

Infants and Children: Acute Management of Abdominal Pain

Summary Clinical Practice Guidelines for the acute management of infants and children with abdominal pain.

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Audience Emergency Departments; Paediatric Units

Secretary, NSW Health

This Policy Directive may be varied, withdrawn or replaced at any time. Compliance with this directive is mandatory for NSW Health and is a condition of subsidy for public health organisations.

INFANTS AND CHILDREN: ACUTE MANAGEMENT OF ABDOMINAL PAIN

PURPOSE

The *Infants and children: acute management of abdominal pain* clinical practice guideline (attached) has been developed to provide direction to clinicians and is aimed at achieving the best possible paediatric care in all parts of the state.

The clinical practice guideline was prepared for the NSW Ministry of Health by an expert clinical reference group under the auspice of the state wide Paediatric Clinical Practice Guideline Steering Group.

MANDATORY REQUIREMENTS

This policy applies to all facilities where paediatric patients are managed. It requires the Chief Executive's of all Local Health Districts to have local guidelines / protocols based on the attached clinical practice guideline in place in all hospitals and facilities required to assess or manage children with abdominal pain.

The clinical practice guideline reflects what is currently regarded as a safe and appropriate approach to the acute management of abdominal pain in infants and children. However, as in any clinical situation there may be factors which cannot be covered by a single set of guidelines. This document should be used as a guide, rather than as a complete authoritative statement of procedures to be followed in respect of each individual presentation. **It does not replace the need for the application of clinical judgement to each individual presentation.**

IMPLEMENTATION

Chief Executives must ensure:

- Local protocols are developed based on the *Infants and children: acute management of abdominal pain* clinical practice guideline.
- Local protocols are in place in all hospitals and facilities likely to be required to assess or manage paediatric patients with abdominal pain.
- Ensure that all staff treating paediatric patients are educated in the use of the locally developed paediatric protocols.

Directors of Clinical Governance are required to inform relevant clinical staff treating paediatric patients of the revised protocols.

REVISION HISTORY

Version	Approved by	Amendment notes
December 2013 (PD2013_053)	Deputy Director General, Population and Public Health	Second edition
January 2005 (PD2005_385)	Director-General	New policy

ATTACHMENT

1. Infants and children: acute management of abdominal pain – Clinical Practice Guideline.

Infants and children:
Acute Management of Abdominal Pain
second edition

CLINICAL PRACTICE GUIDELINES

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This Clinical Practice Guideline booklet is extracted from the PD2013_053 and as a result, this booklet may be varied, withdrawn or replaced at any time. Compliance with the information in this booklet is mandatory for NSW Health.

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A revision of this document is due in 2016.

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Introduction

These Guidelines are aimed at achieving the best possible paediatric care in all parts of the State. The document should not be seen as a stringent set of rules to be applied without the clinical input and discretion of the managing health professionals. Each patient should be individually evaluated and a decision made as to appropriate management in order to achieve the best clinical outcome.

Field, M.J. & Lohr, K.N. (1990) define clinical practice guidelines as:

*'systematically developed statements to **assist** practitioner and patient decisions about appropriate health care for specific clinical circumstances.'* (Field MJ, Lohr KN (Eds). *Clinical Practice Guidelines: Directions for a New Program*, Institute of Medicine, Washington, DC: National Academy Press)

It should be noted that this document reflects what is currently regarded as a safe and appropriate approach to care. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document should be used as a guide, rather than as a complete authoritative statement of procedures to be followed in

respect of each individual presentation. It does not replace the need for the application of clinical judgment to each individual presentation.

This document represents basic clinical practice guidelines for the assessment and management of infants and children with acute abdominal pain.

Each Local Health District is responsible for ensuring that local protocols based on these guidelines are developed. Local Health Districts are also responsible for ensuring that all staff treating paediatric patients are educated in the use of the locally developed paediatric guidelines and protocols.

In the interests of patient care it is critical that contemporaneous, accurate and complete documentation is maintained during the course of patient management from arrival to discharge.

Parental anxiety should not be discounted: it is often of significance even if the child does not appear especially unwell.

Changes from previous clinical practice guideline

There are no major content changes to this guideline, however, it has been realigned so that the text follows the order of items in the flowchart (algorithm).

A section on appendicitis has been added.

Overview

A child presenting with abdominal pain may be suffering from any of a wide range of conditions. Most will be benign and managed by the Emergency Department staff, paediatricians and general surgeons.

However the small percentage of children with a condition that may require surgical intervention and/or be life-threatening need to be treated with greater urgency than adult patients with equivalent conditions because they often have fewer physiological reserves.

The Surgery for Children project has sought to emphasise urgency and rapid escalation through the provision of template Emergency Department algorithms.

The assessment of a child with a possible complaint of acute abdominal pain may be challenging to the doctor or nurse who first sees the patient, if they primarily see adult patients. In the pre-verbal child, the presence of abdominal pain can only be inferred from the child's behaviour and/or from distension and/or tenderness on examination.

If in doubt or unclear about a child's clinical condition, signs or symptoms, consult with someone more experienced, such as a paediatrician or paediatric surgeon, in addition to the

surgical advice available within the facility of presentation.

If a paediatric specialist is not available or there is a need for higher escalation,

Call NETS hotline: 1300 36 2500

"Paediatric Specialist" means a local or regional paediatrician and/or paediatric surgeon experienced in managing paediatric surgical patients. Such consultation is recommended throughout this document (in some hospitals consultation may be done through their registrars).

If such a specialist is not available, call the Newborn and paediatric Emergency Transport Service (**NETS**) **Hotline: 1300 36 2500**. The paediatric specialist involved may also decide to escalate to NETS. NETS will set up a conference call which includes a paediatric surgeon and other relevant paediatric specialists as well as organise urgent transfer of a child to a paediatric centre if necessary.

Calls to NETS are voice recorded and form part of the NETS medical record for the patient.

NETS may also involve local retrieval teams and other relevant clinicians in the conference call.

Initial management of the child with acute abdominal pain

The assessment of the child with possible abdominal pain should follow the pattern of:

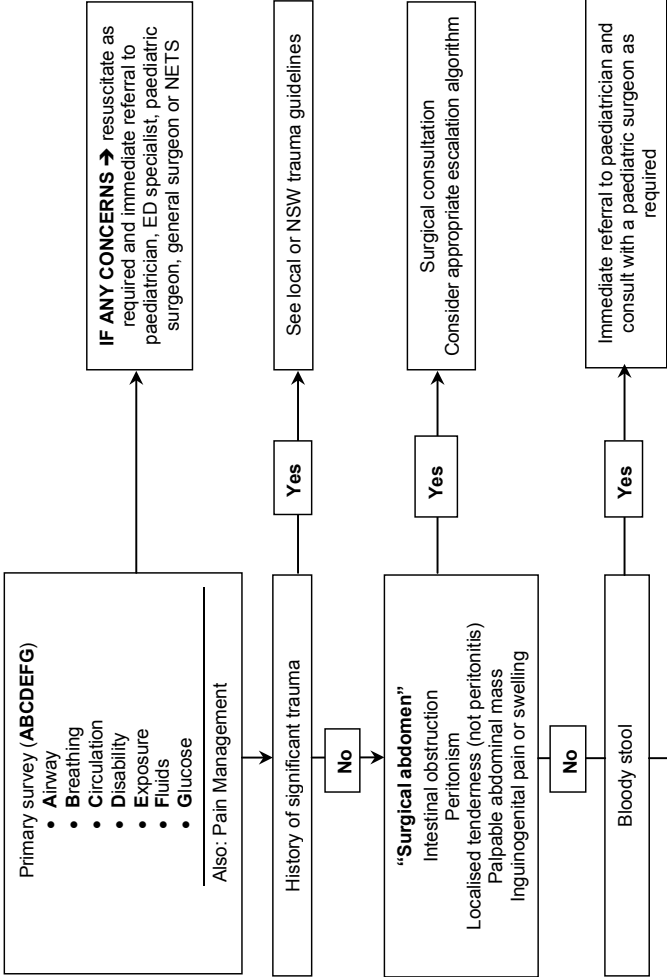
1. Primary survey
 - **A**irway
 - **B**reathing
 - **C**irculation
 - **D**isability
 - **E**xposure
 - **F**luids
 - **G**lucose

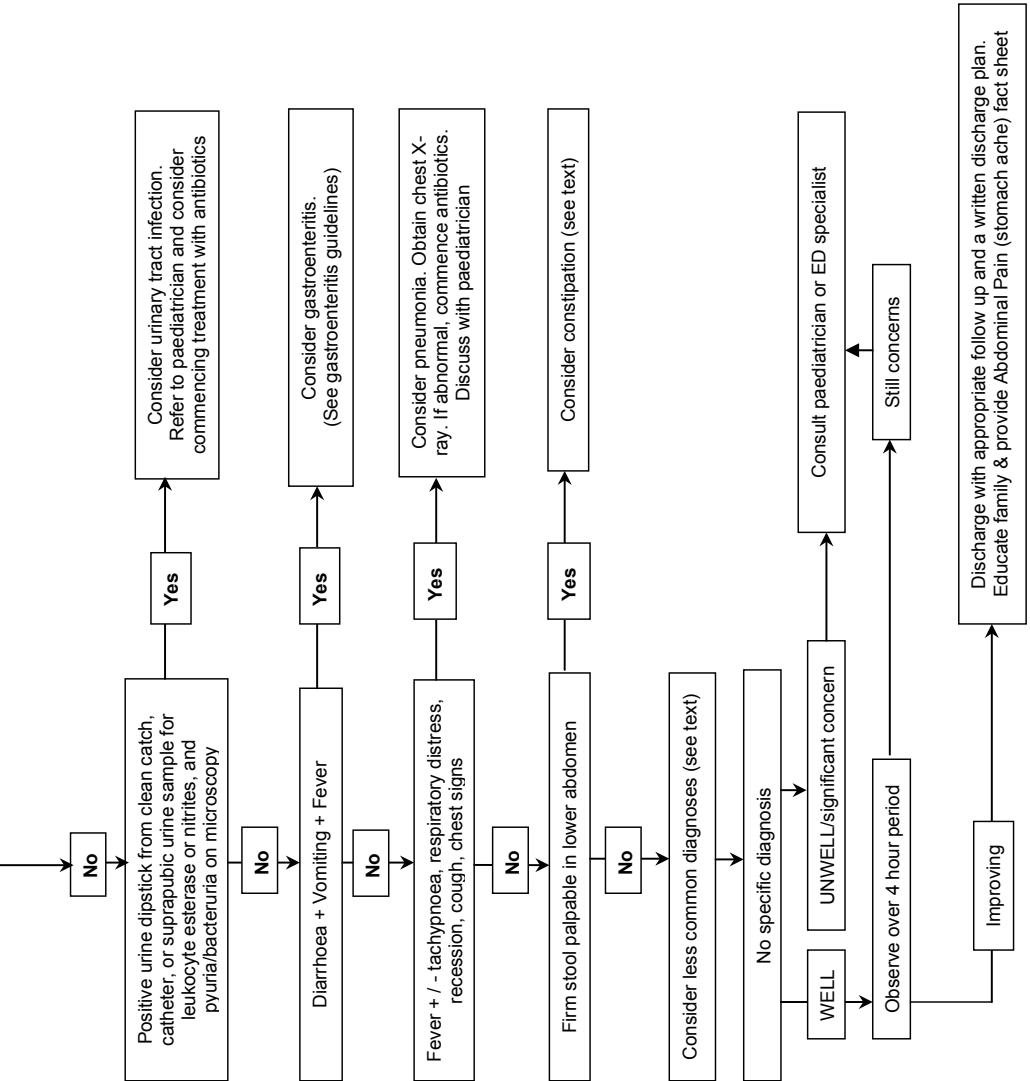
If you have concerns → resuscitation (if required) and refer/consult immediately with a paediatrician and/or paediatric surgeon.

2. Consider pain relief ^{1,2}
3. Take a targeted history (See algorithm on following page)
4. Make a detailed examination
5. Perform appropriate investigations
6. Treatment/referral/follow-up

Abdominal pain algorithm - management of acute abdominal pain in children

Abdominal Pain Algorithm 3,4





Background on questions asked in the flowchart

When and how should I relieve the pain?

Severe abdominal pain should be relieved as soon as possible.^{3,4,14}

There is no evidence to support withholding analgesia for acute abdominal pain in children.⁹

Severe pain is best relieved by intravenous narcotics in small aliquots titrated to effect. Opioid analgesics improve patient comfort, without increasing the risk of errors in diagnosis or treatment, and can be safely given before full assessment and diagnosis in acute abdominal pain. (Level I evidence)¹⁴

An audit of pain management practices and organization in paediatric ED across Australia and New Zealand showed that patients with abdominal pain received analgesia in 62% of cases (opioids in 14%).¹⁰ A notable lack of pain assessment documentation and delays to analgesia was found in the study. All children requiring narcotic analgesia for abdominal pain should have consultation with an Emergency Department specialist, paediatrician or paediatric surgeon. All children receiving narcotics must have constant cardiorespiratory monitoring and observation of vital signs every 15 minutes over a period of one hour. The correct

dose of Naloxone should be calculated and readily available. Infants receiving supplemental oxygen should be monitored for signs of deterioration, in particular respiratory rate. Normal saturation levels may be a compensatory mechanism - the infant may be hypoventilating and in danger of sudden collapse.

As an alternative to IV narcotics, intranasal fentanyl may be used. Studies show early and significant reduction in pain (compared to baseline assessments) was achieved in children using intranasal fentanyl by 10min and sustained throughout the 30min of observations. This raises the possibility of using intranasal fentanyl in children in the pre-hospital setting and may be used as triage nurse initiated administration in the emergency department.^{11,12,13} Less severe pain may be treated with oral analgesics.

Is there evidence of trauma?

- If there is a known history of trauma then local trauma guidelines should be followed.
- If the child is a victim of non-accidental injury then the history may be misleading. One must consider this diagnosis and look for tell tale bruising and/or fractures and/or burns and/or a

history inconsistent with the child's clinical findings.

If non-accidental injury is suspected, child protection history for the child and family should also be checked. Refer to policy directive on Child Wellbeing and Child Protection http://www0.health.nsw.gov.au/policies/pd/2013/pdf/PD2013_007.pdf

Is there a likely acute surgical problem? (“surgical abdomen”)

Does the child have appendicitis?

Appendicitis must be considered as a possible diagnosis in a child presenting with severe abdominal pain. In preschool aged children the symptoms and signs of appendicitis are generally less specific and less well localised, with perforation occurring early in the progress of the condition. Delayed diagnosis has been shown to increase the rate of complications including death. There is usually a history of increasing abdominal pain. Tenderness can be either localized to the right iliac fossa or may be more diffuse. If there is doubt, early referral to a paediatric or experienced adult surgeon is indicated. Appendicitis is essentially a clinical diagnosis and repeated examinations can be helpful. Diagnostic investigations should not delay resuscitation or surgical intervention if indicated.

Does the child have any indicators of intestinal obstruction?

(i) Is there bile-stained vomiting?

This means a definite green colour in the vomit. Sometimes gastric contents can have a yellow tinge. This is not bile staining.

- Bile-stained vomiting means mechanical bowel obstruction until proven otherwise.
- It may be due to volvulus and bowel ischaemia and therefore requires immediate assessment.
- The younger the child, the more likely bile staining in the vomitus is due to obstruction.

(ii) Signs and symptoms of obstruction in children are similar to those of adults but particularly in young children may be more subtle:

- vomiting
- colicky abdominal pain
- absence of normal stooling/flatus
- abdominal distension
- decreased bowel sounds.

(iii) Through the thin-walled abdomens of infants and small children, one may be able to see

- visible distended loops of bowel
- visible peristalsis.

(iv) When thinking about a cause for the obstruction, look for:

- scars; note in children operative

intervention is more often required for adhesive bowel obstruction

- swellings at the site of hernial orifices and of the external genitalia.

Is there any diarrhoea?

Copious amounts of loose stools suggest gastroenteritis but do not exclude other conditions (eg intussusception, pelvic appendicitis, pelvic abscess and inflammatory bowel disease).

NB: Gastroenteritis consists of the triad of vomiting, diarrhoea and fever.⁸

Does the child have other abdominal tenderness?

This is tenderness not associated with peritonitis. Is the tenderness located in the abdominal wall or the abdominal cavity? Is it localised or generalised?

Does the child have peritonitis?

Signs consistent with peritonitis include:

- refusal / inability to walk
- slow walk / stooped forward
- pain on coughing or jolting
- lying motionless
- decreased / absent abdominal wall movements with respiration
- abdominal distension
- abdominal tenderness – localised / generalised
- abdominal guarding / rigidity
- percussion tenderness
- rebound tenderness

- bowel sounds – absent / decreased
- associated non-specific signs – tachycardia, fever.

Symptoms and signs of acute abdominal pathology may be masked by an altered level of consciousness / the presence of shock. Repeat examination after resuscitation or an appropriate interval.

Is there a palpable abdominal mass?

Examination of an abdominal mass should focus on: site, mobility, tenderness, potential relationship to the intestine, mesentery, liver, spleen, pancreas, kidneys or pelvic organs. Examples of conditions with abdominal masses include intussusception (sausage shaped) or neoplasm (eg neuroblastoma), appendicitis, Crohn's disease.

Is there inguino-genital pain or swelling?

(i) Is there an irreducible inguinal hernia?

The inguino-genital region should always be examined in a child presenting with abdominal pain. An irreducible inguinal hernia is a surgical emergency and if suspected, a paediatric or experienced adult surgeon should be consulted immediately.

(ii) If the patient is a male, could he have torsion of the testis?

This pain can often be referred to the abdomen. This is a surgical emergency and if suspected, a paediatric or

experienced adult surgeon should be consulted immediately. An immediate local procedure may be indicated.

Does the stool contain blood?

- Blood mixed with stools may indicate infective diarrhoea. The presence of blood makes it more likely to be bacterial. Ask about travel history and recent antibiotic therapy (pseudomembranous colitis).
- Blood mixed with mucus (redcurrant jelly) suggests intussusception.
- Altered blood (melaena) suggests upper gastrointestinal bleeding.

Other conditions where there can be abdominal pain associated with blood in the stools include:

- Inflammatory bowel disease
- Midgut volvulus (shocked child)
- Henoch schonlein purpura
- Haemolytic uremic syndrome.

Does the child have a urinary tract infection (UTI)?

A urinalysis should be routine for all children presenting with abdominal pain. Urine should be collected from infants by clean catch and by midstream catch from older children. Urgent and less contaminated specimens may be collected from infants by suprapubic aspiration or with a sterile catheter. Babies <3 months old require MCS⁷

If the urinalysis is positive for leukocyte esterase and/or nitrites a UTI is likely and

the specimen must be sent for urgent microscopy and culture.

A urinary tract infection should be treated with appropriate antibiotics and appropriate follow up arranged for the patient with a paediatrician.

Is the problem outside the abdomen?

The chest is not far from the abdomen in children. A lower lobe pneumonia or acute heart failure should be considered if there is fever, cough, tachypnoea, desaturation or consistent clinical signs. Consider a chest X-ray. (NB auscultatory chest signs are often absent in pneumonia in childhood).

Is the child constipated?

Constipation is defined as the progressive accumulation of hard faeces within the rectum associated with increasing difficulty and ultimate failure of the passage of stool.

Although a faecal mass may suggest constipation, this MAY NOT be the cause of the child's pain.

Constipation should not be considered to be the cause of abdominal pain unless a mass of faeces can be felt low in the abdomen. Management should include the use of stool softeners, medical review within two (2) days and referral to a paediatrician. Early follow-up is essential.

Stool softeners: Large dose paraffin, lactulose or Movicol can be used for disimpaction. See NASPGHAN guidelines.⁵

Consultation, escalation, retrieval and transfer issues

In accordance with the LHD established networking arrangements, consultation with an on call specialist paediatrician and/or appropriate other specialist should occur if the infant or child:

- is unstable.
- has no definitive diagnosis.
- has no clear signs of clinical improvement following initial treatment.
- is subject to any suspicion of child protection issues.
- is subject to any degree of concern for a safe patient outcome.
- has significant co-morbidity.
- is considered to have a surgical condition beyond the capacity of the local team.

Clinicians should refer to any relevant local LHD protocols with regard to consultation pathways (within as well as beyond the facility of presentation) and escalation processes.

It is the responsibility of the most senior attending Medical Officer or delegate to assess and determine the need for transfer of a child to a higher level of care, in consultation with the local or network paediatrician on-call and a paediatrician

and / or Emergency Department physician at the receiving hospital. Staff should refer to any local LHD protocols regarding escalation and/or requirements for Medical Officers to attend the patient for assessment.

Urgent/emergency transfer applies to children and adolescents:

- Whose condition is critical, serious or unstable;
- Who are at risk of their clinical condition deteriorating during transport and/or whilst awaiting transfer; or
- Who require intensive care.

NETS (1300 36 2500) is available for paediatric consultation for clinical concerns and advice regarding possible retrieval or transfer. In hospitals where paediatricians and paediatric surgical expertise is not immediately available, early consultation is recommended for children with triage categories 1 and 2 and for children where the diagnosis is not clear or the clinical situation is deteriorating.

Less common diagnoses

Does the child have a known congenital or pre-existing condition that may be related to the abdominal symptoms and signs?

As part of the assessment contact the child's treating specialist to discuss treatment options.

Is there jaundice?

Hepatitis may present with pain due to liver swelling. Rarely children may have a painful obstructive jaundice (e.g. choledochal cyst or gallstones).

Is the child feeding normally?

Poor feeding is a non-specific indicator of serious illness.

Is the patient a post-menarchal female?

Has the adolescent started her periods? If so when was the last normal menstrual period?

Is she sexually active? (Ask the patient on her own. Be aware that there may be a reluctance to disclose).

Strongly consider a serum beta HCG to exclude pregnancy (CONSENT REQUIRED).

Could there be other gynaecological problems?

If history and physical examination are consistent with possible gynaecological problem, refer to a consultant gynaecologist.

Has the child been poisoned or envenomed?

Many toxic agents and some envenomations will cause abdominal symptoms. Some can cause acute abdominal pain (e.g. iron). It is important to ask about a history of possible ingestion and what drugs and other toxic agents are available at home. Some agents will cause characteristic syndromes called toxidromes (e.g. anticholinergics), while others can be measured in the blood (e.g. paracetamol, lithium). It is also important to ask about possible bites and stings. Knowledge of the local venomous creatures is necessary.

Ring the NSW Poisons Information Centre on **13 11 26** 24 hours a day, 7 days a week.

Is there a rash?

Scarlet fever, enteroviruses, Henoch Schonlein Syndrome (HSS) and many other conditions can cause rashes and acute abdominal pain.

Is there an upper respiratory tract infection?

This may cause mesenteric adenitis (lymphadenitis) or non-specific abdominal pain.⁶

Other questions in the diagnosis and management of abdominal pain

When is it necessary to do a rectal examination?

An inspection of the anal and perineal area should be performed, looking for signs of infection, fissures or worms, among other things. Rectal examination should not be performed without first consulting the appropriate surgeon who may wish to perform it themselves to minimise distress to a child.

Appendices

Appendix One – References

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13. Borland ML, Clark L, Esson (2008) A. Comparative review of the clinical use of intranasal fentanyl versus morphine in a paediatric emergency department. *Emergency Medicine Australasia*; 20(6): 515–520.
14. National Institute of Clinical Studies Emergency Care Community of Practice (2008) Pain medication for acute abdominal pain: A summary of best available evidence and information on current clinical practice; *Emergency Care Evidence in Practice Series*

Appendix Two – Resources

More information may be necessary in practice, especially for the management of children with abdominal pain. Possible sources include:

NSW Ministry of Health CIAP web site, PEMSOFT - Acute Abdominal Pain:

<http://pemsoft.ebscohost.com.acs.hcn.com.au/contentUK/confirm.html>

Kilham ,H.,Alexander,S., Wood N., & Isaacs D.,(2009) Paediatrics Manual: The Children's Hospital at Westmead Handbook, (Second Edition) <http://chwh.hcn.com.au/index.php>

NSW Health (October 2008) *Paediatric Surgery Model for Designated Area Paediatric Surgical Sites*

http://www.archi.net.au/documents/resources/hsd/surgery/predictable_surgery/paediatric-surgery.pdf

NSW Health (March 2007) GL2007_006 *Snakebite and Spiderbite Clinical Management Guidelines*

found at http://www.health.nsw.gov.au/policies/gl/2007/GL2007_006.html

NSW Health (June 2010) PD2010_031 *Inter-Facility Transfers of Children and Adolescents Clinical Practice Guidelines* found at:

http://www.health.nsw.gov.au/policies/pd/2010/pdf/PD2010_031.pdf

NSW Health (June 2010) PD2010_032 *Management of Admission of Children and*

Adolescents to Services Designated Level 1-3 Paediatric Medicine & Paediatric Surgery

found at: http://www.health.nsw.gov.au/policies/pd/2010/pdf/PD2010_032.pdf

Appendix Three – Parent Information

An Abdominal Pain (Stomach Ache) Fact Sheet has been jointly developed by The Children's Hospital at Westmead, Sydney Children's Hospital, Randwick and Kaleidoscope Hunter Children's Health Network and is available at:

<http://kidshealth.schn.health.nsw.gov.au/fact-sheets/common-illness/abdominal-pain-stomach-ache>

<http://www.sch.edu.au/health/factsheets/joint/?abdominal.htm>

<http://www.kaleidoscope.org.au/docs/FactSheets/AbdominalPain.pdf>

Appendix Four – Expert working group membership

Dr John Preddy (Chair)

General Paediatrician Visiting Medical Officer, Wagga Wagga Base Hospital

Ms Narelle Boyd

Clinical Nurse Consultant Emergency Department / Critical Care, Formerly Greater Southern Area Health Service Area

Mr Jon Darvill

Paediatric Nurse Educator, Canberra Hospital

Ms Karen Fisher

Formerly GESCHN Liaison Nurse, ACT Health

Dr Hugh Martin

Senior Surgical Visiting Medical Officer, Sydney Children's Hospitals Network (Westmead)

Dr Gerard Roy

Paediatric Surgeon, John Hunter Children's Hospital

Dr Wee Yan Chia

Paediatric Surgeon, Wollongong Hospital

Ms Judith Lissing

Formerly Coordinator, Greater Eastern and Southern Child Health Network

Mr Richard Thode

Formerly Project Officer, Greater Eastern and Southern Child Health Network (2008)

Dr Celine Hamid

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