

BD Chaurasia's Human Anatomy

for Dental Students

Fifth
Edition

has been thoroughly revised and updated, especially the sections on head and neck, embryology and histology, as per the recommendations of Dental Council of India.

Numerous unique line diagrams, originally hand-drawn by late Dr BD Chaurasia and used in the first edition of the book, have now been incorporated in this edition. These simple diagrams can be easily reproduced by the students in their examinations.

The Section 2 : **Head and Neck** and Section 3 : **Brain** colourfully present the following features:

- Illustrated text
- Videos of osteology and soft parts
- Frequently asked questions and answers
- Images from the first edition of *BD Chaurasia's Human Anatomy (Volume 3)* on CBSiCentral App
- Dissection
- Clinical Anatomy
- Facts to Remember
- Clinico-Anatomical Problems, Multiple Choice Questions, Mnemonics

Organisation of Text

Section 1 : **General Anatomy** Chapters 1–8

Section 2 : **Head and Neck** Chapters 9–28.

Section 3 : **Brain** Chapters 29–37

Section 4 : **Other Regions of Human Body** Chapters 38–41 covers upper limb, thorax, abdomen, pelvis and lower limb. Each region is discussed in one chapter only giving clinically relevant details.

Section 5 : **Topics of Importance in Human Anatomy** Chapters 42–45 covers clinical procedures, genetics, embryology and histology.

Chapter on embryology, especially development of face, has been updated. Chapter on histology has been updated with diagrams of entire gastrointestinal tract including the associated glands. Diagrams of urinary system and gonads (testis and ovary) have been introduced. These histological diagrams are supplemented with 3 points of identification.

Edited by

Krishna Garg MS, PhD, FAMS, FIMSA, FIAMS, FASI

is ex-Professor and Head, Department of Anatomy, Lady Hardinge Medical College (LHMC), New Delhi. She joined LHMC where she completed her MS and PhD and taught anatomy till her retirement. She was elected Fellow of the Academy of Medical Sciences (FAMS) in 2005. She was honoured with Excellence Award in Anatomy in 2004 by Delhi Medical Association. She has received Life Time Achievement Award, Fellowship of Anatomical Society of India, and DMA Distinguished Services Award. She is visiting faculty of DNB, MDS and a PhD examiner.

She is the chief editor of popular textbook *BD Chaurasia's Human Anatomy 9/e (Vols 1–4)*; editor of *BD Chaurasia's Applied Anatomy and Physiology for BSc Nursing Students* and *Handbook of General Anatomy 7/e*. She is the coauthor of *Manual of Human Anatomy Dissection*, *Textbook of Neuroanatomy 6/e*, *Textbook of Histology 6/e*, *Anatomy and Physiology for Diploma in Pharmacy* and also for B Pharm students including *practical workbook*; *Anatomy and Physiology for Nurses and Allied Health Sciences (in Hindi)*, *Practical Anatomy Workbook*, *Practical Histology Workbook* and *Practical Anatomy Workbook for Dental Students*. She has published 53 scientific papers.



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Garg



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Human Anatomy
for Dental Students

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As per the Syllabus prescribed by the
Dental Council of India



Available Free on CBSiCentral App

- Videos on Osteology and Soft Parts
- Frequently Asked Questions & Answers
- Original Images from 1st Edition of BDC Human Anatomy (Vol 3) Hand-drawn by Dr BD Chaurasia

Wall Chart on
Head and Neck



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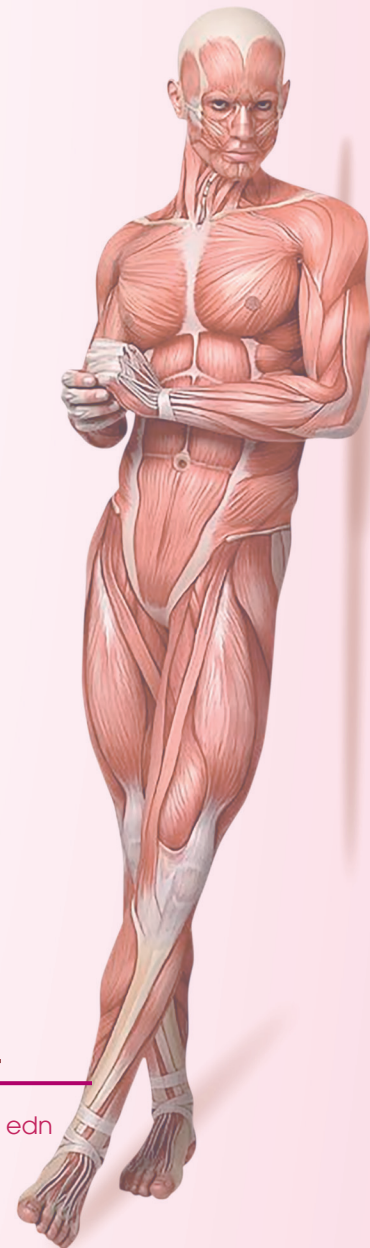
As per the syllabus prescribed by the Dental Council of India

Salient Features

- Regional and Applied Anatomy
- Dissection and Clinical Anatomy
 - Facts to Remember
- Clinicoanatomical Problems
- Multiple Choice Questions
 - Mnemonics
- General Anatomy
- Clinical Procedures
 - Genetics
- Embryology
 - Histology

New Topics

- Frequently Asked Questions
- Viva Voce
- Further Reading
- Molecular Basis of Development
- Flowcharts of Cranial Nerves



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Fifth Edition

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Human
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Preface to the Fifth Edition

Human Anatomy for Dental Students had a successful innings in its fourth edition. Since change for keeping in sync with the newer developments is necessary, the fifth edition is being published.

The text has been updated and diagrams have been corrected and improved.

Molecular basis of development of various organs has been initiated as most of the diseases have a genetic origin.

Some references as "Further Reading" are given at the end of all chapters of head, neck and brain for inquisitive students. Hallmark of this edition continues to be the inclusion of *Viva Voce* questions at the end of Head and Neck and Brain sections. Learning their answers will prepare the students for their numerous practical examinations. These would even give them confidence for their postgraduate medical entrance examinations and the interviews for their jobs.

Accordingly, the various sections in this book are as follows:

Section I General Anatomy contains 8 chapters.

Section II Head and Neck comprises the most important component of anatomy for BDS students. Numerous unique line diagrams, originally hand-drawn by late Dr BD Chaurasia and used in the first edition of the book, after thoughtful moderation, have now been incorporated in the present edition. Our criteria for the selection and manipulation of these drawings were clearly based on the simplicity and lucidity of the anatomic description. These simply structured illustrations can be easily reproduced by the students in multitudes of tests and examinations, including university examinations. Revision can be done by facts to remember, frequently asked questions, MCQ and *viva voce* at the end of all chapters.

Section III Brain highlights of this section are flowcharts of the cranial nerves.

Section IV Other Regions of Human Body covers upper limb, thorax, abdomen and pelvis and lower limb, very briefly, giving important clinical anatomy points.

Section V Topics of Importance in Human Anatomy contains clinical procedures, genetics, embryology and histology.

Chapter on embryology gives a bird's-eye view of the general embryology. Emphasis has been given on the molecular development and congenital anomalies of structures in head and neck, namely tongue, thyroid, parathyroid, pharyngeal arches, pouches, clefts, skull, face, teeth, eye, ear, etc. Some parts have been updated.

Chapter on histology is in two parts. General histology is given with relevant drawings. As far as systemic histology is concerned, only the parts necessary for BDS students are given, such as histology of salivary glands, trachea and general plan of gastrointestinal tract with diagrams of oesophagus, stomach, duodenum, jejunum, ileum, colon, vermiform appendix, liver, gallbladder, pancreas. The diagrams of kidney, ureter, urinary bladder, testis and ovary are also provided. All these diagrams have been complemented with three points of identification. In addition, the endocrine system and special senses are described to complete the organs studied by BDS students.

Obligations are due to Mr SK Jain, Chairman and Managing Director; Mr Varun Jain, Director; Mr YN Arjuna, Senior Vice President (Publishing, Editorial and Publicity); Ms Ritu Chawla, Production Manager; and the entire editorial and production teams at CBSPD. Thanks to Mr Tarun Rajput who has done the formatting part very efficiently, Mr Sanjay Chauhan for doing beautiful graphic work and Mr Prasenjit Paul who has proficiently done the proofreading.

I shall be obliged to the readers for any constructive criticism and suggestions for improvement of the book.

Krishna Garg

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Preface to the First Edition

With an ever-increasing number of students pursuing dentistry as a profession, an urgent need was felt for a comprehensive book on human anatomy for dental students. The books presently available for dental students have a large number of lacunae which require appropriate rectification. With this broad objective in mind, this book has been planned to provide gross anatomy of the whole body with detailed anatomy of the head and neck according to the syllabus prescribed by the Dental Council of India. I am grateful to the Almighty for providing me this unique opportunity.

The fourth edition of *BD Chaurasia's Human Anatomy* published in 2004 and edited by me has been widely accepted as the base-line book on the subject for dental students. In this book the text material of Volume 3 (Head and Neck section) has been revised and included. Dissection as per requirement of BDS students have been given in blue boxes. Multiple Choice Questions and Clinico-anatomical Problems of head and neck region have also been incorporated.

The other regions, namely, brain, upper limb, thorax, abdomen, pelvis and lower limb, have been condensed in description, however, without any compromise on the illustrations which have been revised and improved substantially. It is thus a continuous, well illustrated study of each region. Muscles of all the regions have been tabulated. Besides, at the end of each section the entire course of all the nerves with clinical terms has been incorporated from the viewpoint of revision and retention. Similarly, the brief course of arteries and their branches have been tabulated to aid quick memorization.

The clinical anatomy has also been illustrated profusely with relevant photographs to provide a

glimpse of the future to the first year students of BDS course.

I am obliged to Prof Ved Prakash, Prof Mohini Kaul, Prof Indira Bahl and Prof Kumkum Rana for providing help whenever required.

I am grateful to Dr Suvira Gupta, Ex-Director Professor and Head, Department of Radiology, GB Pant Hospital, New Delhi, for her expert guidance on various radiographs, CT, ultrasound and MRI scans in head and neck sections of the book. Thanks are due to Dr Neeta Agarwal and Dr Dalvinder Singh for constantly encouraging me.

Mr Ankur Mittal and Mr Ajit Kumar, students of BPT 2004 batch from Banarasidas Chandiwala Institute of Physiotherapy, New Delhi, have diligently read the entire text and helped me in correcting the errors of omission. Their help is gratefully acknowledged.

I am obliged to Mr YN Arjuna, Publishing Director of CBS Publishers & Distributors, for providing exemplary guidance and constructive criticism for this book in spite of his extremely busy schedule. His team comprising Mr Karzan Lal Prasher, Mr. Mukesh Kumar Sharma, Ms Neelam, Mr Akhilesh Kumar Dubey and Ms Mehjabeen, has given the best technical support in getting the book in its present format which is attractive and appealing.

Mr SK Jain, Managing Director, CBS Publishers & Distributors, has been constantly monitoring the progress of the book so that it is released at the appropriate time.

I wish to thank all my family members for their cooperation. It is my fervent hope that prayer and the dedication put in this book proves to be useful for BDS and MDS students. I earnestly welcome the teachers and the students in all the colleges to provide suggestions that would help make further improvements in this book.

Krishna Garg

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Syllabus for Undergraduate (BDS)

as Prescribed by Dental Council of India

HUMAN ANATOMY, EMBRYOLOGY, HISTOLOGY AND MEDICAL GENETICS

1. Introduction

1. Anatomical terms.
2. Skin, superficial fascia and deep fascia.
3. Cardiovascular system, portal system collateral circulation and arteries.
4. Lymphatic system, regional lymph nodes.
5. Osteology—including ossification and growth of bones.
6. Myology—including types of muscle tissue and innervation.
7. Syndesmology—including classification of Joints.
8. Nervous system.

2. Head and Neck

1. Scalp, face and temple, lacrimal apparatus
2. Neck—deep fascia of neck, posterior triangle, suboccipital triangle, anterior triangle, anterior median region of the neck, deep structures in the neck.
3. Cranial cavity—meninges, parts of brain, ventricles of brain, dural venous sinuses, cranial nerves attached to the brain, pituitary gland.
4. Cranial nerves—III, IV, V, VI, VII, IX, XII in detail.
5. Orbital cavity—muscles of the eyeball, supports of the eyeball, nerves and vessels in the orbit.
6. Parotid gland.
7. Temporomandibular joint, muscles of mastication, infratemporal fossa, pterygo-palatine fossa.
8. Submandibular region
9. Walls of the nasal cavity, paranasal air sinuses
10. Palate
11. Oral cavity, tongue
12. Pharynx (palatine tonsil and the auditory tube) Larynx.
Osteology—foetal skull, adult skull, individual bones of the skull, hyoid bone and cervical vertebrae.

3. Thorax

Demonstration on a dissected specimen of:

1. Thoracic wall
2. Heart chambers
3. Coronary arteries
4. Pericardium
5. Lungs—surfaces; pleural cavity
6. Diaphragm

4. Abdomen

Demonstration on a dissected specimen of:

1. Peritoneal cavity
2. Organs in the abdominal and pelvic cavity.

5. Clinical Procedures

- a. *Intramuscular injections*: Demonstration on a dissected specimen and on a living person of the following sites of injection.
 1. Deltoid muscle and its relation to the axillary nerve and radial nerve.
 2. Gluteal region and the relation of the sciatic nerve.
 3. Vastus lateralis muscle.
- b. *Intravenous injections and venesection*: Demonstration of veins in the dissected specimen and on a living person.
 1. Median cubital vein
 2. Cephalic vein
 3. Basilic vein
 4. Long saphenous vein
- c. *Arterial pulsations*: Demonstration of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person.
 1. Superficial temporal
 2. Facial
 3. Carotid
 4. Axillary
 5. Brachial
 6. Radial
 7. Ulnar
 8. Femoral
 9. Popliteal
 10. Dorsalispedis
- d. *Lumbar puncture*: Demonstration on a dissected specimen of the spinal cord, cauda equina and epidural space and the inter vertebral space between L4 and L5.

6. Embryology

Oogenesis, spermatogenesis, fertilisation, placenta, primitive streak, neural crest, bilaminar and trilaminar embryonic disc, intra embryonic mesoderm—formation and fate, notochord formation and fate, pharyngeal arches, pouches and clefts, development of face, tongue, palate, thyroid gland, pituitary gland, salivary glands, and anomalies in their development, tooth development in brief.

7. Histology

The cell: Basic tissues—epithelium, connective tissue including cartilage and bone, muscle tissue.

Nervous tissue: Peripheral nerve, optic nerve, sensory ganglion, motor ganglion, skin.

Classification of glands: Salivary glands (serous, mucous and mixed gland), blood vessels, lymphoid tissue tooth, lip,

tongue, hard palate, oesophagus, stomach, duodenum, ileum, colon, vermiform appendix, liver, pancreas, lung, trachea, epiglottis, thyroid gland, para thyroid gland, supra-renal gland and pituitary gland, kidney, ureter, urinary bladder, ovary and testis.

8. Medical Genetics

Mitosis, meiosis, chromosomes, gene structure, mendelism, modes of inheritance.