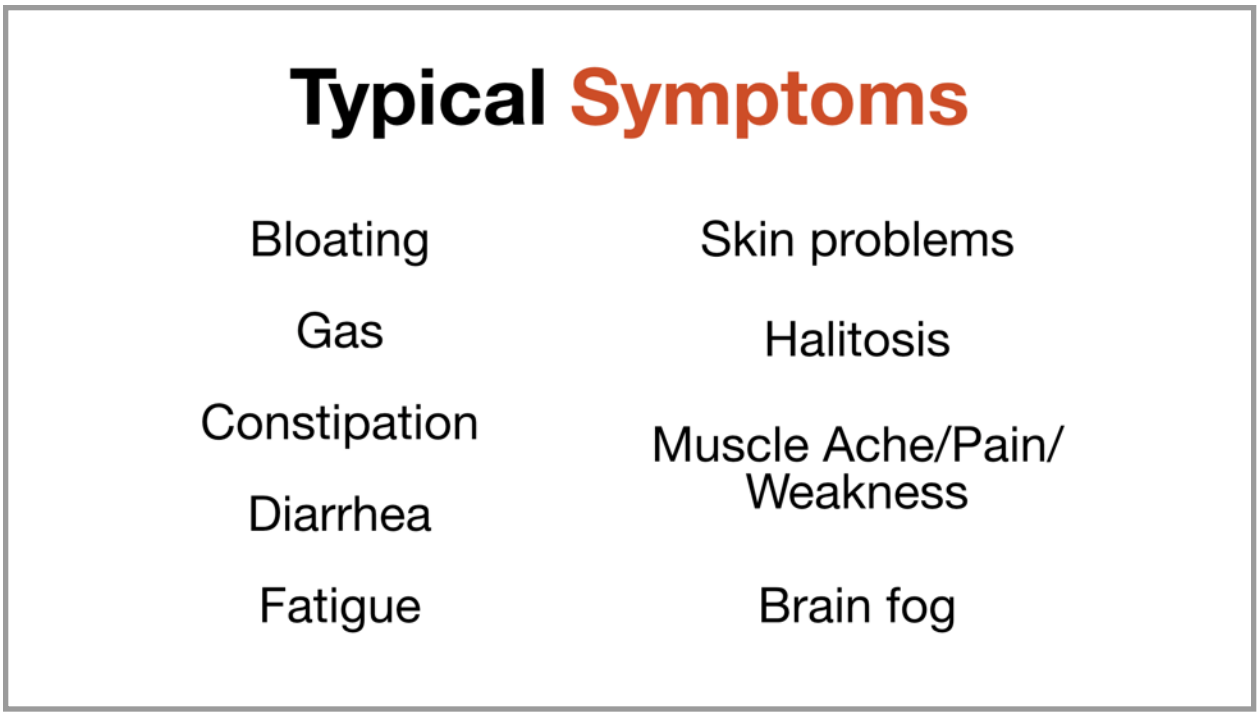
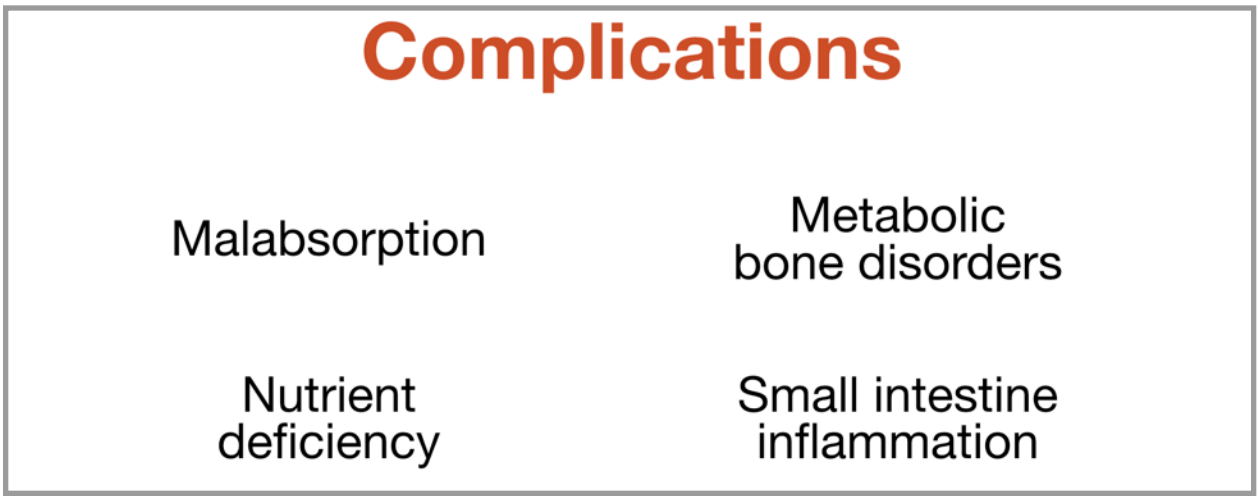
KRESSER INSTITUTE FOR FUNCTIONAL AND EVOLUTIONARY MEDICINE

Gut: SIBO – Part 2



The symptoms of SIBO are diverse and non-specific and not limited to the gut, so let's talk a little bit more about each of those. Diverse, as I mentioned earlier—not all of your SIBO patients will present with gut symptoms like bloating or gas or constipation or diarrhea. They may only have fatigue, they may only have things like skin problems or bad breath or maybe muscle ache or pain, like fibromyalgia. In fact, in one study, up to 50 percent of SIBO patients didn't have gut symptoms, but 100 percent of fibromyalgia patients had SIBO, and only 50 percent of them had gut symptoms. So you had a whole bunch of people who had muscle aches and pains and weakness that were only a manifestation of SIBO. I've also seen patients that are completely healthy and don't have any symptoms at all that are noticeable for them, and the only manifestation of their SIBO might be an increase in cholesterol levels, and when we treat the SIBO, their cholesterol levels come down. So it's really important to be aware of this: you cannot assume that if a patient doesn't have gut symptoms, they don't have SIBO, and it's one of the reasons why we test almost everyone who comes into our clinic for SIBO.



The diversity of the symptoms of SIBO reflects all of the various complications that it's associated with, and that includes malabsorption, nutrient deficiency, metabolic bone disorders, and small intestine inflammation. To give you an example, SIBO is known to cause B12 deficiency because B12 is absorbed in the small intestine, and if there's overgrowth of bacteria or inflammation in that part of the small intestine, which there often is because B12 is absorbed in the terminal ilium, and SIBO is most likely to develop in the terminal ilium, then the result of B12 deficiency will be things like neuropathy, cognitive decline, or even dementia. So given the prevalence of SIBO in the elderly, it makes you wonder how much of B12 deficiency symptoms that are associated with aging are actually related to SIBO and not just "aging." SIBO can cause fat malabsorption, which leads to a buildup of free bile acids, which leads to mucosal inflammation, which leads to intestinal permeability, which can lead to autoimmunity, so there's a possible connection between SIBO and autoimmunity.

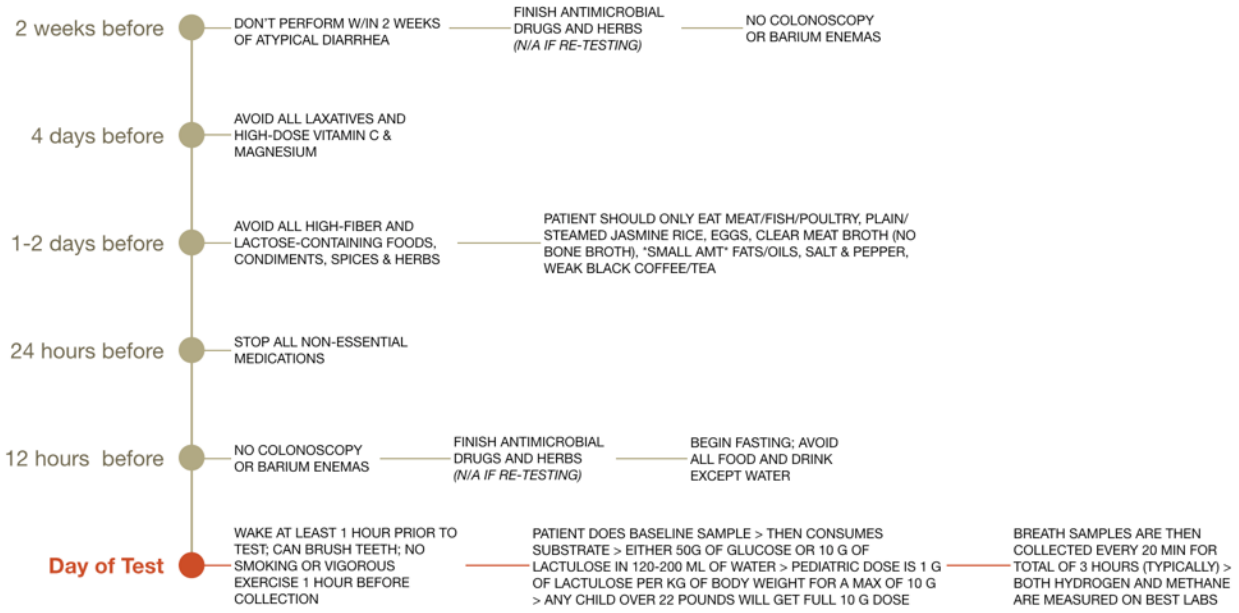
Also, fat malabsorption can lead to a decline in fat-soluble vitamin absorption, which leads to osteoporosis, because that low vitamin D and low vitamin K2 in particular will cause osteoporosis. Also, night blindness due to vitamin A deficiency and retinopathy, and prolonged clotting times due to vitamin K deficiency. When the brush border of the intestine is disrupted, I mentioned before that SIBO can lead to blunted small intestinal villi, and that will affect the brush border. That leads to decreased activity of disaccharides, which are enzymes that are required to break down carbohydrate, and that leads to carbohydrate malabsorption, and this is another vicious cycle because bacteria in the small intestine feed on carbohydrates. So if you have carbohydrate malabsorption, then any bacteria that are present will have a field day, and this will make the SIBO worse, and you get into another vicious cycle there. Bacterial digestion of protein can lead to malabsorption of protein, so when you have too much bacteria in the upper part of the small intestine, where protein is absorbed, then that will interfere with your absorption of protein. And while B12 deficiency is very common with SIBO, folate levels can often be high in SIBO because of increased synthesis of folate by small intestine bacteria. So this is just a small sampling of the many different complications and issues that you can see with SIBO, due to its various pathological mechanisms.

Let's move on to diagnosis. This is really the big problem when it comes to SIBO, in my opinion. There's been a huge focus on it in the functional medicine community, and so many patients are being treated for SIBO, and certainly if they really do have SIBO and it's really causing their pathology, that's appropriate and important, but there are some uncomfortable realities around the diagnosis and treatment of SIBO that you should be aware of as a clinician. Number one is that we still don't have a reliable test and a consensus on how to interpret the tests that are being used. There's tons of controversy about this; if you look in the scientific literature, I'm going to highlight some of that in this presentation. There's really no agreement on what the best method is. There's a lot of conflicting evidence and viewpoints, and I'm going to review all of this in the slides that follow, I'm going to tell you what test I've decided to use and I continue to use with caveats, and then I'm going to move into revealing some results and cases.

So, as I said before, there are two main tests for SIBO. One is an endoscopy with bacterial culture, where they're quantifying the levels of bacteria in the sample they take, and the second one is a breath test. It's really important to understand that SIBO cannot be diagnosed with a stool test or a urine test. Bacterial culture is the most direct method. It's done by endoscopy and they take an anaerobic and aerobic count of the small intestine luminal contents, but there are a lot of problems with this method. The first is that the small intestine has to be intubated, so a catheter is passed into the distal duodenum through an endoscope, and then fluid is aspirated for culture, and that is a very invasive procedure, it's costly, and there is some risk involved. The other thing is that many species that inhabit the small intestine, many species of microbes, cannot be effectively cultured, and so any kind of quantitative culture will underestimate bacterial population in the small intestine as a result. The endoscope and catheter can be contaminated as the instrument is passed through the digestive tract, and that can cause problems for the patient and also for the dependability of the test result. SIBO is known to be patchy in distribution, so let's say they take a sample of an area of the small intestine where there isn't any bacterial overgrowth, and that returns a negative result, where just next to that area there was a slice of small intestine that did have bacterial overgrowth and they missed it, and that can happen frequently. And then, prompt and proper specimen handling is needed to get accurate results, so all of these shortcomings explain why endoscopy is rarely used now in clinical practice for SIBO testing. I only really see it used in research settings at this point, and even then not so much.

All of these various challenges led to the development of a different method of testing for SIBO, which is breath testing, and this is far more commonly used, especially in functional medicine. It's non-invasive, it's safe, it's easy to perform at home, and it's relatively cheap. And the basic premise is that bacteria in the intestines metabolize carbohydrates like lactulose, glucose, sucrose, or xylose, and produce gases like hydrogen and methane, which can be measured in the breath.

Now, there are a lot of things to be aware of in terms of trying to get as accurate a result as possible, and I've listed them here on this slide, and we'll create a handout that has this test preparation matrix or timeline.



So, two weeks before the test, you would want to make sure that the patient finishes any antimicrobials they're taking, drugs or botanicals or nutrients. You would want to make sure they're not having any atypical diarrhea and that they haven't had a colonoscopy or barium enema two weeks before the SIBO test. Four days before the breath test, you would instruct the patient to avoid all laxatives and then high-dose vitamin C and magnesium. One or two days before, you would tell them to avoid all high-fiber and lactose-containing foods, condiments, spices and herbs, and then 24 hours before the test, or during that period, excuse me, one to two days before the patient should only eat meat, fish, or poultry, plain steamed jasmine rice, eggs and clear meat broth, no bone broth, small amounts of fat and oils, salt and pepper, and maybe weak black coffee and tea. And don't worry about writing all this down, we're going to provide a SIBO prep procedure handout for you that you can brand with your own clinic logo and color schemes and give to your patient; just going through all of this now to familiarize you with it before we get into the testing itself.

Twenty-four hours before the test, you'd stop all non-essential medication; 12 hours before you'd begin a water fast, so you'd avoid everything except for water; and on the day of the test, you'd awake at least one hour prior to the test. The patient can brush their teeth, no smoking or vigorous exercise for one hour before the collection, and then the patient does the baseline breath sample, and then they consume the substrate, whether you're using glucose, it'd be 50 grams of glucose, or 10 grams of lactulose, and about 120 to 200 milliliters of water. The pediatric dose is one gram of lactulose per kilogram of body weight, up to a maximum of 10 grams, so if you do the math, any child over 22 pounds would get a full 10-gram dose. And then breath samples are collected every 20 minutes for a total of three hours, typically, though it can vary from lab to lab, and both hydrogen and methane are measured during those 20-minute intervals. You want to make sure that the lab that you use is giving you both hydrogen and methane results, and I'm going to make a specific recommendation for a lab later. So again, we've included a handout on proper test

preparation that you can generate in a PDF generator and give to your patients; really, really important that they follow the proper procedures.