Practical Approach to Paediatric Gastroenterology, Hepatology and Nutrition

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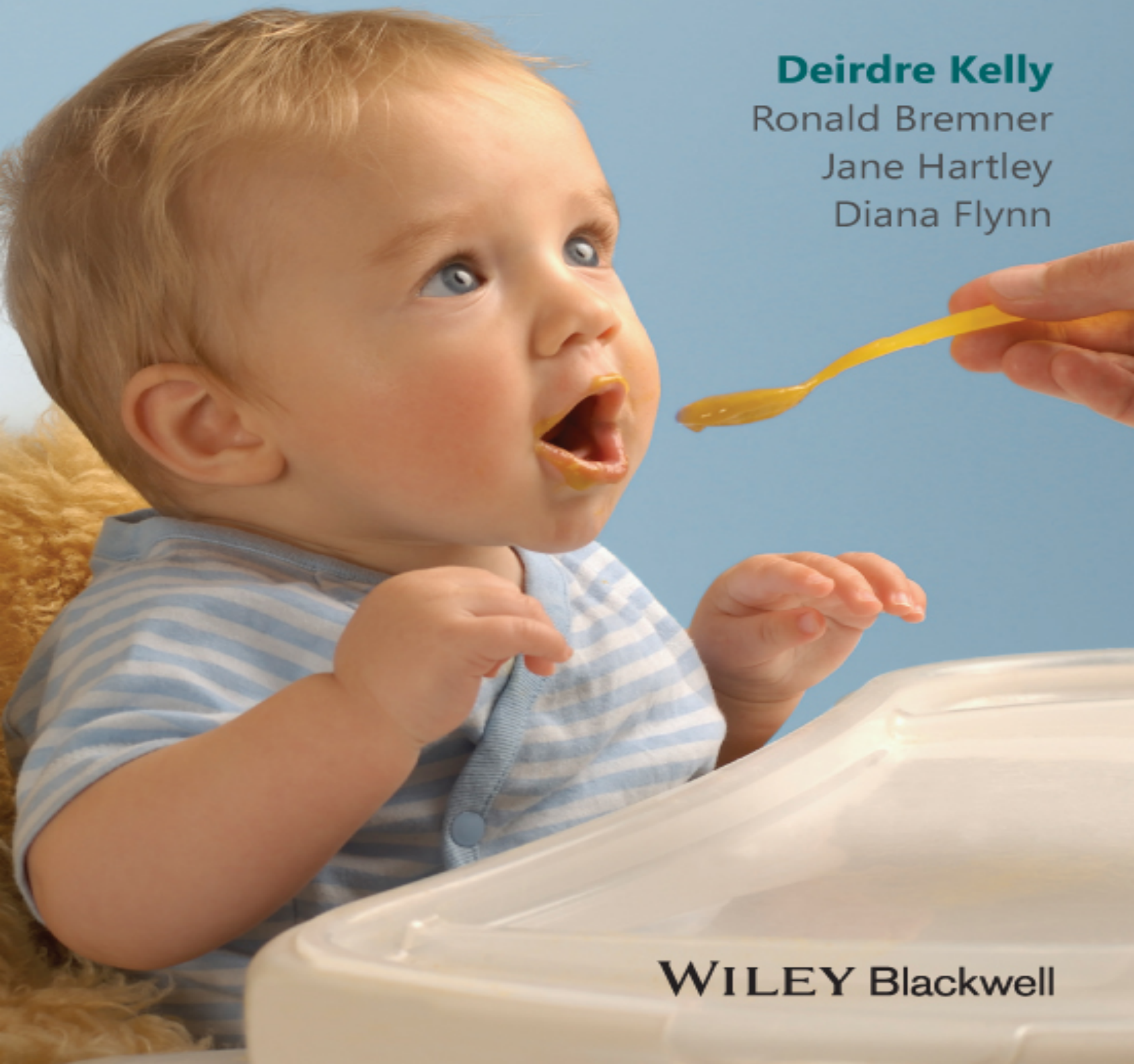

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Preface

Paediatrics is a rapidly evolving field of medicine, particularly in the sub-specialties. This makes it difficult for trainees, junior doctors and allied health professionals to keep up with new developments.

This book aims to provide problem-orientated clinical scenarios in paediatric gastroenterology, hepatology and nutrition, and is designed to make initial assessment, management and referral of children easy to follow.

The book is up to date with current practice, user friendly, with links to the latest guidance, protocols and information, and should be a popular book no trainee doctor should be without.

We hope you enjoy using it and that it will help you improve how you manage children with these specialist conditions.

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PART I

Gastroenterology

Abdominal symptoms are often non-specific, with a wide differential diagnosis. We aim to provide a framework for evaluation, with information for both common and important rare conditions. A multidisciplinary model of care supports optimal management and outcomes. Specialist nursing, dietetics and psychology are central to supporting therapy, especially in chronic illness. Specialist advice and management for rare or complex problems are important, as is recognising non-gastrointestinal illness and conditions requiring surgical intervention, often provided through a defined network of units with pathways for referral, and shared-care with community and hospital teams.

CHAPTER 1

The infant with abdominal pain

It can be difficult to distinguish between ‘normal’ colic and pathological conditions.

Infantile colic is common in the first months of life. Babies scream, draw up their knees and experience severe pain. Episodes may last up to 3 hours and occur several times per week. Causes are listed in Table 1.1.

Table 1.1 Causes, cardinal signs and diagnostic investigations in a child with abdominal pain

Causes	Cardinal features	Diagnostic test
Infantile colic	No abnormal findings	None
Gastro-oesophageal reflux	Regurgitation, back arching	Trial of acid suppression Oesophageal (+gastric) pH probe Oesophageal impedance study Endoscopy and histology
Milk or soya allergy/intolerance	Diarrhoea, rashes	See Chapter 12
Gastroenteritis	Watery stools, fever	Stool virology/microbiology
Constipation	Straining, hard stool, retentive behaviour	See Chapter 14
Urinary tract infection	Fever, pyuria	Urine dipstick test for leukocytes and nitrites, or microscopy Microbial culture
Intussusception	Ill child, red currant jelly stools (late sign) Blood on digital rectal examination	Fluoroscopy with air enema reduction

Volvulus	Distension, bilious vomiting	Abdominal radiograph
Incarcerated hernia	Tender groin swelling	Ultrasonography
Testicular torsion	Scrotum swollen and/or discoloured and/or tender	Ultrasonography
Hirschsprung's disease	Delayed passage of meconium, ribbon stools	Full thickness rectal biopsy
Renal pelviceal/ureteric obstruction	Recurrent urinary tract infection, episodic pain	Ultrasonography
Metabolic disease (e.g. Reye's syndrome, MCADD)	Acidosis, encephalopathy	Blood gases, glucose, ammonia, lactate, serum amino acids, urine amino and organic acids, acyl carnitines

MCADD, medium-chain acyl-CoA dehydrogenase deficiency.

Pathological pain from any site may be interpreted as abdominal in origin, e.g. corneal abrasion, renal tract obstruction, bony fracture.

Investigations

Normal results from screening blood tests can help reassure that underlying renal, liver or metabolic diseases are unlikely.

- FBC, renal, liver and bone biochemistry, blood gases
- Urine analysis and culture
- Plain abdominal radiograph: volvulus in the ill child or with bilious vomiting
- Abdominal ultrasound scan: when intussusception suspected
- Barium swallow and follow to the duodenal–jejunal flexure: to exclude malrotation
- Endoscopy is rarely indicated

Management

In the absence of other obvious cause, a time-limited trial of hypoallergenic feed can be useful to exclude milk allergy/intolerance (see Chapter 12), and antacid therapy can be used if there is acid reflux-related oesophagitis. Most often, colic settles within a few weeks or with changes in routine.

Red flags: When colic is concerning

- Abdominal distension (see Chapter 6)
- Faltering growth: feeding problem (see Chapters 37, 38 and 39) or malabsorption (see Chapter 9)
- Abnormal developmental progress: severe oesophagitis more likely, underlying metabolic disorder

CHAPTER 2

The child with abdominal pain

Abdominal pain is common in school-aged children and is rarely organic.

History

- Duration and location [right upper quadrant pain in hepatitis, Gilbert's syndrome and non-alcoholic steatohepatitis (NASH)]
- Associated symptoms: vomiting, dyspepsia, diarrhoea, fever, groin pain, urinary symptoms
- Blood in stool
- Vaginal discharge
- Foreign travel
- Gynaecological and sexual history
- Family history: inflammatory bowel disease, coeliac disease, migraine, irritable bowel syndrome, gallstones, pancreatitis

Investigations

- Urinalysis: haematuria in renal stones, pyuria in urinary tract infection
- Urine microscopy, culture, sensitivities
- Blood tests: blood glucose, FBC, renal function, liver function, inflammatory markers, amylase, cholesterol, triglycerides

- Other blood tests if indicated, e.g. paracetamol levels, thyroid function tests
- Stool samples if diarrhoea: microscopy, culture, sensitivity, ova, cysts, parasites
- Abdominal imaging:
  - Abdominal X-ray, e.g. if looking for obstruction
  - Chest X-ray, e.g. for pneumonia or air under the diaphragm
  - Ultrasound scan of the abdomen, kidneys, pelvis (females) and testes (males)
  - CT scan may also be appropriate, especially if there is a mass, trauma, jaundice or pancreatitis
- Endoscopy: will depend upon preliminary findings and history; in the absence of any abnormality on blood screen and imaging, negative endoscopy is very likely

Causes

Well child

- Functional bowel disease: recurrent abdominal pain of childhood, abdominal migraine
- Lactose intolerance: worse with dairy products (ice cream and chocolate are high lactose)
- Gastro-oesophageal reflux ± oesophagitis: dyspepsia, epigastric pain, regurgitation
- Constipation: hard, infrequent stools, soiling
- Renal pelvic/ureteric obstruction: intermittent colicky loin pain
- Coeliac disease: variable association with iron deficiency, diarrhoea, oral ampthous ulceration
- Food allergy (see Chapter 12)
- NASH: associated with obesity and metabolic syndrome

Febrile child

- Gastroenteritis (bacterial or viral)
- Mesenteric adenitis
- Urinary tract infection (lower abdominal pain, loin pain – suggests pyleonephritis)
- Pneumonia
- Inflammatory bowel disease
- Liver abscess

The ill child

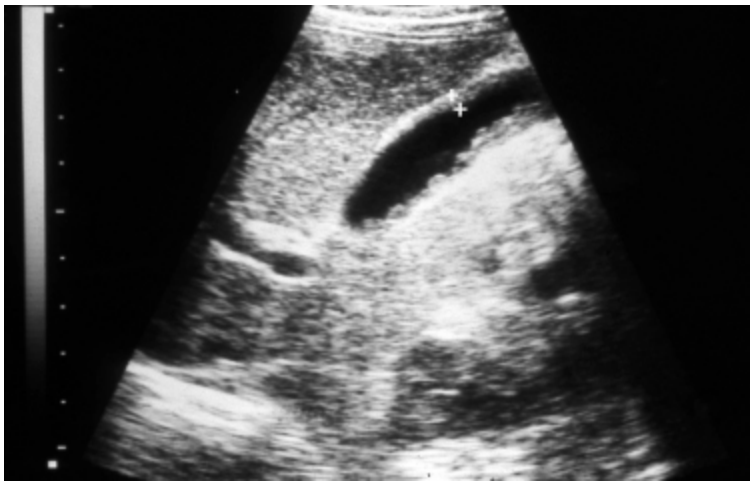
- Diabetic ketoacidosis: check urine for glucose, blood gases
- Mesenteric lymphadenitis: fever, often with associated tonsillitis or pharyngitis
- Peptic ulcer disease: sharp epigastric pain after meals
- Hepatitis: raised liver transaminases ± jaundice; see Chapter 21
- Pancreatitis: high amylase, bilirubin and transaminases may be raised
- Ultrasound: biliary dilatation may be seen in acute pancreatitis
- DNA: *PRSS1* mutations in familial pancreatitis, raised serum amylase and lipase
- Sickle cell anaemia/crisis: blood film shows sickle cells
- Henoch–Schönlein purpura: characteristic vasculitic rash, haematuria or proteinuria
- Acute adrenal failure: hyponatraemia ± hyperkalaemia, check for inappropriate urinary sodium losses

Surgical causes

- Appendicitis: low-grade fever, central then right iliac fossa pain, unable to stand (psoas irritation), beware of atypical symptoms

- Bowel obstruction, e.g. intussusception, volvulus: bilious vomiting, abdominal distension, tenderness
- Trauma, e.g. haematoma, pancreatitis, liver trauma: may present several days after the event. Low haemoglobin, CT scan will identify liver laceration/pancreatic transection or liver abscesses
- Incarcerated hernia: groin or scrotal swelling/discolouration/pain
- Peritonitis: rigid abdomen or distension with tenderness
- Liver abscess: ultrasound – abscess(es) in liver, raised white cell count, blood culture or aspirate from the abscess may grow pathogen (most commonly *Streptococcus* or *Klebsiella*)
- Gallstones/cholecystitis: sickle cell on blood film, raised bilirubin if obstruction, abnormal transaminases, high amylase if the ampulla of Vater is affected, cholesterol or triglycerides may be high, ultrasound – acoustic shadow (Figure 2.1), biliary dilatation if the gallstone is causing obstruction
- Testicular torsion: scrotal swelling, tenderness, discolouration
- Ureteric calculi: colicky pain, macro- or micro-scopic haematuria

Figure 2.1 Ultrasound scan appearance of gallstones with acoustic shadows. The gallbladder wall (marked with crosses) is irregular and thick, consistent with chronic cholecystitis.



Gynaecological causes

- Dysmenorrhoea or endometriosis: prior and/or during menstrual bleed
- Mittelschmerz: mid-cycle colicky pain
- Pelvic inflammatory disease: fever variable

Obstetric causes

- Ectopic pregnancy: sudden onset with shock or peritonism
- Ovarian cyst rupture/torsion
- Miscarriage/abortion/retained foetal products

Drugs/toxins

- Paracetamol overdose
- Iron overdose
- Venoms: spider bite, scorpion sting
- Soap ingestion
- Erythromycin

Referred pain

- Usually musculoskeletal: examine for scoliosis, joint tenderness

Rare causes

- Angioneurotic oedema: episodic, rash or facial/lip swelling – allergy/immunology referral
- Familial Mediterranean fever or systemic lupus erythematosis: episodic fever and raised inflammatory markers with extra-intestinal symptoms – rheumatology referral
- Acute intermittent porphyria: episodic, send urine for porphyrins during an attack
- Peptic ulcer disease – often associated with *Helicobacter pylori* infection

Information: Rome III criteria for functional bowel diseases

- No evidence of an inflammatory, anatomical, metabolic or neoplastic process
- Symptoms: at least once a week for at least 2 months before diagnosis

Functional dyspepsia

- Persistent or recurrent pain or discomfort above the umbilicus
- Not relieved by defecation or associated with the onset of a change in stool frequency or stool form

Irritable bowel syndrome

Abdominal discomfort or pain associated with two or more of the following at least 25% of the time:

- Improved with defecation
- Onset associated with a change in frequency of stool
- Onset associated with a change in form (appearance) of stool

Functional abdominal pain

- Episodic or continuous abdominal pain
- Insufficient criteria for other functional gastrointestinal disorders

Functional abdominal pain syndrome

- Must include: functional abdominal pain at least 25% of the time and either some loss of daily functioning or additional somatic symptoms such as headache, limb pain or difficulty in sleeping

Information: Abdominal migraine

Criteria:

- Two or more times in the preceding 12 months
- Paroxysmal episodes of intense peri-umbilical pain lasting >1 hour
- Intervening periods of usual health lasting weeks to months
- Pain interferes with normal activities
- Pain is associated with two or more of the following:
  - Anorexia
  - Nausea
  - Vomiting
  - Headache
  - Photophobia
  - Pallor

Red flags: When to be concerned about abdominal pain

- Unintentional weight loss
- Growth failure or slowing
- Unexplained fever
- Chronic severe diarrhoea or significant vomiting
- Gastrointestinal bleeding
- Family history of inflammatory bowel disease
- Persistent chronic right iliac fossa or right upper quadrant pain
- Recurrent pancreatitis: consider hereditary pancreatitis or lipidaemia