

AMERICAN ACADEMY OF PEDIATRICS
NORTH AMERICAN SOCIETY FOR PEDIATRIC
GASTROENTEROLOGY, HEPATOLOGY, AND NUTRITION

CLINICAL REPORT

Guidance for the Clinician in Rendering Pediatric Care

Subcommittee on Chronic Abdominal Pain

Chronic Abdominal Pain in Children

ABSTRACT. Children and adolescents with chronic abdominal pain pose unique challenges to their caregivers. Affected children and their families experience distress and anxiety that can interfere with their ability to perform regular daily activities. Although chronic abdominal pain in children is usually attributable to a functional disorder rather than organic disease, numerous misconceptions, insufficient knowledge among health care professionals, and inadequate application of knowledge may contribute to a lack of effective management. This clinical report accompanies a technical report (see page e370 in this issue) on childhood chronic abdominal pain and provides guidance for the clinician in the evaluation and treatment of children with chronic abdominal pain. The recommendations are based on the evidence reviewed in the technical report and on consensus achieved among subcommittee members. *Pediatrics* 2005;115:812–815; *abdominal pain, irritable bowel syndrome, functional bowel disorders.*

ABBREVIATION. ENS, enteric nervous system.

BACKGROUND

Despite decades of clinical observations resulting in numerous articles, books, and monographs, the subject of long-lasting constant or intermittent abdominal pain in childhood remains one of ambiguity and concern for most pediatric health care professionals. The definition of chronic abdominal pain used clinically and in research over the last 40 years has used the criterion of at least 3 pain episodes over at least 3 months interfering with function.¹ In clinical practice, it is generally believed that pain that exceeds 1 or 2 months in duration can be considered chronic. A child who chronically complains of abdominal pain is often a formidable challenge; although the symptom usually indicates a benign problem, the parents may be terribly worried, the child may be in distress, the practitioner may be

concerned about ordering tests to avoid missing serious occult disease, and the family may be enmeshed in psychosocial complexities. Management of this problem can be time consuming and frustrating. Yet, in only a small number of such children is the abdominal pain caused by an underlying organic disease. In most children, the pain is functional, that is, without demonstrable evidence of a pathologic condition such as an anatomic, metabolic, infectious, inflammatory, or neoplastic disorder.

The pathophysiology of functional abdominal pain is thought to involve abnormalities in the enteric nervous system (ENS), a rich and complex nervous system that envelops the entire gastrointestinal tract. The ENS is also known as the “gut brain” or the “little brain in the gut.”² The ENS interacts with the central nervous system, allowing bidirectional communication. A dysregulation of this brain-gut communication plays an important role in the pathogenesis of functional abdominal pain. Most of the research on childhood visceral pain in the 1980s and early 1990s focused on the role of motility disorders and psychiatric abnormalities. Recently, however, more sophisticated diagnostic techniques have failed to identify motor abnormalities severe enough to account for these patients’ symptoms. It is now believed that adults and children with functional bowel disorders, rather than having a baseline motility disturbance, may have an abnormal bowel reactivity to physiologic stimuli (meal, gut distension, hormonal changes), noxious stressful stimuli (inflammatory processes), or psychological stressful stimuli (parental separation, anxiety).³ Additionally, adult patients with functional bowel disorders attending gastrointestinal clinics were often found to have psychological disturbances regardless of the final diagnosis. It was concluded that psychological factors may have been more important in determining health-seeking behavior than the cause of the symptom.⁴

There is growing evidence to suggest that functional abdominal pain disorders may be associated with visceral hyperalgesia, a decreased threshold for pain in response to changes in intraluminal pressure.^{5,6} Mucosal inflammatory processes attributable to infections, allergies, or primary inflammatory diseases may cause sensitization of afferent nerves and

This report was copublished in the *Journal of Pediatric Gastroenterology and Nutrition*, 2005;40:245–248.

The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

doi:10.1542/peds.2004-2497

PEDIATRICS (ISSN 0031 4005). Copyright © 2005 by the American Academy of Pediatrics.

have been associated with the onset of visceral hyperalgesia.⁷ The concept of visceral hyperalgesia may be explained to the patients and family members comparing gut hyperalgesia to what happens when one experiences a burn or a scar: the skin may remain sensitive for prolonged periods of time and perceive as noxious even stimuli that are normally not uncomfortable (such as contact with clothes). There is also an increasing body of evidence in adults suggesting that an abnormal central processing of afferent signals at the level of the central nervous system may play a role in the pathophysiology of this condition.^{8,9}

Functional abdominal pain is the subject of many misconceptions in both the health care and lay communities. A recent survey by the American Academy of Pediatrics and the North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition completed by more than 300 general pediatricians showed that functional abdominal pain was considered an unclear or wastebasket diagnosis by 16% of responders and a specific diagnosis with clear criteria for diagnosis by only 11% of responders (unpublished data). There is ambiguity and confusion with nomenclature as well, with many clinicians using the term “recurrent abdominal pain” to mean functional, psychological, or stress-related abdominal pain. Furthermore, many clinicians are unaware of the different symptom patterns with which functional abdominal pain can present.

The systematic review of the medical literature on chronic abdominal pain in children summarized in the technical report¹⁰ has identified findings that may be surprising to many clinicians. For example, although children with chronic abdominal pain and their parents are more often anxious or depressed than are children without chronic abdominal pain, the presence of anxiety, depression, behavior problems, or recent negative life events does not seem to be useful in distinguishing between functional abdominal pain and abdominal pain attributable to organic disease. Similarly, although children with

chronic abdominal pain are more likely than children without chronic abdominal pain to have headache, joint pain, anorexia, vomiting, nausea, excessive gas, and altered bowel symptoms, the presence of these associated symptoms is unlikely to help the physician discriminate between functional and organic disorders. In contrast, the presence of alarm symptoms or signs (see recommendation 3 below for a list) may suggest a higher likelihood of organic disease and is an indication for the performance of diagnostic tests, whereas in the absence of alarm symptoms, diagnostic studies are unlikely to have a significant yield of organic disease. Furthermore, there is no evidence that emotional or behavioral symptoms predict the clinical course or that families of children with chronic abdominal pain differ in broad areas of family functioning. Although clinicians prescribe a range of treatments, there are only limited or inconclusive studies of pharmacologic or behavioral therapy in children.

RECOMMENDATIONS

1. The term “recurrent abdominal pain” as currently used clinically and in the literature should be retired. Functional abdominal pain is the most common cause of chronic abdominal pain. It is a specific diagnosis that needs to be distinguished from anatomic, infectious, inflammatory, or metabolic causes of abdominal pain. Functional abdominal pain may be categorized as one or a combination of: functional dyspepsia, irritable bowel syndrome, abdominal migraine, or functional abdominal pain syndrome (see Table 1).
2. Functional abdominal pain generally can be diagnosed correctly by the primary care clinician in children 4 to 18 years of age with chronic abdominal pain when there are no alarm symptoms or signs, the physical examination is normal, and the stool sample tests are negative for occult blood, without the requirement of additional diagnostic evaluation.

TABLE 1. Recommended Clinical Definitions of Long-Lasting Intermittent or Constant Abdominal Pain in Children

Chronic abdominal pain	Long-lasting intermittent or constant abdominal pain that is functional or organic (disease-based)
Functional abdominal pain	Abdominal pain without demonstrable evidence of a pathologic condition, such as an anatomic, metabolic, infectious, inflammatory, or neoplastic disorder; functional abdominal pain may present with symptoms typical of functional dyspepsia, irritable bowel syndrome, abdominal migraine, or functional abdominal pain syndrome
Functional dyspepsia	Functional abdominal pain or discomfort in the upper abdomen
Irritable bowel syndrome	Functional abdominal pain associated with alteration in bowel movements
Abdominal migraine	Functional abdominal pain with features of migraine (paroxysmal abdominal pain associated with anorexia, nausea, vomiting, or pallor as well as a maternal history of migraine headaches)
Functional abdominal pain syndrome	Functional abdominal pain without the characteristics of dyspepsia, irritable bowel syndrome, or abdominal migraine

3. The presence of alarm symptoms or signs, including but not limited to involuntary weight loss, deceleration of linear growth, gastrointestinal blood loss, significant vomiting, chronic severe diarrhea, persistent right upper or right lower quadrant pain, unexplained fever, family history of inflammatory bowel disease, or abnormal or unexplained physical findings, is generally an indication to pursue diagnostic testing for specific anatomic, infectious, inflammatory, or metabolic etiologies on the basis of specific symptoms in an individual case. Significant vomiting includes bilious emesis, protracted vomiting, cyclical vomiting, or a pattern worrisome to the physician. Alarm signs on abdominal examination include localized tenderness in the right upper or right lower quadrants, a localized fullness or mass effect, hepatomegaly, splenomegaly, costovertebral angle tenderness, tenderness over the spine, and perianal abnormalities.
4. Testing may also be performed to reassure the patient, parent, and physician of the absence of organic disease, particularly if the pain significantly diminishes the quality of life of the patient.
5. The child with functional abdominal pain is best evaluated and treated in the context of a biopsychosocial model of care. Although psychological factors do not help the clinician distinguish between organic (disease-based) and functional pain, it is important to address these factors in the diagnostic evaluation and management of these children.
6. Education of the family is an important part of treatment of the child with functional abdominal pain. It is often helpful to summarize the child's symptoms and explain in simple language that although the pain is real, there is most likely no underlying serious or chronic disease. It may be helpful to explain that chronic abdominal pain is a common symptom in children and adolescents, yet few have a disease. Functional abdominal pain can be likened to a headache, a functional disorder experienced at some time by most adults, which very rarely is associated with serious disease. It is important to provide clear and age-appropriate examples of conditions associated with hyperalgesia, such as a healing scar, and manifestations of the interaction between brain and gut, such as the diarrhea or vomiting children may experience during stressful situations (eg, before school examinations or important sports competitions).
7. It is recommended that reasonable treatment goals be established, with the main aim being the return to normal function rather than the complete disappearance of pain. Return to school can be encouraged by identifying and addressing obstacles to school attendance.
8. Medications for functional abdominal pain are best prescribed judiciously as part of a multifaceted, individualized approach to relieve symptoms and disability. It is reasonable to consider the time-limited use of medications that might help to decrease the frequency or severity of symptoms. Treatment might include acid-reduction therapy for pain associated with dyspepsia; antispasmodic agents, smooth muscle relaxants, or low doses of psychotropic agents for pain or nonstimulating laxatives or antidiarrheals for pain associated with altered bowel pattern.
9. Additional research is needed to fill the large gaps of knowledge on chronic abdominal pain in children.

FUTURE RESEARCH

Research on chronic abdominal pain in children should incorporate several methodologic features to generate higher-quality evidence for future clinical practice guidelines. The following specific suggestions are made:

1. Symptom phenotypes of study patients should be described in detail, including not only abdominal pain (intensity, frequency, duration, location) but also associated gastrointestinal and other symptoms.
2. Investigators should specify how eligibility criteria were assessed for research participation.
3. Investigators should specify the work-up performed and provide details of the organic conditions found as part of the diagnostic investigation.
4. Validated outcome measures should be used to assess global improvement and changes in individual symptoms.
5. Potential differences in illness course and treatment response should be examined for patients with different symptom phenotypes.
6. Diverse populations should be investigated, including patients in primary care, community controls, and children from different cultural and ethnic groups.
7. The Rome II criteria¹¹ (see Table 6 of the technical report¹⁰) should be validated in a range of clinical settings and populations to determine the utility of the criteria in making clinically useful distinctions between individuals and groups of patients.

In view of the paucity of published literature on therapeutic approaches to this condition, there is an urgent need for trials of all currently used interventions in children with functional abdominal pain. We support the statement of the Functional Bowel Disorders Working Group Report of the First World Congress of Pediatric Gastroenterology, Hepatology, and Nutrition meeting that "there is a need to develop drugs to modulate abnormalities in sensorimotor function of the enteric nervous system in functional disorders to relieve specific symptoms and to assess the proper role of these drugs in the treatment of children and adolescents" and "the role of antidepressants (tricyclics, selective serotonin reuptake inhibitors) in the treatment of functional gastrointestinal disorders associated with abdominal pain needs to be assessed."¹²(pS113) The Rome II working teams also agreed with this need, recommending guidelines for clinical trial research.¹³

SUBCOMMITTEE ON CHRONIC ABDOMINAL PAIN
Carlo Di Lorenzo, MD, Co-chairperson
Richard B. Colletti, MD, Co-chairperson

Harold P. Lehmann, MD, PhD
John T. Boyle, MD
William T. Gerson, MD
Jeffrey S. Hyams, MD
Robert H. Squires, Jr, MD
Lynn S. Walker, PhD

STAFF

Pamela T. Kanda, MPH

ACKNOWLEDGMENT

The Subcommittee on Chronic Abdominal Pain thanks Dr James Boland for insightful suggestions and enthusiastic participation in the initial phase of this project.

REFERENCES

1. Apley J. The child with recurrent abdominal pain. *Pediatr Clin North Am.* 1967;14:63-72
2. Cooke HJ. Role of the "little brain" in the gut in water and electrolyte homeostasis. *FASEB J.* 1989;3:127-138
3. Drossman DA, Camilleri M, Mayer EA, Whitehead WE. AGA technical review on irritable bowel syndrome. *Gastroenterology.* 2002;123:2108-2131
4. Whitehead WE, Bosmajian L, Zonderman AB, Costa PT Jr, Schuster MM. Symptoms of psychologic distress associated with irritable bowel syndrome. Comparison of community and medical clinic samples. *Gastroenterology.* 1988;95:709-714
5. Van Ginkel R, Voskuil WP, Benninga MA, Taminiau JA, Boeckstaens GE. Alterations in rectal sensitivity and motility in childhood irritable bowel syndrome. *Gastroenterology.* 2001;120:31-38
6. Di Lorenzo C, Youssef NN, Sigurdsson L, Scharff L, Griffiths J, Wald A. Visceral hyperalgesia in children with functional abdominal pain. *J Pediatr.* 2001;139:838-843
7. Talley NJ, Spiller R. Irritable bowel syndrome: a little understood organic bowel disease? *Lancet.* 2002;360:555-564
8. Mertz H. Role of the brain and sensory pathways in gastrointestinal sensory disorders in humans. *Gut.* 2002;51:129-133
9. Naliboff BD, Derbyshire SW, Munakata J, et al. Cerebral activation in patients with irritable bowel syndrome and control subjects during rectosigmoid stimulation. *Psychosom Med.* 2001;63:365-375
10. American Academy of Pediatrics, Subcommittee on Chronic Abdominal Pain; North American Society for Pediatric Gastroenterology, Hepatology, and Nutrition. Chronic abdominal pain in children. *Pediatrics.* 2005;115:e370-e381
11. Rasquin-Weber A, Hyman PE, Cucchiara S, et al. Childhood functional gastrointestinal disorders. *Gut.* 1999;45(suppl 2):II60-II68
12. Hyams J, Colletti R, Faure C, et al. Functional gastrointestinal disorders: Working Group Report of the First World Congress of Pediatric Gastroenterology, Hepatology, and Nutrition. *J Pediatr Gastroenterol Nutr.* 2002;35(suppl 2):S110-S117
13. Veldhuyzen van Zanten SJ, Talley NJ, Bytzer P, Klein KB, Whorwell PJ, Zinsmeister AR. Design of treatment trials for functional gastrointestinal disorders. *Gut.* 1999;45(suppl 2):II69-II77

All clinical reports from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

Chronic Abdominal Pain in Children

Pediatrics 2005;115;812

DOI: 10.1542/peds.2004-2497

Updated Information & Services

including high resolution figures, can be found at:
<http://pediatrics.aappublications.org/content/115/3/812>

References

This article cites 13 articles, 2 of which you can access for free at:
<http://pediatrics.aappublications.org/content/115/3/812#BIBL>

Subspecialty Collections

This article, along with others on similar topics, appears in the following collection(s):

Current Policy

http://www.aappublications.org/cgi/collection/current_policy

Subcommittee on Chronic Abdominal Pain

http://www.aappublications.org/cgi/collection/subcommittee_on_chronic_abdominal_pain

Gastroenterology

http://www.aappublications.org/cgi/collection/gastroenterology_sub

Permissions & Licensing

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:

<http://www.aappublications.org/site/misc/Permissions.xhtml>

Reprints

Information about ordering reprints can be found online:

<http://www.aappublications.org/site/misc/reprints.xhtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

Chronic Abdominal Pain in Children

Pediatrics 2005;115;812

DOI: 10.1542/peds.2004-2497

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/115/3/812>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2005 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

