FORENSIC MEDICINE AND TOXICOLOGY

This book is primarily meant for undergraduate and postgraduate students of Forensic Medicine.
- Also helpful for Judicial officers, Advocates, Police personnel and those engaged in Forensic practice.
- Real photographs and illustrations included along with the theory for easy understanding.
- The latest developments in the field of Law, Forensic Medicine and Forensic Science are included.
- The important aspects are presented in a bullet format.
- Multiple choice questions and answers of various competitive Medical PG entrance examinations are included at the end of the book.

About the Author
Dr. P. C. Ignatius completed his MD in Forensic Medicine from Government Medical College, Kochi in 1988. He joined the Department of Forensic Medicine, Government Medical College, Thiruvananthapuram in 1990. He is now working as Professor and Head of the Department of Forensic Medicine, Government Medical College, Palakkad. He was a former Professor and Head of the Department of Forensic Medicine, Kerala Police Academy. He has three decades of experience in teaching, conducting autopsies and other medicolegal works to his credit.

Recommended by Experts (Full review inside)
"Textbook of Forensic Medicine and Toxicology prepared by Dr. Ignatius is highly informative and student friendly. The changing trends in medicolegal scenario have been clearly brought out in the relevant areas. The recent changes and additions in law relating to Medicine have been adequately updated. Easily readable and understandable language and excellent illustrations..."

Dr. M. R. Chandran MD, LLB
Former Director of Medical Education, Kerala State Medical and Dental Council, Expert and Consultant, Kerala

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Dr. P. C. Ignatius

LETTERWAVE BOOKS
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Gustafson’s method of age from tooth - 81-82
Dental profiling - 85
International dental formula (modified FDI) - 85, 86
Ossification of skull sutures - 86
Shoulder, Elbow - 87
Ossification centres Wrist - 88
Pelvis, Femur - 88
Age changes in pubic symphysis - 90
Age changes in mandible - 91
Ossification centres in foetuses - 92
Age of foetuses - 92, 93
Closure of fontanelle in infants - 93
Haase’s rule - 93
Development of secondary sex characteristics - 94
Medicolegal significance of Age - 94-95
Stature, Karl Pearson’s formula - 96-97
Anthropometry, Fingerprints - 97, 99
Poroscopy - 99
Foot prints - 100
Tattoo marks - 101
Sydney shark case - 101
Tattoo marks, Erasure of tattoo - 101, 102
Superimposition - 103
Reconstruction - 103
DNA fingerprinting, RFLP - 103, 104, 105
PCR method - 106
Application of DNA analysis - 106
Hair human, animal - 107-110
Scars, Occupation marks, Gait, Speech - 110
Iris identification - 110

6. Mechanical Injuries
Classification of injuries, abrasion - 112
Pressure abrasion, Imprint abrasion - 113
Age of abrasion - 114
Contusion, Ectopic contusion, black eye - 115-118
Color change - 118
Artificial bruise - 119-120
Lacerations - 120
Incised wounds - 112-122
Cut throat - 122-125
Chop wounds, Wound by axe - 125-126
Penetrating wounds - 126
Perforating wound - 127
Wounds by different weapons - 126-130
Hara-kiri - 132
Suicidal, homicidal wounds 132-133
Defence wounds, Self inflicted wounds 133-134

7. Gunshot wounds & Explosion injuries
Ballistics - 136
Types of firearms, Cartridges - 136-139
Gauge - 138
Ricochet bullet - 141
Pellets, Bullets, Gun powders - 140-142
Shotgun wounds, entrance and exit - 142-147
Rifle wounds, entrance and exit - 147-152
Entrance and exit wounds on skull - 152-154
Accidental, homicidal and suicidal - 156
Extraordinary findings in bullet injuries - 155
Laboratory investigation - 156, 157
Comparison microscope - 157
Explosion wounds - 158, 159

8. Regional Injuries
Head injuries - 161
Skull fractures - 162-164
Mechanism of brain injury - 165-168
Cerebral concussion - 165
Punch drunkenness - 166
Diffuse axonal injury - 169
Cerebral edema - 170
Intracranial hemorrhage - 170
Extra dural hemorrhage - 171
Subdural hemorrhage - 172
Subarachnoid hemorrhage - 174
Intracerebral hemorrhage - 176
Brain herniations - 177
Injuries to vertebral column - 177-178
Whiplash injury - 178
Injuries to bone, teeth, ribs, sternum, liver, spleen, kidneys, urinary bladder, genitalia - 179-183

9. Transportation Injuries
Road traffic accidents, pedestrian injuries - 185
Primary impact, secondary impact injuries - 185-187
Secondary injuries - 187
Waddell’s trial - 188
Injuries to occupants of a vehicle - 188-191
Pedic cyclists, motorcyclists - 191
Railway injuries 192-193
Air craft injuries - 193-194, 191

10. Thermal Injuries
Hypothermia, Trench foot, Frost bite - 195-196
Heat cramps - 196-197
Heat exhaustion, Heat stroke - 197-198
Burns - 199
Wallace rule of nine - 200
Postmortem findings - 201-203
Chilled body - 205
Scalds, Chemical burns - 206-208
Preternatural combustion - 207
11. Electrical Injuries, Lightning & Radiation ——————————————————————————————————— 209
Joule burn, Spark burn, Flash burn — 209 - 210 Postmortem findings, Judicial electrification - 212
Filigree burns — 212 Lightning, Filigree burns — 212-214 Radiation injuries, ARS — 214-215

12. Medicolegal Aspects of Injuries ——————————————————————————————————— 216
Injury, Trauma, Assault, Battery, Homicide, Culpable homicide — 216
Murder, Dowry death, Grievous hurt — 216-218 Torture, Custodial deaths — 219-226
Causes of death from injuries — 216-218 Primary shock, Secondary shock — 221-222
Embolism, Thrombo/ Fat/ Air/ — 223-224 Antemortem and Postmortem wounds — 225-227

13. Asphyxial Deaths ——————————————————————————————————— 229
Anoxia, Mechanical asphyxia, Hanging, Types of hanging — 229-231
Autopsy findings in hanging — 232-236 Bloodless flap dissection of neck — 236-238
Fracture of hyoid and thyroid in Hanging — 239-240 Partial hanging, Sexual asphyxia — 241-244
Judicial hanging 244 Ligature Strangulation 246-251 Throttling — 251-256
Palmar strangulation — 254 Garroting, Mugging — 255 — 256 Suffocation — 256
Smothering — 256 Gagging, Choking — 257-258 Café coronary 258
Traumatic asphyxia, Burking — 259-261 Drowning 262 Types, Mechanism, PM findings — 262-268
Diatom test — 268 Scuba diving, Homicidal — 269
Differences between Antemortem drowning and Postmortem submersion — 271

14. Starvation ——————————————————————————————————— 273
Acute starvation, Chronic starvation — 273-275 Medicolegal aspects — 273-275

15. Sudden Death ——————————————————————————————————— 277
Cardiovascular causes — 277- Location of myocardial infarction — 278
Infarction at distance — 278 Diseases of aorta — 280 CNS, Respiratory causes — 281-282
GIT, GU/ Cause, Negative autopsy, Obscure autopsy — 282-283.

16. Anesthetic Deaths ——————————————————————————————————— 284
General anesthesia, Local anesthesia — 300-301 Anesthetic agents — 282 Spinal anesthesia — 280-282

17. Postmortem Artefacts ——————————————————————————————————— 287
Agnal, Resuscitation artefacts — 287 Artefacts of hypostasis — 287 Artefacts due to rigor mortis — 288
Postmortem corrosion — 288 Artefacts due to decomposition — 289 Embalming artefacts — 289
Exhumation artefacts — 289 Toxicological artefacts — 289 Artefacts due to autopsy — 289

18. Impotence and Sterility ——————————————————————————————————— 290
Sexual cycle, physiology of erection — 290-292 Causes of impotence in males, females — 292-295
Sterility, artificial insemination — 295-297 In Vitro fertilization, ART — 296 Surrogate mother — 297

19. Sexual Offences ——————————————————————————————————— 299
Rape - sections, Examination of victim — 298 - 302 Rape on virgin, Rape trauma syndrome — 302 - 303
Examination of accused — 305 - 307 Sexual assault on children, POCSO — 307 - 308

Unnatural sexual offences, Sodomy — 308 - 310 Buccal coitus, Lesbianism, Bestiality — 311 - 312
Sexual perversions, indecent assault, Sexting, Incest — 312 - 314.

20. Examination of stains and Scene of crime ———————————————————— 316
Blood stains, Chemical examination, microscopy — 316-318 Precipitin test — 318
Blood groups, Tests for blood groups, Abnormal Hb — 319-321
Seamless deaths, Tests for semen, Vaginal fluid, Urine, Feces — 321-323
Locard’s Principle of Exchange — 323
Scene of Crime— 323-326

21. Virginity, Pregnancy, Delivery, Legitimacy ———————————————————— 327
Virgin, Types of hymen, False virgin — 327-329 Pregnancy, Signs and Symptoms, Tests — 329-332
Pseudocyesis, Superfecundation, Superfoetation — 332 - 333
Prenatal diagnosis, FNIT — 331 Delivery — 334 Signs of delivery in living, dead — 334-335
Disputed paternity, Marriage — 335-336

22. Abortion ———————————————————————————————————— 338
Criminal miscarriage, Sections, MTP Act — 338-340 Amniotic fluid embolism — 342
Criminal abortion, complications — 340-342 Spontaneous abortion — 343

23. Infanticide ———————————————————————————————————— 344
Historical aspects, still birth, Dead born — 344-346 Viability — 347
Live birth, Signs of live birth — 348
Hydrostotic test, histopathology of lung, stomach-bowl test — 349-351
Caput succedanum, Cephalhematoma — 352 Natural, unnatural and criminal cases — 353
Precipitate labour, Concealment, Abandoning — 352-354 Battered baby syndrome — 355, 356
Shaken baby syndrome — 356 Manchusen syndrome, Sudden infant death — 357

24. Forensic Psychiatry —————————————————————————————————— 359
Delusional, Hallucination, Delirium, Impulse, Obsession — 359-361 Phobia, psychopath — 361
Classification of psychiatric illness — 361, 362
Schizophrenia, Bipolar disorder, Lucid interval — 362, 363
Neurosis, psychosis, mental subnormality — 363-365 Feigned insanity, Restrain of insane — 365-367
Visitors, Civil responsibility — 368, 369
Criminal responsibility, Mc Naughten’s rule, Durham rule, Curren’s rule — 369, 370
Diminished responsibility, Somnambulism, Hypnosis, Epilepsy — 370-372

25. Medical law and ethics —————————————————————————————————— 373
Indian medical council, State medical council — 373-375 Penal erasure — 373
Professional misconduct — 375-377 Duties of a medical practitioner — 377
Medical negligence, Res ipsa loquitur, Novus actus interveniens — 378, 379
Civil & Criminal negligence — 379-380 Contributory negligence — 381
Defences against Medical negligence — 381-383 Professional secrecy — 383, 384
Privileged communications — 384-387 Consent, rules of consent, therapeutic privilege — 387
Workmen’s compensation — 387 Consumer protection — 387
Human rights, Transplantation Act — 388-390 Euthanasia — 390-391

26. Newer Techniques and Recent advances ———————————————————— 392
Polygraph — 392 Brain Fingerprinting — 392 Nicotine from fingerprints — 394
Narcoanalysis — 393 Virospy — 393, 394
Matrix assisted Laser Desorption imaging — 394
15. Spinal poisons

Strychnos Nux Vomica – 500
Absorption, fate & excretion, Signs and symptoms – 501
Differences between strychnine & tetanus - 502
Conium Maculatum (Hemlock) – 502, 503

16. Irrespirable gases

Carbon monoxide – 504
Carbon dioxide – 505, 506
War gases – 507
Lacrimations or tear gases – 507
Paralytics – 507
Nerve gases – 508

17. Animal irritants

Ophitoxaemia (Snake bites) – 509
Differences between poisonous and non-poisonous snakes – 509-511
Cobra, Common cobra, King cobra – 511, 512
Russel’s viper, Saw-scaled viper – 512
Malabar pit viper – 513
Krait, Common krait, banded krait – 514
Sea snakes, beaked sea snake – 515
Bar-bellied sea snake – 516
Viper venom, krait venom – 516, 517
Bites by Sea snakes – 519
First aid, Treatment for snake bites – 520
Green vine snake, Checkered keelback – 522
Dendrelaphis tetratus – 522
Golden tree snake – 523
Scorpions – 524, 525
Bees & Wasps – 526
Centipedes – 527

18. Food poisoning

Botulism – 528
Amanita muscaria – 529, 530
Argemone Mexicana, Epidemic dropsy – 530
Poisonous fish & Marine creatures – 532
Scombroid poisoning, Shell fish poisoning – 533
Box gelly fish, Dart frogs – 534

Tips to remember in Toxicology
Forms of Certificates and reports
Multiple Choice Questions
INDEX
**Chapter 1**

**INTRODUCTION**

**FORENSIC MEDICINE AND TOXICOLOGY**

Forensic Medicine:

It is defined as the application of medical knowledge for the administration of justice.* Doctor acquires medical knowledge during his career and applies that knowledge in giving his opinions in various cases to solve many medicolegal problems faced by the legal authorities. The word ‘forensic’ originated from the Latin word *Foren arist*, meaning ‘of the forum’. In Rome, forum was the meeting place where the legal matters were discussed (Court of law).* Forensic Medicine is called Legal Medicine in European countries and United States.

Forensic pathology:

It deals with the study of various forms of violence on the human body and unnatural deaths. It essentially deals with the interpretation of autopsy findings in the investigation of unnatural deaths like injuries causing death, drowning, neck violence, suspicious and unexpected deaths. This also includes findings and interpretation of histopathology of tissues taken during autopsy.

Thanatology:

It is a branch of science which deals with death and all its medicolegal aspects.*

Clinical Forensic Medicine:

Examination of living persons for medicolegal purposes may be termed as clinical forensic medicine. Victims of assaults, rape and accidents, accused in criminal cases, drunkenness etc., all require examination and report. This includes collection of material evidences and formulation of opinions in various medicolegal cases by examination of living persons.

With enormous advances in knowledge and technology, fields like Forensic odontology, Forensic serology, Forensic entomology, Forensic radiology, Forensic ballistics, Forensic psychiatry, Forensic nursing etc. have come to be recognized as separate specialities.

Medical Jurisprudence:

*(Justica = law; prudencia = knowledge)*

It deals with legal aspects of practice of medicine. It includes responsibilities of the doctor and deals particularly with doctor-patient relationship,* medical negligence, rights, privileges and duties of doctors, professional misconduct, consent, medical ethics etc. It was also termed as *State Medicine*.

Medical ethics:

It deals with the moral principles which should guide members of the medical profession in their dealings with the patients and with the State. It is the moral code of conduct. The word ethics is derived from the Greek word *ethikos* which means the ‘rules of conduct’.

Medical etiquette:

It deals with the conventional laws of courtesy observed between members of the medical profession. Ethical behaviour is a self-imposed duty observed between members of the medical profession. Ethical behaviour is a self-imposed duty upon each other. A doctor should not criticize or denigrate the professional ability of another doctor.

Doctor has to execute two types of duties in his career. One is his medical duty and the other is his legal duty. All individuals in the community have their commitment to the society but doctor’s social commitment is much higher than others’ since the doctor is dealing with human life. He has to issue certificates in various medicolegal cases. He has to appear before the court to testify his reports. Doctor should be impartial. Doctor has to give his opinion by scientifically analysing the facts observed by him. He has no victim to save and no accuser to be punished. Truth, honesty and integrity should be the basic qualities that should guide a doctor in his career.

Toxicology:

It is the study of poisons. It deals with the signs and symptoms, diagnosis and treatment of poisons and various analytical methods to detect them.* Forensic toxicology deals with the medicolegal aspects of poisoning, e.g. the situations of poisoning, duties of doctors in poisoning cases admitted in hospitals and various laws regarding the handling and control of poisons and drugs.

History:

Medicine and law were inseparable from the time of origin of human communities and civilizations. Law-medicine problems are found written in records of Egypt, Samaria, Babylon, China and India. In China Materia Medica was written in about 3000 B.C, which gives information on drugs and poisons. The Code of Hammurabi, by the King of Babylon (about 2200 B.C.) is considered to be the oldest medicolegal code.* Chinese laws were prevalent from 4000 B.C.

Egyptian laws were prevalent from 3000 B.C. They knew the art of mumification. Imhotep was the chief justice and physician topharvah Djosar and he can be considered the first medicolegal expert. Jewish laws and Greek laws were prevalent from about 1200 B.C. Socrates (470 – 399 B.C.), the great philosopher and social reformer in Athens, was executed on the crime of ‘misleading the young generation of Greece’, by being given the poisonous plant hemlock. Hippocrates (460-377 B.C.) has contributed to the code on medical ethics. He is considered the father of Modern Medicine.

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Multiple Choice Questions are included in Section 1 of the book. Answers of MCQ's are indicated by *
This question arises in cases of inheritance of property or obtaining insurance money when a person is alleged to have been dead and body is not found. Under Sec. 107 of Indian Evidence Act, a person is presumed to be alive if there is nothing to suggest the probability of death of a person within 30 years. Sec. 108 I.E.A. states that, if proof is produced that the same person has not been heard of for 7 years by his friends or relatives, death is presumed.

PRESUMPTION OF SURVIVORSHIP

This question may arise in cases of inheritance of property when two or more persons die in a common disaster, e.g. earthquake, plane crash, shipwreck etc. The question may arise as to who survived longest when no direct evidence is available on this. In the absence of such evidences, the survivorship is presumed considering the age, sex, physic, diseases, severity of injuries and mode of death. Young person will survive longer than the aged persons. Males will survive longer than females. Person with less severe injury will survive longer.

QUESTIONS

1. Define autolysis and putrefaction. Briefly describe the decomposition changes on the body 24 hrs after death
2. Enumerate the changes within 18 hrs after death. Describe briefly postmortem cooling and hypostasis and their time of occurrence
3. Define death. Discuss the M/L problems arising in the certification of death.
4. Describe the features of postmortem staining and adipocere. What are the medicolegal informations available from them? Describe in detail how they can help in postmortem clocking.
5. Differentiate between
   a) Somatic and Molecular deaths
   b) Hypostasis and Contusion (bruise)
   c) Rigor mortis and Cadaveric spasm

Viva: In addition to the above questions – presumption of death, artificial mummification, vegetative life, living cadaver transplantation (beating heart donor)

REFERENCES AND FURTHER READING

2. Gordon and Shapira: Forensic Medicine 13, 1, 21, 1991
7. Mason JK: Forensic Medicine, an illustrated reference, Chapman and Hall, Chennai, 1993
Identification of poisonous snakes

I. At first, look for the belly scales. If they are divided, it is non-poisonous. If they are single scales, it may be poisonous or non-poisonous.

II. Then look for the head. If the head is triangular and covered with small scales, it may be poisonous (viper). Then look for the pit between eye and nostrils (pit viper). If there is an arrow mark or bird foot mark on the centre of head, it is poisonous (saw-scaled viper).

III. If the head scales are large, it may be poisonous or non-poisonous. Look for the 3rd supra labial and if it is touching the eye and the nasal shield, it is poisonous (cobra or coral snake).

IV. If the 3rd supra labial is not touching eye and nasal shield, then look at the ventral aspect of head. If the 4th infra labial is larger than the others on either side, it is poisonous (krait).

V. If the head is black and the other part of the body is of uniform color without dots, it is poisonous (coral snake).

COBRA

These are two types:

1. Common cobra (Naja naja, Nag)
(Cobra has a hood. On the dorsal side of the hood it bears a spectacle or a monocle mark (Naja Kaouthia). There may be sometimes 3 bands on undersize of the mark. There is a white band at the point of separation between the hood and body. The length is about 1.5 to 2 metres.)

The belly scales are single up to the genital pore and double thereafter. There are two poisonous fangs on the upper jaw which are grooved followed by one or two small teeth. Common cobra is predominantly neurotoxic and slightly hemotoxic.
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