complete their medical education. They usually take 6 years, depending on the nature of the research subject. The topic for the PhD can be chosen some time into medical school, after the student has become somewhat familiar with the subjects. After the first 2 years of medical school, these students begin their research work, which goes on for 3–4 years. After completing this, they return to their regular medical education. Those who have an MD and PhD generally fare better in residency applications and have better prospects as

far as admission to teaching hospitals as faculty is concerned.

Parallel to the BAMS and BUMS in India is the Doctor of Osteopathy (DO) degree in the USA. Initially envisaged as a holistic approach to healthcare in the nineteenth century, it relies on the manipulation of bones and joints to diagnose and treat illness. However, the distinction between the MD and DO has diminished over the years, such that even Harrison's textbook claims that the training, practice and credentialing of DOs are indistinguishable from those of MDs. After 4 years of osteopathic medical school, graduates are eligible for specialty training in the same specialties as regular MDs, and may even be preferred to MDs for residency in some streams, such as orthopaedics. Around 11% of doctors in the USA are now DOs. Other medical education systems, such as chiropractic, are less widely recognized in the USA.

CONCLUSION

Many students lack a holistic understanding of medical education and the impact that different course structures can have on the healthcare scenario in India. Will shorter courses serve us better? Is it time to look for a better way to fund our medical colleges and a better way for students to finance it? How do we integrate traditional complementary medical knowledge into modern medicine courses? These and other pressing questions about our teaching hospital system will need to be answered soon, and a well-informed student populace will ensure that it gets the best out of the system. We hope that this discussion serves to enlighten our readers. We encourage our colleagues to seek out information on this simmering issue, as it will definitely become useful in the near future.

Correspondence

Prioritization of a patient for liver transplant: Does MELD score require downgrading?

The two major aims (among several) of deceased donor liver transplant (DDLT) are: (i) to identify the most seriously ill patient for early liver transplant (LT) to avoid mortality on the waiting list, and (ii) to expect long survival of the patient after LT. For prioritization of a patient for LT, both these aims should be given sufficient importance. At present, long survival of the patient after LT is not given adequate importance.

For a patient on the waiting list for DDLT, the allocation of a liver should be based on: (i) the expected mortality within 3 months, as indicated by the Model for end-stage liver disease (MELD) score;¹ (ii) the rate of progress of the disease (recalculation of MELD at intervals); (iii) the chance of recurrence of the disease; and (iv) the expected survival after DDLT. The lower the recurrence rate of the disease and the younger the patient, the better the expected survival outcome.

For rapidly progressive disease such as hepatocellular carcinoma (HCC), it is recommended that the MELD score be upgraded.² For equitable organ allocation, downgrading of the MELD score

should also be considered (for patients on the waiting list), for those with diseases with a higher rate of recurrence (Table I) and elderly patients, to achieve long survival of the patient after LT.

Severity of liver disease and rate of progress

The MELD score is calculated from serum bilirubin, creatinine and international normalized ratio (INR), using a complicated formula.

$$3.8 \log_e (\text{bilirubin mg/dl}) + 11.2 \log_e (\text{INR}) + 9.6 \log_e (\text{creatinine mg/dl})^* + 6.4$$

*(creatinine value is assumed 4 for patients on dialysis.)

It indicates short term mortality within 3 months for patients with chronic liver diseases.¹

The usefulness of the MELD score for allotment of a liver to the most seriously ill patient on the waiting list for DDLT was validated in February 2002 (United Network for Organ Sharing: UNOS).³ The MELD score is recalculated every 7 days, 30 days, 3 months and 12 months if it is >25, 19–24, 11–18 and ≤10, respectively, at the time of entry into the waiting list. The MELD score eliminates the previously used criterion of duration on the waiting list (first come, first served) for allocation.