KRESSER INSTITUTE
FOR FUNCTIONAL AND EVOLUTIONARY MEDICINE

Gut: SIBO – Part 5

24-Hour Preparation Diet

Jasmine White Rice

Meat/Poultry/ Fish

Eggs

Hard Cheese

Clear Beef/Chicken Broth

Oil

Salt & Pepper

Water

Let's talk a little bit more about the test prep diet. It requires a 24-hour prep diet and then an overnight fast, so the patient is going to start the test in the morning on, let's say, a Wednesday. Then, starting on Tuesday, they would begin the prep diet. That should be limited to jasmine white rice, not basmati white rice or any other kind of white rice. The reason for this is that jasmine white rice has a very high glycemic index and is absorbed very high up in the small intestine, and that's what we're looking for. The purpose of this diet is to remove any residual fibers or starches that would not be digested very high up in the small intestine, so it's a low-residue diet. Jasmine white rice; meat, poultry, or fish; eggs; hard cheese if the patient tolerates it; clear beef or chicken broth, not bone broth with a lot of fat in it, just the clear broth; oils or fats like coconut oil or olive oil; salt and pepper; and water.

Again, the purpose here is to avoid any fermentable carbohydrates or other foods that would cause a buildup of residual fiber in the gut, and one of the ways that you can determine, or you can get a hint that a patient didn't follow the prep diet is if you see a high baseline level of hydrogen. Sometimes that can happen in SIBO, but often a high baseline value of hydrogen that then maybe goes down a little bit before going back up, or a high baseline of hydrogen that is high and then just goes down and you see normal hydrogen throughout the rest of the test, that can often be indicative of improper test prep. In some cases where patients have constipation or slow motility, you should advise them to do a prep diet of two days instead of one, and that might be required to reduce the baseline hydrogen production to a lower normal value. Then as I mentioned before, antimicrobials and antibiotics should not be used for two weeks prior to the initial test, and

some recommend not using them for as long as four weeks prior to the initial test. This is something we definitely need more research on.

SIBO breath test interpretation criteria comparison

Criteria	H_2	CH_4	$H_2 + CH_4$
Quintron	↑ ≥20 ppm **over lowest preceding value** within 120 min of lactulose	↑ ≥12 ppm **over lowest preceding value** within 120 min of lactulose	↑ ≥15 ppm **over lowest preceding value** within 120 min of lactulose
NUNM	↑ ≥20 ppm **at any point during test** within 120 min of lactulose	↑ ≥12 ppm **at any point during test** within 120 min of lactulose	↑ ≥15 ppm **at any point during test** within 120 min of lactulose
2017 Consensus	↑ ≥20 ppm **at any point during test** within 90 min of lactulose	Methane levels ≥10 ppm **at any point during test**	N/A

As I have mentioned so far, interpretation of SIBO breath testing results can vary quite a bit, and there has only recently been a consensus issued. For many years, there was no consensus, and people were just doing it differently according to their understanding or reading of the literature, or whoever they trained with. We are going to look at some different criteria here. I imagine this will all hopefully be changing to come into alignment with the 2017 consensus, but since that is so recent, at least as far as I know, Quintron and labs such as NUNM have not yet changed their criteria, but that could change at any moment.

The Quintron criteria is an increase of greater than or equal to 20 parts per million over the lowest preceding value within 120 minutes of lactulose or an increase in greater than or equal to 12 parts per million of methane over the lowest preceding value within 120 minutes or an increase of combined methane and hydrogen of greater than or equal to 15 parts per million over the lowest preceding value within 120 minutes of lactulose. If you are using a lab, and they are just spitting out machine-generated test interpretation, this is usually the criteria that will be used to generate those results. Especially now with the new consensus, you can see why it is problematic to just rely on the machine-generated criteria for your interpretation because especially until they change to update with the consensus, it is not going to be in alignment with the most recent evidence.

NUNM had slightly different criteria than Quintron based on the experience of clinicians such as Dr. Pimentel and Dr.Siebecker, who runs that lab. They had changed the criteria a little bit. It

was an increase of greater than or equal to 20 parts per million of hydrogen at any point during the test within the 120 minutes of lactulose, increase of greater than or equal to 12 parts per million at any point during the test within 120 minutes of lactulose for methane, and then the same for combined methane and hydrogen.

However, as we talked about a few slides back, we now have this consensus criteria, and I think this is what we should be using as clinicians and what all of the labs hopefully will shift to, so this is where we really want to point our attention. For hydrogen, again, it is an increase of greater than or equal to 20 parts per million at any point during the test within 90 minutes of lactulose. That increase could happen at 30 minutes. It could happen at 60 minutes, or it could happen at 90 minutes. For methane, we are looking for a level greater than or equal to 10 parts per million at any point during the test. Once again, that could even be in the colon or at 160 minutes. It could also be right at baseline, which is actually somewhat common with methane. It is much more common to see higher levels at baseline, as we will see later on in the presentation.

Special considerations for breath test interpretation

Higher risk of false positive	Higher risk of false negative
Diarrhea/loose stools	Constipation
Young children *(esp. infants)*	Elderly
Crohn's disease, celiac disease	Gastroparesis, S.I. motility disorders, intestinal pseudo obstruction
Laxatives, prokinetics, and other drugs that decrease transit time	PPIs, opiates, and other drugs that increase transit time

It's really important to consider transit time in breath test interpretation. I feel like this is not being done by most clinicians in the functional medicine world and even in the conventional medicine world, and that's unfortunate given what we've already talked about in terms of the research on transit time in healthy volunteers being less than 90 minutes in many cases, and lactulose being primarily an indicator of transit time more than anything else. If a patient has frequent or loose stools, if they have an early rise in hydrogen even at 60 to 70 minutes, it could

be normal because they have a fast transit time, and lactulose could be reaching the colon at that point. On the other hand, if the patient is significantly constipated, and you see a rise in hydrogen at 140 minutes, that would typically be interpreted by the various labs as being negative for SIBO, but in this case, it might be positive because it's possible that the lactulose is still in the small intestine for them because they have slow transit time.

This is further complicated by the fact that orocecal transit time, which is the amount of time it takes for the lactulose to get from the mouth to the colon, does not always mirror total transit time. For example, it's theoretically possible for someone to have a somewhat faster orocecal transit time but normal transit time overall. Maybe their colon transit time is a little bit slower than average, so the time it takes for something to get from the mouth to defecation is normal, but their orocecal transit time is fast, or it could be the other way around. Fortunately, at least as far as I can tell from reading the research, that doesn't happen very often. Usually, total transit time is a good representation of orocecal transit time, so if you have someone who's having frequent stools throughout the day, undigested food in the stool, all those kinds of things that would make you expect fast transit time, then it's likely that their orocecal transit time is fast and vice versa.

Another factor to consider is the age of the patient. In elderly patients, transit time tends to be increased and constipation is common, whereas in young children, especially infants, transit time tends to be decreased. Finally, you'd want to consider the effect of motility disorders such as gastroparesis, small intestine inflammation, celiac disease, and pseudo-obstruction. The chart here on the slide summarizes all of what we've just talked about. Patients who you would consider a higher risk of false positive would be patients with diarrhea or loose stools, young children, patients with Crohn's or celiac disease or other issues in the small intestine, and certainly patients taking laxatives, prokinetics, or other drugs that decrease transit time. Of course, they shouldn't be taking these drugs during the SIBO test, but something to keep in mind. Patients who are at a higher risk of a false negative would be those with constipation, elderly people with gastroparesis or other motility issues, or patients taking PPIs, opiates, and other drugs that increase transit time.