



Indian Journal of ORTHOPAEDICS

Volume 50 | Issue 4 | July - August 2016

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Current state of orthopedic education in India

India is a second most populous country in the world with average life expectancy of 67 years. About 30% population of India is below the poverty line. India is the unique land of contrasts inhabiting most affluent to the poorest of the poor. 250 million can afford best of the treatment available on the land, while 80% (1000 million) depends on government run institutions to get orthopedic care. We are one of the favored destinations for medical tourism from Europe, African subcontinent, Middle and East Asia. We have huge disease burden of affluent class diseases similar to Western countries such as heart disease, arthritis, and complex trauma. We have to cater a sizeable number of patients with poor men's disease such as tuberculosis (TB infection), deficiency diseases and neglected untreated patients reporting late with complications of a simple clinical problem.

The medicine has taken a tremendous leap in last 100 years to alleviate pain and suffering of the humanity. The health planners are taking an active part in identifying the health needs of the society, suggesting the preventive steps and preparing to provide optimum care. Pulmonary TB was a giant killer in Europe once upon a time. The incidence of TB started declining from 1900 AD by improved sanitation, hygiene, and nutritional state of the population almost 50 years before the actual introduction of antitubercular drugs.¹ In next 50 years, the advancement of diagnostics and treatment ensured that the TB practically does not exist in affluent countries. The credit should go to medical community who worked simultaneously in preventing, diagnosing, and treating TB.

In India, orthopedic surgeons face a huge disease burden of injury, infective, neoplastic, degenerative, and metabolic conditions in various stages of natural history.² They also face a new stage of disease unknown in Western countries where the patient report late with untreated/ill-treated cases or following a missed diagnosis. In countries with the limited health-care budget, we have to work holistically not only in treating these cases but also finding evidence-based solutions to the cases in various stages of natural history of the disease. The orthopedic training and orthopedic services have to contribute to each other to improve the bone health of the nation. It is desirable that each country tailors its medical education to the medical needs specific to their inhabitants.

Providing a minimum standard of orthopedic care to all is the need of hour.³ All agencies, namely government

health planners, medical educationists, individual medical practitioners, and Indian Orthopaedic Association (IOA) have to think and work together to achieve the target. Let us analyze the current state of orthopedic services and education and suggest remedial solutions.

- Poor surgeon–patient ratio: We have over 10,000 orthopedic surgeons registered with IOA while we may have another 10,000 which are not a member of IOA. Hence, approximately 20,000 orthopedic surgeons are available to cater about 1250 million population, i.e. one surgeon to 62,500 population. The surgeons are concentrated in metropolitan and big cities. The orthopaedic surgeon population ratio gets worse in rural India which inhabitate 72% of total population³
- Poorly trained first responder to musculoskeletal emergencies: The MBBS graduates are the first responder to musculoskeletal emergencies in rural and far of places. MBBS doctors (basic doctor) are not being adequately trained to provide care for fracture and musculoskeletally injured patients. He should be well versed in identifying the orthopedic clinical problems, providing the first aid in the form of splintage, analgesia, executing the triage in case of disasters, and identifying the institution where the patient can get specialist attention
- Lack of infrastructure: Due to scarcity of the hospital settings, the patients in the rural areas do not get primary care in an emergent situation. There is a huge unmet need of surgical facilities. The patient referral system does not exist; as a result the family has to plan out the access to treatment facilities without any guidance. The diagnosis is delayed in nonemergent cases, hence by the time they get treatment they are already complicated, which requires the expertise of tertiary care centers. The operating facilities in primary health centers are suboptimal with non-standardized implants and suboptimal theater conditions. As a result, disastrous complications are observed and tertiary care hospitals are over burdened by the patients needing treatment for preventable complications of a simple clinical problem.
- Absence of minimum (optimum) standard of orthopedic care: There is a huge variation in quality of treatment for an identical clinical problem throughout the country.³
- Orthopedics training and services are working at crossroads:² The orthopedic education is not tailored to our need. As a result the trained surgeons are not

able to provide evidence based treatment to the clinical problems unique to our land in available infrastructure.

DEFICIENCY IN CURRENT ORTHOPEDIC TRAINING IN INDIA

It was noted long back that there has been a considerable decline in standard of knowledge, particularly the basic sciences, namely anatomy, embryology, physiology, pathology, and genetic engineering which are alternatively going to play vital role in development of speciality.⁴ The postgraduate (PG) training in India is not comprehensive enough and some graduates may have insufficient training to practice independently.⁵ The issues and suggested remedies are:

- **Deficient orthopedic training in MBBS course:**

Musculoskeletal diseases affect more than one out of every two persons in the United States aged 18 and over, and nearly three out of four age 65 and over.⁶ The musculoskeletal conditions such as arthritis and back pain affect more than 1.7 billion people worldwide and are the second greatest cause of disability and have the 4th greatest impact on the overall health of the world population when considering both death and disability.⁷ The musculoskeletal injury/disease is a frequent cause of consultation with general practitioner. If a person dies following road traffic accident than at least 20–30 get severe musculoskeletal injuries and 50–70 minor injuries to treat. In India, as per the WHO report 236,562 persons died following road traffic accident (RTA) in 2013.⁶ By that counts, over 6 million major injuries and 12 million minor injuries were treated. 7–8% of our population is over 65 years, thus we have a sizeable number of patients with age-related spinal problems, chronic arthritis, and osteoporosis.³ In periphery at the primary health center or sub-centers, the initial care in trauma-related cases is provided by medical officers. The current MBBS pass out is not being adequately trained in orthopedics. Orthopedics is still treated as part subject to general surgery. Although the curriculum includes 10 weeks of clinical training but in the final evaluation, they are merged with general surgery. The suggestions to include orthopedics as a separate subject in MBBS curriculum are considered by regulatory bodies (Medical Council of India) as unnecessary and always turned down. The undergraduate students consider the orthopedics as a minor subject, and fail/pass is decided by cumulative marks in general surgery. Hence, even after attaining MBBS, the trainee has not been trained and evaluated for skills one requires to treat musculoskeletal diseases. The PG entrance examinations are conducted at the end of one year compulsory rotating internship.

During internships, the students are busy in preparing for entrance examinations and do not concentrate in learning psychomotor skills. Practically, the whole internship program is run on paper and is not actually adding to MBBS training

Solutions: The orthopedics should be made a separate subject and students be compulsorily trained and evaluated before awarding MBBS degree. We should ensure adequate training to an undergraduate student in orthopedics with a particular emphasis on acute emergency care of orthopedically injured, identifying and diagnosing diseases of the musculoskeletal system. All the entrance examinations for postgraduation should be conducted immediately after final year examination of MBBS. The merit list prepared during entrance examination conducted at the end of the final year may be used for counseling to allot PG seats one year later. This will allow the students to be free during the internship to develop psychomotor skills.

- **Postgraduate training:** PG training is not tailored to our need. Our course contents are primarily same as in the UK/USA and spend most of the time in training for degenerative reconstructive conditions. There are scant information and competence transferred on the clinical issues unique to our land such as neglected, infective, neoplastic and deficiency diseases in various stages of natural history. The course content has to be tailored to our need. We need to define what we expect from a fresh MS Orthopedician at the end of training (3 years). Certainly, we do not expect him to be proficient in complex reconstruction of hip/spine/knee, but we certainly expect him to diagnose and treat orthopedic infections, fractures and dislocation, tumors and nutritional diseases. Three years are not enough to make him a subspeciality expert (spine, arthroplasty/arthroplasty)

Solution: The course contents have to be divided into basic training and advanced training. We need to restructure the education into basic (MS orthopedics) and mandatory post qualification residency for 2 years and two fellowships in sub-speciality area of 6 months each. The whole training should also be monitored on a web-based logbook. By this, we shall ensure optimum training to provide minimum standards of orthopedic care to one and all as far as common orthopedic ailments are concerned

- **Delivery of core education:** There is a wide variation in the end product, i.e., MS orthopedics from various centers in the country. We are far away from the acceptable patient–doctor ratio; hence, it is imperative that each and every trained orthopedic surgeon should be able to attain minimum acceptable level of competence. We need to define must know

core education content and have to ensure that core education is delivered and competence attained. We are following the apprenticeship model of training where the trainee learns while at the same time he helps in patient care. In institutions with heavy patient load, the trainee becomes the workforce and hardly gets time to keep a balance with the study. It is important that the trainee while assisting in the treatment of the patients get time to read and assimilate the rationale of finer points of skills. On the other hand, there are institutions particularly private medical colleges/DNB institutions where the patients footfall in the institution is very poor, hence the trainee is not adequately exposed to patient management in sufficient number. A correct balance has to be developed where neither the student is considered a workforce to cater only health care need but also get time to study. It is also to be ensured that the trainee is mandatorily exposed to a certain patient number of each type. The orthopaedic training should be considered equally important component of effective health care and a responsibility of government so that continued supply of trained doctors is maintained.⁸ The training program before and after PG qualification should be monitored over a logbook which is electronically run over a software by universities/institutions and cross checked by the mentors so that attainment of the core competence is ensured.

- **Evaluation:** There are a wide disparity and gaps in the evaluation of MS orthopedics of various universities. The evaluation by National Board of Examination is well structured; hence, it is desirable to implement structured evaluation in different colleges and universities. We have to get away from a system where MS orthopedics is awarded, on the basis of feedback from internal examiners disregarding the performance in the actual examinations. The students should be objectively evaluated in theory and clinical examinations separately. The guidelines to frame question papers and practical evaluation should be defined. The candidate needs to be evaluated for 70% must know areas 20% should know the area and 10% for may know areas. Once a student fails to pass the MS/DNB examinations in view of deficient training, he has no further opportunity to improve. Once the tenure of MS/DNB (3 years) is finished, the student has to leave the course and he is asked to appear in the examination after every 6 months. As a result in the subsequent examination, he continues to perform dismally. It is suggested that unless the student attains the optimum competence for MS/DNB, he should continue to be a student in the institution. He may be

paid for subsequent 6 months, however may remain unpaid beyond 6 months, if required. At no point, the student should be awarded degrees without ensuring the attainment of requisite competence over an objective evaluation

- **Cultivating research temper:** Development of research temper is the key to find out evidence-based solutions to the clinical problems unique to India. Hence, the inclusion of research methods in curriculum and evaluation for research method should be mandatorily included. The thesis/dissertation/journal clubs should have a proper evaluation. Each student/mentor has to undergo a certain number of presentations. The knowledge of research method and cultivating a research temper will help us in generating evidence-based solutions to the clinical problems unique to our land⁹
- **Faculty development:** The quality of teachers is important to ensure the effective training. The current eligibility to become a teacher is just a postgraduate degree and teaching experience of a certain number of years. The quality of teaching capabilities (certification of teacher) or recertification need to be included in faculty development. The teachers should also be evaluated by the trainee. The teacher's development should be taken in the right earnest. The teaching is an art which needs to be cultivated. This will remove the inconsistency in the delivery of education.

The role of regulating bodies: The Ministry of Health and Medical Council of India has to take orthopedic education in the right earnest. It is pity that for last 69 years we have not been able to sort out even the certification of teaching institution. Year after year we are talking about poor quality of standard of medical colleges but not been able to fix the problem. We should move to effective training and ensuring the end product of orthopedic education, i.e., MS orthopedics. It is time we start working holistically on preventive and curative orthopedics so that sequelae and handicap is prevented.

The IOA must take an active role in education and certification for the practice of orthopedic surgery in our country. The world over the orthopedic associations plays an important role in formulating training programs to suit the local need. The IOA should also play an active role in defining the orthopedic needs of the nation, gap in need and available workforce and infrastructure, development of course content and defining the steps to ensure attainment of core competence to achieve cherished goal to provide optimum orthopaedic care to all and improve bone health of the nation.

Anil Kumar Jain

Director Professor and Head Department of Orthopaedic, University College of Medical Sciences and GTB Hospital, New Delhi, India

Address for correspondence: Dr. Anil Kumar Jain, University College of Medical Sciences and GTB Hospital, New Delhi, India. E-mail: dranilkjain@gmail.com

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Access this article online	
Quick Response Code: 	Website: www.ijoonline.com
	DOI: 10.4103/0019-5413.185586

How to cite this article: Jain AK. Current state of orthopedic education in India. Indian J Orthop 2016;50:341-4.