

# SIBO Test Options

Breath testing is the most common testing method for SIBO. It's non-invasive, safe, easy to perform from home, and relatively inexpensive. The breath test is effective since bacteria metabolize carbohydrates, including lactulose and glucose, resulting in the production of hydrogen and methane gas, which can be measured.

## TEST PREPARATION:

Specific preparation instructions are provided with each kit. The following are general guidelines:

- Do not take a breath test within two weeks of atypical diarrhea, antimicrobial medications or supplements, colonoscopy, or barium enema.
- Avoid all laxatives and high-dose vitamin C for four days prior.
- One to two days before: Avoid high-fiber and lactose-containing foods, condiments, spices, and herbs. Eat meat, fish, poultry, plain and steamed jasmine rice, eggs, clear meat broth (no bone broth), small amounts of fats and oils, salt and pepper, and weak black coffee and tea.
- Twenty-four hours before: Stop all non-essential medications.
- Twelve hours before: Avoid all food and drink except water.
- Day of test: Wake at least one hour prior to test. No smoking or vigorous exercise one hour before collection.

## PROCEDURE:

- Collect baseline sample
- Drink the substrate, either 50g of glucose or 10g of lactulose mixed in 120-200 milliliters of water
  - Pediatric dose is 1g lactulose per kg body weight for max of 10g
  - Some tests do not recommend testing in people under 25 lbs
- Breath samples are then collected at specific time intervals for two to three hours, depending on the specific test used

## PROBLEMS:

- No consensus on which substrate to use (glucose or lactulose)
- Varying opinions on how best to interpret
  - North American Consensus recommendations released in 2017
- Optimum protocol for timing, collection, and method of administering not known
- Antimicrobial supplements or medications may affect results, but not known how long to wait after completing antimicrobials to obtain reliable results

## COMPARISON OF GLUCOSE AND LACTULOSE AS SUBSTRATES:

Substrate	Advantage	Disadvantage	Risk
<b>Glucose</b>	More specific	Greater risk of <i>false negative</i>	Under-treatment
<b>Lactulose</b>	More sensitive	Greater risk of <i>false positive</i>	Over-treatment

### TESTING CONSIDERATIONS:

- Should use Quintron machine or novel 4-gas device
- Should test at the very least hydrogen (H<sub>2</sub>) and methane (CH<sub>4</sub>) with the preference to add hydrogen sulfide (H<sub>2</sub>S) testing when warranted or available
- Should measure values over a two to three hour period
- Should advise proper test diet
- Preference for North American Consensus guidelines

### TESTING OPTIONS:

#### 1) TrioSmart breath test by Gemelli Biotech

- Measures H<sub>2</sub>, Ch<sub>4</sub> and H<sub>2</sub>S levels using a novel 4-gas device over a 135 minutes
  - Uses North American Consensus guidelines for interpretation
- Glucose substrate is provided in the kit
- Lactulose substrate will need be prescribed by the practitioner at 10 gm/15 ml solution to be picked up by the patient at their preferred pharmacy

#### 2) Genova breath test

- Offers a 2 or 3 hour breath test option via Quintron
  - Recommended 3 hour breath test for those with slower gastrointestinal transit or constipation
- Only measures H<sub>2</sub> and Ch<sub>4</sub> gasses
  - Uses North American Consensus guidelines for interpretation
- Lactulose and/or glucose included in the kits

#### 3) NCM breath test

- Offers a 3 hour breath test via Quintron
  - Not using North American Consensus, reports they are using manufacturer's guidelines and research-based evidence in the literature
  - Normal results:
    - No increase of H<sub>2</sub> above 20 ppm within 120 minutes (of lactulose)
    - CH<sub>4</sub> never reaches greater than 12 ppm within 120 minutes (of lactulose)

- Only measures H<sub>2</sub> and CH<sub>4</sub> gasses
- Lactulose and glucose included in the kits

#### **4) Hydrogen sulfide urine test**

- Hydrogen sulfide is not measured on any breath tests. If there is no detectable H<sub>2</sub> and CH<sub>4</sub>, it may be hydrogen sulfide-positive SIBO. Some clinicians recommend using this hydrogen sulfide urine test as a follow-up.
- When sulfide combines with iron compounds, it produces iron sulfide, which causes the urine to turn dark.
- When there are bacteria in the gut that produce large amounts of H<sub>2</sub>, the normal sulfide oxidase enzyme in the wall is not able to oxidize all of it and convert it to thiosulfate. It is then passed into the blood and filtered out by the kidneys and excreted in urine.
- The test has not been validated, and methodology is not peer-reviewed.