There are many probable causes of chronic diarrhea and abdominal pain including Inflammatory Bowel Disease (IBD), Irritable Bowel Syndrome (IBS), Celiac Disease, infectious GI pathogens, and malignancy. After excluding other causes of chronic diarrhea, a physician is left with the diagnosis IBS-diarrhea (IBS-D). One main cause of IBS-D is bile acid malabsorption.

**BILE ACIDS, IBS, AND 7AC4**

Bile acids are synthesized from cholesterol in the liver and released into the digestive tract where they function to emulsify dietary fats and facilitate lipid absorption in the small intestine. More than 95% of bile acids are then reabsorbed primarily by active uptake in the distal ileum, while less than 5% are excreted in stool.

Patients with increased bile acids in their stool often suffer from chronic diarrhea, a condition called bile acid malabsorption (BAM). Approximately 25-30% of patients with IBS-D have BAM. Identifying patients with BAM is typically done by measuring total and fractionated bile acids in stool.

The loss of bile acids in the stool of patients with BAM leads to upregulation of bile acid synthesis in the liver. Recent studies have shown that serum concentrations of the metabolic intermediate in bile acid synthesis, 7α-hydroxy-4-cholesten-3-one (7AC4) are elevated in patients with BAM and can be used as a surrogate to the timed fecal collection.²⁻⁴
**A UNIQUE TESTING APPROACH**

Mayo Clinic physicians and researchers pioneered the understanding of BAM in chronic diarrhea. Mayo Medical Laboratories offers the first, stand-alone serum screening test for BAM.

Using the results of the Mayo Clinic 7AC4 test, the physician may rule out bile acid malabsorption, consider a confirmatory fecal test, or consider a trial treatment of a bile acid sequestrant.

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**LABORATORY EVALUATION OF A PATIENT WITH CHRONIC DIARRHEA**

1. **Patient with chronic diarrhea without occult blood**
2. **Symptoms meet Rome IV criteria**
3. **Rule out non-IBS-D conditions**
4. **Evaluate for BAM**

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**Next Steps**

- Depending on the 7AC4 result
  - BAM is unlikely
  - Order confirmatory fecal bile acid test
  - Start bile acid sequestrant therapy

**Test Options**

- **Fecal Bile Acids**
  - Definitive for BAM
  - Requires 48h fecal collection while on a high fat diet

- **7AC4**
  - Screening for BAM
  - Fasting Serum Sample

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**REFERENCES**