

DIARRHEA

What's the Problem, and How Do You Diagnose It?

Diarrhea is simply an increase in the frequency of and a decrease in the consistency of the stools. In HIV+ people it can range from a minor annoyance to a life-threatening problem. For some people, it is chronically severe enough to cause major alterations in lifestyle and major pain and distress. With diarrhea, diagnosing that you have it is easy. Diagnosing the causes and then addressing them may be very difficult but must always be pursued. It is very important to know that with a sufficiently aggressive approach to diagnosis and treatment, this is a problem that can almost always be solved. Never accept the oft-heard, “Oh, that’s just HIV, and you’ll just have to live with it.” No it isn’t, and no you don’t.

What are the Causes?

For anyone currently experiencing diarrhea, the most important thing to know is that there are often multiple causes, all of which must be addressed for full resolution of the problem. There’s a tendency for many to think “oh, that must be my drugs causing it” and not pursue any other possibility. In other cases, a single infection will be diagnosed and that will be the end of the diagnostic pursuit. Either of those would be very big mistakes.

□ **For anyone on HAART, antiretroviral meds certainly may be contributing, but UCLA's Peter Anton, MD, the world's expert on HIV-associated diarrhea, says that you should never presume that HAART meds are the only problem.** Diarrhea’s multiple causes can include not only drugs but also infections or parasites, cancers (lymphoma, anal cancer or colon cancer), fat malabsorption, lactose intolerance and functional bowel disease. You might be one of the lucky ones in whom only one of these is going on, making diarrhea diagnosis and elimination easier. But for many HIV+ people, several of these may be contributing, and improvement may not be seen until they’re all addressed.

You can help your doc diagnose the problem by keeping a record of what’s going on—how often do you have a bowel movement and is there a pattern to how they occur, how big and how watery are the stools, what color are they, is there any blood visible, and so on. Keeping track of this over time can give your doc valuable info to help in the diagnosis.

□ **There are many pathogens that may be at least a major part of the problem, and in some cases the sole cause. These include various bacterial, viral, and parasitic infections.** Depending on your CD4s, your doc should use stool samples (often three samples are requested, taken on 3 successive days), biopsies and other tests to check for infections. Possible causes of diarrhea include cryptosporidiosis, microsporidiosis, isosporiasis, CMV colitis, CMV gastritis and duodenitis, *C. difficile*, common ova and parasites, bacterial infections, MAC, and candida overgrowth. Several enteric viruses, including astrovirus, adenovirus, and picobirnavirus, have also been shown to cause diarrhea in some HIV+ people. In addition, it is thought that HIV itself can cause an enteropathy (an intestinal disease) that causes diarrhea.

If your CD4s have been below 100 within the last six months, MAC, cryptosporidiosis, or microsporidiosis are most likely. If your CD4 counts are consistently higher than 200, those are less likely, although not impossible. However, the focus of your diagnostic efforts might be better placed on those potential causes that commonly occur in those with higher CD4 counts. This includes all of the non-infectious causes (fat or lactose intolerance, irritable bowel syndrome or other functional bowel problems) and the infections that could occur even in the immune competent (parasites, the bacteria that cause food poisoning, other bacterial infections, candida overgrowth, other viral infections, etc.). With antibiotic use, even if it was some time ago, suspect *C. difficile*. If your CD4 counts are below 50, you will have to presume that your diarrhea could be caused by virtually any of the causes discussed here.

Aggressive diagnosis that uses absolutely every necessary test and procedure to obtain an accurate diagnosis of all possible causes of diarrhea is an absolute must. An aggressive approach to diagnosis will usually begin with a stool analysis for ova and parasites (with the lab request written to specifically request that the analysis include tests for cryptosporidia, *Giardia lamblia*, microsporidia, *Blastocystis hominis*, *Entamoeba histolytica*, *Dientamoeba fragilis*, and so on; in other words, don't count on a lab to automatically look for everything they should; the requesting physician should specifically list all the possibilities), then a purged stool analysis for ova and parasites, and then another standard ova and parasites analysis (all with the same requests as to specifics). In addition, stool cultures should be performed with each of the three samples (specifically for *Shigella*, *Salmonella*, *Candida albicans* and other yeasts, *Campylobacter*, etc.; again, the physician should request a comprehensive list so that the lab won’t fail to look for something that might be important).

A toxin assay for *Clostridium difficile* should also be done, as well as appropriate smears, stains, swabs, and other tests, as needed, to check for *Cryptosporidium*, *Isospora belli*, and *Microsporidia*.

Because some bacteria will appear in the blood when they don't show up in stool cultures, it is also recommended that if the diarrhea is associated with fever, then blood cultures, a chest x-ray, and a urinalysis should be done. If the stool smears show more than five white blood cells per high-powered field and the diarrhea began suddenly, bacterial gastroenteritis is a possibility.

Dr. Anton also recommends a lactulose breath analyzer test for bacterial overgrowth in the gut. Normally, the large intestine has bacteria in it but the small intestine is sterile. However, in some HIV+ people the small intestine becomes populated with bacteria which can cause diarrhea. If you don't have access to the lactulose breath analyzer test and all other possible causes have been eliminated, empirical treatment with a ten-day course of ciprofloxacin (500 mg, twice per day), an effective treatment for this, is considered reasonable. In addition, if you have traveled to any tropical climes (including Mexico) or Morocco, Peru, New Guinea, Nepal, or any other location where traveler's diarrhea is common, then request that the stool sample be examined for *Cyclospora*, the cause of much traveler's diarrhea.

Adding a purged stool sample analysis to the normal stool analyses improves the chances for proper diagnosis as does use of a lab that specializes in stool analysis. A purged stool is a stool sample obtained by forcing complete evacuation of the contents of the colon, usually by use of some saltwater-type solution.

If a good laboratory has found nothing with three successive samples, then physical observation and biopsy will be necessary. Some specialists recommend using a D-xylose test first as a way of determining whether it is more likely that there is small intestine disease or large intestine disease. Because an abnormal D-xylose test indicates malabsorption, it points to the likelihood of a small intestine problem. If such an abnormal reading is found when other symptoms also point to the upper intestines as the most likely site of the problem, then an upper endoscopy would be appropriate in order to obtain a biopsy from the distal duodenum or proximal jejunum (parts of the intestines), along with cytologic brushings and aspirates (stimulation and removal of cells). On the other hand, if the D-xylose is normal and the other symptoms point to the large intestine, then a colonoscopy would be appropriate in order to obtain several random biopsies.

Even if the intestinal mucosa appear normal to the observer, it is important to perform the biopsies since it has been estimated that observation alone would miss many diagnoses, including at least a third of CMV colitis cases. Dr. Anton notes that many physicians believe that a full colonoscopy is needed rather than just a short colonoscopy with a flexible sigmoidoscope since a third of CMV is present only in the right colon, an area not seen using the flex sig. However, he notes that unless tissue inflammation is seen, then CMV is probably not causing diarrhea (even if CMV is present). If symptoms don't provide clear cut indications as to which part of the intestines may be the likely problem area, then the experts recommend that both procedures be done. In cases where examination of the part of the intestines that originally seemed most likely doesn't reveal anything, then the other testing should be done.

This approach of trying to narrow down the possibilities to the most likely is aimed at avoiding both the expense and trauma of doing everything on everyone. However, do be aware that, because of the likelihood of multiple infections and conditions, some physicians and researchers believe that both an upper endoscopy and a full colonoscopy should be done in anyone with diarrhea. Without this, it is possible that a more obvious condition will be diagnosed while others which are not initially suspected, but, in fact, may be the primary cause(s) of the diarrhea, might be missed. Again, *multifactorial causation* is more often the case than not. In addition, by doing both procedures at once, you only have to undergo sedation once.

After the upper endoscopy, tissue analysis must include histology with special stains, virology, AFB stain and culture, and electron microscopy. After the colonoscopy, tissue analysis must include histology with special stains and virology. If even extensive testing reveals no pathogen and eliminating all the non-pathogenic causes discussed here fails to resolve the diarrhea, then the experts suggest that the cycle of diagnostic tests be repeated, again including several stool analyses and endoscopic biopsies. It has been found that if the cycle is repeated several times, a pathogen is often eventually identified. The greatest necessity for diagnosis is a highly skilled pathologist who can knowledgeable read the samples. In cases where a local lab does not have a pathologist who is very experienced in analyzing tissue from HIV+ people, the best course is for the patient to request that the slides be sent to a facility that has such expertise.

□ **One common cause of diarrhea in HIV+ people is lactose intolerance, the inability to adequately digest the milk sugar called lactose.** It appears that even in those who previously handled dairy products with absolutely no problem, this problem often develops in the course of HIV disease. When it does, you're no longer producing sufficient quantities of lactase, the enzyme necessary for lactose digestion and, thus, the digestion of all dairy products. When the lactose reaches the colon undigested, there is bacterial digestion and fermentation of the lactose. The result can be watery diarrhea, as well as gas, bloating, stomach cramps, nausea, a feeling of an "acid stomach," and/or fatigue.

Note that the reaction to lactose is sometimes dose-dependent, with different people's tolerances widely variable. Some people can tolerate small amounts of dairy products or foods that have relatively low levels of lactose but will react badly to larger amounts. For example, they may be able to tolerate the lower amounts of lactose found in yogurt, buttermilk, kefir, aged cheese, and "sweet acidophilus" milk (which is actually fermented milk) or reduced-lactose milk (which has had lactase added to it to help you digest it). However, the same person that can consume those things with no problem may get gas and diarrhea if they drink a big glass of milk. For others, even very small quantities of dairy products can cause diarrhea. This could be as little as a teaspoon of cream in coffee, a small dab of cheese on your pasta, one cookie or piece of bread that contains milk powder or whey, one sandwich with luncheon meat containing milk powder, a smidgen of ice cream, a supplement or weight gain drink containing lactose, or a dab of margarine that contains whey. Thus, your assessment of whether you may be lactose intolerant may be difficult. If you eat yogurt every day with no problem, don't think that this means that a big glass of plain milk couldn't be causing diarrhea problems. It could.

Be aware that, by volume, there is more lactose in lower fat products. This can create a problem for those attempting to lower the fat content of their diets (since fat itself can cause diarrhea; see below) by switching from whole milk to skim milk or from high-fat ice cream to the low-fat iced milk frozen dessert. Skim milk has more lactose than low-fat milk which has more lactose than whole milk which has more lactose than cream. Because of this, some people who can't consume any other dairy products without symptoms can actually eat a high-fat premium brand of ice cream with no problem. There are people for whom this has created the false belief that lactose is not a problem. Because they like ice cream and eat it with no apparent problem, they are then sure that drinking milk couldn't possibly be contributing to their diarrhea. Since that is not the case, be careful how you assess your reaction to dairy foods.

A lactose hydrogen breath test can be performed to determine whether there is lactose intolerance. If that's not available to you, the simplest test is to eliminate *absolutely all* dairy products from your diet for a week or two, watching to see if your symptoms improve. If they do, this is probably at least part of your problem. For a further test, after the period of abstinence, you can then consume a high dairy meal—try a grilled low-fat cheese sandwich with a couple of big glasses of nonfat milk—and observe the results. Just don't choose high-fat dairy products when you do this test, because you might then see problems caused by the fat, rather than the dairy.

□ **That's because fat intolerance, another major cause of diarrhea, is also common in HIV disease, and appears to worsen with disease progression.** Fat malabsorption is apparently already present in some in early disease stages. As time goes on, more and more people become unable to properly digest and absorb fat. This improperly digested, unabsorbed fat can then pass into the colon where it is acted upon by bacteria, causing diarrhea. The result is often 3-10 bowel movements per day, with large stool volume. The stool volume will usually decrease when food intake is cut back. With this sort of diarrhea (as opposed to that caused by infections), the person may otherwise feel relatively well and will often continue to have a reasonably good appetite. Too often, this possible diarrhea cause is unsuspected, either due to a lack of awareness on the part of physicians (despite a large number of studies that have been published showing this), or because the person with diarrhea is unaware of how much fat is really being consumed. The American diet is very high in fat so for many this "normal" diet isn't under suspicion.

For clear diagnosis of this, Dr. Anton suggests using a 24-hour stool test for fecal fat. If it shows that the fecal fat level is too high (a condition which is called steatorrhea), then the need to cut back fat in the diet and do everything possible to improve fat digestion is clear. The test is done by giving a 100-gram fat diet for two full days, throughout the second day of which you collect the stool for a full 24 hours. With healthy function, there should only be around 7 grams of fat in the stool. According to Dr. Anton, it is not uncommon to see 20-60 grams of fat in the stool of people with fat intolerance.

□ **In some people, caffeine may contribute to diarrhea.** Caffeine stimulates bowel contractions and as HIV disease progresses, some people appear to become more sensitive to it. This means that the cup of coffee that they used to be able to drink with no problems might now cause or exacerbate diarrhea. Although it is unlikely to be the sole cause of diarrhea, for someone ingesting caffeine repeatedly, it could certainly contribute to the problem. Caffeine also stimulates loss of fluids which can be a serious problem in those already losing fluids with diarrhea.

□ **Sugar can also be a problem.** Sugar is hygroscopic, or water-seeking, which is why a high-sugar food like a chocolate bar or dish of ice cream makes you feel thirsty. In someone without diarrhea, drinking a glass or two of water will usually resolve this. However, in someone with diarrhea, sugar's tendency to pull water into the intestines can actually worsen the problem.

□ **Stress, depression, and anxiety are other potential causes of diarrhea via their effects on peristalsis** (the rhythmic motion that results from the contraction and relaxation of muscle fibers in the walls of your intestines that propels the movement of food through the intestines). They are unlikely to be the sole cause of severe, unremitting diarrhea but if occasional go-rounds are your problem, this is a possibility.

□ **Other frequently overlooked possible contributors to diarrhea are all the same functional bowel problems that occur in the HIV-negative.** Diarrhea can be caused by bowel problems such as irritable bowel syndrome (in the past, sometimes called spastic colon, nervous colon, unstable colon, nervous bowel, spastic bowel, nervous colitis, mucous colitis, or spastic colitis, all of which are now considered inaccurate or misleading) and inflammatory bowel disease (which includes both ulcerative colitis and Crohn's disease). The former is estimated to cause problems for 22 million Americans, and the latter for at least one to two million. Thus, many people living with HIV may be affected by these problems. If they have occurred and been properly diagnosed before the diagnosis of HIV disease, then their possible contribution to the occurrence of diarrhea will probably be taken into account. However, for those who happen to develop these conditions after an HIV diagnosis, the possibility that diarrhea is being caused by these may not be considered. Thus, make sure that these are kept in mind. To help you distinguish between the two, these are the common characteristics of each.

Irritable bowel syndrome (IBS) can cause crampy abdominal pain, gas, and bloating (to the extent that there may be visible abdominal distention), diarrhea and, confusingly, constipation, or constipation that alternates with diarrhea. There may be more frequent bowel movements and looser stools with the onset of abdominal pain, and the pain may be relieved by bowel movements. These symptoms may be markedly influenced by dietary factors and psychological factors or stressful life situations. With IBS, there is no fever or bleeding, no signs of tissue damage, no changes in the lining of the bowel, and no likelihood of progression to more serious disease.

Inflammatory bowel disease (IBD) can also cause diarrhea, along with abdominal pain, rectal bleeding, fever, weight loss, and inflammation and ulceration of the bowel lining that can be observed with x-rays and direct viewing via an endoscopy. In general, it is just important to remember that these conditions affect many millions of people and, thus, may be contributing to diarrhea in many. As with so many other aspects of HIV disease, there is a tendency for some to forget that anything that affects humans, although entirely unrelated to HIV disease, can affect someone living with HIV so any comprehensive diagnosis must include considering non-HIV-related causes of problems. With HIV+ people, there is a tendency to think of any diarrhea as being related to immune dysfunction and other disease processes, so it may be that undiagnosed functional bowel problems are contributing to diarrhea in far more HIV+ people than is commonly realized.

There is, of course, a long list of drugs that may cause diarrhea. Of the antiretrovirals, the protease inhibitors are the most likely cause. The two most commonly reported to be stool-looseners are nelfinavir (Viracept) and zidovudine (ZDV) (Atrivir®). Other antiretrovirals that may be problematic include didanosine (ddI) (Videx®), zalcitabine (ddC) (Hivid®), zalcitabine (Zerit®), 3TC (Epivir®), abacavir (Ziagen®), nevirapine (Viramune), and efavirenz (Sustiva). Research has shown that at least one of the ways in which protease inhibitors may be causing diarrhea is that they block normal digestive enzymes from doing their jobs. Since those enzymes are needed for food to be properly digested, this protease inhibitor-caused enzyme inhibition can result in improperly digested food passing into the colon where it will be acted upon by bacteria and produce diarrhea and, often, smelly gas.

Many other drugs, including the anti-herpes drug acyclovir (Zovirax) and many antibiotics and other meds, can also cause this problem. Antibiotics such as amoxicillin, clindamycin, Cipro, erythromycin, and ampicillin frequently

cause diarrhea. Clarithromycin (Biaxin), used as a treatment or prophylaxis for MAC can increase intestinal motility and, thus, sometimes cause diarrhea. Other potentially diarrhea-causing medications sometimes used in the treatment of opportunistic infections, or other infections or cancers, include amphotericin B, etoposide, Nystatin, spiramycin, sulfadiazine, and vinblastine sulfate.

Gastrointestinal drugs like magnesium-containing antacids, laxatives, misoprostol, and olsalazine are designed to induce softer stools but may result in diarrhea. Various cardiac drugs, including digitalis, beta blockers, ACE inhibitors and diuretics, may cause diarrhea. Lipid-lowering agents (used to treat elevated blood fats) that can cause diarrhea include clofibrate, gemfibrozil, lovastatin and probucol. Various drugs used to treat psychiatric problems may cause diarrhea, including lithium, fluoxetine (Prozac), alprazolam (Xanax), valproic acid, ethosuximide and L-Dopa. Other miscellaneous drugs that can cause diarrhea include theophylline, thyroid hormones, colchicine and non-steroidal anti-inflammatory drugs.

Antibiotics can be particularly problematic, whether used short-term (as for the treatment of an infection) or long-term (as prophylactics against PCP or other infections). The problem is that these meds kill not only the bad bacteria (the ones that cause infections) but also the “good” bacteria that normally live in your intestines. A lack of these good microorganisms in the intestines can be a causative factor in diarrhea. Normally, these good bacteria aid digestion. When those that are needed to help break down foods, completing their digestion, are not present, the undigested food particles sitting in the intestines can create or worsen diarrhea.

The good bacteria also block the growth of unwanted organisms that may cause diarrhea, both by competing for intestinal space with them, and by producing natural antibiotics that help to suppress the bad guys. When the good bacteria are not there taking up space, there is more room for pathogens to latch on, possibly increasing the person’s susceptibility to intestinal infections of several kinds.

A particularly likely problem with antibiotic use is development of *Clostridium difficile* infection. *C. difficile* is a bacteria that can overgrow when antibiotic therapy has wiped out the normal good bacteria in the intestines. It has long been observed that the use of the antibiotic clindamycin and prolonged hospitalization are particularly associated with development of *C. difficile*-associated diarrhea. However, virtually every antibiotic has been known to cause the infection, so *C. difficile* should always be suspected when diarrhea develops during antibiotic therapy.

However, less known to some is that *C. difficile* has been shown to develop in HIV+ people even when there has been no really recent exposure to antibiotics. In some cases, there may be a period of several weeks or months after antibiotic use before *C. difficile*-induced diarrhea begins. University of California at Irvine researchers found that *C. difficile*-associated diarrhea (CDAD) was the problem in approximately 25 percent of HIV+ people with chronic diarrhea. In fact, it was the single most common identifiable cause of diarrhea in their HIV-positive patients. They also note that, although there was no consistent pattern of drug association, every one of those diagnosed with CDAD (14 out of 14) had received TMP/SMX (Bactrim/Septra) prior to their diagnosis with CDAD, and most (11 out of 14) had received prolonged fluconazole therapy.

Some herbs and vitamins may cause diarrhea, especially if taken improperly. Taking more vitamin C than the body can tolerate (the amount of which is entirely individual, and may change, depending on whether or not a person is experiencing infections that increase the body’s need for the vitamin) can cause diarrhea. Increasing the dose of vitamin C too rapidly may also be problematic, so for those seeking to increase their C intake, it’s always best to increase the dose slowly over a couple of weeks. Excessive magnesium supplementation could also cause diarrhea; again, for those who need to supplement this mineral, it’s best to gradually increase the dosage (and generally not go past a dose of 500 to 600 mg daily, always balanced with calcium). If watery diarrhea suddenly appears, cut the dose back. A wide range of herbs sometimes used to treat constipation may, if used in too high a dose or for too long, cause diarrhea. Aloe latex (“drug aloe” as opposed to the gel or juice), oats, marijuana, cassia (senna), chicory, rhubarb and castor oil from *Ricinus communis* may all have excessive laxative effects.

Consuming too much insoluble fiber may result in diarrhea, especially in someone whose intestinal function is already compromised. This is unlikely to be a sole cause of diarrhea, but it could contribute to the problem. Foods that are high in insoluble fiber include wheat bran, whole-wheat products, popcorn, nuts, seeds, potato skins, corn, and a high intake of raw fruits and vegetables (especially, their peels).

What are the possible treatments?

Overall, if the onset or sudden worsening of diarrhea is tied closely to beginning a med or other therapy, it's a likely suspect. In some cases, the diarrhea may diminish after a period of time on a drug, particularly in the case of antiretrovirals, but too often the problem remains. If a drug substitution is possible, that may be the best solution, and will usually result in quick disappearance of the diarrhea. However, note that in many cases, antiretroviral-caused diarrhea may have a simple solution, as discussed below, which will make it unnecessary to switch meds. And never forget that more than one cause may be contributing. Truly effective treatment always requires aggressive diagnosis to pin down all possible factors.

With results from all your diagnostic tests in hand, it will be very important to try to implement changes and begin therapies to address all possible causes. If you only try one thing at a time, you may never perceive improvement. That particular change or therapy may have actually helped, but if several other causes are ongoing, you may not notice that drop from ten bowel movements per day to only eight. So the best treatment approach is to aggressively implement *all* the possible changes and treatments necessary to address *all* the possible causes.

After the diarrhea is fully resolved, you could then experiment to see if certain things would no longer be problematic. For example, if you'd cut way back on fat in your diet, then after the diarrhea is eliminated you could try increasing fat a bit and then watch for changes. If you'd eliminated dairy products just to be sure you were trying everything to eliminate your diarrhea, after the diarrhea is eliminated you could then try drinking a glass of milk or eating some cheese to see whether they might be tolerable. Just always note the results of your experiments carefully.

Key Treatments

Infectious Diarrhea

If infections or parasites have been discovered, seek information on state-of-the-art therapies, and use them precisely as directed by your physician. Make sure that appropriate followup is done to ascertain that the infectious organisms have been eliminated.

Blastocystis, Giardia, Entamoeba

Tinidazole (Fasigyn) 500mg x 8 (Doctor Rx required)	Giardia or Blastocystis: 4 pills one day Amoebas: 4 pills 3-5+ days plus humatin immediately afterward for 7 days
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Tinidazole for many indications appears to work as well as its cousin, metronidazole (Flagyl). The happy news is that it has far fewer side effects than Flagyl. However, you must NOT drink alcohol while on this drug as this may cause a very serious reaction (as well as eliminating the drug's therapeutic efficacy).

Cryptosporidia, Microsporidia

NTZ 500mg x 6; Rulid 300mg x 10	NTZ: 2x2/day with food for 7 days; NTZ+Rulid: 2 daily of each 15 minutes after food; then Rulid: 2/day for 7 days
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C. Difficile

Saccharomyces Boulardii, a product containing a type of good bacteria, will sometimes help eliminate the symptom of diarrhea, although it will not address the causes. It seems to work particularly well for *C. difficile*-associated diarrhea. It is usually recommended that the dose be gradually increased, as necessary to control diarrhea, beginning with 1 capsule, two to three times daily, and increasing gradually, if necessary, up to 2 capsules, two to three times daily.

Florastor 250mg (<i>Saccharomyces boulardii</i>)	4/d (2 before food morning and evening)
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Nutraceuticals for Infectious Diarrhea Caused by Parasites

For those seeking to avoid harsher drug treatments for parasites, there are traditional formulas that contain herbs that have long been used for treatment of such infections. Phoenix naturopathic physician Kären van der Veer, N.D., reports good results using the following two products:

Grapefruit seed extract: 5 to 10 drops in a half glass of water or juice, consumed at least 4 times per day;

or

Tyler Para-Gard (which contains grapefruit seed extract, along with berberine, gentian, golden seal, artemisia, quassia, black walnut, and other herbs): 1-2 capsules, three times daily, taken in between meals.

With either of these products, Dr. Van der Veer recommends continuing them until there is resolution or significant improvement of the diarrhea. She notes that it will often be necessary to take the product for 10 to 14 days to achieve the optimal effect. Then the product should be tapered off gradually over a few days. In cases where no improvement is seen after the first few days, then other courses of action should be taken.

Dr. Van der Veer notes that in some cases, diarrhea may initially worsen as the parasites are being cleared. This is the result of what is sometimes called a Herxheimer's reaction, the temporary development or worsening of symptoms that occurs when pathogenic (disease-causing) organisms begin to die off and release toxins into the body. In addition to a worsening of diarrhea, some people may also experience symptoms of nausea, fatigue, headaches, and fever. If this happens, Dr. Van der Veer recommends beginning the dosing again with a lower dose of Para-Gard that is gradually increased over time. On this schedule, the initial dose would be 1 capsule, three times daily, taken in between meals (morning, afternoon, and evening). Every few days, the dosing is very gradually increased by only one capsule daily; so, for example, the second step up would mean that one capsule is taken in the morning, two at noon, and then one in the evening. Eventually the dosing can be increased to as many as 2 to 3 capsules, three times daily, if needed. There are several other things that may help reduce the Herxheimer's reaction symptoms. Both pantethine, the active coenzyme form of pantothenic acid, a B vitamin, and vitamin C can help alleviate such symptoms. Doses of pantethine (300 mg, three times daily) and vitamin C (1,000 to 2,000 mg, 3 to 4 times daily) would be useful. Drinking large quantities of water will also help the body flush out the toxins more quickly. Generally, symptoms caused by a Herxheimer's reaction will fade away within a few days, in any case, but doing these things may help prevent what might otherwise be an unpleasant period.

Dr. Van der Veer stresses the need to always accompany any treatment of infectious organisms with daily intake of acidophilus and other probiotic bacteria, as discussed below.

Antimicrobials: One of the primary classes of botanicals used for treating infectious diarrhea are those that contain the isoquinolone alkaloid berberine. These include: goldenseal, barberry, and coptis. Any one of these can be used against a wide variety of pathogens that can cause diarrhea.

Barberry (*Berberis spp.*), Coptis (*Coptis chinensis*), Goldenseal (*Hydrastis canadensis*) Roots: Each is rich in the isoquinolone alkaloid berberine which has very potent antimicrobial activity. Each is extremely bitter and traditionally has been used as a simple digestive bitter as well as for more serious infectious conditions such as dysentery and giardia, candida overgrowth, as well as many forms of infectious diarrhea.

Dosage: Equivalent to 1-3 g daily.

Astringents: These are botanicals rich in plant acids, such as tannins, that have an astringent action which can arrest abnormal fluid discharges. Many astringents also have antimicrobial action as well.

Bayberry Bark (*Myrica cerifera*): Used as an astringent specifically for diarrhea and dysentery.

Dosage: 1 teaspoon slowly boiled in 1 cup of water for 10 minutes in a covered vessel. Drink 1-2 cups daily.

Yarrow Herb (*Achillea millefolium*): One of the most widely used astringents which also possesses broad-spectrum antimicrobial activity.

Dosage: Steep 1-2 tablespoons in 1 cup of boiled water for 10 minutes in a covered vessel. Drink 1-3 cups daily.

Nutraceutical Formulas for Infectious Diarrhea Caused by Parasites

Biocidin. A highly potent concentrate of trace minerals, garlic and Chinese/Western herbs with antimicrobial (antiparasitic, antibiotic), and anti-inflammatory properties, potent against bacteria, fungi, protozoa, worms, and possibly candida and viruses. There are anecdotal reports of its successful use for the treatment of low grade *Candida* overgrowth, chronic infection with the parasite *Blastocystis hominis*, and intractable, chronic diarrhea caused by microsporidiosis and cryptosporidiosis in a number of HIV+ people. It should not be used for more than a few weeks at a time, and should be taken along with an additional acidophilus supplement. If liver enzymes are elevated, take it with alpha lipoic acid and silymarin. Do not use if pregnant. Always take with food; and for best results, combine with a good vitamin/mineral supplement, extra vitamin C, and a diet rich in grains and dark green leafy vegetables. The recommended dosage for initial treatment of such problems is 3-4 tablets, 3 times per day for at least three weeks. For ongoing preventive use, the recommended dosage is 2 tablets, 3 times per day. take with food.

Bovine Colostrum: One of the most nutritionally rich sources of carbohydrates, proteins, carbohydrates and beneficial fats obtainable. It also contains numerous immunoglobulins and insulin-like growth factors. One of the most effective treatments for infectious diarrhea.

Dosage: The equivalent of 10-20 g daily.

Nutraceuticals for Infectious Diarrhea:

B-50 Complex x 250	2-3/d
Biocidin x 175 .	3-12/d (1-4B, 1-4L, 1-4D) with meals
C Time Release 100mg x 250	3-6/d (1-2B, 1-2L, 1-2D)
Para-Gard x 120	1-2 3 x/ d between meals. Build up to dose slowly.
Pantethine 300mg x 60	3/d (1B, 1L, 1D)

Fat Intolerance and Malabsorption

□ If fat intolerance and malabsorption seem likely (because you normally eat a high-fat diet or because you notice that your diarrhea seems to worsen after high-fat meals) or have been diagnosed (using the fecal fat test), take steps to improve the health of the gut, cut back on dietary fat as much as is necessary to see improvement, and take a pancreatic enzyme formula that contains lipase, the fat-digesting enzyme, with all fat-containing meals and snacks.

The overall goal here should be to improve fat tolerance by using the nutrients that help to heal the gut and using pancreatic enzymes to improve absorption. At the same time, trying to improve the kinds of fats consumed, eliminating the unhealthy ones and adding those that promote health, will be crucial. Initially, it may also be necessary to significantly reduce fat intake in order to improve diarrhea. Over time, by doing the other things to improve fat tolerance, a higher level of fat intake will very likely again become possible.

Pancreatic enzymes can be immensely useful in improving absorption and, thus, lessening any contribution that malabsorption is making to diarrhea. If you can obtain a prescription for the enzymes, that can save you money. One of the best prescription products is Digestive Care, Inc.'s **Pancrecarb** (covered by Medicaid in all 50 states). This product works better than most others because it is not only high in lipase (which is the fat-digesting enzyme) and amylase (necessary for proper digestion of carbohydrates) but is also enteric-coated (which is what gets it through the stomach acid unharmed and into the small intestine where it works). It also contains a bicarbonate buffer. The bicarbonate, which is a natural secretion of the pancreatic gland, is released when the tablet reaches the small intestine, thus optimizing enzyme activity, especially of lipase, by creating optimal pH (a measure of acidity vs. alkalinity; it needs to be at a specific point for enzymes to work the best; Pancrecarb's design ensures that.) With this combination of

features, this product appears to deliver better enzyme activity and, thus, greater effectiveness in reducing diarrhea, gas and bloating when compared to other products. A double-blind placebo-controlled trial has shown significant diarrhea reduction (as measured by improvement in stool consistency) in HAART-takers with diarrhea who were given Pancrecarb with meals. You will have to experiment to see how many enzymes are needed with each meal. For some, one tablet with each meal or snack may be enough; for others, three or four enzyme tablets may be needed with each meal or snack.

In addition to prescription forms, there are also many over-the-counter enzyme products available, but be sure to pick only brands that are enteric-coated (ensuring that they will reach the small intestine unharmed by stomach acid) or that are from vegetable sources where they work in a wide range of pH from 2 to 12. Make sure that the enzyme includes sufficient lipase, the fat-digesting enzyme which appears to be the key for diarrhea improvement. A good non-prescription formula is NYBC's **Plant UltraEnzymes**, also high in lipase. UltraEnzymes are also useful because they are a vegetable enzyme formula which aid in the digestion of such gas-producing foods as beans, cabbage, broccoli, cauliflower, Brussels sprouts, onions, and garlic.

Nutraceuticals for fat intolerance and malabsorption

Plant Ultra Enzymes: Plant enzymes are not affected by stomach acid and are released in the intestines in a broad pH range, making them a good choice for HIV+ people. A blend of the following enzymes (plus papain and bromelain) derived from vegetable sources: Protease (breaks down protein), amylase (breaks down starch), lipase (breaks down fiber), and lactase (breaks down lactose). Suggested use is one capsule one to two times a day with meals.

NYBC Enzymes to Support Digestion:

Plant Enzymes x 240	1-3 with each meal
Plant UltraEnzymes x 90	1 with each meal

Reducing Dietary Fat

However, initially, when diarrhea is ongoing and you are only just beginning your gut improvement program, or when improving the gut in all these ways is not sufficient for completely eliminating fat malabsorption, it will be important to look at all the possible ways to reduce dietary fat in order to eliminate its contribution to diarrhea. Always remember that much of the fat you are consuming every day is likely to be "hidden." Meat (other than very lean varieties) and dairy products other than those made from skim milk (including cheese and cream and yogurt and ice cream) are all loaded with fat. Breakfast and luncheon meats, including bacon, sausage, bologna, pastrami, and so on, are very fatty. In addition, a huge percentage of snack foods are fat-loaded, including most chips, many crackers, many cookies, many granola bars, many candy bars, most hot dogs, peanuts, nuts, and so on. And, of course, the fats found in salad dressings and peanut butter or other nut butters and many sauces can add huge amounts of fat calories if you overdo them. Fried foods of all kinds (burgers, French fries, fried chicken, fried fish, fried or deep-fried vegetables, and so on) are often lethally high in fat. And last but not least, the addition of fatty products such as butter or vegetable oils or mayonnaise or cream or whipping cream or sour cream can dramatically increase the fat content of any dish.

Many people remain unaware of how much fat they're taking in daily, in part because of its hidden nature.

If you keep a food diary that lists every single food and every single drink that you consume over several days, you may discover that your intake is higher than you had thought. The total from both hidden and obvious fats can be high:

- Cream in the morning coffee, granola for breakfast (sounds healthy but usually very high in fat) with whole milk (also high in fat), and maybe some bacon (fat) or sausage (fat) or toast dripping with butter (even more fat) or bagel coated with cream cheese (lower in fat than butter but think how much cream cheese you slather on compared to butter).
- A chicken salad sandwich at lunch (loaded with fatty mayonnaise) or one containing high-fat luncheon meats and accompanied by fries or chips (most varieties are extremely high in fat) or a trip to that seemingly healthy salad bar where many of the extras like olives, cheese, nuts, seeds, and dressings can skyrocket the total fat content.
- Pizza or a pasta with a high-fat sauce for dinner accompanied by a salad with lots of dressing, seeds, olives and cheese (again, fat, fat, and more fat). Or maybe a crunchy plate of fried chicken (tons of oil in that coating) accompanied by

mashed potatoes (tons of butter mixed in) and other vegetables (also slathered with butter), with a few biscuits covered with gravy (half fat).

□ Between meal snacking on doughnuts (don't forget that they're deep-fried), or cookies (many are surprisingly high in fat), or chips (heat them up in the oven once; you'll be amazed by how much fat you see), or croissants (they're made with loads of butter; and any that you add worsens the fat content) or a double order of fries (there's a reason that their container looks so greasy).

□ And don't forget that far too many meals are eaten out where control of fat content can be very difficult. Since fat tastes so good, most restaurants add copious amounts to many foods.

For a couple of weeks, try to avoid such foods, instead experimenting with a truly low-fat diet, with the emphasis on complex carbohydrates and plenty of vegetables and fruit and lean sources of protein. Desirable foods would include brown rice, pita bread, baked or steamed potatoes, oatmeal or other such grain cereals, beans, broth-based soups, steamed vegetables, fresh or stewed fruits, and low-fat meats and fish (particularly when broiled or grilled), including poultry with the skin removed and tuna packed in water. When choosing the grain foods you will eat, note that for some people, gluten (the protein portion of grains) is problematic, and may contribute to gut inflammation and diarrhea. For these people, reducing or eliminating the intake of gluten-containing foods may be helpful. Gluten is contained in wheat, rye, oats, and barley. Gluten-free grains are rice, quinoa, millet, and buckwheat. Experimenting with a low-gluten diet for a week or two may be helpful in knowing if this could improve your diarrhea.

A week or two on a lower fat diet can help you know if fat is contributing to your gas, bloating, or diarrhea problems. Very often, people who have been living with gas and/or diarrhea for sometimes quite lengthy periods will find that this dietary change will greatly help.

Relatively simple dietary and food preparation changes can significantly reduce the fat content of your diet:

- Avoid high-fat sauces and gravies and butter, substituting herbs and other seasonings to improve the flavor of foods. We're all programmed to like the flavor that fat contributes and eliminating it from dishes often seems to remove a lot of the flavor that we're all accustomed to. So try flavoring dishes in fat-free or low-fat ways by using salsas, cumin, curry powder, aromatic herbs, roasted garlic or shallots, flavored vinegars, chicken broth, and various hot sauces to spice up low-fat dishes.
- Bake, broil, or grill your meats, poultry, or fish instead of frying them.
- Use skim milk and skim milk cheeses and yogurt instead of whole milk or the cheeses or yogurt made from it.
- Avoid high-fat breadstuffs like croissants, doughnuts, muffins, and most cornbread. Use whole-wheat pita bread or low-fat whole-grain breads instead. If you're making your own baked goods or sauces, use unsweetened condensed skim milk in place of cream.
- To thicken a sauce or a soup, use pureed white beans, instant mashed potatoes, or cornstarch and skim milk instead of the heavy cream that so many recipes call for.
- To make mashed potatoes, you can use fat-free chicken broth instead of butter and milk when you mash them.
- Substitute steamed or baked vegetables and baked potatoes for the greasy fried varieties.
- To "sauté" onions, garlic, mushrooms, or other foods, use water or poultry broth instead of butter or oil. Alternatively, just "sweat" such foods. Place the chopped onions or garlic in a frying pan and use moderate heat just until they begin to brown around the edges. Then pour in stock or vinegar to de-glaze the pan.
- Prepare your own popcorn, using skim-milk grated cheese and various seasonings instead of fat as the topping.
- When you just *have* to have a little fat for flavor, use toasted sesame oil or other strongly flavored oils. A little of those goes a long way in increasing both the appetite-stimulating smell and flavor of foods.

As you work on changing your fat choices, do remember that in addition to reducing fat intake, it's very important to try to choose good fats instead of the health-damaging variety. For many reasons, it is very important to eliminate partially hydrogenated fats (often called "trans" fats) from the diet. These are chemically modified fats that are found in most margarines, vegetable shortening, and a large percentage of commercial baked goods (including most breads, crackers, cookies, pastries, etc.) and snack foods. Everyone who cares about protecting their cardiovascular system needs to read labels (look for the words "partially hydrogenated" followed by any oil) and try to avoid these damaging

fats to the greatest extent possible. Instead, stick with the fats Mother Nature made, especially the monounsaturated fats like olive oil.

If flavor is an issue to you in terms of oil choices, note that olive oil is available in the more full-flavored green varieties, as well as in lighter versions that have little or none of the usual olive taste. For baking or other cooking where you don't want the traditional olive oil flavor, the latter would be a good choice. There are other monounsaturated oils that would be good choices, including walnut oil and almond oil. Some of the other monounsaturated oils are less desirable. For example, canola oil is heavily processed (using heat and chemicals) in ways that make it less appealing for those seeking the best oil for health.

To find baked goods and snack foods that don't contain partially hydrogenated fats, you may need to seek out a whole foods supermarket or one of the large supermarket chains (Safeway and King Sooper's and other national chains) that now carry a substantial amount of "health foods" or "natural foods." Luckily, some of these stores now have entire aisles of healthy foods, and their bread sections include some of the organic whole-grain breads that generally don't have any trans fats on their lists of ingredients.

In addition to cutting the total amount of fat in the diet back, eating smaller but more frequent meals can help. This will reduce the amount of fat hitting your digestive tract at one time. If your body's capacity to digest fat is limited, this may help.

Switching to a different kind of more digestible fat can also help. One good source of fat for those who find that fat intolerance is, indeed, a problem is the particular type of fat made up of medium chain triglycerides (MCT's). In most products, the main source of MCT's is coconut fat. Whether the coconut fat is found in coconut itself or the products made from it (macaroons, coconut cream, coconut milk, grated coconut, etc.) or the fractionated coconut oil found in some of the better supplemental drinks (such as Clintec Peptamen and Clintec Nutren and Mead Johnson Lipisorb and others), it provides this type of fat that is easier to digest and absorb and, thus, does not contribute to gas, bloating, or diarrhea. This is a saturated fat that is very high in calories and so would not be something that most people would want to overdo. But for those in need of maintaining their caloric intake when other fats have been restricted because of intolerance, the coconut fat products can be useful. Coconut cream is very tasty. It comes packaged similarly to butter, in large sticks, and can be used in place of butter or oils for frying, for making soups or sauces, for "buttering" your bread, and so on. MCT oil can be purchased in many health food stores where it is usually promoted as a body-building supplement. For those who need additional calories, this can be added to soups, potatoes, grains, casseroles, stews, or supplemental drinks. Because fat is a good source of calories and helps to make food tasty, coconut cream or MCT oil can be good resources for a kind of fat that won't cause diarrhea while you continue to work on improving your fat tolerance.

Medium Chain Triglycerides (MCT) x 16 oz	as needed
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The one caution about all this discussion of fat is that, as with all things, you shouldn't carry fat avoidance to an extreme. What we are talking about here is a whole foods diet that contains moderate amounts of the good kinds of fats. We are not talking about a diet with no fat at all. In the concern to educate people about the need for diets that are lower in fat than the American norm (which is extremely high in fat, usually of all the wrong kinds), it seems that it is sometimes forgotten that fat is necessary at appropriate levels and in appropriate forms. Essential fatty acids are just that—essential. Both the omega-3 and omega-6 fatty acids are very important for human health. When levels of fat intake drop so low that the levels of essential fatty acids in the body are compromised, there can be many negative health consequences, including skin problems, neurological problems, energy problems, and suppressed immunity. In addition, fat is the body's storehouse of energy. You need reasonable amounts of it stored in your body. And some fat in the diet is required for the absorption of the fat-soluble vitamins A, D, E, and K. So, in your attempt to decrease intake of fats, don't throw the baby out with the bath water. A reasonable intake of moderate amounts of healthful fats is what is wanted. Extremes of fat intake in either direction, too much or too little, are not desirable. And remember that taking the enzymes, as discussed above, may improve your fat digestion sufficiently to make severe dietary changes unnecessary.

For those in whom severe fat intolerance problems make a really low-fat diet a necessity for any period of time, it will be important to take a good multivitamin/mineral to ensure the daily intake of the fat-soluble micronutrients (A, D, E,

and K). In addition, it will be useful to take essential fatty acid nutraceuticals that will provide omega-6 fatty acids (as in borage oil; two capsules daily) and omega-3 fatty acids (as in fish oil and flaxseed oil, 1 to 2 capsules with each meal).

Because you need reasonable levels of fat for all these reasons, and because low-fat diets are very difficult to maintain for lengthy periods, do remember that the best approach in the end is to work on decreasing gut inflammation, healing the gut, and improving absorption so that a reasonable intake of the right kinds of fats no longer causes problems.

NYBC Nutraceuticals for Fat Digestion

Added Protection, Ultra Preventive	6/d (2B, 2L, 2D)
Borage Oil 1,000mg x 120	2/d
Flaxseed Oil 1,000mg x 200	3-6/d (1-2B, 1-2L, 1-2D)
Essential Balance 1,000mg x 120	6/d (2B, 2L, 2D)

For overall improvement in gut health, it will also be extremely important to supplement with glutamine and acidophilus. See those discussions in the separate entries below under *Improving Intestinal Health and Absorption*. With a combination of the natural anti-inflammatories, glutamine, acidophilus, and pancreatic enzymes, you may find that there will be much less need to severely reduce fat intake.

Lactose Intolerance

□ If lactose intolerance is present, eliminate or decrease dairy products as much as possible, and take lactase enzyme any time they're consumed. With lactose intolerance, removing dairy products from the diet or aiding their digestion by the use of lactase can significantly reduce the diarrhea and gas that might otherwise be caused by these foods. However, getting lactose out of your diet isn't always easy.

It's easy to see that you will need to reduce or eliminate the obvious milk-containing foods such as milk itself, powdered milk, puddings or sauces prepared with milk, ice cream, cream soups, cheese, milk shakes, and so on. However, it may not be so easy to spot the milk (or its derivatives) which are hidden in many, many other foods and some drugs. This includes many fast foods (burger, chicken, and pizza joint fare), prepared foods (frozen entrees and packaged meal items), baked goods (including a great many breads, pastries, and cookies), processed meats that contain milk powder (bologna, hot dogs, etc.), and all nutraceuticals or supplemental drinks that contain lactose or whey.

You'll have to read labels carefully, watching for ingredients like powdered milk or lactose, to spot these. Also remember that milk or cream is added to many soups, sauces, casseroles, and desserts so be very careful to check on the ingredients of any food you didn't prepare for yourself.

Remember that, as discussed above, the reaction to lactose is sometimes dose-dependent, with different people's tolerances widely variable. Some people can tolerate small amounts of dairy products or foods that have relatively low levels of lactose but will react badly to larger amounts. You may have to experiment to see if you can tolerate the lower amounts of lactose found in yogurt, buttermilk, kefir, aged cheese, and "sweet acidophilus" milk (which is actually fermented milk) or reduced-lactose milk (which has had lactase added to it to help you digest it), but get gas, bloating, and diarrhea if you drink regular milk.

If you are extremely lactose intolerant, you may have to avoid even the very small quantities of dairy products found in a teaspoon of cream in coffee, a small dab of cheese on your pasta, one cookie or piece of bread that contains milk powder or whey, one sandwich with luncheon meat containing milk powder, a smidgen of ice cream, a supplement or weight gain drink containing lactose, or margarine that contains whey, etc.

Always remember that there is more lactose in lower fat products. If you have worked on lowering the fat content of your diet (because fat is causing diarrhea or gas or you have cardiac concerns) by switching from whole milk to skim milk or from high-fat ice cream to the low-fat iced milk frozen dessert, you may actually have created a lactose intolerance problem. Again, skim milk has more lactose than low-fat milk which has more lactose than whole milk which has more lactose than cream.

With experimentation you may find that you can actually eat a high-fat premium brand of ice cream with no problem, while most other dairy products cause diarrhea and gas. Just don't be tricked into believing that your good results with the ice cream mean that lactose intolerance is not a possibility. The lower fat dairy products may still be contributing to gas and diarrhea. Since there is so much individual variation in the level of lactose tolerance, your personal experience will have to be your guide to what you can eat without problems.

If you suspect that lactose intolerance may be a serious contributor to your gas or diarrhea problems, it may be best to try for complete avoidance. *Read labels carefully.* If you are trying to eliminate all lactose-containing products in order to see if this is a problem, it is best to avoid even the reduced-lactose products. The level of lactose may be reduced in these, but some will still be present. It is sometimes possible for people who are lactose intolerant to resolve the problem by taking enzyme products containing lactase at any time when they eat a dairy product. Some people find this to be completely effective but for others it may not be. In that case, the only solution is elimination of the dairy products. Such lactase products are widely available over the counter. One of the more commonly available ones is Tylers's Lactase concentrate HP which works well for some. Another lactase product is Dairy Ease which, unfortunately, contains mannitol. (Since mannitol can actually cause diarrhea, it's probably better to use Lactaid.)

In a total approach to reducing lactose, don't forget that it is present in a number of drugs, including the acyclovir (Zovirax) 200 mg capsules. It is not, however, present in the 800 mg acyclovir tablets so if you need the drug but can't tolerate the lactose, that's your solution. It is also present in azithromycin (Zithromax), sometimes used in the treatment of MAC or cryptosporidiosis. Always have your complete list of drugs checked by your physician and/or pharmacist to see if any contain lactose.

It is very important to note that lactose intolerance can develop even in those for whom dairy products have never before caused problems. Don't presume that it's a complete impossibility because you've *always* drunk lots of milk or eaten lots of ice cream or cheese and never had it bother you. The intolerance frequently develops as HIV disease progresses and affects many more people than in the population at large. In fact, some experts have suggested that virtually all those living with HIV will eventually become lactose intolerant. In particular, the intolerance may become apparent during secondary infections. After an infection is cleared, the person who was intolerant during the infection may again be able to use dairy products.

If it appears that complete elimination of dairy products is necessary in order to eliminate your symptoms, using dairy substitutes such as rice milk, almond milk, oat milk, or coconut milk can be helpful. The latter is relatively high in fat but, as discussed above, most of it is in the form of medium-chain triglycerides which do not cause diarrhea and which have actually been shown to be very useful for weight restoration in those with diarrhea. Since dairy products are widely found in the American diet, it may seem difficult to avoid them completely. A good guide to living lactose-free is *Milk Is Not For Every Body* by Steve Carper (Facts on File, 1995), a comprehensive meal-planning guide for those who must avoid dairy products.

Lactase Concentrate - HP 137mg x 60	1 with dairy
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Improving Intestinal Health and Absorption

Another key for improving digestion and absorption is to work on improving the health of the gut (the intestines). Research has clearly shown that HIV+ people have a great deal of inflammation in the gut, often as a result of the elevated production of inflammatory cytokines, cell-produced chemicals that are released as part of the body's immune response. This inflammation contributes to problems with proper absorption. Thus, the use of agents to counter this inflammation as part of an overall approach to improving the gut would seem to be appealing.

However, long-term use of systemic anti-inflammatory drugs could be needlessly risky. One problem is that over-suppressing the inflammatory response with the powerful effect that drugs have might increase the risk for infections (since the inflammation is part of the immune system's way of countering infections). In addition, anti-inflammatory drugs can cause many side effects, particularly gastrointestinal bleeding. There is ongoing research looking at the use of non-systemic drugs for reducing gut inflammation (drugs that are not absorbed and instead pass through the gut where they have a local effect) and these may one day be found to be useful. However, the main focus of this research is currently on the use of such drugs to lower viral load (since inflammation increases viral load, and a substantial portion of

the HIV in the body is found in the gut), and the research is not yet completed so it may be some time before we know whether such therapies might also be useful for diarrhea.

For now, the more sensible approach to reducing gut inflammation would seem to be using the foods and nutrients that are known to have natural anti-inflammatory properties. Because such foods have been used for thousands of years with no apparent adverse effects on immune responses, it seems likely that long-term consumption of them would be considerably safer than long-term use of drugs. Their anti-inflammatory effects are more subtle but might still provide substantial benefit. Naturally anti-inflammatory substances are found in the following foods and seasonings:

- garlic, ginger, turmeric
- bioflavonoid- and antioxidant-rich fruits and vegetables
- omega-3 fatty acid-rich foods such as fatty fish (e.g. salmon, mackerel, sardines, tuna, cod and halibut), flaxseed, and walnuts.
- chlorophyll-containing foods such as wheat grass juice and blue-green algae. There are also specific nutritional supplements and herbs that counteract excess inflammation and may help to lower levels of tumor necrosis factor. These include N-acetyl-cysteine (NAC), carnitine, nettle leaf extract, grape seed extract and bilberry extract, as well as a broad spectrum of all the other important antioxidants (vitamin E, vitamin C, bioflavonoid complex, carotenoid complex, selenium, coenzyme Q-10, and alpha-lipoic acid). For more detailed information on the above foods and supplements, please see *NYBC's Core Nutrient Protocols* and *Counteracting Inflammation and Tumor Necrosis Factor* in the *Introduction*, as well as the description of *Health-Enhancing Nutrients* in *NYBC's Self-Care Guide*.

The amino acid L-glutamine can help to heal damaged intestines (the gut), maintain intestinal absorption, and actually reduce diarrhea by enhancing water and sodium absorption across the wall of the small intestine.

Glutamine is critical for maintaining the health of the intestinal tract since it is required for the constant rebuilding of intestinal cells. The cells lining the intestine function to absorb nutrients and to block the uptake of pathogens. These cells are regenerated every 72 to 96 hours (every 3-4 days). The energy which allows this process to occur comes from glutamine. If glutamine concentrations are low, the result is intestinal tissue atrophy and decreased absorption, with resulting lack of uptake of nutrients vital to the body's function. Glutamine is also necessary to maintain the barrier function of the intestines, the body's ability to block the uptake of pathogens and improperly digested food particles.

As is readily apparent, glutamine's ability to help repair the intestines is among its most important benefits for people living with HIV. Unfortunately, the demand for glutamine is very high in HIV disease because it is not only used for repair and maintenance of the intestinal tissue, but also for maintenance of optimal antioxidant status—for which there is a constant demand in the bodies of HIV+ people since the disease causes considerable oxidative stress, for building and maintenance of muscle tissue, and for maintenance of optimal immune function. Glutamine is the primary fuel source for lymphocytes and macrophages, immune cells which consume glutamine at high rates even when there are no special demands for immune system responses to an infection. During an immune response when the immune cells have to increase in number and do their work of destroying pathogens (including HIV, hepatitis viruses, and any other infections that may occur), the rate at which glutamine is used increases dramatically. The combination of all these glutamine needs means that many HIV+ people run short.

Glutamine researcher Judy Shabert, M.D., recommends glutamine supplementation to help ensure that there is a sufficient supply of this amino acid to meet all these needs, including maintaining the proper functioning of the small intestine. This will help to prevent the malabsorption that could otherwise cause or contribute to diarrhea. Dr. Shabert recommends doses of from five grams daily (for those without current problems who wish to maintain their intestinal tissue and provide sufficient glutamine for all the other needs discussed above) up to 30 or 40 grams daily (for those with current malabsorption, diarrhea, or wasting). A powdered form of glutamine is best. Mix it in water or juice and take in 3 to 4 divided doses daily, preferably on an empty stomach, 20 to 30 minutes before eating).

Glutamine Tabs 900mg x 180	5+ daily
Glutamine Powder 1,000g	10 to 40 grams/d, between meals or at very beginning of a meal

□ **Putting acidophilus and other good bacteria into the body regularly, especially during or after any period of antibiotic use, may be very helpful for healing the gut, preventing infections, and improving digestion in ways that may help prevent diarrhea.** In those who are not severely lactose intolerant, consuming fermented dairy products (such as yogurt, kefir, buttermilk, or sweet acidophilus milk) may be enough to repopulate your gut with the “good bacteria” that normally live there. For those who are too lactose intolerant to consume any dairy products, or those who don’t regularly consume such foods, taking nutraceuticals containing acidophilus and other microorganisms (in capsules, powders, or liquid forms) will be needed. Repopulating the intestines with good bacteria may even improve the digestion of dairy products, thus helping to eliminate lactose intolerance problems.

Using probiotic nutraceuticals regularly can also help to prevent overgrowth of *Candida*, or *C. difficile*, or other disease-causing organisms. Even where an infection already exists, consuming products that contain acidophilus and the other good bacteria may help to repopulate the intestines so that drug therapies can work better. In other words, as the drug therapies kill off the pathogenic organisms already present, the acidophilus and other "good" bacteria may help prevent their regrowth. For as long as antibiotics are continued, they will continue to kill off the good bacteria, but the only solution is to keep using the probiotics nutraceuticals to put them back in during the whole course of treatment, and then for at least another several weeks after any antibiotic treatment is completed. These good bacteria may also help reduce the inflammation in the intestines that can be part of what's causing diarrhea. For all of these reasons, supplementation with acidophilus nutraceuticals often helps to eliminate digestive gas and diarrhea. It’s best to take acidophilus products two or three times daily, preferably 20-30 minutes before eating, mixed with room temperature water (or if in liquid form, after allowing it to reach room temperature).

Bifidus Balance: Contains four strains of bifidobacteria (combined with fructo-oligosaccharides (FOS), that aid in their replication) which inhibit the growth of common disease-causing bacteria, including coliforms, *Salmonella*, and *Candida*, as well as aiding in digestion and the production of B-vitamins. It should be refrigerated.

Candimycin: A blend of whole plant oil extracts of oregano, thyme, and peppermint along with goldenseal in an enterically-coated softgel to assure absorption, for combating excessive yeast growth (candidiasis). Test tube studies show that oregano oil can kill candida. 3d Do not use if there is obstruction of bile ducts, gallbladder inflammation, or severe liver damage.

JarroDophilus: A blend of stabilized enterically coated beneficial intestinal organisms (four billion potency) combined with fructo-oligosaccharides (FOS), that aid in their replication.

Saccharomyces Boulardii, a type of good bacteria, will sometimes help eliminate the symptom of diarrhea, although it will not address the causes. It seems to work particularly well for *C. difficile*-associated diarrhea. It is usually recommended that the dose be gradually increased, as necessary to control diarrhea, beginning with 1 capsule, two to three times daily, and increasing gradually, if necessary, up to 2 capsules, two to three times daily.

Florastor: (Saccharomyces Boulardii)

Oregano Extract: Essential oil of oregano along with oil of ginger and fennel. Test tube studies show that oregano oil can kill candida.

NYBC and Other Nutraceuticals for Intestinal Support:

JarroDophilus	1-2 after each meal
Candimycin x 90	3/d (1B, 1L, 1D)
Bifidus Balance 280mg x 100	1-3/d, 30 minutes before eating
Florastor 250mg x 40 (Saccharomyces Boulardii)	4/d (2 before food morning and evening)
Oregano Extract x 90	3/d (1B, 1L, 1D)

Other Nutraceuticals for Improving Intestinal Health and Absorption:

Quiet Digestion. There are anecdotal reports that this Chinese herbal blend can sometimes be helpful for cramps, gas, bloating and diarrhea. It is traditionally used to reduce gastric distress including pain, cramping, nausea, vomiting, diarrhea, regurgitation, and poor appetite. The suggested dosage is 2 tablets taken after meals, 3 times per day. The formula may also be taken between meals, as needed.

Seacure. A concentrate of pre-digested white fish proteins that is very easy to assimilate. Helpful for weight gain, increased energy, and improved digestion; especially helpful for people suffering from malabsorption; may also help those with liver toxicities as well as to offset drug side effects. For maintenance: 3 capsules twice daily; for weight gain: 12-20d in divided doses.

Quiet Digestion	6/d after meals (2B, 2L, 2D); between meals as needed
Seacure 500 mg x 180	Maintenance: 3 capsules twice daily Weight gain: 12-20d in divided doses.

Protease Inhibitors

For protease inhibitor-caused diarrhea, calcium taken in doses of 500 mg, twice per day, will often eliminate or at least lessen the diarrhea. First shown in a small study to work well with nelfinavir-associated diarrhea, it now appears to help with diarrhea caused by any of the protease inhibitors. In the studies done to date, it is not universally successful but it definitely seems to help many people with protease inhibitor-caused diarrhea.

Calcium Citrate 520mg x 250	2/d (1B, 1D)
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For protease-inhibitor-caused diarrhea, pancreatic enzymes may help. As discussed above, research has shown that protease inhibitors block normal digestive enzymes from doing their jobs. Since those enzymes are needed for food to be properly digested, this protease inhibitor-caused enzyme inhibition can result in improperly digested food passing into

the colon where it is acted upon by bacteria and produces diarrhea, as well as smelly gas. Taking enzymes with each meal

or snack helps to counter the negative end result (diarrhea and gas) that the protease inhibitors might otherwise create when they inhibit the proper use of enzymes. The protease inhibitors will still be inhibiting a certain percentage of the enzymes present (both those naturally produced by the pancreas and those taken orally), but the increased total amount of enzymes achieved through supplementation will mean that enough enzymes are present and working to allow food to be properly digested, thus helping to prevent diarrhea and gas.

If you're going to be using enzymes, note that although enzyme products can be purchased over the counter, they can also be prescribed by a physician and will then probably be covered by your insurance or Medicaid. One of the best prescription products is Digestive Care, Inc.'s Pancrecarb (covered by Medicaid in all 50 states). This product works better than most others because it is not only high in lipase (which appears to be the key enzyme for solving gas and bloating problems) and amylase (necessary for proper digestion of carbohydrates) but is also enteric-coated (which is what gets it through the stomach acid unharmed and into the small intestine where it works). It also contains a bicarbonate buffer. The bicarbonate, which is a natural secretion of the pancreatic gland, optimizes enzyme activity, especially of lipase. With this combination of features, this product appears to deliver better enzyme activity and, thus, greater effectiveness in reducing diarrhea, gas and bloating when compared to other products. A double-blind placebo-controlled trial has shown significant diarrhea reduction (improvement in stool consistency) in HAART-takers with diarrhea who were given Pancrecarb with meals. You will have to experiment to see how many enzymes are needed with each meal. For some, one tablet with each meal or snack may be enough; for others, three or four enzyme tablets may be needed with each meal or snack in order to reduce protease inhibitor-caused diarrhea.

☐ For caffeine consumers, a trial period of avoiding caffeine-containing foods or liquids such as coffee, tea, colas, chocolate, etc., can help to ascertain if this chemical may be contributing to diarrhea. If it does appear to be problematic, avoiding caffeine as much as possible will be important.

☐ For anyone with diarrhea, and especially for those whose diets normally contain a fair amount of sugar, cutting back or eliminating all concentrated-sugar foods, as well as sugar itself, is important. Be careful about turning to sugar substitutes. Both mannitol and sorbitol (sweeteners found in many products) can cause intolerance reactions, including diarrhea. Thus, it's important to avoid any of the diet drinks and sugar-free chewing gums or candies which contain these sweeteners. And remember that too many of the liquid or powdered products promoted as ways to add calories contain too-high levels of sugars and fats, potentially worsening diarrhea. Stevia, an alternative herbal sweetener available at most whole foods supermarkets or health food stores, can be an effective substitute for sugar. It's a white powder which tastes sweet but is plant-derived (no nasty chemicals or artificial formulas), does *not* contain glucose, and will not raise blood sugar. It can be used any place that sugar would be used, but in lower amounts since it actually tastes sweeter than sugar. Just be careful of which product you choose. Some manufacturers add saccharine or other artificial sweeteners to stevia so read labels carefully and make sure you choose a product that contains nothing but stevia itself.

☐ If it appears that stress may be contributing to diarrhea, then do everything you can to lower the stress level in your life, while you also learn relaxation techniques or meditation or any other approach that can help you handle stress when it can't be avoided. [For more information, see *NYBC's Self-Care Guide*.]

☐ When all causes can't be eliminated, use whatever therapies are necessary to relieve symptoms. Allowing diarrhea to continue unchecked can rapidly deplete the body of nutrients and fluids, and create electrolyte imbalances that could be life-threatening. While you work on eliminating all possible causes, it will often be necessary to use the various agents that can help slow or stop diarrhea. By addressing all the causes, to the greatest extent possible, the hope would be that any need for these would only be short-term. Possibilities for decreasing diarrhea include:

Standard anti-diarrheal agents (Kaopectate, Pepto-Bismol), as directed by a physician.

Anti-motility agents (Imodium, Lomotil, tincture of opium, paregoric, or opiates), as directed by a physician.

Luminal-acting agents (cholestyramine, pectin, Kaolin, or fiber nutraceuticals), as directed by a physician.

☐ Increasing intake of foods that contain soluble fiber can also help since they absorb water and expand, binding together the intestinal contents. This bulks up the stool and slows the passage of food, particularly when there is a lot of fluid in the stool. Included are peeled apples or apple sauce made from them, oatmeal, oat bran, white rice, barley,

apricots, peaches, pears, plums, grapes, berries, nectarines, prunes, raisins, and bananas, as well as soluble fiber

nutraceuticals like psyllium (Metamucil) and citrus peel (Citrucel) and apple pectin powder and oat bran capsules. Fiber intake should be slowly increased to help limit the increase in intestinal gas that it can cause.

White rice, although lacking in the fiber and higher levels of nutrients found in the brown rice that would normally be recommended as part of a healthful, whole-foods diet, may be temporarily useful as a source of calories that won't irritate the intestines. Mashed potatoes (made without the skins) can also be useful for this.

Cautions: While hydrophyllic fibers are beneficial for promoting elimination, their cold and wet nature tend to have a negative effect on digestion and assimilation. To counteract this tendency, they should always be used with warming carminatives herbs such as cinnamon, ginger, or anise. Hydrophyllic fibers can also decrease the absorption of conventional medications. In cases where there is a very narrow threshold regarding the effective dosage of medications or in the case of taking medications for life-threatening conditions, consult with a qualified health professional prior to using hydrophyllic fibers.

Rice water is a particularly useful source of soluble fiber since it can also help by reducing intestinal motility (the contractions that move food through the intestines). Rice water can be made by adding water to white rice in a ratio of four to one (four parts water to one part rice). Then boil until the rice is tender. The rice water you can then strain off will contain some of the soluble fiber in rice. It can be used to create an electrolyte replenishment drink or drunk on its own as a source of both hydration and soluble fiber.

The well-known BRAT diet that is often recommended for those suffering from severe diarrhea—Bananas, Rice, Applesauce and Toast—is simply a formula for increasing soluble fiber, and avoiding other foods that might worsen diarrhea. It consists of eating small servings of banana (one soft one), boiled white rice (one-half cup), applesauce (one-half cup), and dry white toast (one slice) repeatedly throughout the day (every hour or so). To counter the boredom of eating this over and over, the flavor can be varied by cooking it with a beef or chicken bouillon cube (added to the water when you cook the rice) or by adding any seasonings or cooking herbs whose flavor you like.

For those whose condition has been severe but who seem able to tolerate the BRAT diet, it is often possible to add other foods that are not hard on the intestines. You can try a small amount (a half-cup or so) of canned peaches or pears, oatmeal, boiled or baked chicken, hard-cooked egg whites, mashed potatoes or sweet potatoes or carrots (made without the skin and without butter), plain macaroni or other pasta, saltine crackers, and rice cakes. Needless to say, this sort of diet does not contain the high level of a wide variety of nutrients that is generally advisable for HIV+ people. As soon as what is causing the diarrhea can be identified (and those causes eliminated, to the greatest extent possible, and the intestines again begin to tolerate other foods, it will be important to move back to a better overall diet. (For additional information, see *NYBC's Self-Care Guide*.)

Flax Fiber is ground flax meal and may be helpful primarily as a means to improve digestion. It can also provide some polyunsaturated fatty acids. It contains soluble and insoluble fibers as well as lignans. Other fiber products may work as well; look for one containing both water soluble and insoluble forms of fiber. Insoluble fiber is found in wheat bran, whole-wheat products, popcorn, nuts, seeds, corn, and raw fruits and vegetables; soluble fiber is found in oat bran, apples or applesauce, oatmeal, citrus fruits, beans, apricots, pears or peaches without the skin, and many other vegetables and fruits. Those currently suffering from diarrhea should emphasize soluble fiber and avoid insoluble fiber, which can be too irritating and may worsen the diarrhea.

Oat Bran is an excellent source of soluble and insoluble fiber, suitable for vegetarians. As a hot cereal, it cooks in a jiffy, is tasty and high in protein. It is also available in pill form.

Shaman Botanicals' SB Normal Stool Formula, an over-the-counter tree sap extract that many HIV+ people have reported helps reduce or eliminate med-induced runs. It appears to be particularly useful for watery diarrhea.

Flax Fiber 12 oz (Organic)	3-6g daily
Oat Bran Plus 1,000mg x 100	6-9/d (2-3B, 2-3L, 2-3D)
SB Normal Stool Formula 350mg x 10	1-2 tablets 2-4 times daily

For as long as diarrhea continues, it's crucial to consume plenty of calories (eat more and make every bite count toward high-quality nutrition) and healthful liquids (water, juices, herb teas, broth, and fruit juice smoothies) to

replace what's being lost.

UCLA's Peter Anton, M.D., states emphatically that, "Aggressively looking for infectious causes of diarrhea while the patient is not being nutritionally supplemented is essentially losing the war while planning to win the battle." Using an aggressive approach to nutrition and fluid replenishment during any episode of diarrhea is a must.

An important part of this is, of course, drinking sufficient water and other healthful fluids. This may seem entirely obvious but many people fail to counteract the fluid losses created by diarrhea with sufficient liquids. In some cases, this can occur when people overestimate how much liquid they're drinking. Instead of guessing, you can assess your total daily water intake by measuring out a good daily amount of water and the other fluids you will be drinking in containers that, when combined, equal 2 quarts or more. Then drink exclusively from these containers throughout the day. When you are ready to go to bed, you'll be able to see how much you're really drinking every day.

The rule most often given is to aim for a daily consumption of at least one cup of fluid for every fifteen pounds of body weight. The simple way to calculate this (it won't match perfectly but will be close enough) is to take your body weight in pounds, divide it in half, and then drink that many ounces of fluids daily. In addition to water, juices, non-caffeinated teas, broth, and fruit juice smoothies can contribute to your fluid intake. Just remember that drinking anything with alcohol or caffeine will not only *not* count in your fluid intake total, but will increase the need for drinking additional amounts of healthful liquids since both alcohol and caffeine are diuretics that increase fluid loss.

Continuing to eat as well as you possibly can is also crucial. When food is not being absorbed very well because of diarrhea, every bite should really count. You need both high-calorie and nutrient-rich foods. This can be a problem when diarrhea or other conditions (including the infections that may be a partial fatigue cause, and the malnutrition that may result from it) leave you feeling tired, weak, and uninterested in eating. For help with this, see the discussion in *Appetite Loss*. Following the guidelines in that section may be very helpful for improving your overall intake of food enough to counter what is being lost because of diarrhea.

In addition, it may be necessary to use "enteral nutritional" products to help replenish calories. These are the liquid drinks that are a concentrated source of calories. Sugar-loaded products could worsen candida overgrowth and might make the diarrhea worse, as could products high in long-chain fats or products that contain lactose. Instead, use products which provide carbohydrates, amino acids, and glutamine, have no lactose, and are low in, or have no fat, or use medium chain triglycerides rather than long-chain fats. (For help with this, see the discussion in *Appetite Loss*.)

Products that contain rice syrup solids (which as mentioned above may help to slow motility) as their source of carbohydrates may be the best choices for those with diarrhea. One such product is Optim Nutrition's Optimune, a powdered whey protein product. When diarrhea is severe and absorption is poor, you may need "predigested" products such as Clintec's Peptamen or, for even higher protein levels, Clintec's Peptamen VHP; Vivonex; or Alitraq.

Other than in situations where the diarrhea is so severe that the bowels need to be allowed to rest and recover while the treatments required for whatever is causing it kick in, it is important to think of such products as additions to your standard diet of three good meals and a couple of good snacks per day and not substitutions. If you use them as an instant meal instead of eating, they aren't likely to be sufficient to prevent weight loss or help you re-gain already lost weight. It may also be necessary, especially when the diarrhea can't be quickly eliminated and weight loss is occurring, to use temporary peripheral parenteral nutrition which is administered intravenously into the arm, and may provide either partial or total nutrition. However, other than in rare circumstances, it is best to think of the PPN as an addition to your regular diet, not a substitution. Used in this fashion, it can often be very helpful in turning around diarrhea-induced weight loss.

□ **Any time there is diarrhea, the body's electrolytes (charged particles that are crucial in many body processes) may become unbalanced.** Thus, especially when diarrhea is more severe, it will be very important to replenish and re-balance the electrolytes which include sodium, potassium, and chloride. This is important both for maintaining your health, and to simply help you feel better. Imbalanced electrolytes can make you feel quite awful, causing a miserable combination of weakness, listlessness, fatigue, nausea, thirst, decreased urination, dry mouth, loss of appetite, rapid heartbeat, and dizziness upon arising that such imbalances can cause. Doing whatever is necessary to return your body's balance to normal will very rapidly eliminate those symptoms. Your physician should always be watching your electrolyte situation, but you can help prevent problems from developing by drinking vegetable and fruit juices, nectars, or broths. You can dilute thicker juices or nectars with water to improve their absorption.

At times, you may need more concentrated sources of electrolyte minerals. The use of commercial electrolyte replenishment drinks can substitute for part of your water intake. Gatorade, the widely advertised sports nutrition drink, is often suggested for electrolyte replacement therapy. However, it is not a very concentrated source of the

minerals and it is also loaded with sugar which might actually exacerbate diarrhea in some people. Pedialyte, an infant

formula, is more concentrated in the needed minerals but many people don't care for its taste. The better choices among such products are probably the oral rehydration solutions made with rice syrup, including Infalyte and BestLyte. They may not only help to rebalance electrolytes but may also actually reduce diarrhea since the rice syrup solids contained in these drinks help to slow motility (the movement of the digestive contents through the digestive tract).

Another electrolyte replenishment possibility is Alacer Miracle Water, available in many health food or whole foods stores. Tasting like lemon water, it has higher amounts of the important minerals than many of the more common rehydration solutions, and contains no sugar at all. Another possibility is the use of the bland-tasting oral rehydration salts, long recommended by the World Health Organization for people in the developing world who have diarrhea that results in electrolyte imbalances. This is one of the two least expensive options since each packet, when dissolved in water, will provide a liter of electrolyte replenishment fluid at a cost of less than a dollar. These salts are available through many pharmacies or can be ordered by them.

The other inexpensive option is your own home-made version of electrolyte replenishment liquid. You can mix a teaspoon of "light" salt (which contains potassium mixed with sodium) and a quart of orange juice. Apricot, peach, and pear nectars are particularly rich in potassium so they could substitute for the orange juice, but mix them half and half with water. When creating such a mixture, it will be even better to use rice water instead of plain water to mix with the nectars since the rice water will add soluble fiber. (See the recipe for rice water above, under *Increasing intake of foods that contain soluble fiber...*) You can add a tablespoon of pasteurized honey to such mixtures, if you'd like it to taste sweeter.

The more severe the diarrhea and the resulting dehydration, the more electrolyte replenishment fluids may be needed. In cases of serious dehydration, it may be necessary to use electrolyte replenishing drinks for much of the daily fluid intake. The use of such fluids will help prevent the electrolyte imbalances that often occur with diarrhea and, thus, not only prevent the awful symptoms that such imbalances can cause, but potentially also help save your life when the electrolyte imbalances are serious. In extreme cases, you may need IV replacement of fluids and electrolytes. It's far better to pay attention to this early on so that this will not become necessary.

□ Until diarrhea can be resolved, avoiding foods that contain large amounts of insoluble fiber may be necessary.

Since this fiber increases the speed at which food travels through the intestines, consuming such foods could worsen a diarrhea problem. Foods that are high in insoluble fiber include wheat bran, whole-wheat products, popcorn, nuts, seeds, potato skins, corn, and a high intake of raw fruits and vegetables (especially, their peels).

□ If you notice that certain foods or liquids worsen diarrhea or the gas that often accompanies it, try eliminating them or at least cutting them back as much as possible.

The foods most likely to worsen diarrhea are coffee and other caffeinated beverages, alcohol, chocolate, fried and fatty foods, spicy foods, and high-sugar foods or liquids. The food items most likely to worsen intestinal gas and cramping are the gas-producing foods like beans, cabbage, broccoli, cauliflower, Brussels sprouts, garlic, onions, and carbonated drinks. Watching what happens over the next few hours when you consume any such foods can help guide you toward the things you might wish to eliminate. In addition, the use of digestive enzymes, as discussed above, can be very helpful since they can dramatically decrease the gas that could otherwise result from such foods.

Avoiding hot, spicy foods like curries or other highly seasoned foods that contain peppers, chilies, or other potent spices may help since these can sometimes exacerbate diarrhea. Acidic foods can also be a problem, particularly when you eat or drink enough of them to cause the diarrhea to be even more stinging. Thus, you may need to limit oranges, grapefruits, pineapple, and their juices.

□ Make sure the water you drink is safe. Some of the water-borne infections are major causes of diarrhea. Drinking only safe water seems obvious when traveling to less developed countries, but remember that even the water coming out of big-city taps has sometimes been found to contain organisms that may cause illness, especially in the immune-compromised. If you can, buy a water filter that is rated *NSF-3*, which means that the filter is fine enough to screen out these tiny bugs. Another possibility is buying bottled water but definitely check *Consumer Reports* and other resources for the best brands as not all brands have been found to be safe for HIV+ people. If purchasing water or buying filters is too expensive, then you can simply boil your water for 5-10 minutes. Then cover it and allow it to cool to room temperature; then place it in the refrigerator. (See *NYBC's Self-Care Guide* for additional info on this.)

□ Make sure the food you eat is safe. Food poisoning kills thousands of people in North America each year, and for HIV+ people, the risk is greater than for others. Most forms of food poisoning will cause diarrhea that is sometimes very severe. You don't want to add such problems to other diarrhea causes. Always carefully follow food safety guidelines to prevent this possibility. (See *NYBC's Self-Care Guide* for additional info on this.)