NAUSEA

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

Nausea is the queasy, sick-to-your-stomach sensation that makes you feel like you may have to vomit. It is a very serious problem, especially when it recurs frequently, because feeling nauseated may prevent proper intake of food and, when severe, medications. When someone is severely nauseated, they may feel unable to swallow anything, and the result can be unwillingness or inability to take meds properly, as well as greatly decreased intake of food and liquids. Many HIV+ people will experience nausea at some point. It is terribly important to report nausea to your physician immediately so that steps can be taken to counter it. If allowed to drag on, it can not only make your daily life miserable but also sabotage your drug regimen and send you on a downhill slide toward wasting due to inadequate food intake.

Diagnosing the severity of nausea can help your physician know what is required to best address this problem. It is helpful to keep a diary that details your experience with it. Include such information as:

□ How often you feel nauseated each day, and whether you vomit on any of these occasions. If the feeling persists through much of the day, note this.

□ How long each episode of nausea lasts, from the moment you first experience the feeling until it disappears completely.

□ Any pattern that you may be able to ascertain about when the nausea occurs. Does it occur when you first wake up, or after you take your meds, or when you smell food, or when you begin eating, or some time after meals, or in response to any other stimulus that you can identify?

□ How many days of the week the nausea occurs. Is it once every week or two or every single day or something in between?

□ Any effects that the nausea has on properly taking your meds. Do you end up ever skipping doses of your antiretrovirals or other meds because you simply feel too nauseated to take them? If so, how often does this occur?

□ Any effects that the nausea has on your intake of food and liquids. Are you still able to eat all your meals and usual snacks? Or do you believe that your total intake of food and liquids has decreased because of the nausea? If so, how much would you estimate that your food and liquid intake has decreased?

□ Are there other symptoms that seem to accompany the nausea? Do you often feel bloated or have the feeling that food just sits in your stomach, not properly moving on as it should?

In addition to keeping this diary, it will be important to have your physician run blood tests to see if liver problems, infections, or other medical conditions might be contributing to the nausea.

With the answers to these questions in hand, your physician and you may be able to determine what is most likely triggering the nausea, and what may help counter it.

What are the Causes?

Nausea has multiple possible causes in HIV disease, and in many people, there may be more than one factor contributing to its development.

Nausea is a particularly common result of antiretroviral medications, cancer chemotherapies and radiation, and other drugs. All the currently available antiretrovirals may cause nausea in at least some people. It is difficult to even list which drugs might be more likely because your own individual reaction to a drug will affect any tendency that drug may have to cause nausea. If pressed, community docs might list as the most likely nausea inducers AZT (alone in Retrovir® and also in the combination drugs Combivir® and Trizivir®), 3TC (alone in Epivir®) and also in the combination drugs Combivir® and Trizivir®), abacavir (Ziagen®), ritonavir (Norvir®), saquinavir (Fortovase®), indinavir (Crixivan®), and amprenavir (Agenerase®).

WARNING: If anyone taking abacavir develops nausea, it is crucial for the physician to be contacted immediately so that an assessment can be made whether this symptom might be part of a potentially fatal hypersensitivity reaction to the drug. If the physician is not available, the person developing the symptom should report to the emergency room immediately.

Many other drugs can cause nausea. One nausea-causing drug that many HIV+ people with lower CD4 counts may be taking is the sulfa antibiotic Bactrim/Septra which is used for prophylaxis against *Pneumocystis carinii* pneumonia (PCP). Most people tolerate this drug well but some will develop nausea from its use and may need to switch to a different prophylactic medication.

Drugs used in the treatment of many infections can cause nausea, but this is almost always limited to the time period when the drugs are being taken. This means that the nausea seen with treatment of short-term infections will most likely soon be gone, but nausea that is caused by drugs used in the treatment of some long-lasting opportunistic conditions may be a long-term problem.

Cancer chemotherapies can sometimes cause very severe nausea. It will be hugely important to address this in order for the person to be able to continue the therapy for the full time necessary to treat the cancer. Radiation can also cause serious nausea.

Nausea is sometimes caused by infections. Any infection that causes nausea in the general population may, of course, cause nausea in HIV+ people as well. Included are many common bacterial and viral infections. The organisms that cause food poisoning will very often cause sudden and sometimes severe nausea so this should always be considered. Some opportunistic infections or cancers and other infections that may occur in HIV+ people can also cause nausea. Included on a long list are endocarditis (with nausea caused by the strep organism that causes the endocarditis), *Mycobacterium avium* complex (MAC), secondary syphilis, cryptococcal meningitis, common parasite infections, cryptosporidiosis, isosporiasis, toxoplasmosis, hepatitis, and lymphoma. It is always important to consider the possibility that an infection or other medical condition is contributing to nausea, and take all necessary steps to diagnose these.

Nausea caused by liver problems. With liver damage, nausea may be present. Using the appropriate tests to assess the possibility of liver problems will be important to ascertain if this may be contributing to nausea problems. Using the therapies that can help support the liver and possibly reverse damage or prevent its worsening will be important to counter the nausea caused by liver problems. [For a full discussion of these tests and therapies, see *Liver Dysfunction*.]

Nausea caused by pain medications. Because many HIV+ people will experience pain at some point, the use of pain medications is common in HIV disease. Many of these medications can cause nausea. It will be terribly important to address this in order for pain to be treated effectively. [Treatments for this are discussed below. For additional information on pain in HIV disease and appropriate treatments, see *Pain*.]

What are the possible treatments?

The first must for effective treatment of nausea is identification of all the possible contributing causes, to the greatest extent possible, followed by elimination of as many of these as possible. Unfortunately, it may not be possible to eliminate some of the most common causes (for example, the meds you're taking), in which case there are many therapies that may help.

Key Therapies

It is very important to know that regardless of the cause of nausea, there are many agents that may be able to effectively counter it. The simplest of these is ginger which very often will solve the problem. When this or other natural remedies are not sufficient to eliminate the nausea, there is a long list of drugs that can provide relief.

Natural anti-nausea substances. In addition to all the anti-nausea medications discussed below, there are several natural substances that are very often effective. Since they have no side effects, are inexpensive, and are commonly available, they might be the best place to start in seeking help for nausea.

Ginger root is a particularly effective anti-nausea remedy. In studies of both motion sickness and chemotherapy-induced nausea, ginger has been shown to be effective, and countless anecdotal reports from HIV+ people indicate that it also works in many instances of HIV-associated nausea, including that caused by drugs. There is a commercially available ginger syrup by New Chapter which can be put in hot, fizzy or cold water to make a sipping beverage. Some people report that sipping this ginger beverage throughout the day, and, particularly, prior to taking medications that cause nausea, is highly effective. For those who experience nausea when they first wake up in the morning, she recommends keeping this beverage near the bed and sipping it upon first awakening.

Chopped ginger root can also be consumed by drinking ginger tea. Chop up two or three tablespoons of fresh ginger root and add to a cup or so of boiling water. Then either simmer this for at least five to ten minutes, or remove from heat and steep for at least 10-15 minutes. Drink this tea several times daily. It can be drunk either hot or cool, although it should not be iced. You can add lemon or pasteurized honey if you'd like to flavor this tea. Chopped ginger root can also be added to many dishes where it will not only add its spicy flavor, but also possibly help to suppress nausea during the meal. Powdered ginger is also found in capsules. Take two 500 mg capsules, three to four times daily.

Lemon may also help suppress feelings of nausea that may occur with meals. Before beginning a meal, slice a fresh lemon and sniff it for a minute or two while taking deep breaths. Then eat a few crackers or a piece of dry toast before you begin the meal.

Peppermint tea may also be useful for some people with nausea. It can be brewed for a few minutes, and then drunk warm prior, during, or after eating.

Vitamin K will also often help with nausea, although the mechanism via which it helps is unclear. Five drops of a vitamin K liquid can be taken immediately before each meal. Dr. Van der Veer reports that this works very well for nausea associated with meds, as well as for pregnancy-caused nausea.

Herbal and Food Bitters. Certain herbs have a bitter quality that can boost appetite. Bitters are an important class of botanicals to help support normal digestive, assimilative, and eliminative processes. They help to promote the free flow of bile from the liver which helps to stimulate intestinal peristalsis. There are numerous individual herbs such as gentian, yarrow, Oregon grape root, and wormwood, which when prepared as teas, act as digestive bitters. There are also numerous commercial bitter preparations prepared as hydro-alcohol extracts that are available in health food and liquor stores.
Dosage: As tea, 1-2 teaspoons of herb slowly boiled in water for 10 minutes in a covered vessel. Drink 1-3 cups daily. As hydro-alcohol extracts; 1 tablespoon morning and evening.

Beginning a meal with a salad that includes some bitter greens (Swiss chard, dandelion, arugula, watercress and any other bitter leafy green vegetables) may also stimulate appetite and diminish nausea. There are also digestive formulas (for example, Swedish bitters) that contain these herbs that can be used prior to a meal as an appetite stimulant.

Artichoke Leaf (*Cynara scolymus*): Increases flow of bile, inhibits cholesterol biosynthesis and lowers serum lipids, antioxidant, increases liver regeneration, protects liver cells from chemical damage. Specific indications include: Dyspeptic complains, nausea, vomiting, spasmodic abdominal pain, stomach ache, loss of appetite, constipation, bloating.
Dosage: The equivalent to 4-6 g daily.

DGL or deglycyrrhizinated licorice chewed three times per day between meals has also been helpful. Licorice has been used extensively in traditional and modern Asian medicine as a multi-factorial anti-inflammatory therapy.

Ketotifen also appears to be **protective of the cells in the gastrointestinal tract**, protecting cells in the stomach, small intestine, and colon from toxins. In non-HIV research, it has shown some effectiveness as a treatment for colitis, or inflammatory bowel disease. *Thus, it may also provide some protection against the damage to the intestines commonly caused by inflammation and pathogen-produced toxins.* This could help preserve gut function and, thus, proper absorption of nutrients, making a nutrient program more likely to succeed.

Improving digestion. Many HIV+ people often have compromised digestion and absorption which may contribute to nausea. In some cases, the nausea associated with food may be the body's way of saying that it doesn't have what it needs to properly digest and absorb that food. By improving this, the nausea associated with food may be greatly diminished.

Pancreatic enzymes are often very useful for improving digestion and lessening malabsorption in HIV+ people. In particular, the enzyme products that contain the fat-digesting enzyme called lipase seem to work very well. If you're going to be using enzymes, note that, although enzyme products can be purchased over-the-counter, they can also be prescribed by a physician and will then probably be covered by your insurance or Medicaid. One of the best prescription products is Digestive Care, Inc.'s Pancrecarb (covered by Medicaid in all 50 states). This product works better than most others because it is not only high in lipase and amylase (necessary for proper digestion of carbohydrates) but is also enteric-coated (which is what gets it through the stomach acid unharmed and into the small intestine where it works). It also contains a bicarbonate buffer. The bicarbonate, which is a natural secretion of the pancreatic gland, optimizes enzyme activity, especially of lipase. With this combination of features, this product appears to deliver better enzyme activity and, thus, greater effectiveness in improving digestion when compared to other products. A good non-prescription formula is NYBC's **Plant UltraEnzymes**, also high in lipase. UltraEnzymes is a vegetable enzyme formula which aids in the digestion of such high-fiber and gas-producing foods as beans, cabbage, broccoli, cauliflower, Brussels sprouts, onions, and garlic

The best way to determine appropriate dosing of the enzymes is to begin by taking one or two with each meal or snack, and then increasing the number of tablets until digestion seems to improve (which may be indicated by reductions in nausea and/or gas problems). Some people will see great improvement with low doses (one or two tablets with each meal), while others may need to swallow 3 to 5 tablets with each meal or snack.

Some people may have inadequate production of hydrochloric acid in their stomachs for proper digestion to take place. It is believed that the parietal cells (those that produce hydrochloric acid) in many HIV+ people are adversely affected by disease processes with the end result being an inadequate production of hydrochloric acid. In such people, supplementation with the acid betaine hydrochloride may improve digestion and reduce gas. It is available in capsules which are best taken throughout the meal (if taking more than one). It is advisable to not take the capsules after meals since that increases the chances of creating a burning feeling. The amount needed may vary considerably since some individuals may have only a slight underproduction of stomach acid, requiring perhaps only a capsule or two with each meal, while others may produce very little, requiring multiple capsules. It would always be best to start with only one capsule, and then watch to see the results, only adding additional capsules if they seem to be needed to fully improve digestion.

It is important to know that needless supplementation with HCl can cause feelings of indigestion and heartburn (a "burning" feeling in the esophagus or stomach), and would be harmful if continued over time. The best way to test for the need for extra stomach acid is with gastric analysis by radiotelemetry, a process that requires you to swallow a capsule that contains a radio transmitter, followed by analysis of readings from your stomach both at baseline and after test solutions are given. If the pH level is too high, either initially or after the test solutions are given, it will indicate too-low production of stomach acid, and thus the need for supplementation.

If this test is not available to you, a trial can be done giving betaine hydrochloride with meals to see if it improves digestion and reduces gas. If after supplementation with the HCL, there is ever a feeling of heartburn or other discomfort, the supplemental HCl should be discontinued, and an antacid mixture of baking soda and water drunk for immediate relief (since that will counter the acid).

However, note that many people under-produce hydrochloric acid and because the pH of the stomach is then too alkaline (not acid enough), the sphincter muscle at the top of the stomach does not receive the signal it needs to close (a signal that comes from the presence of a normal acid level when food is consumed). When the sphincter muscle does not close, the stomach acid that is present can then rise into the esophagus and create a burning feeling. In some cases, this may lead people who actually have too little stomach acid to believe that they have too much.

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

However, long-term use of systemic anti-inflammatory drugs could be needlessly risky. One problem is that over-suppressing the inflammatory response with the powerful effect that drugs have might increase the risk for infections (since the inflammation is part of the immune system's way of countering infections). In addition, anti-inflammatory drugs can cause many side effects, particularly gastrointestinal bleeding.

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

☐ garlic, ginger, turmeric

☐ bioflavonoid- and antioxidant-rich fruits and vegetables

☐ omega-3 fatty acid-rich foods such as fatty fish (e.g. salmon, mackerel, sardines, tuna, cod and halibut), flaxseed, and walnuts.

☐ chlorophyll-containing foods such as wheat grass juice and blue-green algae.

There are also specific nutritional supplements and herbs that counteract excess inflammation and may help to lower levels of tumor necrosis factor. These include N-acetyl-cysteine (NAC), carnitine, nettle leaf extract, grape seed extract and bilberry extract, as well as a broad spectrum of all the other important antioxidants (vitamin E, vitamin C, bioflavonoid complex, carotenoid complex, selenium, coenzyme Q-10, and alpha-lipoic acid). For more detailed information on the above foods and supplements, please see *NYBC's Core Nutrient Protocols and Counteracting Inflammation and Tumor Necrosis Factor* in the **Introduction**, as well as the description of *Health-Enhancing Nutrients* in *NYBC's Self-Care Guide*.

To improve absorption, it will also be extremely important to supplement with glutamine. For many reasons, there is a high demand for glutamine in HIV+ people, and normal intake may not equal the demand. Thus, proper maintenance of intestinal tissue, for which glutamine is absolutely required, may not occur. Taking a steady supply of glutamine may significantly improve the proper turnover of intestinal tissue, and thus increase absorption. The end result can be a significant improvement in the way the body handles food. Doses needed for this will depend on each person's other needs for glutamine, and may range from 5 grams up to 30 grams or more daily. A powdered form is best; mix it in water or juice and take in 3 to 4 divided doses daily, preferably on an empty stomach, 20 to 30 minutes before eating. [For more information on glutamine and appropriate dosing, see *NYBC's Basic Nutrient Protocols* and *Counteracting Inflammation* in the *Introduction* and the *Diarrhea* section, and the information on specific nutrients in *NYBC's Self-Care Guide, Nutrient Supplementation*.]

Consuming acidophilus and other "good bacteria" is also useful for improving digestion. Naturally occurring intestinal microorganisms aid digestion and produce vitamins for the body. Most people refer to these organisms as "acidophilus" in reference to *Lactobacillus acidophilus*, a particular strain of these "good" bacteria, although there are actually many different strains normally present in a healthy intestine. 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 nausea, gas, bloating, and 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 problems that could result from it. In particular, repopulating the intestines with good bacteria may improve the digestion of dairy products.

Long-term use of acidophilus may help in other ways. Researchers in Italy have shown that elderly people taking 8 capsules of mixed-bacteria supplements per day achieved a 50 percent decrease in intestinal inflammation. Since, as discussed above, HIV is known to cause significant intestinal inflammation, a problem that may, in turn, worsen digestion, the possibility that acidophilus might also decrease this inflammation and, thus, help heal the gut is appealing.

NYBC and Other Nutraceuticals for Nausea:

Artichoke Leaf 15% 500mg x 180	3-6/d (1-2B, 1-2L, 1-2D)
Swedish Bitters x 16.90 oz	1 teaspoon before each meal
DGL 400mg x 100	3/d chew (1B, 1L, 1D)
Ginger 6:1 500mg x 100	3-6/d (1-2B, 1-2L, 1-2D)
Glutamine 900mg x 180	6+/d (2B, 2L, 2D)
Glutamine powder 1,000g	10-30grams day
Hydrochloric Acid x 120	1-2 in the middle of a meal
AD8-Dophilus x 60	3/d (1B, 1L, 1D)
Ketotifen 1mg x 50	2-4/d (1-2B, 1-2D)
Peppermint enteric softgels x 90	3/d (1B, 1L, 1D)
Plant Ultra Enzymes 800mg x 90	3/d (1B, 1L, 1D)

Acupressure and acupuncture. Both acupuncture (using needles at energy points in the body) and acupressure (using physical pressure on energy points) are sometimes helpful for nausea. One simple way to get daily benefit from acupressure is via the use of acupressure bands for nausea. Most commonly sold as remedies for motion sickness, they sometimes seem to help with nausea from other sources. The bands are available through many pharmacies, health food stores, or from practitioners.

Dietary and environment changes. There are many dietary tricks and tips that may help prevent nausea, as well as certain environmental changes that could help. Included are the following.

□ Eating smaller meals along with frequent small snacks is often useful. Allowing your stomach to remain empty for too long may increase the tendency toward nausea. Munching on small snacks repeatedly throughout the course of the day will often help.

□ Dry and/or salty foods like crackers, pretzels, plain bread, dry toast, bouillon, or chips may help calm the stomach. For those with morning nausea, it may be useful to leave a few crackers or pretzels near the bed so that they can be consumed before even getting out of bed. For those who develop nausea with meals, try munching on one of these a few minutes prior to eating.

□ Sweet foods will sometimes worsen nausea, while protein foods may improve it. Consuming a small amount of protein such as leftover chicken or a hard-boiled egg first thing in the morning may help with morning nausea. Doing the same thing at night may help with night-time nausea.

□ Sipping cool beverages such as clear fruit juice or carbonated beverages such as fruit juice spritzers may help during a period of nausea, or if consumed prior to eating or taking meds.

□ Because cold foods generally have less smell than their hot counterparts, making a meal out of such foods may help. Possibilities are fruit, cold cereal, sandwiches, yogurt, cottage cheese, hard-boiled eggs, bread, crackers, and gelatin with fruit. Even foods that are normally eaten hot may seem more appealing and become less likely to induce nausea if they are allowed to cool in order to decrease their smells before being eaten. Always cool foods in the refrigerator. Leaving hot food sitting on the counter is a recipe for food poisoning. Substituting a cold version of a given food for a hot one may help. For example, try chicken salad instead of hot baked chicken, or eat a cold tuna salad instead of broiled fish. With this approach, you're getting the same nutrients that the hot versions of these foods would contain but in a form that may be more palatable.

□ Chewing food extremely thoroughly can also help. This will mean that the stomach can handle the food taken in more easily, with less work to do to break it down. Since it will then leave the stomach sooner, there may be less tendency to vomit up the food eaten.
□ Certain foods may be particularly likely to irritate the stomach and cause nausea. It may be best to try to avoid most spicy foods, fried foods (all those fast foods), high-fat meats (for example, luncheon meats or bacon), high-fat sauces or gravies, sour cream, and caffeine-containing foods such as coffee, tea, or colas. Alcohol may also make nausea worse.
□ Substituting bland foods for spicy or strong-smelling or rich items may help. Bland foods that may be less likely to cause nausea include broth with crackers, mashed potatoes, rice, noodles, oatmeal, toast, unseasoned chicken or turkey, blandly seasoned soups, and yogurt.
□ If it appears that smelling food being cooked causes feelings of nausea, try to see to it that food preparation is carried out in a well-ventilated room. Open windows, if possible, or turn on fans that can help to blow cooking smells away. If possible, have someone else prepare the food while you stay away from the cooking area. If you have to prepare all your food yourself, then at least leave the room while foods are cooking. Microwaving foods in place of other cooking methods will sometimes help by reducing cooking smells. It is also a means of speedy food preparation that may allow you to eat quickly, during any period when you are not experiencing nausea.
□ Don't eat in a room that feels stuffy or still has lingering cooking odors.
□ With liquid foods (soups or drinks), try sipping them through a straw in order to limit their smells and help prevent the nausea that the smells might cause.
□ Some people may find that it will be best to avoid drinking liquids while eating food. Instead, eat your meals without drinking, and then wait an hour or so before consuming liquids. Even then, sip the liquids slowly.
□ It is usually desirable to avoid your favorite foods during any time period when you are frequently experiencing nausea. Otherwise, vomiting these foods up or feeling terribly nauseated when you eat them may condition you to dislike them.
□ Always eat sitting up, preferably sitting at a table in a comfortable position. Trying to eat while reclining will often increase nausea.
□ It is always best to avoid lying down immediately after meals or snacks during any period of nausea. Remaining in an upright position for at least two hours after eating can help reduce the tendency to vomit up the food you have eaten.

Drug changes. When a medication has been identified as a cause of nausea, know that this side effect often disappears after a short period of time on a new drug. If possible, try to wait for the several weeks that it may take for this symptom to subside. However, in some cases, the nausea will continue long-term, and you may need to discuss with your physician the possibility of drug changes. There is one important caveat, however. Although it would seem appropriate to look for possible substitutions for any drug that appears likely to be contributing to nausea, there may not always be available substitutes.

This may be a particular problem for people who are very treatment experienced with HAART meds. They may have become resistant to many previously used drugs, and might well be on the only combo currently available to them. Some people may also be intolerant of certain classes of drugs because of the symptoms that they cause. If the current HAART combo is otherwise working well and providing the anti-HIV benefits needed, it may be necessary to stay with those meds, while attempting to address the nausea with some or all of the other therapies discussed here.

If you can't eliminate a particular drug, always consult your physician or pharmacist to determine whether taking it at a different time can help. Some drugs need to be taken with a full meal in order to avoid nausea. Other drugs may require taking them in between meals in order to decrease this side effect. In particular, timing any chemotherapy or radiation treatments so that you have eaten at least two hours before they begin may help prevent nausea.

With drugs that are stressful to the liver, doing everything possible to support that vital organ may help prevent the nausea that these drugs might otherwise cause. [For suggestions, see *Liver Dysfunction*.]

Stomach irritant avoidance. Avoiding anything that is known to irritate the stomach can sometimes help with nausea. Common stomach irritants that it would be best to avoid are alcohol, aspirin, smoking, and excessive caffeine. These changes are not likely to solve major nausea problems, but they could help as part of a total program to quell nausea.

Supporting the liver. If liver damage is determined to be one of the causes of nausea, using the therapies that can help support the liver and possibly reverse damage or prevent its worsening will be important. [For a full discussion of these therapies, see *Liver Dysfunction*.]

Anti-nausea drugs (anti-emetics). When all of the above are insufficient to completely eliminate nausea, the drugs discussed here are very effective treatments. In some cases, it may be possible to only use such drugs for a short period, while in others there may be a need for long-term use.

For example, nausea caused by antiretrovirals will often disappear after a few days or weeks on new drugs. Using an anti-emetic drug during this period may be all that's needed to prevent nausea. After the initial period on new drugs, you can experiment with decreasing and then eliminating the anti-emetic drugs. If the nausea does not return, the problem

has been solved. If it does come back, then you will have to assess whether there may be other causes that have not been identified, or whether the drug(s) are simply not tolerable by you, necessitating a drug change.

With cancer chemotherapy-induced nausea, the anti-emetic drugs can be extremely useful for countering the severe, life-debilitating nausea that may occur with some of these drugs. Using the more powerful anti-emetic drugs may greatly help, and the nausea will usually disappear not too long after the course of chemotherapy is completed. The proper use of anti-emetic drugs during chemotherapy may be crucially important for supporting the person's ability to continue the treatments for the full length of time that is necessary to best treat the cancer.

With nausea caused by autonomic neuropathy, there may be a long-term need for daily use of an anti-emetic drug, taken shortly before each meal. The most common drug used for this is metoclopramide (Reglan). One note on this is important. With constant daily use of Reglan, its effectiveness may diminish. Thus, it will always be best to use the drug only when truly necessary. [For more information on nausea caused by autonomic neuropathy and ways to improve it, see *Neuropathy*.]

With nausea caused by liver problems, the symptom may persist, requiring long-term use of anti-emetics, but doing everything possible to support the liver may help. [For more information on liver support, see *Liver Dysfunction*.]

There are many different anti-emetic drugs that can be used to control the symptoms of nausea and vomiting, even when the cause(s) cannot be diagnosed or eliminated. For obvious reasons, however, it is very important that aggressive diagnosis always be done to identify all possible nausea causes so that they can be addressed and eliminated, whenever possible. Using an anti-emetic drug to counter nausea while ignoring the possible causes would be a terrible idea.

Some of the anti-emetic drugs can be given orally while others require either intramuscular injections or intravenous infusions. The best results are sometimes seen using combinations of several drugs that act in different ways. For example, some drugs work by emptying your stomach more quickly, while others block the signals to and from the brain that would otherwise result in nausea. The combination of two such drugs might be effective when a single med does not help.

The anti-emetics that are most commonly used are the phenothiazine derivatives. Included are triethylperazine maleate (Torecan), prochlorperazine (Compazine), and promethazine (Phenergan). Compazine is usually given in doses of 10 mg, every 6-8 hours. Phenergan can be given in doses of 25-50 mg, every 4-6 hours. These drugs are often effective but with long-term use, or with use of higher dosages, side effects can occur, including drowsiness, blurred vision, low blood pressure, dizziness, agitation, and lowered white blood cell counts.

A benzamide derivative, trimethobenzamide hydrochloride (Tigan) is often very useful for nausea, but a common side effect is drowsiness. It is available as an oral drug, usually given in doses of 100-250 mg, 3-4 times per day. It can also be given via a 200 mg suppository or intramuscular injections, usually of 100-200 mg, 3-4 times per day. Another benzamide derivative, metoclopramide (Reglan), discussed above as a treatment used to lessen nausea caused by autonomic neuropathy, can also be used as an antiemetic for nausea that stems from other causes. With the tablet or syrup form, it is usually given in doses of 10-20 mg, 3-4 times per day. For more severe nausea and vomiting, especially that associated with chemotherapy, metoclopramide doses of up to 2 mg per kilogram of body weight can be given intravenously. For severe episodes of nausea (such as might occur immediately after a chemotherapy treatment), 50 mg can be given intravenously every six hours for 24 to 48 hours. Even when used in high doses, metoclopramide generally has few side effects other than drowsiness.

Scopolamine (TransdermScop), the anti-emetic drug often used for motion sickness, is administered via a skin patch that gradually releases the drug over 48 to 72 hours. Generally, only one patch is used every three days. It has been found to be useful for chronic nausea, especially when combined with other drugs.

Haloperidol, given in doses of 1.5 mg, once or twice daily, is another possibility for nausea control. It can be taken at night to help prevent early-morning nausea.

Benzquinamide hydrochloride (Emete-con) is an antihistamine drug that also controls nausea. It is not available in oral form and is usually given as an intramuscular injection. Its most common side effect is drowsiness.

Dronabinol (Marinol) is the synthetic marijuana drug that is an effective anti-emetic, as well as appetite stimulant. In doses of 2.5 to 10 mg, three times per day, it often works to control nausea, although some find the side effects of feeling "stoned" and drowsy too difficult for long-term use. However, when nothing else works to eliminate nausea, Marinol or marijuana itself sometimes do, so its benefits may outweigh its negative aspects for some. Marijuana itself can be a source of the fungus *Aspergillus fumigatus* which causes aspergillosis, a serious fungal infection that can result in pulmonary disease, sinusitis, external and middle ear disease, and brain and muscle abscesses. The fungus can be acquired from moldy marijuana so if you are using marijuana for appetite, nausea, or other indications, it is best to bake it first in order to kill this fungus (though this is relatively rare—but for people with AIDS, a caution to note).

Ondansetron hydrochloride (Zofran) is a serotonin antagonist that is a very powerful anti-emetic, most commonly used for severe chemotherapy-induced nausea. Intravenously, it is usually given in doses of 0.15 mg per kilogram, administered before and after chemotherapy treatments. Some physicians prescribe 10 mg, given intravenously every six

hours, as necessary to control severe nausea. Orally, the usual dosage of Zofran is 4 to 8 mg, given three times per day. University of California at San Francisco researchers have reported that using Zofran in this way is effective for a substantial percentage of those with intractable nausea, whether the cause is drugs or gastrointestinal disease. Granisetron is another oral serotonin antagonist that may be useful in doses of 1 mg, twice per day.

Antihistamines like hydroxyzine pamoate (Vistaril; 10-25 mg every 4-6 hours) or diphenhydramine (Benadryl; 25-50 mg every 4-6 hours) or hydroxyzine hydrochloride (Atarax; 10-25 mg every 4-6 hours) may be particularly useful for suppressing the nausea that can be caused by narcotic painkillers. However, they are generally not potent enough to be useful for other forms of nausea.

Community physicians have reported that the best success often comes with some combination of the above drugs. One such combo that seems to work for many is the use of the oral versions of Tigan and Reglan, along with Marinol. For more severe nausea, the combination of intravenous Reglan or Zofran with either hydroxyzine or scopolamine will often work.

Maintaining food and liquid intake and electrolyte balance during periods of nausea. Nausea and the vomiting that result from it can seriously reduce the intake of calories and nutrients that are needed for continued food health. Always remember that continual good nutrition and adequate fluid intake are both crucial. If nausea and vomiting prevent these, then you may need aggressive measures, including the use of intravenous nutrition (total parenteral nutrition or TPN) to keep your body functioning well until the nausea and vomiting can be resolved. If the nausea waxes and wanes, try to drink lots of fluids and take in lots of protein and calories when you're feeling better in order to make up for the times when you don't feel like it. Try drinking supplemental drinks as an extra boost for both nutrients and fluids. [For suggestions on improving food intake, see *Appetite Loss*.]

Any time there is prolonged vomiting, the body's electrolytes (charged particles that are crucial in many body processes) may become unbalanced. Thus, especially when nausea and vomiting are severe, it will be very important to rebalance the electrolytes, including sodium, potassium, and chloride. This is important both for maintaining your health, and to simply help you feel better. Imbalanced electrolytes can make you feel quite awful, causing a miserable combination of weakness, listlessness, fatigue, thirst, decreased urination, dry mouth, loss of appetite, rapid heartbeat, dizziness upon arising, and, yes, in a vicious circle, nausea.

Doing whatever is necessary to return your body's balance to normal will very rapidly eliminate those symptoms. Your physician should always be watching your electrolyte situation, but you can help prevent problems from developing by drinking vegetable and fruit juices, nectars, or broths during any period when the nausea lessens. You can dilute thicker juices or nectars with water to improve their absorption.

At times, you may need more concentrated sources of electrolyte minerals. The use of commercial electrolyte replenishment drinks can substitute for part of your water intake. Gatorade, the widely advertised sports nutrition drink, is often suggested for electrolyte replacement therapy. However, it is not a very concentrated source of the minerals and it is also loaded with sugar. Pedialyte, an infant formula, is more concentrated in the needed minerals but many people don't care for its taste. The better choices among such products are probably the oral rehydration solutions made with rice syrup, including Infalyte and BestLyte.

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

The other inexpensive option is your own home-made version of electrolyte replenishment liquid. You can mix a teaspoon of "light" salt (which contains potassium mixed with sodium) and a quart of orange juice. Apricot, peach, and pear nectars are particularly rich in potassium so they could substitute for the orange juice, but mix them half and half with water. You can add a tablespoon of pasteurized honey to such mixtures, if you'd like it to taste sweeter.

Keeping any of these electrolyte replacement drinks readily prepared and on hand will be important so that any period when nausea lessens can be a moment when these can be quickly consumed.

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