

# Gut: Treatment Protocols - SIBO, Part 5



## Drug additions for methane

Standard is **Neomycin** 500 mg BID for 10 days

**Pimentel/Cedars Sinai** trial with metronidazole (Flagyl) with some success > 250 mg TID for 10 days

**Metronidazole** doesn't appear to adversely affect gut microbiota > but not as well tolerated as rifaximin/ neomycin

If you use **neomycin** or **metronidazole** with longer course of rifaximin > limit their use to 10 days

If methane is elevated in addition to hydrogen, the typical protocol is to add neomycin at a dose of 1,000 milligrams per day for 10 days. It's available in 500 milligram quantities, so you do 500 milligrams twice a day, once at 8 a.m. and once at 8 p.m. I mentioned before that neomycin has a black box warning, but that's primarily for the topical form applied to the ear or the parenteral IV form. The oral form has only shown ototoxicity with long-term use in patients with kidney disease and other serious issues. It's worth pointing out that Dr. Pimentel at Cedars-Sinai is also trialing metronidazole, which is Flagyl, for methane with some success. Metronidazole is used at 250 milligrams three times a day for 10 days. If you use neomycin or metronidazole with a longer course of rifaximin, you want to be sure to limit their use to 10 days, so if you do 30 days of rifaximin, you'd still only be doing 10 days of metronidazole or neomycin.

## Other options for methane



Lactobacillus plantarum



Atrantil



Rifaximin  
30 days

If you don't want to use neomycin or metronidazole, remember the alternatives that we discussed earlier. Lactobacillus plantarum at a dose of 10 billion CFU per day, Atrantil at a dose of 2 capsules 3 times a day and/or a longer course like 30 days or more of rifaximin.

## Pharmaceutical/combo protocol for SIBO

Therapeutic agent	Dosage
<b>Rifaximin</b>	Depends on breath test results
<b>Lauricidin</b>	1 scoop TID with each meal
<b>Interfase Plus</b>	3-4 capsules BID on empty stomach
<b>TerraFlora</b>	One BID upon rising and before bed
<b>Atrantil (optional)</b>	(Only if methane elevated) 2 capsules BID
<b>L.plantarum and/or L.reuteri (optional)</b>	(Only if methane elevated) 10 billion CFU/d
<b>Iberogast (optional)</b>	(Only w/bile issues) 20 drops TID w/meals
<b>Ox bile (optional)</b>	(Only w/bile issues) 100–500 mg w/ meals

Here is a combination drug and probiotic nutrient protocol. The rifaximin dose and duration depends on breath test results. Lauricidin, Interfase Plus, and Terraflora would be the basic protocol. Then, you may consider adding Atrantil if methane is present. You might consider Lactobacillus planetarium and/or Lactobacillus reuteri if methane is elevated since they are methane degraders. You might consider Iberogast if bile issues are present, and you might consider ox bile, again if bile issues are present.

The final specific SIBO treatment that I want to discuss is the elemental diet. So, this is a liquid diet consisting of powdered nutrients in pre-digested, easily absorbed form. The main ingredients are amino acids, some type of carbohydrate, typically maltodextrin in commercial formulas, and fat, which is typically industrial seed oils in commercial formulas, and then vitamins and minerals. And studies show 80 to 84 percent success rate in eradicating SIBO, so it's arguably the most effective treatment and shown to be safe without risks and complications. However, there are some downsides to elemental formulas. They're expensive, they're nasty, to put it bluntly, they're high in sugar like maltodextrin and the fats that the commercial formulas have are made by companies like Nestlé, so they have industrial seed oils. They taste terrible, the patient can't eat solid food for two to three weeks, they can lead to significant weight loss if the patient is underweight already, and everyone I've seen do an elemental diet for a significant period of time has developed a thick white coat on the tongue, which could be indicative of oral thrush or candida overgrowth. Not sure about that, but it's generally not a great sign.

## Vivonex ingredients

**INGREDIENTS**

INGREDIENTS (UNFLAVORED): MALTODEXTRIN (FROM CORN), L-GLUTAMINE, MODIFIED CORNSTARCH, L-LEUCINE, L-ARGININE ACETATE, SOYBEAN OIL AND LESS THAN 2% OF MAGNESIUM GLUCONATE, L-LYSINE ACETATE, CALCIUM GLYCEROPHOSPHATE, L-ISOLEUCINE, L-VALINE, L-PHENYLALANINE, SODIUM CITRATE, L-THREONINE, POTASSIUM CITRATE, L-CYSTEINE HYDROCHLORIDE, CITRIC ACID, L-METHIONINE, L-TYROSINE, L-HISTIDINE HYDROCHLORIDE, L-ASPARTIC ACID, L-PROLINE, L-TRYPTOPHAN, DISODIUM PHOSPHATE, POTASSIUM CHLORIDE, CHOLINE BITARTRATE, L-SERINE, L-ALANINE, GLYCINE, ASCORBIC ACID, POLYGLYCEROL ESTERS OF FATTY ACIDS, TAURINE, L-CARNITINE, ALPHA-TOCOPHERYL ACETATE, ZINC SULFATE, POTASSIUM SORBATE AND BHA AND BHT AND TOCOPHEROLS (TO MAINTAIN FRESHNESS), FERROUS SULFATE, NIACINAMIDE, VITAMIN A PALMITATE, CALCIUM PANTOTHENATE, COPPER GLUCONATE, VITAMIN D<sub>3</sub>, PYRIDOXINE HYDROCHLORIDE, MANGANESE SULFATE, RIBOFLAVIN, THIAMINE HYDROCHLORIDE, FOLIC ACID, CHROMIUM CHLORIDE, BIOTIN, POTASSIUM IODIDE, SODIUM MOLYBDATE, SODIUM SELENITE, PHYTONADIONE, VITAMIN B<sub>12</sub>

The main formula used in studies is Vivonex Plus, which is made by Nestlé as I mentioned, and as you can see here on the slide, the ingredients are not that nice. You've got maltodextrin from

corn as the main one, modified corn starch, and you've got soybean oils as the fat source. It's only 6 percent fat, and very, very high in carbohydrate.

Fortunately, there are some alternatives. The alternative packaged product is called Absorb Plus. This is formulated by a woman named Jenny Patel-Thompson, who's a nutritionist that suffered from severe IBD and healed herself with an elemental diet. It uses whey protein in addition to free-form amino acids. The carb source is maltodextrin as well, but it's derived from tapioca, so it's tapioca dextrin, which is from cassava plant instead of corn, it's less of an allergen, it's relatively low in fructose, which can cause GI issues in people with IBD and IBS, and it also does not contain any fat, so you can add your own fat using coconut oil or a medium-chain triglyceride (MCT) oil, or Udo's oil or flax oil, etc. One thing to keep in mind is that Absorb Plus has never been tested in a study, and it's not technically a pure elemental formula, because whey protein is not in the amino acid form, so it may not be as easily digested as amino acids. Absorb Plus does contain amino acids, but it also contains whey. Having said that, I've seen good results with it, and I think it's a vastly better choice than the Vivonex.

## Dr. Siebecker's **DIY** elemental diet formula

Nutrient	Ingredient	Notes
<b>Protein</b>	Amino acid powder	Should contain full range of amino acids; dose at 15-20% of total calories per day
<b>Carbohydrate</b>	Honey, dextrose, glucose-flavored liquid, or grape syrup	Should comprise 20-50% of total calories per day
<b>Fat</b>	MCT, coconut oil, Udo's oil, flax oil, avocado oil, macadamia oil	Should comprise 30-65% of calories per day
<b>Vitamins &amp; minerals</b>	Must not contain fiber, food, or anything other than synthetic nutrients	Options: Freeda SCD Multi, Klaire VitaSpectrum Powder, Pure Encapsulations Nutrient 950
<b>Sodium</b>	Sea salt; 1,500 mg/d is adequate daily intake	Can mix with formulas or take separately in water

Finally, Dr. Allison Siebecker, who's a naturopathic physician in Oregon who specializes in treating SIBO and has worked with Dr. Pimentel, has a do-it-yourself elemental formula recipe on her website, it's freely available. It's also never been tested in a study, so keep that in mind, and the recipe consists of protein source, which would be an amino acid powder. It should contain the full range of amino acids, and it should be dosed at about 15 to 20 percent of total calories per day. Then you'd want to use a carbohydrate; it has to be a rapidly digested carbohydrate in keeping with the nature of an elemental formula. The whole idea, by the way, I should mention this, of an elemental formula is that it contains food ingredients or nutrients that

are absorbed extremely high up in the digestive tract so there's nothing left over to feed the bacteria in the small intestine; you basically starve those bacteria. So you have to use rapidly absorbable carbohydrates with a very high glycemic index, like honey, dextrose powder, which is just pure glucose, glucose-flavored liquid, or grape syrup, and that should comprise about 20 to 50 percent of total calories per day, and then you would use a fat source, and this could be MCT oil, coconut oil, Udo's oil, flax, avocado oil, macadamia oil, and that should comprise 30 to 65 percent of calories per day. And you want to add vitamins and minerals, and they must not contain any fiber, food, or anything other than just the synthetic nutrients themselves. So options would be Freeda SCD Multi, which is used in the specific carbohydrate diet community, Klaire VitaSpectrum powder, or Pure Encapsulations' Nutrient 950, which I like, and then you want to do a little bit of sea salt, 1,500 milligrams per day is kind of a minimum adequate daily intake, and you can either mix that with the formulas or you can take it separately in water. Make sure to avoid any fiber, gums, thickeners, food items, or prebiotics because those are not rapidly digested, and note that meal replacement powders like MediClear, ClearVite, UltraClear, etc., are not elemental formulas; those are meal replacement powders, but not elemental formulas. We'll provide this as a handout for you, and the full recipe is also available at Dr. Siebecker's site, which we'll include a link to in the resources section.



Standard duration **2 weeks**;  
can go up to 3 weeks  
(under supervision)

**Don't combine** with other  
treatments

Best used as **last resort**

May require **periodic re-  
treatment**

Some considerations about the elemental diet. Two weeks is standard duration, you can go as long as three weeks. Patients should be closely supervised here. I don't believe this is a good DIY approach. It's best not to combine it with other treatments, and I typically consider it a last resort if botanical and rifaximin treatments have failed and test results have continued to be unequivocally positive. These patients will often relapse, unfortunately, and often require periodic retreatment, so you could do occasional retreatments with elemental diet or botanical or drug protocols, but if you have a patient that's continually experiencing recurrence, then you'd want to make sure to continue looking for the underlying cause or mechanism that's leading to the recurrent SIBO.



**Paleo Reset** works well for SIBO diet

Combination of **Low FODMAP** and low fermentation potential (**FP**) may help with symptoms during the antimicrobial treatment

Finally, let's talk about what to eat during SIBO treatments. As we've mentioned before, SIBO treatment is not always straightforward. Clinical experience and recommendations shift with time, as they should. We're constantly learning, I hope, and we should be constantly updating our treatment protocols as we learn new things, both in terms of our experience with patients and the research. Initially, when I started to treat patients with SIBO, I recommended a low-FODMAP and a low-fermentation potential diet. These are diets that are low in carbohydrates that can be metabolized by bacteria in the small intestine. Then, I shifted away from that because of the research showing that adding partially hydrolyzed guar gum increased the efficacy of rifaximin.

The idea there, as I mentioned, is you have to feed them to kill them. Through conversations with Dr. Mark Pimentel and others, we started to suggest that patients don't restrict these fermentable carbohydrates too much during treatment because the idea was that if they did that, then the bacteria would go into a dormant state, and they would be easier to kill by the antimicrobials. However, I found, as with including PHGG, that having patients eat, not restrict FODMAPS or not reduce the fermentation potential of the diet actually led to worse results, both in terms of the symptoms patients experienced during the treatment and afterwards and also in terms of the follow-up test results. So, now we are back to recommending a low-FODMAP and low-fermentation potential diet because we didn't see much benefit with the have to feed them to kill them approach.