

Textbook of Forensic Medicine and Toxicology

Textbook of Forensic Medicine and Toxicology

SECOND EDITION

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Textbook of Forensic Medicine and Toxicology

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Dedicated to my beloved parents



Late Sri S Gopal Rao and Late Smt Sharada Bai G Rao

“If I have the belief that I can do it, I shall surely acquire the capacity to do it, even if I do not have it at the beginning”.

—Mahatma Gandhi

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FOREWORD TO THE SECOND EDITION

Ramdas M Pai

President & Chancellor



Law and medicine are the world's oldest noble professions that are claimed to have been wedded long ago, transforming into a science of facts assisting in to resolve the social evils. No other professional endeavour has ever struggled in recent decades as forensic medicine to develop into what it is today! Indeed, with escalating violence, terrorism and such worldwide criminal activities, it is obvious that degree of application of forensic principles and its concepts accomplished a lot in solving the crime mysteries fascinatingly. As a doctor, a forensic expert applies his/her medical knowledge to the knowledge of law not only in solving the crime, but also imparting justice in the court of law to the distressed or dead.



Professor Nageshkumar G Rao, was our faculty, worked as Head of the Department of Forensic Medicine at Kasturba Medical College (KMC), Mangalore, has profound experience and knowledge to compile and revise this book. His research publications available in the world forensic literature have earned many honours conferred on to him by the various authorities in India. I understand that Dr Rao got the coveted honour of ICFMT Annual Congress Award, 2008. In 1987, Kasturba Medical College had conferred him with *Dr TMA Pai Gold Medal for Research publication*.

I have gone through this revamped second edition of *Textbook of Forensic Medicine and Toxicology*. The book has very useful information for the medical and law students, and for the practising physicians and legal professionals. The publisher's efforts to reprint the first edition clearly spell out the popularity of the book. Innumerable references cited in each chapter construe the scientific base for the book. The book also includes worthy appendices at the end, comprising of question bank providing theory and viva-voce questionnaires, varsity examination methodology and suggested syllabus in both theory and practical examinations.

I am sure, the second edition of the book too will get very good reception. My best wishes to Prof Nageshkumar G Rao.

Ramdas M Pai



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FOREWORD TO THE FIRST EDITION

Forensic Medicine has claimed its full share in dramatic progress of medicine during the present century. No aspect of patient care is free from its growing impact and Medical Jurisprudence of yesteryears has moved from the fringes to the center stage of a doctor's training. Today, forensic issues confront not only the specialist but also the young doctor treating a victim of violence in a village, a consultant facing a consumer claim and an investigator seeking informed consent for a new procedure. Forensic medicine has cast its mantle on every facet of the interaction between medicine and society.



Unlike the predecessors, today's physicians are called upon to deal with a new variety of problems, which impinge on science, ethics and law. *In vitro* fertilization, surrogate motherhood, brain death, organ donation, consumer protection and the living will raise unprecedented questions, which demand the attention of the best minds in medicine, jurisprudence and law. Furthermore, the spread of violence and increase in diabolical crimes has aggravated the problems for the practicing physician. To tackle the practical side of these questions, forensic medicine has summoned the resources of science in full measure—DNA technology for identity tests, neutron-activation analysis and scanning electron microscopy for crime detection and many other examples illustrate the scientific advances in its methodology. It is imperative that the medical student gains a clear understanding of the practical, legal and philosophical issues in forensic medicine during the course of his or her training. This is as important for his or her trouble-free practice as for the safety of the society whom he serves.

Professor Nageshkumar G Rao has drawn upon his rich experience as a teacher in writing this book, which is primarily addressed to the medical students. They will find here a mine of up-to-date information on every aspect of forensic medicine, presented lucidly and expertly with collection of excellent color photographs and simple line drawings. The coverage includes ethics, legal procedures, consumer protection, thanatology, autopsy examination, trauma, toxicology, and other important topics. Professor Rao deserves our compliments for preparing this easily readable text which I hope will become popular among medical students and the practitioners of medicine.

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FOREWORD TO THE FIRST EDITION

Textbook of Forensic Medicine and Toxicology is a lucid elucidation of the essence of medicolegal aspects of medical practice, which is essential knowledge, nay, compulsory knowledge, for all medical students, and practicing doctors irrespective of their specialty. Professor Nageshkumar G Rao, presently our Head of the Department of Forensic Medicine and Director of Postgraduate studies, has been my student whom I know intimately, right from his undergraduate student days.



After paying due obeisance to his postgraduate training and teaching expertise in the specialty of Forensic Medicine, I must confess that he has matured into a good teacher and an excellent communicator at the same time.

The book is concise, but covers all vital aspects of Forensic Medicine. I feel it will be an asset to every practicing doctor to be kept with him for ready reference. With the consumer problems coming into medicine in a big way, this assumes greater significance. I wish we had taught our students the Indian code of ethics, which, in my opinion, is far superior to the Hippocratic ethics that we all swear by.

Consumerism is a bane to the practising doctors; but we must remember that it is the medical profession, which has taken medicine to the market place and converted it into a business, like any other profit making business, to attract consumerism. "Never make money in the sick room" was Hippocratic dictum. With corporate business getting into hospitals based on the five-star western culture (while large hospitals in the West are closing down), it was inevitable that some checks and balances had to be introduced into the practice of medicine.

The format and the printing of the book have been of very high order. Photographs, line drawings, flow charts, and tables in the book are relevant and extremely useful. Colour photographs presented in 60 plates with nearly 300 pictures are excellent. The language is simple and easily understandable. The book should be in the clinic of every practising doctor. This would be a blessing as a ready reference in the courtroom also. I see a bright future for this book. I feel it may help the exam going student as well. I wish the book all success.

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FOREWORD TO THE FIRST EDITION

Forensic Medicine is a vast subject, which needs to be explored by an overburdened student, in very little time available to him. There are umpteen number of text books available in the market, but many of them give archaic information, which is no more relevant in the current scenario. Forensic medicine is a rapidly changing subject, and there was a dire need to look at it from a fresh angle. By their very nature, the existing books, were not able to do justice with this situation. They were existent in the market for a long time, and the authors were sometimes reluctant to jettison old and archaic information, which had earlier found favor with the students.



I first met Nageshkumar G Rao, the author of this eminently readable book, more than a decade ago, during an academic conference in Berhampur, and was immediately struck by his academic brilliance. I couldn't help being drawn towards him, and gradually found myself drifting closer and closer to him. During the next few years, we all saw him edit the *Journal of the Indian Academy of Forensic Medicine*, which undoubtedly had its best period under his stewardship. Not only did he edit the journal, but from time to time, published brilliant academic papers in it too. Many times I found that the papers were brilliant enough to have found a place in some more widely circulated journals originating from some Western countries, and I often spoke my heart out to him. I was struck by the answer he gave me. He told me, "Anil, we have to enrich our own journals, not the foreign ones." Such was the commitment of this author towards Forensic Medicine, and Indian Forensic Medicine in particular.

For a long time we all wanted to have a book, which could look at Indian forensic medicine from a fresh angle, and judging by my experiences with him, I had no doubt that it was Nagesh who could do it. When I was in the Edinburgh Medical School, Scotland, during the late eighties and early nineties, working with the doyen of Forensic Medicine, Professor Anthony Busuttil, I maintained close contact with him, and advised him in this direction. During the mid-nineties, I found myself in Japan working with Professor Katsuji Nishi, and later in Armed Forces Institute of Pathology, Washington DC with Dr Charles Stahl, and during those periods too I would often write to him, stimulating him to do this long pending job. I suspect, it was that stimulation which finally spurred him on to write this book.

From then onwards, whenever I would actually meet him during an academic conference, I would always ask him what he had done in that direction. Last year, during the Annual IAFM conference at AIIMS, New Delhi he showed me some work he had done in this direction, and I was happy he had started. But when I first had a look at the complete manuscript, I couldn't believe myself. Undoubtedly, I had expected a sterling book from him, but this was a different stuff altogether. It was concise and to-the-point, and yet contained all the latest stuff that should have rightly been there. For instance there is a detailed and scholarly treatment of latest Acts like The Consumer Protection Act, The Human Organs Transplantation Act and even the latest ethical and legal position on diseases like AIDS. No existing book on forensic medicine deals with these subjects as comprehensively as this one. Toxicology has been dealt with from a fresh angle too. The book has a number of diagrams, which make the text easier to comprehend.

I suspect, whenever a new textbook comes to the market, the author owes an explanation not only to students, but to all his academic brethren. The question often asked is, "What was the need of a new book, when a plethora of textbooks were already available?". But fortunately Nageshkumar G Rao will not have to go through this often embarrassing exercise. This book is in many ways different from the existing textbooks, and undoubtedly would come as a succor to all the students of this country and abroad.

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PREFACE TO THE SECOND EDITION

The book is a complete revitalization of its predecessor published around a decade ago. The publisher's effort to reprint the previous edition earlier explains the popularity of the book. However, as an author I felt the need to revise the text on account of rapid advances and developments in forensic research globally. This edition was made possible by the combined efforts of nearly sixty brilliant academicians who served as the *honorary review panel members and contributors* of this book.

The contributors helped me in improving the contents by providing new information, chapters, photographs and such other materials, while the review panel did the critical evaluation, appended recent advances, checked the language and made essential changes in the text. *Dr Antony Busuttil*, Regius Professor of Forensic Medicine of the University of Edinburgh; *Dr S Subramaniam*, Forensic Pathologist, Dept of Pathology, Kuwait University, Kuwait; *Dr L Thirunnavakarasu*, Retired Professor and Head, Dept of Forensic Medicine, Victoria Hospital, Bangalore Medical College and St. John's Medical College, Bengaluru, Karnataka, India *Dr Alexander F Khakha*, Professor and Head, Dept of Forensic Medicine, Vardhaman Medical College, Safdar Jung Hospital, New Delhi, India and *Dr B Santha Kumar*, Professor and Head, Dept of Forensic Medicine, Govt. Stanley Medical College, Chennai, Tamil Nadu, India are five elite gentlemen and the best of my friends, whose selfless helps and remarkable efforts were crucial in revising this book. Besides, one of my brilliant postgraduate students—*Dr Ritesh G Menezes*, currently the Assoc. Professor of Forensic Medicine, at Kasturba Medical College, Mangalore, Karnataka, India has provided enduring and outstanding assistance in every phase of this venture.

The first edition with *two parts* and *26 chapters* has now been transformed into *five parts* and *40 concise and quality chapters* packed with recent scientific advances. This edition also includes Appendices with four important addenda on *Question Bank*, *Syllabus and Varsity Examination Aid*, *Laws of Relevance to Medical Profession in India* and, *Starvation and Neglect and Law*. I have avoided too many case stories, historical anecdotes and quotes in this book, which I felt were superfluous and digressed from an academic point of view. The primary focus of this over 600 pages edition has been to incorporate relevant subject matter covering the *syllabus* recommended by the *Medical Council of India* using simple, comprehensible language. Over 1500 references, 700 photographs, 500 drawings, charts and tables found in this book will make the intricate theory of the subject extremely easy to understand for every reader. Especially students will not only excel in examinations but also achieve a thorough, usable knowledge of the subject for future professional life. M/s Jaypee Brothers Medical Publishers (P) Ltd, New Delhi, India has published this book with great care using international standard printing technologies. They have designed an attractive cover, and utilized the power of coloured printing to create clear and beautiful pages so that reading of this book can be made pleasurable and interesting.

Suggestions, constructive criticisms and thoughts for improving this book are more than welcome. Kindly email them to prof.nkgr@gmail.com I am sure that the forensic panorama provided in this edition will draw the attention of every reader and generate more response than the previous edition from students, professionals, clinicians, general practitioners, police and law officials alike.

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PREFACE TO THE FIRST EDITION

Forensic Medicine and its methods have been in practice down the ages in history, but its scientific status and the development as a single discipline are of only recent origin. It appropriately now constitutes an integral part of undergraduate and postgraduate medical curricula. Modern Forensic Medicine, with an objective of making the subject specialty more wider, practical and to evolve into a tertiary specialty, has been re-introduced under five major subdivisions or newer taxonomy, viz, *History and Developments in Forensic Medicine, Medical Jurisprudence, Forensic Pathology, Clinical Forensic Medicine and Forensic Toxicology* as appreciated globally. In this book an attempt is made to introduce these newer concepts in India, as approved and proposed by the Medical Council of India (*Gazette of India, May, 17, 1997*).

The 26 chapters presented in this edition, amalgamating all these five major subdivisions of the subject specialty, not only harvest of my personal experiences gained from the living and dead cases, I have been involved as *medicolegal expert*, but also blend with the cream of knowledge gathered from innumerable references in forensic literature.

As a teacher in Forensic Medicine over the last two decades I have been feeling the need for a well-illustrated textbook, with precise and specific information. With short and lucid text and nearly 300 *colored photographs, 200 B/W photographs, line drawings and simple flow charts*, and 100 *tables* rendering easy understanding, recollection and reproduction in the examinations by medical students, I feel this textbook is the first of its kind in India. Perhaps this book could also cater to the needs of every *medical practitioner, investigating police officer, lawyer, law enforcing authority, court and forensic scientist*. My earnest hope is that this new book will find favorable response from all medical students and other concerned group of readers and find a suitable place in Forensic literature.

Nageshkumar G Rao

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