

# Manipal Manual of Clinical Paediatrics

Third  
Edition

This is the thoroughly revised and updated edition of the manual gives a quick revision of good paediatric history taking and examination in a very simple and lucid manner. It contains numerous mnemonics, tables, charts, diagrams, formulas, triads and easy to remember principles to enable easy registration and recall of the clinical aspect of paediatrics.

This edition also features post-Covid changes in modalities, either is examination, formulary and treatment protocols. Many sections such as growth and development, nutrition, immunization (including corona vaccines), neonatology, paediatric drugs, instruments, X-rays have been enlarged and a few chapters on poisoning, emergency paediatric, musculo-skeletal, rheumatology and Covid-19 have been added.

A clinical book designed to serve the felt needs of undergraduate medical students, nurses, paramedics and residents.

*A very useful and informative companion handbook for residents during paediatrics posting*

**Kafeel Khan** MBBS, MD (Paediatrics)

is currently Assistant Professor and Head, Department of Paediatrics, Indira Medical College and Hospital, Pandur, Thiruvallur, Tamil Nadu. After completing his MBBS and MD (Paediatrics) from KMC, Manipal, he served as Assistant Professor in SMIMS, Sikkim, and BRD Medical College, Gorakhpur, UP.

In continuance of his social cause, he organizes free medical camps under the banner "Doctors On Road" in rural areas for the underprivileged citizens. He is also the founder of "Health for All" initiative.



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Clinical Paediatrics

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Edition

# Manipal Manual of Clinical Paediatrics



**Kafeel Khan**

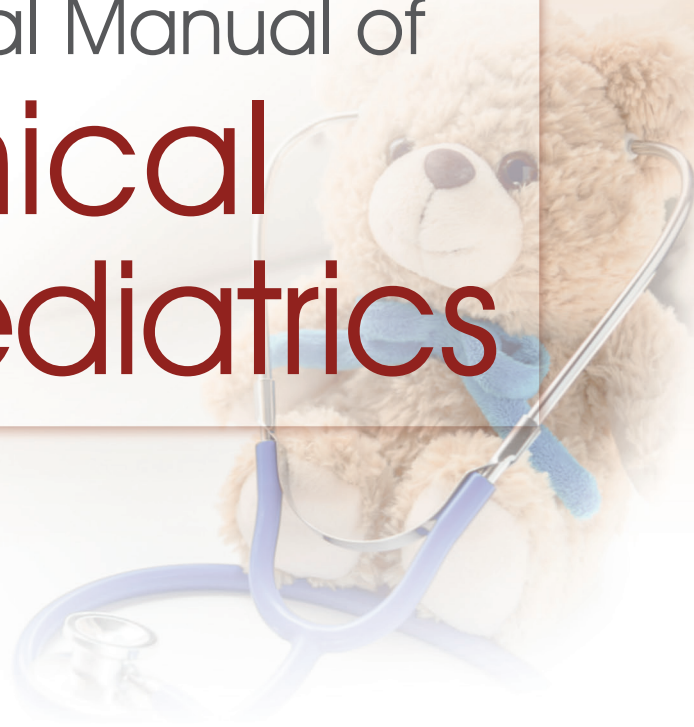


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Third Edition

Manipal Manual of  
**Clinical  
Paediatrics**





**Third Edition**

# Manipal Manual of **Clinical Paediatrics**

**Kafeel Khan**

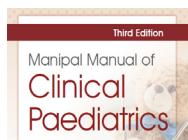
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to

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my loving families

Late Er Shakeel Khan, Mrs Nuzhat Perween  
Mr Adeel Khan, Dr Ayesha Khan,  
Dr Ahmar Uddin, Dr Farkhanda A,  
Er. Kashif J Khan, Mrs Khalida K, Dr Fazeel Khan,  
Mr Samar Khan, Mrs Zeenat Fatima,  
and my lovely wife Dr Shabista Khan  
for teaching me the value of hard work and for their  
selfless love and support

all the kids who taught me milestones especially  
Zara, Jasir, Rida, Abaan, Rahil, Zabrina  
and to the new addition of our family  
Oliver and Yusuf

all my friends, colleagues, and seniors  
for their support, encouragement and never  
letting me doubt my dreams

all my patients and their families and teachers  
who continue to aid in my development as paediatrician

and my alma mater  
KMC, Manipal

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## Foreword

---

I am really proud to write this foreword for the third edition of *Manipal Manual of Clinical Paediatrics* by Dr Kafeel Khan.

There are many changes bound to happen post-COVID either in history taking, examination, formulary and treatment protocols. It is very important to update this concise yet very informative paediatric book aimed to serve undergraduate medical students, nurses, paramedics and residents.

In this third edition, many sections such as growth and development, nutrition, immunization (including corona vaccine), neonatology, paediatric drugs, instruments, and X-rays have been enlarged, and chapters on poisoning, emergency paediatrics, musculo-skeletal disorders, rheumatology and COVID-19 the needed guidelines have been added.

I hope this manual will serve its purpose and become a must-be companion for the readers during their posting in paediatric ward.

But this book definitely is not a substitute for the theory textbooks on paediatrics.

I must finally congratulate Dr Kafeel Khan, Assistant Professor and acting Head, Department of Paediatrics, Indira Medical College and Hospital, Thiruvallur, Tamil Nadu, and wish him great success in his future to continue his research and academic work.

**Dr Vasanthamani Palanisamy**

MD DGO MNAMS MBA

Dean

Indira Medical College and Hospital  
Thiruvallur, Tamil Nadu



## Foreword

*"Children are heritage from the LORD,  
Offspring a reward from him"*

**M**anipal Manual of Clinical Paediatrics was first published in 2013 and after long demand of undergraduates and residents this Second edition has shaped.

I feel proud to write this foreword for the updated and revised 2nd Edition, what I call "*Pearl Book*" as this is a informative and well-written pocket book touching upon most aspects of practical and clinical pediatric.

Notable changes to this edition includes a significant reorganization of text and figures, many sections have been enlarged such as growth and development, nutrition, immunization, neonatology, common and essential used drugs, instruments, X-rays.

I have always emphasised to my students that diagnostic tools would never replace a good history and thorough clinical examination. Keeping this in mind and the modification made in this edition, I feel this book would be better readable and practically useful.

I must congratulate Dr Kafeel Khan, a bright student and now a famous successful paediatrician who worked with me for 10 years during his undergraduation and postgraduation for this excellent addition to the medical student's book shelf. I sincerely hope that this book will continue to be favorite book to carry in paediatric wards by undergraduates, postgraduates as well as paramedics.

I wish Dr Kafeel Khan a great success for his future projects aimed at betterment of health of children.

**Dr Leslie Lewis**

MBBS DCH DNB (Paediatrics)

Professor and Head

Department of Paediatrics

Kasturba Medical College, Manipal, Karnataka

## Foreword

---

**I**t gives me immense pleasure to write this foreword for the very informative and well-written pocket book for undergraduate students and residents. This is a concise book on paediatrics touching upon the most aspects of practical and clinical paediatrics. The illustrations/tables add to recall of appropriate basic science knowledge at the time of analysis of the clinical problems. This book definitely is not a substitute for the textbooks on paediatrics which a student has to read for learning paediatrics.

I must finally congratulate the author for this excellent addition to the medical student's book shelf which I am certain will be carried by students starting their clinical practice in the years to come. I am sure Dr Kafeel Khan will be motivated enough after this book to work hard for his future projects.

**Dr Sudip Dutta**

MBBS MD (Paediatrics)  
Professor and Head  
Department of Paediatrics  
CRH, SMIMS  
Gangtok, Sikkim



## Preface to the Third Edition

I started writing this Manual when I was in the final year of my MD (Paediatrics) at KMC, Manipal, and it took two years to publish the first edition of this book in February 2013.

In 10 years with all the support and encouragement from the students, the pocket-sized book has transformed into magnum opus clinical manual aimed to serve the felt needs of undergraduates, nurses, paramedics and residents. While many clinical books written by great authors are available, there are very few concise yet comprehensive, easy-to-use manuals. This manual will serve this purpose.

In this edition we have kept in mind the post-COVID changes. Many sections such as growth and development, nutrition, immunization (including corona vaccine), neonatology, paediatric drugs, instruments, X-rays have been enlarged, and chapters on poisoning, emergency paediatrics, musculo skeletal disorders, rheumatology and COVID-19 have been added.

I am thankful to Dr Fazeel Ahmed Khan MBBS, D Ortho, DNB (orthopedics), Senior Clinical Fellow, University Hospital Birmingham, Birmingham, UK, for helping me write the chapter entitled "Muscle, Bones, Joints and Rheumatic Disorders".

This book would not have been possible without the effort of my colleagues Dr Arshad Jamal, Dr Shabista Khan, Dr Arun Kumar, Dr Satish Reddy, Dr Ajeet Dwivedi, Dr Aswini Gupta, Dr N Azam, Dr Satriq Nawaz, Dr Puja Lakshmi, Dr Salim, specially my senior resident, Dr Chandini J and my juniors. Each of them selflessly dedicated his/her time and expertise to improve the quality and contents of this book.

I am thankful to my PMT days teacher, my guru, S Ahmad Sir, for helping me prepare the manuscript. The credit for prompt publication of the manual and making it available to the students across the globe goes to the publisher, CBS Publishers and Distributors.

Suggestions for further improvement of the Manual would be welcomed and gratefully acknowledged. You can mail me at: [teamdrkafeel@gmail.com](mailto:teamdrkafeel@gmail.com)

**Kafeel Khan**



## Preface to the First Edition

When I was doing my UG, I felt the need to have a pocket-sized clinical book to carry in the ward and refer it immediately in need. While we have many clinical books written by great authors we do not have a concise yet comprehensive easy to use manual. I wrote this book designed to serve the felt needs of undergraduates and residents and hope that the manual will serve this purpose. This manual gives you the quick revision of good history taking/examination in a very simple manner. This Manual contains a number of mnemonics, tables, charts, diagrams, formulas and easy to remember tips which will enable easy registration and recall of the clinical aspect of paediatrics. It also provides the essential information on growth and development, nutrition, immunization, neonatology, common and essential used drugs, instruments, X-rays.

I am sure you will find this manual useful and informative and hope this manual becomes a good companion during your paediatrics posting.

Suggestion for further improvement of the manual would be welcomed and gratefully acknowledged.

This book would not have been possible without the effort of my colleagues Dr Ganga S, Dr Ashish P, Dr Satish V, Dr Subodh Shetty, Dr Aruna S, Dr Satish Reddy, Dr Narendra Rai, Dr Ankur Sinha specially Dr Tsultem Doma Bhutia and my juniors Dr Bhanu, Dr Bijya Jha, Dr Aditya K. Each of them selflessly dedicated his/her time and expertise to improve the quality and contents of this publication.

I am thankful to Mr Fakhruddin Ahmad for typing the manuscript. The credit for prompt publication of the manual goes to the publishers, Dr Rakesh Dubey and Rahul Singh.

**Kafeel Khan**



## Hippocratic Oath

---

**I**swear by Apollo Physician, by Asclepius, by Hygieia, by Panacea, and by all the gods and goddesses, making them my witnesses, that I will carry out, according to my ability and judgment, this oath and this indenture.

To hold my teacher in this art equal to my own parents; to make him partner in my livelihood; when he is in need of money to share mine with him; to consider his family as my own brothers, and to teach them this art, if they want to learn it, without fee or indenture; to impart precept, oral instruction, and all other instruction to my own sons, the sons of my teacher, and to indentured pupils who have taken the physician's oath, but to nobody else.

I will use treatment to help the sick according to my ability and judgment, but never with a view to injury and wrong-doing. Neither will I administer a poison to anybody when asked to do so, nor will I suggest such a course. Similarly I will not give to a woman a pessary to cause abortion, but I will keep pure and holy both my life and my art. I will not use the knife, not even, verily, on sufferers from stone, but I will give place to such as are craftsmen therein.

Into whatsoever houses I enter, I will enter to help the sick, and I will abstain from all intentional wrong-doing and harm, especially from abusing the bodies of man or woman, bond or free. And whatsoever I shall see or hear in the course of my profession, as well as outside my profession in my intercourse with men, if it be what should not be published abroad, I will never divulge, holding such things to be holy secrets.

Now if I carry out this oath, and break it not, may I gain for ever reputation among all men for my life and for my art; but if I break it and foreswear myself, may the opposite befall me.

*Translated by*  
—WHS Jones



## The Physician's Pledge (NMC)\*

1. As a member of the medical profession,
2. I solemnly pledge to dedicate my life to the service of humanity;
3. The health and well-being of my patient will be my first consideration;
4. I will respect the autonomy and dignity of my patient;
5. I will maintain the utmost respect for human life;
6. I will not permit considerations of age, disease or disability, creed, ethnic origin, gender, nationality, political affiliation, race, sexual orientation, social standing, or any other factor to intervene between my duty and my patient;
7. I will respect the secrets that are confided in me, even after the patient has died;
8. I will practise my profession with conscience and dignity and in accordance with good medical practice;
9. I will foster the honour and noble traditions of the medical profession;
10. I will give to my teachers, colleagues, and students the respect and gratitude that is their due;
11. I will share my medical knowledge for the benefit of the patient and the advancement of health care;
12. I will attend to my own health, well-being, and abilities in order to provide care of the highest standard;
13. I will not use my medical knowledge to violate human rights and civil liberties, even under threat;
14. I make these promises solemnly, freely, and upon my honour.

\*NMC Act (the National Medical Commission Act), 2019 also known as National Medical Commission Registered Medical Practitioner (Professional Conduct) Regulations Act, 2022.

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## Abbreviations

-: Absent	DMARDs: Disease modifying anti-rheumatic drugs
+: Present	DMD: Duchenne muscular dystrophy
ABG: Arterial blood gas	DNS: Deviated nasal septum
AF: Anterior fontanelle	DOA: Date of admission
AGA: Appropriate for gestational age	DOE: Date of examination
AGN: Acute glomerulonephritis	e.g.: For example
ALF: Acute liver failure	ECG/EKG: Electrocardiography
ALT: Alanine transferase	ECHO: Echocardiography
AP: Antero-posterior	EDTA: Ethylene-diamine-tetra-acetic acid
AR: Aortic regurgitation	EEG: Electroencephalogram
ARC: AIDS-related complex	ELBW: Extremely low birth weight
ARF: Acute renal failure	EMG: Electromyography
ARhF: Acute rheumatic fever	Fr: French scale
AS: Aortic stenosis	Fwd: Forward
ASD: Atrial septal defect	GA: Gestational age
ASO: Anti-streptolysin O titre	GBS: Guillain-Barre syndrome
AST/SGOT: Aspartate transaminase/serum glutamic oxaloacetic transaminase	GDM: Gestational diabetes mellitus
A-V fistula: Arteriovenous fistula	GH: Growth hormone
B/L: Bilateral	h/o: history of
BA: Bronchial asthma	Hb: Haemoglobin
BAL: British anti-Lewisite or dimercaprol	Hg: Mercury
BD/bid: Twice a day	HR: Heart rate
Bkd: Backward	Ht: Height
BP: Blood pressure	HTN: Hypertension
C/F: Clinical features	I/D: Intradermal
CAH: Congenital adrenal hyperplasia	ICS: Intercostal space
Cal: Calorie	ICT: Intracranial tension
CBC: Complete blood count	IE: Infective endocarditis
CCF: Congestive cardiac failure	IM: Intramuscular
CFT: Capillary filling time	IO: Intraosseous
cm: Centimeter	IPD: In-patient department
CML: Chronic myelogenous leukaemia	ITP: Immune thrombocytopenic or thrombotic thrombocytopenic purpura
COA: Coarctation of Aorta	IUGR: Intrauterine growth retardation
CT: Computed tomography	IV line: Intravenous line
DM: Diabetes mellitus	

IV: Intravenous	PIH: Pregnancy-induced hypertension
JVP: Jugular venous pressure	PO: Per oral
KFT: Kidney function test	PPV: Positive pressure ventilation
kg: Kilogram	PR: Pulse rate
L/N: Lymph nodes	PS: Pulmonary stenosis
LBW: Low birth weight	qid: Four times a day
LCM: Left costal margin	r/o: Rule out
Let: Lateral	RBC: Red blood cells
Lf: Flocculation unit	RCM: Right costal margin
LFT: Liver function test	RF factor: Rheumatoid factor
LGA: Large for gestational age	RL: Ringer's lactate
LL: Lower limb	RR: Respiratory rate
LS: Lower segment	Rt: Right
Lt: Left	RVH: Right ventricular hypertrophy
MG: Myasthenia gravis	S/C: Subcutaneous
mic/mcg: Microgram	SD: Standard deviation
ml: Millimeter	SGPT: Serum glutamate pyruvate transaminase
mm <sup>3</sup> : Cubic millimeter	SGA: Small for gestational age
mmol/L: Millimols per liter	SpO <sub>2</sub> : Peripheral capillary oxygen saturation
MODS: Multiple organ dysfunction syndrome	T diameter: Transverse diameter
MR: Mitral regurgitation	TA: Tricuspid atresia
MRI: Magnetic resonance imaging	TAPVC: Total anomalous pulmonary venous connection
MS: Mitral stenosis	TB: Tuberculosis
NAD: No abnormality detected	TDS/TID: Three times a day
NB: Newborn	Temp: Temperature
NCV: Nerve conduction velocity	TGA: Transposition of great arteries
NEC: Necrotizing enterocolitis	TOF: Tetralogy of Fallot
NRP: Neonatal resuscitation programme	TR: Tricuspid regurgitation
NS: Normal saline	TS: Tricuspid stenosis
NSAIDs: Nonsteroidal anti-inflammatory drugs	tsp: Tablespoon
OD: Once a day	U/L: Unilateral
OPD: Out-patient department	UL: Upper limb
ORS: Oral rehydration solution	US: Upper segment
PA view: Posterior-anterior view	USG: Ultrasonography
PaCO <sub>2</sub> : Partial pressure of carbon dioxide in arterial blood	VLBW: Very low birth weight
PaO <sub>2</sub> : Partial pressure of oxygen in arterial blood	VSD: Ventricular septal defect
PDA: Patent ductus arteriosus	WBC: White blood cells
PEM: Protein energy malnutrition	Wt: Weight
PET: Positron emission tomography	