Gut-Brain Axis: Unveiling its Role in Teen Mental Health

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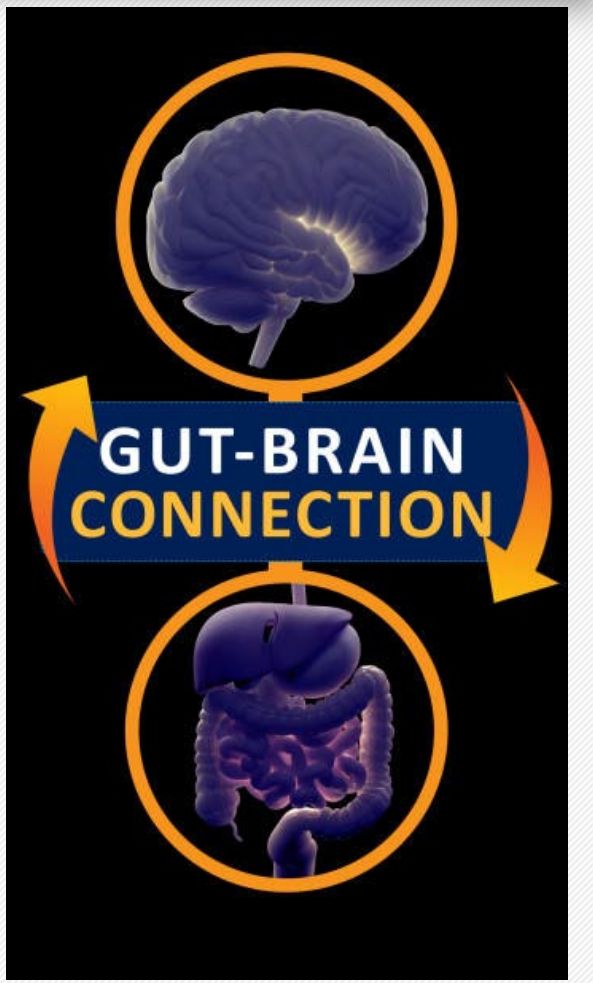
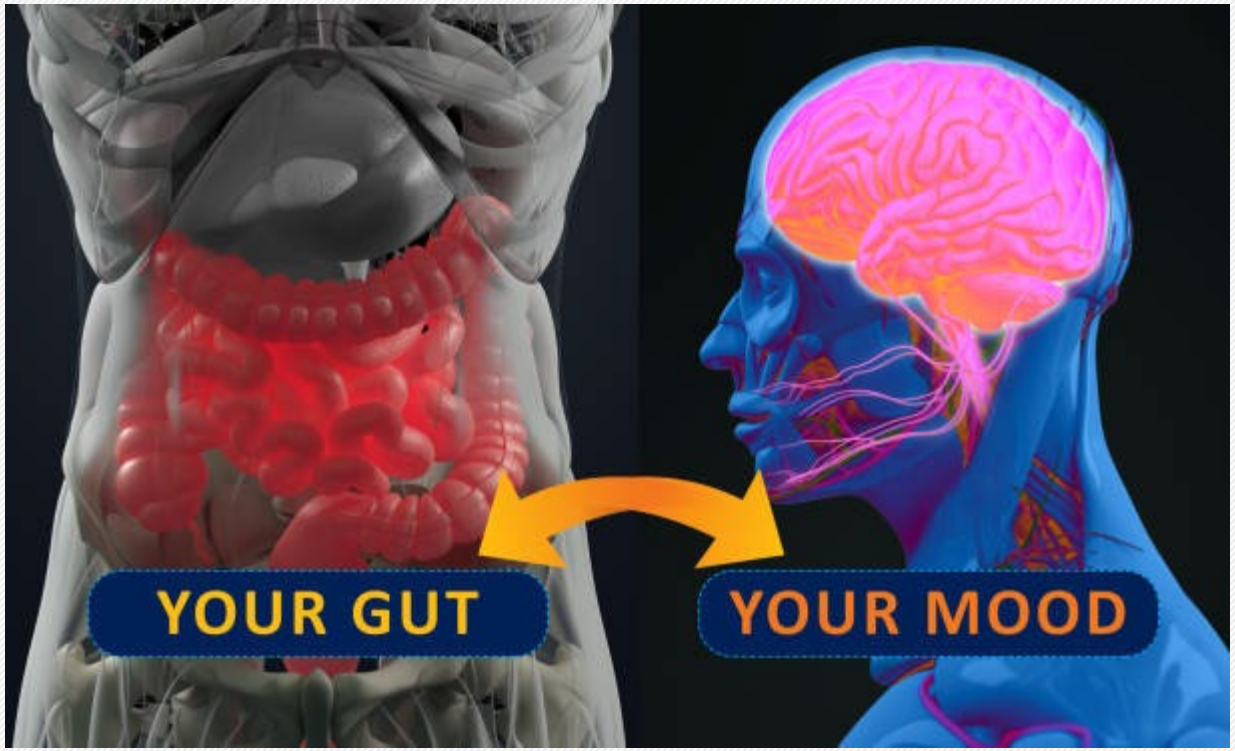
Introduction to the Gut-Brain Axis

- The gut and brain are in constant communication.
- This axis plays a key role in digestion, mood, immunity, and behavior.
- Children's brains are especially sensitive to gut changes.
- Emerging studies link gut imbalances to ADHD, autism, anxiety, and sleep issues.



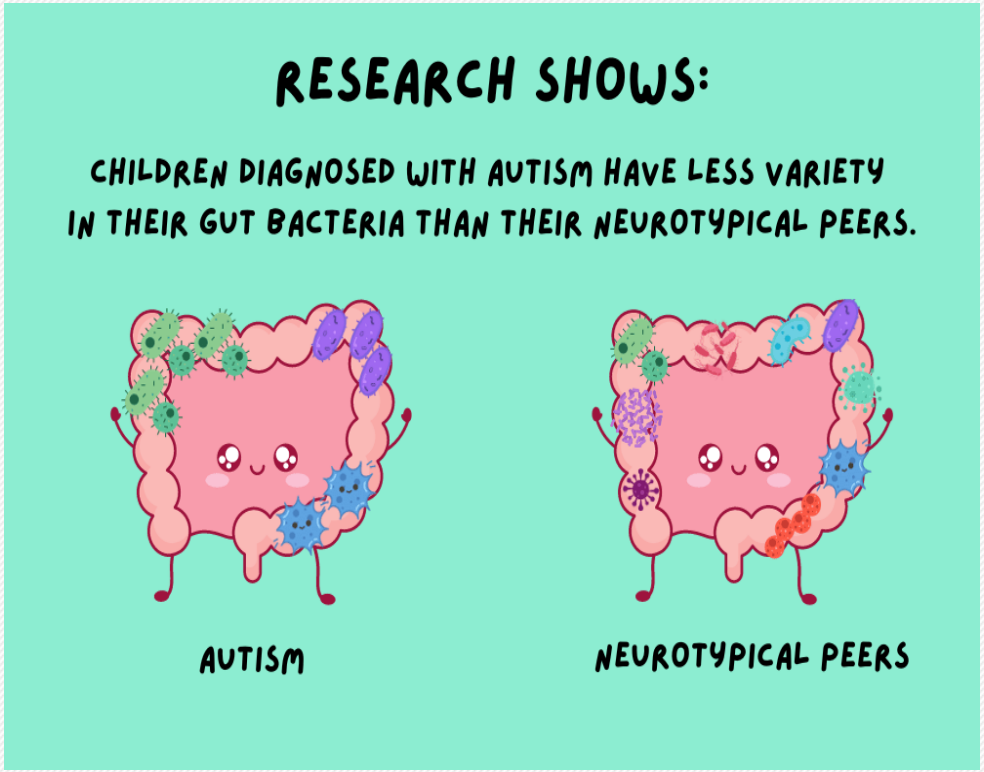
What Is the Microbiome?- Your Inner Ecosystem

- Trillions of bacteria, fungi, and viruses live in our digestive tract.
- These microbes influence nutrient absorption and neurotransmitter production.
- A healthy microbiome supports immune development and emotional regulation.
- Disruptions early in life can have long-term effects.



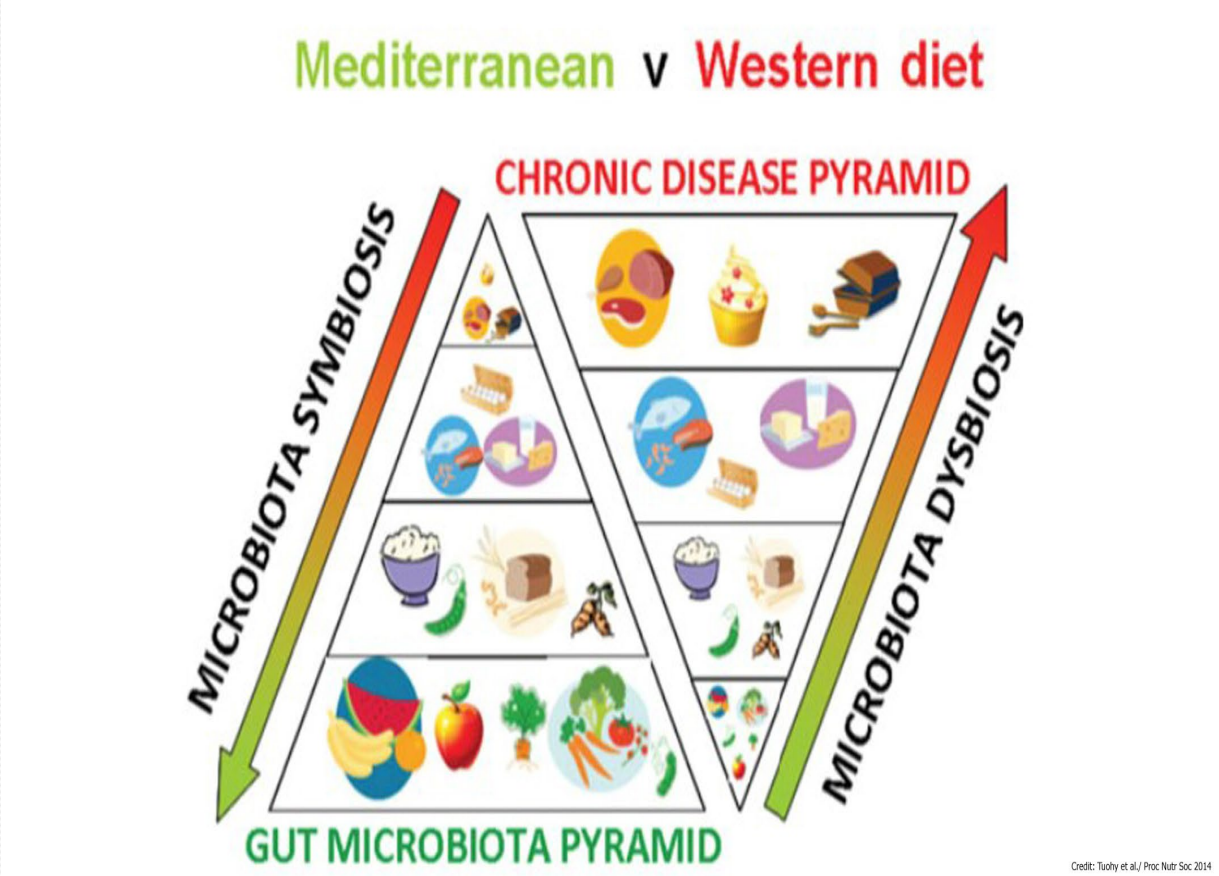
Gut-Brain Connection in Adolescents & Children

- Certain microbes are tied to anxiety, depression, and mood shifts.
- Research shows gut changes in children with autism and sensory disorders.
- Up to 70% of children with autism have significant gut issues.
- Treatments that improve the microbiome can support behavioral health.



Nutritional Influences on the Microbiome

- Whole foods (berries, oats, sweet potatoes) feed good bacteria.
- Fermented foods (yogurt, kefir) enhance microbial diversity.
- Processed foods, sugar, and dyes worsen inflammation and gut imbalance.
- Elimination diets (gluten/dairy) may help reduce inflammation short-term.



Top Gut-Friendly Foods

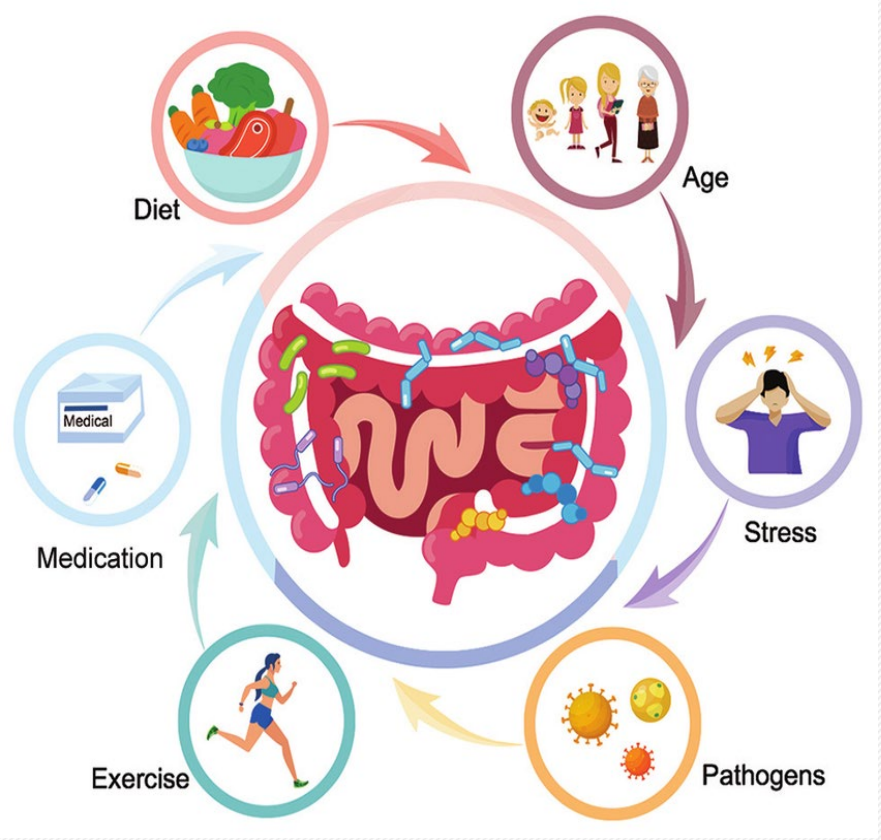
- **Pears & apples (with skin)** – rich in pectin, feeds beneficial bacteria
- **Berries (blueberries, raspberries)** – polyphenols and fiber for microbiota diversity
- **Oats & barley** – beta-glucan prebiotic fiber for gut immunity
- **Sweet potatoes & carrots** – soluble & insoluble fiber plus antioxidants
- **Slightly underripe bananas** – high resistant starch for good bacteria
- **Cooked & cooled rice or potatoes** – resistant starch forms during cooling
- **Fermented vegetables (unpasteurized sauerkraut, kimchi)** – live cultures & enzymes
- **Legumes & lentils** – fiber and resistant starch for regularity
- **Bone broth** – collagen-rich, soothes gut lining

Top Gut-Friendly Foods Continued

- **Chobani Plain Greek Yogurt (Kids)** – high protein, low sugar, L. acidophilus & L. bulgaricus
- **Siggi's Icelandic Skyr** – thick texture, 4–6 live strains, very low sugar
- **Stonyfield Organic Whole-Milk Yogurt** – organic, grass-fed, live active cultures
- **Green Valley Lactose-Free Yogurt** – L. rhamnosus & B. lactis for lactose-sensitive kids
- **Forager Project Coconut Yogurt** – dairy-free with tapioca fiber & L. rhamnosus
- **Nancy's Probiotic Yogurt** – 12 live cultures including B. bifidum & L. casei
- **Lifeway Kids Probiotic Kefir** – up to 12 strains, drinkable format

Environmental and Lifestyle Factors

- Stress and poor sleep harm the gut lining and microbial balance.
- Physical activity promotes microbial diversity and digestion.
- Screen time before meals can impair digestion.
- Good habits protect emotional and cognitive development.

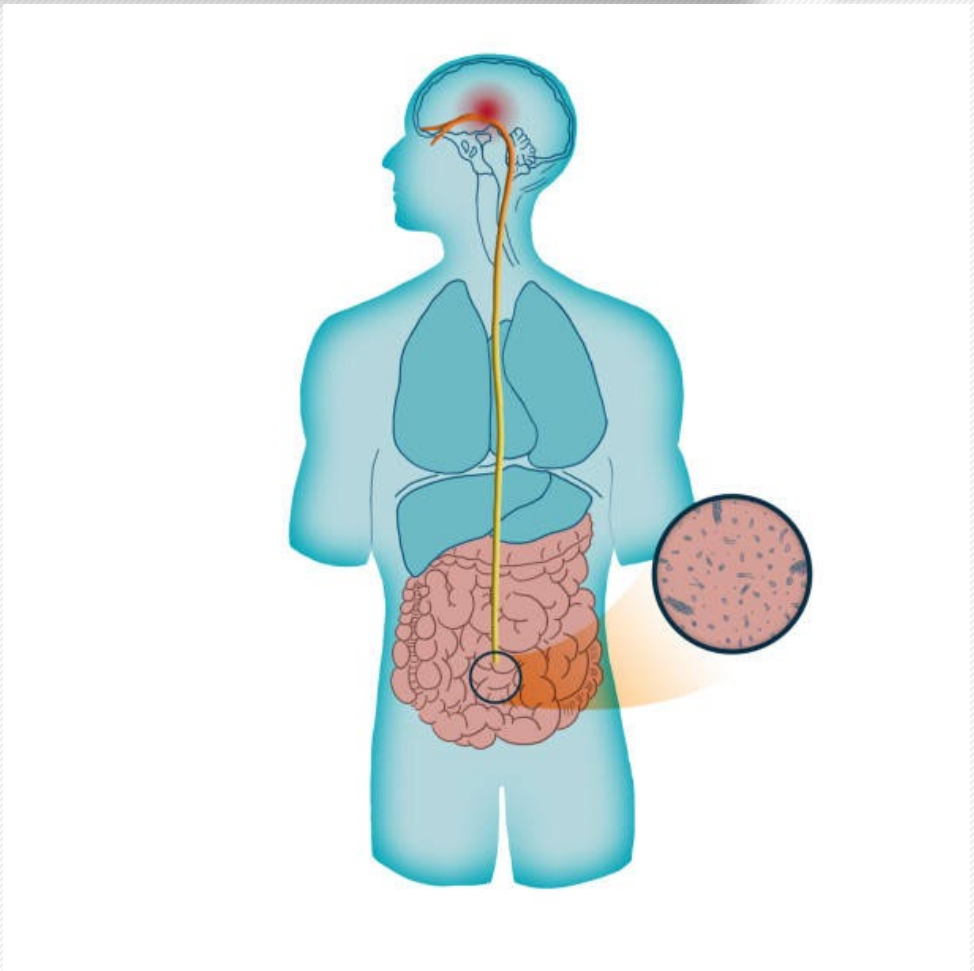


Relationship Between the Gut and the Brain in Adolescents

- Having a particular type of gut microbes can increase teen anxiety and depression.
- A shift in the microbiome is associated with mood disorders.
- Animal experiments have demonstrated that the microbiome can cause specific effects.
- Treatments that focus on microbes are a new possibility.

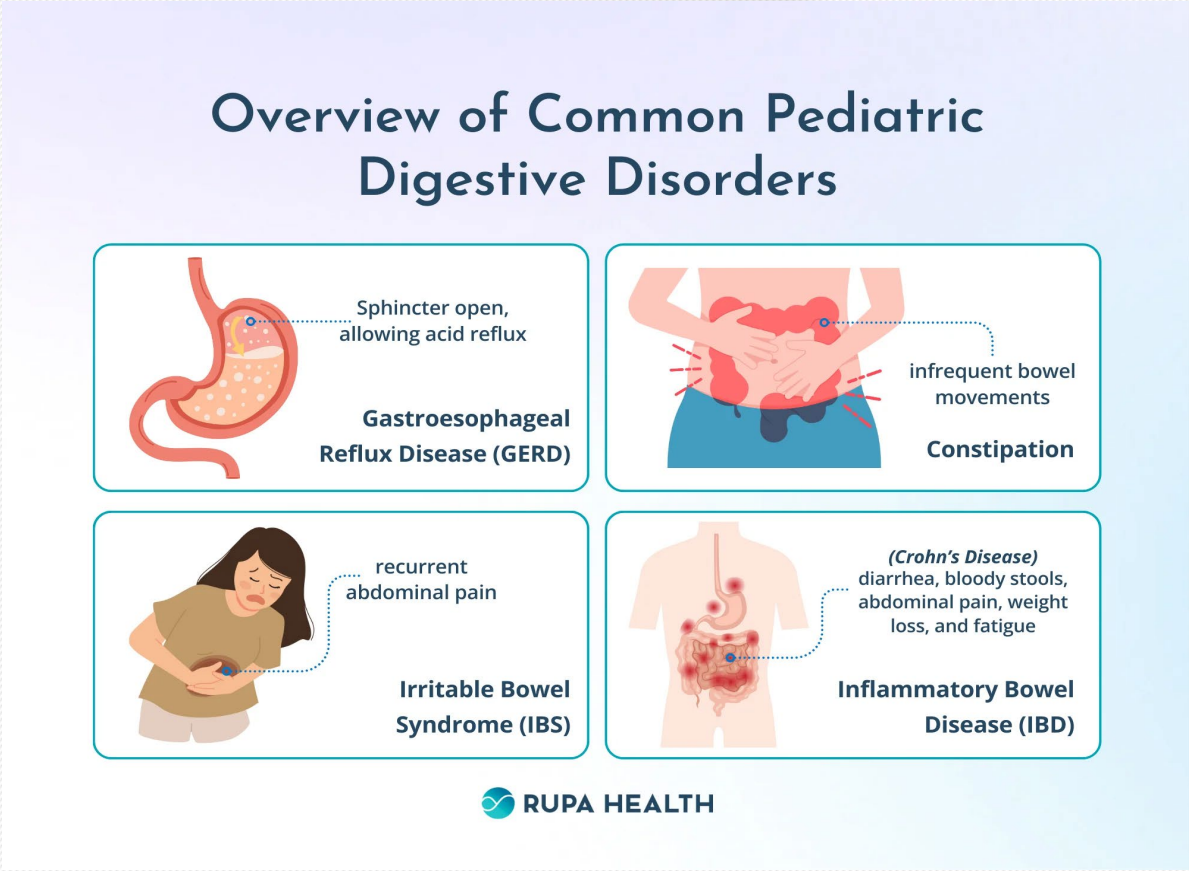
Mechanisms of Gut-Brain Communication

- The vagus nerve sends messages between the gut and brain.
- Microbial metabolites (like SCFAs) affect mood and cognition.
- Inflammation in the gut can trigger immune signals to the brain.
- These pathways explain why gut health influences behavior and focus.



Common Pediatric Conditions Linked to Gut Health

- **Infantile colic:** Often due to immature digestion and microbial imbalance.
- **Constipation:** May still be present despite daily bowel movements.
- **Autism-related GI issues:** Pain and bloating worsen behavior.
- **IBS and EoE:** Chronic, stress-responsive, and tied to food sensitivity.

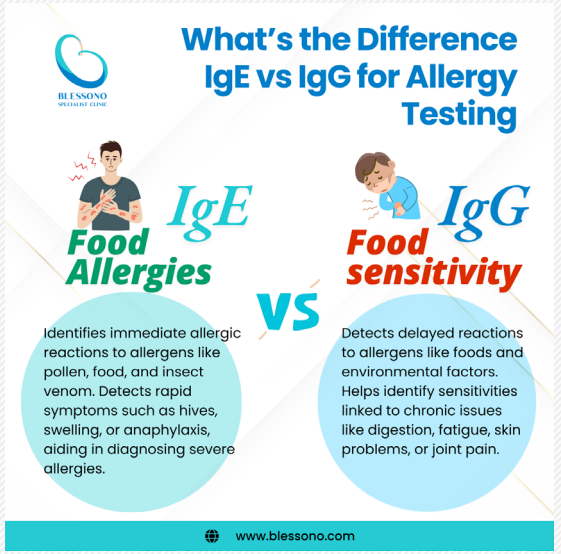


Signs of a Struggling Gut

- Frequent gas or bloating
- Stomach pain without fever or infection
- Behavioral meltdowns at meals
- Mucus in stool or hard pellets
- Mood swings or hyperactivity after meals

Key Testing to Consider

- **GI-MAP / Genova Stool Test:** Bacteria, yeast, parasites, inflammation.
- **Zonulin / Leaky Gut Markers:** Check gut permeability/absorbency.
- **IgG Food Sensitivities:** Guide elimination diets.
- **OAT (Organic Acids):** Look at yeast, clostridia, mitochondrial markers. (Urine-base test)
- **Vitamin panels:** B12, D, zinc, iron—important for behavior and focus.
- **SIBO Breath Test:** Small intestinal bacterial overgrowth.



Case Study: Probiotics and Teen Anxiety

- Probiotics like *L. rhamnosus GG* and *S. boulardii* reduce anxiety and diarrhea.
- Help repopulate gut after antibiotics.
- New research supports using strains for targeted mood improvement.
- Safe and well-tolerated in kids when chosen carefully.

Supplement & Natural Remedy Toolkit

- **Magnesium citrate:** Eases constipation, calms the nervous system.
- **Chamomile/fennel tea:** Soothes digestion.
- **L-glutamine & zinc carnosine:** Heal gut lining post-antibiotics.
- **Omega-3s:** Reduce inflammation, support focus.
- **Digestive enzymes:** Aid digestion when food is poorly broken down.

Gut Biome Probiotics

Strain	Primary Benefits	Typical Pediatric Dose	Example Brand/Product
Lactobacillus rhamnosus GG	• Reduces diarrhea (including rotavirus-associated) • Eases colic and atopic eczema • Supports post-antibiotic recovery	5–10 billion CFU/day	Culturelle® Kids Daily Probiotic
Bifidobacterium infantis	• Improves stool consistency and frequency • Calms immune-mediated inflammation • Supports barrier function	1–5 billion CFU/day	Align™ Probiotic (B. infantis blend)
Saccharomyces boulardii	• Helps clear and prevent antibiotic-associated diarrhea • Inhibits pathogenic bacteria and toxins	125–250 mg (5–10 billion CFU) once or twice daily	Florastor® Kids (250 mg capsules)
Lactobacillus acidophilus	• Enhances lactose digestion • May reduce instances of functional constipation • Supports immune modulation	1–5 billion CFU/day	Hyperbiotics PRO-Kids (multi-strain powder)

Gut Biome Probiotics Continued

Strain	Primary Benefits	Typical Pediatric Dose	Example Brand/Product
Bifidobacterium bifidum	• Strengthens mucosal barrier • Reduces gut inflammation • Aids in reducing colic symptoms	1–5 billion CFU/day	Garden of Life Dr. Formulated Probiotics Organic Kids
Bifidobacterium longum	• Produces short-chain fatty acids for gut lining health • Helps detoxify and modulate immunity	1–5 billion CFU/day	Renew Life Ultimate Flora Kids
Lactobacillus plantarum	• Reduces bloating and gas • Inhibits pathogens like E. coli • Supports healthy microbiome diversity	1–5 billion CFU/day	Klaire Labs Ther-Biotic™ Infant
Lactobacillus bulgaricus	• Traditional yogurt culture • Aids protein breakdown and supports overall fermented-food benefits	~1–3 billion CFU/serving (in yogurt)	Chobani Plain Greek Yogurt (Kids)

How to Use These Products Safely in Kids

- **Check CFU & Strain Purity**: Look for ≥1 billion CFU of the target strain and minimal “extra” fillers.
- **Start Low & Go Slow**: Begin with half the recommended dose once daily, then increase as tolerated.
- **Timing**: Take probiotics at least 2 hours away from antibiotics or acid-lowering meds to maximize survival.
- **Storage**: Refrigerate strains that require cold storage (check label), and use within the “best by” date.

Medications that Disrupt Gut Health

- **Antibiotics:** Rank from clindamycin (high disruption) to rifaximin (gut-targeted).
- **Stimulants, SSRIs, antacids:** May impair gut lining or bacterial balance.
- **Support Plan:** Pair antibiotics with *S. boulardii*, restore lining with L-glutamine.

Most Aggressive to Least Aggressive Antibiotics (Gut Impact Ranking)

- 1. **Clindamycin**
- • **Very disruptive** to gut flora
- • Strong association with *C. difficile* overgrowth and long-term microbiome imbalance
- • Often prescribed for dental infections, abscesses, or serious skin issues
- 2. **Amoxicillin-Clavulanate (Augmentin)**
- • Broad-spectrum; kills many beneficial bacteria
- • High risk of diarrhea and yeast overgrowth
- • Commonly used for ear, sinus, and respiratory infections
- 3. **Cefdinir / Cefixime (3rd-generation cephalosporins)**
- • Potent broad-spectrum activity
- • Can cause diarrhea and imbalance in gut flora
- • Frequently used for ear infections, UTIs, and pneumonia

Most Aggressive to Least Aggressive Antibiotics (Gut Impact Ranking) Continued

- 4. Azithromycin (Zithromax)
- • Moderate disruption
- • Can lead to yeast issues or stomach upset, though often perceived as gentle
- • Used for respiratory and skin infections
- 5. Amoxicillin
- • Narrower spectrum than Augmentin
- • Still disrupts beneficial gut bacteria, but less than combinations or cephalosporins
- • Very common for pediatric infections
- 6. Cephalexin (Keflex)
- • Older cephalosporin with narrower activity
- • Mild-moderate impact on gut bacteria
- • Used for skin and urinary infections

Most Aggressive to Least Aggressive Antibiotics (Gut Impact Ranking) Continued

- 7. **Nitrofurantoin (Macrobid)**
- • Primarily targets bladder/urinary infections
- • Minimal systemic absorption, so **low impact** on gut flora
- • A good option for UTIs when appropriate
- 8. **Rifaximin**
- • **Minimal gut disruption**—in fact, often used to treat *SIBO* and IBS
- • Non-absorbable; stays in the gut
- • Rarely prescribed to children unless part of a GI protocol

Supportive Tips When Antibiotics Are Prescribed

- • Always **pair antibiotics with probiotics** (e.g., *Saccharomyces boulardii* during and *Lactobacillus/Bifido* afterward).
- • Space probiotics at least **2–3 hours away** from antibiotic doses.
- • Add **L-glutamine** and zinc carnosine after the course to support gut lining recovery.
- • Watch for **signs of imbalance**: loose stools, yeast rashes, mood shifts, or food aversions.

OTCs & Gut Disruption

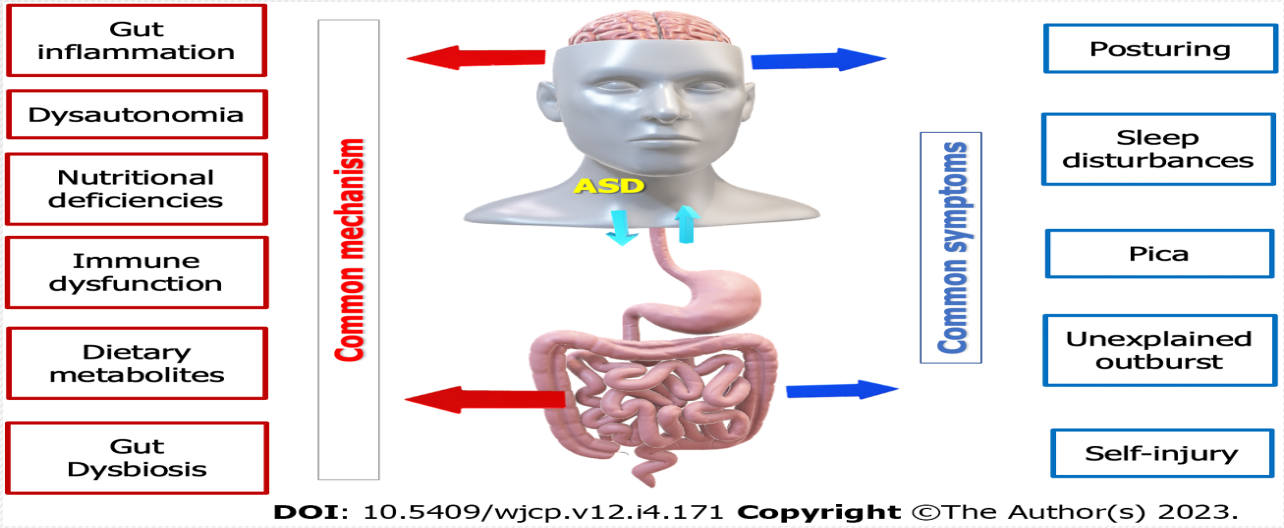
- **PEG 3350 (Miralax):** Can irritate gut in sensitive kids.
- **Antacids:** Lower stomach acid, leading to dysbiosis.
- **Artificial sweeteners:** Sucralose and sorbitol alter gut flora.
- **Beware of additives in probiotics and fiber products.**

How to Talk to Your Child's Doctor

- "Can we test for bacterial imbalances?"
- "Would probiotics or magnesium be safer than laxatives?"
- "Is there a way to check for inflammation in the stool?"

Recognizing Gut-Related Behavior in Autism

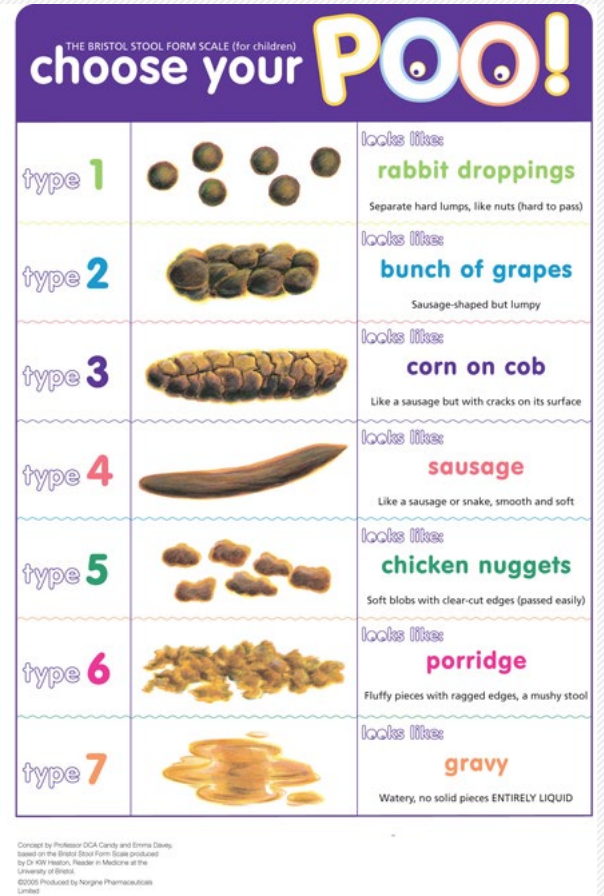
- Nonverbal signs of gut pain: head banging, toe walking, refusal to eat.
- GI symptoms can worsen stimming, night waking, or aggression.
- Treating gut issues may improve engagement and communication.



DOI: 10.5409/wjcp.v12.i4.171

Practical Tools for Families

- Use a food-mood-poop journal to spot patterns.
- Use playful visuals to teach about poop health.
- Choose liquid or powder supplements for picky eaters.
- Be patient—gut healing is slow but powerful.

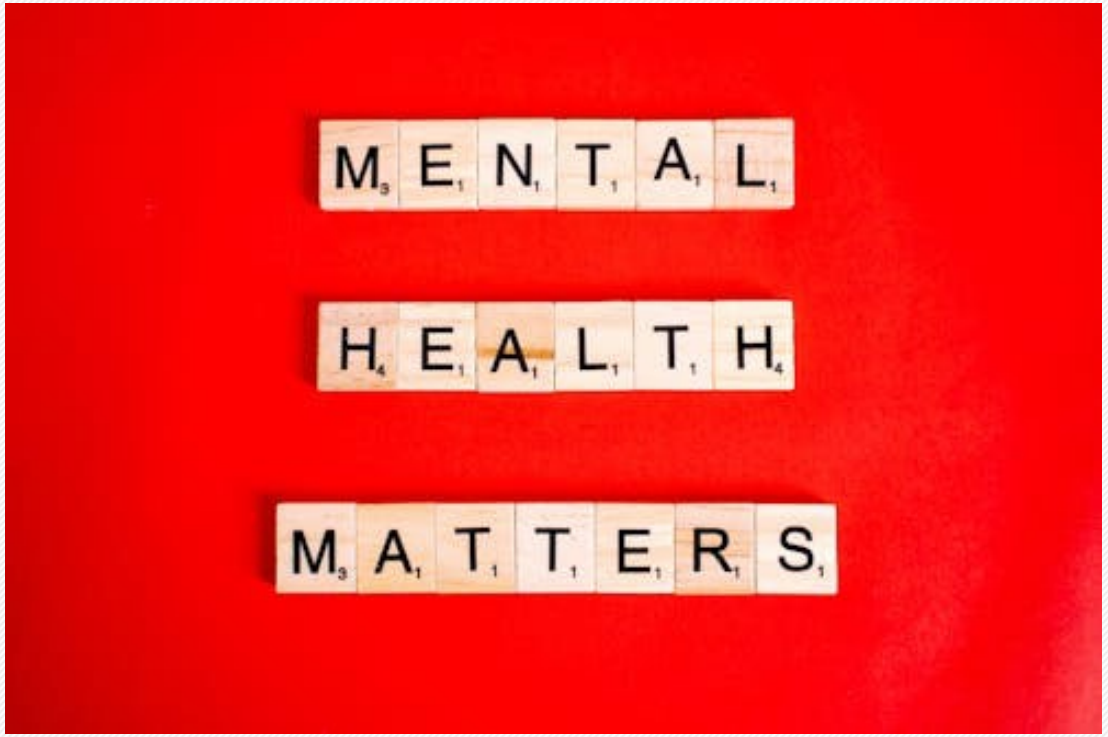


Practical Methods for Teachers & Other Professionals

- Encourage movement, stress reduction, and whole food snacks.
- Collaborate with parents and school nurses to track behavioral trends.
- Share observed mealtime behaviors or physical complaints.

Community-Based Approaches & Equity

- Children in food deserts or high-stress environments face higher risk.
- Cultural food traditions can support microbiome health.
- Community gardens, education, and school meals make a difference.

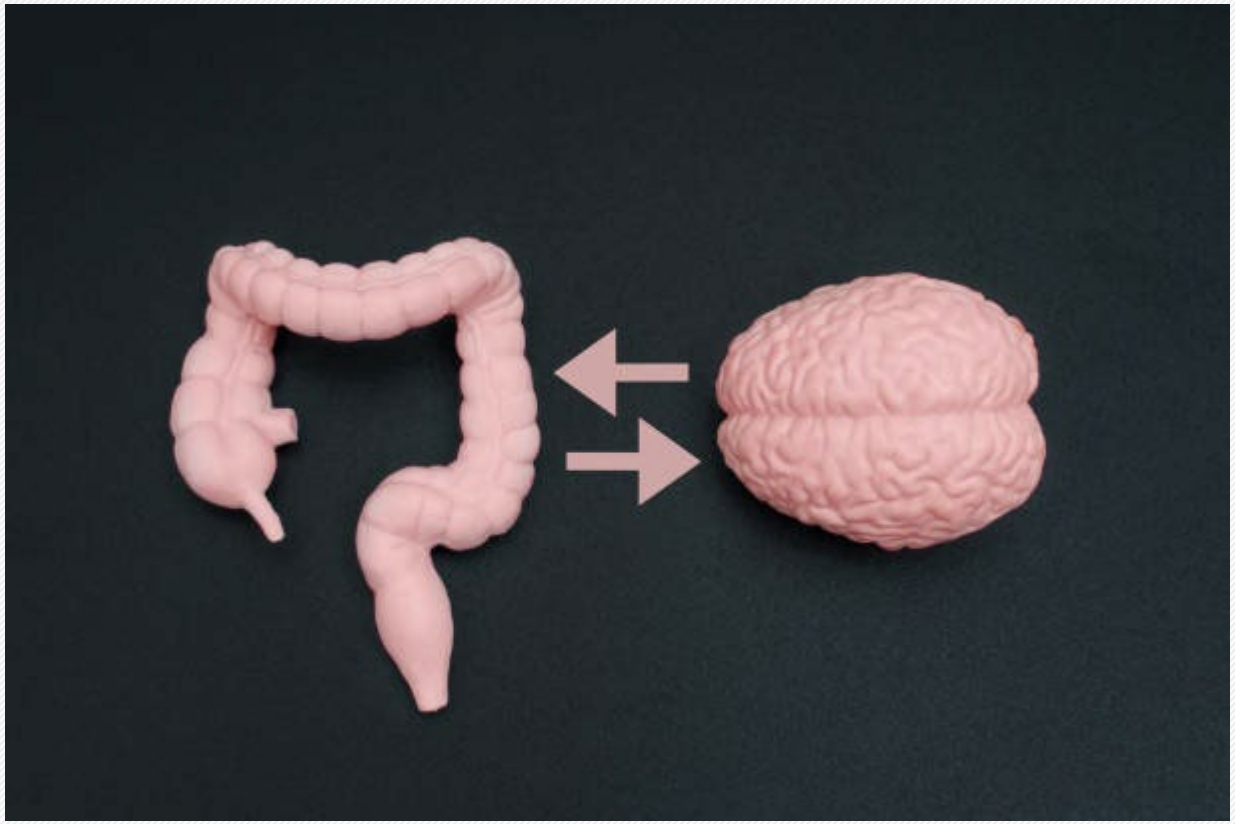


Current Research & Future Directions

- Personalized microbiome therapies are emerging.
- AI tools may help predict mood and gut issues from stool data.
- Ethical concerns include access, privacy, and over-treatment.

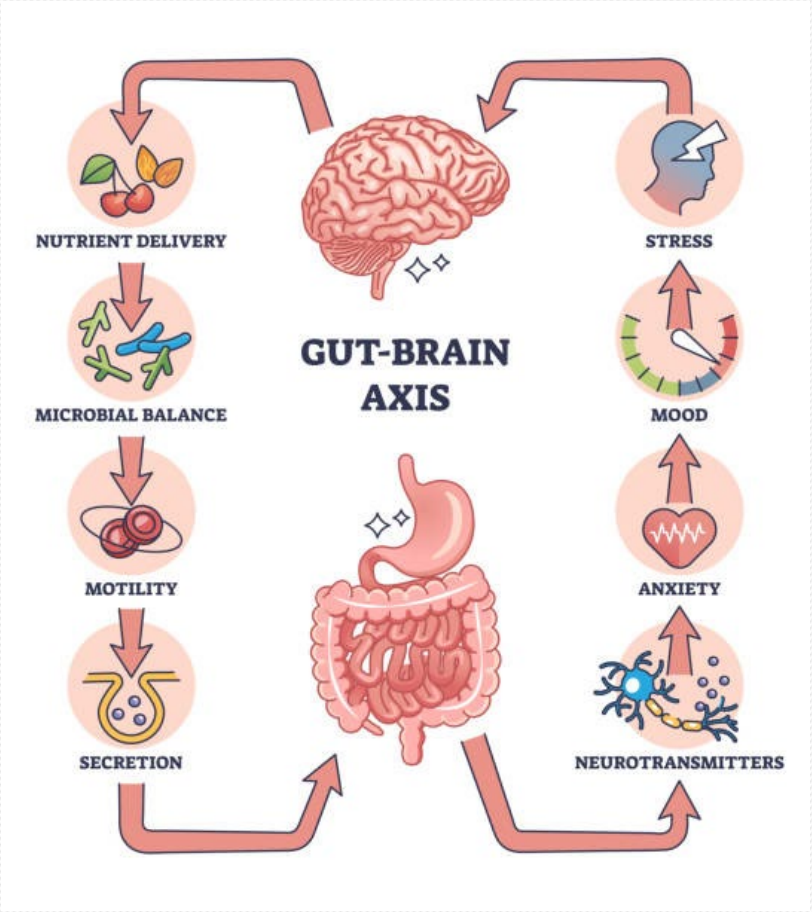
Summary and Key Takeaways

- The gut-brain connection is key in pediatric health.
- Diet, lifestyle, and supplements offer powerful, low-risk support.
- Families, clinicians, and communities must work together.
- Every child deserves a chance to thrive from the inside out.



Let's Discuss

- Ask questions or share experiences.
- Let’s collaborate to improve children’s comfort and behavior naturally.
- Contact me if you would like me to present or consult with.



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