



GHAPP

Gastroenterology & Hepatology
Advanced Practice Providers

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Gastroenterology & Hepatology
Advanced Practice Providers

Management of Small Intestinal Bacterial Overgrowth (SIBO)

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Disclosures

Monica Nandwani

- No disclosures

Objectives

Describe small
intestinal bacterial
overgrowth (SIBO)

Outline diagnosis of
SIBO

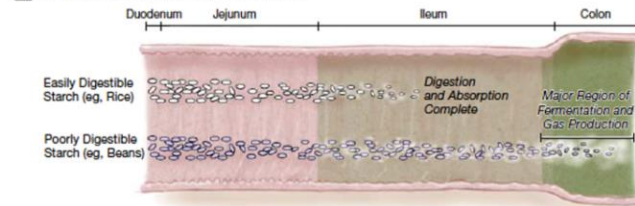
Discuss current
American College
of Gastroenterology
(ACG) clinical
guidelines for the
management of
SIBO

SIBO: Definition

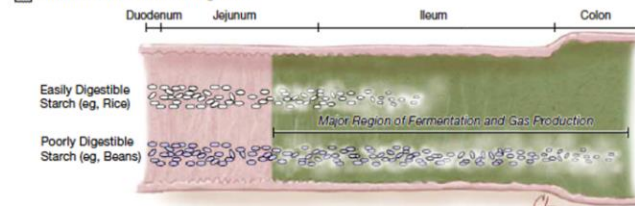


Excessive bacteria in the small bowel causing gastrointestinal symptoms

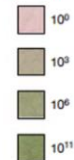
A Normal Distribution of Intestinal Bacterial Flora



B Small Intestinal Bacterial Overgrowth



Bacterial Concentration, organisms/mL



SIBO: Signs & Symptoms

Nausea

Bloating

Flatulence

Abdominal
distention

Abdominal
cramping

Abdominal
pain

Diarrhea

Constipation

Steatorrhea

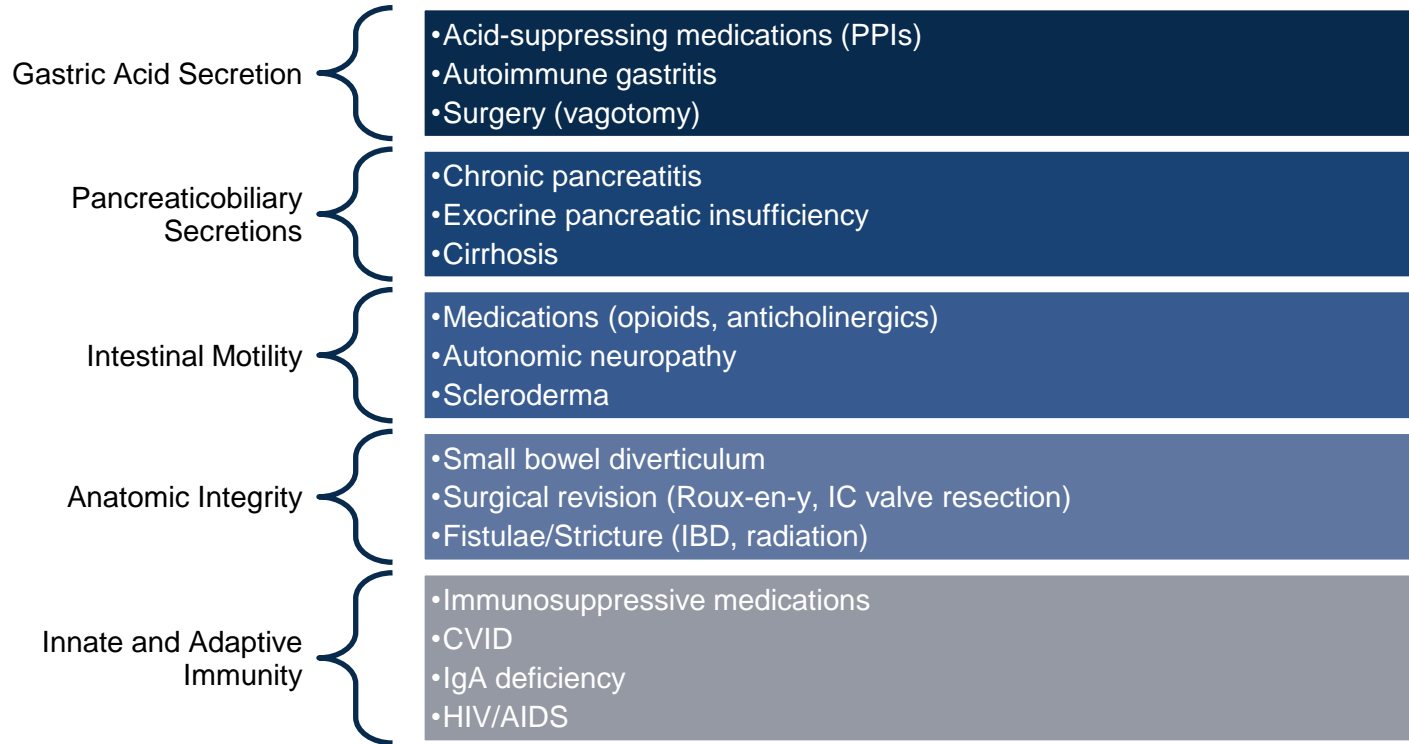
Weight loss

Anemia

Fat soluble
vitamin
deficiency



SIBO: Protective Measures & Associated Disorders



SIBO: Diagnosis

Duodenal/jejunal Aspirate

- $\geq 10^3$ colony-forming units per milliliter (CFU/mL)

Breath Testing

- Rise in exhaled hydrogen of at least 20 parts per million (ppm) above baseline within 90 minutes of oral ingestion of either 75g glucose or 10g lactulose

Diagnosis: Breath Testing for SIBO

Glucose breath test

75g

Can cause acute hyperglycemia and gut dysmotility in diabetics

Sensitivity:
20 – 93%

Specificity:
30 – 86%

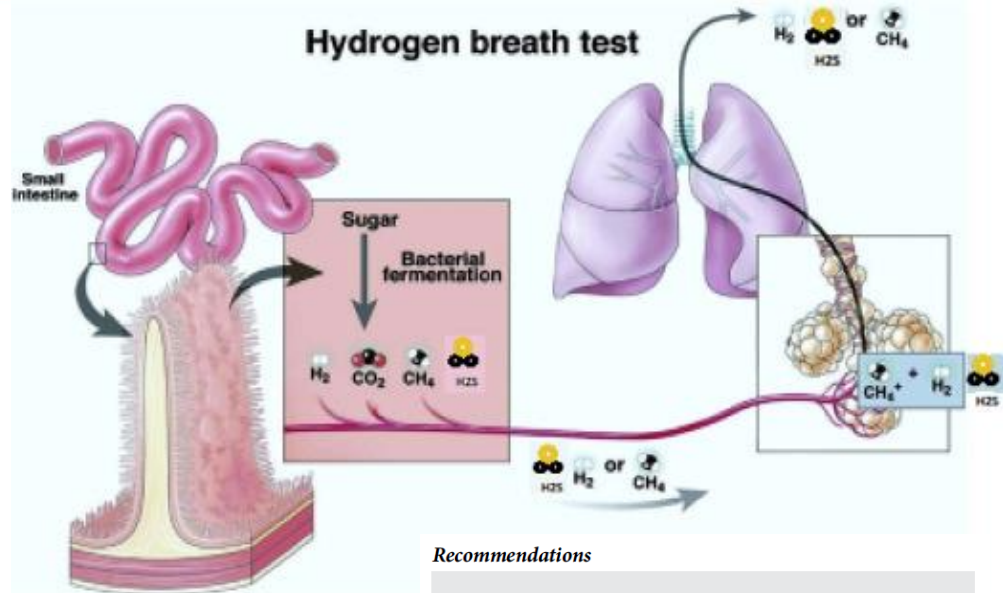
Lactulose breath test

10g

May be preferred for diabetics as a non-absorbed carbohydrate

Sensitivity:
31 – 68%

Specificity:
44 – 100%



Recommendations

1. We suggest the use of breath testing (glucose hydrogen or lactulose hydrogen) for the diagnosis of SIBO in patients with IBS (conditional recommendation, very low level of evidence).

Diagnosis: Breath Testing for SIBO

Preparation

- Avoid antibiotics for 4 weeks prior
- Avoid promotility agents and laxatives for 1 week prior
- Avoid fermentable foods day before
- Fast for 8-12 hours

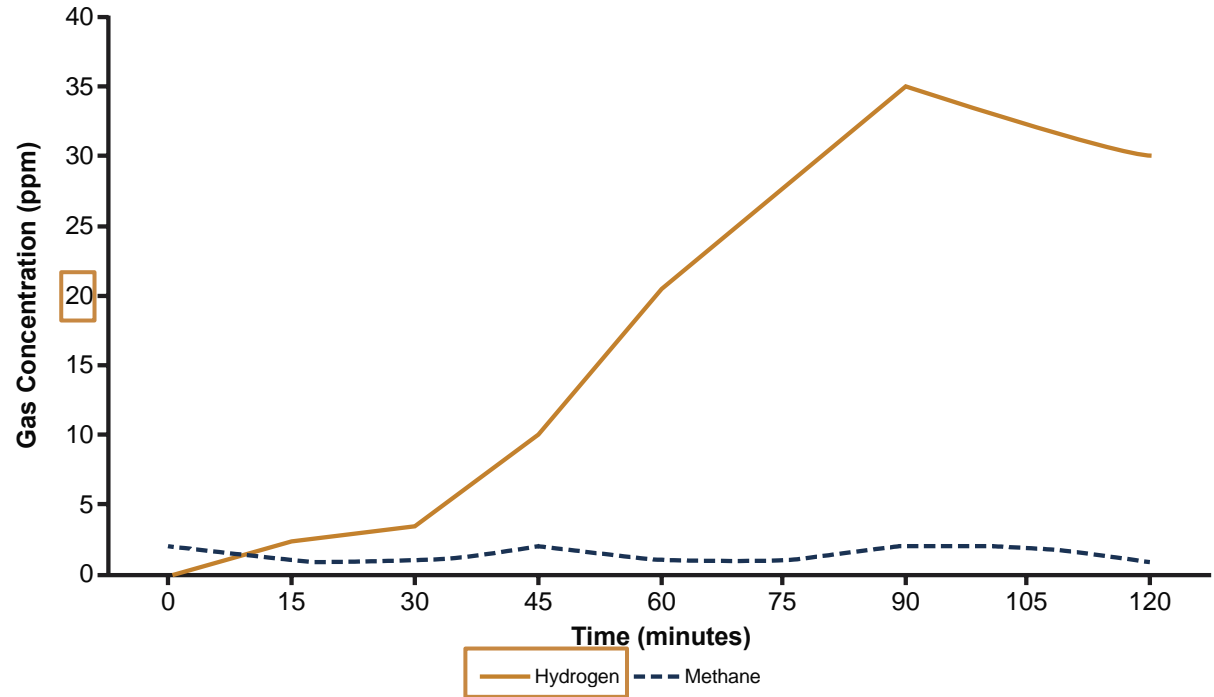
Avoid smoking

Minimize physical exertion

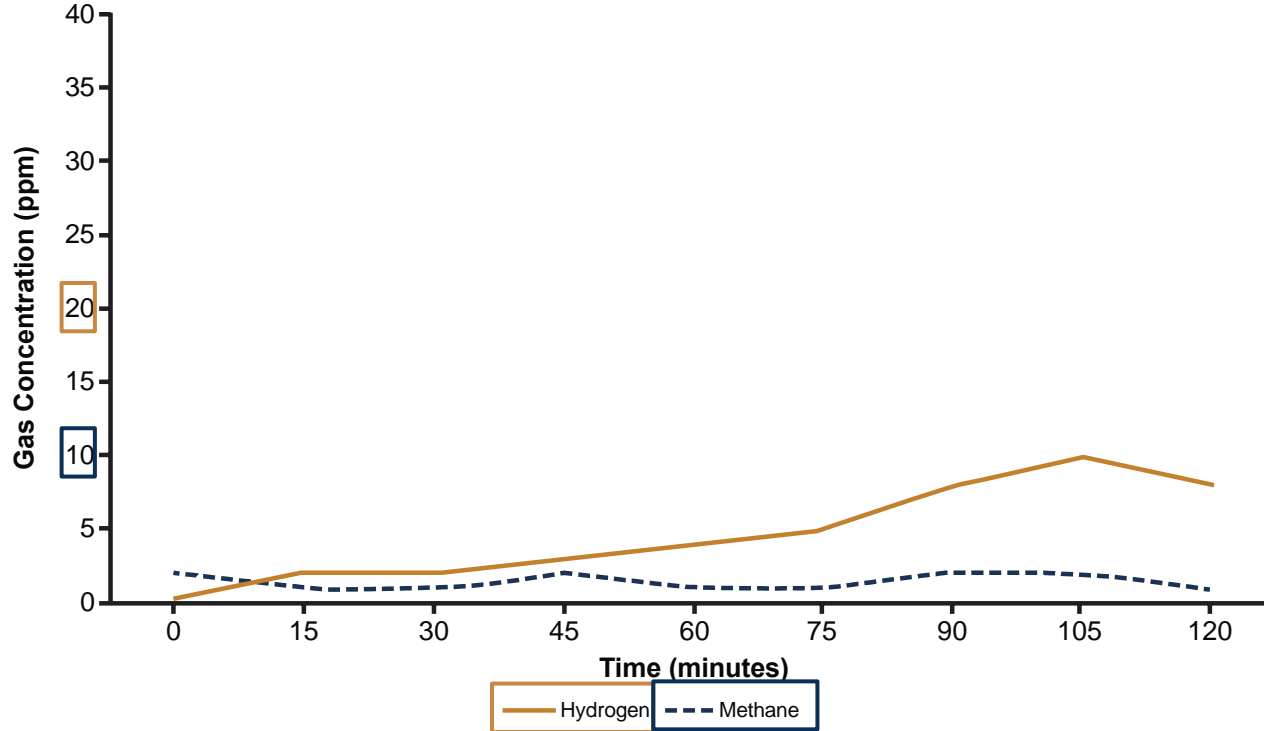
Not necessary to stop proton pump inhibitors (PPI) prior

SIBO on Breath Testing

Increase in hydrogen concentration of ≥ 20 ppm from baseline within 90 minutes

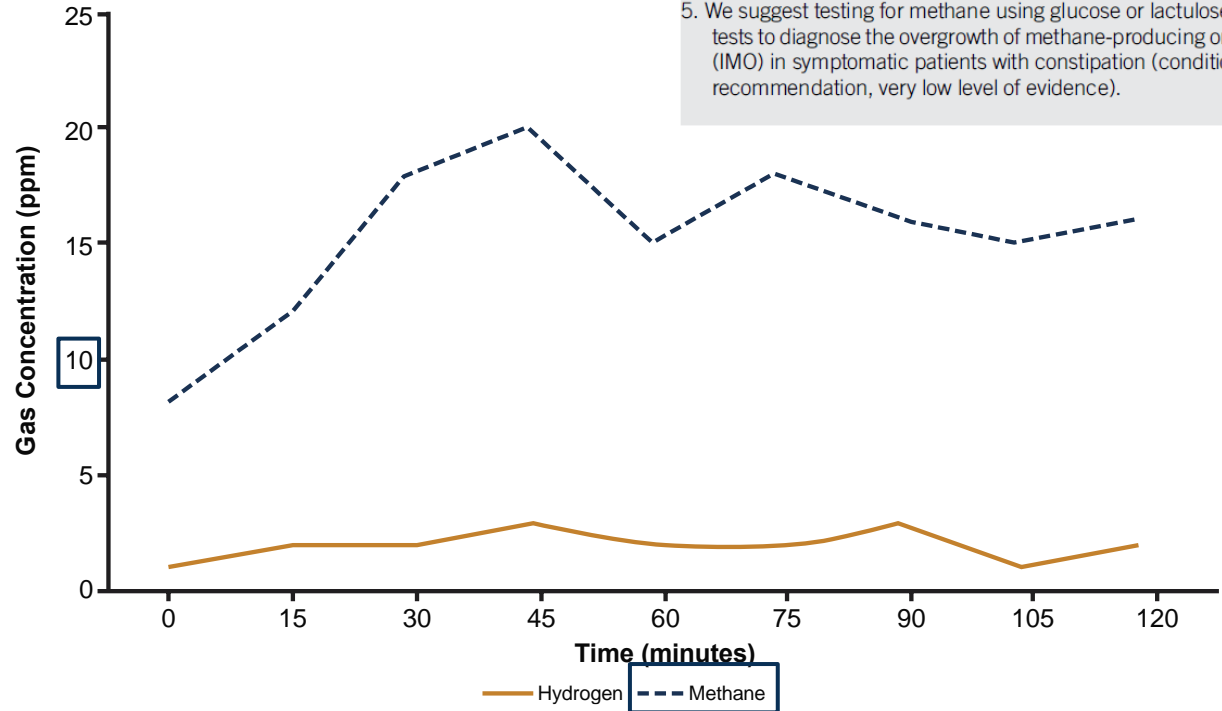


Normal Breath Test



Intestinal Methanogen Overgrowth (IMO)

For methane, a concentration of ≥ 10 ppm at any point during the test is indicative of methanogen colonization



5. We suggest testing for methane using glucose or lactulose breath tests to diagnose the overgrowth of methane-producing organisms (IMO) in symptomatic patients with constipation (conditional recommendation, very low level of evidence).

Hydrogen Breath Testing in the COVID-19 Era

Elective procedure

Aerosol-generating

- Patients should have negative COVID-19 test prior

PPE Recommendations

- N95 mask, gloves, face shield (or alternative protective eye ware), gown

Hydrogen Breath Testing in the COVID-19 Era

- Home breath test kits

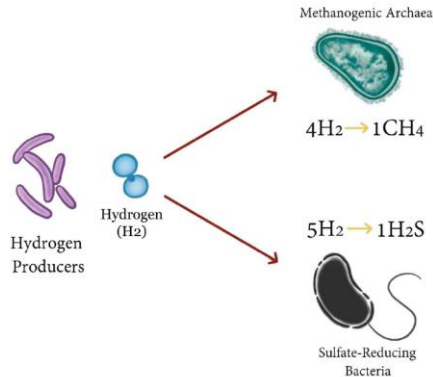


Hydrogen Sulfide (H₂S) Breath Test



Gas dynamics in the GI tract

- Hydrogen is consumed in the gut to produce methane and H₂S gases



HYDROGEN

Indicative of:
Small Intestinal Bacterial Overgrowth (SIBO)

Correlated with:
No correlation with symptoms

METHANE

Indicative of:
Intestinal Methanogenic Overgrowth (IMO)

Correlated with:
Constipation



SIBO: Future Diagnostics

P1144 (S0507). SIBO Diagnosis: Clinical Survey of Practice Patterns, Unmet Needs, and Perception of a Novel Ingestible Diagnostic Capsule

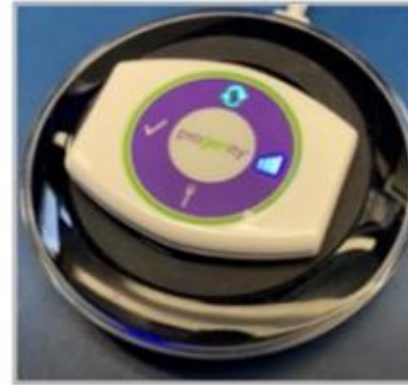
Baharak Moshiree, MD, MSc¹; Abraham Khan, MD²; Mitchell L. Jones, MD, PhD³; Sharat Singh, PhD⁴; Christopher Wah⁵, MD; Emil Chuang, MD⁶
¹UNC Charlotte, Atrium Health, Charlotte, NC; ²NYU Langone Health, NY; ³Progenity, Inc., San Diego, CA



Capsule (Patented)
Auto-locates, collects and analyzes sample for TBC



Patent Pending

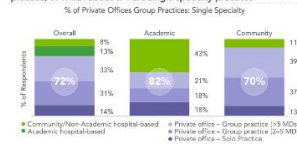


Wearable receiver
Receives data from capsule

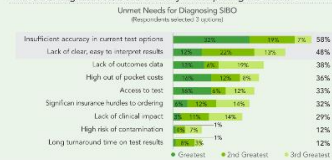
1. Singh, et al. DDW 2019 (poster)



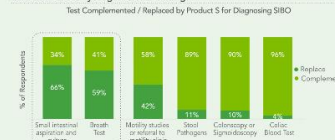
Fig 1. Of the GIs surveyed, 2/3 work in a private office group practice, of which about 3/4 are single specialty practices



with SIBO diagnostic tests and difficulty in interpreting the results.



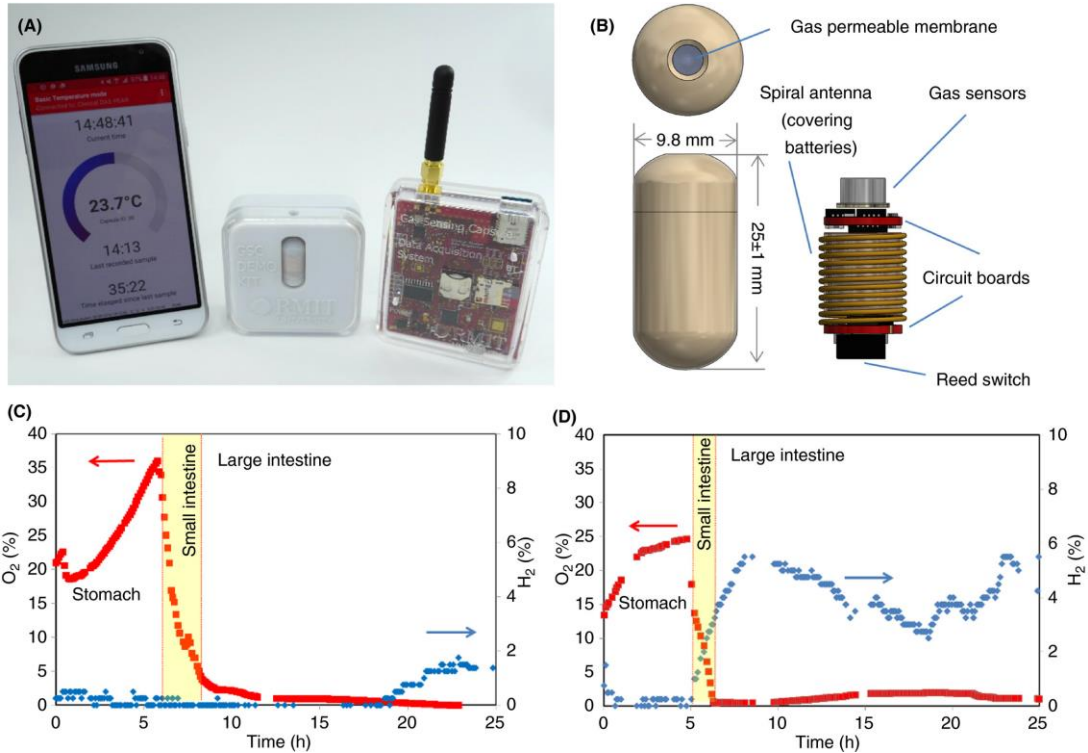
and culture and hydrogen breath testing.



Conclusions

- Current tools for diagnosing SIBO are suboptimal.
- H2 breath test and empiric antibiotic therapy are widely used; however, most GIs are dissatisfied with both options.
- Endoscopic aspiration and culture is not commonly available.
- The initial performance of the assay were viewed favorably by GIs and superior to breath testing, leading in part to their preference for Product S.
- A novel diagnostic ingestible capsule is viewed favorably and has the potential to replace both endoscopic aspiration and H2 breath testing as the preferred diagnostic tool for suspected SIBO patients.

SIBO: Future Diagnostics



SIBO: Treatment Goals



SIBO: Antibiotic Therapy

Antibiotic	Recommended dose	Efficacy	Duration (days)
Nonabsorbable antibiotic			
Rifaximin	550 mg TID	61 – 78%	14
Systemic antibiotic			
Amoxicillin-clavulanic acid	875 mg BID	50%	10-14
Ciprofloxacin	500 mg BID	43 – 100%	10-14
Doxycycline	100 mg QD to BID		10-14
Metronidazole	250 mg TID	43 – 87%	10-14
Neomycin	500 mg BID	33 – 55%	10-14
Norfloxacin	400 mg QD	30 – 100%	10-14
Tetracycline	250 mg QID	87.5%	10-14
Trimethoprim-sulfamethoxazole	160 mg/800mg BID	95%	10-14

Recommendations

6. We suggest the use of antibiotics in symptomatic patients with SIBO to eradicate overgrowth and resolve symptoms (conditional recommendation, low level of evidence).

1. Ginnebaugh B et al. *Gastroenterol Clin North Am.* 2020;49(3):571–587;
2. Pimentel M et al. *Am J Gastroenterol.* 2020;115(2):165–178.

SIBO: Recurrence

40% of patients with SIBO will have persistent symptoms after initial antibiotic treatment

Recurrent SIBO is also frequent particularly in:

- Older adults
- History of appendectomy
- Chronic PPI use

SIBO: Recurrence Approach

Second course of antibiotics

- If partial symptomatic improvement
- Early recurrence (<3 months)
- Consider repeat breath test if >3 months

Antibiotic Prophylaxis

- Reserved for patients with ≥ 4 distinct and well-documented episodes in 1 year and with risk factors
- Administer antibiotics periodically (5-10 days/month or every other week)
- Change antibiotics to prevent drug resistance

Re-evaluate for alternative diagnosis if no improvement

Elemental diet

- If unable to tolerate antibiotics
- Expensive
- Limited by palatability

SIBO: Other Therapeutic Considerations

Dietary Therapy

- Low FODMAP diet
- Gluten-free diet (no good evidence)
- Elemental diet

Probiotics

- Mixed/inconclusive data

Prokinetics

Herbal Therapy

Fecal microbiota transplant (FMT)

- Concrete data on effects of FMT on SIBO are limited

1. Ginnebaugh B et al. *Gastroenterol Clin North Am.* 2020;49(3):571–587;
2. Pimentel M et al. *Am J Gastroenterol.* 2020;115(2):165–178.

SIBO: In Summary

New ACG Clinical Guidelines in 2020 for SIBO

Most common symptom is bloating

Hydrogen breath testing is recommended for diagnosis

- Aerosol generating procedure
- Consider home breath testing
- New breath test available that evaluates H₂S

Antibiotics are recommended for treatment of SIBO in symptomatic patients

- Also treat underlying etiology

Presence of excessive methane indicates IMO

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