

Second Edition

Volume
1

Second Edition

Volume 1

Manipal Manual of

Clinical Anatomy

Competency Based Undergraduate Curriculum for the Indian Medical Graduate

Highlights of the Book

- Complete coverage of General anatomy, gross anatomy, osteology, histology, embryology, neuroanatomy and genetics in three volumes
- Every chapter clearly highlights the learning objectives for the students and matching them with NMC guided competencies
- Around 1500 high quality-coloured illustrations, including 2-dimensional images for understanding the anatomy and simple line diagrams to enable presentation of topics/answers in structured subjective examinations
- Clinical correlations of the anatomical region being studied follow the description of the topic. These are summarized and presented in boxes
- Over 200 appropriate case scenarios are included to facilitate self-study and discussion, aimed to sensitize the students to clinical relevance of anatomy
- Just before the exam, adequate tabulations, flowcharts and mnemonics help the students to prepare in their examination.
- A detailed list of possible questions for the theory examination, list of possible OSPE questions for the practical examination and histology spotters exams identification notes.
- Microscopic anatomy descriptions matching with function (physiology) and biochemistry for integration of basic medical sciences.
- More than 1000 high-yield, application-based multiple choice questions that will aid in preparation for competitive

Sampath Madhyastha is an alumnus of Kasturba Medical College, Manipal and former Additional Professor of Anatomy, Kasturba Medical College, Mangaluru (Manipal Academy of Higher Education) and is currently Director, Postgraduate Studies, Department of Anatomy, Faculty of Medicine, Kuwait University, Kuwait. He has been teaching Human Anatomy to students of Medicine, Dentistry and Allied Health Science courses for the past 25 years in India and abroad. He is vastly experienced in understanding, designing and delivery of Anatomy curriculum at both undergraduate and postgraduate levels. His international experience is reflected in this manual and make it very special and distinctive. His *Manipal Manual of Anatomy for Allied Health Science Courses* is the most preferred book for allied health science courses in India and abroad. He is an outstanding teacher and won the heart of thousands of medical students in India. He has been awarded 'Good Teacher Award' many times instituted by Kasturba Medical College, Mangaluru. Apart from teaching, Dr Madhyastha is actively involved research in the field of neuroscience. He has published more than 70 research papers in reputed national and international journals. He is recipient of many independent research grants given by Indian Council of Medical Research (ICMR). He has guided many doctoral theses in Manipal Academy of Higher Education. He has involved many undergraduate medical students in ICMR sponsored students' research. He has been awarded the prestigious Dr TMA Pai Gold Medal for excellence in medical research.



M Chakrapani is a renowned physician with three decades of experience in teaching and patient care. Currently he is Professor, Department of Medicine, Kasturba Medical College, Mangaluru (Manipal Academy of Higher Education). He is the former Associate Dean and Director of Research at Kasturba Medical College, Mangaluru. He is currently the Unit Head of Medicine III at Kasturba Medical College, Mangaluru. His area of expertise is insulin resistance and machine learning in medicine. Apart from his teaching and patient care commitments, he has immensely contributed to medical research by publishing original research articles in national and international reputed journals. He has many awards to his credit and to name a few are gold medal for best outgoing medical graduate, good teacher award, distinguished alumni award. Above all his academic achievements, he is a great human being.



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Clinical Anatomy

Second Edition

Madhyastha
Chakrapani



Volume 1

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Competency Based Undergraduate Curriculum for the Indian Medical Graduate



- General Anatomy
- General Histology
- General Embryology
- Genetics
- Upper Limb
- Lower Limb
- Back

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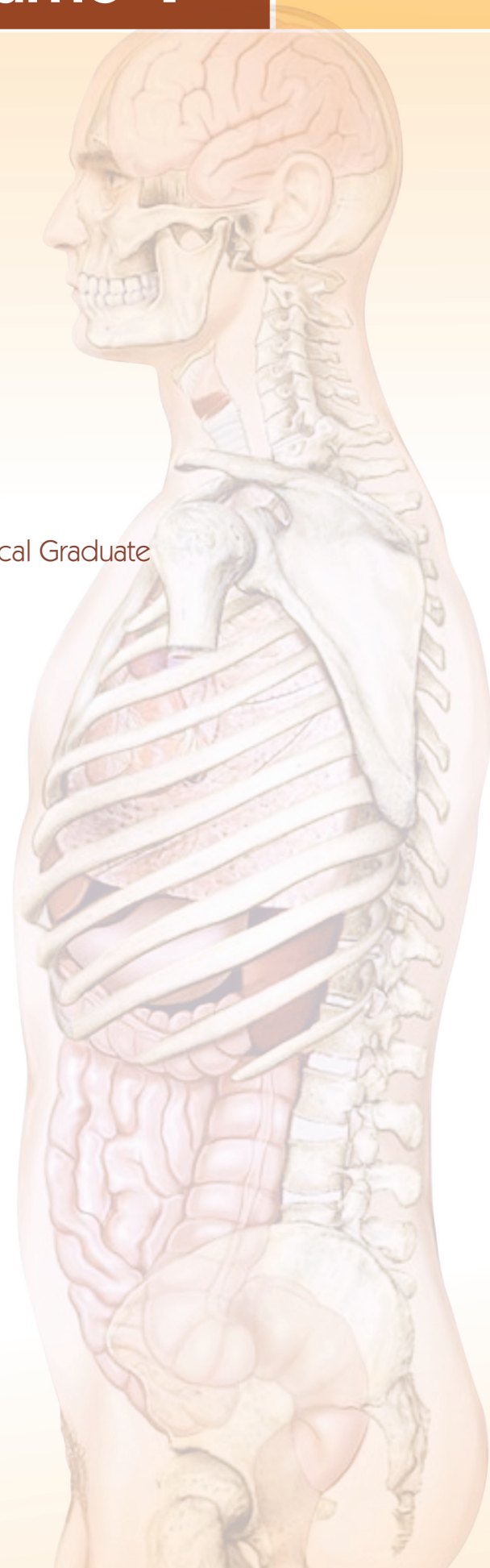
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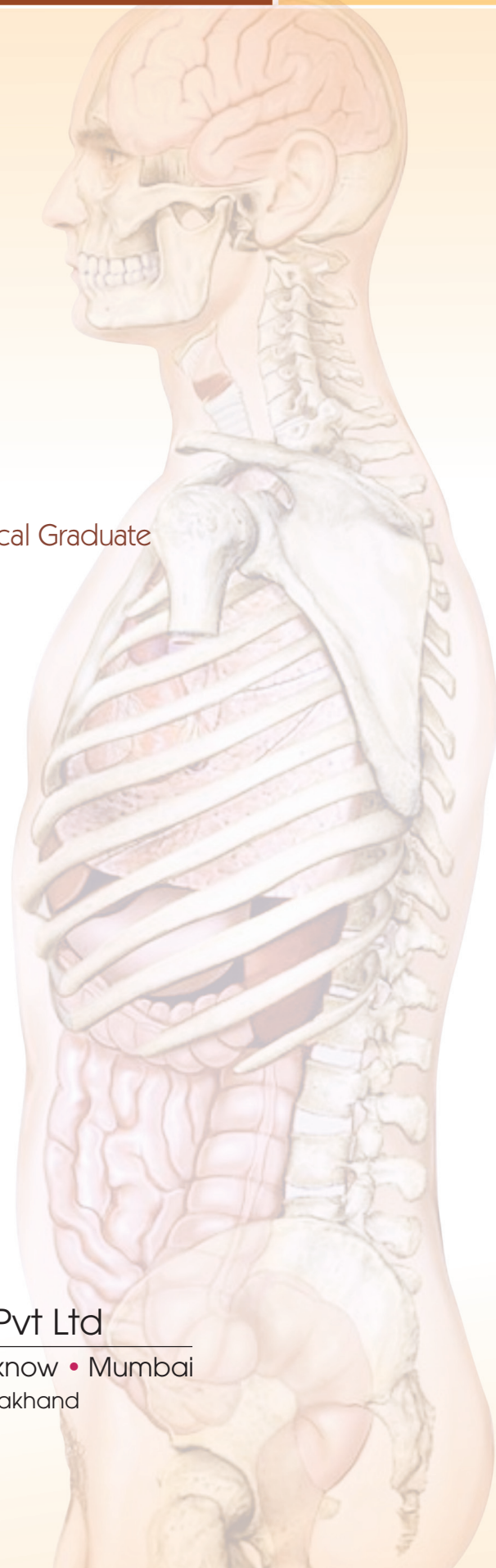
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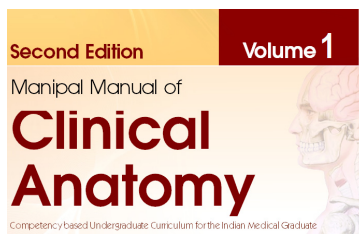
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Preface to the Second Edition

The preface to the first edition began with advocating for a revision of undergraduate medical curriculum especially in Anatomy which was long due. The previous curriculum was overloaded with information where the students were expected to learn anatomy from many textbooks (general anatomy, gross anatomy, histology, embryology, genetics, neuroanatomy) during their short academic period of approximately ten months. Further the evaluation process was also focusing mainly on recalling the information rather than testing the critical thinking ability of the students or their application skills. Hence, the first edition of '*Manipal Manual of Clinical Anatomy*' attempted to address these issues where all branches of human anatomy was presented in just two volumes without diluting the contents. Further the manual had a lot of case scenarios which enabled the students to apply their anatomy knowledge in clinical practice. The vast number of clinically oriented MCQs further enhanced the critical thinking and problem-solving skills of the students. The first edition of *Manipal Manual of Clinical Anatomy* (2014) was unique and first among the many anatomy textbooks in many aspects. There was mixed response among the anatomy fraternity, majority in support of our view while others cautioned about early exposure of clinical anatomy for the first-year medical students. The National Medical Commission (NMC) during 2019 introduced competency-based curriculum to undergraduate medical students which was perfectly matching with our previous thoughts. Thanks to NMC for a well thought and designed curriculum which is expected to be a game changer in undergraduate medical education. Based on the feedback from the anatomy teachers from India and abroad and also based on NMC suggested competency-based curriculum, the *Manipal Manual of Clinical Anatomy* is now revised thoroughly and presented as a second edition. The second edition has more elaborated tissue and organ histology which was inadequate in the first edition. Hence, the book is presented in three volumes.

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Preface to the First Edition

The anatomy curriculum for the medical undergraduate students is a matter of debate in India since many years with medical education experts calling for restructuring/reframing of the same. Unfortunately, no substantial measures were implemented in the past in revising the syllabus and the student evaluation process. Most of the recommended books are loaded with excess of information for the undergraduate understanding with every new volume creating a 'curriculum hypertrophy'. At present, most of the standard recommended books for all branches of anatomy (general anatomy, gross anatomy, osteology, embryology, histology and neuroanatomy) accumulates to approximately 2500 pages with the students having to assimilate this 'information influx' in less than one academic year. Though opinions differ regarding the ideal duration of the study course in anatomy, the basic need is to tackle the 'curriculumegaly'. The *Manipal Manual of Clinical Anatomy* has embraced and matched this task to a great extent after continuous discussions with physicians, surgeons and senior anatomists. With exception of histology, all other branches of anatomy are succinctly covered in 1000 pages without any 'dilution' of the subject content, merely by omitting additional information that is not warranted at an undergraduate level.

The objectives that are clearly identified in each area after thorough discussion with experts will enable both teachers and students to focus on key issues of every topic. Currently, strong views are emerging that traditional methods of teaching anatomy as practiced by most medical schools have limitations in development of application skills of such knowledge in clinical practice. The teaching methodologies and student evaluations are mainly focused on memorizing and recalling the stringent course and relations of human body parts with no value-addition in development of application skills. *Manipal Manual of Clinical Anatomy* discusses the clinical relevance immediately after elaboration of the gross anatomy, which greatly aids the students in correlation of anatomy with the clinical application. Clinical case scenarios that are carefully designed to emphasise the importance of anatomy could be further elaborated for problem-based learning. These clinical case scenarios are placed immediately after clinical relevance boxes, so that the students can discuss the cases in groups where the teacher can act as a facilitator. Medical schools that follow the systemic rather than regional anatomy approach for integrated teaching will also be benefited by these case studies. Developmental events (embryology) are briefly summarized with more emphasis on birth defects and their embryological basis. Multiple choice questions are designed on the basis of clinical application of anatomy, which would help them in future competitive postgraduate entrance tests.

Manipal Manual of Clinical Anatomy is hereby offered as a genuine attempt to view human anatomy in a new dimension. Your suggestions and feedback are welcome to improve this Manual to meet the requirements of the students and make the learning of anatomy an enjoyable experience.

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I am indebted to my editorial board who are eminent anatomists from various parts of India. Their valuable input has taken this manual to the next level. Without their support this would not have been possible. My special thanks to Dr Prameela MD, Associate Professor, Department of Anatomy for her meticulous editing of every chapter.

I pay my sincere gratitude to my in-laws, my wife Dr Prashanthi Madhyastha and my adorable son Pradhan Madhyastha who is the source of my inspiration.

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Sampath Madhyastha

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