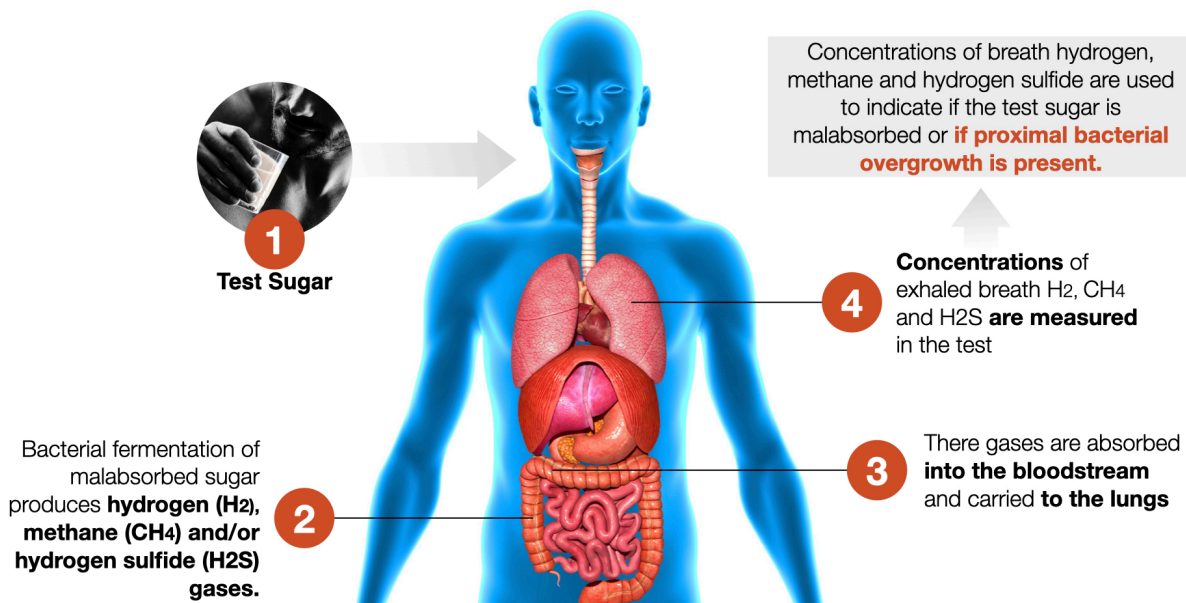


# Gut Pathology - Part Three

Diagnosis of SIBO, as you'll find later when we really dive into this, is controversial and fraught with problems. We're going to talk a lot about breath tests in particular, and the pros and cons of breath testing and the special considerations you need to keep in mind when you're interpreting breath test results. The two primary methods that are used currently are the breath test and then also aspiration of the small bowel using an endoscope. The small bowel endoscopy has several disadvantages: it's invasive, expensive, not widely used, can only sample aerobic bacteria, and only samples one small area. It's been established that SIBO can be patchy, so if you sample where there's not bacterial overgrowth and conclude that there isn't anywhere else in the intestine, that could lead you to a false negative result. You can't sample the jejunum or the ileum, which are the middle and distal parts of the small intestine and actually the most likely places for SIBO to occur, which is obviously problematic. And then there's also some risk with an endoscopy procedure itself, as there's possibility for contamination of the endoscope. So it's really not an ideal test for a number of reasons, and that's good news because it's not widely available. And in most cases I'm sure people listening to this won't be able to order them anyways. So, breath testing is a much better option, although it's not perfect.



So with a breath test, a patient blows into a tube to collect a baseline reading and then consumes a substrate, which is usually glucose or lactulose, and then continues blowing into the tube at 15- to 20-minute intervals. Depending on the test and the lab that it's being collected from, that collection can be anywhere from two to three hours. Breath testing is far safer, cheaper, more convenient, and less invasive than small bowel aspiration, but there are several issues to consider:

- First, there tends to be some discrepancy in consensus on how to interpret the results, which is pretty amazing given how widely used these tests are. However, in 2017, in an attempt to have some standardization, the North American Consensus released their recommendations for SIBO

breath testing interpretation. I think at this time, most labs and clinicians have transitioned over to using this interpretive guide, but I imagine there are still some clinicians out there that may be using older interpretive guidelines like the Rome consensus criteria, or Pimentel's original recommendations. If you look in the scientific literature, you'll see different guidelines used in different studies, which of course complicates the interpretation of the literature itself in terms of establishing associations between SIBO and other diseases. You have to look at the fine print, look at what year the study was published and look to see how SIBO was defined in that particular study. It can raise a lot of questions in terms of the literature on SIBO and how to use that information.

- Second, each substrate that you use with the breath test has its own pros and cons, so for example, glucose is more specific but it's less sensitive, whereas lactulose is more sensitive but less specific. We'll be going into a lot more detail about that later.
- Third, breath testing assumes that orocecal transit time is 120 minutes or more in everyone. So, in other words, the time that it takes for lactulose that's consumed during the test to go from the mouth to the colon is assumed to be 120 minutes, but studies have clearly established that that's not true, even in healthy people or so-called "healthy" people with no digestive issues. Orocecal transit time can be much lower in people, maybe even as low as 70 to 80 minutes, and that presents some challenges in terms of test interpretation.
- Fourth, differences in bacterial flora determine the response to the breath test. Previously, we were only able to test for hydrogen and methane production on most SIBO breath tests, and there was some concern that up to 10 to 15 percent of people could be colonized with bacteria that produce gases other than hydrogen or methane, like hydrogen sulfide. So in the past, if you had someone that you suspected had hydrogen sulfide production but you weren't able to test them, there was a possibility that their methane and hydrogen levels would be really low or even flatlined on that test, and present as a normal or negative result. We now have a test that looks at hydrogen sulfide production, but that's only one test. The hydrogen sulfide test is a pretty new development at the time of this recording, so not every SIBO breath test and lab is testing for all three gases, so you do have to keep an eye on which lab you're using.

So as you can see, there are a lot of issues with breath testing, but despite them, the breath test is still the best test to run for SIBO. Hopefully in years to come we'll have more alternatives and we'll talk a little more about emerging tests as we walk through the subject matter in more detail. I also want to mention here that you cannot diagnose SIBO with a stool or a urine test. You can see changes in bacterial counts and types in a stool test, but that doesn't tell you where it's coming from because we're really looking at what's going on in the colon since that's where most bacteria are. And in the urine test you can see organic acids that are produced by bacteria in the intestine, but it doesn't tell you where those bacteria are located or the quantity. So breath testing is more specific in terms of determining the location of where the overgrowth is occurring.

Okay, the next pathology to discuss is gut infections, and there are three basic categories here: viruses, parasites, and bacteria. We're going to focus on parasites and bacteria mostly since viral infections are typically self-limiting and they're not easy to test for. Having said that, it's important to know that viral gastroenteritis is considered to be a risk factor for IBS, IBD, SIBO, and other gut conditions, so it's just something to look for when you're working up a new

patient. If they mention that their symptoms started after a bout of flu, or stomach flu, then that certainly can be a red flag and can signal a significant change in the GI tract that led to some of the problems that they're having.