Diet, the Microbiome, and the Gut-Brain Axis: *Practical Use of Enzyme Therapies*

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Wild Child Medicine, PLLC

Conflict of interest

The presenter has no relevant financial relationships to disclose. Discussion will include dietary supplements and enzyme-based products that are not FDA-approved medications. Off-label and non-pharmacologic uses will be identified when applicable.

Disclaimer:

This work was prepared as part of the official duties of Dr. Reeves who is the President and CEO of Wild Child Medicine, PLLC.

This talk will include discussions of evidenced-based care and the use of products that are regulated by the FDA as dietary supplements, not as medications.

About Me:

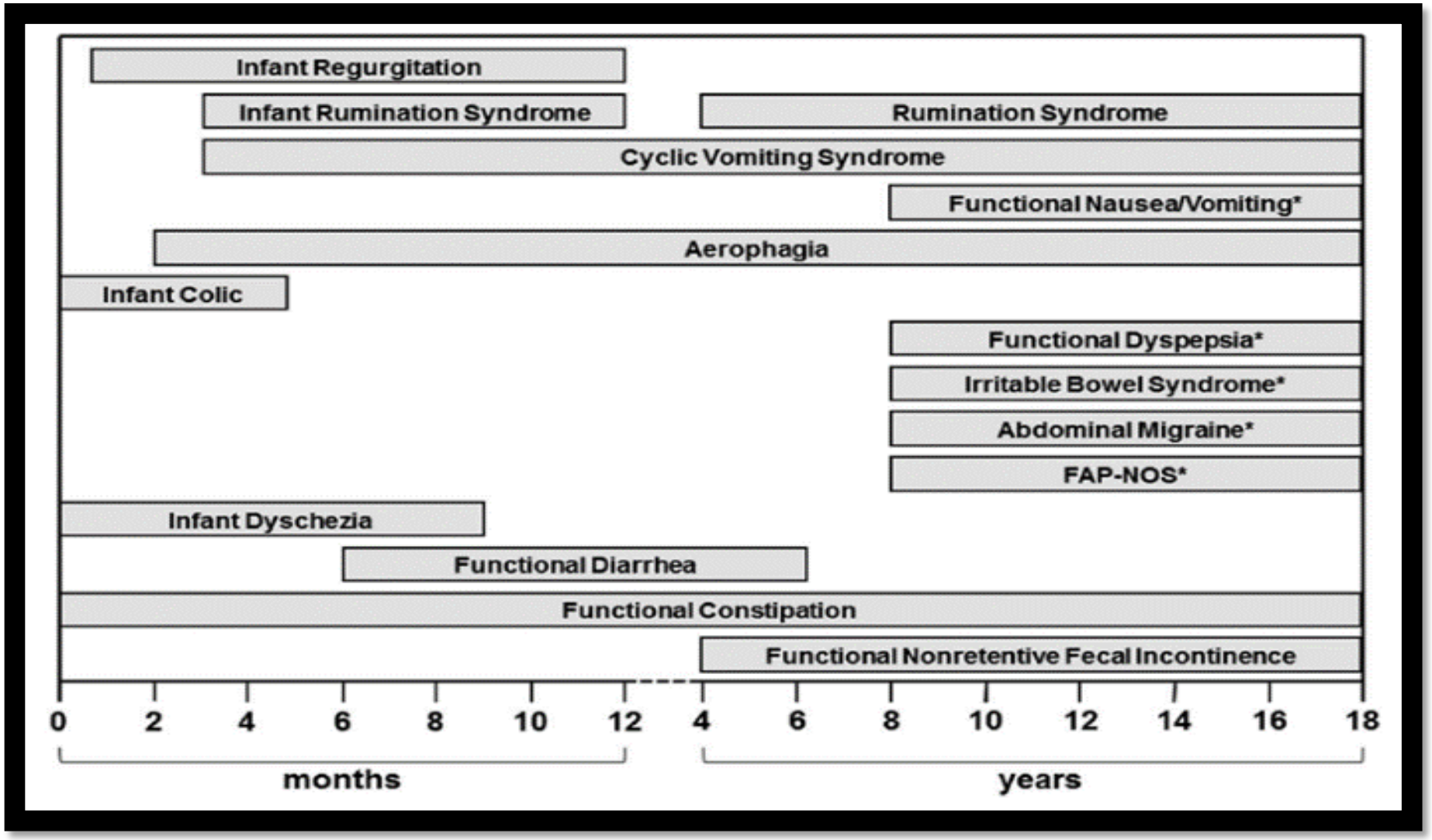
- **Born**: Houston, Texas
- **Undergraduate**: Texas A&M University
- **Fellowship Training**: Walter Reed National Military Medical Center
- **Board certifications**: General Pediatrics, Pediatric Gastroenterology, Obesity Medicine, Clinical Informatics
- **Research focus**: Clinical Action Plan development and implementation
- **Academics**: Associate Professor of Pediatrics [USUHS and UT Health]; Associate Professor of Military Medicine [Texas A&M]
- **Husband and Father of 2**
- **Hidden Talent**: I am a carpenter

Learning Objectives

1. Describe the role of microbiome disturbance and visceral hyperalgesia in the pathophysiology of pediatric and young adult disorders of gut–brain interaction
2. Identify common high-FODMAP foods that trigger gastrointestinal symptoms and understand their mechanisms of action.
3. Discuss how enzyme-based therapies can be integrated into guideline-aligned dietary strategies to prevent or reduce symptom flares associated with fermentable carbohydrates.

Disease Classification
&
Epidemiology

Functional Gastrointestinal Disorders = Disorders of Gut-Brain Interaction



Robin SG, et al. J Pediatr 2018

Epidemiology

Worldwide Epidemiology of Disorders of Gut–Brain Interaction (DGBI)

- Disorders of gut–brain interaction affect **approximately 30–40% of the global population** at some point in life.
- DGBIs occur in **both children and adults**, with symptom onset often beginning in childhood or adolescence.
- Prevalence is similar across regions worldwide, though diagnosis rates vary by access to care and cultural factors.
- DGBIs are among the most common reasons for gastroenterology visits globally.

DGBI Epidemiology in Children

- An estimated **20–25% of children worldwide** meet criteria for a DGBI.
- The most common pediatric DGBIs include **functional abdominal pain disorders and IBS**.
- Symptoms often begin in **school-aged children**, with persistence into adulthood in a subset.
- Boys and girls are affected at **similar rates in early childhood**, with female predominance emerging after puberty.

DGBI Epidemiology in Adults

- Approximately **35–40% of adults worldwide** meet criteria for at least one DGBI.
- Many adults report **symptom onset before age 30**, even if diagnosis occurs later.
- DGBIs are associated with **reduced quality of life, work productivity loss, and high healthcare utilization**.

Irritable Bowel Syndrome

Prevalence

- IBS affects approximately **4–10% of the global population**, depending on diagnostic criteria used.
- IBS is the **most commonly diagnosed DGBI** in both primary care and gastroenterology settings.
- Prevalence is higher in **Western countries**, though underdiagnosis exists worldwide.

IBS: Age Distribution

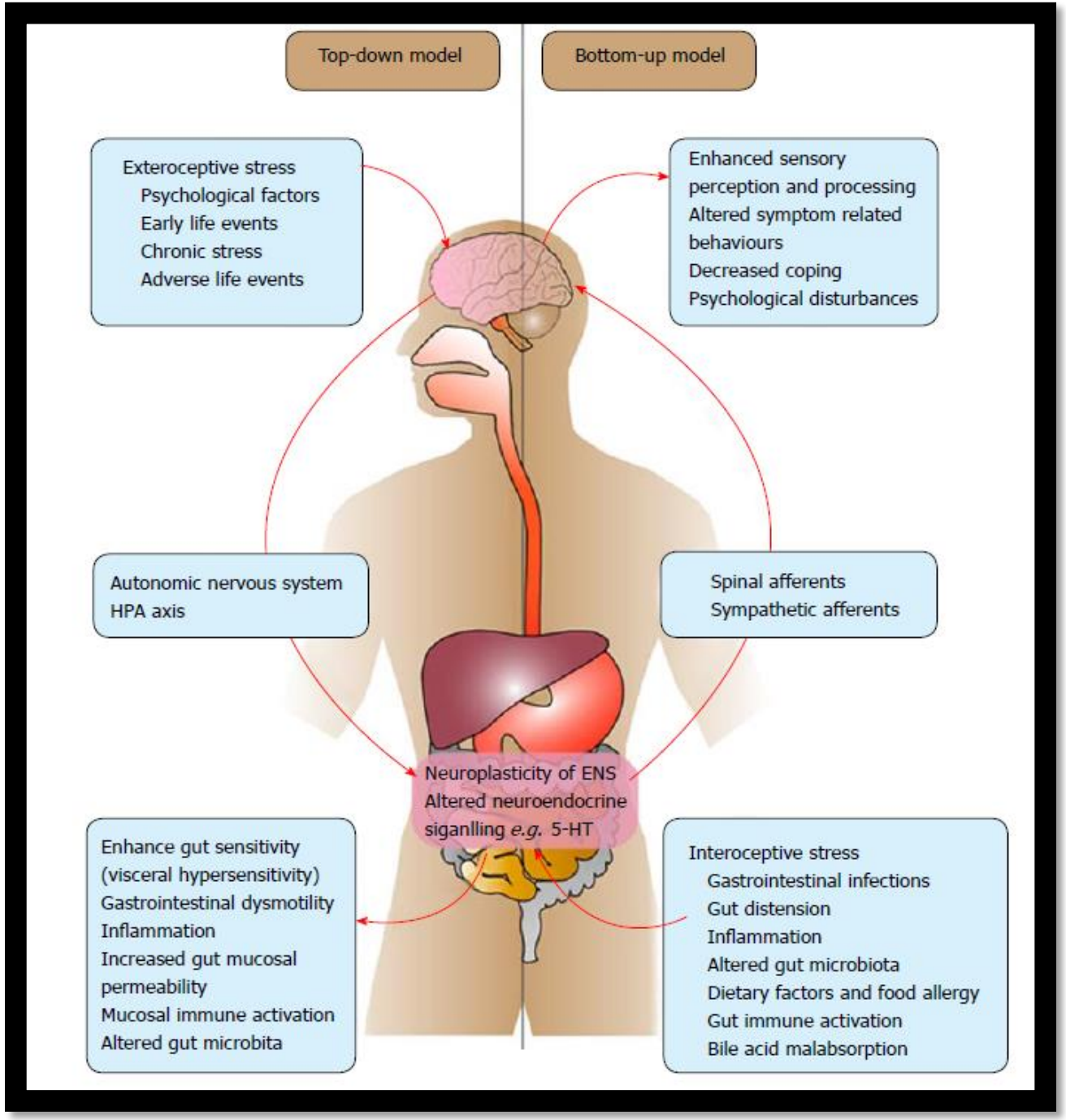
- Median age of diagnosis is typically **late 20s to early 40s**.
- IBS frequently begins in **adolescence or early adulthood**.
- New-onset IBS after age 50 is **less common** and warrants evaluation for alternate diagnoses.

IBS: Gender Differences

- IBS is **more common in females**, with a female-to-male ratio of approximately **2:1** in most regions.
- Female predominance is most pronounced in **IBS with constipation and mixed subtypes**.
- Gender differences are less pronounced in **pediatric populations** and in some Asian regions.

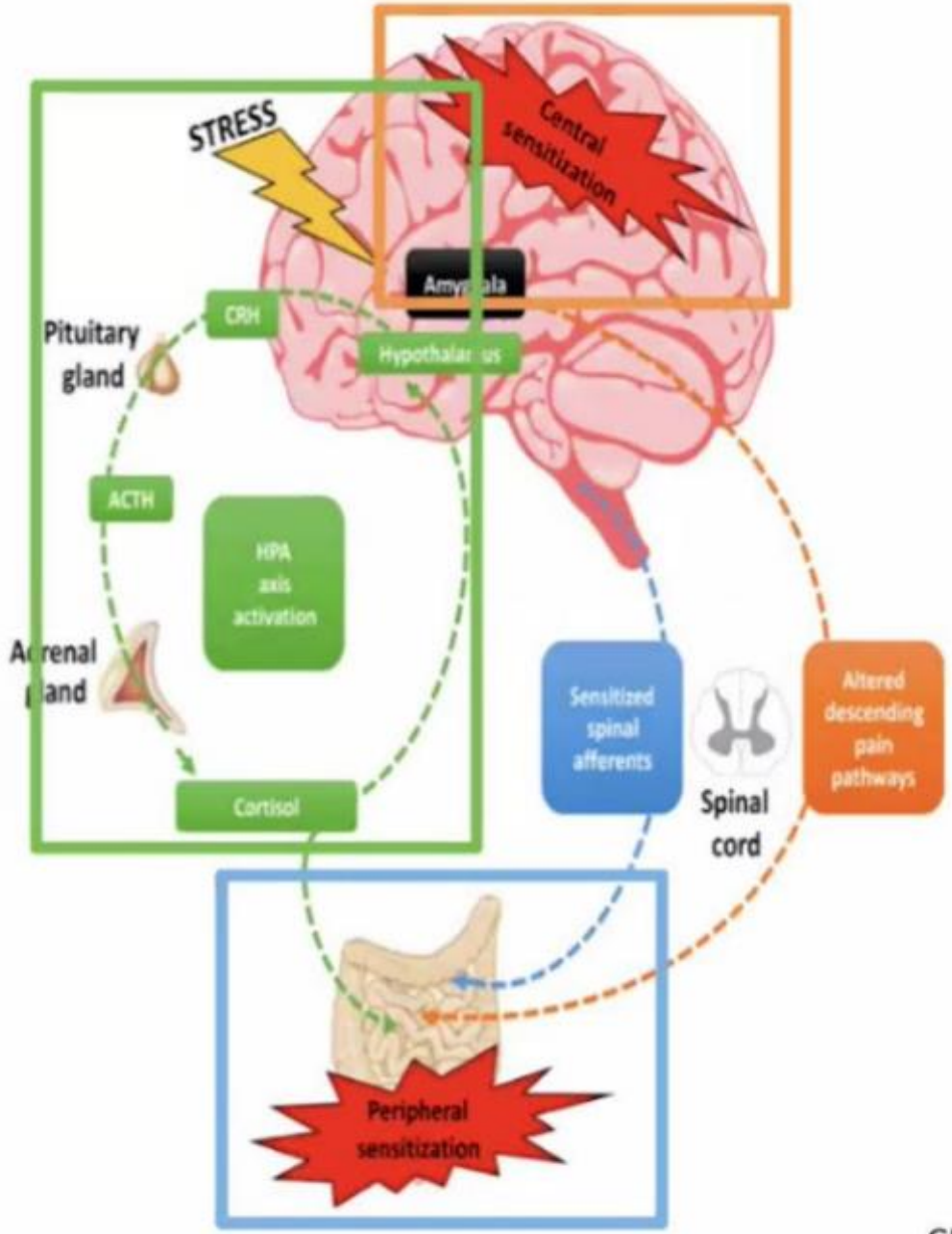
Pathophysiology

Pathophysiology



Devanarayana NM, et al. World J Gastroenterol 2018

The mechanisms of chronic pain



(1) Peripheral sensitization

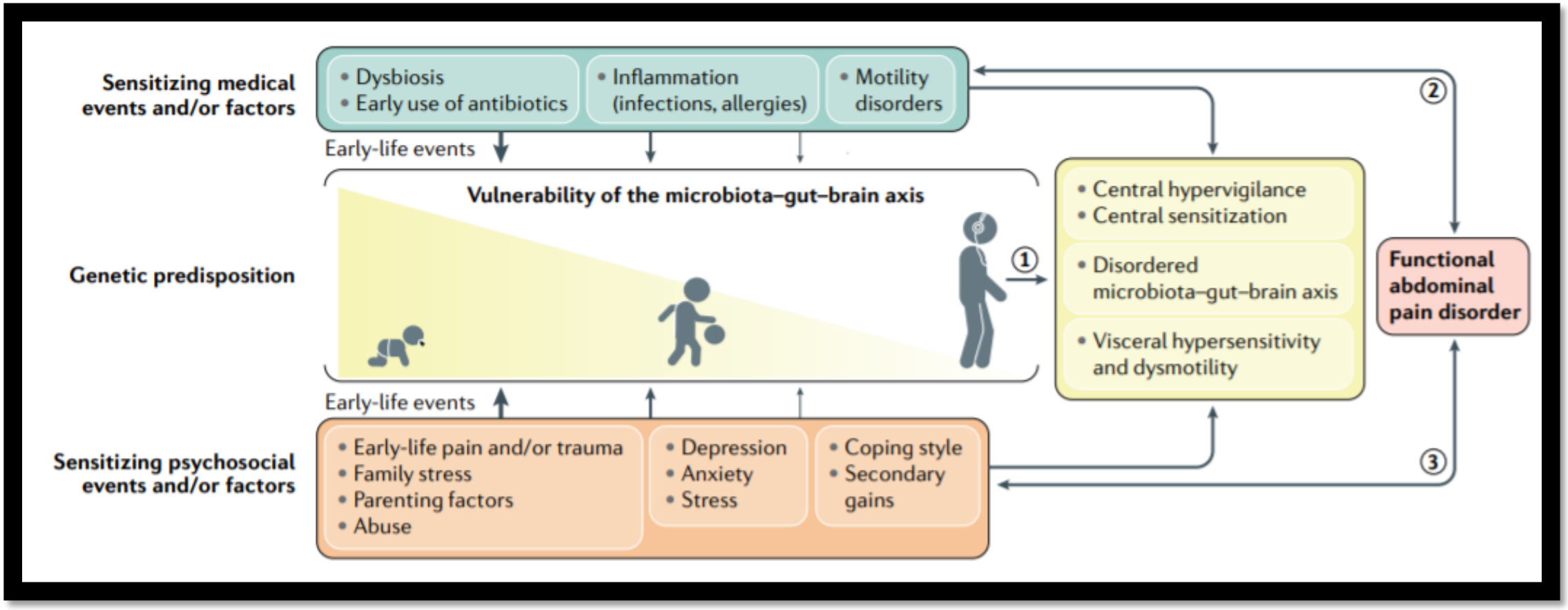
(2) Central sensitization

(3) Hypothalamic- pituitary-adrenal axis

- Visceral hypersensitivity
- Altered threshold of pain

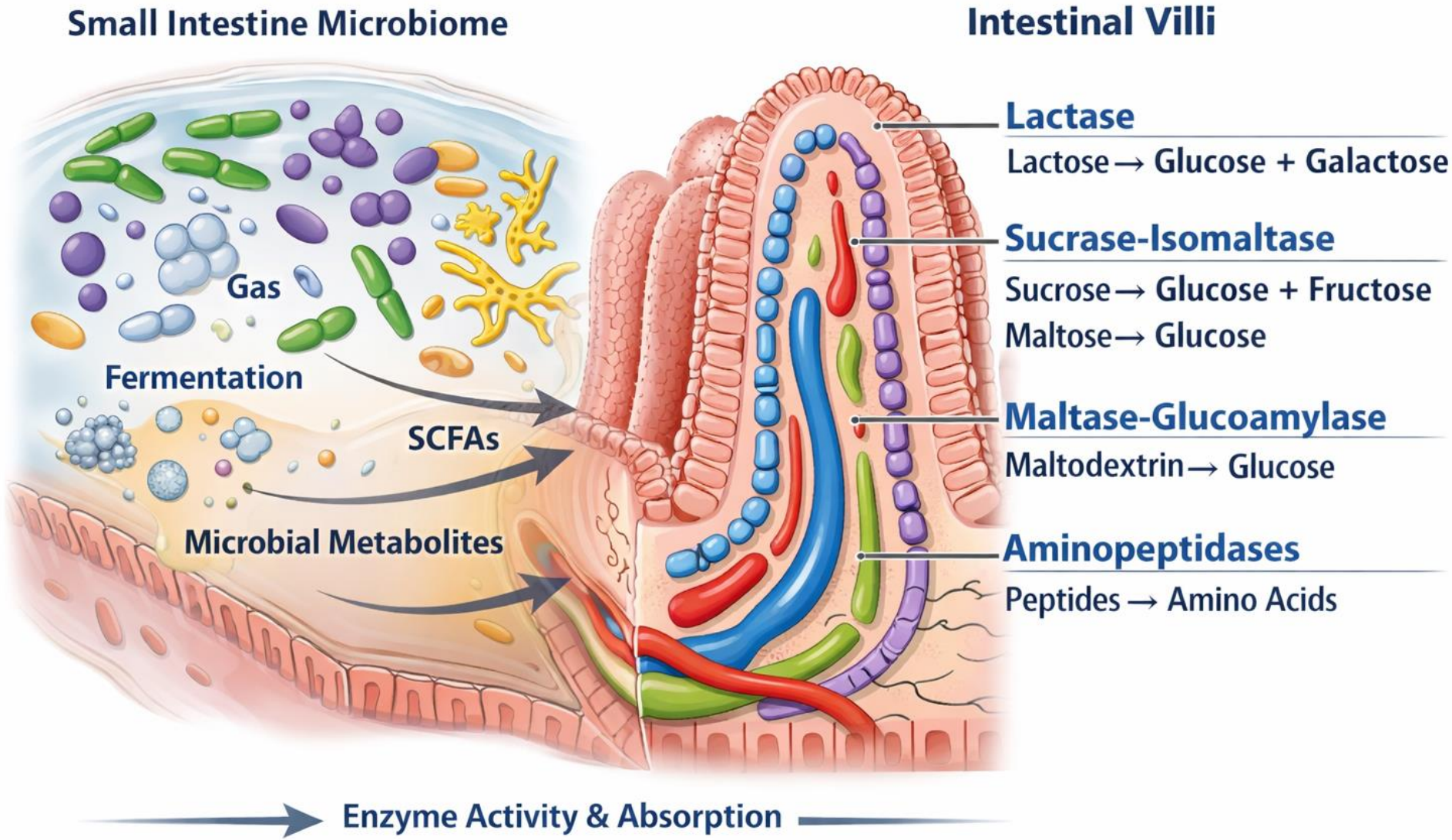
CNS Neurosci Ther. 2016;22(2):102–117

Microbiome-gut-brain axis

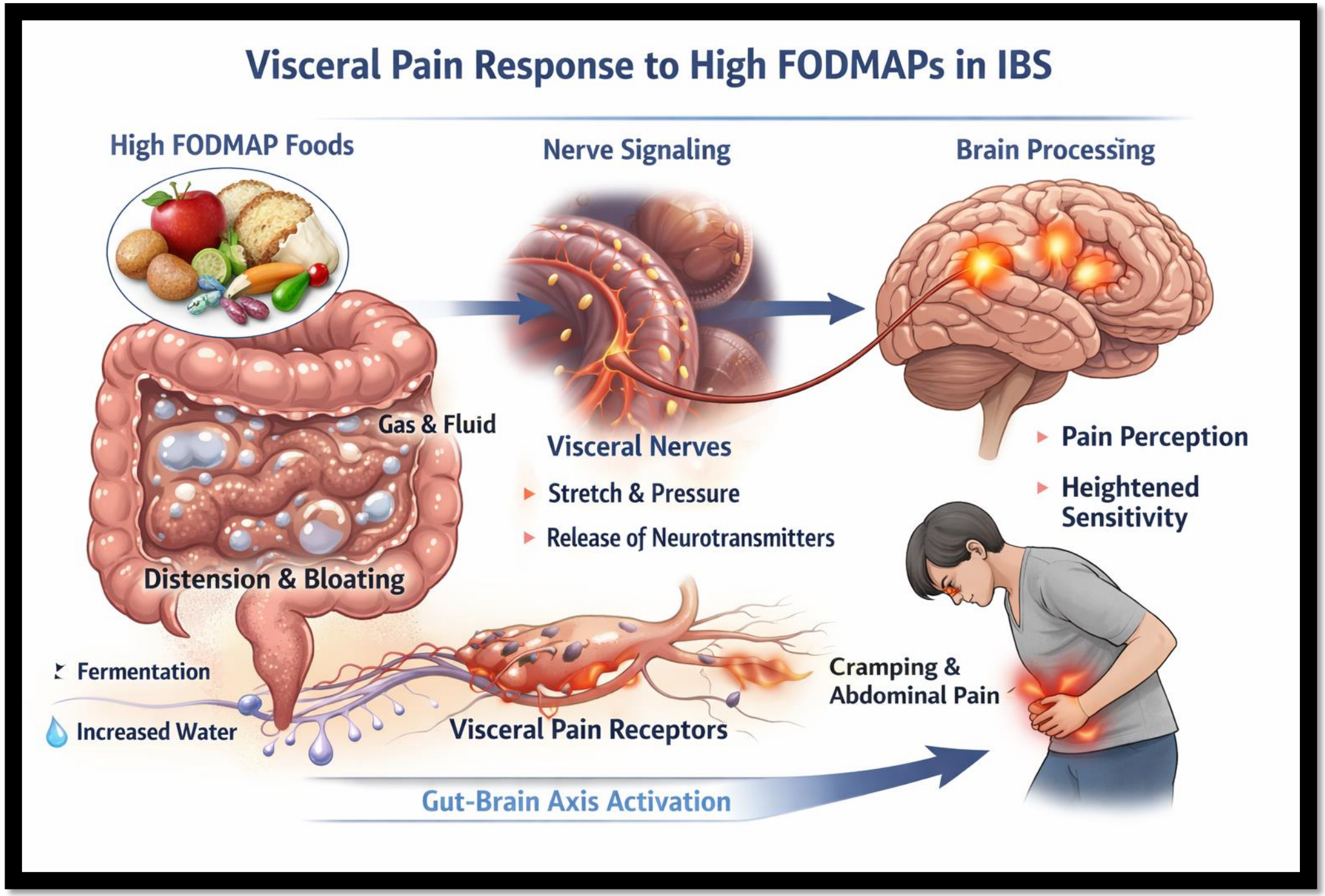


Thapar N, et al. Nat Rev Dis Primers 2020

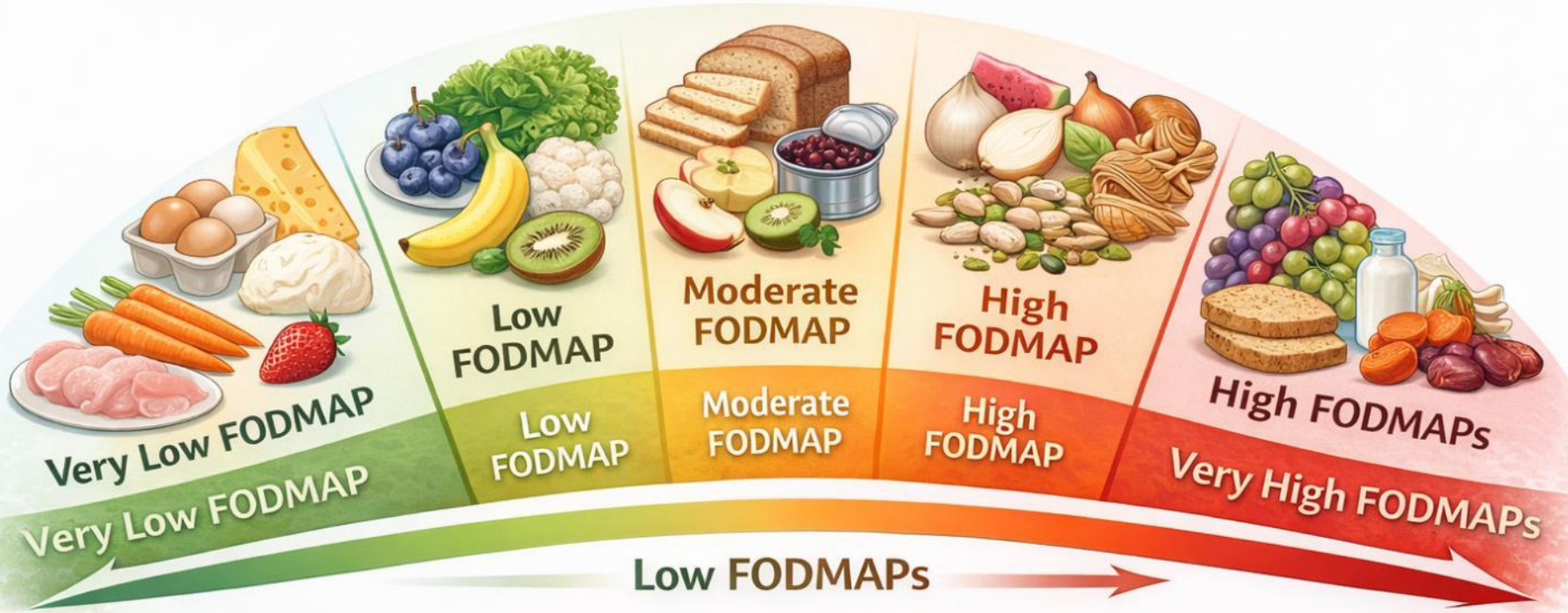
Microbiome Effects on Intestinal Enzymes



Visceral Pain Response to High FODMAPs in IBS



Low to High FODMAPs Food Scale



Very Low FODMAP

- Eggs, Carrots, Strawberries, Oranges, Oats, Plain Chicken, Hard Cheeses, Lactose-Free Milk, etc.

Low FODMAP

Blueberries, Unripe Bananas, Kiwi, Rice, Lettuce, Potatoes, Ham, etc.

Moderate FODMAP

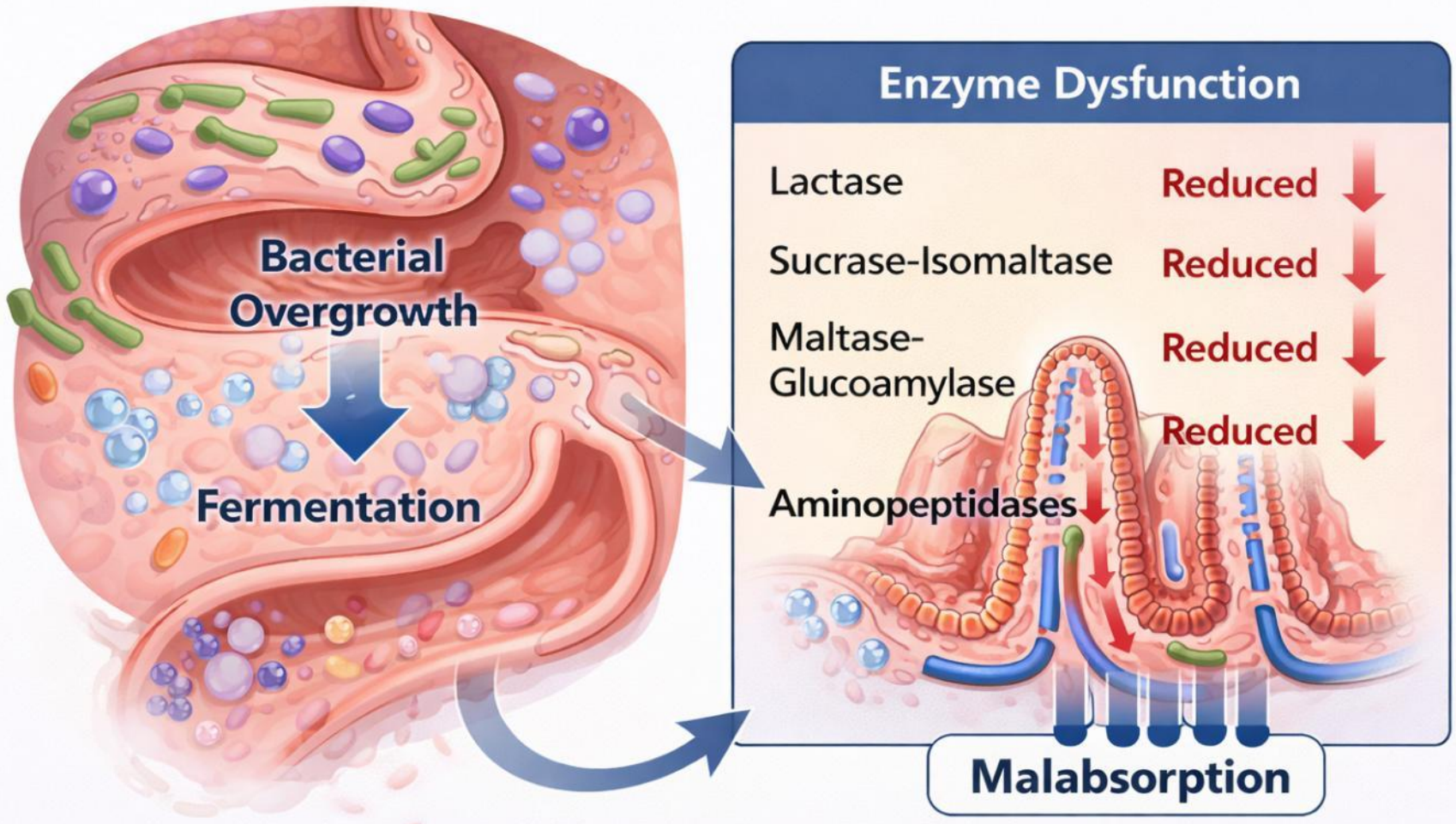
Apples, Beets, Whole Wheat, Beans, Avocado, Cashews, Almonds, etc.

High High FODMAP

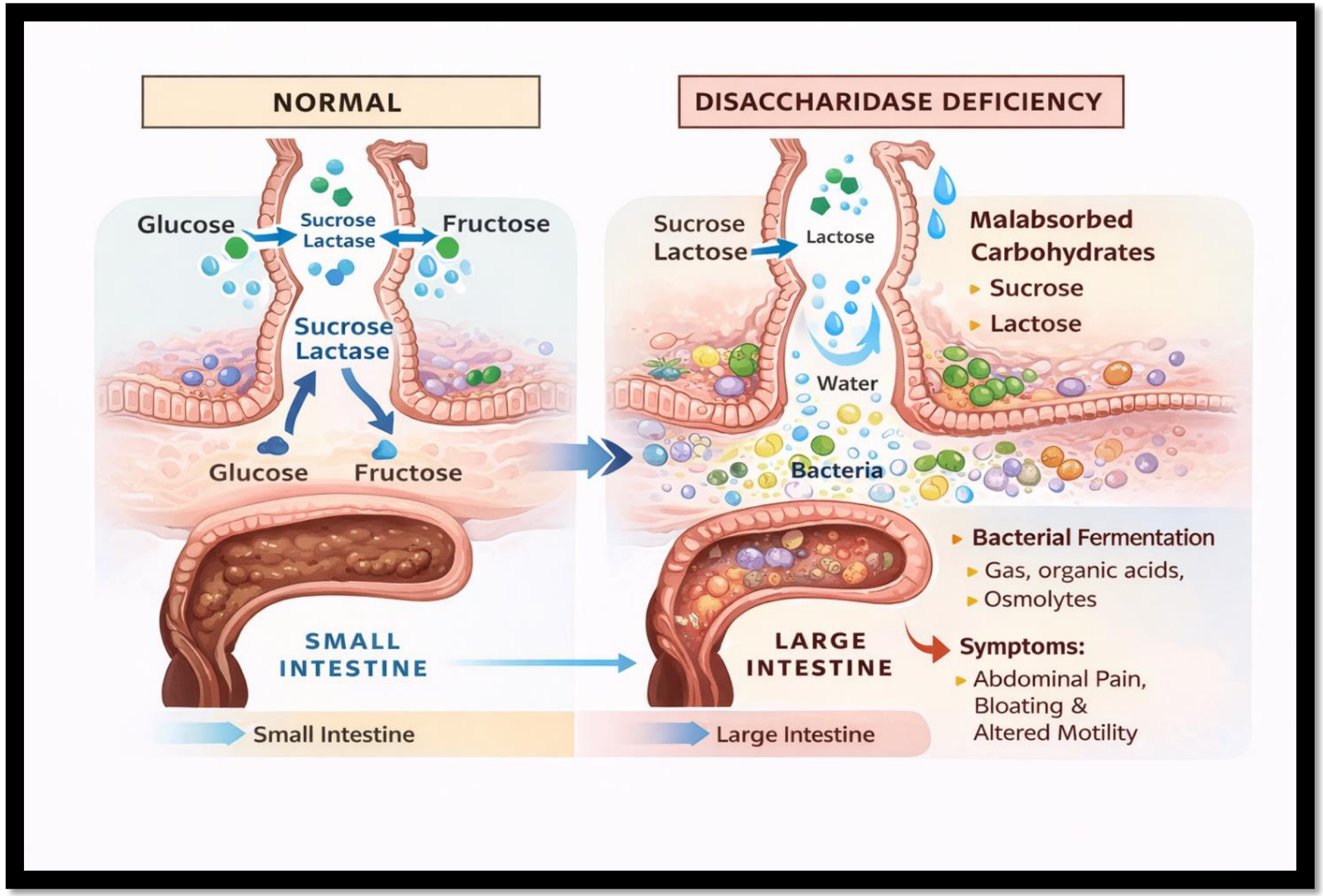
- Garlic, Onions, Watermelon, Pistachios, Whole Grain Pasta, Honey, etc.

*FODMAP tolerance varies per person

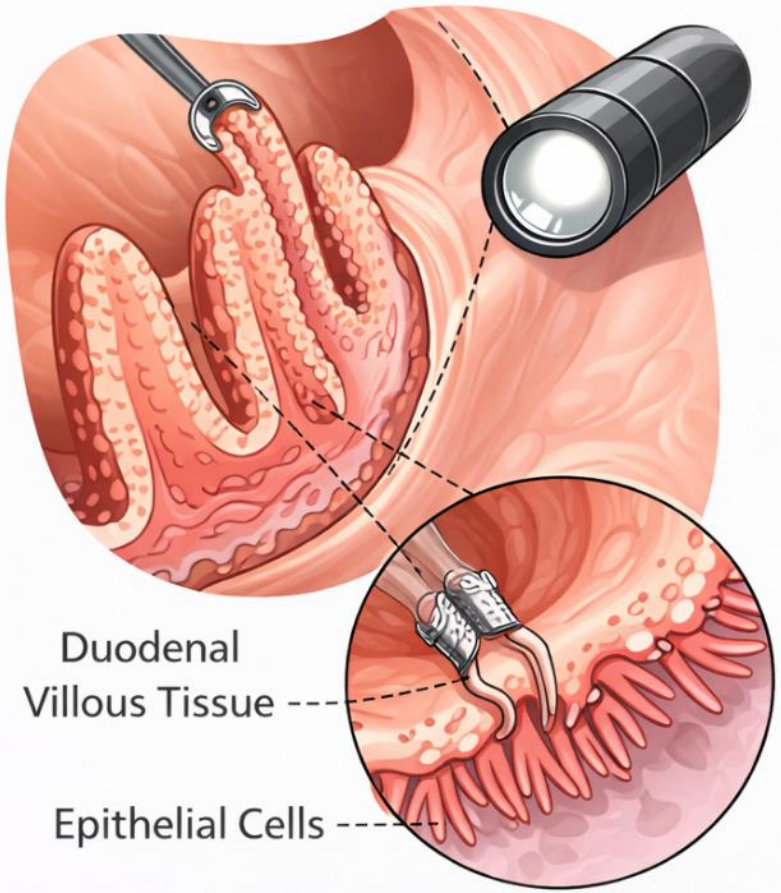
Small Intestine Bacterial Overgrowth and Villi Enzyme Dysfunction



Disease States and State-of-the-Art Diagnostics


NORMAL
DISACCHARIDASE DEFICIENCY
Glucose
Sucrose
Lactase
Fructose
Sucrose
Lactase
Glucose
Fructose
SMALL INTESTINE
Small Intestine
Sucrose
Lactose
Lactose
Water
Bacteria
Malabsorbed Carbohydrates
Sucrose
Lactose
Bacterial Fermentation
Gas, organic acids,
Osmolytes
LARGE INTESTINE
Large Intestine
Symptoms:
Abdominal Pain, Bloating & Altered Motility

Upper Endoscopy Biopsy of Disacchridase Testing



Biopsy forceps collecting villous tissue

Normal Disaccharidase Activity Levels		
Enzyme	**Normal Range** (µmol/min/g protein)	
Lactase	> 15	
Sucrase-Isomaltase	> 25	
Maltase-Glucoamylase	> 100	
Trehalase	> 5	

Evidence-based Medicine and Treatment

What does the Evidence say for Adults?

- **AGA Diet Clinical Practice Update (2022)**
  - Adult-focused guideline
  - Emphasizes **low-FODMAP** (most evidence-based diet intervention)
  - it does **not** list lactase or other enzymes as specific IBS treatment.

- **ACG Clinical Guideline: Management of Irritable Bowel Syndrome (2021)**
  - Adult-focused guideline
  - The guideline recommends a limited trial of a low-FODMAP diet to improve global IBS symptoms
  - Some “food reactions” or symptoms attributed to IBS may reflect enzyme defects (e.g., lactase, sucrase-isomaltase) or other carbohydrate transport issues
    - i.e., these are alternative explanations/overlaps to consider, not routine IBS therapy

What does the Evidence say for Children?

Study (PMID)	Population	Design	Comparator	Primary Outcomes	Key Results	Limitations
Chumpitazi 2015 PMID: **26104013**	33 children, 7–17 yrs with Rome III IBS	**Double-blind crossover RCT** (low-FODMAP vs typical American childhood diet, 48 hrs each)	Usual diet	Abdominal pain frequency & severity	↓ pain episodes on low-FODMAP (1.1 vs 1.7 episodes/day, $p<0.05$). Responders had distinct baseline microbiome profiles (↑ saccharolytic taxa).	Short intervention; highly controlled feeding not real-world; small sample
Stróżyk 2021 PMID: **33388067**	Children 5–18 yrs with Rome IV FAPDs	**RCT protocol**	Standard healthy diet	Responder rate, pain intensity, stool pattern, QoL	Designed to test whether low-FODMAP superior to standard diet with 4-wk elimination + reintroduction.	Protocol only—results pending; heterogeneity of FAPDs
Dogan 2020	60 children with IBS (Rome III)	Prospective comparative study	Conventional IBS diet	Global GI symptoms, pain, bloating	Low-FODMAP group showed greater improvement in pain and bloating scores over 3 months vs control diet.	Non-blinded; not placebo-controlled; adherence self-reported
Boradyn 2020	84 children with functional abdominal pain	Randomized trial	NICE-based diet	Parent/child symptom ratings	Both diets improved symptoms; **low-FODMAP produced greater reduction** in pain frequency and school absence; good parental acceptance.	Subjective outcomes; short follow-up; no microbiome data

What about other supplements?

- For **supplements**
  - **Peppermint oil**: suggested for global IBS symptom relief (conditional).
  - **Probiotics**: suggested **against** for global IBS symptoms (conditional; very low-quality evidence).

High FODMAP foods to limit while assessing symptoms

Fructan	GOS	Lactose	Fructose	Polyols
Artichoke	Almond	Buttermilk	Agave	Apple
Banana	Beans	Condensed Milk	Asparagus	Apricot
Brussels Sprouts	Beet	Cream	Bell Pepper (Red,	Artificial Sweeteners
Cabbage	Cassava	Cream Cheese	Orange, Yellow)	Avocado
Cauliflower	Cashew	Cottage Cheese	Butternut Squash	Blackberry
Chicory Root, Inulin	Chickpeas	Custard	Figs	Celery
Corn	Falafel	Goat Milk	Fruit Juices	Cherry
Dried Fruit	Kale	Goat Cheese	High Fructose Corn	Coconut
Garlic, Onion	Lentils	Haloumi	Syrup	Date
Honeydew	Peas	Ice Cream	Grapes	Mushroom
Pomegranate	Pine Nuts	Kefir	Grapefruit	Nectarine
Scallion, Shallot	Pistachio	Milk	Honey	Peach
Squash (Acorn, Delicata,	Silken Tofu	Powdered Milk	Mango	Plum
Kabocha, Pumpkin)	Soy Milk (Soy Bean)	Ricotta	Pear	Prune
Sweet Potato	Taro	Sour Cream	Raisins	Rutabaga
Wheat, Rye, Barley	Tomatillo	Queso Fresco	Soda	Turnip
Zucchini	Walnuts	Yogurt	Tomato	Watermelon

Benefits of Low FODMAP

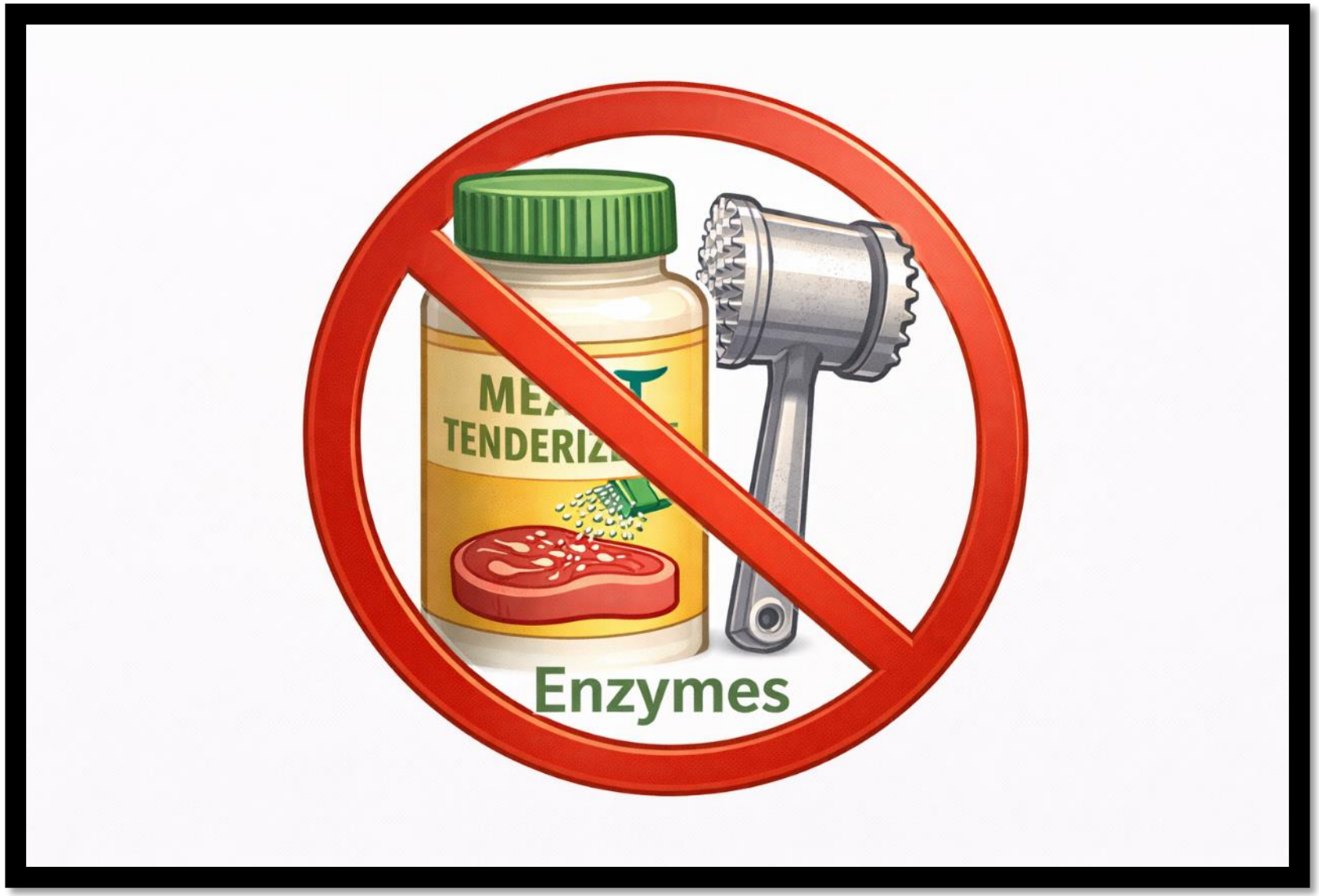
- Relief of IBS symptoms, such as pain, bloating, gas, diarrhea and constipation
- Improved bowel regularity

Potential Risks

- Nutritional and energy deficiencies
- Food anxiety and social isolation
- Higher food costs
- Microbiome disruption

Notes on the Evidence

- The **Chumpitazi 2015 RCT** remains the most rigorously controlled pediatric trial to date with objective crossover design.
- Additional RCTs (e.g., Stróżyk 2021) are emerging but evidence remains **limited** and heterogeneous in design, duration, and outcomes.
- Systematic reviews note evidence is **promising but insufficient** to universally recommend low-FODMAP in all pediatric functional GI disorders.
- Guidelines generally treat enzymes as targeted therapy for the *right diagnosis*, not IBS itself.

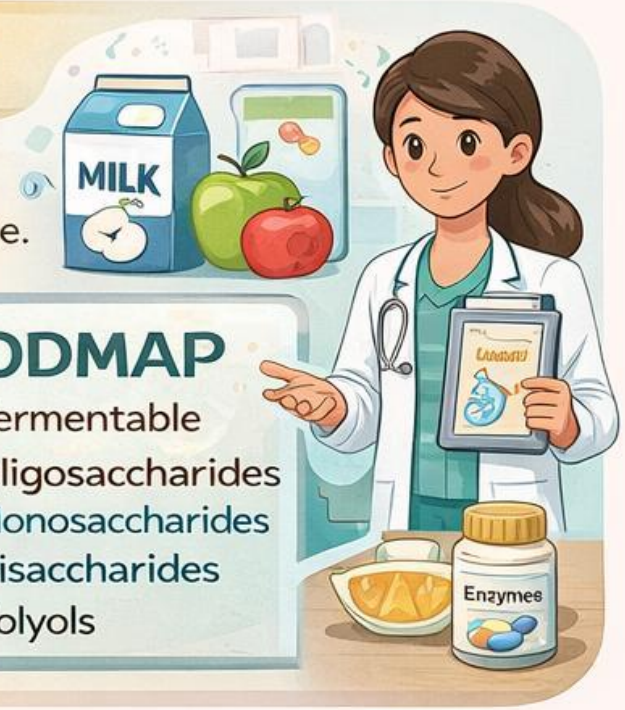

TENDERIZ
Enzymes

Practical Strategies for Patients

1 Understand FODMAPs

FODMAPs are fermentable carbohydrates that are poorly absorbed in the small intestine.

- They increase **gas, fluid shifts,** and intestinal distension.
- This can **trigger abdominal pain, bloating**, gas, diarrhea, or constipation.
- People with gut-brain interaction disorders (like IBS) are more sensitive to these effects.



2 Elimination Phase

- Remove all **high-FODMAP** foods from the diet.
- Lasts **2 to 3 weeks**.
- See if GI symptoms improve when FODMAPs are reduced.
- This phase is diagnostic, not permanent. If symptoms don't improve, the Low FODMAP diet may not be helpful.

Are there risks to a FODMAP diet?

Long-Term Low-FODMAP

>6 WEEKS!

>6 WEEKS!

RISKS:

- Poor growth
- Underweight
- Deficiencies in calories, vitamins (like thiamin, folate)
- Minerals (e.g., calcium, magnesium, iron)

Risk increases when extending FODMAP elimination >6 weeks

High-FODMAP With Enzymes

ENZYMES!

- Supports Growth
- Energy & Calories
- B vitamins (like thiamin, folate)
- Minerals (calcium, magnesium, iron)

BENEFITS:

- Supports Growth
- Energy & Calories
- B vitamins (like thianin, folate)
- Minerals (calcium, magnesium, iron)

Digestive enzymes allow greater diet variety while minimizing GI distress

3 Reintroduction (Challenge Phase)

- Reintroduce **high-FODMAP foods** one category at a time.
- Test each **FODMAP** group over several days.
- Monitor **symptoms** closely to identify triggers.
- **Take your enzymes.**
- If symptoms recur, that FODMAP group is removed again.
- Track food and symptoms.

FODMAP & Enzyme Symptom Log

Name: _____ Week of: _____

Date	Meal / Snack	High-FODMAP Food Eaten	Portion Size	Enzyme Taken? (Y/N)	Time to Symptoms	Symptoms (check)	Stool (Bristol 1–7)
	Breakfast				☐ Pain	☐ ☐ ☐ ☐	
	Lunch				☐ Bloat	☐ ☐ ☐ ☐	
	Dinner				☐ Gas	☐ ☐ ☐ ☐	
	Snack				☐ Diarrhea	☐ ☐ ☐ ☐	
					☐ Nausea	☐ ☐ ☐ ☐	

Weekly Summary

- **Best tolerated foods this week:** _____
- **Worst triggers:** _____

- **Did enzymes help?**
  - ☐ Yes - clear improvement
  - ☐ Maybe - partial
  - ☐ No difference
- ☐ Yes - clear improvement
- ☐ No difference

Bowel pattern this week: ☐ 1 2 3 4 5 6 5 7

Bowel movements per day: _____

Bowel summary

- Most common Bristol type ☐ ☐
- Bowel movements per day: _____

Other factors

- ☐ 1 2 3 4 4 5 6 7 _____
- ☐ Stress level (0–5): _____
- ☐ Sleep hours: _____
- ☐ Illness / antibiotics: _____

_____

Severity Scale

- 0 = none
- 1 = very mild
- 2 = moderate
- 3 = severe
- 5 = Next Day

Common FODMAPs

- **Fructans:** onion, garlic, wheat, inulin
- **Lactose:** ice cream, milk, soft cheeses
- **GOS:** beans, lentils
- **Polyols:** sugar alcohols apples, pears
- **Fructose excess:** honey, mango

Enzymes

Type/Dose: e.g, lactase, FODZYME, alpha-galactosidase

Breathe & Relax

Take a moment to eat mindfully.

Mix with Food

Sprinkle on meals & snacks

Cool Hot Foods

Let hot foods cool before using.

Double Up if Needed

Use extra for big meals or sensitivity.

Chew Thoroughly

Chew well to mix with food.

Repeat as Needed

Take with each new meal.

Practical takeaway for patients

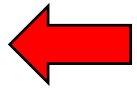
- Lactase tablets = **FDA-regulated supplement**, not FDA-approved medication
- Potency can vary between brands
- Generally considered safe with minimal side effects
- No prescription required

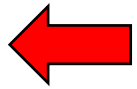
Case Scenarios

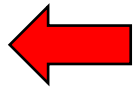
Case 1- Teenager with IBS

- A 14-year-old girl with no prior medical history presents with daily cramping abdominal pain for the past three months.
- Symptoms began shortly after she moved to a new school. The pain occurs most days, is worse during school hours, and does not improve with acetaminophen or ibuprofen. She denies weight loss, vomiting, blood in stool, or nocturnal symptoms.
- She was initially evaluated by her pediatrician and treated with fiber supplementation and laxatives for presumed constipation, without improvement.
- She was then referred to a pediatric gastroenterologist, who diagnosed irritable bowel syndrome and recommended a trial of cyproheptadine. Her parent expressed concern about “starting a medication” and wanted to explore non-pharmacologic options first.
- The patient met with a dietitian and began a low FODMAP diet, which led to mild symptom improvement after two weeks. However, the family reports the diet is too restrictive and difficult to maintain, particularly given school meals and social activities, and they are seeking alternative, sustainable management strategies.
    - **Question is: What should we try next?**

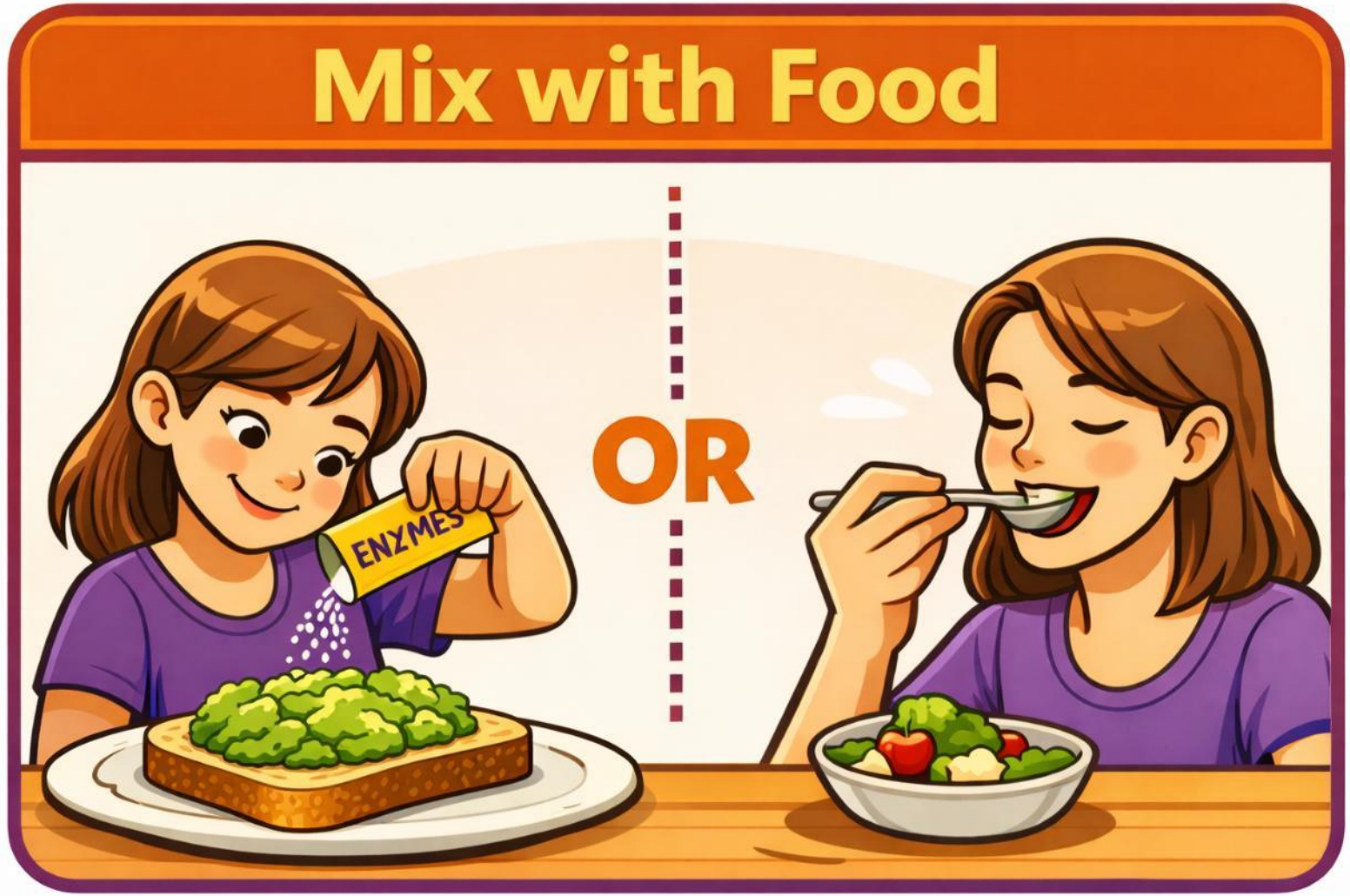
Type of Food	Foods to Include (Low FODMAPs)	Foods to Avoid (High FODMAPs)
Milk & Dairy	Rice milk, almond milk, coconut milk, hemp milk, lactose-free milk. Yogurt made with low FODMAP milk or lactose-free kefir. Ice cream made with lactose-free milk.	Cow, sheep, goat, and soy milk. Yogurt made with evaporated or sweetened condensed milk. Cream soups made with evaporated or condensed milk.
Cheese	Cheddar, Swiss, Brie, mozzarella, Parmesan, feta, blue cheese. Cottage or ricotta cheese ≤ 2 Tbsp per meal. Mascarpone.	Large portions of soft or high-lactose cheeses.
Dairy Condiments & Desserts	Butter, cream cheese, sour cream, whipping cream. Sorbet made from low FODMAP fruits.	Ice cream, frozen yogurt, or sherbet made with high FODMAP fruits or milk.
Fruit	Banana, blueberries, strawberries, raspberries, cantaloupe, honeydew, oranges, grapefruit, grapes, kiwi, pineapple, lemon, lime. Rhubarb < ¼ cup. Limit to 1 fruit per meal.	Apples, pears, mango, watermelon, cherries, peaches, nectarines, plums, apricots, prunes, papaya, avocado. Dried fruit and concentrated fruit juice.
Vegetables	Lettuce, spinach, carrots, cucumber, green beans, eggplant, bok choy, red bell pepper, tomatoes, potatoes, yams, zucchini.	Asparagus, artichokes, cabbage, cauliflower, mushrooms, pumpkin, broccoli, Brussels sprouts, garlic, onions, leeks, sugar snap peas.
Grains	Rice, oats, quinoa, corn, polenta. Gluten-free bread, pasta, cereal, crackers.	**Wheat**, rye, barley, spelt.
Legumes	Tofu, peanuts.	Beans, lentils, chickpeas, hummus, edamame.
Nuts & Seeds	Almonds, macadamia nuts, pecans, pine nuts, walnuts. Pumpkin, sesame, sunflower seeds. Limit to 10 nuts or 1 Tbsp seeds per meal.	Cashews, pistachios.
Sweeteners	Sugar, glucose, pure maple syrup. Equal or Splenda.	**Honey**, agave, high-fructose corn syrup. Sugar alcohols including sorbitol, mannitol, xylitol, maltitol, erythritol, lactitol.
Alcohol	Wine, beer, vodka, gin. Limit to 1 drink per day.	Rum.
Fats & Oils	Olive oil, canola oil, butter, olives.	Excess **avocado**.
Protein Foods	Beef, pork, chicken, turkey, fish, eggs.	None.
Other Beverages	Coffee or tea. Carbonated beverages.	Drinks sweetened with high FODMAP sweeteners.







https://www.cmeoutfitters.com/wp-content/uploads/2018/07/lowfodmapdiet.pdf


Mix with Food
ENZYMES
OR

Case 2- College student

- An 18-year-old female college freshman presents with intermittent abdominal pain, bloating, and alternating constipation and diarrhea for the past year.
- Symptoms worsened after starting college and are most noticeable during periods of academic stress. She reports symptom relief after bowel movements and denies alarm features such as weight loss, anemia, or gastrointestinal bleeding.
- She was evaluated by her primary care provider and diagnosed with irritable bowel syndrome based on symptoms and normal screening laboratory studies.
- She has tried dietary fiber, probiotics, and over-the-counter antispasmodics with minimal benefit. She feels like gluten is a trigger, but she LOVES baking. The use of Lactaid milk has not helped.
- She is interested in learning how diet, stress, and gut–brain interaction contribute to her symptoms and is looking for a structured but flexible treatment plan that fits college life.
    - **Question is: What should we try next?**

FODMAP & Enzyme Symptom Log

Name: _____ Week of: _____

Date	Meal / Snack	High-FODMAP Food Eaten	Portion Size	Enzyme Taken? (Y/N)	Time to Symptoms	Symptoms (check)	Stool (Bristol 1–7)
	Breakfast	10 g gluten	2 hr	N	☑ Pain	☑ ☑ ☐ ☐	7
	Lunch	10 g gluten	2 hr	N	☑ Bloat	☑ ☑ ☐ ☐	7
	Dinner	10 g gluten	1 hr	N	☐ Gas	☑ ☑ ☐ ☐	7
	Snack	10 g gluten	1 hr	N	☐ Diarrhea	☑ ☑ ☐ ☐	7
					☐ Nausea	☑ ☑ ☐ ☐	7

Weekly Summary

- ✔ **Best tolerated food:** boiled chicken
- ✔ **Worst triggers:** Sourdough

- ✔ **Did enzymes help?**
  - ☐ Yes – clear improvement
  - ☐ No difference
  - ☑ No difference
  - ☐ Yes – clear improvement
  - ☐ No difference
  - ☐ No difference

Bowel pattern this week: 7 1 2 3 4 5 6 3 7

Bowel movements per day: _____

Bowel summary

- ✔ Most common Bristol type 7
- ✔ Bowel movements per day: _____

Other factors

- ☐ Stress level 5 5 6 7 _____
- ☐ Sleep hours: _____
- ☐ Illness / antibiotics: _____

Severity Scale

- 0 = none
- 1 = very mild
- 2 = moderate
- 3 = severe
- 5 = Next Day

Common FODMAPs

- **Fructans:** onion, garlic, wheat, inulin
- **Lactose:** ice cream, milk, soft cheeses
- **GOS:** beans, lentils
- **Polyols:** sugar alcohols apples, pears
- **Fructose excess:** honey, mango

Enzymes

Type/Dose: e.g. lactase, FODZYME, alpha-galactosidase

Figure t:

Non-Food Sources of Gluten

Gluten can be found in everyday products and may be accidentally ingested from hands, lips, or mouth. These are the most frequent hidden sources:

Personal Care Products

- **Toothpaste and mouthwash** (some contain wheat starch or hydrolyzed gluten)
- **Lip balm, lipstick,** and **lip gloss**
- **Cosmetics** that touch the mouth (foundation on lips, flavored gloss)
- **Hand creams** and **lotions** used before eating

Medications & Supplements

- **Prescription and over-the-counter pills** using wheat starch as a filler
- **Chewable vitamins** and gummy supplements
- **Probiotics** and herbal products with barley or wheat derivatives.
- **Communion wafers**

Dental & Medical Products

- Some dental polish pastes
- Throat lozenges
- Medicated mouth sprays

Cross-Contact Risks (Not Food Itself)

- Shared toasters, cutting boards, strainers
- **Flour in the air** from baking
- **Shared** condiment jars (butter, peanut butter)

Household & Daily Items

- **Play-Doh** and modeling clays
- **Envelope glue** and stamp adhesive.
- **Pet food** or **treats** handled before eating
- **Craft supplies** made with wheat paste

Quick Safety Tips for Families:

- **Choose** products labeled **"gluten-free"** for anything that touches.
- Wash hands after handling Play-Doh or pet food.
- **Ask** the pharmacy to verify gluten-free excipients.
- Keep a separate toaster and condiment containers.

Tips-Non-food sources of gluten

Gluten can be found in non-food items and inadvertently ingested.

These items should be gluten free:

- Lip balm, lip stick, and lip gloss.
- Any make up that could come in to contact with your lips.
- Shampoos.
- Hand sanitizer (if not gluten free, wash hands before eating).
- Hand lotion (if not gluten free, wash hands before eating).
- Playdough (if not gluten free, wash your hands after using).
- Medications and supplements can contain gluten as an additive. Call the ma nufacturer and check DailyMed.

Case 3- Adult Patient (35-Year-Old, Mother of 4)

- A 35-year-old woman, mother of four children, presents with a long-standing history of irritable bowel syndrome with diarrhea-predominant symptoms that began in her mid-20s.
- She reports recurrent abdominal cramping, bloating, and urgent loose stools, particularly in the late afternoon and evening. Symptoms often worsen on busy days and around mealtimes.
- Her symptoms are strongly associated with chronic stress related to working outside the home, managing multiple children's school and activity schedules, and preparing meals, often without support due to her husband frequently traveling for work. She describes fatigue for which she compensates with caffeine from coffee, skipping meals during the day, eating quickly, and relying on convenience foods, which frequently trigger symptom flares.
- She has previously undergone evaluation including normal laboratory testing, upper endoscopy [with disaccharidase testing] and colonoscopy.
- She has tried general dietary modifications and over-the-counter antidiarrheal medications with partial and inconsistent relief. **She committed to dairy free for 1 month, saw some benefit but that benefit was not maintained when using OTC lactase enzyme supplementation before meals.**
- She is seeking a practical, sustainable management plan that fits family life, reduces symptom flares, and allows her to function at work and at home.
    - **Question is: What should we try next?**

Does Coffee Trigger IBS?

Coffee is **LOW-FODMAP**, but can still trigger **IBS!**

RISKS for IBS

RISKS for IBS:

- **Stimulates Gut Motility:** ↑ urgency, diarrhea
- **Increases Stomach Acid:** Dyspepsia, abdominal pain
- **Triggers Gut Sensitivity:** Discomfort FODMAP-safe
- **Add-Ins Are Often Issue:**
  - Milk/cream = high lactose, syrups = fructose/
  - Sugar-free sweeteners = sorbitol/mannitol

Coffee ≠ high FODMAP,
but common non-FODMAP IBS trigger.

Coffee ≠ high FODMAP, but common non-FODMAP IBS trigger.

Use ENZYMES for safer coffee

- ✓ Lactase for milk/cream
- ✓ Alpha-galactosidase for soy, oats
- ✓ **FODZYME** (fructans, GOS)

Coffee & FODMAP Status

✓ LOW	✗ HIGH
✓ Black Coffee	✓ With Milk: Lactose (high FODMAP)
✓ Espresso	✓ Flavored Syrups Fructose, polyols
✓ Cold Brew	✓ Artificial Sweeteners: Sorbitol, mannitol
✓ Lactose-free milk, almond, oat	

IBS-D With High Life Stress: What to Try Next

Patient Profile

- Adult with IBS-D
- Stress-related flares
- Partial response to diet and OTC therapies
- Normal labs, endoscopy and colonoscopy

Step 1: Stabilize the Basics

→ **Regular meals**
→ **Slow eating**
→ Avoid meal skipping and late-day overloading

Step 2: Targeted Nutrition (Not Restriction)

→ Modified low-FODMAP approach
→ Identify 1–2 high-risk triggers only
→ Avoid full elimination diets

Step 3: Enzyme Support

→ Trial broad carbohydrate-digesting enzymes
→ Use with trigger meals, not every meal
→ Reassess response in 2–3 weeks

Step 4: Treat the Gut–Brain Axis

→ Gut-directed hypnotherapy or CBT-IBS
→ Normalize as biologic treatment, not stress counseling

Step 5: Neuromodulation if Needed

→ Low-dose TCA at bedtime
→ Target visceral pain and urgency
→ Reassure: dosing is for gut sensitivity, not mood

Goal: Strategic Medications

✓ Antidiarrheals as needed, situational use
✓ Antispasmodics before predictable trigger times

Conclusions

- Both Adult and Pediatric DGBIs have evidence supporting the use of Low FODMAP Diet
- There are limitations to this diet
- Enzymes provide a safe, OTC option to alter symptoms
- The key to success is trial and error with symptom tracking throughout

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