

## Management of Children with Acute Abdominal Pain Children's Health Services

**Custodian/Review Officer:**

Director—Paediatric Emergency  
Medicine, Children's Health  
Services

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**Applicable To:**

Medical and nursing staff working  
in children's health services

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Children's Health Services

**Name:**

Dr Peter Steer

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**Signature**

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and admission, discharge criteria

**Accreditation References:**

EQulP 5 criteria 1.3.1, 1.4.1,  
1.5.1

### 1. Purpose

This procedure provides clinical practice guidelines to guide clinicians involved in the emergency management of children with acute abdominal pain.

### 2. Scope

This procedure relates to staff involved with the care and management of children with acute abdominal pain.

### 3. Introduction

Abdominal pain is common problem in childhood and is responsible for 5-10% of emergency service presentations each year.<sup>1,2</sup> The pain may be acute, recurrent or chronic.

Abdominal pain usually falls into one of 3 categories:

- visceral (splanchnic)—originates from distension or ischaemia of organs, feels dull and is poorly localised to the midline
- parietal (somatic)—arises from irritation of the parietal peritoneum, is sharper and localises to the inflamed area
- referred pain—where afferent visceral or somatic nerves from distant locations share a common central pathway.<sup>3</sup> For example diaphragmatic irritation leads to shoulder tip pain because the phrenic and shoulder cutaneous nerves converge at the spinal cord around C4.

There are many causes of acute abdominal pain (Table 1). Finding no cause ("non-specific abdominal pain") is common, occurring in up to 15% of emergency visits. Other frequent "medical" causes of abdominal pain in children include gastroenteritis, mesenteric adenitis, constipation and urinary tract infection.<sup>1,4</sup> The more common important surgical conditions include appendicitis, intussusception, bowel obstruction, malrotation/volvulus and suspected testicular or ovarian torsion. In children, surgery is only required in 1-7% of cases of abdominal pain.<sup>2,5</sup> It is important to remember that pneumonia, toxic exposures and diabetic ketoacidosis may also present with acute abdominal pain.



**Table 1: Causes of acute abdominal pain in children**

Surgical	Medical	Obstetric and gynaecological
<ul style="list-style-type: none"> <li>■ Appendicitis</li> <li>■ Bowel obstruction (including intussusception, volvulus)</li> <li>■ Trauma</li> <li>■ Incarcerated hernia</li> <li>■ Peritonitis</li> <li>■ Testicular torsion</li> <li>■ Cholecystitis/cholelithiasis</li> <li>■ Renal tract calculi</li> </ul>	<ul style="list-style-type: none"> <li>■ Gastroenteritis</li> <li>■ Constipation</li> <li>■ Urinary tract infection</li> <li>■ Mesenteric lymphadenitis</li> <li>■ Pneumonia</li> <li>■ Peptic ulcer disease</li> <li>■ Diabetic ketoacidosis</li> <li>■ Inflammatory bowel disease</li> <li>■ Acute adrenal failure</li> <li>■ Pancreatitis</li> <li>■ Henoch-Schönlein purpura</li> <li>■ Porphyria</li> </ul>	<ul style="list-style-type: none"> <li>■ Ectopic pregnancy</li> <li>■ Ovarian cyst rupture/torsion</li> <li>■ Abortion</li> <li>■ Dysmenorrhoea</li> <li>■ Mittelschmerz (mid-cycle pain)</li> <li>■ Pelvic inflammatory disease</li> <li>■ Endometriosis</li> </ul>
<b>Drugs and toxins</b>		<b>Rare</b>
<ul style="list-style-type: none"> <li>■ Venoms</li> <li>■ Iron</li> <li>■ Lead</li> <li>■ Paracetamol</li> <li>■ Erythromycin</li> </ul>		<ul style="list-style-type: none"> <li>■ Angioneurotic oedema</li> <li>■ Familial Mediterranean fever</li> </ul>
		<b>Unknown cause</b>
		<ul style="list-style-type: none"> <li>■ Infantile colic</li> <li>■ Functional bowel disease</li> </ul>

Adapted from: Leung and Sigale<sup>3</sup>

#### 4. Assessment

Paediatric acute abdominal pain is often a diagnostic dilemma. While the vast majority of these episodes are benign and self-limiting, persistent abdominal pain may indicate underlying pathology requiring urgent intervention. Timely assessment and intervention are critical in preventing untoward sequelae in children presenting with acute abdominal pain (Figure 1).

Because of the spectrum of aetiologies that manifest as abdominal pain, the differential diagnosis remains broad and diagnosis can be challenging. In most cases, a thorough history and physical examination can narrow the broad differential. However, depending on the age of the child, additional investigations may be required to delineate diseases that present with similar symptoms. Furthermore, even with the assistance of parents or carers, a comprehensive history is often difficult to obtain, and diagnosis therefore relies heavily on the clinical judgment of the health practitioner.

#### Investigations

Few investigations are required in the assessment of acute abdominal pain. Where the diagnosis is unclear, the need for investigations should be based upon presenting signs/symptoms and clinical findings. A senior emergency medical officer should be consulted prior to the ordering of tests in children with abdominal pain.

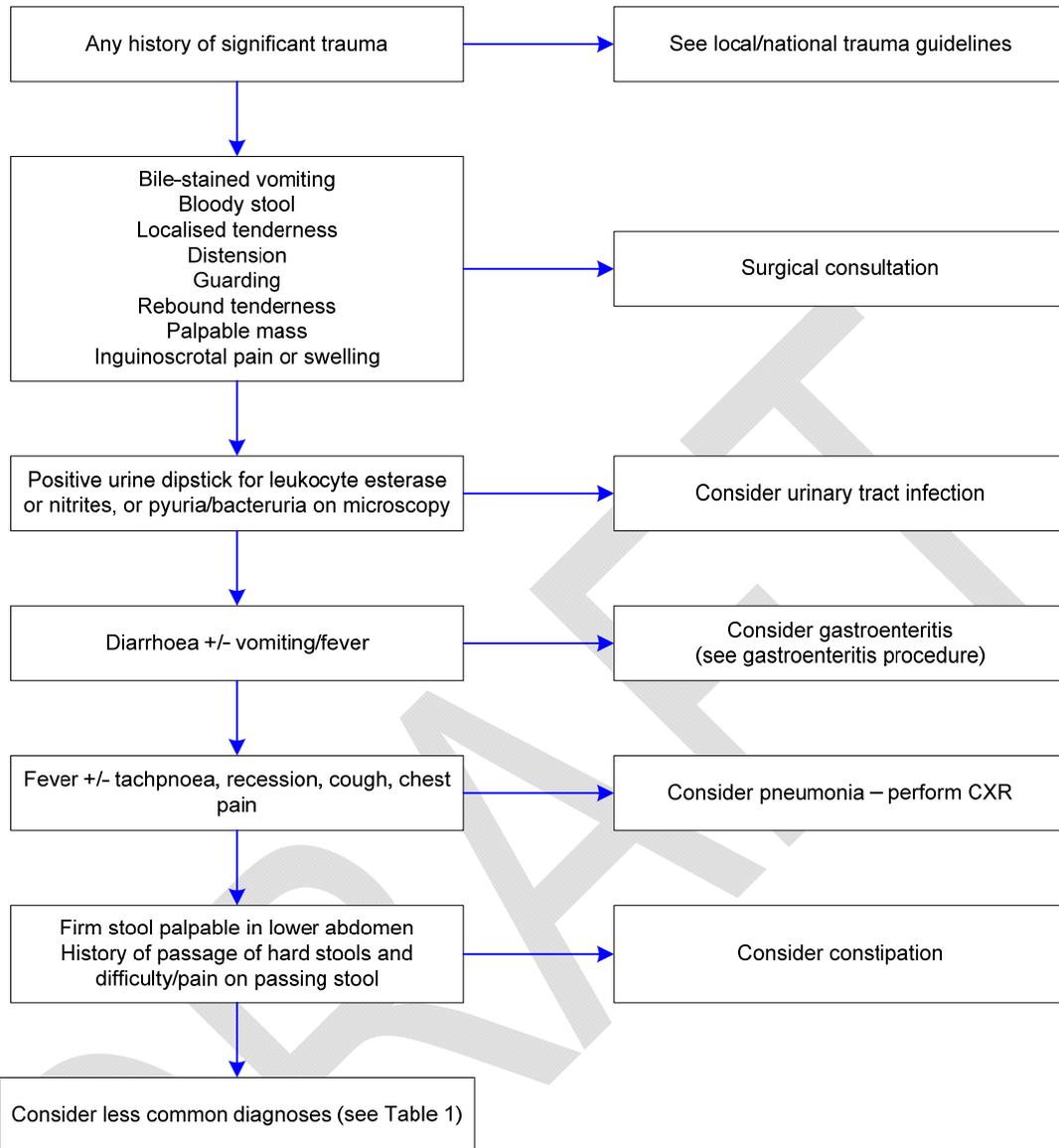
Simple and inexpensive investigations that may be performed to aid in diagnosis include:<sup>4,6,7</sup>

- a urinalysis to help exclude a urinary tract infection
- a blood sugar level to help exclude diabetic ketoacidosis
- a chest x-ray to identify pneumonia-associated abdominal pain if the child has tachypnoea, increased work of breathing, or cough.

Plain film abdominal x-rays are often requested as a screening procedure for children with a non-specific presentation with abdominal pain, however they seldom yield useful information.<sup>8</sup> Abdominal x-rays *should not* be routinely ordered for investigation of abdominal pain or suspected constipation in children. Abdominal x-rays may be of some value when an obstruction or perforation is suspected.



**Figure 1: Assessment and management of children with acute abdominal pain**



Source: Adapted from New South Wales Health<sup>9</sup>

### Pain Assessment

Regrettably, clinicians continue to withhold analgesia from children with acute abdominal pain due to concerns that pain medication may mask physical signs and symptoms and make diagnosis more difficult.<sup>10-12</sup> However, administration of opioids to children with moderate to severe abdominal pain results in a significant reduction of their pain without any significant difference in diagnostic accuracy, and usually aids examination.<sup>11,13-15</sup> Assessment and documentation of pain score (eg. FLACC behavioural pain assessment scale or the faces rating scale) should be used to document pain before and after analgesia, with analgesic medication titrated accordingly.<sup>16-18</sup>

## 5. Management

Management is directed at the underlying cause and should include the following based on the findings of physical examination and investigations:<sup>3,6</sup>

- Pain assessment and documentation with titrated analgesia according to pain requirements.
- Early surgical referral if a surgical condition is suspected. Rectal examination, if indicated, should be done by the surgical doctor as repeated rectal examinations on children usually causes distress without offering any additional useful information.



- Child should remain “nil by mouth” until surgical review or decision that non-surgical cause of pain.
- Investigations as previously described. Use local topical anesthetic cream where possible and obtain blood samples whilst cannulating to avoid unnecessary venipuncture.
- Insertion of nasogastric tube if bilious vomiting or obstruction is suspected. Bile stained vomitus (green) is a surgical emergency and should prompt urgent surgical review.
- If constipation is diagnosed, refer to evidence based guidelines for treatment.

### Pain management

Best practice principles<sup>19</sup> for management of paediatric abdominal pain include:

#### Principle 1

Diagnosis of abdominal pain is not masked or compromised by analgesia therefore analgesia should not be withheld. (Level 1)

#### Principle 2

Pain assessment at triage facilitates appropriate and timely administration of analgesia. Pain assessment score must be documented on initial assessment and re-documented post analgesia. Regular pain assessment facilitates effective pain management in children (Level 1)

#### Principle 3

Analgesia is given as soon as possible within thirty minutes of pain assessment at triage.

#### Principle 4

Appropriate analgesia is given to the child with abdominal pain according to the pain score. Under-dosing of analgesia does not provide effective or timely pain relief. (Level 1)

#### Principle 5

Oral analgesia may be given irrespective of fasting requirements.

#### Principle 6

Non- pharmacological therapies such as distraction and cognitive behaviour interventions are effective in reducing pain in children. (Level 1)

Analgesia is recommended as follows:

MILD PAIN (pain score 1- 3)	MODERATE PAIN (pain score 4- 6)	SEVERE PAIN (pain score 6 and above)
<ul style="list-style-type: none"> <li>■ Paracetamol 15 mg/kg (maximum 1 g) up to 4 hourly (but maximum 4 doses per day)</li> </ul>	<ul style="list-style-type: none"> <li>■ Paracetamol and</li> <li>■ Oxycodone 0.1–0.2 mg/kg (maximum 5mg) 4 to 6 hourly</li> </ul>	<ul style="list-style-type: none"> <li>■ Paracetamol and</li> <li>■ Intranasal fentanyl 1.0 – 1.5 micrograms/kg (maximum 100 mcg/dose)</li> </ul> <p style="text-align: center;"><b>OR</b></p> <ul style="list-style-type: none"> <li>■ Intravenous morphine 0.1 mg/kg maximum 2.5 mg) as initial dose then titrate in 0.05 mg/kg aliquots</li> </ul>

Adapted from: National Health and Medical Research Council<sup>16</sup>

Ibuprofen is not recommended for treatment of abdominal pain as it can contribute to abdominal symptoms and compromise renal function in the event of dehydration. Codeine is not advocated as efficacy is variable in up to 50% of children.<sup>17</sup>



## 6. Disposition

If pain is non-specific and the child is discharged, ensure appropriate follow-up is arranged. Educate the parents/caregivers in regard to pain management, providing reassurance and clear advice about symptoms/signs that should prompt return.<sup>2</sup> Advise the parents/caregivers to keep a record of time, nature and association of future episodes of pain.

Some children may require admission to a children's ward for observation if the clinical diagnosis is unclear and they require ongoing pain management.<sup>4,5</sup>

Children with significant findings need to be referred to a surgical team. If appropriate staff and facilities are unavailable, the child should be transferred to a Level 6 facility.

When a decision is made to transfer a child to Level 6 facility, referral should be made through RSQ.<sup>20</sup>

[Activation of the QLD emergency medical system coordination centre \(QCC\)](#)

Further information on the preparation of a child prior to transport can be obtained through RSQ *Clinical Guidelines* paediatric section (page 31-35).<sup>20</sup>

[Statewide RSQ clinical guidelines—Paediatrics](#)

## 7. Abbreviations

Term	Definition
Children	0-14 years of age
CHS	Children's Health Services
CSCF	Clinical Services Capability Framework
FLACC	Refers to the FLACC Behavioural pain assessment scale—Face, Legs, Activity, Cry, Consolability

## 8. References and Suggested Reading

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## 9. Supporting Documents

- Parent/care [Abdominal Pain in children fact sheet](#)

## 10. Consultation

Key stakeholders who reviewed this version are:

- Director of Paediatric Emergency Medicine, Children's Health Services
- Clinicians (medical, nursing, allied health) working within Level 4, Level 5 and Level 6 Children's Health and Metro Children's Health Services in emergency, inpatient and ambulatory services
- Children's Health Services District clinical leaders — medical, nursing and allied health
- District Chief Executive Officers — Children's Health Services, Metro South, Metro North and West-Moreton Health Service Districts
- Queensland Ambulance Services — Manager Clinical Standards.

### Acknowledgements:

Children's Health Services would like to acknowledge the contribution made by:

- Dr Jason Acworth—Director of Paediatric Emergency Medicine, Children's Health Services
- Donna Franklin—Project Manager SEQ PP, Children's Health Services
- Andrea Hetherington—Project Manager SEQ PP, Children's Health Services
- Dr Adrian Bonsall—Fellow, Emergency Services, Mater Children's Hospital



- Dr Shane George—Medical Officer, Emergency Services, Royal Children’s Hospital
- Shahn Horrocks—Nurse Practitioner, Emergency Services, Gold Coast and Logan Hospitals
- Suzanne Williams—Nurse Practitioner, Emergency Services, Mater Children’s Hospital
- Sharon Bluett—Nurse Educator, Emergency Services, Mater Children’s Hospital
- Rachel Browne—Project Officer/Clinical Nurse Consultant, Ipswich Hospital
- Ange McMillan—Clinical Nurse Facilitator, Emergency Services, Ipswich Hospital.

## 11. Procedure Revision and Approval History

Version No	Modified by	Amendments authorised by	Approved by
1.0	Greater Brisbane metropolitan area clinical procedures working group	Greater Brisbane metropolitan area clinical procedures editorial group	Chief Executive Officer, Children’s Health Services

## 12. Audit / Evaluation Strategy

<b>Level of risk</b>	High
<b>Audit strategy</b>	<ol style="list-style-type: none"> <li>1. Staff survey to evaluate awareness of procedure and emergency management practices</li> <li>2. Observe practice</li> <li>3. Review documentation, i.e. chart audit, to evaluate compliance with procedure</li> </ol>
<b>Audit tool attached</b>	Nil
<b>Audit date</b>	Annual snapshot review (August)
<b>Audit responsibility</b>	Individual Greater Brisbane Metropolitan hospitals, i.e. Ipswich, Logan, Redland, MCH, RCH, TPCH, Redcliffe, Caboolture
<b>Key Elements / Indicators / Outcomes</b>	KPI 1 — greater than 80% staff awareness of procedure KPI 2 — greater than 80% compliance with procedure

