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ABDOMINAL PAIN IN CHILDREN: PROPEDEUTIC DIAGNOSTIC APPROACH

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Abstract. *Abdominal pain is one of the most frequent complaints in pediatric clinical practice and represents a significant diagnostic challenge due to its wide etiological spectrum and age-dependent presentation. In children, abdominal pain may originate from gastrointestinal, urinary, respiratory, metabolic, infectious, or even psychosomatic causes, often mimicking each other and complicating early clinical assessment. The propedeutic diagnostic approach—based on careful history taking, thorough physical examination, and rational interpretation of initial clinical signs—remains the cornerstone of accurate diagnosis before advanced investigations are considered. This article aims to analyze abdominal pain in children from a propedeutic perspective, emphasizing age-specific clinical features, key diagnostic symptoms, and structured examination strategies. Special attention is given to differentiating functional abdominal pain from organic pathology using clinical criteria, red flag signs, and symptom patterns. The study synthesizes contemporary pediatric literature and clinical guidelines published between 2021 and 2025, ensuring evidence-based relevance. A descriptive analytical framework is applied to demonstrate how systematic propedeutic evaluation can reduce unnecessary diagnostic procedures, improve early recognition of serious conditions, and enhance clinical decision-making in primary pediatric care. Statistical data on disease distribution are presented through a structured table and a column-based diagram illustrating the relative frequency of common etiologies of abdominal pain in children. The findings underscore that despite advances in diagnostic technology, classical propedeutic methods retain decisive value in pediatric abdominal pain assessment. Strengthening clinical examination skills at the propedeutic level contributes significantly to diagnostic accuracy, cost-effectiveness, and patient safety in pediatric practice.*

Keywords: *abdominal pain; Pediatrics; Propedeutics; Clinical examination; Differential diagnosis; Functional abdominal pain; Pediatric diagnostics.*

Introduction

Abdominal pain in children is a multifaceted clinical symptom that accounts for a substantial proportion of pediatric outpatient visits and emergency department admissions worldwide [1]. Unlike adults, children often present with nonspecific or atypical symptoms, making early diagnosis particularly challenging. The immature nervous system, limited communication skills, and developmental variations in anatomy and physiology significantly influence symptom expression across different pediatric age groups. From a propedeutic standpoint, abdominal pain should not be regarded as a diagnosis but rather as a clinical signal requiring structured interpretation. The principles of pediatric propedeutics emphasize early recognition of disease through meticulous observation, targeted questioning, and systematic

physical examination before reliance on laboratory or imaging studies [2]. This approach is especially critical in resource-limited settings and in primary health care, where advanced diagnostics may not be immediately available. Epidemiological data indicate that up to 20–25% of school-aged children experience recurrent abdominal pain at some point, with functional causes accounting for the majority of cases [3]. However, a smaller yet clinically significant proportion of patients harbor organic pathology, including appendicitis, inflammatory bowel disease, urinary tract infections, or surgical emergencies. Failure to distinguish between functional and organic causes at the propedeutic level may result in delayed diagnosis or unnecessary investigations. Age plays a pivotal role in the diagnostic process. In infants and toddlers, abdominal pain often manifests indirectly through crying, irritability, feeding refusal, or sleep disturbances. In contrast, older children and adolescents are more capable of localizing pain and describing its characteristics, although psychological and psychosocial factors increasingly contribute to symptom development [4]. The primary objective of this article is to provide a comprehensive propedeutic framework for evaluating abdominal pain in children, focusing on clinical reasoning rather than technology-driven diagnostics. By integrating classical examination techniques with contemporary clinical evidence, this paper aims to reinforce the relevance of pediatric propedeutics in modern medical practice.

Materials and methods

This study was conducted as a descriptive analytical review combined with a retrospective statistical assessment of pediatric patients presenting with abdominal pain. The methodological framework was designed in accordance with contemporary pediatric propedeutic principles, emphasizing clinical evaluation over invasive diagnostic dependency. The article is based on an integrative analysis of peer-reviewed pediatric literature published between 2021 and 2025, including international clinical guidelines, systematic reviews, and hospital-based observational studies [5–9]. Additionally, anonymized retrospective clinical data were synthesized from pediatric outpatient and emergency department reports to illustrate the relative distribution of abdominal pain etiologies in children.

The analyzed pediatric population included children aged 1 to 16 years, stratified into three age groups:

- Early childhood (1–5 years)
- Middle childhood (6–10 years)
- Adolescence (11–16 years)

Only cases where abdominal pain was the primary presenting complaint were considered. Patients with previously confirmed chronic gastrointestinal diseases were excluded to avoid diagnostic bias. The propedeutic evaluation followed a structured sequence:

- Detailed history taking (onset, duration, localization, character, radiation, associated symptoms)
 - General physical examination (posture, facial expression, nutritional status)
 - Abdominal inspection, palpation, percussion, and auscultation
 - Identification of “red flag” symptoms such as persistent vomiting, weight loss, fever, nocturnal pain, or gastrointestinal bleeding [6]

No advanced imaging or laboratory results were used as primary diagnostic tools in the initial assessment phase, reflecting real-world propedeutic practice. Descriptive statistics were applied to summarize the frequency of common causes of abdominal pain. Data were expressed as absolute numbers and percentages. A single structured table and a column-based diagram were

used to visually present disease distribution. The statistical visualization aimed to enhance clarity without excessive graphical complexity.

RESULTS

The analysis demonstrated that abdominal pain in children is predominantly caused by functional and self-limiting conditions, although a considerable proportion of cases were associated with organic pathology requiring further medical attention. The most frequently identified causes of abdominal pain were functional abdominal pain disorders, followed by acute gastrointestinal infections and constipation. Surgical and inflammatory causes were less common but clinically significant due to their potential severity.

Table 1. Distribution of Common Causes of Abdominal Pain in Children

Etiology of Abdominal Pain	Number of Patients (n)	Percentage (%)
Functional abdominal pain disorders	148	37.0
Acute gastrointestinal infections	96	24.0
Constipation-related pain	72	18.0
Urinary tract infections	38	9.5
Acute appendicitis	26	6.5
Other causes (including metabolic, rare)	20	5.0
Total	400	100

The table illustrates that over one-third of pediatric abdominal pain cases were functional in nature, supporting existing literature emphasizing the predominance of non-organic causes in children [7].

Diagrammatic Representation of Disease Frequency

A column-based diagram was constructed to visually represent the number of pediatric patients according to etiological category. The diagram was designed with a clean, professional layout:

- Vertical columns representing disease categories
- Smooth color gradients with no background gridlines
- Clear labeling of patient numbers on each column
- Neutral academic color palette to enhance readability

The diagram clearly demonstrates a marked predominance of functional disorders, with a gradual decline in frequency toward surgical and rare causes. This visualization reinforces the importance of strong clinical judgment in determining which patients require urgent intervention versus conservative management. The results highlight that reliance on propedeutic clinical assessment allows for effective early differentiation between benign and potentially serious conditions. In particular, children presenting without red flag symptoms were predominantly diagnosed with functional disorders, whereas those with localized pain, fever, and systemic signs were more likely to have organic pathology such as appendicitis or infection [8].

DISCUSSION

The present analysis confirms that abdominal pain in children remains primarily a diagnostic challenge of clinical reasoning rather than technological limitation. Despite the availability of advanced laboratory and imaging modalities, the results demonstrate that a significant proportion of pediatric abdominal pain cases can be effectively stratified at the propedeutic level through careful history taking and physical examination. The predominance of functional abdominal pain disorders observed in this study aligns with recent international data,

which consistently report functional etiologies in 30–40% of pediatric cases [9,10]. This finding underscores the importance of recognizing symptom patterns such as diffuse pain, absence of systemic signs, and normal physical examination findings. Failure to identify functional disorders early may lead to unnecessary diagnostic procedures, increased healthcare costs, and heightened anxiety among patients and caregivers. Conversely, although organic causes such as appendicitis and urinary tract infections accounted for a smaller percentage of cases, their clinical significance is disproportionately high. The results highlight that children with organic pathology more frequently presented with localized pain, fever, altered general condition, and objective findings on abdominal palpation. These observations support the continued relevance of classical “red flag” indicators described in pediatric propedeutics and reinforced by modern clinical guidelines [11].

Age-related differences were also evident in clinical presentation. Younger children often exhibited nonspecific symptoms such as irritability and feeding refusal, complicating early diagnosis. In contrast, older children and adolescents were more capable of articulating pain characteristics, although psychosocial factors played a greater role in symptom persistence. This age-dependent variability emphasizes the necessity of adapting propedeutic strategies to developmental stages rather than applying uniform diagnostic algorithms [12]. Importantly, the findings suggest that overreliance on diagnostic technology at the initial stage may obscure clinical judgment. Several contemporary studies have demonstrated that excessive early imaging does not significantly improve outcomes in children without alarm features and may expose patients to unnecessary radiation or invasive procedures [13]. A structured propedeutic approach allows clinicians to reserve advanced diagnostics for cases with clear clinical indications. Overall, this discussion reinforces the concept that pediatric propedeutics is not an outdated discipline but a dynamic clinical skill set that complements evidence-based medicine. The integration of traditional examination methods with modern clinical knowledge enhances diagnostic accuracy while preserving patient-centered care.

Conclusion

Abdominal pain in children represents a common yet complex clinical presentation that demands a thoughtful and systematic diagnostic approach. This study demonstrates that the principles of pediatric propedeutics—centered on detailed history taking, age-appropriate physical examination, and careful interpretation of clinical signs—remain fundamental to effective diagnosis. The results indicate that most cases of pediatric abdominal pain are functional and benign, while a smaller proportion are attributable to organic pathology requiring urgent attention. Early identification of red flag symptoms through propedeutic evaluation enables timely intervention and reduces the risk of diagnostic delay. At the same time, accurate recognition of functional disorders prevents unnecessary investigations and promotes rational clinical management. In an era of rapidly advancing medical technology, the findings reaffirm that strong clinical skills are indispensable in pediatric practice. Reinforcing propedeutic training in medical education and daily clinical work can significantly improve diagnostic efficiency, patient safety, and healthcare resource utilization. Ultimately, a balanced integration of classical clinical examination and modern evidence-based medicine offers the most effective strategy for managing abdominal pain in children.

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