

~ Treatments for Diarrhea ~

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Diarrhea in people living with HIV infection can have many, many causes. It can be a symptom at several different stages of infection and can range from a minor annoyance to a life-threatening problem, especially when it contributes to wasting. Defined most simply, diarrhea is an increase in the frequency of and a decrease in the consistency of the stools. According to Peter Anton, M.D., a gastroenterologist and researcher with the University of California at Los Angeles, Department of Medicine, Division of Digestive Diseases, diarrhea is considered to be present if one of the following applies: (1) stool weight of greater than 200 g per day; (2) more than 2 stools per day for more than 30 days; (3) more than 3 stools per day for more than 7 days; (4) more than 3 stools per day, looser than usual, for more than 3 days; or (5) more than 3 stools per day, with a change in frequency or consistency. [The only exception to this might be the person on a whole-foods, high-fiber diet who normally has three well-formed stools daily because s/he eats three high-fiber meals daily; for this person, it would be an increase beyond this frequency or a change in consistency that would indicate diarrhea.]

Diarrhea is considered acute if there is an increase in stool frequency or liquidity for less than a month. It is considered chronic if there are more than three stools every day for more than a month. What's most important is for you to convey to the physician exactly what you're experiencing, with as many specifics as possible. This includes how often you're having a bowel movement, whether each bowel movement is small or large, the consistency of the stool (very watery, somewhat watery, somewhat formed but still very soft, or relatively well-formed), what color the stool is, whether you notice any blood in the stool, and whether there is any pattern as to when the bowel movements occur (more in the morning, more at night, whether you have to get up in the night). Writing all this down as it occurs will help your physician make a diagnosis and then be able to measure whether or not there is improvement when you are treated. According to Dr. Anton, it is estimated that 50-70 percent of people living with HIV will, at some point, have diarrhea. He also points out that the presence of diarrhea correlates with decreased survival. Thus, identifying causes and eliminating them in order to stop the diarrhea is crucial.

The exact cause(s) can be very difficult to determine but studies show that careful examination of diarrhea via stool samples combined with the other tests described below can lead to identification of disease-causing organisms in a large percentage of cases. Dr. Anton estimates that, depending on the thoroughness of the workup, there will be an identifiable infectious cause in around 50-80 percent of cases. Very aggressive use of appropriate diagnostic procedures is necessary to ascertain which of the many pathogens may be part (or all) of the cause. Paul Cimoch, M.D., strongly emphasizes the need for "*pathogen-specific therapy*" and states that repeated tissue samples may sometimes be necessary for proper diagnosis. He goes on to say, "*It has been our experience that if you look long and hard enough, you will eventually find a specific pathogen. In the interim, it is important to aggressively manage the diarrhea.*"

It is important to note, however, that *diarrhea may often have multifactorial origins*. There may not be just a single cause, and pathogens may only be part of the problem. All of the causes will need to be addressed for full resolution of the diarrhea. It's not unheard of for someone to have an opportunistic infection (which requires appropriate drug therapy), a common parasite or two (drug therapy, again), a lactose intolerance (requiring dietary changes), an inability to digest and absorb fat (more dietary changes), and a food allergy (you guessed it, more dietary changes). Until each and every one of the appropriate measures is carried out, the person will continue to suffer from diarrhea. Thus, with this condition, you must aggressively pursue every possible cause and then aggressively apply every needed therapy or change. Don't be satisfied that diagnosis is complete just because a single pathogen has been identified. There is often more than one pathogen present, along with a number of other causative factors.

Unfortunately, there have been many people living with HIV who have been immensely frustrated because some pathogen was identified and then treated, with little if any improvement. The failure was then attributed to a lack of effectiveness of the drug or the particular therapeutic approach being used when, in fact, the drug may have worked perfectly well and that pathogen may have been eliminated. However, the three or four or eight additional causes had not been concurrently addressed. For example, a client of mine was recently diagnosed with cryptosporidiosis and was then aggressively treated for that with the agents currently considered cutting-edge, but no other changes were suggested by his physician. There was only a tiny bit of improvement, much to the patient's frustration. He continued to have multiple watery bowel movements every day and to lose weight rather precipitously.

Then, luckily, a broader view was taken and it was found that, in addition to the cryptosporidiosis, he was also suffering from lactose intolerance (and he was drinking milk frequently and eating a lot of ice cream and cheese in a misguided attempt to gain weight), food allergies to soy products (and a dietitian had been giving him a soy-

based supplemental drink, also for weight gain), candida overgrowth (due to years of prophylactic antibiotics which had wiped out his "good" intestinal microorganisms), and a diet too high in fat (again because the dietitian had advised him to "add mayonnaise, butter, sour cream, and cheese to everything" in order to gain weight). [A booklet written by a dietitians' group that is currently being circulated to people living with HIV contains precisely this advice. No, I'm not kidding.]

Upon correction of all these problems through dietary changes (eliminating all dairy and soy products and reducing the fat content of the diet substantially), supplementation with acidophilus (and other "good" microflora), and elimination of the candida overgrowth (via treatment with fluconazole), his diarrhea finally disappeared completely and, with plenty of whole foods combined with *appropriate* supplemental drinks (as discussed in *Chapter Three*), he regained all his lost weight. It turns out that the drug therapy (paromomycin combined with azithromycin) had successfully suppressed the cryptosporidial part of the problem and small doses keep it at bay. Currently, this person, who at one point had almost been written off, continues his professional career, travels abroad frequently, and has a dazzling social life.

The lesson is clear. *Multifactorial causation is more often the case than not when it comes to diarrhea.* You must aggressively pursue all possible causes and all necessary treatments. Dr. Anton says that *"because the cause of the diarrhea is often multifactorial, treating one 'bug' only partially treats the diarrhea; the rest may be the result of untreatable infection, undiscovered infection, or noninfectious causes. The patient, understandably, is concerned and often immobilized by one symptom—diarrhea—and frustrated by the complexity of the contributors. We are, too. This is why investigation of diarrhea and weight loss requires compulsive, thorough evaluation and follow-up, to ensure that no treatable causes are missed."*¹² He's absolutely right. Don't let a lab result that shows a single pathogen stop your search for answers. In many, and probably *most* cases, it won't be the only problem.

There are, however, 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. The most severe diarrhea is often caused by cryptosporidiosis, an infection which is probably responsible for at least 10-20 percent of the diarrhea that occurs in those living with HIV. Another protozoal infection, isosporiasis, causes diarrhea in a much smaller percentage of patients and, luckily, can easily be treated. Because of the difficulty in diagnosing it, microsporidiosis, caused by a tiny parasite, is thought to cause many unexplained cases of diarrhea, along with bile duct inflammation and suppression or cessation of bile flow. It may account for 25-30 percent of HIV-associated diarrhea. Cytomegalovirus (CMV) colitis can also cause diarrhea, as can *Mycobacterium avium* complex (MAC). Many bacterial infections can cause diarrhea and traditional antibiotics can often help, although you must be careful when taking antibiotics to not set off a candida overgrowth problem or, more importantly, trigger proliferation of *C. difficile*, a toxin-producing bacteria that can itself cause diarrhea. Taking acidophilus along with the antibiotics and for at least a month afterwards (and preferably long-term) is helpful. Diarrhea can be caused by candida overgrowth or many different common parasites. Several enteric viruses, including astrovirus, adenovirus, and picobirnavirus, have also been shown to cause diarrhea in some HIV+'s. In addition, it is thought that HIV itself can cause an enteropathy (an intestinal disease) that causes diarrhea. Symptoms that may relate to specific pathogens and diagnostic approaches are discussed below.

In addition, as seen in the example above, diarrhea can be caused by food allergy reactions. Testing for these via the ELISA/ACT and/or RAST IGG and IGE blood tests is highly recommended. A number of cases of severe, long-term diarrhea have been found to be caused by an unsuspected food allergy. When it was properly diagnosed and all exposure to the food was eliminated, the diarrhea vanished. Because this problem is often unsuspected and unpursued by physicians, it is likely that it affects a great many people living with HIV infection. I (Lark), personally, know several people who, having suffered from severe, chronic diarrhea for many months, had been put through Diagnostic Hell (poked, prodded, blood sampled, stool sampled, biopsied, proctoscoped, colonoscoped, and so on through the entire set of medical techniques) over many months' time and then been told that nothing could be found and nothing could be done except to attempt to stem the flow with handfuls of drugs. Their physicians were too skeptical or too unaware of the possible causation by food allergies to run the proper test for that.

After months of needless suffering these people finally did get food allergy testing done (either by demanding it of their current physician or going to one better educated on the subject), applied the results, and had total cessation of the diarrhea within days. In one case, a soy allergy was found in someone who had not only been eating tofu almost daily but also using a weight gain drink that was, you guessed it, soy-based. When he eliminated these soy products the diarrhea he'd had for fifteen months vanished overnight. After seeing a goodly number of such cases I would strongly say that ascertaining whether food allergies might be a factor in otherwise unexplained diarrhea is highly recommended.

It is also very important to consider the fat content of the diet whenever chronic diarrhea is a problem. The

research done by Wayne Callaway, M.D., and others has shown that excess fat in the diet can often be the cause of otherwise undiagnosed diarrhea. Fat malabsorption is apparently already present in some in early disease stages.³ Over time, it appears that more and more people become unable to properly digest and absorb fat.⁴ In some people, the improperly digested, unabsorbed fat can pass into the colon where it is acted upon by bacteria, causing diarrhea. Diarrhea that results from such malabsorption can cause 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. In my experience, excess fat in the diet is frequently the cause of undiagnosed diarrhea, either because it is unsuspected by the physician or because the person with diarrhea is unaware of how much fat is really being consumed.

Unfortunately, in our society, high-fat diets are the norm and many people are unaware of how much fat is really in their diets. You have to think in terms of both the hidden fat contained within many foods as well as the more obvious added fats in an average diet. In other words, remember that 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 are particularly high in fat, including bacon, sausage, bologna, pastrami, and so on. A huge percentage of snack foods are very high in fat, including most chips, many crackers, many cookies, many granola bars, many candy bars, most hot dogs, 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, fries, fried chicken, fried fish, fried or deep-fried vegetables, and so on) are often lethally high in fat. 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 the diet.

Many people kid themselves on this issue. They will tell me that they're sure their diets are low in fat and that that couldn't possibly be causing the problem. Then they tell me what they actually eat in a given day and there are actually very substantial amounts of both hidden and obvious fats: cream in the morning coffee, high-fat granola for breakfast with whole milk, a chicken salad sandwich at lunch that's loaded with mayonnaise or one containing high-fat luncheon meats and accompanied by fries or chips, pizza or a pasta with a high-fat sauce for dinner accompanied by a salad with lots of dressing, seeds, olives and/or cheese, doughnuts for a snack (don't forget that they're deep-fried), croissants (they're made with loads of butter; any that you add worsens the fat content), bacon or sausage with breakfast, far too many meals eaten out where control of fat content can be terribly difficult, and so on. So don't kid yourself. For a couple of weeks, avoid such foods and try a truly low-fat diet, with the emphasis on lots of complex carbohydrates and plenty of vegetables and fruit and lean sources of protein. Desirable foods would include whole-grain pasta, 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.

This is exactly the sort of diet that Dr. Callaway recommends. Specifically, his suggestion is to keep the fat content of the diet below 25% while obtaining additional calories from complex carbohydrates (which should be 55-60% of your diet). In addition, he recommends a healthy intake of protein (15-20% of your diet). A week or two on such a diet will tell you if fat is contributing to your problem. Very often, people who have been living with diarrhea for sometimes quite lengthy periods have told me that just this dietary change completely eliminated it. Dr. Anton also 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. It is not uncommon to see 20-60 grams of fat in the stool of people with fat intolerance.

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 cause diarrhea. 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. 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 be hard on your body.

In order to improve your digestion and absorption, Dr. Callaway also suggests using pancreatic enzyme tablets. Inadequate production of the enzymes needed to properly digest fats, proteins, and carbohydrates is not uncommon with HIV infection. Supplementation with pancreatic enzymes can help. However, do note that the best results will come from doing everything necessary to improve digestion rather than focusing on enzymes alone. 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.

Another potential dietary cause of diarrhea is consumption of dairy products such as milk, cheese, cream, ice cream, etc. Many people with HIV infection develop lactose intolerance,⁵ meaning that they can no longer adequately digest the milk sugar called lactose. They apparently are no longer producing sufficient quantities of lactase, the enzyme necessary for its 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. Total elimination of all dairy products will eliminate this type of diarrhea. This includes 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, note that milk or its derivatives 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 supplements or supplemental drinks that contain lactose or whey. 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.

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), but get gas and diarrhea if they drink regular milk. For others, even very small quantities of dairy products (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, margarine that contains whey, etc.) can cause diarrhea.

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) 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. I have known people for whom this created the false belief that lactose was not a problem. Because they liked ice cream and ate it with no apparent problem, they were 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. 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 part of the problem, it is 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. 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 *Lactaid* 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 addition, don't forget that lactose is present in a number of drugs, including the commonly prescribed 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. Yes, it's another Catch-22. A drug you're being given to treat an infection that causes diarrhea may itself cause diarrhea. Sigh. 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 become lactose intolerant.⁶ 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. 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 to determine lactose intolerance is simply to eliminate *absolutely all* dairy products from your diet for 2-3 weeks, watching to see if your symptoms improve. If they do, this is probably at least part of your problem.

If you really want to test the theory, after the 2-3 weeks of abstinence, sit down to a big dairy meal (plenty of non-fat milk, cheese, yogurt, etc.) and see what happens. If your diarrhea had disappeared or improved and now recurs, you'll know this is a problem. The reason to stick to non-fat dairy products for this test meal is to make sure that any observed changes come from the introduction of lactose and not just an increase in fat. Regular milk and dairy products derived from it are fairly high in fat. You want to make sure you're testing your tolerance for lactose, not for fat. If you find that lactose intolerance is part of your problem, using dairy substitutes such as rice milk, soy milk, or coconut milk can be helpful. The latter is relatively high in fat but 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.

Avoidance of caffeine-containing foods or liquids such as coffee, tea, colas, chocolate, etc., helps some people. 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. For someone ingesting caffeine repeatedly, this could be a serious problem. Caffeine also stimulates loss of fluids which can be a serious problem in those already losing fluids with diarrhea. In high-caffeine products (including regular coffee and any of the more concentrated coffees like cappuccino or espresso), the diuretic effect will cause more fluid loss than the liquid gained from what you drank. Decaffeinated coffee isn't entirely free of problems either. All coffees, including those that have been decaffeinated, stimulate the production of gastric acids which could themselves exacerbate diarrhea (and, of course, cause that "acid stomach" feeling). If you're thinking of substituting a different hot drink for coffee, be aware that some coffee substitutes and many herbs can have a laxative effect and so should be avoided by those with diarrhea. You'll have to choose your substitute carefully. And remember to consider any herbs you are taking as a possible contributor to diarrhea. Get expert advice on any that you're taking to make sure that none of them are known to have a laxative effect.

Alcohol is also a stimulant that might contribute to the speed with which food travels through your gastrointestinal tract. In addition, it is hydroscopic and can pull liquids out of your body. It is a known creator of dehydration, in general. That's why people feel so thirsty when they're hung over. It could seriously contribute to dehydration in those suffering from diarrhea.

Also remember that sugar is hydroscopic, or water-seeking. That's 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 diarrhea. For anyone with diarrhea, it's best to eliminate all concentrated-sugar foods, as well as sugar itself. However, when you do that, don't turn 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. They're also found in most commercial toothpastes so it may be best to substitute a toothpaste that doesn't contain them. One of these is Arm & Hammer's Tartar Control Dental Care. If you don't want to switch, make sure you rinse your mouth very carefully after brushing to avoid swallowing any of the toothpaste.

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. Keep a diary to see if the diarrhea incidents seem to be related to stress or depression or anxiety episodes in your life. If there is a pattern that suggests this as a possibility, then do everything you can to lower the stress level in your life, and learn relaxation techniques and other reducers of stress or other negative emotions in order to help your body handle these things when they occur despite your best efforts at avoiding them.

Diarrhea is also a side effect of many drugs so this has to be considered as a possibility when you are trying to determine the source of the problem. The antivirals ddI, ddC, nelfinavir, indinavir, ritonavir, and acyclovir can cause diarrhea. Antibiotics such as amoxicillin, clindamycin, Cipro, and ampicillin frequently cause diarrhea.

Clarithromycin (Biaxin), used as a treatment or prophylaxis for MAC and, thus, frequently prescribed for those living with HIV, can increase intestinal motility and, thus, sometimes cause diarrhea. [Yes, this is HIV Catch-22 #417; the drug you're taking to prevent an infection that could cause severe diarrhea or to treat the infection once it develops may itself cause diarrhea; nobody said this was going to be easy ☺.] Other medications that may cause diarrhea include amphotericin B, etoposide, Nystatin, spiramycin, sulfadiazine, and vinblastine sulfate. Adding the lactose intolerance problem discussed above to the other reasons that drugs can cause diarrhea means that a fair number of the drugs in common use in people living with HIV can be part (and sometimes all) of the problem. Discuss with your physician taking a break from any and all drugs that might be problematic (either by discontinuing something that is not absolutely necessary or finding an acceptable substitute).

Last but not least and frequently overlooked, it's important to remember that all the same functional bowel problems that occur in the HIV-negative might be contributing to diarrhea and other problems in the HIV-positive. For example, irritable bowel syndrome or spastic colitis could cause diarrhea. Thus, these and other functional bowel problems, very common in the American population as a whole, must be considered as potential causes of diarrhea. Because there is a tendency to think of any diarrhea in someone living with HIV as being related to immune dysfunction and other disease processes, it may be that such functional bowel problems are contributing to diarrhea in far more HIV+s than is commonly realized.

With so many potential causes, whether the onset is sudden or more gradual, careful diagnosis is extremely important. It's important to note any recent travel, particularly to countries where the water system may not be safe, or to parts of the country where there may be infections not commonly found in your own locality. This can help a physician know what s/he should be looking for. Any changes in medications or the diet may be important. Keeping track of the amount of diarrhea, the frequency with which bowel movements occur, the timing of the episodes, and the presence or absence of certain other symptoms can be helpful. Frequent, bloody bowel movements, especially if accompanied by abdominal pain and tenderness, can indicate diseases of the colon. On the other hand, large amounts of diarrhea at one time, occurring relatively infrequently or mostly at night, may indicate small intestine infections. In any case, you will need a very thorough analysis which may include purged stool sample analyses, biopsies, cultures, X-rays, colonoscopies, and/or endoscopies. It's worth the trouble if an accurate diagnosis can point you in the right direction for appropriate therapy.

We are going to go into detail on approaches to diagnosis because we have been horrified by the stories we have heard from countless people suffering from chronic diarrhea whose physicians did *not* do what should have been done for proper diagnosis. If your diarrhea has not been diagnosed and a search for a cause is not being aggressively pursued, then at least you can use this information to help you know what to demand. This information on diagnosis has come from our personal communications with several specialists in the field, including in particular Dr. Peter Anton, along with that obtained from several overview articles published in various journals. One of the best of the latter is "HIV-Associated Diarrhea" by Edward A. Lew, M.D., Michael A. Poles, M.D., and Douglas T. Dieterich, M.D., published in *PAACNOTES*, Volume 5, #10, October, 1993, pp. 406-410. If you don't think your physician is doing what s/he should, take the article with you and ask that it be read and the guidelines for diagnosis followed. There is no excuse for letting diarrhea drag on, when a proper diagnosis might identify a treatable problem.

In considering what needs to be done for diagnosis, Dr. Anton believes that it is important to consider what is most likely, based in part on CD4 counts. CD4 counts are, of course, never perfect criteria for reaching conclusions about either diagnosis or therapy since the functionality of cells is at least as important as the number. However, since we have no way to measure functionality, the count is at least a starting point. The likelihood of certain infections is fairly closely tied to CD4 counts. For example, cryptosporidiosis and microsporidiosis are usually (although not always) seen in those with CD4 counts below 200. Cytomegalovirus colitis and *Mycobacterium avium* complex (MAC) are more common in those with counts below 50. If your CD4 counts are consistently higher than 200, all of these are less likely, although not impossible. Thus, 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-pathogenic causes (fat or lactose intolerance, food allergies, 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.). On the other hand, 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.

Stool sample analysis is a must for anyone, and a purged stool analysis may be needed for diagnosing parasites and other difficult-to-diagnose possibilities. A purged stool is a stool sample obtaining by forcing complete evacuation of the contents of the colon, usually by use of some saltwater-type solution. It is also very important to use a lab that is very experienced in assessing the samples for parasites. Very few labs are sophisticated in such parasite analysis and an unfortunately large percentage of standard stool samples are given false negatives (meaning

that the lab misses the parasite when it is, in fact, present and thus gives a negative report when it should have been positive). Many experts recommend doing a series of *at least three* separate stool analyses on three successive days in order to increase the likelihood of an accurate diagnosis.

The best recommendation is probably to do a stool analysis for ova and parasites first (specifically requesting that it look for cryptosporidia, *Giardia lamblia*, microsporidia, *Blastocystis hominis*, *Entamoeba histolytica*, *Dientamoeba fragilis*, etc.; in other words, don't count on them to look for everything they should unless your physician specifically directs them), 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, your physician should give them an extensive list so that they don't fail to look for something). Also request a toxin assay for *Clostridium difficile*. Also request a modified acid-fast bacilli smear (Kinyoun) for *Cryptosporidium* and *Isospora belli*. A monoclonal antibody reagent is now commercially available which may be superior to staining techniques for diagnosis of cryptosporidiosis. You should also have a modified chromotrope (modified trichrome) stain (taken from a stool sample) for *Microsporidia*; a biopsy can also be used for diagnosis of microsporidiosis but is, obviously, more difficult. The modified trichrome stain is thought to be preferable by some researchers who have found that analysis of stool samples appears to be more sensitive than duodenal biopsies in identifying patients with microsporidial infection.⁷ However, other researchers disagree, pointing to a study that found that even with the trichrome stain, only two cases of microsporidiosis were diagnosed via a stool sample compared to seven found via biopsy and transmission electron microscopy.⁸ Since the latter is more difficult and more expensive, this might be a case where you start with the stool analysis and then, if negative, undergo the biopsy before you eliminate microsporidiosis as the cause of diarrhea. A rectal swab may also be advisable for accurate diagnosis.

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. Some bacteria will appear in the blood when they don't show up in stool cultures. If the stool smears show more than five white blood cells per high-powered field and the diarrhea began suddenly, bacterial gastroenteritis is a good possibility. Dr. Anton also recommends a lactulose breath analyzer test for bacterial overgrowth in the gut. Normally, the colon (the large intestine) has bacteria in it but the small intestine is sterile. However, in some HIV+'s the small intestine becomes populated with bacteria which can cause diarrhea. The normal treatment is ciprofloxacin. 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) might be reasonable. In addition, if you have traveled to any tropical climes or, especially, Morocco, Peru, New Guinea, or Nepal, request that the stool sample be examined for *Cyclospora*.

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. Kits for purged stool analyses can be obtained from Urokeep (816-373-2040); ask for an ova and parasites kit (\$5.75 each). Instructions for properly obtaining the sample will be enclosed. The most important are to avoid all red meat for three days prior to the purge and all red fruit or vegetables or red fruit juice for 24 hours prior to obtaining the sample. Eat only a light evening meal the night before the morning you will do the purge. Don't ingest anything other than clear liquids after midnight that night. You will then do the purge (the means for creating this flushing out of the body is enclosed in the kit) and collect the sample immediately upon awakening. Highly regarded labs are Dowell Laboratories (Mesa, AZ), Meridian Valley Laboratory (Kent, Washington), Great Smoky Mountains Laboratory (Asheville, North Carolina), and DiagnosTechs Laboratory (Kent, Washington). The sample can be sent via overnight delivery.

If a good laboratory has found nothing with three successive samples, then physical observation and biopsy will be necessary. Some specialists in this field recommend doing a D-xylose test first as a way of deciding whether it is more likely that there is small intestine disease or large intestine disease.⁹ An abnormal D-xylose test indicates malabsorption and makes it more likely that the problem is in the small intestine. If such an abnormal reading is found when the other symptoms also make the upper intestines the 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 suggest that the large intestine is the likely problem area, 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 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, the CMV is probably not causing the diarrhea (even if present). If symptoms don't provide clearcut indications as to which part of the intestines may be the likely problem area, then

both procedures should be done. In addition, if the one that originally seemed most likely doesn't reveal anything, then the other 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* 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 above also 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.¹⁰ The greatest necessity for diagnosis is a highly skilled pathologist who can knowledgeably read the samples. In cases where a local lab does not have a pathologist who is very experienced in analyzing tissue from HIV+'s, the best course is for the patient to request that the slides be sent to a facility that has such expertise.

Once you have been properly diagnosed, aggressively treat any infection found. Just don't forget that most diarrhea is of multifactorial origin. Address all the possible contributing factors, not just a single pathogen. And don't address them sequentially. If four things are involved and you only remove one at a time, the diarrhea may not improve enough for you to notice. Only by addressing all issues at once, to the greatest extent possible, can you give yourself the best chance of success. Then, if it is unclear what contributed to your success (and, thus, was a problem) and what did not, you can add back one thing at a time and observe the result. If the diarrhea is now gone, you could try increasing the fat content of the diet back up a little to see if you can tolerate it. Or you could add back a food you had been suspicious might be an allergenic cause. Or you could see if you could tolerate a dairy product or a cup or two of coffee daily. Whatever you wish to try, just make sure that you only re-introduce one possible factor at a time so that if the diarrhea begins again, you'll know what caused the problem. It would be best to wait several days after re-introduction of a given item before re-introducing something else. If you add several things with too short a period in between, you won't be able to be sure what's causing the diarrhea, if it recurs. The most common pathogenic causes of diarrhea are discussed briefly here, but refer to the other appropriate sections of this chapter for treatment information.

So-called common parasites, including *Entamoeba histolytica* and *Giardia lamblia*, are a very frequent cause of diarrhea, and one that is often unrecognized because of the difficulty in diagnosing their presence. Parasitic infection does not usually cause severe diarrhea, and it often waxes and wanes. In addition to diarrhea, parasites can cause excessive gas, nausea (especially upon awakening), abdominal cramps, and fatigue, often combined with feeling generally depressed and ill. These symptoms should be an indicator for aggressively pursuing this possibility. It is very important to rid the intestines of parasites as quickly as possible because they have clearly been shown to cause malabsorption in HIV+'s.¹¹ This can quickly worsen your nutrient status and make it difficult to restore nutrient levels. It is also very important to avoid re-exposure, making the need for scrupulously safe sex and testing of your partner compelling. Candida overgrowth, often created by use of antibiotics that kill off the good bacteria that would normally keep candida in check, can cause intestinal damage and inflammation and resulting diarrhea. Other signs of candida overgrowth include digestive gas and bloating, itching in the anal area, and thrush in the oral cavity. Women may also have vaginal yeast infections. It is our belief that candida and parasites are present in many HIV+'s in whom the problem remains unrecognized. Because they can present such a danger, especially if undiagnosed over a long period of time, we would recommend that all HIV+'s consider the possibilities for infection or overgrowth and obtain comprehensive analysis, as described above, to look for both problems. Many physicians are skeptical of candida as a cause of diarrhea but many people have told us that when their candida overgrowth problems were resolved, their diarrhea went away. The widespread use of antibiotics has created candida overgrowth in a large percentage of HIV+'s. It makes sense that the inflammation, irritation, and intestinal damage that can result from this might eventually contribute to diarrhea. Long-term daily usage of non-toxic substances like oregano extract, grapefruit seed extract, garlic, and acidophilus may also be advisable for general preventive reasons.

The use of the latter may be particularly important. Lack of microorganisms in the intestines can be a causative factor in diarrhea in and of itself (not just as related to candida overgrowth). Thus, supplementation with acidophilus is quite important, particularly for those in later disease stages. Naturally occurring intestinal microorganisms aid digestion and produce vitamins for the body. They are often deficient in people living with HIV,

particularly in those who have had repeated rounds of antibiotics or are using prophylactics. When the bacteria 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. Consuming fermented dairy products (such as yogurt, kefir, buttermilk, or sweet acidophilus milk) or taking supplements containing acidophilus and other microorganisms can help to prevent the digestive malfunction that can be caused by deficiencies of these good bacteria, and the diarrhea that could result from it. In particular, repopulating the intestines with good bacteria may improve the digestion of dairy products.

Keeping good bacteria in the intestines may also help in other ways. We have long known that the good bacteria both directly attack yeast and produce chemicals such as lactic acid which suppress the growth of yeast. Animal research suggests that they may also help to prevent infections like MAC or cryptosporidiosis or CMV from taking hold in the intestines, both by competing for space with the pathogens in a way that keeps the pathogens from colonizing the intestines and also by producing natural antibiotics and antiparasitics.¹² These friendly bacteria produce proteins called bacteriosins which block the growth of other bacteria. In animal experiments, cryptosporidial infections have been prevented by giving them "friendly bacteria" like acidophilus. It appears that the good microorganisms may help prevent the pathogens from colonizing the intestines. As discussed above, it is thought that the good organisms may work both by occupying space in the intestines (thus, blocking *Cryptosporidia* from growing there) and also by producing substances which prevent the spread of cryptosporidial organisms. In addition, it is thought that the friendly bacteria activate the local immune system in the intestine.

It, thus, appears that a good daily dose of acidophilus and other microorganisms may be very useful in preventing cryptosporidiosis and other intestinal infections. It may also be that, even where an infection already exists, consuming products that contain acidophilus and the other good bacteria might help repopulate the intestines such that drug therapies would ultimately be more effective. In other words, as the drug therapies kill off the pathogenic organisms already present, the acidophilus and other "good" bacteria would prevent their regrowth. They may also help reduce the inflammation in the intestines that can be part of what's causing diarrhea. Researchers in Italy have shown significant increases in the number of B cells and a decrease in intestinal inflammation of 50% in elderly people taking 8 capsules of mixed-bacteria supplements per day.¹³ For all of these reasons, supplementation with acidophilus supplements often helps to eliminate digestive gas and diarrhea. Other than candida, fungal infections are rarely the cause of diarrhea, but histoplasmosis can cause it (often combined with fever and abdominal pain) in a small percentage of cases. If you have traveled to or live in an area where this infection is common, this should be considered a possible cause. It can be diagnosed with a histopathologic examination of Giemsa-stained material.¹⁴

As already mentioned, another problem that antibiotic use can create is *Clostridium difficile* infection. *C. difficile* is a bacteria that has been seen to cause problems when antibiotic therapy has wiped out the normal "good" bacteria in the intestines. Just as with the candida overgrowth problems, this allows the growth of these unwanted organisms. Both the use of the antibiotic clindamycin and prolonged hospitalization have been particularly associated with development of *C. difficile*-associated diarrhea. However, virtually every antibiotic has been known to cause this. *C. difficile* should always be suspected when diarrhea develops during antibiotic therapy. However, in HIV+'s it may develop even when there has been no recent exposure to antibiotics and, thus, should not be excluded from the list of diagnostic possibilities in any case. Note that there is sometimes a period of several weeks or months after the antibiotic use before the *C. difficile*-induced diarrhea begins. University of California at Irvine researchers have reported that, even in a hospital with a low incidence of *C. difficile*-associated diarrhea (CDAD), in approximately 25 percent of HIV+'s with chronic diarrhea, *C. difficile* was the cause.¹⁵ In fact, it was the most common identifiable cause of diarrhea in their HIV+ 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/Septa) prior to their diagnosis with CDAD, and most (11 out of 14) had received prolonged fluconazole therapy. They suggest that "*agents such as atovaqone or pentamidine for PCP prophylaxis might decrease the chances of HIV+ patients developing CDAD.*"¹⁶ They also urge that "*Among the attributes of agents used for prophylaxis and treatment of HIV-associated infections, their propensity to predispose to CDAD should be considered.*" *C. difficile* can cause a bloody mucous diarrhea, and sometimes causes damage to the mucous membranes in the small intestine and colon that results in shedding of intestinal tissue, along with mucus mixed with blood (a condition called pseudomembranous colitis).

MAC (*Mycobacterium avium* complex) is the most common HIV-related systemic bacterial infection. It can cause body-wide infection but the most common lasting symptom is a chronic, wasting diarrhea. It frequently also causes fever, night sweats, and anemia, along with severe malabsorption. Diagnosis requires biopsy of either the small intestine or colon. However, Dr. Anton feels that a single positive MAC isolation from the intestinal tract is not sufficient to diagnose MAC as the problem. He says that a combination of diarrhea with MAC found in the stool and evidence of tissue inflammation or acid-fast bacilli seen in the biopsies is required for a clear-cut diagnosis.

Another bacteria that may sometimes cause problems is *Escherichia coli*. Although *E. coli* is a normal resident of the intestinal tract and does not usually cause problems, an unusual enteropathogenic strain (EPEC-type) has been identified as the cause of chronic diarrhea in at least one person living with HIV.¹⁷ EPEC types of *E. coli* are known to cause intestinal disease, although mostly in hospitalized infants. In this case study, after ten months of diarrhea and resulting weight loss, the person responded promptly to a ten-day course of ciprofloxacin. This is one of the odd possibilities to consider when none of the other more common causes are found. Interestingly, BWPT-302, an oral, cow's milk-derived high-antibody whey concentrate made by Biomune Systems of Salt Lake City, Utah, is now being looked at as a possible treatment for *E. coli*-induced diarrhea. Although not currently being studied for HIV+, it has shown good results in children with the problem and might be a possibility. This product is, in essence, the same as the BWPT-301 now being studied as a treatment for cryptosporidiosis.

Fevers above 101 degrees Fahrenheit may indicate bacterial causes of diarrhea such as *Salmonella* sp., *Shigella flexnerii*, *Campylobacter jejuni*, *Escherichia coli*, *Staphylococcus aureus*, and a number of others. Never forget that sudden-onset diarrhea could be the result of plain old-fashioned food poisoning caused by such organisms. All of these have the potential to be fatal in someone with HIV infection if not immediately and appropriately treated. In addition to severe diarrhea, such infections can cause vomiting and can be quite difficult to treat. Although symptoms that are most commonly seen with each of the possible infections are listed below, it is very important to remember that in people living with HIV, there can be atypical symptoms, or lack of symptoms. Thus, don't eliminate these as a possibility because your symptom pattern doesn't perfectly fit these. The most common types of food poisoning come from one of four types of bacteria, and the pattern of symptoms can help to indicate which one is likely. *Campylobacter* can cause abdominal pain, malaise, nausea, fever, headaches, and mild to severe diarrhea, sometimes with blood or mucus. The symptoms can begin 2-5 days after exposure. Researchers have found that "uncommon" species of *Campylobacter* may not be so uncommon in HIV+'s. In one study, of 43 people with diarrhea, 6 had uncommon species such as *C. concisus*, *C. mucosalis*, *C. sputorum*, and an erythromycin-resistant *C. jejuni* subspecies *doylei*.¹⁸ *Listeria* can cause flu-like symptoms initially, followed by bacteremia, encephalitis, or meningitis. Symptoms can appear 2-30 days after exposure. *Salmonella* can cause flu-like symptoms with cramps, fever, and watery diarrhea, and can cause bacteremia and disseminated infection (sepsis). Symptoms can appear 6-48 hours after exposure. There are sometimes unusual strains of this bacteria such as *Salmonella arizonae*. Note that a high incidence of *Salmonella* sepsis has been found to be associated with CMV gastrointestinal disease.¹⁹ The latter can cause inflammation and damage that apparently leaves an opening for the *Salmonella* infection. *Shigella* will cause dysentery, fever, and abdominal pain, and should be especially considered if there is a previous history of exposure. For the first 24 hours, *Shigella* may only cause watery diarrhea, without blood or mucus. It has been estimated that PWA's are at least 20 times more susceptible to *Salmonella* and *Campylobacter* and 200-300 times more likely to develop *Listeria* infections than the population at large so great care should be taken to avoid all these infections. Another bacterial infection that is not uncommon in HIV+'s is *Yersinia* which can cause inflammation of the stomach and intestines (inflammatory gastroenteritis) which can result in appetite loss, nausea, abdominal pain, and weakness, in addition to diarrhea. It can also cause inflammation of the lymph nodes.

These infections often come as a result of eating unpasteurized milk or cheeses or undercooked poultry, eggs, meat, or fish. They can also be acquired from contaminated water or by oral-anal contact during sex. Most of these are usually diagnosed by stool cultures which can take 3-4 days. However, blood cultures may be required. *Listeria* definitely requires a blood culture. Most of these bacterial infections are not generally thought of as leading to chronic diarrhea. However, in someone who is HIV+, *Salmonella* can cause recurrent fever and diarrhea, even after initial treatment with antibiotics is given. *Shigella* and *Campylobacter* may also, on occasion, recur. Never, ever ignore sudden-onset diarrhea. *Call your physician and get diagnosed!*

There are many protozoal infections that can cause diarrhea, the most common being cryptosporidiosis, caused by *Cryptosporidium parvum*. Cryptosporidiosis is probably responsible for at least 10-20 percent of diarrhea in those living with HIV. There are two forms of cryptosporidiosis and they have differing symptoms. The more severe form is jejunoileitis which causes severe malabsorption, often accompanied by large fluid losses. The water loss has been described as a pump that can't be turned off. There is often a large volume of diarrhea and it frequently occurs at night. The second form is ileocolitis with which there is usually fat malabsorption but a remaining ability to absorb amino acids and carbohydrates. It is usually less severe. Neither generally causes fever.

Microsporidiosis may be one of the more frequently missed causes of diarrhea because of the difficulties in diagnosis. It could formerly only be diagnosed through biopsies of the small intestine which are examined under an electron microscope. However, a modified chromotrope or modified trichrome stain (taken from a stool sample) for microsporidiosis is now available. Two species of *Microsporidia*, *Enterocytozoon bieneusi* and *Septata intestinalis*, have been found to be the cause of a substantial number of cases of chronic diarrhea for which no other cause could be found. The *Microsporidia* invade the small intestine and have been estimated to cause 30-50

percent of cases of persistent diarrhea with no other known cause. *S. intestinalis* microsporidial infection is often disseminated to the kidneys, whereas *E. bienewisi* generally infects only the small intestine. However, *Microsporidia* can be found throughout the body. It is thought that *Microsporidia* are a frequent cause of otherwise unexplained bile duct inflammation and suppression or cessation of bile flow.

Isosporiasis is a relatively rare infection caused by the protozoan *Isospora belli* which can also cause severe diarrhea. It is clinically indistinguishable from cryptosporidiosis, but can be identified by the same techniques used to identify cryptosporidiosis, described above. Cyclosporiasis is caused by an acid-fast coccidian protozoan that is related to *Cryptosporidium parvum*, the cause of cryptosporidiosis. It can cause not only severe diarrhea, but also nausea, stomach cramps, and fatigue, and is generally clinically indistinguishable from cryptosporidiosis. It apparently accounts for around a fourth of traveler's diarrhea cases (even in the HIV-negative), and is most commonly seen in those who have traveled to tropical areas of the world. Thus, any recent travel to tropical climates or, especially, Morocco, Peru, New Guinea, or Nepal (in all of which it has been reported), should raise suspicion that this might be a possibility. However, it has also been identified as the cause of illness in people in North America who have eaten contaminated strawberries and other fruits so lack of travel doesn't exclude it as a possibility. Cyclosporiasis can cause severe intestinal malabsorption that can result in very sudden weight loss, with decreases of 15-20 pounds sometimes occurring in only a few weeks. This type of weight loss is another warning sign that this might be the cause of diarrhea. *Pneumocystis carinii* is another protozoan that, in rare cases, has been seen to infect the colon and cause diarrhea.

A number of viruses can cause diarrhea, including HIV itself. Although most experts believe that HIV is very seldom the sole cause of this problem, it may more often be a contributing factor. This HIV-associated mucosal disease is usually subtle and non-specific, and most commonly occurs secondary to opportunistic infections. However, there are rare cases in which HIV colitis appears to be the sole cause of diarrhea. Cytomegalovirus (CMV) is a member of the herpes virus family which can cause many different problems. CMV infection can cause severe inflammation of the blood vessels in the esophagus, stomach, and colon. If untreated, this can result in perforation of the affected area. This gastrointestinal CMV can cause cramp-like abdominal pain (sometimes quite severe) and diarrhea. It is often accompanied by fever. Because it does not usually cause small intestine dysfunction, CMV doesn't usually cause malabsorption, but it can cause large duodenal or esophageal ulcers, enteritis, and ileal perforation in the small intestine. A biopsy of the rectum or colon is required for diagnosis of CMV colitis. Stool cultures will not detect CMV.

CMV colitis may be accompanied by CMV gastritis and esophagitis which can cause symptoms similar to those caused by peptic ulcers or acid indigestion (acid reflux, or the movement of the stomach contents back up into the esophagus). It can cause pain in the chest or abdomen and difficulty in swallowing. The presence of these symptoms is an indicator for the possibility of CMV as a cause of diarrhea. Again, a biopsy of these areas is required for an absolute diagnosis. Herpes simplex virus infection of the rectum can also cause diarrhea, along with very painful perianal ulcers. A biopsy is required for diagnosis. Again, if any of the above infections are diagnosed, refer to the appropriate sections earlier in this chapter for information on possible treatments.

In addition to all of these at least somewhat treatable viruses, a number of enteric viruses, including astrovirus, adenovirus, and picobirnavirus, have also been shown to cause diarrhea in some HIV+'s. Unfortunately, there are no known treatments for these. Adenovirus can be diagnosed with a colonic biopsy. One study found that diarrhea was present in 41 percent of those in whose stool samples adenovirus was found.²⁰ A review of the literature found that 45 percent of those infected with adenovirus die within two months of virus detection. Whether the presence of the adenovirus is in any way causative of death is not clear. The alternative explanation is that it surfaces to detectable levels predominantly in those whose immune suppression is so severe that death is imminent.

It is also very important to remember that diarrhea may be caused by non-HIV related 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 diarrhea, as well as sometimes crampy abdominal pain, gas, bloating (to the extent that there may be visible abdominal distention), 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.

The treatment for both of these is aimed at treating the symptoms since the underlying causes are not definitely known. Dietary changes aimed at increasing the intake of both soluble and insoluble fiber can help a lot with IBS, often eliminating the symptoms entirely. High-fiber diets keep the colon slightly distended which helps to prevent spasms. Soluble fiber binds water and helps prevent both excessive dehydration and hardness of the stool, as well as excessive liquidity. [See further discussion of fiber below.] Reducing stress or learning to handle it better may also help with IBS. Antispasmodic drugs and tranquilizers are sometimes prescribed for acute attacks of IBS. Surgery is not used for IBS. It appears that some people with IBS may be deficient in magnesium, a factor which may contribute to the abdominal cramping. For them, taking magnesium in doses of 700-1000 mg per day may be useful. Since too much magnesium could actually contribute to diarrhea, anyone wishing to try this should start with a low dose and work up slowly, aiming for the dose that will help eliminate the cramping without further loosening the stools.

For IBD, a combination of anti-diarrheal, antispasmodic, and anti-inflammatory drugs may be used. During any flareup of symptoms, avoiding large doses of insoluble fiber as well as very rough foods such as raw carrots, nuts, corn on the cob, and so on may help with IBD. Surgery may be used since it can cure ulcerative colitis and can correct some complications of Crohn's disease, as well as providing symptomatic relief. Ensuring a plentiful supply of the nutrients that help the intestines to heal themselves may also help with both IBS and IBD. [See *Treatments for Intestinal Damage*] 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. [Remember, physicians: s/he's not just a person with HIV; s/he's a person. Again, s/he's not just a person with HIV; s/he's a person. Now, say it with me: S/he's not just a person with HIV . . .]

One last contributor to diarrhea that is usually never considered is not thoroughly rinsing your dishes. Yes, indeed, dish soap or dishwasher detergent can be strong laxatives if you end up ingesting them because the dishes were not rinsed well enough. Always make sure that all dishes are rinsed until absolutely no soap remains. Don't rinse your dishes by dipping them in a sink of water. The latter is bound to grow ever soapier as the rinsing continues and could leave considerable residue on the dishes. Use flowing water instead. And, of course, make sure your dishwasher is rinsing properly. You can test this easily by removing a dish after the rinse cycle and feeling it and looking at it to make sure no soap remains. It would be very unlikely that soap ingestion is the sole cause of diarrhea, but it could certainly contribute.

When it is not possible to completely eliminate chronic diarrhea, there are several drugs that may help with the symptoms, especially in the short term. One that had been tried in the past was the hormonal agent sandostatin (Octreotide) which works similarly to the natural hormone somatostatin. A similar somatostatin analogue is Vapreotide. These drugs slow transit time, decrease secretion of gastrin, and inhibit all the gastrointestinal hormones. In some cases, sandostatin has resulted in a virtually complete cessation of diarrhea, even in some people who had been suffering from it for many months and for whom nothing else seemed to work. However, it definitely doesn't work for everyone. Recent studies have shown that, although there may be some benefit in the short-term, there is no long-term benefit. It is most effective for those who are suffering with an acute, severe diarrhea episode. Intravenous use of sandostatin is inadvisable since it can cause bradycardia (slow heartbeat). Be aware that the subcutaneous injections are painful, causing a stinging or burning feeling, and that the drug is quite expensive. Thus, this should be probably be considered as a last resort when nothing else works. Sandostatin can, of course, be used in conjunction with the other agents discussed here.

Another approach that has been suggested is the use of cholestyramine (Questran/Cholybar) or colestipol (Colestid), resins that bind bile acids in the intestine, thereby preventing their conversion into laxatives by bacteria in the colon. In the short-term, this may be useful. However, be aware that there's no good research on the long-term use of these agents in people living with HIV. There might be adverse effects because these drugs are designed to lower cholesterol; people with HIV usually already have cholesterol that's way too low. Second, bile acids are needed for the proper digestion of fats. It is possible that these drugs could worsen fat digestion which is already inadequate in many people.

Another possibility, especially where serious inflammation may be contributing to the diarrhea, is the use of 5 ASA (5-aminosalicylic acid) compounds, either oral versions like sulfasalazine (Azulfidine) or mesalamine (Asacol or PENTASA), or topical versions such as mesalamine (ROWASA), available in either suppositories or

in a suspension to be used via a retention enema. These are anti-inflammatory agents which may help to reduce diarrhea by reducing the inflammation in the colon. Whether taken orally or via the suppositories or retention enemas, they are believed to work topically in the intestines. The usual dose of sulfasalazine is 2-4 grams per day, taken in divided doses. Four grams is thought to deliver approximately 1.6 grams of free mesalamine to the colon. The usual dose of Asacol is 2400 mg per day (two 400 mg tablets, three times per day). This dose can be increased up to 4800 mg per day (four 400 mg tablets, three times per day), where necessary. The usual dose of PENTASA is 2000 mg per day (two 250 mg tablets, four times per day). This dose can be increased to 4000 mg per day (1 g, four times per day), where necessary.

Each ROWASA enema delivers up to 4 grams of mesalamine to the left side of the colon. Each ROWASA suppository delivers 500 mg of mesalamine to the rectum. Thus, the ROWASA enema may deliver the most concentrated amount of the active agent, but will only reach the lower colon. The oral drugs deliver a lower concentration of mesalamine but should be more effective in reaching the entire colon. Of the oral agents, both Asacol and PENTASA deliver considerably larger amounts of 5-ASA to the colon than sulfasalazine, while having a much lower potential for side effects. For those with serious inflammatory problems, the combination of an oral form with a suppository or enema is often the most effective. The ROWASA enema is particularly useful for anyone who experiences *urgency*, the feeling that you absolutely must go to the bathroom *now*. It delivers the mesalamine to the area where it's needed most in order to reduce urgency. In addition to these drugs, the use of natural anti-inflammatories such as quercetin and other bioflavonoids, essential fatty acids as found in fish oil or flaxseed oil, and ginger may be helpful. Anything that helps to reduce inflammation in the colon may help to reduce the diarrhea.

Narcotics such as opium, morphine, or codeine can help slow diarrhea but can cause grogginess, fatigue, and the other usual side effects of opiate drugs. A time-released oral form of morphine, Oramorph SR (MS Contin), that is most commonly used for pain relief is also often very effective for diarrhea relief. The usual dosage is 15-30 mg, two to three times per day. It often causes grogginess when first used but within two to four days of use, the grogginess side effect will usually disappear while the diarrhea control will remain. Lomotil (diphenoxylate) and Imodium AD (loperamide) are also drugs that can slow the movement of food through the intestine. The use of such anti-motility agents can be very helpful for short periods of time, especially when you'll be at work, or traveling in cars or planes or public transportation, or in any other situation where there is no immediate access to a bathroom. However, if you can possibly avoid it, it is not recommended that any of these drugs be used long-term. This slowing of food passage can lead to an unhealthy buildup of harmful bacteria and toxins which, because of the slow transit time, may be reabsorbed in the colon.

Dr. Cimoch suggests beginning with set schedules for use of Imodium or Lomotil (rather than having the patient "wait and see" if s/he needs it) and then, if control of the diarrhea is not achieved within a few days, switching to the stronger drugs like paregoric, tincture of opium, or oral opiates. He believes that too many physicians hesitate to use these when they are, at least for a time, truly necessary and the result is needless suffering, along with all the physical consequences of continuing diarrhea. He states that it may be necessary to use maximum doses of such drugs in order to initially control the diarrhea, followed by lower doses for maintenance.²¹ So use these if you must, but remember the warnings about bacterial buildup and pursue full diagnosis and appropriate treatments as quickly as possible so that, it is to be hoped, you won't need them for very long.

Soluble fiber supplements and foods containing soluble fiber such as oat bran, oatmeal, rice, barley, apples, and many other fruits (see more complete list below) can help to absorb excess water in the intestines, reduce the water content of the stool, and build up the bulk in the stool. One or two tablespoons of one of the commonly available soluble fiber supplements such as Metamucil (which contains psyllium seed), taken in a glass of water 2-3 times per day, may help with some mild cases of diarrhea. It is most useful to take such soluble fiber supplements with meals. If they are taken away from meals, the result may be the usual abnormal stool followed later by a mass of gelatinous fiber. It is better to take them toward the end of the meal rather than just before or at the beginning. Doing the latter can make the stomach feel too full too soon, cutting down on the amount of food that's eaten. It is also better to slowly increase the dosage of fiber. Starting out with several tablespoons per day will often increase gas. Beginning with small amounts and working your way up to the amount that helps reduce the diarrhea is the best approach. Don't confuse soluble fiber supplements with those containing insoluble fiber such as wheat bran. The latter can be irritating to the intestines and might exacerbate diarrhea. [See further discussion below.] It has also been found that high doses of beta-carotene (150,000 IU per day) may help in some mild cases of diarrhea. [No, we don't know why; perhaps because the vitamin A derived from it helps to heal the lining of the intestine?]

In addition to soluble fiber and beta-carotene, there are two non-drug therapeutics that may be useful for diarrhea. *Saccharomyces boulardii* is a non-pathogenic live yeast that is widely used in Europe as a treatment for diarrhea. It is not clear how it works since it does not appear to destroy infectious organisms that could be

causing the diarrhea. It has been proposed that it might be working by either suppressing inflammation in the intestines or by increasing immune responses in the blood. A great deal of research has been done on the use of *Saccharomyces boulardii* in the treatment of diarrhea, but very little of it in people living with HIV. Two uncontrolled trials in HIV+ people have shown dramatic drops in diarrhea (from 4-8 liters of watery stools per day down to less than one liter per day) after only two days of *S. boulardii* use, and complete resolution of the diarrhea in one to two weeks.²² In a placebo-controlled trial in 36 HIV+ people with diarrhea which had not responded to any other treatments those receiving the yeast had improvements in volume, firmness, and frequency of stools.²³ In 10 out of the 18 people treated with it, there was complete resolution of the diarrhea, compared to diarrhea elimination in only one person in the placebo group, a finding that was highly statistically significant. Only twice in nearly 50 years of use has a systemic infection resulting from its use occurred, and both infections were treatable with amphotericin B.²⁴ Three controlled studies of antibiotic-induced diarrhea (not in people living with HIV) have all confirmed its efficacy in reducing diarrhea.

Regardless of what may be causing the diarrhea this may be an important option to help stop the symptom itself. It is still very important, obviously, to seek an accurate diagnosis, not relying on this as sole treatment. However, if no treatable pathogen or other cause can be found, this is a very important possible treatment option. This may be a particularly desirable and safe option for children. *Saccharomyces boulardii* is generally taken in doses of 3 capsules (300 mg each), three times per day, taken with unchilled water, 20-60 minutes after meals. It is available in North America from Jarrow (800-726-0886); they also have a good fact sheet on it. Some buyers clubs, including DAIIR, Healing Alternatives Foundation (which carries the Jarrow brand), and the PWA Health Group (which prefers the Biocodex brand), sell it. The Biocodex brand may be more potent, ostensibly carrying a billion live yeasts per 250 mg cap vs. Jarrow's 500 million in a 310 mg capsule. Whichever form is purchased should be kept refrigerated.

Another possibility is bovine colostrum, already discussed above as a possible treatment for cryptosporidial diarrhea. Scientists have proposed a number of different ways in which colostrum may provide defense against infections, including cryptosporidiosis. It is thought that the immunoglobulin molecules in colostrum tag pathogens by sticking to their outer surfaces, thus targeting them for the immune surveillance cells in the intestines. It is also theorized that when the immunoglobulins stick to the outside of a pathogen, it may help prevent adherence to the gut wall, thus helping ensure that the pathogens are washed out of the intestines before they can do damage. Colostrum also contains specialized proteins that may help to stimulate repair of the intestinal lining. Another substance contained in colostrum is lactoferrin, an iron-binding protein that sequesters iron from pathogens, thus slowing their growth. In addition, colostrum contains glycoconjugate (sugar-containing) molecules that are similar to the structural sugar-containing molecules in the lining of the gut which are a major adherence site for many disease-causing organisms. It is thought that the presence of colostrum's free-floating sugar molecules may confuse pathogens which then adhere to the colostrum molecules instead of the gut wall. In all these ways, colostrum may provide benefit for people with diarrhea.

The results with its use for diarrhea in the AIDS community appear mixed. As discussed above, some studies have shown good results using colostrum for the treatment for cryptosporidial diarrhea, although others have not. Anecdotal reports from the community seem to show that it works in some cases and not in others. Part of the problem may be that many people, and some studies, have used inadequate doses. In studies done in Germany that showed good results with cryptosporidiosis, the dosage used was 10-20 grams (10,000-20,000 mg) per day. Some forms may also work better than others. The studies that seem to have gotten the best results were using liquid forms rather than the dried encapsulated forms commonly sold. There may also be better results when the colostrum is delivered directly to the small intestine via a nasogastric tube, avoiding any possible breakdown in the stomach. Colostrum is available in the U.S. from several different companies. Two of these are Sterling Technology, 800-522-3699, makers of "Nature's Colostrum;" and Lambda Biolife, 800-246-5433, makers of "Biolife Colostrum." Colostrum is also available through veterinary supply houses. In addition to colostrum itself, there are other milk-derived products that contain high levels of immunoglobulins. Although so far mostly used in the treatment of cryptosporidiosis, some of these may have a broad spectrum effect that could be useful in the treatment of diarrhea stemming from other infections.

Another possibility for treatment of chronic diarrhea that responds to nothing else is thalidomide (one brand name is Synovir; there are others). Discussed in *Chapter Seven* as an immune modulating and antiviral agent and below as a treatment for aphthous ulcers and for weight loss and wasting, thalidomide is a very effective tumor necrosis factor (TNF) inhibitor that often causes constipation as a side effect. British research done in people with severe, chronic diarrhea (mostly from microsporidiosis) found that thalidomide resulted in a reduced number of bowel movements and increased weight, along with lowered TNF levels. Research is ongoing with those in whom chronic diarrhea has failed to respond to any other treatments. The dosage being used is 100 mg of thalidomide, given at bedtime. Because thalidomide can cause many objectionable side effects, including neuropathy and

grogginess (and, of course, severe birth defects when given to pregnant women), it may be difficult for people to use long-term. Don't even think about taking this drug without being fully informed about all its possible side effects.

One last possible treatment for diarrhea is diethylhomospermine, currently being investigated for possible usefulness in controlling diarrhea that doesn't respond to other treatments and has no diagnosable cause. This research is being conducted at the University of Florida Clinical Research Center but results aren't in yet. When they are, we'll let you know in the *Positively Well Updates*. There have been community reports of effectiveness in controlling cryptosporidial diarrhea with this drug. The drug can be given either intravenously or subcutaneously.

Always remember that proper diagnosis should be aggressively pursued, with symptomatic relief only used until a diagnosis and proper treatment can be obtained, or when no other effective treatment can be found. On the other hand, until proper treatment eliminates the cause it is certainly important to do everything possible to eliminate the diarrhea in order to prevent dehydration, wasting, and electrolyte imbalances. Thus, don't hesitate to use standard anti-diarrheal agents (Kaopectate, Pepto-Bismol), antimotility agents (Imodium, Lomotil, tincture of opium, paregoric, or opiates), luminal-acting agents (cholestyramine, pectin, Kaolin, or fiber supplements), or hormonal agents (Sandostatin) for as long as is necessary to relieve your symptoms.

Regardless of the cause, until diarrhea can be resolved, remember that it is crucial to replenish lost fluids and lost calories and rebalance the body's electrolytes. Dr. Anton 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.*"²⁵ [!] Using an aggressive approach to nutrition and fluid replenishment while addressing all the other factors related to internal decline and weight loss is critical. Drinking plenty of water and other healthful fluids seems obvious but many people fail to properly rehydrate themselves, often believing that they're drinking more liquids than they really are. It can be useful to actually measure 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 and then drink from these containers all day. At the end of the day, you'll be able to see how much you're actually drinking. In general, aim for a daily consumption of at least one cup of fluid for every fifteen pounds of body weight. In addition to water, juices, herb teas, broth, and fruit juice smoothes can contribute to your fluid intake.

With any episode of diarrhea, it's also very critical to rebalance the body's electrolytes, including sodium, potassium, and chloride. It is to be hoped that your physician will be monitoring this but, in the meantime, drinking vegetable and fruit juices, nectars, or broths can help. Just dilute thicker juices or nectars with water to enhance their absorption. However, you may need more concentrated sources of electrolyte minerals. The use of commercial electrolyte replenishment drinks is a tried and true quick fix. You'd be amazed how awful imbalanced electrolytes can make you feel and how quickly setting them to rights will improve that awful feeling. The listlessness, fatigue, and feeling of being "poisoned" inside that an electrolyte imbalance can cause will quickly vanish when it's eliminated. Electrolyte replenishment fluids can substitute for part of your water intake. Gatorade is the commonly available sports nutrition drink that is often used for electrolyte replacement therapy. However, it is not a very concentrated source of the minerals and it is also loaded with sugar which could exacerbate the diarrhea. Pedialyte, an infant formula, is more concentrated in the needed minerals but many people don't care for its taste and it's rather expensive. Oral rehydration solutions made with rice syrup, including Infalyte and BestLyte, not only help to rebalance electrolytes but may also actually help to reduce diarrhea in some cases. The rice syrup solids actually help to slow motility.

Another electrolyte replenisher is *Alacer Miracle Water*, available in many health food stores. It has higher amounts of the important minerals than many of the more common rehydration solutions, and contains no sugar at all. It tastes like lemon water so most people find it easy to drink. If you can't locate it, call the Alacer main office in Irvine, California. Another possibility is the use of the oral rehydration salts recommended by the World Health Organization. This is one of the two least expensive options since each packet only costs about 50 cents and, dissolved in water, provides a liter of electrolyte replenishment fluid. The taste is fairly bland and not objectionable to most people. These salts are available through many pharmacies or can be ordered by them. You can also order them directly from Jianas Brothers, 2533 Southwest Blvd., Kansas City, MO 64108; 816-421-2883. The other inexpensive option is a teaspoon of *light* salt (which contains potassium mixed with sodium), a tablespoon of pasteurized honey, and a quart of water or orange juice or tea. In addition, apricot, peach, and pear nectars are particularly rich in potassium so they can serve as the base for an electrolyte replenishment drink. Mix a cup of water with a cup of nectar and then mix in a half teaspoon each of salt and baking soda. You can add a tablespoon of honey if you'd like it to taste sweeter. Even better, instead of plain water, use rice water. Add 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 the electrolyte replenishment drink or drunk on its own as a source of both hydration and soluble fiber. All of these will help both to hydrate you and serve as electrolyte replenishers.

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 most of the daily fluid intake. The use of such fluids will help prevent the electrolyte imbalances that often occur with diarrhea and, thus, prevent some of the weakness, fatigue, nausea, thirst, decreased urination, dry mouth, loss of appetite, rapid heartbeat, and dizziness upon arising that such imbalances can cause. 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. Don't ignore this.

Eating as well as you possibly can is, of course, also crucial. When you're not absorbing food very well because of diarrhea, every bite should really count. You need both calorie-dense and nutrient-rich foods and you need to take in as large amounts as you can, as discussed in *Chapter Three*. You also need to improve your digestion as much as you possibly can, following the guidelines in *Chapter Two* and *Chapter Three*. Chewing your food very, very well can help.

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 (which may help heal the intestines; see below), have no lactose, and are low in, or have no fat, or use medium chain triglycerides rather than long-chain fats.

Products that contain rice syrup solids (which as mentioned above may help to slow motility) as their source of carbohydrates may be good choices. One such product is Optim Nutrition's Optimune, a powdered whey protein concentrate which, for the reasons discussed above in the section on colostrum, also might help via its high concentration of immunoglobulins. 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 won't help 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.

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. This includes wheat bran, whole-wheat products, popcorn, nuts, seeds, potato skins, corn, and a high intake of raw fruits and vegetables (especially, their peels).

On the other hand, including foods that contain soluble fiber can be useful 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. Such foods will often provide considerable improvement in the symptom of diarrhea, although, of course, they will not eliminate the cause(s). Foods that contain soluble fiber include peeled apples or apple sauce made from them, oatmeal, oat bran, white rice, barley, apricots, peaches, pears, plums, grapes, berries, melons, nectarines, prunes, raisins, and bananas. Increasing your intake of these foods may be helpful, as may the soluble fiber supplements such as Metamucil discussed above. White rice and white bread, although lacking in the fiber and higher levels of nutrients found in their whole-foods counterparts (and, thus, not generally recommended as part of a healthful, whole-foods diet), may be temporarily useful as sources of calories that come in a package that will not irritate the intestines. Mashed potatoes made without the skins are also useful for this.

For those with serious diarrhea who can find little that they are able to tolerate, the B.R.A.T. diet has long been recommended. 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). If you're stuck with this for a while, plain white rice could become awfully boring. Try varying the flavor by cooking it with an added beef or chicken bouillon cube and/or with herbs like bay leaf or dill weed or basil or oregano and/or with garlic powder. You could also add small amounts of soy sauce or tomato sauce.

If the B.R.A.T. diet seems to be tolerable, you can then try adding small amounts (a half-cup or so) of other foods that are easy on the intestines such as 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. Note that in some versions, the B.R.A.T. diet has an

additional "T" at the end, standing for tea. However, since caffeine can sometimes exacerbate diarrhea and most tea contains it, it is better to leave this out. If you do want tea, stick to a caffeine-free herbal variety (and make sure you choose an herb not known for having a laxative effect).

If intestinal cramping goes along with the diarrhea, it can be helpful to lessen the intake of gas-producing foods such as beans, cabbage, broccoli, cauliflower, Brussels sprouts, and carbonated drinks. In addition, the use of digestive enzymes, as discussed in *Chapter Three*, can be very helpful since they can dramatically decrease the gas that could otherwise result from such foods. Avoiding carbonated drinks can also help to decrease gas. In addition, 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.

As you look at your total program to handle diarrhea, always remember that both the various intestinal pathogens and the irritation caused by the diarrhea itself can damage the intestines. Infections that are allowed to drag on long-term may be particularly problematic in this regard, damaging the basement membrane to such an extent that then the intestinal villi (the tiny threadlike projections that cover the surface of the mucosa of the small intestine and absorb fluids and nutrients) which have been damaged or destroyed don't grow back normally. Thus, immediate treatment of any diarrhea is extremely important. In addition, it is critical to do everything necessary to heal the intestines in order to prevent future problems. For this, supplementation with L-glutamine is particularly important. It may also actually help to reduce the diarrhea by enhancing water and sodium absorption across the wall of the small intestine. For both these reasons, its use during any period of diarrhea is very important.

Last but not least, diarrhea can cause serious irritation of the rectal tissue which can be very painful. Wiping the area after a bowel movement can feel like torture. The absolutely best remedy for this is bag balm. This is sold as a veterinary product since it was originally designed for use on a cow's udder, but it is also available in most pharmacies. It is very, very soothing. If applied frequently, it can greatly reduce the irritation that would otherwise be caused by the bowel movements. If necessary, apply it before a bowel movement, to provide a protective coating, and then again afterwards to soothe the rectal tissue. Slightly dampening the toilet paper and, of course, using a very soft brand of tissue can also help reduce the irritation created by frequent wiping.

Because all of the above can seem so overwhelming, let us summarize the basics with the following. When diarrhea begins it is reasonable to first do a stool culture, while treating the symptoms with Lomotil or other anti-diarrheals. If an identifiable pathogen is found, then, of course, treat for that. However, if after 3-4 weeks, the diarrhea has not been eliminated, it is very important to press for doing the entire aggressive set of diagnostic procedures discussed above. This should definitely include endoscopies (both upper and lower), evaluation of stool fat, and consideration of bacterial overgrowth in the small intestine (doing the lactulose breath test or, if all other causes have been eliminated and this test is not available to you, an empiric dose of ciprofloxacin for two weeks). Also assess the possibility of lactose intolerance, food allergies, and/or a superimposed motility disorder (functional bowel disease), as discussed above. Until diarrhea can be eliminated, follow all of the above suggestions for managing the symptom, replenishing the body's liquids, rebalancing electrolytes, and maintaining nutrient status.

To assist you with carrying out all of the above steps for eliminating diarrhea, I am providing a checklist that can be used to ensure that every single element is addressed. In addition to using this yourself for focusing on those elements over which you have control, you can carry this with you to your physicians' office to discuss those elements for which you will need medical assistance.

Checklist for Diarrhea Diagnosis & Elimination

G Always remember that in a large percentage of cases diarrhea is multifactorial; thus, aggressively pursue all possible causes and don't stop until you have found every single one.

G Have physician run tests for cryptosporidiosis (stool sample; modified acid-fast bacilli smear), microsporidiosis (biopsy of small intestine and/or stool sample; modified chromotrope/modified trichrome stain), isosporiasis (stool sample; modified acid-fast bacilli smear), CMV colitis (biopsy of the rectum or colon), CMV gastritis and duodenitis (biopsy), *C. difficile* (stool sample; toxin assay), common ova and parasites (series of 3 stool samples/purged stool samples, sent to specialty lab; look for *Giardia lamblia*, *Blastocystis hominis*, *Entamoeba histolytica*, *Dientamoeba fragilis*, etc.), Mycobacterium avium complex/MAC (polymerase chain reaction), bacterial infections (stool culture; look for shigella, salmonella, campylobacter, yersinia, etc.), other bacterial infections (blood culture; look for listeria, etc.), and candida overgrowth (stool culture; also check for clinical signs including anal itching, oral thrush, digestive gas and bloating, vaginal yeast infections).

G If any pathogens are found, refer to appropriate section above for treatment possibilities and pursue with your physician aggressive treatment(s).

G If candida overgrowth is found or suspected, treat appropriately with antifungals, if necessary, and use high doses of acidophilus supplements, as described above. In any case, take acidophilus daily at maintenance levels.

G If no other infections are found and there is any history of antibiotic use, suspect *C. difficile*; treat as described above.

G Also have physician run ELISA/ACT food and chemical sensitivity test or RAST IGG/IGE tests for food allergies; if allergens are found, remove completely from diet.

G Check medications list for possibility of diarrhea side effects or lactose content; switch to other medications, if possible, or take a break from any that might be problematic, where possible.

G Breathe deep, calm down, chill out; remember that stress can cause diarrhea.

G Remove all dairy products (every single one; see list above) for a period of a few weeks to see if that helps; if it does, you're either lactose-intolerant or allergic to milk products; see complete discussion above.

G Decrease fat content of diet to 25% or lower; try to make a substantial portion of the fat you consume come from medium chain triglycerides (MCTs); see above.

G Avoid caffeine-containing coffees, teas, chocolate, colas, etc., for at least a few weeks to see if that helps.

G If none of the above have eliminated the problem, consider empirical treatment, based on symptom patterns, for the infections for which misdiagnoses (false negatives when you really do have the infection) are common, e.g., MAC, cryptosporidiosis, parasites, etc.

G Until a diagnosis can be made or, worst case, when none ever is, aggressively control the diarrhea with anti-diarrheal, antimotility, luminal-acting, or hormonal agents; also consider use of *saccharomyces boulardii*; see above.

G Until diarrhea is eliminated, aggressively replenish lost fluids and calories; see above and; always do everything else needed to prevent weight loss and internal wasting.

G Ensure that the diet has optimal levels of protein and fiber; until the diarrhea is resolved, avoid large amounts of insoluble fiber; see above.

G Take sufficient nutrient supplements to ensure optimal levels of the nutrients required for intestinal repair; take optimal doses of L-glutamine.

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