

GI Effects Stool Profile

Digestion: A Focus on the Digestive Capacity

Lahnor Powell, ND, MPH

Medical Education Specialist | Genova Diagnostics





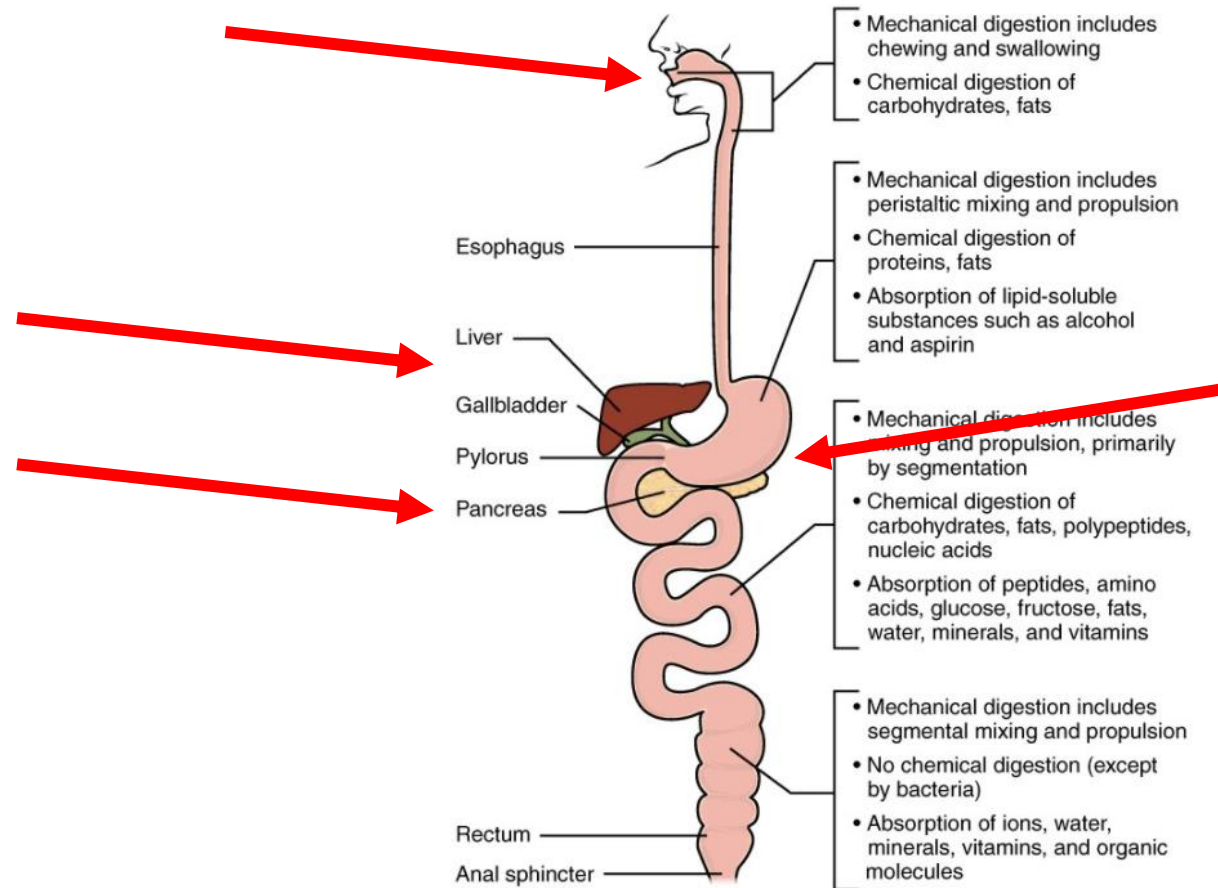
Objectives for This Presentation

- Overview of digestion and absorption
- In-depth review of digestion and absorption markers on the GI Effects Profile
- Discuss the benefit and clinical management or results

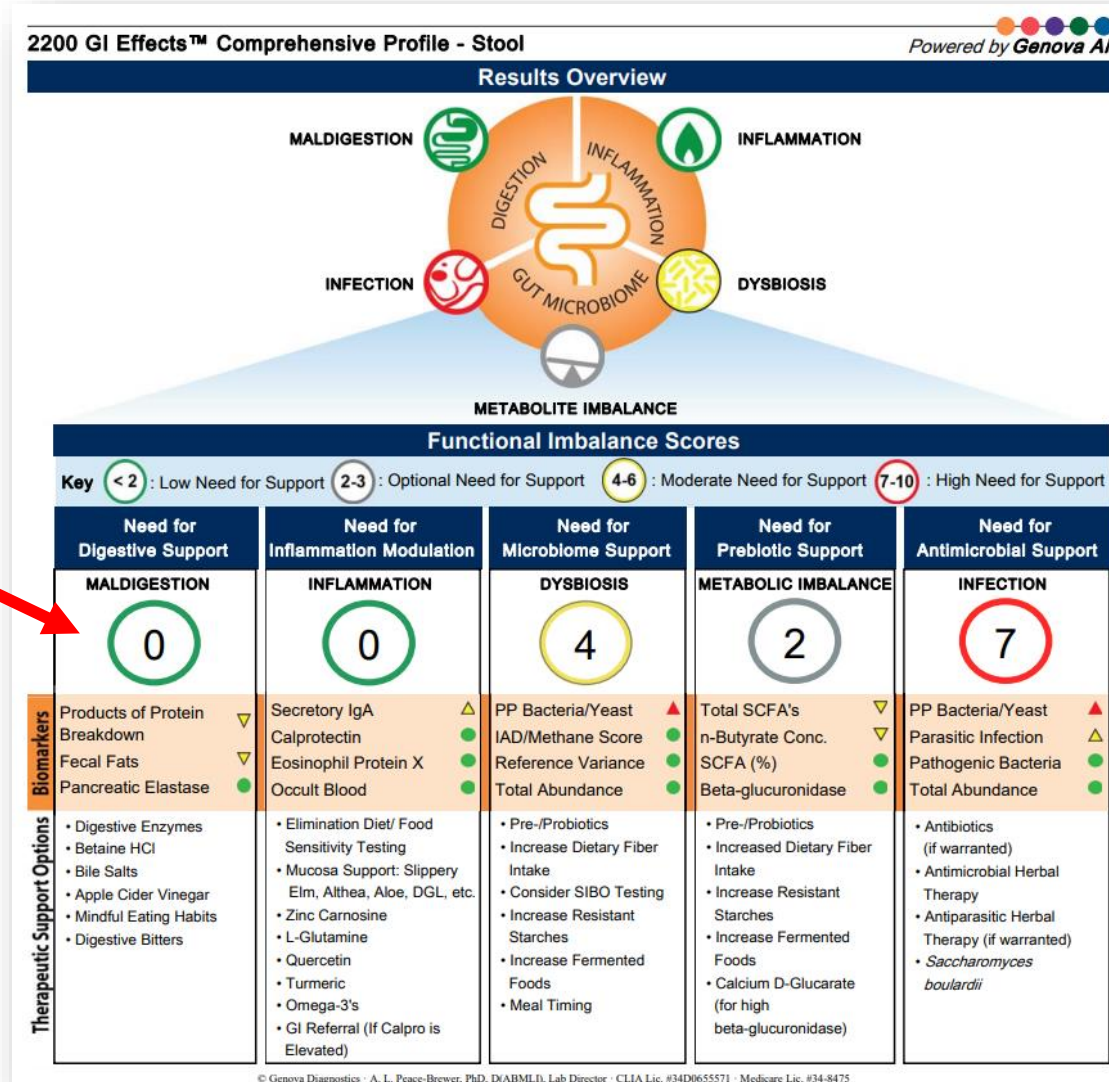




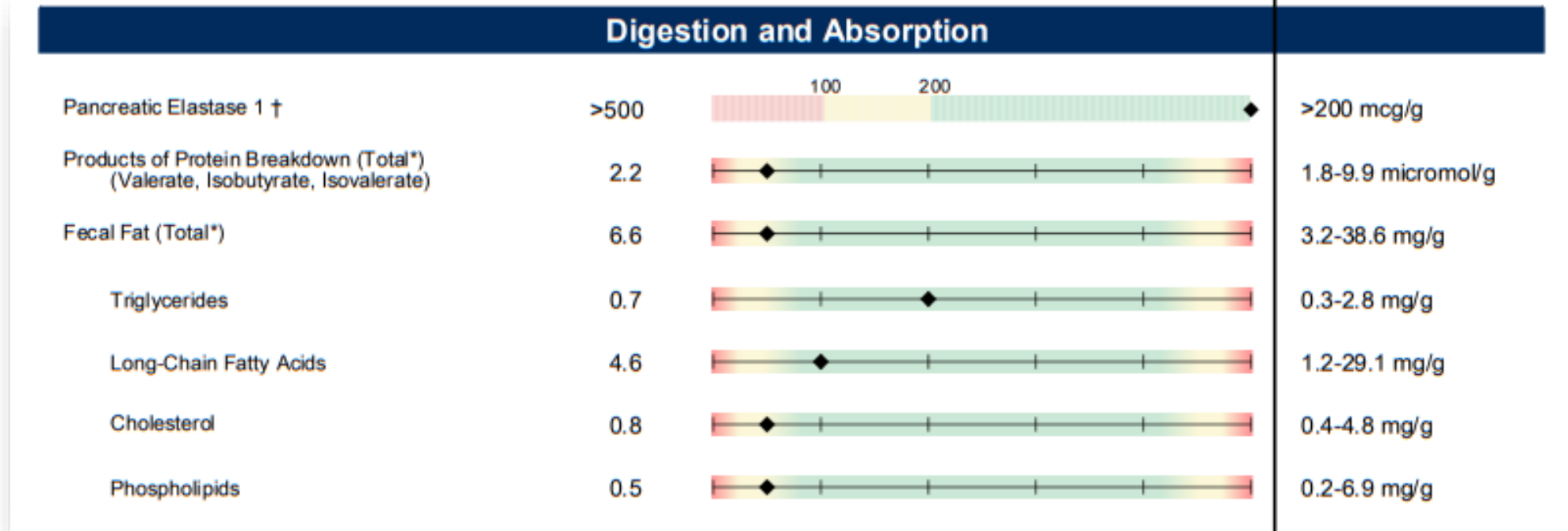
Digestion and Absorption Overview



Digestion and Absorption



Digestion and Absorption



*Total value is equal to the sum of all measurable parts.

†These results are not represented by quintile values.

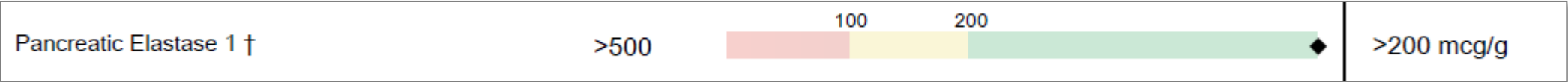
Tests were developed and their performance characteristics determined by Genova Diagnostics. Unless otherwise noted with *, the assays have not been cleared by the U.S. Food and Drug Administration.

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Pancreatic Elastase 1 (PE-1)



A digestive enzyme secreted exclusively by the pancreas

- Insight into pancreatic exocrine function

| Fecal PE-1 (mcg/g) | Interpretation |
|--------------------|--|
| >200 | Normal exocrine pancreatic function |
| 100 to 199 | Mild-to-moderate exocrine pancreatic insufficiency (EPI) |
| <100 | Severe pancreatic insufficiency |



Pancreatic Elastase-1 (PE-1)

- Exocrine pancreatic insufficiency (EPI) symptoms
 - Diarrhea
 - Steatorrhea
 - Foul-smelling stools
 - Bloating and/or excess gas
 - Abdominal discomfort
 - Weight loss
- Common Causes of EPI
 - Pancreatic Causes
 - Cystic Fibrosis, Chronic pancreatitis, GI Surgery, Gallstones, or Pancreatic tumor/cancer
 - Non-Pancreatic Causes
 - Celiac disease, IBD, aging, alcoholism, SIBO, smoking, obesity, vegan/vegetarian diets, or diabetes/insulin resistance



Pancreatic Elastase-1 (PE-1)

- Therapeutic considerations
 - Further investigation to determine the underlying cause of dysfunction
 - Address cause for dysfunction
 - Support patients with pancreatic enzyme replacement therapy
 - Consider small and frequent meals
- Further Evaluation
 - Consider nutritional assessment as pancreatic exocrine insufficiency may be associated with deficiencies in nutrients



Products of Protein Breakdown (PPB)



- Products of Protein Breakdown (Isovalerate, Valerate, and Isobutyrate)
 - Derived from bacterial fermentation of protein by colonic bacteria
- Therapeutic Considerations
 - Evaluate dietary protein intake
 - Assess for, and treat, root causes of insufficient protein digestion
 - Digestive support with meals

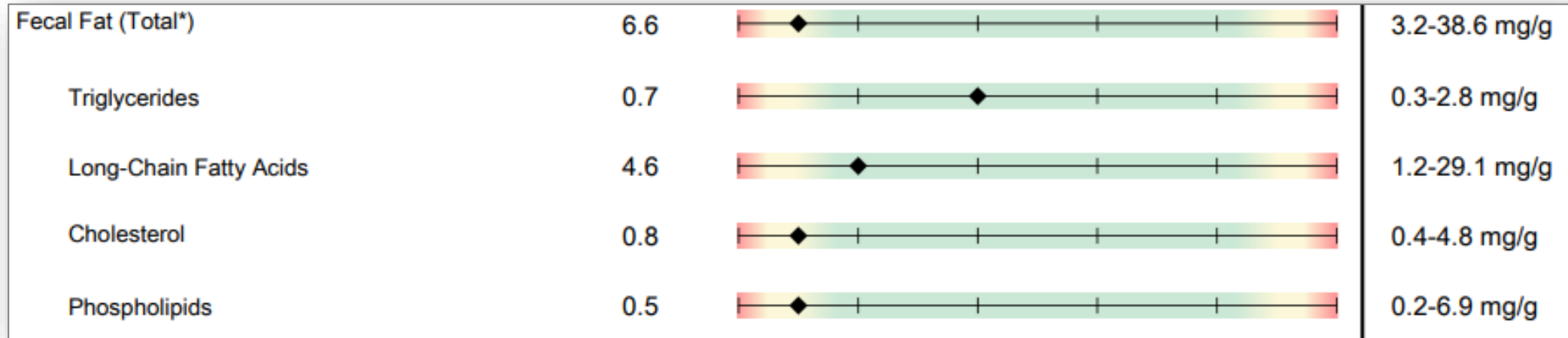


Products of Protein Breakdown (PPB)

- Causes of low PPB
 - Very low protein diet
 - Antibiotic use
 - Low commensal bacteria
 - Intestinal inflammation
- Causes of high PPB
 - High protein diet
 - Exocrine pancreatic dysfunction
 - SIBO
 - Low gastric HCL
 - Rapid transit time
- Further Evaluation
 - Consider nutritional assessment of amino acids as elevated PPB may be associated with deficiencies



Fecal Fats



- Evaluates multiple lipid analytes including triglycerides (TG), long-chain fatty acids (LCFAs), phospholipids, and cholesterol
- The total fecal fat is derived from a sum of the lipid analytes.



Fecal Fats

- Triglycerides
 - Increased fecal TG signifies maldigestion
- LCFAs
 - Increased fecal LCFAs are often indicators of malabsorption
- Cholesterol
 - Increased levels can indicate maldigestion or malabsorption but also can be derived from the diet
- Phospholipids
 - Elevations in fecal phospholipids can be due to mucosal cell turnover, malabsorption, or bile.



Fecal Fats

- Causes of fat maldigestion

- Exocrine pancreatic insufficiency
- Bile salt insufficiency
- PPI usage and hypochlorhydria
- Small intestinal bacterial overgrowth
- Use of medications designed to impair intestinal lipase activity (i.e., weight loss products)

- Causes of fat malabsorption

- Intestinal dysbiosis and SIBO
- Intestinal parasites
- Gastric bypass, ileal resection, or other surgeries that limit absorptive surface area
- Irritable bowel syndrome (mainly D)
- Inflammatory bowel disease
- Celiac disease



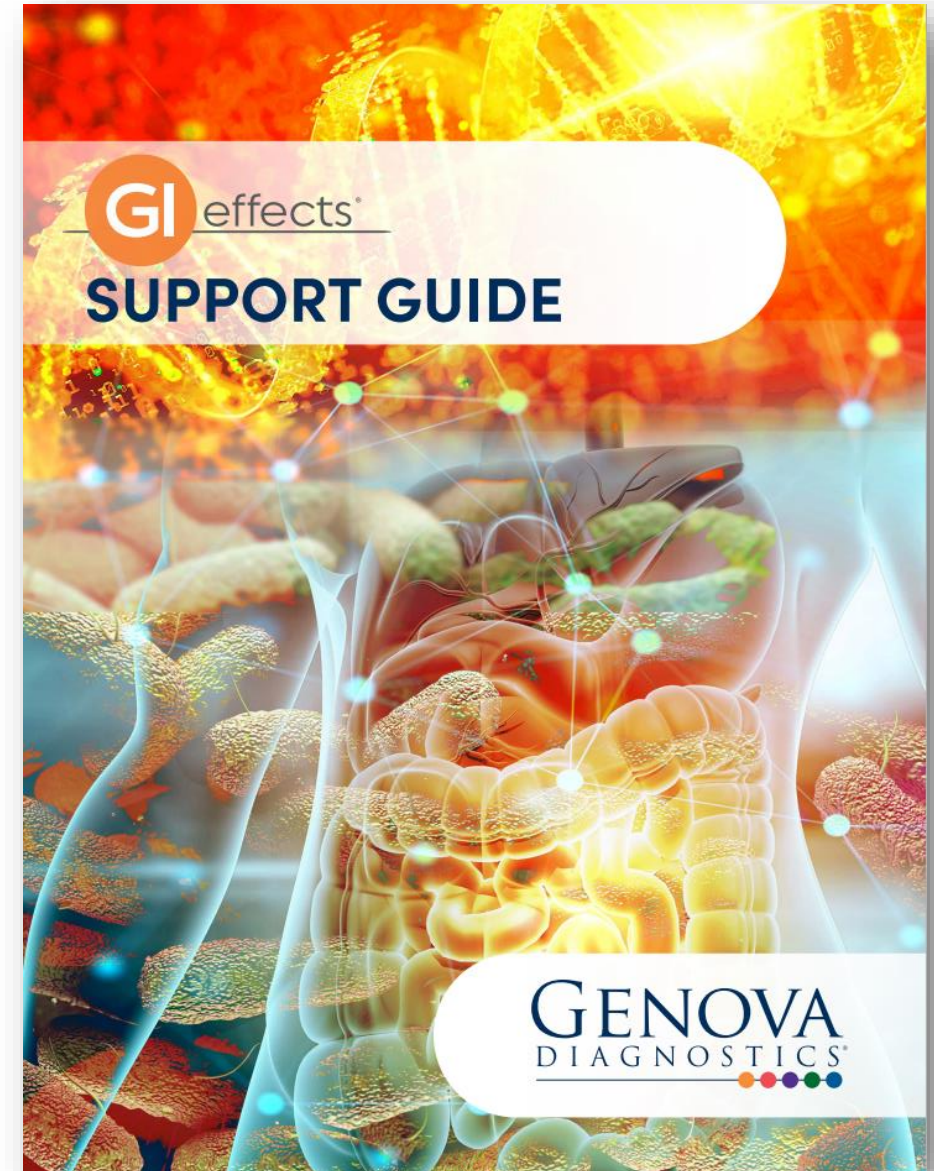
Fecal Fats

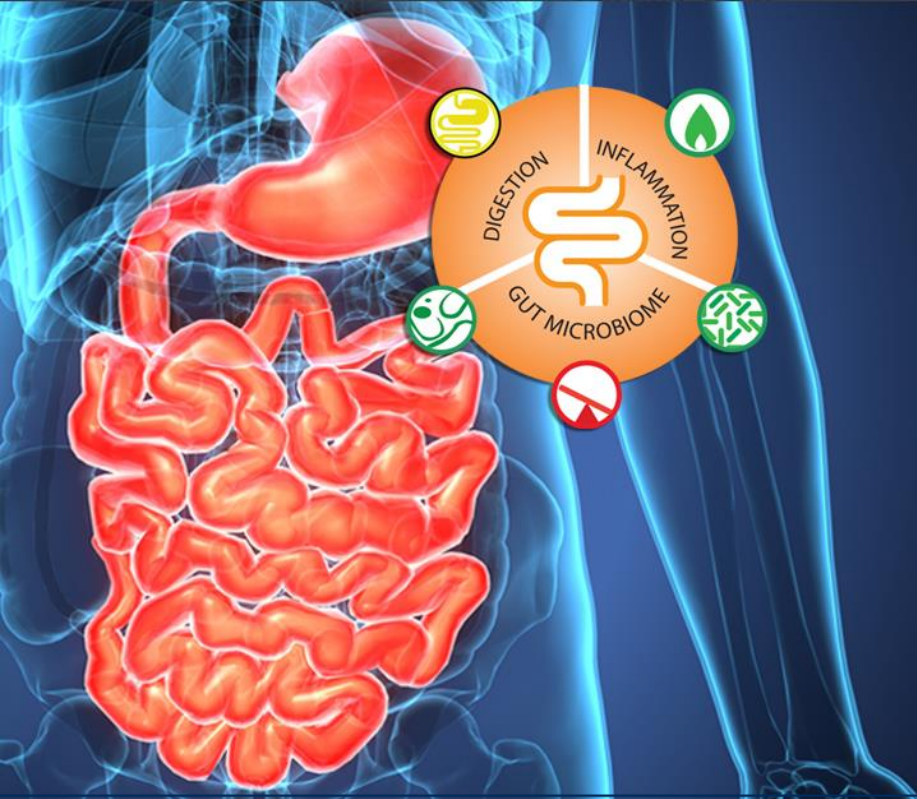
- Therapeutic considerations
 - Assess for, and treat, root causes of insufficient digestion or absorption of fats
 - Digestive support with meals
- Further Evaluation
 - Consider nutritional assessment of essential fatty acids and fat-soluble vitamins as fat maldigestion/absorption may be associated with deficiencies in fat or fat-soluble nutrients



Genova Educational Materials

- GI Effects Support Guide
- Complimentary Education Appointments
 - US Client Services: 800.522.4762
 - UK Client Services: 020.8336.7750
- Learning Library (www.gdx.net)
- Podcast (The Lab Report)





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