

*Textbook  
of  
Orthopedics and Trauma*



Volume One

# *Textbook of Orthopedics and Trauma*

*Under the aegis of  
Indian Orthopedic Association*

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**Second Edition**

*Editor*

**GS Kulkarni** MS MS (Ortho) FRCS FICS  
Director, Professor and Head  
Postgraduate Institute of  
Swasthiyog Pratishthan  
Miraj, Maharashtra

*Director*

Sandhata Medical Research Society  
Miraj, Maharashtra



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Phones: +91-11-23272143, +91-11-23272703, +91-11-23282021, +91-11-23245672

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**Hyderabad** 500 095, Phones: +91-40-66610020, +91-40-24758498, Rel: +91-40-32940929  
Fax: +91-40-24758499, e-mail: hyderabad@jaypeebrothers.com
- No. 41/3098, B and B1, Kuruvi Building, St. Vincent Road  
**Kochi** 682 018, Kerala, Phones: +91-484-4036109, +91-484-2395739, +91-484-2395740  
e-mail: kochi@jaypeebrothers.com
- 1-A Indian Mirror Street, Wellington Square  
**Kolkata** 700 013, Phones: +91-33-22651926, +91-33-22276404, +91-33-22276415,  
Rel: +91-33-32901926, Fax: +91-33-22656075, e-mail: kolkata@jaypeebrothers.com
- Lekhraj Market III, B-2, Sector-4, Faizabad Road, Indira Nagar  
**Lucknow** 226 016, Phones: +91-522-3040553, +91-522-3040554  
e-mail: lucknow@jaypeebrothers.com
- 106 Amit Industrial Estate, 61 Dr SS Rao Road, Near MGM Hospital, Parel  
**Mumbai** 400 012, Phones: +91-22-24124863, +91-22-24104532, Rel: +91-22-32926896  
Fax: +91-22-24160828, e-mail: mumbai@jaypeebrothers.com
- "KAMALPUSHPA" 38, Reshimbag, Opp. Mohota Science College, Umred Road  
**Nagpur** 440 009 (MS), Phone: Rel: +91-712-3245220, Fax: +91-712-2704275  
e-mail: nagpur@jaypeebrothers.com

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*To  
my wife  
Shashikala  
and Children  
Milind, Sunil, Rajiv, Vedavati, Ruta and Vidisha  
for the untiring help*



# Contributors

## **Abel Eric W**

University of Dundee  
School of Biomedical Engineering  
Caird Block. Royal Infirmary  
Dundee DD1 9ND

## **Acharya Kiran Kumar V**

Asst. Prof. Dept of Orthopedics  
Kasturba Medical College  
Manipal- 576 104

## **Acharya Shiv**

Lecturer  
Govt. Medical College  
Surat

## **Agarwal Anil** MS (Ortho)

131, Ankur Apartment  
7, IP Extension, Parparganj  
New Delhi

## **Agarwal BR**

Dept. of Hematology  
JJ Hospital  
Mumbai

## **Agarwal Manish**

A 2/B, 38 A, Ekkta Aptts (MIG Flats)  
Pashchim Vihar  
New Delhi

## **Agarwal MG**

201-2A Deep Jyoti Housing Society  
Sus Road, 3, Petrol Pump  
Opp. Hotel Mayuri, Thane  
West, Mumbai

## **Agashe VM**

Dr Agashe's Maternity and  
Surgical Nursing Home  
Vrindavan, Off. LB Shastri Marg  
Kurla  
Mumbai

## **Aggarwal Aditya N**

Dept. of Orthopedics  
University College of Medical Sciences  
New Delhi

## **Aggarwal Rajiv**

Prof. of Orthopedics  
Dept. of Orthopedics  
Govt. Medical College  
Patiala

## **Agrawal AK** MS (Ortho) FICS

FIMSAMAMSGOP  
Associate Professor  
Dept. of Physical Medicine and  
Rehabilitation  
KC Medical College, Lucknow

## **Aithal VK** MS (Ortho)

Associate Professor  
Department of Orthopedics  
Kasturba Medical College  
Manipal

## **Aldegheri Roberto** MD

Institute of Clinical Orthopedics and  
Traumatology  
Policlinico Di Borgo Roma  
Verona, Italy

## **Alquwayee Khalid**

MBBS Clinical and Reserach Fellow  
Division of Reconstructive Orthopedics  
University of British Columbia  
Vancouver, BC Canada

## **Amin SN** MD

Senior Rheumatologist  
Bombay Hospital Postgraduate  
Institute of Medical Sciences  
Bombay Hospital, Mumbai

## **Ammini AC**

Dept. of Endocrinology  
All India Institute of Medical Sciences  
Ansari Nagar  
New Delhi

## **Anchar Chetan**

Senior Registrar, Orthopedic Oncology  
Tata Memorial Hospital  
Mumbai

## **Anderson E Megan** MD

Beth Israel Deaconess Medical Centre  
Children's Hospital Boston  
Boston, MA, United States

## **Anderson GA**

MS (Ortho) D (Ortho) MNAMS MCh (Ortho)  
(Liverpool) FAMS (Vienna) FIMS  
Professor of Ortho. Surg.  
Head Dept. of Hand Surgery and  
Leprosy Reconstr. Surgery  
CMC Hospital, Vellore

## **Antoniou John** MD FRCS

Clinical Fellow in  
Central Dupage/Rush  
Adult Reconstructive Fellowship  
Chicago  
Illinois

## **Aronson James** MS (Ortho) D (Ortho)

MNAMS (Liverpool) FAMS (Vienna) FIMS  
Professor of Ortho. and Head, Dept. of  
Hand and Leprosy  
Reconstruction Surgery  
CMC Hospital  
Vellore

## **Aroojis Allaric**

8/424, Church View  
14th Road, TPS III, Bandra (West)  
Mumbai

## **Arora Anil**

Professor, Dept. of Orthopedics  
University College of Medical Sciences  
New Delhi

## **Arwade DJ**

Sanjeen Hospital, Orth. Nursing Home  
Gulmohar Colony  
Sangli  
Maharashtra

## **Ashok N** MS (Ortho) D (Ortho)

Assistant Professor  
Dept. of Orthopedics  
Kasturba Medical College  
Manipal

## **Athani BD** MS (Ortho) DNB

Director, All India Institute of Physical  
Medicine and Rehabilitation  
Hazi Ali  
Mumbai

## **AV Gurava Reddy** MB D (ortho)

DNB (Ortho) FRCS (Ed) MCh (Liverpool)  
Consultant Joint Replacement Surgeon  
94, Happy Valley Road No.13  
Banjara Hills, Hyderabad  
Andhra Pradesh

## **Babhulkar Ashish**

Anuroop, 6, Vishrambag Society  
SB Road  
Pune

**Babhulkar Sudhir**

Sushrut Hospital and Research Centre  
Ramdaspath  
Nagpur

**Babhulkar Sushrut S**

Sushrut Hospital and Research Centre  
Ramdaspath  
Nagpur

**Bakshi DP**

DA-3, Sector 1  
Salt Lake City  
Kolkata

**Bapat Mihir Ravindra**

Shree Samratha Nursing Home  
121, Hindu Colony, 5th Lane  
Dadar, Mumbai  
Maharashtra

**Bhagwati SN** MS MCh (Neurosurg)

Head, Dept. of Neurosurg  
Bombay Hospital  
Mumbai

**Bhalla R** MS (Ortho) MNAMS FICS FACS

Senior Consultant and Chairman of  
Orthopedics  
Sir Ganga Ram Hospital  
New Delhi

**Bhan Surya**

Prof. and Head Dept. of Orthopedics  
All India Institute of Medical Sciences  
Ansari Nagar  
New Delhi

**Bhatia Anil G** MS (Ortho)

Orthopedic Surgeon  
Poona Hospital and Research Centre  
Pune

**Bhattacharya Sailendra** MBBS (Cal)

FRCS (Eng)

21/7 Gariahat Road  
Gol Park  
Kolkata

**Bhave Arvind** MS (Ortho) IPTM (ISRAEL)

FICOE

Prof. of Orthopedics Bharati  
Vidyapeeth Medical College Pune  
Spine Surgeon, Deenanath  
Mangeshkar Hospital  
Pune

**Bhende Harish S**

5, Satjangad Co-Op. Housing Society  
166-D, Dr. Ambedkar Road, Dadar (E)  
Mumbai

**Bhojraj Shekhar Y**

Choudhari Spine Surgeon  
Lilavati Hospital  
Mumbai

**Bhosale PB** MS (Ortho) D (Ortho) DNB (Ortho)

Professor  
Unit Chief, KEM Hospital and Seth GS  
Medical College  
Parel  
Mumbai

**Bukshi Ashish MD**

Department of Medical Oncology  
Tata Memorial Hospital  
Mumbai

**Cavendish ME**

Consultant Orthopedic Surgeon  
88 Rodney Street  
Liverpool, England

**Chadha Manish** MS (Ortho)

C-A/16 Tagore Garden  
New Delhi

**Chakraborty K**

DA-3, Sector 1  
Salt Lake City  
Kolkata

**Chaudhary Milind** MS (Ortho) (Mumb)

Centre for Ilizarov Techniques  
Chaudhary Trust Hospital  
Civil Lines  
Akola

**Chawra GS** MS (B Com)

26 Kala Bhawan  
3 Mathew Road  
Behind Opera House  
Mumbai

**Chitale AR**

Chief Pathologist  
Bombay Hospital  
Mumbai

**Chodankar Rohit**

8, Status Chambers  
1221/A, Wrangler Paranjape Road  
Off. FC Road, Pune

**Choong FM Peter** MBBS MD FRACS FAOrth

Professor of Orthopedics  
University of Melbourne  
St. Vincent's Hospital  
Melbourne  
Australia

**Clement Joseph J**

Orthopedic Surgeon, Sports and  
Arthroscopy Clinicgkm Hospital  
Coimbatore  
Tamil Nadu

**Connor O' I Mary**

Department of Orthopedics  
Jacksonville, FL  
United States

**Currimbhoy ZE**

JJ Hospital  
Mumbai

**Dave PK**

Professor and Head  
All India Institute of Medical Sciences  
Ansari Nagar  
New Delhi

**Deendhayal J**

Ganga Hospital  
Coimbatore

**Deshmane P Prashant**

Dept. of Orthopaedics  
KEM Hospital  
Mumbai

**DeMuth Brian**

Insall Scott Kelly Institute for  
Orthopedics and Sport Medicine  
170 East End Avenue at 87th Street  
New York, USA

**Devadoss A**

424, KK Nagar  
Madurai, Tamil Nadu

**Dhal AK**

G-41, Lajpat Nagar III  
New Delhi

**Dhammi IK** MS (Ortho)

Dept. of Orthopedics  
University College of Medical Sciences  
and GTB Hospital  
New Delhi

**Dhanshekara Raja**

Department of Orthopedics and  
Spine Surgery  
Ganga Hospital, Swarnambika Lay out  
Ramnagar  
Coimbatore, India

**Dhar Sanjay**

Bombay Hospital and Medical  
Research Centre  
Nair Hospital, Mumbai

**Dhillon MS**

Department of Orthopedic Surgery  
Postgraduate Institute of Medical  
Education and Research  
Chandigarh

**Dilip Patel**

54, B, Brahmin Mitramandal Society  
Near Old Sharda Mandir, Ellisbridge  
Ahmedabad

**Diwan BS** MS(Ortho)

Consultant Orthopedics  
Diwan Hospital  
Sangli

**Diwan Sandeep**

Postgraduate Institute of Swasthiyog  
Pratishthan  
Extension Area  
Miraj

**Diwanmal BM**

Postgraduate Institute of Swasthiyog  
Pratishthan, Extension Area  
Miraj

**Doshi K**

Tarabai Park  
Kolhapur  
Maharashtra

**Dudani Baldev G**

E-23, Shanti Kunj. Opp. GPO  
Pune

**Duncan Clive P** MD FRCS

Prof. and Chairman  
Division of Reconstructive Orthopedics  
University of British Columbia  
Vancouver, BC Canada

**Durai V**

Medical Officer  
Central Leprosy Training and Research  
Institute, Chengalpattu

**Dutta SK** MS (Cal) MS (Ortho) Cal

Orthopedic Surgeon and Incharge  
Regional Artificial Limb Fitting Centre  
NRS Medical College  
Kolkata

**Ekbote SV** BSc

Ashiwini Back Institute  
Aditya Nursing Home  
Gokhale Road, Naupada  
Thane, Mumbai

**Garg B**

All India Institute of Medical Science  
New Delhi

**Gajiwala Lobo Astrid**

Head, Tissue Bank  
Tata Memorial Hospital  
Mumbai

**Ganjwala Dhiren**

Santosh, Opp. Polytechnic  
Ahmedabad 380015  
Gujrat

**Garbuz Donald S** MD FRCS

Clinical Instructor  
Division of Reconstructive Orthopedics  
University of British Columbia  
Vancouver  
BC Canada

**Garg Hitesh**

Research Fellow  
All India Institute of Medical Sciences  
New Delhi

**Garg R**

Deptt. of Endocrinology  
All India Institute of Medical Sciences  
Ansari Nagar  
New Delhi

**Garude Sanjay**

36/A 1st Floor, Sai Nivas  
Road No. 2, Sion (E)  
Mumbai

**Gebharodt C Mark** MD

Beth Israel Deaconess Medical Centre  
Children's Hospital  
Boston, MA  
United States

**George Selvaraj**

Karunya Mann Anjhala  
Nalanchira PO  
Trivandrum  
Kerala

**Ghosh MS**

21, Lake Avenue, Kolkata  
West Bengal

**Gill Paramjeet** MD FRCS

Clinical Fellow in  
Central Dupage/Rush  
Adult Reconstructive Fellowship  
Chicago  
Illinois

**Gill Shivinder Singh**

Dept. of Orthopedics  
8/H2 Sector 12 PGIMER  
Chandigarh

**Goel SC**

Amaravati, A23, Brij Enclave  
Sunderpur, Varanasi  
Uttar Pradesh

**Gopmes D Counha**

Hand and Reconstructive  
Microsurgery  
Lokmanya Tilak Municipal Medical  
College and Hospital, Sion  
Mumbai

**Gordon I**

Jeslok Hospital, Mumbai

**Goswami Nitingiri** MS (Ortho)

Kamal 11, Sangaita Society  
Near Ankur Bus Stop, Naranpura  
Ahmedabad

**Govardhan RH**

No. 5, 8th Street, T Block  
Anna Nagar, Chennai  
Tamil Nadu

**Goyal Atul**

Ganga Hospital  
Coimbatore

**Goyal HC**

Additional Director of General Health  
Service (DGHS)  
Nirman Bhavan  
New Delhi

**Goyal Manoj Kumar** MS (Ortho)  
DNB(Ortho)

A-6, Meera Bagh  
Pashchim Vihar  
New Delhi

**Goyal Saurabh**

21, Laxminagar, Naranpur  
Ahmedabad  
Gujarat

**Green Stuart A** MD

Director  
The Problem Fracture Service  
Rancho Los Amigos Hospital  
7601 E Imperial Highway  
Downey CA  
USA

**Greidarius Nelson** MD FRCS

Clinical Fellow in Central  
Dupage/Rush  
Adult Reconstructive Fellowship  
Chicago  
Illinois

**Grimer Robert J** FRCS

Royal Orthopedic Hospital, NHS Trust  
Birmingham, UK

**Gupta AK** MBBS MS (Ortho)

Associate Professor  
Central Institute of Orthopedics  
Safdarjung Hospital, New Delhi

**Gupta Sandeep** MD

Associate Professor, Medical Oncology  
Tata Memorial Hospital, Mumbai

**Gupta SP** MS (Ortho)

Lecturer  
Dept. of Ortho and Rehabilitation  
MG Hospital and Dr SN Medical  
College  
Jodhpur

**Haddad Fares S** BSc MCh (Orth) FRCS (Orth)

Clinical and Reserach Fellow  
Division of Reconstructive Orthopedics  
University of British Columbia  
Vancouver, BC Canada

**Hardikar SM** FRCS (E)

Hardikar Hospital  
1160/61, Ganeshkhind Road  
Shivajinagar, Pune

**Hardinge K**

Wrighton General Hospital, UK

**Hathi SK**

Dept. of Physiology  
Bombay Hospital  
Mumbai

**Healey H John** MD FACS

Chief Orthopedic Service  
Memorial Sloan Kettering Cancer  
Centre  
New York, United States

**Herzenberg John E** MD

Associate Professor  
Division of Ortho Surg  
University of Maryland  
Baltimore  
USA

**Holz U**

Prof. of Orthopedic  
Katharinen Hospital  
7000 Stuttgart  
Germany

**Huckstep Ronald L** CMG MD FRCS FRACS

(Ann) 108 Sugarloaf Crescent  
Castlecrag, Sydney, NSW 2068  
Australia

**Hugate Ronald Jr** MD

Mayo Clinic, Department of  
Orthopedics  
Rochester, MN  
United States

**Ingalthalikar Vinod T**

Adity Nursing Home, Gokhare Road  
Thane (W)  
Maharashtra

**Irani TZ**

Postgraduate Institute of Swasthiyog  
Pratishthan  
Extension Area, Miraj  
Maharashtra

**Iyer VM** MS (Ortho)

Iyer Orthopedic Centre and  
Physiotherapy Clinic  
103, Railway Line, Solapur 1

**Jahagirdar PL**

Krishna Medical College and Research  
Centre  
Dhebewadi, Karad

**Jahagirdar SP**

Krishna Medical College and Research  
Centre  
Dhebewadi, Karad

**Jain Anil K** MS (Ortho)

University College of Medical Sciences  
and Guru Teg Bahadur Hospital  
New Delhi

**Jain SK**

Orthopedic Surgeon  
241 Jaipur House Colony  
Agra

**Jambhekar NA** MD

Professor Pathology  
Tata Memorial Hospital  
Mumbai

**Jhunjhunwala HR**

D/4, Sunita 62, Pedder Road  
Mumbai, Maharashtra

**Jindalkar Ashok**

All India Institute of Physical  
Medicine and Rehabilitation, Hazi Ali  
Mumbai

**Johar A**

7 Jilani Manzil 1st Floor  
120/128 Gokhale Road (North)  
Opp Portuguese Church  
Dadar (W)  
Mumbai

**John Ebnezar**

Parimala Hospital, Bilekahalli  
Near Iimb  
Bannerghatta Road  
Bangalore, Karnataka

**Joshi Anant**

E-52, Lokmanya Nagar, TH Kataria  
Marg Mahim  
Mumbai, Maharashtra

**Joshi BB**

Consultant in Hand Surgery and  
Reconstructive Surgery  
JESS Research and Development  
Centre  
No 10 ONGC Complex, Bandra  
Reclamation (W), Mumbai

**Joshi KR** MD PhD

Prof. and Head  
Dept. of Microbiology  
SN Medical College, Jodhpur

**Joshi N**

Post Graduate Institute of Swasthiyog  
Pratishthan  
Miraj

**Joshi VR**

Consultant Physician and  
Rheumatologist  
PD Hinduja National Hospital and  
Medical Research Centre  
Veer Sarvarkar Marg, Mahim, Mumbai

**Kanaji BB**

JESS Research and Development  
Centre, No 10 ONGC Complex  
Bandra Reclamation (W)  
Mumbai

**Kanna Raj**

Clinical Fellow  
Breach Candy Hospital, Mumbai

**Kapoor Atul**

Kitty Cottage,  
883 Circular Road, Amrutsar 143 001  
Panjab

**Kapoor Sudhir K** MS

Head  
Dept. of Orthopedics  
Lady Hardinge Medical College  
New Delhi

**Kathju MN**

Santhokba Durlabhji Hospital  
Bhawani Singh Marg  
Jaipur

**Katoch Kiran** MD  
Asst Director (Clin)  
Central JALMA Inst for Leprosy  
Taj Ganj  
Agra

**Kaushik Aditya**  
403 C, Plot No. 5, Gurukrupa  
Samrath Ngr Cross Rd No. 2  
Andheri (W), Mumbai  
Maharashtra

**Kaveri Dheeraj**  
Shri Chintamani, 2nd Floor  
Opp. New English School  
Tilak Road, Pune

**Kawans Hirotaka** MD PhD  
Orthopedic Service  
Memorial Sloan Kettering Cancer  
Centre  
New York, United States

**Kher SS**  
Ashiwini Back Institute  
Aditya Nursing Home, Gokhale Road  
Naupada, Thane, Mumbai

**Krishna M** MD  
Associate Professor  
Department of Anatomy  
LTMM College, Mumbai

**Korula Ravi JD**  
Professor and Head  
Dept. of Orthopedics and  
Accid Surg Unit II  
Christian Medical College and Hospital  
Vellore

**Kotwal Prakash P** MS (Ortho)  
Additional Professor  
Dept. of Orthopedics  
All India Institute of Medical Sciences  
Ansari Nagar, New Delhi

**Krieger Abbott J** MD  
Section of Neurological Surgery  
University of Medicine and  
Dentistry of New Jersey  
New Jersey Medicine School  
Newark, New Jersey, USA

**Kripalani Suresh**  
Kripalani Hospital, Tarabai Park  
Kolhapur

**Kukure PA**  
Tata Memorial Hospital  
Parel, Mumbai

**Kulkarni AA**  
Dental Clinic  
Opp. Laxmi Temple  
Bijapur

**Kulkarni GS**  
Postgraduate Institute of Swasthiyog  
Pratisthan, Miraj

**Kulkarni M**  
Postgraduate Institute of Swasthiyog  
Pratisthan  
Extension Area  
Miraj

**Kulkarni R**  
Postgraduate Institute of Swasthiyog  
Pratisthan  
Miraj

**Kulkarni RM** MS (Ortho)  
Assistant Professor  
Postgraduate Institute of Swasthiyog  
Pratisthan  
Extension Area  
Miraj

**Kulkarni Ruta**  
Postgraduate Institute of Swasthiyog  
Pratisthan, Extension Area  
Miraj

**Kulkarni S** MS (Ortho) D Ortho  
Professor  
Postgraduate Institute of Swasthiyog  
Pratisthan, Extension Area  
Miraj

**Kulkarni Sanjay B** MD (Microbiology)  
Flat 3/FF, Shete Complex  
Dufferin Chowk  
Solapur

**Kulkarni Sunil G**  
Postgraduate Institute of Swasthiyog  
Pratisthan, Miraj

**Kulkarni V** MS (Ortho)  
Assistant Professor  
Postgraduate Institute of Swasthiyog  
Pratisthan  
Extension Area  
Miraj

**Kumar Bhaskaranand**  
Deputy Medical Supt. and Prof.  
and Head  
Orthopedic Surgery  
Kasturba Medical College and Hospital  
Manipal

**Kumar Kush**  
Dean, Prof and Head  
Dept. of Orthopedics  
Himalayan Institute of Medical  
Sciences  
PV Narasimha Rao Medical College  
and Himalayan Institute Hospital  
Jolly Grant, Dehradun

**Kumar Sudhir** MS (Ortho), MCh (Ortho)  
Head, Department of Orthopedis  
University College of Medical Sciences  
Shahdara, Delhi

**Kumta Sameer**  
E-18, Shanti Society  
Modgul Lane, Mahim (West)  
Mumbai

**Lakhanpal Ved Prakash**  
Prof and Head, Deptt. of Ortho  
HP Medical College  
Simla

**Laskar Siddhartha**  
Assistant Professor  
Dept. of Radiation Oncology  
Tata Memorial Hospital, Parel  
Mumbai

**Lele Vikram R**  
Chief of Nuclear Medicine Dept.  
Dept. of Radiol, Jaslok Hospital and  
Research Centre  
Mumbai

**Limaye Rajeev**  
8, St. Stephens Gardens  
Norhallerton  
North Yorkshire  
DI7 8xn

**Lorenz I**  
Katharin Hospital  
7000 Stuttgart  
Germany

**Lype Wilson** MS  
Department of Orthopedics  
Amala Institute of Medical Sciences  
Thrissur  
Kerala

**Madhuri Vrisha**  
Professor of Orthopedics  
CMC and Hospital  
PO Box 3  
Vellore

## xii Textbook of Orthopedics and Trauma (Volume 1)

### **Magu NK**

Deptt. of Orthopedics  
Medical College, Rohtak, Haryana

### **Maheshwari J**

Delhi Inst. of Trauma and Ortho  
Sant Parmanand Hospital Civil Lines  
New Delhi

### **Maini Lalit MS**

Assistant Professor Orthopedics  
Maulana Azad Medical College  
New Delhi

### **Maini PS**

Ortho Consultant  
430 Tower 11, Mount Kailash  
East of Kailash, New Delhi

### **Maitra TK MS (Ortho)**

Lecturer and Ortho Surgeon  
BC Roy Polio Clinic and Hospital for  
Crippled Children  
Kolkata

### **Malaviya GN**

Asst. Director (Surg)  
GJIL  
Agra

### **Marya SKS**

644, Sector A Pocket C  
Vasant Kunj  
New Delhi

### **Masri Bassam A MD FRCS**

Clinical Ass. Prof. and Head  
Division of Reconstructive Orthopedics  
University of British Columbia  
Vancouver, BC Canada

### **Mavre SM**

Post Graduate Institute of Swasthiyog  
Pratishthan  
Miraj

### **Mazumdar N De**

Prof. and Head, Dept. of Orthopedics  
Vivekananda Institute of Medical  
Sciences  
Ramakrishna Mission Seva Pratishthan  
Kolkata

### **Mehta MT MS (Gen Surg) MS (Ortho)**

Orthopedic Nursing Home  
Opp. Shiv Cinema, Ashram Road  
Ahmedabad

### **Mehta Rujuta**

5, Garden View Society  
Sarojini Road, Vile Parel (West)  
Mumbai

### **Menon Padma MD**

Prof. and Head of the Dept. Medicine  
GS Medical College  
Mumbai

### **Mittal RL MBBS MS (Ortho) (Gold Medalist)**

Dip SICOT FICS FAMS FAIS  
Mittal Orthopedic Centre  
97 New Lal Bagh Colony  
Patiala

### **Mohanty Shubhanshu MS (Ortho)**

FASIF (Swiss) FRCS (Edin)  
Asst. Professor, Deptt. of Orthopedics  
King Edward Memorial Hospital  
Mumbai

### **Mohite SM MS D (Ortho)**

Kshema Orthopedic Hospital  
Hubli

### **Muckaden MA MD**

Professor, Radiation Oncology and  
Palliative Care Services  
Tata Memorial Hospital  
Mumbai

### **Mudholkar SR MS DCP**

Professor and Head  
Dept. of Anatomy  
Govt. Medical College  
Miraj

### **Mukherjee DK**

P 281, Narkal Danga  
Main Road, Kolkata

### **Mullaji Arun FRCS (Ed) MCh (Orth) MS (Orth)**

DNB (Orth) D (Orth)  
Joint Replacement Surgeon  
Breach Candy Hospital and Lilavati  
Hospital  
Mumbai

### **Muthu BCD**

Orthopedic Surgery  
Sports Medicine  
Institute for Orthopedics  
170 East End Avenue at 87th Street  
New York, USA

### **Nagalotimath SJ**

Pathologist, Ramdev Galli  
Belgaum

### **Nagi ON**

Prof. and Head  
Dept. of Orthopedics  
PSG Institute of Orthopedics  
Chandigarh

### **Naik Nagesh MS (Ortho) Dip NB (Ortho)**

Dip NB (Phy Med and Reh)  
Orthopedic Hospital  
Near ST Stand, Sangli

### **Naik Premal**

Pediatric Orthopedic Surgeon  
Asso. Professor of Orthopedics  
NHL Municipal Medical College  
Ahmedabad

### **Nair Narendra MD**

Head, Radiation Medicine Centre  
(BARC), Mumbai

### **Nanda R**

Asst. Prof. of Orthopedics  
Prof. and Head Deptt. of Orthopedics  
HP Medical College  
Shimla

### **Naneria Vinod**

Ortho Surgeon  
53 Patrakar Colony, Indore

### **Natarajan MV**

Professor of Orthopedic Surgery  
Madras Medical College, Chennai

### **Nene Abhay**

Spine Consultant  
PD Hinduja National Hospital  
Mumbai

### **Oberoi IPS**

H-No. 2311, Sector 28  
Faridabad, Haryana

### **Oommen PK**

Dy. Director (Surg)  
Central Leprosy Teaching and  
Research Institute, Chengalpattu

### **Pachore JA**

Postgraduate Institute of Medical  
Sciences  
Bombay Hospital, Mumbai

### **Page Anirudh**

Clinical Fellow  
Lilavati Hospital, Mumbai

### **Pai Vasant R**

Tata Memorial Hospital  
Parel, Mumbai

### **Paley Dror MD FRCS**

Professor of Ortho Surg  
Maryland Centre for Limb  
Lengthening and Reconstruction  
Baltimore  
USA

**Panchwagh Yogesh MD**

Senior Registrar, Orthopedic Oncology  
Tata Memorial Hospital  
Mumbai

**Pande HK MS MCh (Cardio)**

Wanless Hospital, Miraj

**Pande VK**

Professor of Ortho (Hand Surgery)  
SMS Medical College and Hospital  
Jaipur

**Pandey Ketan**

Consultant Orthopedic and Spinal  
Surgeon  
Division of Spinal Surgery  
Sushrut Hospital Research Centre and  
Postgraduate Institute of Ortho  
Ramdaspath, Nagpur

**Pandey Sureshwar MBBS (Hons)**

MSFICS FIAMSMS (Ortho) FACS  
Ram Janam Sulakshana Institute of  
Orthopedics  
Trauma Rehabilitation and Research  
Rameshwaram  
Ranchi

**Paramshetti Vinod**

Paramshetti Hospital Sangli Miraj Road  
Miraj

**Parikh Piyush**

5a, Nandita Apts, Opp Pathik Society  
Naranpura  
Ahmedabad  
Gujarat

**Paprosky Wayne (MD FACS)**

Director of Adult Reconstructive  
Fellowship and  
Associate Prof. Rush Medical College  
Chicago, Illinois

**Paranis R**

Archic, 35/98  
Bhusari Colony, Kothrud  
Pune

**Pardiwala Dinshaw**

Jiwan-Flat. 7a, Ii LD Ruparel Marg  
Malabar Hill  
Mumbai  
Maharashtra

**Parihar Mangal**

Mangal Anand Hospital  
48 Swastik Park, Chembur  
Mumbai, Maharashtra

**Patil D**

Sushrut Hospital and Research Centre  
Ramdas Peth  
Nagpur

**Patil Dayanesh**

Sushrut Hospital and Research Centre  
Ramdas Peth  
Nagpur

**Patel Dinubhai A**

Khanpur Orthopedic Hospital  
Ahmedabad

**Patel Pankaj**

C-1, Parshwanath Habitat Patel Soc.  
Gulabai Tekra Ellisbridge  
Ahmedabad, Gujarat

**Patil JK**

Apple Diagnostic Centre, Vyapari Peth  
Kolhapur

**Patnaker Kiran**

Apple Diagnostic Centre  
Vyapari Peth, Kolhapur

**Patwa Jagadish J**

Patwa Nursing Home  
1 Dashaporwad Society, Paladi  
Ahmedabad

**Patwardhan Milind H MD (Med)**

DM (Endocrinol)  
Endocrine Research Centre  
Vantamure Corner, Sangli Road  
Miraj

**Pawardhan Sandeep**

B-7, ICCHAMANI Homes  
Behind Kothrud Petrol Pump  
Mayur Colony, Kothrud, Pune

**Pendsey Sharad**

Diabetes Clinic and Research Centre  
Shreeniwas, Opp. Dhantoli Park  
Nagpur

**Phatak Uday MD**

Consultant Physician  
Sharada Research Institute  
Miraj, Dist. Sangli

**Poduwal Murli**

Lecturer, Dept. of Orthopedics  
KEM Hospital and Seth GS Medical  
College, Mumbai

**Ponseti Ignacio V**

Emeritus Prof.  
University of IOWA  
Iowa, USA

**Prabhoo Ram**

W03, Carlton Court, Perry Cross Road  
Bandra (W)  
Mumbai, Maharashtra

**Prabhu Deep**

All India Institute of Physical  
Medicine and Rehabilitation, Hazi Ali  
Mumbai

**Prabhu PV**

All India Institute of Physical  
Medicine and Rehabilitation, Hazi Ali  
Mumbai

**Pujari BD**

Shree Hospital, Extension Area  
Miraj

**Punjabi M MD PhD**

Professor of Biomechanics  
Yale University School of Medicine  
333 Cedar Street, New Haven  
Connecticut, USA

**Puri Ajay**

Associate Professor Orthopedic  
Oncology  
Tata Memorial Hospital, Parel  
Mumbai

**Purohit AK MBBS MS MCh (Neuro)**

Additional Professor and Head  
Dept. of Neurosurgery  
Nizam's Institute of Medical Sciences  
Panjagutta, Hyderabad

**Purohit G**

VS Medical College, Ahmedabad

**Purohit S**

Purohit Hospital, Sangli

**Purvish M Parikh**

Tata Memorial Hospital  
Parel, Mumbai

**Puthoor Dominic K MS**

Department of Orthopedics  
Amala Institute of Medical Sciences  
Thrissur, Kerala

**Raghava Dutta Mulukutla**

Udai Clinic, Orthopedic Centre  
5-9-94, Chapel Road  
Hydrabad, Andhra Pradesh

**Ragurams T**

Additional Professor and Senior  
Resident Dept. of Ortho  
All India Institute of Medical Sciences  
New Delhi

**Rajan David** MS (Ortho)

Prof. and Head of the Dept.  
Arthroscopy and Sports Medicine  
Kovai Medical Center and Hospital  
Avanashi Road  
Coimbatore

**Rajderkar SS**

Dept. of Anatomy  
Govt. Medical College, Miraj

**Rajgopal Ashok**

B181, Shivalik Enclave  
Malaviya Nagar  
New Delhi

**Rajsekharan S** PhD

Director and Head  
Department of Orthopedics and Spine  
Surgery  
Ganga Hospital, Swarnambika Lay out,  
Ramnagar  
Coimbatore, India

**Ranjalkar SA** DNB (Ortho)

Postgraduate Institute of Swasthiyog  
Pratisthan, Extension Area, Miraj

**Rao Achut**

Postgraduate Institute of Swasthiyog  
Pratisthan  
Miraj

**Rao CG** MS MS (Ortho) FICS (Ortho) D (Ortho)  
DMB (Ortho)

Asst. Prof. Ortho  
KMC Hospital  
Manipal

**Rao K Sharath** MBBS MS (Ortho)

Assoc. Prof. of Orthopedics  
Kasturba Medical College and Hospital  
Manipal

**Rao P Tejeswar**

MBBS (Hons) FRCS (Edin), FRCS (London) MCh  
(Ortho) (Liverpool)  
Prof. of Ortho  
Ranihat Medical Road, Cuttack

**Rao Sripathy** MS (Ortho)

Prof. of Orthopedics  
Kasturba Medical College  
Manipal

**Rastogi Shishir** MS (Ortho) DNB (PMR)

Additional Prof. of Ortho  
All India Institute of Medical Sciences  
Ansari Nagar  
New Delhi

**Rathi Prasanna**

Postgraduate Institute of Swasthiyog  
Pratisthan  
Miraj

**Rohira Rajesh**

JESS Research and Development Centre  
No.10-ONGC Colony  
Bandra Reclamation, Bandra (W)  
Mumbai

**Rowley DI**

University of Dundee  
Department of Orthopedics and  
Trauma Surg  
Dundee Royal Infirmary  
Caird Block Royal Infirmary  
Dundee

**Sabhpathy S Raja**

Head  
Dept. of Plastic Surgery  
Hand and Microsurgery  
Ganga Hospital, Coimbatore

**Sabharwal Sanjiv**

Associate Prof. of Orthopedics  
Chief Pediatric Orthopedics  
Dept. of Orthopedics  
U M DNG – New Jersey Medical School  
90, Bergen Street, DOC 7300  
New York NJ 07103, USA

**Saini Raghav**

Department of Orthopedic Surgery  
Postgraduate Institute of Medical  
Education and Research  
Chandigarh

**Sancheti Parag** MS (Ortho) DNB  
(Ortho) FASIF (Swiss)

Sancheti Institute for Ortho and  
Rehabilitation  
16 Shivajinagar, Pune

**Sancheti KH** MS (Ortho) PhD (Ortho)

Sancheti Institute for Orthopedics and  
Rehabilitation  
16, Shivajinagar, Pune

**Sandhu Hardas S**

Kitty Cottage  
883 Circular Road, Amrutsar 143 001  
Panjab

**Sandhu Parvinder S**

Kitty Cottage  
883 Circular Road, Amrutsar 143 001  
Panjab

**Sandhu MS**

Kitty Cottage, 883, Circular Road  
Amritsar  
Punjab

**Sane SM**

Sane Nursing Home  
Vaibhav Apartments  
Gr. Floor, SK Bhole Road  
Dadar, Mumbai

**Sangwan Sukhbir Singh**

6 J/14, Medical Enclave  
Rohtak, Haryana

**Sarpotdar VG** ND DCH

Shivaji Nagar, Extension Area  
Miraj

**Schlicht Stephen M** MBBS FRANZCR  
MANZAPNM

Director of Nuclear Medicine  
Department of Medical Imaging  
Consultant Radiologist  
St. Vincent's Hospital  
Melbourne, Australia

**Scuderi Giles R**

Orthopedic Surgery  
Sports Medicine  
Institute for Orthopedics  
170 East End Avenue at 87th Street  
New York  
USA

**Scully Sean P** MD PhD

Professor of Orthopedics  
University of Miami School of  
Medicine, Miami, FL  
United States

**Sen RK**

University of Dundee  
School of Biomedical Engineering  
Caird Block. Royal Infirmary  
Dundee DD1 9ND

**Sengupta Dilip K**

Assistant Professor  
Department of Orthopedics Spine  
Center  
Dartmouth-Hitchcock Medical Center  
One Medical Center Drive  
Lebanon, NH 03756, USA

**Senoy RB** MBBS D (Ortho) DNB (Ortho)

Assistant Professor of Orthopedics  
Kasturba Medical College and Hospital  
Manipal

**Shah Manish** MS (Ortho)

21 Shantinagar, Ashram Road, Vadaj  
Ahmedabad

**Shah KN** MS (Ortho)

Fracture and Orthopedic Hospital  
Near Mahalaxmi Char Rasta Opp Unnati  
Vidyalaya  
B/h Krishnanand Complex  
Paladi  
Ahmedabad

**Shah RR** MS (Ortho)

Prof. of Orthopedics  
4-45 Makhalumdura  
Gulberga

**Shah Vikram**

21, Laxminagar, Naranpur  
Ahmedabad, Gujarat

**Shanmugsundaram TK**

MSMCh (Ortho) FRCS (Eng) FRCS (Edin) FAMS  
Emeritus Professor of Orthopedics  
Surgery  
Madras Medical College  
Chennai

**Sharma Amit** MS (Ortho)

Research Fellow  
Breach Candy Hospital  
Mumbai

**Sharma JC** MS (Ortho)

Prof. and Head of the Dept. of  
Orthopedics  
SMS Medical College and Hospital  
Jaipur

**Sharma LR**

Prof and Head of the Dept,  
Krishna Medical College and Hospital,  
Karad

**Shinde Kaustubh**

Sushrut Hospital and Research Centre  
Ramdaspath, Nagpur

**Shivshankar B** MS (Orth)

Iyer Orthopedic Center  
Railway Lines  
Solapur

**Sinopidis Chris**

Royal Liverpool University Hospital  
Liverpool, UK

**Sim Franklin H** MD

Mayo Clinic, Department of  
Orthopedics  
Rochester, MN  
United States

**Singh Arun Pal** MS (Ortho)

2221, 48-C  
Chandigarh

**Siwach Ram Chander** MS DNB FICS

Dept. of Orthopedics  
Pt. BD Sharma PGIMS  
31/9J, Medical Enclaves  
Rohtak, Haryana

**Shifiq Pirani**

Assist. Prof.  
205-245 East  
British Columbia Street  
British Columbia  
Vancouver, Canada

**Sohail Muhammad Tariq**

Prof. and Head of Orthopedics and  
Spine Surgery  
Services Institute of Medical Sciences  
Services Hospital  
Lahore, Punjab, Pakistan

**Solomon Samuel**

Head  
Branch of Surgery and Surgical Rehab  
Schieffelin Leprosy Research and  
Training Centre  
Karigiri

**Sortur SV** MD

Vantmure Corner  
Sangi-Miraj Road, Miraj

**Srijit Srinivasan**

Postgraduate Institute of Swasthiyog  
Pratisthan, Miraj

**Srinivasan H** FRCS (Eng and Edin)

12/1 First Seaward Road, Valmiki  
Nagar, Chennai

**Srinivasan M**

Venkateswar Orth. Hospital, Bodi  
Tamil Nadu

**Sriram K** MS (Surg) MS (Ortho) FRCS

6 Sivaswamy Street  
Off Radhakrishnan Road  
Chennai

**Srivastava KP**

Emeritus Prof. of Orthopedics  
SN Medical College  
Agra

**Srivastava RK**

Consultant and Head  
Department of Rehabilitation  
Safdarjung Hospital  
New Delhi

**Sundar Rajan SR**

Consultant Orthopedic Surgeon  
Department of Orthopedics and Spine  
Surgery  
Ganga Hospital, Swarnambika Lay out  
Ramnagar  
Coimbatore: 641 009, India

**Suryanarayan P**

Appolo Hospital  
Chennai

**Taneja DK**

178, Anoop Nagar  
Indore  
Madhya Pradesh

**Tanna DD**

65, Pedder Road  
Pleasant Park  
Mumbai, Maharashtra

**Tapasvi S**

8, Status Chambers  
1221/A, Wrangler Paranjape Road  
Off. FC Road  
Pune

**Taraporvala JC**

91-A Paradise Appt.  
44 Nepean Sea Road  
Mumbai

**Thacker Mihir** MS

Instructor, Orthopedics  
University of Miami School of  
Medicine  
Miami, FL, United States

**Thakur AJ**

Irla Nursing Home and Polyclinic  
189, Sv.Rd, Irla, Vile Parle/W  
Mumbai, Maharashtra

**Thakur SR**

Prof. and Head, Deptt. of Ortho  
HP Medical College, Simla

**Thatte Mukund R** MS (Gen) MCh (Plastic)

Hand and Reconstructive  
Microsurgery  
Lokmanya Tilak Municipal Medical  
College and Hospital  
Sion, Mumbai

**Thatte Ravin L**

Hon. Prof. and Head  
Department of Plastic and  
Reconstructive Surgery  
Lokmanya Tilak Municipal Medical  
College and Hospital  
Sion, Mumbai

**Thomas Kishen** D(Ortho) DNB

Spine Fellow  
Department of Orthopedics and  
Spine Surgery  
Ganga Hospital  
Swarnambika Layout, Ramnagar  
Coimbatore

**Thomas Temple H** MD

Professor of Orthopedics and Pathology  
University of Miami School of Medicine  
Miami, FL, United States

**Tuli SM**

Prof and Head of the Orthopedics  
University College of Medical Science  
and Guru Teg Bahadur Hospital  
New Delhi

**Vaidya Ramesh B** MS (Anat)

Associate Professor  
Govt. Medical College  
Miraj

**Vaidya VS**

King Edward VII Memorial Hospital  
Department of Orthopedic Surgery  
6th Floor, R. No. 608  
MS Building, Parel, Mumbai

**Vaishnavi AJ**

Prof. and Head of the Deptt. of  
Orthopedics  
Sayajirao Medical College  
Vadodara

**Vaz Laxmi**

Postgraduate Institute of Swasthiyog  
Pratishthan  
Miraj

**Venkatachalam S** MS (Ortho) (London) FRCS

Consultant Orthopedic Surgeon  
Kovai Medical Center and Hospital  
Coimbatore

**Vidyadharan S** MS(Ortho) DNB (Ortho)  
Spine Fellow

Department of Orthopedics and  
Spine Surgery  
Ganga Hospital  
Swarnambika Lay out, Ramnagar  
Coimbatore

**Vora Pravin H**

Hon. Orthopedic Surgeon  
Children's Orthopedic Hospital  
Haji Ali  
Mumbai

**Wakankar Hemant**

B-89, Tulshibagwale Colony  
Devchhayaa  
Sahakar Nagar Road Parvati  
Pune  
Maharashtra

**Warrier SS**

204, Silver Nest  
Sardar Vallabhai Patel Nagar  
Andheri (W)  
Mumbai

**Yadav SS** MS (Ortho)

Prof. and Head of the Dept. of  
Orthopaedics  
SMS Medical College and Hospital  
Jaipur

**Zaveru Goutam**

6 Bhaweshwar Kutir  
4th Road, Rajawadi  
Ghatakopar (E)  
Mumbai

**Zha SS**

Zha Hospital  
Boring Road  
Patna

# Foreword to the Second Edition

The Herculean task of bringing out the second edition is taken up by the editor Prof Dr GS Kulkarni to update and edit the present knowledge of Orthopedics and Traumatology. The textbook has an excellent collection of topics written by experienced and knowledgeable orthopedic surgeons. The scholarly work done by the editor is being published by Indian Orthopedic Association as its revised second edition.

All the contributors have taken tremendous efforts to incorporate the present day knowledge and recent trends of the concerned topics. Many Orthopedic problems in developing countries are different from those in the western country and most of the books, journals and publications are published from the west. The problems associated with Osteosynthesis and recent trends in nailing interlocking have been elaborately written. The common problems of neglected fractures and their management which every surgeon encounters in the practice are well covered. The conditions associated with traumatology and their complications are nicely covered in this edition. The textbook has covered almost all the topics and conditions which we face day-to-day.

This book will be relevant and definitely helpful to Orthopedic Surgeons and students. Dr GS Kulkarni with his vast experience and dedicated efforts has brought us the new edition of this book with a very high standard which will be helpful to the readers.

**Prof (Dr) Sudhir Babhulkar**

MS (Orth), D.Ortho, PhD Orth, DSc Orth, FAMS  
Past President Indian Orthopedic Association



# Forewords to the First Edition

The *Textbook of Orthopedics and Trauma*, being published by the Indian Orthopedic Association, edited by Dr. GS Kulkarni, is the most useful undertaking. This textbook provides the collective experiences in the field of orthopedics and trauma of all the senior and experienced orthopedic surgeons of India.

India is perhaps the foremost amongst the developing countries. The CATCH 22 of the word “developing” fails to reveal that if the whole population of countries like India is taken into account. A certain section may have reached a level of development almost near to that developed by the so-called developed countries, and certain section is plagued by poverty and ignorance.

The orthopedic surgeons practising in India are familiar and capable of dealing not only with diseases and disabilities that affect the prosperous dominant elite, who expect the same kind of health care as is available in the most developed countries of the world but also to be able to look after and treat adequately such conditions which have almost disappeared from those countries, e.g. paralytic poliomyelitis, pyogenic infections of bones and joints, tuberculous disease of bone and joints, mycotic infections, the neural and osteoarticular damage caused by Hansen’s infections specially among young children and infants including the newborn. These diseases usually affect the poorer section of the society.

The challenge of the orthopedic surgeons in developing countries, therefore, is more comprehensive and varied. They have to handle all these serious conditions with severe financial and infrastructural constraints. Considering these challenges the editor Dr. GS Kulkarni has done an excellent job of selecting the topics and contributors for the book. Among all the developing countries India happens to have a fairly well-trained body of orthopedic surgeons, who have had experience in the management of dealing with these wide variety of diseases and disabilities of the locomotor system. The contributors have taken great pains and have described in detail these subjects, which, I am sure, will be extremely useful to the orthopedists of the developing countries.

Lately, with the introduction of mechanization and high-speed transport facilities, there is increased incidence of high-velocity trauma causing polytrauma, which requires a very well-planned system of casualty care, which does not exist in countries like India. I am pleased to read the chapters on polytrauma written by eminent personalities.

Dr. GS Kulkarni is known to me since long. He is a devoted orthopedic academician. I also know many of the section editors and contributors. They are sincere hard working group of orthopedic surgeons.

The textbook points out the wisdom of senior orthopedic surgeons of India, fills the gap that exists in this field. The enterprise that the Indian Orthopedic Association is undertaking, is indeed most gratifying.

I hope that this textbook will act as a pathfinder and a guide to help orthopedic surgeons, who are practising in developing countries.

**B. Mukhopadhyay**  
Emeritus Professor  
Patna

Orthopedics and Trauma is the largest specialty of surgery and especially with the subspecialties in orthopedics which are more than 15 now, it obviously becomes difficult to encompass the total spectrum in its fullness in any textbook. However, I must give credit to Dr. GS Kulkarni, who has made tremendous efforts and that too successfully to cover most of the spectrum of this specialty in adequate manner.

Medical education and training with its three-fold commitment to patient care, research and continuing education always presents a difficult challenge. The term “Core Curriculum” is used widely but seldom defined, therefore, selection and integration of essential information must form the basis for such publications.

## xx Textbook of Orthopedics and Trauma (Volume 1)

A good medical textbook should provide not only information but also a philosophy and approach which makes the knowledge relevant. The authors must have experience, ability and dedication to the mission of teaching. They should be scientifically accurate and capable of projecting their personalized approach. This is amply seen in this textbook.

There are many reasons why prevention is still in its infantile stage. Grants for cancer and heart disease are largely available as this is considered a real science. The life of a cell can be turned round more easily than the mind of a motorcyclist. Looking at the prevention means stepping outside our familiar role as a curative orthopedic surgeon. Road trauma is a great challenge and fills the hospital beds to a great extent.

Intoxication, designing of the roads, playground for children, police protection, bicycle tracks and maintenance of trucks and safe driving are some of the few issues which should be considered very logically for prevention of trauma, and these are the legitimate areas for research even if they do not have the kudos of molecular biology or so much financial support. "Prevention is wholesale. Treatment is retail".

I am sure these remarks will be helpful to the future thinking and the present textbook mainly contributed by the Indian orthopedic surgeons will be a great boon for the orthopedic surgeons practising not only in developing countries but will be very informative to all who are devoted to this science and art. I am sure these volumes must find their place in academic libraries all over the world.

**KT Dholakia** Hon FRCS (Eng)  
Past President SICOT, Past President ASI  
Past President IOA, Past President ASSI  
Emeritus Professor of Orthopedics  
University of Bombay  
Sr. Orthopedics Surgeon, Bombay Hospital  
Breach Candy Hospital and  
PD Hinduja National Hospital

The art and science of Orthopedics has changed remarkably. There has been an explosion in the orthopedic knowledge in recent years. The success of joint replacement, improvement in implant material with application of improved techniques and the new investigative techniques have made orthopedics a very exciting and rewarding specialty.

Indian Orthopedic Association felt the necessity of a textbook, which can give more importance to commonly observed problems in clinical practice in our specialty as our problems are not similar to those seen in western countries. The aim of this book is to provide authentic account of common conditions seen in our country more specifically for the young surgeons during and after their training. The newer developments like joint replacement, distraction osteogenesis (Ilizarov and Jess), interlocking intramedullary nailing, spinal instrumentation and arthroscopy have been included. The operative details have been excluded as they are available in many books on operative orthopedics. The commonly prevailing problems of cold orthopedics have also been properly dealt with. There can be no better method of making the future of our specialty brighter than by ensuring that our trainee surgeons have the benefit of the knowledge and experience of their seniors. The contributors deserve full appreciation for doing their best in this regard and for giving their valuable time for this purpose.

Dr. GS Kulkarni is an expert editor, with enormous experience of editing journals and books. It is his dedication and constructive efforts that could provide us *Textbook of Orthopedics and Trauma* of such a high standard and value. He has done a commendable job for the Indian Orthopedic Association.

I am sure this book will be of tremendous value and help to its readers.

**KP Srivastava**  
MS (Surg) MS (Ortho) D (Ortho) FICS  
FACS FAMS FAIS FIAMS  
*President*  
Indian Orthopedic Association

# Preface to the Second Edition

Since the publication of first edition of the Textbook of Orthopedics and Trauma, phenomenal advances have been seen in each sub-branch of orthopedics. Locking plate has revolutionized the management of fractures, especially intra- and juxta-articular fractures and fractures of osteoporotic bones. Arthroscopy has extended its indications. Surface replacement and unicompartamental arthroplasty are on the horizon. Similar developments have occurred in other branches too. Each chapter of the book has been revised and updated. The creation and production of a work of this magnitude requires dedicated contribution of a large number of authors. Younger generation of orthopedic surgeons have taken keen interest in the book and have contributed to a great extent. I am grateful to them.

This book will be very useful to postgraduate students, their teachers and to the practicing orthopedic surgeons as a reference book.

**GS Kulkarni**



# Preface to the First Edition

Orthopedic knowledge is literally exploding at an astounding rate. No other surgical specialty has a greater number of variety of procedures than orthopedics. The orthopedic market is also flooded with bewildering number of implants and instrumentation sets. The practicing orthopedic surgeons as well as the postgraduate students are at a loss to select the clinical material from the vast literature and the implants and instrumentation. This book will be a quick text as a refresher and an easy reference to orthopedic surgeons. For postgraduate students this book should be indispensable.

Orthopedic problems of the developing countries are different from those in the West and most of the books and journals on the subject emanate from the western countries. Incidence of paralytic poliomyelitis, tuberculosis, chronic osteomyelitis, leprosy, etc. are rampant and so are the road-side accidents which are common in the developing countries. Conditions associated with trauma such as nonunion (with or without infection), malunion, deformity stiff joints, etc. are day-to-day taxing problems. Even the sizes of Indian/Asian bones are smaller than those in the West. This disparity creates problems in inserting implants for the replacement of joints and for the treatment of fractures. Every orthopedic surgeon encounters a large number of cases of neglected trauma, deformities, infections and even tumors of bones and joints. Neglect of orthopedic disease is a common scenario, as also are the poor conditions of the operating rooms, and low quality of implants. Often the surgical technique is not performed meticulously as described by different methodology. All these add to the complications.

The textbook has been designed to adequately cover all such conditions which are missing from or inadequately described in the western textbooks. The main aim of this book is to give comprehensive information about disease and problems peculiar to the developing countries and to provide one source of orthopedic information. Each chapter is written by a surgeon who has a special interest in the subject. I take particular pride in the list of outstanding contributors, many of whom are leading authorities in their fields. An attempt is made to give a complete orthopedic knowledge including basic and applied sciences and rehabilitation of musculoskeletal system.

In a multi-author book of this nature, some repetition is unavoidable, but is useful. This is mainly addressed to the practicing orthopedic surgeons and postgraduate students in the developing countries. I am very much thankful to the Indian Orthopedic Association for asking me to edit this prestigious book.

**GS Kulkarni**



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