The diagnosis is based on history, examination and selected investigations as clinically indicated.

Most common medical cause is gastroenteritis

Most common surgical cause in appendicitis

Vomiting generally precedes pain in medical conditions; the opposite tends to be true in surgical conditions

Diarrhoea is associated with gastroenteritis and food poisoning

If the diagnosis is not clear after initial evaluation, repeated physical examination by the same physician is useful

Selected imaging may be helpful

Surgical opinion is necessary if a surgical cause is suspected or the cause is not obvious after thorough evaluation

**Pathophysiology**

Abdominal pain falls into 3 categories:

1. Visceral (splanchnic) pain
2. Parietal (somatic) pain
3. Referred pain
<table>
<thead>
<tr>
<th>Type of pain</th>
<th>Visceral</th>
<th>Parietal</th>
<th>Referred</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area affected</td>
<td>Viscus</td>
<td>Parietal peritoneum</td>
<td>Remote area</td>
</tr>
<tr>
<td>Mechanism</td>
<td>Tension, stretching, ischaemia, tissue congestion and inflammation</td>
<td>Ischaemia, inflammation or stretching</td>
<td>Remote area supplied by same dermatome as affected organ</td>
</tr>
<tr>
<td>Nerve pathway</td>
<td>Bilateral unmyelinated fibres enter spinal cord at multiple levels</td>
<td>Unilateral myelinated afferent fibres to specific dorsal root ganglia</td>
<td>Shared central pathways for afferent neurons from different sites</td>
</tr>
<tr>
<td>Characteristics of pain</td>
<td>Dull and poorly localised</td>
<td>Sharp, intense, discrete and localised</td>
<td>As parietal</td>
</tr>
<tr>
<td>Site</td>
<td>Midline Foregut-epigastrium Midgut-periumbilical Hindgut-lower abdominal</td>
<td>Directly over affected viscus, aggravated by coughing or movement</td>
<td>In area supplied by same dermatome e.g. pneumonia presenting as abdominal pain</td>
</tr>
</tbody>
</table>

**Causes of Acute abdominal pain in children**

**Gastrointestinal causes; gastroenteritis, appendicitis, mesenteric adenitis, Constipation, trauma**, intestinal obstruction, intussusception, peritonitis, food poisoning, peptic ulcer, Meckel’s diverticulum, inflammatory bowel disease, lactose intolerance

**Liver, spleen and biliary tract disorders; hepatitis**, cholecystitis, cholelithiasis, splenic infarction, ruptured spleen, pancreatitis

**Genitourinary causes; urinary tract infection**, urinary calculi, dysmenorrhoea, Mittelschmerz, pelvic inflammatory disease, threatened abortion, ectopic pregnancy, ovarian/testicular torsion, endometriosis, haematocolpus

**Metabolic disorders; diabetic ketoacidosis**, hypoglycaemia, porphyria acute renal insufficiency

**Haematological disorders; sickle cell anaemia, Henoch Schonlein Purpura**, haemolytic uraemic syndrome

**Drugs and toxins;** Erythromycin, salicylates, lead poisoning, venoms

**Pulmonary causes; pneumonia**, diaphragmatic pleurisy

**Miscellaneous;** infantile colic, angioneurotic oedema, migraine, non-specific abdominal pain (i.e. other causes excluded)
Clinical Evaluation

History

Age of onset
Pain history: location, character etc
Recent trauma
Precipitating or relieving factors: movement
Associated symptoms: D&V, constipation, pyrexia, urinary symptoms, cough, polyuria, polydipsia, rash, joint pain.
Gynaecological history: menstrual history, sexual activity, and contraception.
Past medical history, family history, drug use

Physical Examination

General appearance, hydration status, degree of pain, temperature, pulse, blood pressure, respiratory rate, oxygen saturation

NB if tachycardia remains after analgesia and/or antipyretics this is an ominous sign and serious pathology must be suspected. This may be a sign of compensated shock, which can decompensate if not treated (see APLS handbook).

Abdominal examination:

Observation

Movement of abdomen, scars from previous surgery, bruising, rashes, distension, visible masses, herniae, visible peristalsis/reverse peristalsis

Palpation

Tenderness, guarding, rebound (percussion tenderness less traumatic to elicit), masses, organomegaly, hernial orifices, femoral pulses, external genitalia, and bowel sounds.

Rectal and pelvic examinations are rarely needed in children and should only be done by the physician or surgeon with ongoing responsibility for the child.

Any bruising in abdominal trauma is significant, as a great deal of force is required to produce bruising on the abdomen.

Other systems should be examined; ENT and cervical lymph nodes, chest, musculoskeletal (HSP, hip pathology), peripheral oedema or rash with HSP

Investigations (if clinically indicated)

- Urinalysis-UTI, HSP, DKA
- FBC-Infecitive causes, blood loss, sickle cell anaemia
- Pregnancy test
- Plain film of abdomen-constipation, obstruction, calculi
• CXR-pneumonia
  Erect chest and supine abdomen – bowel perforation
  Ultrasound-intussusception, pyloric stenosis.
• CT- trauma

**Indications for Surgical Consultation** (SHO may see, but not discharge a child without discussion with Registrar or Consultant)

• Any child who is not settling with analgesia, or in whom there is no obvious aetiology
• Severe or progressive pain
• Evidence of peritonitis or bowel obstruction
• Significant trauma or blood loss

**Management**

**Initial resuscitation**

ABC & DEFG (don’t ever forget glucose)

O2 via face mask if necessary

Analgesia- Paracetamol, Ibuprofen, Diclofenac, Codeine, Morphine

NG tube if necessary

IV fluids – 20ml/kg 0.9% saline for shock
  0.45% saline + 5% dextrose for maintenance

Any child with abdominal pain who requires a fluid bolus, or who requires more than simple analgesia, should be seen by the attending Consultant

Treat underlying cause - refer to Surgeons in SPH or St George’s for very young children

**Reference:**
*American Family Physician June 1st, 2003/Volume 67, Number 11.*