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Clinical Features and Management of Chronic Abdominal Pain Syndrome in Children: A Multifactorial Approach

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Annotation: Chronic abdominal pain syndrome (CAPS) in children is common, disabling, and largely functional in origin. It arises from the interaction of biological factors (visceral hypersensitivity, altered motility, mucosal immune activation, microbiota changes), psychological factors (anxiety, depression, stress reactivity), and social factors (family responses, school stressors), within the framework of disorders of gut–brain interaction. This article reviews clinical presentation, red flags and differential diagnosis, practical evaluation strategies that minimize unnecessary testing, and evidence-informed management emphasizing a biopsychosocial model. Multimodal treatment—education and reassurance, graded return to function, targeted dietary measures, microbiota modulation, psychological therapies (CBT, gut-directed hypnotherapy), and judicious pharmacotherapy—improves symptoms and quality of life while reducing health-care utilization.

Key Words: Chronic abdominal pain, children, functional abdominal pain disorders, biopsychosocial model, gut–brain axis, Rome IV, cognitive-behavioral therapy, hypnotherapy, low-FODMAP, probiotics

Main Part: Chronic abdominal pain in pediatrics is defined as recurrent or continuous abdominal pain lasting ≥2 months and interfering with daily activities. Most children meet Rome IV criteria for functional abdominal pain disorders (FAPD)—functional dyspepsia, irritable bowel syndrome (IBS), abdominal migraine, or functional abdominal pain–not otherwise specified—without structural disease. A smaller subset has organic etiologies (e.g., celiac disease, inflammatory bowel disease, peptic disease, biliary or pancreatic pathology).

Clinical Features: Typical features include periumbilical or epigastric pain, often daily or near-daily, fluctuating in intensity, and associated with nausea, early satiety, bloating, altered stool form/frequency, headaches, and sleep disturbance. Pain amplification by stress, school attendance, or meals is frequent. Functional disability may exceed objective disease markers. Psychosocial comorbidities (anxiety, low mood, somatic symptom tendency) are common and correlate with pain severity and school absenteeism.

Red flags: necessitating targeted investigation include involuntary weight loss or deceleration of growth, gastrointestinal bleeding, persistent fever, profuse/chronic diarrhea, nocturnal pain that wakes the child, persistent vomiting, localized right upper/lower quadrant pain, family history of IBD/celiac/peptic ulcer, unexplained anemia, and abnormal physical findings (focal tenderness, organomegaly, perianal disease).

Pathophysiology: A Multifactorial Model

CAPS reflects dysregulation along the gut–brain axis: visceral hypersensitivity, impaired descending pain inhibition, dysmotility, mucosal immune activation with low-grade

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inflammation (e.g., mast cells near enteric nerves), increased intestinal permeability, and altered microbiota composition and metabolites. Psychosocial stressors activate the HPA axis and autonomic pathways, increasing arousal and pain vigilance. Parental attention to symptoms and school avoidance can inadvertently maintain disability. The model implies treatment must address biology, behavior, and context.

Evaluation: A careful history and examination are the primary tools. In the absence of red flags, limited tests suffice: complete blood count, CRP/ESR, celiac serology (tTG-IgA with total IgA), basic metabolic profile, and stool calprotectin if diarrhea or IBD concern. Further studies (abdominal ultrasound, Helicobacter pylori testing, endoscopy) are reserved for selected presentations guided by symptoms and red flags. Over-testing can medicalize benign pain, increase anxiety, and rarely changes management.

Positive diagnosis is encouraged: explain FAPD/IBS mechanisms and validate the child's pain as real but reversible, shifting goals from "pain elimination" to **restoration of function** and quality of life.

Management: A Multimodal, Stepwise Plan

1. **Education, Reassurance, and Function-First Goals**

Pain neuroscience education linking stress, gut sensitivity, and real pain; written action plans; graded return to school, sleep normalization, and activity pacing. Use brief, frequent follow-ups to reinforce progress.

2. **Lifestyle and Dietary Measures**

Regular meals; adequate fluids; age-appropriate fiber from foods; limit ultra-processed foods, caffeine, and excess fructose.

- For IBS: a **targeted** low-FODMAP trial (2–4 weeks) under dietitian guidance, followed by structured reintroduction to identify triggers.
- For dyspepsia: small frequent meals; trial of acid suppression if prominent epigastric burning.
- Identify and treat constipation aggressively (osmotic laxatives, toileting routines).

3. **Microbiota-Directed Therapies**

Probiotics (e.g., *Lactobacillus rhamnosus GG*, *Bifidobacterium* spp.) may reduce pain frequency and intensity in FAPD/IBS; consider a 4–8-week trial. Some children benefit from partially hydrolyzed guar gum or other prebiotics; evidence is modest but favorable in selected cases.

4. **Psychological Therapies**

Cognitive-behavioral therapy (CBT) targeting catastrophizing, avoidance, and coping skills has robust evidence for pain and disability reduction.

Gut-directed hypnotherapy shows durable benefits, including home-based digital protocols. Brief relaxation training, diaphragmatic breathing, and mindfulness can be taught in clinic and reinforced at home. Engage families to reduce reinforcement of illness behaviors.

5. **Pharmacotherapy (selective, time-limited)**

- **Antispasmodics** (e.g., hyoscine) or **peppermint oil** for cramping pain.
- **Acid suppression** (short PPI/H2RA course) for dyspeptic phenotypes.

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- **Neuromodulators** at low dose in refractory cases under specialist care: tricyclics (amitriptyline) for IBS-pain/sleep, cyproheptadine for early satiety/functional dyspepsia (younger children), or SSRIs when anxiety/depression predominate. Regularly reassess need; use shared decision-making and safety monitoring.

6. **Comorbidity and Context**

Screen and treat headaches, sleep problems, and mood/anxiety disorders. Coordinate with school for attendance plans and accommodations. Encourage regular physical activity.

Outcomes and Follow-Up

Most children improve with multimodal care; early restoration of routine and targeted psychosocial support predicts better outcomes. Set expectations for fluctuating symptoms and emphasize self-management skills. Use brief validated tools (e.g., Functional Disability Inventory) to track progress beyond pain scores.

Conclusion

Chronic abdominal pain in children is best understood—and treated—through a multifactorial lens that integrates biology, behavior, and environment. A positive, function-focused diagnosis; limited, judicious testing; and a personalized combination of education, dietary optimization, microbiota support, psychological therapy, and selective pharmacologic neuromodulation form the core of effective care. When clinicians partner with families and schools to reduce disability, build coping skills, and address comorbidities, most children achieve meaningful symptom relief, normalized function, and durable improvements in quality of life. Future directions include precision phenotyping (including microbiome and psychophysiologic profiling), scalable digital CBT/hypnotherapy, and trials that prioritize functional recovery as the primary outcome.

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