

# Concise Textbook Forensic Medicine Toxicology

Trd Edition

R. K. Sharma

# CONCISE TEXTBOOK OF FORENSIC MEDICINE AND TOXICOLOGY Third Edition

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# CONCISE TEXTBOOK OF FORENSIC MEDICINE AND TOXICOLOGY

# **Third Edition**

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# Concise Textbook of Forensic Medicine and Toxicology, 3/e RK Sharma

First Edition 2005 Second Edition 2008 Third Edition 2011

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ISBN: 978-81-921050-0-0

Medical knowledge is constantly changing. As new information becomes available, changes in treatment, procedures, equipment and the use of drugs become necessary. The authors, editors, contributors and the publisher have, as far as it is possible, taken care to ensure that the information given in this text is accurate and up-to-date. However, readers are strongly advised to confirm that the information, especially with regard to drug dose/usage, complies with current legislation and standards of practice.

Price Rs. 320/-

Published by Global Education Consultants, Aster-06/603, Supertech Emerald Court, Sector - 93 A Expressway, Noida- 201 304, Uttar Pradesh Tel.: 0120-4248457 • Mobile: 09891098542 E-mail: rksharma1@gmail.com

Printed and bound at Process & Spot, C-112/3, Naraina Industrial Area, Phase-I, New Delhi 110 028

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To All departed souls on whose bodies we learnt Forensic Medicine

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# Preface to the Third Edition

I am happy that undergraduate students of Forensic Medicine and Toxicology have immensely appreciated the second edition of this book. The medical fraternity teaching Forensic Medicine and Toxicology has also welcomed the second edition of the book. Both students and teachers generously sent their comments/suggestions for improving the book. So, I felt the need to thoroughly revise the book in light of their comments and suggestions. The third edition of the book is thus in your hands.

We are aware that medical knowledge is evolving rapidly, hence some parts of the book needed to be revised and updated incorporating recent developments. A new chapter, Recent Advances in Crime Detection featuring new concepts like lie detector test, narco-analysis, brain mapping, and hypnosis and voice stress test has been added. The section on the techniques of collecting samples for DNA fingerprinting in living and dead cases as also the chapters, Insanity and Forensic Psychiatry and Sexual Offences have been thoroughly revised and updated. More photographs have been added and new tables have been inserted in some chapters with the understanding that these would facilitate comprehension of critical concepts and enhance retention of information. It is hoped that this endeavour would help the students to perform better in examinations. A new appendix on toxic agents has been included which would be useful in the study of toxicology.

I sincerely thank all my students and colleagues for their frank comments to enhance the value of the book. I am aware that perfection cannot be achieved in one or two attempts, it requires more efforts. I, therefore, request my students and colleagues to continue sending their comments and suggestions just as they did for this edition.

I hope the book would serve the purpose of students more effectively now.

New Delhi R.K. Sharma

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# **Preface to the First Edition**

During my undergraduate days, I felt the lack of a good short textbook of forensic medicine which would be useful in revising the curriculum at quicker pace at the time of examinations, as we were burdened with other subjects too. When I joined as a faculty member, I saw my students facing the same problem. To overcome this problem, the idea of writing the present book took shape in my mind.

This book has been written keeping in view needs of undergraduate students and it covers the whole curriculum as prescribed by Medical Council of India. I hope it would also be useful for students pursuing carrers in a ayurvedic, homoeopathic, unani and siddha systems of medicine. This book contains 40 chapters which are based on the lecture schedule as followed in most of the medical colleges. New concepts like cloning, euthanasia, date rape, DNA fingerprinting have also been added. Toxicology has been revised according to latest clinical practice.

Critical comments and suggestions to improve this book are welcome from all, especially students and residents.

I would thank my childhood friends Umashanker Sharma, Ved Prakash Jindal, Dr. Vinod Kumar Jain and Harprit Singh for their moral support. My departmental colleagues especially Dr. D.N. Bhardwaj, Additional Professor and Dr. Sudhir Kumar Gupta, Assistant Professor who are more of friends have encouraged me at all levels to complete this work.

I would like to thank the Elsevier team especially Mr. Rajiv Banerji, Tanweer Ahmad, Ritesh Bhutani.

Last, but not the least, my grateful thanks and appreciation to my family which suffered silently while I was physically and mentally preoccupied with the book for two years.

New Delhi R.K. Sharma

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# Section 1 FORENSIC MEDICINE

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# **Definition and History of Forensic Medicine**

# **DEFINITIONS**

The specialty of Forensic Medicine is known by various names like Forensic Medicine, Legal Medicine, Medical Jurisprudence and State Medicine, etc. Although all the names carry different meanings they are related to each other.

The word "Forensic" means "of court of law". Forensic Medicine is defined as application of medical knowledge in the administration of justice.

Medical Jurisprudence deals with the legal aspects of medical practice and knowledge. It brings doctors in contact with laws.

State Medicine is application of medical knowledge in prevention of diseases. It defines the duty of a doctor in relation to notification of all births, deaths, notifiable diseases and food poisoning. It deals with the legal mandatory duties of medical practitioners and personnel.

# HISTORY OF FORENSIC MEDICINE

The history of Forensic Medicine is quite old. Documents related to medico-legal work have been found dating back to 4000–3999 B.C. in Egypt, Sumer, Babylon, India and China. A document dated around 3000 B.C. has been found in China that describes poison. Imhotep (2730–2900 B.C.) is considered as the first medico-legal expert. He was the personal physician and Chief Justice to the

King of Egypt. Some of the important landmarks in this context are as follows:

- Code of Hummurabi of Babylon (2000– 1000 B.C.) is the oldest medico-legal code given by King of Babylon in 2200 B.C. It describes punishment for medical practitioners in case of improper treatment.
- 2. Code of the Hittite (1400 B.C.) describes compensation for personal injuries sustained.
- 3. **Roman Law (451 B.C.)** contained a lot of provisions related to medico-legal matters.
- 4. **Hippocrates** (460–377 B.C.) described lethality of wounds, medical ethics, sudden deaths, etc.

Around the beginning of the Christian Era, many public laws relating to public health, sexual matters and eugenics were made in India which are popularly known as laws of Manu.

- 5. **Justinian Code** (**A.D. 529–564**) described penalties for medical practice and principles of regulation of medical profession.
- 6. **The Barbarian Statute** described the role of medical experts in evaluating injuries.

The first Medico-legal autopsy was conducted by Bartolumeo De Varignana in A.D. 1302 in Bologna, Italy. Guidelines on how to conduct investigations into the cause of death was prepared in China in thirteenth century. In sixteenth century,

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the Penal Code of the Bishop of Bamberg and the Caroline Code emphasised on the role of medical evidence in court trials. The famous book on Medico-legal questions, *Questiones Medico-legales*, was written by Paolo Zacchia in 1621 in seven volumes. He was the principal physician to Pope Innocent X and Alexander VII.

Towards the end of the sixteenth century, medico-legal autopsies started becoming frequent at various places around the world. The first book on Forensic Medicine was written in 1602 by Fortunate Feedele, an Italian physician. Famous works on medico-legal scenario by Zacchia was published in seventeenth century. In eighteenth century, professorship in legal medicine was created in Germany. Orfila (1737–1853) was the professor of chemistry and legal medicine in Paris and is regarded as the founder of modern toxicology.

### FORENSIC MEDICINE IN INDIA

Manusmriti (3102 B.C.) is the first treatise on various laws written by King Manu. It prescribed code of conduct for society and had many medico-legal laws about marriage, punishment for rape, adultery, etc.

Vedas (2000–1000 B.C.), especially Atharvaveda, furnish details about how to cure wounds, poisoning and snake bites. The first Indian book on medicine, Agnivesha Charaka Samhita was written by the famous physician Charaka. It describes training, duties, privileges and social status of physicians. It is considered as Indian code

of medical ethics. *Sushruta Samhita* written by Sushruta in 200–300 A.D. refers to poisons, snake signs and treatment of poisoning. Sushruta is considered to be the Father of Indian surgery. Unani system of medicine was introduced in India by Mughal rulers when Ayurveda was flourishing in India. Coroner's Act 1811 was introduced by British in Kolkata and Mumbai and police investigations began in India then. The first chair of professor of Medical Jurisprudence was established in 1857 at Madras Medical College.

The Indian Penal Code (I.P.C.) came into existence in 1860 and Criminal Procedure Code in 1861. The Indian Medical Council Act came in 1933 and established the Medical Council of India at New Delhi.

The most outstanding contribution in medicolegal field in India was made to modern dactylography. Sir William Herschel of the Indian Civil Service in 1858 used dactylography as a method of identification, which was later improved by Sir Francis Galton.

The modern Forensic Medicine in India was started by Dr Jaising P. Modi. For the first time in India in 1920, he was the one who wrote a book on Forensic Medicine and toxicology. It was titled, *Medical Jurisprudence and Toxicology*. He is called the Father of Forensic Medicine in India. He described the Indian medico-legal experience for the first time in his book. In the last fifty years, the specialty of Forensic Medicine has grown all over India and is a part of curriculum in all medical schools. Now, various organisations are working in this field for improvement of the specialty.

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