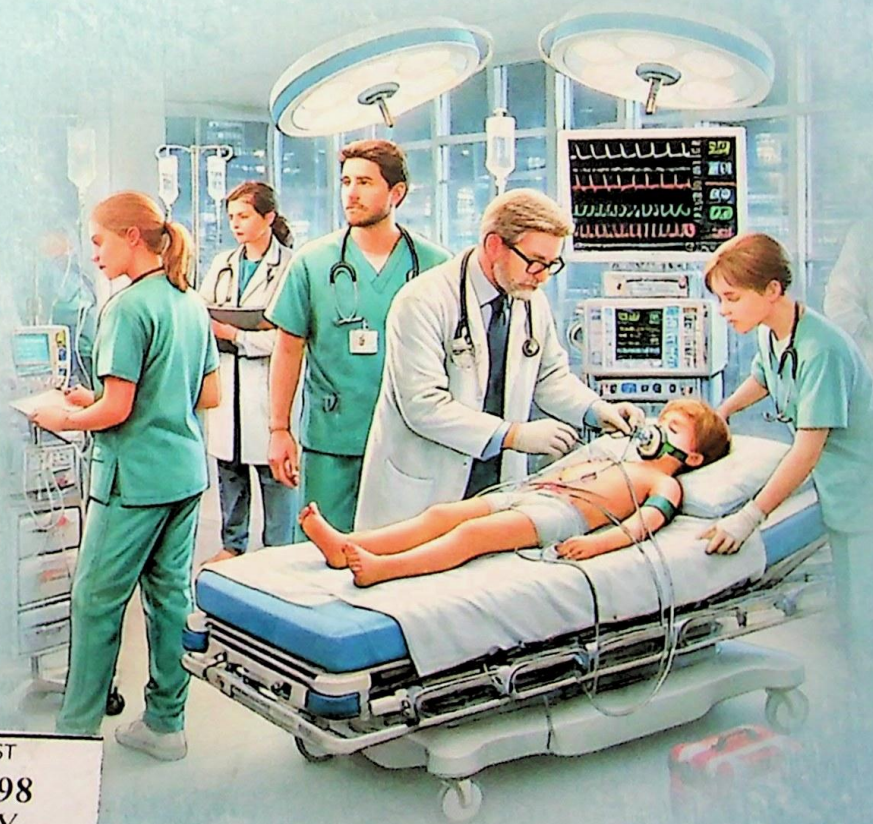


Essentials of Paediatric Surgical Emergencies

Textbook for Undergraduate and Junior Doctors

B. Sayanthan



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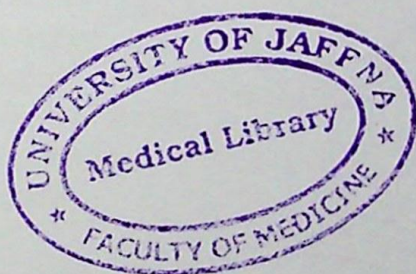
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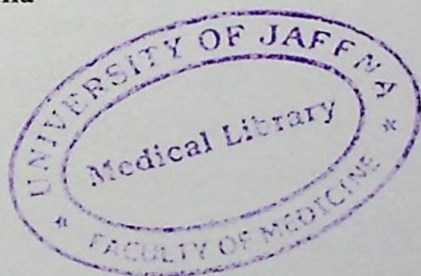
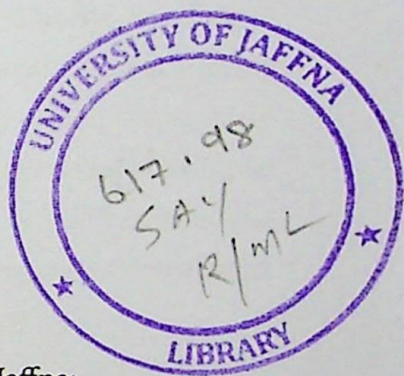
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Kumaran Book House

Colombo - Chennai

2025

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Essentials of Paediatric Surgical Emergencies

by Dr. B. Sayanthan

First Edition 2025

Published by

Kumaran Book House

39, 36th Lane, Colombo - 6, Tel. - 0112 364550, E.mail : books@kumarangroup.net

No.14, Anna 2nd Street, Therodum Veethi, Thiruverkadu, Chennai - 600077

Tel : +91 94 4480 8941, E-mail: kumaranbookhouse@yahoo.com

Printed by

Kumaran Press (Pvt) Ltd.

39, 36th Lane, Colombo - 6

Publication No.: #1073

ISBN 978-624-6709-15-0

Foreword

It gives me immense pleasure to write the forward for paediatric Surgery emergencies, a timely & valuable contribution to the academic & Clinical landscape of paediatric Surgical care. In an era where early recognition & prompt management of surgical emergencies in children can mean the difference between life and death, this book stands, out as a practical and accessible guide for both undergraduate students and postgraduate registrars in surgery and paediatrics.

Dr.B.Sayanthan, with his wealth of experience in Paediatric Surgery and Medical educations, has distilled complex clinical scenarios in to clear, concise and structured chapters. His hands on approach and deep understanding of the subject are evident throughout the book. Each Section is meticulously organized to offer a step by step guide to diagnosing and managing the most common and some less common emergencies encountered in paediatric surgical practice.

What makes this work particularly commendable is it's emphasis on core principles of emergency are, balanced up to date clinical protocols and radiologic support. The illustrations imaging examples and emergency management algorithms enhance learning and equip readers to apply theoretical knowledge to real life scenarios is confidence.

In many ways, this book is more than just a reference, it's a reliable companion for young clinicians navigating the often daunting world of pediatric emergencies. I am confident that it will not only improve Clinical at outcomes but also inspire furthers learning and curiosity in the field of Pediatric Surgery.

I extent my congratulations to Dr. Sayanthan for his dedication and commitment to enhancing medical eduction and for providing a much needed resource in this critical area of medicine.

Dr. Sanjaya Abeygunasekara

Consultant Paediatric Surgeon

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Colombo, Sri Lanka.

Preface

Managing paediatric trauma and surgical emergencies is an integral part of a doctor's career. Even though managing an emergency is often a challenging task, the outcome is often rewarding. The management strategies of paediatric trauma and surgical emergencies are dynamic and ever – changing. However, the principles more or less remain the same. Considering the fact that key aspects of emergency surgical conditions to be delivered clearly and concisely, the author has formulated this essential list of paediatric trauma and surgical emergencies often encountered in day to day practice. The content is delivered in a structured manner in order to understand and assimilate by the user. Even though the book is intended to be used by medical students, it would benefit any medical professional in an emergency setting. The author has a vast experience in managing paediatric trauma and surgical emergencies with hands-on experience and also began an academic arena for a long time involving in medical teaching of both undergraduates and Junior Doctors at a tertiary care centre. We hope that this book would provide a platform and knowledge base for those who are interested in encountering paediatric trauma and surgical emergencies in their early career, in particular the internship training program.

The author has no second thought that the obtaining hands on training by managing paediatric surgical emergencies is the ultimate way to gain experience and this concise book would be an ideal companion in understanding the basis of emergency paediatric surgical emergencies

The author would like to entertain feedback from the users to uplift the standards of this maiden endeavor. We also would like to thank Dr. Sanjaya Abeygunasekara Consultant Paediatric Surgeon for generously agreeing to provide a forward and the Kumaran publication for materializing our thoughts.

Dr. B. Sayanthan

Acknowledgement

I would like to acknowledge and offer thanks for the input of all contributors without whom this maiden effort would not have been possible. I am very grateful to Dr.Sanjaya Abeygunasekara, Consultant Paediatric surgeon for accepting my request and giving a foreword as words of wisdom. Special appreciation is extended to Prof. Sittampalam Rajendra for his generous time and effort in reviewing this book. I would like to express my sincer gratitude to Dr. Thishanthini Vijayakumar for her assistance in editing and compiling. My sincere thanks go to Kumaran Publishers for working extremely hard in bringing this book to fruition.

Dr. B. Sayanthan

Abbreviation

ABG	-	Arterial Blood Gas
ADHD	-	Attention Deficit Hyperactivity Disorder
ARM	-	Anorectal Malformation
ASIS	-	Anterior Superior Iliac Spine
BUN	-	Blood Urea Nitrogen
CDH	-	Congenital Diaphragmatic Hernia
DIC	-	Disseminated Intravascular Coagulation
EA	-	Esophageal Atresia
ECMO	-	Extra Corporeal Membrane Oxygenation
ELBW	-	Extremely Low Birth Weight
FFP	-	Fresh Frozen Plasma
GCS	-	Glasgow Coma Scale
HFOV	-	High Frequency Oscillatory Ventilation
ICP	-	Intracranial Pressure
IV	-	Intravenous
LHR	-	Lung to Head Ratio
MCUG	-	Micturating Cystourethrogram
MRI	-	Magnetic Resonance Imaging

MVAs	-	Motor Vehicle Accidents
NAI	-	Non Accidental Injury
NBM	-	Nil By Mouth
NEC	-	Necrotizing Enterocolitis
NG	-	Nasogastric Tube
NSAIDs	-	Non Steroidal Anti-Inflammatory Drugs
PUV	-	Posterior Urethral Valves
RBC	-	Red Blood Cells
RIF	-	Right Iliac Fossa
RLQ	-	Right Lower Quadrant
SCIWORA	-	Spinal Cord Injury Without Radiographic Abnormality
SMA	-	Superior Mesenteric Artery
SMV	-	Superior Mesenteric Vein
TBI	-	Traumatic Brain Injury
TCAs	-	Tricyclic Antidepressants
TEF	-	Tracheo Esophageal Fistula
TPN	-	Total Parenteral Nutrition
TXA	-	Tranexamic Acid
UTI	-	Urinary Track Infection
VBG	-	Venous Blood Gas

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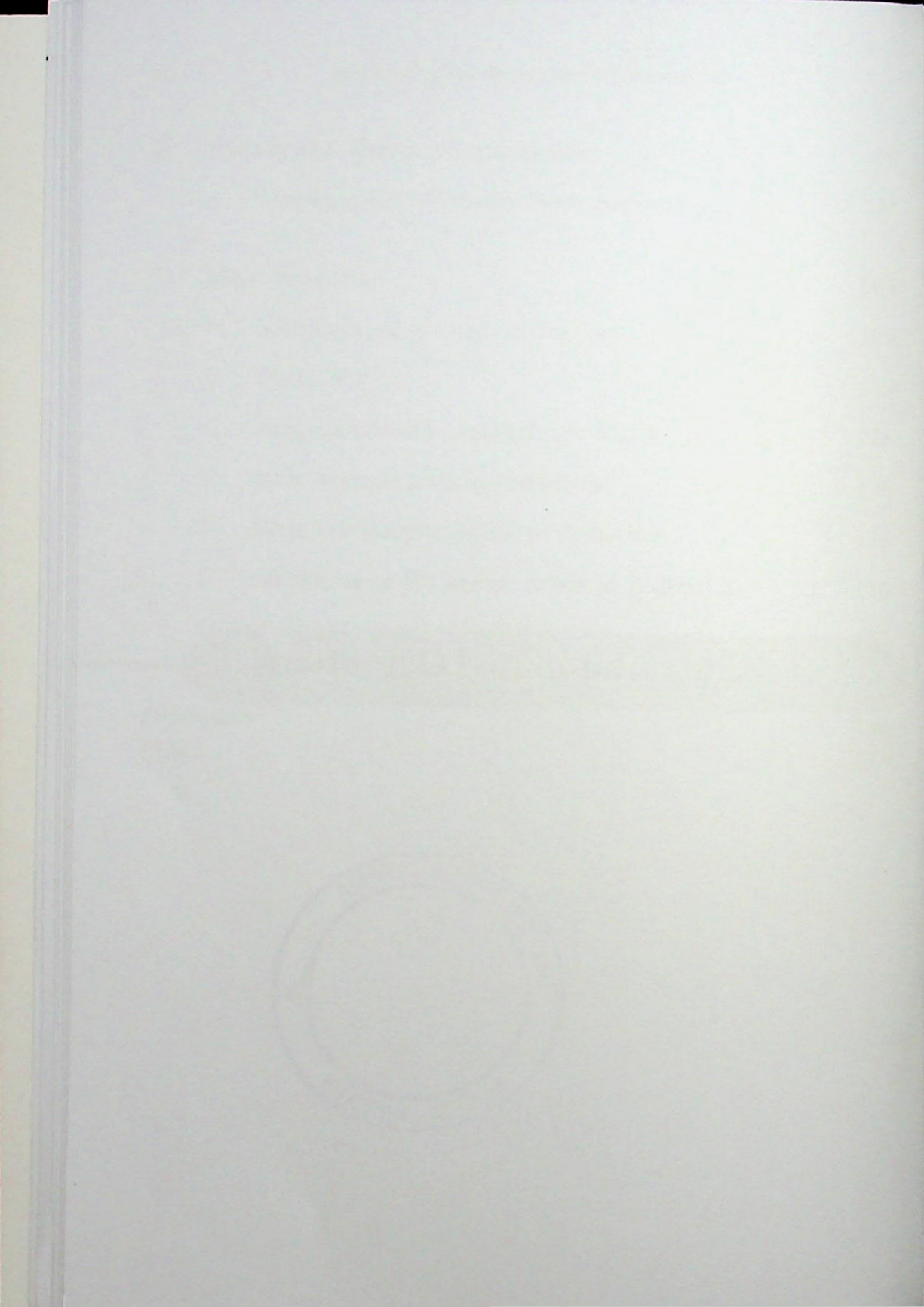
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1. Acute Abdominal Conditions





A. Acute Appendicitis

Clinical evaluation

Symptoms

- Pain starts as vague, central (periumbilical) pain that later localizes to the right lower quadrant (RLQ) (McBurney's point).
- Anorexia.
- Nausea and Vomiting - Typically follows the onset of pain (pain → vomiting).
- Fever - Low grade fever ($38-38.5^{\circ}\text{C}$), higher if perforated.

Signs

- Tenderness - Maximal at McBurney's point (1/3 from anterior superior iliac spine (ASIS) to umbilicus).
- Rebound tenderness - Pain increases when pressure is released.
- Guarding - Voluntary or involuntary muscle tightness.
- Rovsing's sign - Pain in RLQ when the left lower quadrant is palpated.
- Psoas sign - Pain on extension of the right hip (retrocecal appendix).
- Obturator sign - Pain on internal rotation of the flexed right hip (pelvic appendix).

Variation in clinical presentation with age

- <5 years - Often atypical, may present with diffuse abdominal pain, irritability, lethargy, vomiting, fever. Higher risk of perforation.
- 5-12 years - More typical features, though communication may still be limited.
- Adolescents - Usually classical textbook presentation.

Red Flags Indicating Perforation:

- High fever ($>39^{\circ}\text{C}$).
- Generalized abdominal pain with signs of peritonitis.
- Abdominal distension.
- Toxic appearance (lethargy, tachycardia).
- Palpable mass (appendiceal abscess or phlegmon) in right iliac fossa (RIF).

Differential Diagnosis

1. Mesenteric lymphadenitis.
2. UTI (Urinary Track Infection).
3. Intussusception.

Investigations:

- Blood tests: Elevated WBC count, CRP.
- Urinalysis: To exclude UTI.
- Ultrasound Abdomen: First-line in children (to look for inflamed appendix, free fluid).
- MRI/CT Abdomen: If the diagnosis remains uncertain (CT is limited due to radiation exposure).

Alvarado Score

- A number of clinical laboratory based scoring systems have been devised to assist diagnosis. The most widely used is the Alvarado score. A score of 7 or more is strongly predictive of acute appendicitis.

Alvarado Score	
Feature	Score
Migration of pain	1
Anorexia	1
Nausea	1
Tenderness in right lower quadrant	2
Rebound pain	1
Elevated temperature	1
Leucocytosis	2
Shift of while blood cell count to the left	1
Total	10

Management:

- Keep nil by mouth.
- IV fluids.
- Analgesia.
- IV antibiotics- Cefuroxime and Metronidazole.
- Appendectomy (laparoscopic or open).
- Conservative management may be considered in selected cases (appendix mass).