

# Undergraduate Forensic Medicine & Toxicology Curriculum; Current Practices and Recommendations

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Forensic Medicine is an application of medical knowledge to solve legal problems. It is the branch of medical science which helps the law in searching for the truth to maintain justice in the society<sup>1</sup>. The main objective of teaching Forensic Medicine & Clinical Toxicology is to build the competencies of the undergraduate medical student for the interpretation of the community medico-legal, toxicological and ethical problems.<sup>2</sup>

Forensic Medicine is the only state subject that is essential for bridging the gap between law and medicine, by aiding courts to maintain justice in the country. The aim of this article is to propagatethe concept of aModularTeaching in Forensic Medicine and Toxicology according to the standards specify by World Federation of Medical Education (WFME)<sup>2</sup>.

In Pakistan each Government hospital receives on average of 11-13 medicolegal cases daily. Approximately twenty thousand (20,000) cases daily reported in eighteen hundred (1,800) Government (tertiary and secondary) health care centres / hospitals of Pakistan . Majority of these cases include accidents, physical assault, RTA, construction site injuries, industrial injuries), poisoning cases, homicidal injuries, firearm, rape and medical negligence <sup>3</sup>. Nearly six million (6,000,000) individuals reported in Medicolegal clinics each year. About 30% of these victims have a severe disability limiting a significant life activity<sup>4</sup>. The law and order situation is getting worst day by day. Significant improvement in law and order situation can be evoked by improving quality of legal services provided in medicolegal clinics by restructuring the curriculum at undergraduate level<sup>2,3</sup>.

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Similarly it has been observed that doctors appointed in rural areas are having difficulty in conducting medico-legal work and autopsies. The doctors on duty due to lack of knowledge and skills are unable to examine and declare injuries according to Qisas and Diyat Act. The injury section left blank and important evidence is lost by our negligence. In private hospitals doctors are not authorised to treat medicolegal cases, but in life threatening situations they treat that patientand after treatment referred them to the Government hospitals for MLC, where these injuries were marked as old injuries and accused escapes easily. Many cases reported as fabricated or false injuries or false rape cases too but recent decades have brought a plethora of technological advances, popularised criminal cases, and even mainstream media programs that have thrust this specialty into the public view, adding to its demystification and professional esteem<sup>4,5</sup>.

We need to uplift the standard of education. Certain reforms are needed on urgent basis in every speciality to meet the upcoming challenges. Here are few recommendations for all specialities but prime focus is on undergraduate forensic teaching and training.

1. **Curriculum Reforms:**At present the curriculum of Forensic Medicine need to be updated to meet the current challenges. New methods of crime are being introduced daily, it is most important to know how to encounter them. Our doctors and police need to have this knowledge to solve these cases without wasting time and resources of the state. Therefore it must be

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required that curriculum should be properly allied with our society and community needs<sup>5</sup>.

2. **Method of Information Transfer:**At present Forensic Medicine is being taught through didactic lectures with a few demonstrations; this method is however not appropriate. Such deficiencies compel us to look forward for more skill-based teaching and training programs for this subject. We desire to create modules which will be full of knowledge and skills for our trainee doctors<sup>1,2,5</sup>.
3. **Modular Themes:**The Undergraduate Medical Curriculum has been reviewed by subjects experts at Khyber Medical University (KMU).Forensic Medicine can be well placed in each theme of the module. In modular teaching it can be easily incorporated where clinical and legal application is required; only few topics needs separate discussion. Instead of didactic lectures major component of syllabus should be covered in demonstrations, tutorials, Small Groups Discussions (SGD) and Case Base Learning (CBL)<sup>2,4,5</sup>.
4. **Learning Objectives:**Similarly, the learning objectives and contents (ethical and legal issues) of Forensic Medicine must be placed in each theme of the module relevant with the content of the module. The legal and ethical issues must be integrated both horizontally with each theme and vertically with each academic year<sup>2</sup> (table 1).
5. **Case Base Learning:**The subject is different and difficult, in a sense that it is an interpretation of act and fact of the events happened in the past such as forceful impact of blunt weapon caused lacerated wound, shock waves cause bursting of blood vessels or HCN causes spontaneous death<sup>6</sup>. It is difficult to demonstrate such acts and student has to learn the subject theoretically or from the interpretation of facts.Such issues can be solved by introduction of Case base learning (CBL) and problem-based learning (PBL)<sup>7</sup>.
6. **Credit Hours:**The credit hours for teaching should be more as recommended by PMDC. It is a subject of the state and its importance must be emphasized. There should be 350 hours for teaching and training undergraduatemedical

students. It is recommended that relevant components of the subject should be taught in all academic years in vertical integration. 25 teaching hours each for 1<sup>st</sup> and 2<sup>nd</sup> year while 300 hours for 3<sup>rd</sup> year and 4<sup>th</sup> year<sup>9</sup>.

7. **Clinical Rotation:**The subject is more clinical. Students must be rotated for 4 weeks in 3<sup>rd</sup> and 4<sup>th</sup> year in medico legal clinics and autopsy centers, courts, forensic science laboratory. Summative exam must be in 4<sup>th</sup> year instead of 3<sup>rd</sup> year<sup>8</sup>.
8. In 1<sup>st</sup> and 2<sup>nd</sup> year the basic application of forensic knowledge regarding the module will be incorporated in each theme. For example in **musculo-skeleton module** for 1<sup>st</sup> year, there are 5 themes for 5 week module<sup>8</sup>. (table 1)

**Learning Objectives:**

By the end of the module students should be able to

1. Interpret age of an individual from appearance and fusion of epiphysis of joints (shoulder, wrist and elbow) by examining X-rays of upper and lower limbs.
2. Enlist common injuries to upper and lower limbs due to accidents.
3. Enlist poisons which deposit in the body and causes symptoms of muscle weakness and fatigue.
4. Discuss law of compensation of injuries (injured person act).

Theme	Forensic Learning Objectives (LOs)
Shoulder Pain	Discuss Medico-legal significance of upper arm bones in Age estimation of players Discuss mechanism of fracture and dislocation of shoulder joint
Weak grip and painful hand	Discuss Medico-legal significance of wrist joint in Age estimation of age of children for schooling Interpret common injuries to wrist to pedestrian in RTA Party Drugs and Saturday night palsy
Pain in lower limb	Age estimation from hip bone for consent and marriage Explain bruises and torture under Police custody
Backache	Discuss and classify Spinal injuries in fall and RTA
Muscle weakness and	Discuss general features of Chronic metallic poisons arsenic, Lead and

fatigue	mercury
Bony arches & Fracture of foot	Enlist Sports injuries, interpret ankle sprang and its medico legal significance, compensation to injuries

9. **Assessment:** End of module assessment must include 10% MCQs from Forensic Medicine and Toxicology in 1<sup>st</sup> year and 2<sup>nd</sup> year where as student has to pass the subject in 4<sup>th</sup> year. 1<sup>st</sup> and 2<sup>nd</sup> year module weightage may be 10 %. Summative marks will be included in 4<sup>th</sup> year final exam<sup>6,7,8,9</sup>.
10. **Licensing Requirement:** Every medical graduate has to compulsorily serve the government in Pakistan, before he can be a duly registered medical practitioner with the Pakistan Medical and Dental Council. It should be mandatory for the graduates to be rotated for 03 month duration in forensic medicine & Toxicology department. During the course of his service as a Government Medical Officer, he is required to undertake medico-legal examinations of living and medico-legal autopsy of the dead relating to common offenses<sup>9,10</sup>.
11. **Innovations:** The current medical curriculums of all the disciplines need to be reformed. It is the need of a day to remove obsolete methods and introduce modern techniques and methods. In forensic medicine and Toxicology the existing syllabus need to be cut down and new innovations like DNA fingerprinting, digital autopsy, online medicolegal report writing should be introduced<sup>8</sup>.

## Conclusion

The curriculum of Forensic Medicine should focus on understanding of students towards medico-legal examination of victim. They must be able to interpret nature of injuries and issue medico legal report. The doctor should be familiar with process and procedure of death investigations and able to solve the cases. They should be well converse with their role during court trial, proceeding in the courts, in evidence collection such as dying declaration or in any investigation or trial as they are be part of the medico-legal system. This is the beginning of preparing modules in Forensic Medicine Toxicology. It will definitely help to

improve teaching and training in this specialty. It requires dedicated team approach and we have enough national talent to make these a reality. A series on module will be published in coming issues till objectives are achieved.

## Conflict of interest

The author has no conflict of interest to declare.

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