

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.

Upgrading MELD score for HCC

Since patients with HCC on the waiting list have an increased risk of intra- and extrahepatic complications, additional points are allotted as follows:²

- Patients with a single lesion ≤ 2 cm: 20
- Patients with a single lesion 2–5 cm or ≤ 3 lesions which are no greater than 3 cm: 24
- For every 3 months on the waiting list: 10% (additional)

Following upgrading of the MELD score for patients with HCC, the number of LTs performed for HCC have increased,² at the disadvantage of patients with non-malignant diseases. This should be a matter of concern to patients with non-malignant disease and the transplant team.

Downgrading the MELD score

The expected recurrence rate after LT and age of the patient should be considered to downgrade the MELD score. The rate of recurrence of the disease, the duration after which the recurrence occurs, the rate of progress of the disease after recurrence and the availability of treatment (prophylactic and/or therapeutic) should be noted for each disease.^{4–9} Patients with cholangiocarcinoma are usually not listed for LT as the recurrence rate is high and occurs early.¹⁰ The recurrence rate for HCC after LT is high (10%–20%) and, early (within 1–2 years) and effective treatment is not available.² Hence, longevity is shortened in a number of patients, despite successful LT. After LT, the 5-year survival for HCC was poor but is now comparable (75%) to that for non-malignant liver diseases.²

TABLE I. Downgrading of MELD score, according to recurrence rate after liver transplant in different diseases

Disease	Recurrence rate (%)	Downgrading
Hepatic cholangiocarcinoma	>85	-12
Hepatocellular carcinoma	10–20	-6
Hepatitis C virus cirrhosis	90–95	-5
Hepatitis B virus cirrhosis	20–25	-4
Alcoholic cirrhosis	20–30	-3
Cryptogenic cirrhosis	15–20	-2
Primary biliary cirrhosis	8–20	-2
Sclerosing cholangitis	15–30	-2
Autoimmune hepatitis (cirrhosis)	17	-1
Wilson disease (cirrhosis)	–	0
Biliary atresia	–	0

Since one of the major aims of LT is to provide long term survival, younger patients should have preference over elderly patients, as a higher mortality has been reported in elderly (51–70 years) patients.¹¹ Depending on the recurrence rate of each disease after LT (Table I) and the age of the patient at the time of LT, the downgrading of the MELD score for different diseases should be done and approved by a regional review board. Unless downgrading of the MELD score is given adequate importance, more patients with non-malignant liver diseases would be expected to die on the waiting list, as long as scarcity of deceased donor organs persists. If this concept of downgrading of the MELD score is widely accepted, more accurate criteria for downgrading could be devised in the future.

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MCI internal assessment system in undergraduate medical education

The Medical Council of India (MCI)¹ introduced a system of internal assessment^{2–4} of medical undergraduate students in 1997. This system has not been implemented in all universities as it is largely based on subjective scoring and, therefore, prone to bias and error. Some differences between subjective and objective scales are shown in Table I.

TABLE I. Differences between subjective and objective scales

Parameter	Subjective	Objective
Inter-examiner variation in marks	Large	Nil
Intra-examiner variation in marks	Large	Nil
Time required for testing	Long	Short
Validity of the result	Variable	Constant
Main assessment areas	Aptitude	Competence, knowledge, attitude, participation skill, proficiency

The system of internal assessment laid down by the MCI includes subjective areas scored by the use of a subjective scale. The areas include (i) proficiency in performing practical tasks, (ii) skills required in carrying out small research projects, and (iii) participation in community healthcare projects.

These guidelines focus on how knowledge is acquired and not on how much knowledge is acquired. The scores derived from such subjective assessments are added to the result of

the final university examination and influence the final result.

I feel that the system of internal assessment should be changed and based on objective parameters. For example, one of the parameters used in subjective assessment is the 'interest' shown by a student in the subject; 10 marks are assigned for this. Being subjective, 'interest' cannot be assessed in a consistent manner. It would be better to objectively assess the student's performance. The same applies to 'scientific attitude', 'active participation' and 'interpersonal skills'. Ten marks are awarded for each of these in the MCI's scheme of internal assessment. The assessment of 'attitude', assigned 40 marks, suffers from the same fallacy.

Internal assessment of medical undergraduates should be based solely on objective criteria rather than the subjective criteria currently proposed by the MCI.

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Activin A/follistatin expression in glioma and its *in vitro* effect on a cell line

Activin A has been found to be overexpressed in some kinds of cancers. It has also been shown to enhance proliferation of some cancer cell lines, as well as induce apoptosis of other cancer cell lines. We studied the expression of activin A and follistatin in glioma and normal brain tissue, and evaluated the effect of the activin A/follistatin system on the proliferation or apoptosis of the U87MG cell line *in vitro*.

The expression of activin A and follistatin was assessed by immunohistochemistry (IHC) in 31 glioma and 8 normal brain samples. We studied four different groups. These were: (i) normal controls, (ii) activin A, (iii) follistatin and (iv) activin A plus follistatin group. The vitality of cells was evaluated by determining

the DNA synthesis of cultured cells with [3H]thymidine incorporation assay. The apoptosis rate and proliferation index of the cells were determined at 48 hours by flowcytometry.

In normal brain samples, both activin A and follistatin were lightly expressed by IHC, but there was a prominent overexpression of activin A in gliomas. On the other hand, the expression of follistatin in gliomas was far less than that of activin A. The [3H]thymidine assay showed that activin A (3-30 ng/ml) produced a dose-dependent increase in DNA synthesis of U87GM cells compared with controls. Flowcytometry showed that the proliferation index of the activin A group was higher than that of controls.

Glioma is a common and fatal tumour in adults and accounts for 25% of all brain tumours.¹ It is the second most common cause of cancer-related death in young adults and is associated with major morbidity.² The survival ranges from 9 to 12 months after initial diagnosis.³

Our study showed that activin A expression was higher in gliomas than in normal brain samples, while follistatin expression was not different in gliomas and in normal brain samples. Cell culture showed that activin A can stimulate the proliferation of U87MG, while follistatin can block the effect of activin A on U87MG. These results imply that the imbalanced expression of activin A/follistatin may be one of the causes of the development and tumorigenesis of gliomas.

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