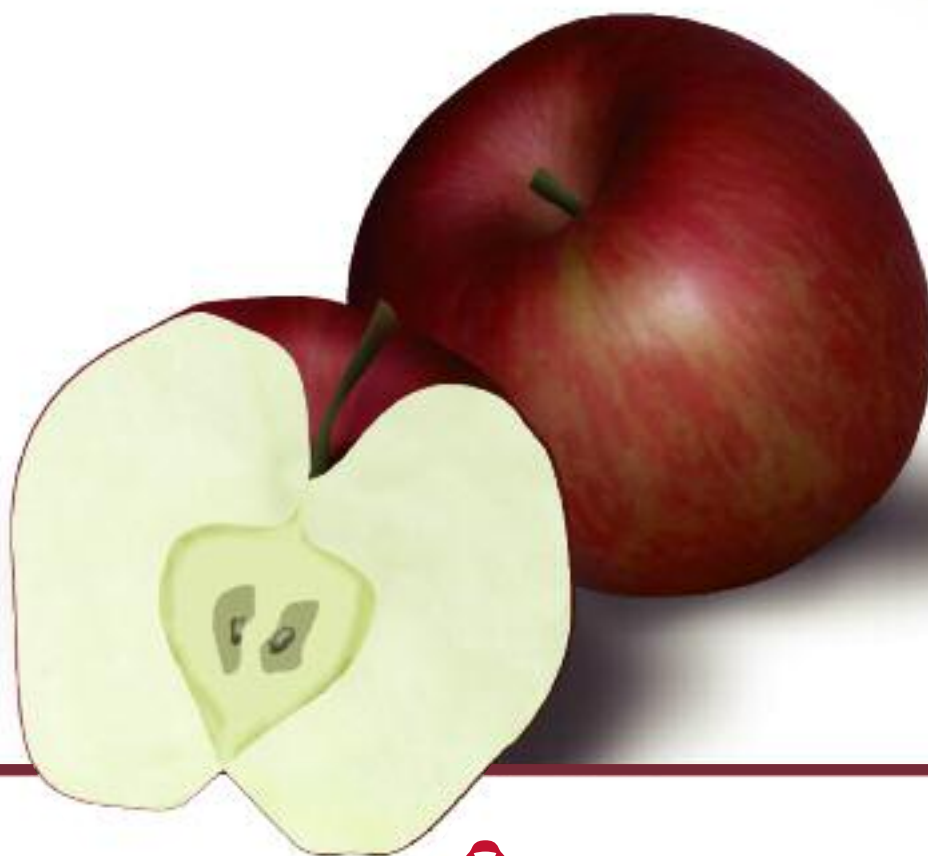


A Practical Guide to  
**Nutrition**

*for People Living with HIV*



Canada's source for  
HIV and hepatitis C  
information

# A Practical Guide to Nutrition

for People Living with HIV

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CATIE thanks the many people living with HIV who contributed their stories, wisdom and advice to this guide. Production of this guide has been made possible through financial contributions from the Public Health Agency of Canada.

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CATIE also acknowledges the Office of Nutrition Policy and Promotion, Health Canada for supplying copies of *Canada's Food Guide*.

#### About CATIE

CATIE is Canada's source for up-to-date, unbiased information about HIV and hepatitis C. We connect people living with HIV or hepatitis C, at-risk communities, healthcare providers and community organizations with the knowledge, resources and expertise to reduce transmission and improve quality of life.

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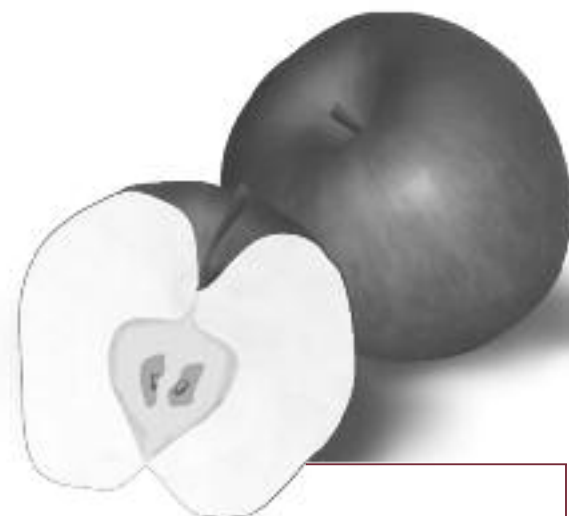
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CATIE offers workshops on nutrition and a wide range of other HIV treatment topics. Contact us at [www.catie.ca](http://www.catie.ca) or 1-800-263-1638 for more information.

This guide is also available online at [www.catie.ca](http://www.catie.ca).

Ce guide est également disponible en français. Visitez [www.catie.ca](http://www.catie.ca) ou téléphonez à 1-800-263-1638 pour commander votre copie.

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# Part One: A Three-Course Meal

## 1. Appetizer – You, Food and HIV

### Why this guide is important for you

The saying goes: You are what you eat. The good news is that nutrition is in *your* hands—and in your mouth. Good nutrition can keep you healthy and decrease your chances of getting other chronic diseases. People with HIV who get the nutrients they need get sick less often, are stronger and have improved quality of life. With good nutrition and medical care you can not only live longer with HIV... you can live better.

### Nutrition in HIV/AIDS

#### Nutrition and your immune system

We have known for decades that nutrition plays a major role in immunity and the ability of the immune system to respond to infection. The nutrients our bodies derive from food keep the immune system strong in countless ways. For example, the skin and linings of the lungs and gut provide the first line of defence by acting as physical barriers to invaders such as viruses and bacteria. These barriers are very sensitive to nutrition, especially vitamin A, and deteriorate when people don't get proper nutrition. When this happens, viruses and bacteria have easier access into the body.

As another example, the body mounts a defense against invaders by using different types of immune cells and chemicals. This defense requires energy, proteins, vitamins and minerals—all of which are supplied by food. A lack of any of the key nutrients can weaken the body's ability to fight infection.

#### How HIV affects nutrition

Nutritional issues are common in HIV disease. At some point, almost everyone living with HIV will face challenges in maintaining good nutrition. Problems can be related to HIV infection itself and to the effects of anti-HIV therapy, also called HAART (highly active antiretroviral therapy). For example, the virus can infect some of the immune cells in the intestines, causing local inflammation and making it more difficult to absorb nutrients and medicines. This can result in weight loss or vitamin and mineral deficiencies.

Also, the nutritional needs of people with HIV are greater because the body has to work overtime to deal with a chronic viral infection and to fight off opportunistic infections. People co-infected with hepatitis C, which attacks the liver, are even more at risk of nutritional problems because the liver has a central role in processing all nutrients and most drugs. Finally, poor appetite, fatigue, nausea and other side effects of medications can make it hard to eat well.



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*Your immune system  
needs good nutrition  
to function well.*



*Good nutrition is an important part of your HIV care plan.*

## Nutrition as part of your HIV care plan

Although there is still no cure for HIV, HAART has given many people with HIV hope and renewed health. While nutritional strategies cannot replace HAART, good nutrition can be an important part of your overall HIV care plan. In the time before you start HAART—which might last from a few weeks to many years after your diagnosis—good nutrition and a healthy lifestyle are two important strategies to maintain good health and quality of life. And once you start HAART, nutrition is still an important component of your plan to keep yourself healthy and your body's immune system strong.

## Nutrition's role in other chronic diseases

In recent years a great deal of attention has been paid to the role of nutrition in preventing illnesses like heart disease, diabetes and certain cancers—conditions that are thought to be influenced by nutrition and lifestyle. People with HIV are at increased risk of developing these conditions due to the virus itself or to the side effects of HAART. People with HIV are also living longer and getting older, which incurs a whole range of health concerns that can be influenced by nutrition and lifestyle. All this to say that by reading this book you are taking care of much more than just HIV.

## How this book can help you

This practical guide is divided into two parts. This first part is an overview of nutrition basics and suggestions for designing a healthier diet. While you are free to read only bits and pieces, this section is meant to be consumed like a meal, with appetizers first and dessert last. The second part is more like snacks—browse through and take only what you need. In this section you will find tips on vitamin and mineral supplementation and how to deal with more specific issues, such as symptoms and side effects. There is also lots of information on nutrition and HIV on the Web. Check out Appendix D for a list of reliable sites.

One of the biggest barriers to good nutrition faced by people living with HIV, in Canada and around the world, is not being able to get the food they need in order to have healthy, active lives. This guide will attempt to address this issue by including strategies for more affordable grocery shopping.

This practical guide is part of a series and is meant to be used in conjunction with the other guides. The other titles are:

- *A Practical Guide to Drug Treatment*
- *A Practical Guide to Complementary Therapies*

- *A Practical Guide to Herbal Therapies*
- *A Practical Guide to HIV Drug Side Effects*

All of these guides are available at [www.catie.ca](http://www.catie.ca) or by calling us at 1-800-263-1638.

## Finding a nutrition professional

This guide is meant to help you make informed decisions about your nutrition care plan, but you may decide to look to a nutrition professional for more advice. In fact, before making any significant changes in your nutrition, you should talk with a nutrition professional. They will take into consideration your unique health situation and needs and provide the best care and advice.

When choosing a nutrition professional, there are some things you should know about their qualifications. *Registered dietitians* have years of education and training in the science of food and nutrition and are good at translating science into real-life food choices. The term *dietitian* is protected and can only be used by a person with the right qualifications. Dietitians can be found at hospitals, some HIV clinics and community agencies. To find a dietitian in your area, ask your healthcare team to refer you. Or check the Dietitians of Canada Web site at [www.dietitians.ca](http://www.dietitians.ca).

*Naturopathic doctors* have four years of pre-medical training and four years of full-time naturopathic medical training; they must pass licensing examinations and carry malpractice insurance before entering practice. They are very well trained in the nutritional use of foods for various conditions. Their training also includes nutritional supplementation and botanical and homeopathic medicine. To find a qualified naturopathic doctor near you, call the Canadian Association of Naturopathic Doctors (CAND) at 1-800-551-4381 or visit them online at [www.cand.ca](http://www.cand.ca).

The term *nutritionist* is generic and can be used by anyone regardless of education or training. When getting advice it is important to find out more about the nutritionist's qualifications. You might also get nutritional information from people at stores that sell vitamins and other health products, but remember that they are in the business of selling.

Unfortunately, not every person with HIV has easy access to a dietitian or naturopathic doctor. Your doctor and other members of your healthcare team may also be able to help. Doctors can answer questions related to treatment, while nurses, pharmacists and other members of your healthcare team can provide practical tips about dealing with side effects.



*Accredited nutrition professionals include dietitians and naturopathic doctors.*

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## 2. The Main Course – Healthy Eating

### Building a healthy diet

Food is the foundation of nutritional health. Nothing can replace food. It can be supplemented, adjusted, increased or decreased, but not entirely replaced. Food provides the building blocks of carbohydrates, proteins and fats (the macronutrients), as well as vitamins and minerals (the micronutrients). The best way to make sure you're getting all of these nutrients is by eating a wide variety of healthy foods every day.

Most countries have a food guide to help people make good decisions around food choices. *Canada's Food Guide* is divided into a rainbow of four food groups:

- vegetables and fruits
- grain products
- milk products and alternatives
- meat and alternatives

The 2007 food guide recommends the following daily servings of each food group:

- at least 7 servings of vegetables and fruits
- 6 to 8 servings of grain products
- 2 to 3 servings of milk products and alternatives
- 2 to 3 servings of meats and alternatives

See the back pocket of this guide for copies of *Canada's Food Guide*—the general version and the First Nations, Inuit and Métis version are included—or visit [www.hc-sc.gc.ca/fn-an/food-guide-aliment/index\\_e.html](http://www.hc-sc.gc.ca/fn-an/food-guide-aliment/index_e.html) to download a copy. The guide includes more specific information based on your gender and age and gives examples of servings.

Keep in mind that food guides are developed for the population of the whole country. The recommendations don't take into account your special needs as a person living with HIV. And there may be other factors, like additional medical conditions, that may affect your diet. You can use the food guide as a good way to start building your balanced diet, but make sure you talk with your doctor and your dietitian about any special adjustments you may need to make.

### Understanding food

You're likely familiar with the terms *carbohydrate*, *protein* and *fat*. They are the building blocks of food. They are also the building blocks of our bodies—they are used to create and maintain the physical structures of our bodies. Carbohydrates, protein and fat also provide energy for *metabolism* (the name for all of the normal chemical reactions that go on inside the body). We usually use the term *calorie* when talking about food energy.



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*Canada's Food Guide will give you the basics of healthy eating.*



Carbohydrates, protein and fat are called *macronutrients* because the body needs them in large amounts. Getting the right kinds and amounts of each macronutrient is critical to staying healthy.

### Carbohydrates

Carbohydrates (carbs for short) are mainly used for energy. They fall into two groups, simple and complex.

**Simple carbohydrates** include sugars, fruits (especially juices) and white starchy foods such as white bread and white rice. These foods are digested easily and so are fast sources of energy. When you eat simple carbohydrates, the level of sugar in your blood goes up quickly but is held within a normal range by insulin (see “Insulin resistance and diabetes,” Chapter 5).

**Complex carbohydrates** which include whole grains, legumes (beans and peas) and vegetables, raise the blood sugar levels more slowly and generally provide more fibre, vitamins and minerals than simple carbohydrates.

Carbohydrates are the most affordable foods and form the backbone of the diet. Generally speaking, complex carbohydrates are a better choice than simple carbohydrates. The body handles carbohydrates best when they are spread throughout the day, so you should try to include them in every meal.



*Complex carbohydrates are a healthy source of energy.*

*Main sources of complex carbohydrates: whole grains, beans and peas, vegetables and fruits*

## Balancing carbohydrates

### *Getting started*

- Eat carbohydrates with every meal. They are affordable, nutritious and satisfying.
- Eat some fruits and vegetables every single day.
- Choose whole grain breads and cereals. *Canada's Food Guide* recommends that at least half of your grain products every day should be whole grain.

### *Other tips*

- Choose more complex carbohydrates, like brown or wild rice, whole wheat bread and pasta, oatmeal, whole grain cereals, barley and vegetables.
- Work up to eating 7 servings of fruits and vegetables daily. Frozen vegetables are a healthy alternative to fresh ones and keep longer.
- Limit simple carbohydrates by reducing consumption of fruit juices, soft drinks and other sweetened drinks, desserts, candies and sugar.
- Lower-cost carbohydrates include oatmeal, rice, bread, and fruits and vegetables in season. Small produce stands and farmers' markets sometimes offer lower prices for fruits and vegetables.



*Protein is especially important for people with HIV.*

*Main sources of protein: meats, fish and shellfish, poultry and eggs, legumes and soy products, nuts and seeds, milk and dairy products*

## Proteins

Proteins have many important functions in every cell and system throughout the body. They are used to make cell structures, hormones, enzymes and components of the immune system. In general, **people living with HIV need higher amounts of protein** to maintain lean body mass and provide building blocks for the immune system. However, some medical conditions can be made worse by too much protein, so it is important to follow any directions your doctor gives you about your protein requirements.

Foods high in protein include meats, game, fish and shellfish, poultry, eggs, legumes (dried peas and beans), tofu, peanut and other nut butters, nuts and seeds, milk, cheese, yogurt and soy milk.

Aim for at least 1 gram of protein per kilogram body weight per day (1 gram per 2 pounds of body weight). See Appendix A for a list of good food sources of protein and Appendix B to figure out how much protein you need.

## Boosting protein

### *Getting started*

- Find out which foods are rich in protein (see Appendix A) and then make sure you have them on hand.
- Try to eat protein-rich foods at least 3 times a day.

### *Other tips*

- Work protein-rich foods into every meal and snack. For example, a glass of milk or soy milk will add protein to a bedtime snack.
- Powdered skim milk can be used to increase the protein content of foods and beverages.
- Protein powders can be used to increase protein when you're finding it hard to get enough from your regular foods. Whey protein may be better for people with HIV because of its antioxidant-stimulating properties. It is possible to get too much protein from powders because they can be very concentrated. Too much protein places a lot of stress on the liver and kidneys—the organs where protein is metabolized and excreted.
- Lower-cost protein sources include peanut butter, tofu, legumes, canned fish, eggs and milk. Milk powder may seem expensive but it can go a long way and does not require refrigeration.
- If you get paid once a month and you have a freezer, buying meat in bulk can be more economical. Package the meat into single portions and then freeze.

## Fats

Fats and oils are the most concentrated source of energy in our food supply. Some fats are necessary in our diets to provide building blocks—called *essential fatty acids*—that the body can't make. However, eating too much fat is dangerous because it can clog the arteries and contribute to problems with your heart and blood vessels.

Some types of fats are more hazardous to our health because they increase the risk of heart disease. **Saturated fat**—found in animal fats, dairy fat and palm oil—should be limited to a very small amount. It is hard to completely avoid saturated fats because they occur naturally in many foods that are part of a healthy diet. **Trans fats** or trans fatty acids—found in many processed foods—are believed to significantly increase health risks and should be avoided. In Canada, laws require food labels to list the amount of trans fats in the food. Reading ingredient lists can also identify trans fats—sometimes manufacturers use the term *partially hydrogenated oil* which is another name for trans fats. Processed snack foods like cookies, crackers and chips, as well as hard margarine and partially hydrogenated margarine are common sources of trans fats.

**Healthy fats** are composed more of *monounsaturated fatty acids* and *omega-3 fatty acids*. Examples of healthy oils and fats are olive oil, canola oil, flax oil, nut oils, nuts and avocados.



*Healthy fats include monounsaturated fats and omega-3 fatty acids.*

*Examples of healthy fats: olive oil, canola oil, flax oil, nut oils, nuts, avocados*

## Eating fat the healthy way

### **Getting started**

- Learn to identify all the ways you get fat in your foods. Read labels and watch how you cook.
- Choose lower-fat dairy products such as skim or 1% milk, low-fat yogurt, light cream cheese and lower-fat cheese (e.g. skim milk mozzarella).
- Cut back on greasy, fatty foods, such as fried foods and fatty red meat.

### **Other tips**

- If using margarine, use a type that is non-hydrogenated. If using butter, use sparingly.
- Eat more fish, especially fatty fish like salmon, sardines, anchovies, herring and mackerel.
- Use olive and canola oil for cooking.
- Use lean cuts of meat and trim off visible fat. Remove the skin from chicken and other poultry either before or after cooking.
- Baked goods and pastries are very high in fat (and not the good kind).
- Learn to identify trans fats by reading labels; avoid products with “partially hydrogenated oil.”



*Your state of health can affect how much fluid you should drink. Check with your doctor.*

### Don't forget the fluids

Fluids are required to keep the body's cells working smoothly. Because we lose fluid through urine, stool and sweat, it needs to be replaced each day. An easy-to-remember rule of thumb is to drink 8 glasses of water a day. However, the amount of fluid you need depends on your body size and how much water you lose. If you want more detailed information about how much fluid you should be consuming, see Appendix B. Also bear in mind that other factors can play a role in how much fluid you need. For example, some medications require a high intake of fluids to protect the kidneys, while some medical conditions can be made worse by drinking too much water. Be sure to follow any directions given by your doctor about how much fluid to drink.

### Drinking enough fluids

#### *Getting started*

- Get more of your fluids as water and less as sweet beverages (e.g. juice, drink crystals, soft drinks) and coffee.
- If you don't like the taste of water, add one or two slices of fresh lemon or lime to a pitcher of water and store it in the fridge.

#### *Other tips*

- If you're not used to drinking much water, fill a bottle or jug with the required amount each day and do your best to drink all of it.
- Drink small amounts often throughout the day. Fluids come in the form of water, juices, milk, soups, herbal teas and, according to some experts, even coffee and tea.
- Alcohol does not count in fluid intake because it removes water from your body.
- Keep water at your bedside for drinking during the night.

### Meal planning

Before looking at how to build a diet, a menu or even a meal using the fundamentals of good nutrition, stop for a second and think about this: You've gotten this far in life, so you must be doing some things right when it comes to food. But there is always room to do better. If you really want to know how you're doing, here's something to try: For three days, write down everything you eat and drink. Try to include one weekend day in your three days. This should give you a general idea of your eating habits right now.



*When changing your eating habits, start with one thing at a time.*

There's no way around it: Changing your eating habits is hard work. But don't think of changing everything at once. Start with one thing. When you succeed, feel good. When you slip, don't feel bad. The advantage of nutrition is that you always have a chance to do it better at the next meal or snack.

One of the keys to eating well is to make sure you have healthy food available when you're hungry. This can range from throwing an apple or some nuts in your bag for a quick, easy snack to planning a menu for several days. Healthy eating does require some thoughtfulness and preparation, including planning meals and purchasing the required groceries. There will be more of this kind of work in the beginning as you learn what works for you. As you become more knowledgeable, it will likely become easier. It might even become second nature.

## Stocking a healthy pantry

### ***Getting started***

- Identify the things you need to do to eat more healthfully (e.g. replace your afternoon chocolate bar with a banana, your late-night bag of chips with some almonds and a glass of soy milk).
- Start with small steps and try to change only one thing at a time.

### ***Other tips***

- Plan ahead. Start with planning the main meal of the day for the next 2 or 3 days. Work up to making a weekly menu. Make a list of the groceries you'll need.
- Bring the list to the grocery store and have a snack before you go. Both will help keep you from making impulse purchases.
- Don't purchase large packages of unhealthy foods that you can't resist (e.g. the econo-bag of potato chips that always seems like a bargain).
- Read the nutrition information and ingredients on food packaging. Your dietitian can help you learn how to interpret the information.
- Focus on more unprocessed foods and whole grains. Over time, you might find you skip the grocery aisles filled with processed foods.
- Think about brushing up on your cooking skills. Crack open a recipe book and start with the basics. Simple foods from natural ingredients are not only healthier and easier to cook, they are often cheaper.
- Carry healthy snacks. This will decrease the likelihood of needing fast food or junk food to curb sudden hunger.
- If you get paid once a month, stock up on foods like oats, peanut butter, canned fish, brown rice, pasta, canned lentils, black beans, baked beans, pea soup and frozen vegetables.

- No fridge or stove? There are many foods that are nutritious, keep well and don't require a lot of cooking, including:
  - bread or bagels
  - peanut butter and nuts
  - cereal and granola bars
  - powdered milk
  - canned salmon, sardines and tuna
  - canned beans, vegetables and fruit
  - rice cakes and crackers
  - raisins, bananas and apples
  - nutrition drinks
- Find out about and use food programs in your neighbourhood.
- Join a community kitchen if there is one nearby. This is a good way to learn how to cook and save money on meals by sharing the cost. They also make meals more social, an important benefit of good nutrition.
- Read "KISS in the Kitchen – 15 food groups to pack in your pantry" in the Spring/Summer 2004 issue of CATIE's *The Positive Side*, available at [www.positiveside.ca](http://www.positiveside.ca). And don't forget to check out the Web resources listed in Appendix D for other ideas.

### Planning a menu

One way to build a menu is to arrange your daily servings of the different food groups into a series of meals and snacks. On the next page we've outlined a five-step path to building a daily menu that includes five meals or snacks. It might seem counter-intuitive to build a menu up from components, but it's a good way to ensure you're getting what you need.

## Planning a menu: 5 steps to getting started



### 1. Start with fruits and vegetables (7 servings)

- There are many healthy foods to choose from in this category. The serving sizes are quite small (about 1/2 cup) so you might choose 2 servings of the same food (e.g. 1 cup of cooked carrots).
- If you currently eat 1 serving per day, try to add a few more servings even if you don't get up to 7. Spread out the fruits and vegetables throughout your meals and snacks.
- Make sure you eat both vegetables and fruits throughout the day, not just one or the other.
- Include fresh, frozen, canned or dried vegetables and fruits as well as vegetable or real fruit juice. Eat more whole fruit and drink less juice.
- Look for colours, lots of different colours. Try to include 1 dark green (e.g. broccoli, spinach, kale) and 1 orange (e.g. carrot, squash, sweet potato, pepper) vegetable.
- Some people with HIV may not be able to tolerate this many servings of fruits and vegetables because of the high fibre content. Eat what you can. (See "Figuring out fibre," Chapter 6.)

### 2. Then add grains (6 servings for women, 8 for men)

- Spread out the servings throughout your meals. For example, you might want to have 2 servings at breakfast, lunch and dinner. Extras can be added as snacks.

- Include foods such as bread or bagels, pasta, hot and cold cereals, rice, barley, quinoa and couscous.
- Make most of your choices whole grain (e.g. whole wheat, oat, flax, millet, buckwheat, spelt and brown or wild rice).

### 3. Combine with milk products and alternatives (2-3 servings)

- Include cow's or goat's milk, cheese, yogurt, kefir and milk alternatives (such as soy, almond or rice milk).
- If you need extra protein or calories or you have osteopenia, you might need more than 3 servings. (See "Bone health," Chapter 5.)
- When choosing a milk alternative make sure it is fortified with calcium and vitamin D.

### 4. Serve with meat and alternatives (2-3 servings)

- Include food from animals, such as meats, fish, poultry and eggs, as well as legumes (dried peas, lentils and beans) tofu, peanut butter, nuts and seeds. (See Appendix A for serving sizes.)
- Choose 3 or more servings if you need extra protein.
- Choose lower-fat products and cook with little added fat.

### 5. Sprinkle lightly with fats and oils

- Aim for about 2-3 tablespoons of added fats daily. This includes butter, oil, salad dressing, margarine and mayonnaise.

*Try to eat a wide variety of foods to get the nutrients you need.*

## A sample food plan for one day

	Vegetables and fruits	Grains	Milk and alternatives	Meat and alternatives	Fats and oils
<b>Breakfast</b>					
1/2 cup berries	1				
1 cup bran flakes		1			
1 cup milk			1		
<b>Lunch</b>					
1 cup vegetable soup	1				
1 cup green salad	1				
Salad dressing					1 tbsp
Chicken breast sandwich		2		1	1 tbsp
<b>Afternoon snack</b>					
Apple	1				
1 container yogurt (175 g)			1		
<b>Dinner</b>					
1/2 cup cooked carrots	1				
1/2 cup cooked broccoli	1				
1 cup brown rice		2			
Grilled fish				1	
<b>Evening snack</b> (good with meds)					
Banana	1				
1 small whole grain bagel		2			
Cheese (increase or decrease fat depending on meds)			1		2 tbsp
<b>Total</b>	7	7	3	2	4 tbsp

This menu provides approximately 2,200 to 2,400 calories and 85 to 90 grams of protein.

In this plan, we haven't worried too much about the total number of calories you are eating. By following the recommended servings of *Canada's Food Guide* and by listening to your body, you will likely have a good idea of how much food is enough. If you want more information, see Appendix B for recommended caloric intake by body weight.

If you are trying to gain or lose weight, counting calories is a useful tool. You'll most likely want to know how many calories to add or cut out rather than total numbers required. See Chapter 3 for further discussion on calories and weight.

### A meal is more than just food

There's a lot more to a meal than just the food. There is a whole emotional and social context that comes with food. Sometimes we use food to celebrate, sometimes to console. And we often use it as a way to spend time with other people. When thinking about meal planning, don't forget this important aspect of food. And try to use it to make your life better. That could mean sharing a meal with friends or family, or taking pleasure in the fact that you created the meal yourself. Living



with HIV poses many challenges and taking charge of your nutrition can be a positive, enriching experience.

## Different diets

There are many factors that can affect your diet: medical conditions, religious beliefs, cultural practices or ethical concerns. There are so many variations that we can't address them all here. Instead, try to get advice from someone, like a dietitian or doctor, who has experience with people in your situation.

### Vegetarian diets

Many people choose to avoid animal foods for health, religious or ethical reasons. There are many different kinds of vegetarian diets, from strict forms like vegan and macrobiotic to more relaxed diets that include some animal products (e.g. eggs and dairy).

Vegetarian diets are generally very healthy because they are high in whole grains, fruits and vegetables. However, for people living with HIV, it may be more difficult to obtain enough protein. Those who consume eggs and dairy products find it easier to get adequate protein by including these foods regularly, but vegans who avoid all animal products need to be more aware of protein intake and ensure that they get enough. It is important to include vegetarian sources of protein, such as soy products, legumes, gluten, nuts and seeds, at each meal and snack.

Other nutrients you might not get enough of are iron, zinc, vitamin B<sub>12</sub>, calcium and essential fatty acids. To be sure you are meeting all your nutritional needs, get advice from a dietitian.

## Meeting your needs without eating meat

- Focus on protein-rich foods. Include vegetarian sources of protein with every meal and snack.
- Eat a wide variety of foods to get all the building blocks needed to make the body's protein.
- Get plenty of iron from greens, whole grain cereals and legumes. Iron is absorbed better if you eat food high in vitamin C (e.g. oranges, red peppers) at the same time.
- If you are vegan and eat no food from animals, you should talk to your doctor about whether you need to watch the levels of vitamin B<sub>12</sub> in your blood (see "Key vitamins and minerals for HIV," Chapter 4).



*What ever diet you follow, make sure it meets your nutritional needs as a person with HIV.*

### Diets of different cultures

In Canada, people with HIV come from diverse cultural backgrounds and have diverse diets. People often mix their culture's eating habits with the typical North American diet or with food from other cultures. This can be a great advantage because it allows people to benefit from the nutritional strengths of each culture's diet. For example, African diets include foods that are good sources of complex carbohydrates. Traditional diets of Canada's Aboriginal people tend to be rich in protein from fish and game and can be high in antioxidants if locally available fruits, berries and greens are eaten regularly. Asian and South Asian diets incorporate ideas of foods that can heal, which can be valuable when dealing with side effects of medication.

Whatever diet you follow, the most important thing is to make sure it meets the basic nutritional needs of people with HIV.

- Pay attention to your weight and make sure you're getting enough calories to maintain your weight. Choose complex carbohydrates as a main source of calories.
- Get enough protein. In Canada, good sources of protein are readily available and relatively affordable.
- Watch out for deficiencies in vitamins and minerals (see Chapter 4). Every person with HIV would benefit from taking a multivitamin-mineral supplement every day.
- Incorporate your strategies for managing common side effects and symptoms into your nutrition plan. If you decide to take an herbal therapy, be sure to tell your doctor and pharmacist, so they can make sure it will not interact with any medications you're taking.

### Food and water safety

#### Food hygiene and sanitation

People with weakened immune systems are more vulnerable to illness from food that has become contaminated by disease-causing germs. Often called "food poisoning," the symptoms include nausea, vomiting, chills, cramps and diarrhea. They can be short-lived or can become chronic and difficult to treat, especially for people with HIV. Common types of bacterial infections are salmonella, campylobacter, listeria and E coli. Other harmful substances can sometimes be found in food, like moulds and industrial toxins such as PCBs and mercury.

You usually have little control over food production, transportation, processing and storage, but you do have control over how you select your food and handle it at home.

## Keeping your food safe

- When **buying** food, avoid damaged cans and packages. Buy only pasteurized milk, cheese, honey, apple cider and fruit juices. Check the “best before” date. Avoid alfalfa sprouts, cracked eggs and bruised or mouldy fruits and vegetables. Buy cold and frozen foods last when shopping and go directly home to refrigerate or freeze them.
- When **storing** food, keep perishable items in the fridge and keep meats on the bottom shelf. Don’t reuse plastic bags for food storage. If foods have become mouldy (e.g. cheese) discard them because mould has invisible roots penetrating the food.
- Food **preparation** is one area where many people have acquired unsanitary habits. “Be clean” is the motto of food preparation: clean hands, clean work surfaces, clean utensils and clean foods. Wash your hands with warm, soapy water. Wash fruits and vegetables under running water. Thaw frozen foods in the fridge, not at room temperature. Avoid contamination by keeping raw meats, their juices and packaging away from other foods. After preparing raw meats, clean the preparation area and all the equipment and cutting boards with hot, soapy water. To be sure, you could also rinse with a weak bleach solution (1 teaspoon of bleach in 1 litre of water).
- When **cooking**, make sure all food from animals (including meats, poultry, fish and eggs) is well done. Always keep hot food hot and cold food cold. Hot dogs should be cooked steaming hot. Cut the green part off potatoes and eat the white part inside. Don’t eat uncooked cookie dough or cake batter because of the potential of salmonella in the raw eggs.
- **Leftovers** are safe and practical to eat if handled properly. Store leftovers in the fridge or freezer right away. If it is a large amount of hot food, place it in a container and sit the container into a large bowl of ice water to cool it down before refrigerating. Eat leftovers within 2 to 3 days; label them with the date so you know how long they have been in the fridge. Reheat leftovers to steaming hot. When in doubt, throw it out because contaminated food does not always look or smell bad.
- When **eating out**, choose restaurants that are clean and appear to have a high standard of food sanitation. Eat cooked foods like well-done poultry, meat, shellfish and eggs. Hot foods should come to the table hot. Avoid salad bars, sandwich bars and juice bars. Some foods, like Caesar salad, gazpacho and mousse, may contain raw eggs. Sushi made with vegetables and cooked seafood is safer than sushi made with raw seafood. Take leftovers home and refrigerate immediately.
- When **travelling**, think even more about the safety of the food you eat and the water you drink. Some places you visit might not have clean water or safe food-handling practices. (For more information, see “Vacationing with the Virus,” in the Spring/Summer 2006 issue of CATIE’s *The Positive Side*, available at [www.positiveside.ca](http://www.positiveside.ca).)



*When preparing food  
remember the motto  
“be clean”.*

- Reduce exposure to contaminants like mercury and PCBs by eating a wide variety of foods and limiting food known to have high levels of specific toxins. Tuna, for example, is theoretically a healthy food but should be limited to about 2 to 3 servings per week because of high mercury levels. Pregnant women and young children are particularly vulnerable to the ill effects of mercury.

### Water safety

Normally the water supply in Canadian cities and towns is safe to drink because chlorination kills most of the germs that cause infection and diarrhea. *Cryptosporidium* is one germ that is not killed by chlorine, but it is not usually found at high enough levels to cause problems. If *Cryptosporidium* levels increase to a dangerous level, a public health warning is issued.

People with low immune function—especially with a CD4+ count of less than 200—are at increased risk of getting infected by *Cryptosporidium* and may need to take special precautions (see below). People who obtain water from wells or other sources of untreated water should also follow these guidelines even if they have a high CD4+ count. If there is a water advisory, it also may be necessary to use treated water to wash foods and brush your teeth.



*Use purified water if your CD4+ count is below 200 or if your water supply is not treated.*

### Treating your water right

#### ***Use one of the following three methods:***

- Boil tap water for 1 minute at a rolling boil. Boil water once a day and keep it in the refrigerator. Boiled water should be used for drinking water, ice cubes and making juice, coffee or tea.
- Filter the water with filters that remove all particles that are 1 micron in size or larger. Some commercial filters are not small enough. Make sure the filter you are using is the right size. For example, the Brita filter for the pitcher is not the right size but the Brita filter for the tap is.
- Use bottled water that has been distilled or treated by reverse osmosis. Not all bottled water has been treated, especially the water sold in individual-size bottles. Water coolers and other containers for bottled water can be a major site of microbial growth. Bacteria and moulds grow in these containers; they must be thoroughly cleaned inside with a vinegar solution at least once a month. Don't reuse individual-size water bottles. They can harbour bacteria and moulds.

#### ***What's different for people with HIV***

Most of these guidelines apply to everyone but they are especially important for people with lower CD4+ counts. People with HIV with a CD4+ count less than 200 have the highest risk of getting sick from food or water contamination and should follow these guidelines carefully.

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## 3. Dessert – Nutrition, Weight and HIV

Regardless of HIV status, the equation is simple: Your body weight is a result of how many calories you take in through food and how many calories you use up through all the activities of your day. This equation is called *energy balance*, and HIV can affect energy balance by increasing the amount of energy used up in the fight against the virus.

Your weight is an indicator of whether or not your energy needs are being balanced by your food intake. In this section we take a look at weight and what to do when weight gets too low or too high.

### Energy balance

The body requires fuel each day to have energy to perform all the activities required to sustain life, from the pumping of your heart to your walk in the park. Calories are the measure of energy or fuel that food provides. All foods provide calories: carbohydrates and proteins provide 4 calories per gram and fat provides 9 calories per gram.

REE (resting energy expenditure) is a measure of the number of calories needed by a person when the body is at complete rest. Research has shown that asymptomatic people with HIV have an REE that is slightly increased, by about 10%, because of the widespread effects of chronic inflammation caused by the virus.

### Keeping energy in balance

- People with HIV who are asymptomatic and at an ideal weight need 30 to 35 calories per kg body weight per day (14 to 16 calories per pound).
- To lose weight, decrease calories by 300 to 500 calories per day. This can be done by cutting out sweets and high-fat snacks and decreasing portion sizes.
- To gain weight, increase calories by 300 to 500 calories per day. One peanut butter sandwich and a glass of milk provide about 400 calories.

### Weight

Your body weight is an important indicator of your health and nutritional status. Unwanted weight changes can be the first sign that there is an underlying health problem. Weighing yourself once tells you if your weight is in a healthy range, or if it has changed compared to your usual weight. Tracking your weight over time reflects what's going on with your health.

Experts classify people as being underweight, ideal weight, overweight or obese. Different degrees of health risk are assigned to the different groupings. The BMI (body mass index) is one tool you can use to



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*Keep track of your weight as one way to monitor your health.*

classify your weight. (BMI is calculated as weight [in kilograms] divided by height [in metres] squared.) The BMI has limitations in that it does not factor in gender, age, ethnicity or body composition (see next section). However, it remains the standard for evaluating a person's health risk according to their weight. See Appendix C for a chart that will help you quickly determine your BMI.

The following is the classification system for BMI developed by the World Health Organization. **For people living with HIV, a BMI below 20 is considered underweight.**

Classification	BMI (kg/m <sup>2</sup> )	Health Risk
Underweight	under 18.5	increased
Normal	between 18.5 and 24.9	least
Overweight	between 25 and 29.9	increased
Obese	over 30	high

### Body composition

Body weight doesn't tell the whole story about your health. Picture two people, one muscular and one obese, who each weigh the same. Obviously these two people would be in very different states of health. Now imagine somehow being able to separate the different substances that make up your body (fat, muscle, etc.) and weigh each of them. This would give you a useful inventory of what your body is made of—your *body composition*. This inventory is often divided into two parts, the total amount of bodily fat, called *fat mass*, and everything else, called *fat-free mass*.

**Fat** is present in the body as *essential fat* and *stored fat*. Essential fat is required for normal metabolism and the physical structure of the body. The amount of essential fat is fairly stable and does not change easily. The other kind of fat, stored fat, acts as a reserve of energy, similar to a savings account at a bank. Stored fat is the most variable body compartment: It changes depending on energy balance. Most stored fat is found just under the skin. This is called *subcutaneous fat*, and it is the tissue that decreases in people who have fat wasting, or lipodatrophy (see “Lipodystrophy,” Chapter 5).

**Fat-free mass**, also called **lean mass**, can also be subdivided into *body cell mass* and *extracellular mass*. Extracellular mass is made up of the body's “inert” parts: water and fluids, bones and structural tissues. Body cell mass includes the muscles and organs. Muscle tissue is the largest reservoir of body cell mass and the most susceptible to change. Because it is critical for survival, a loss of even 5% of body cell mass is considered severe.

Studies have shown that people with HIV sometimes lose body cell mass over time even though weight may stay the same. This is why it's important to monitor your body composition rather than just your body weight and to try to maintain a good amount of muscle mass.

### Analyzing your body

- Try to find a dietitian who can perform body composition analysis.
- Measure your own waist at a point just above the belly button to see if you are at increased risk of heart disease. If you're a man, your risk is increased if your waist is greater than 102 cm (40 inches). For women, the risk is higher when your waist is larger than 88 cm (35 inches).

### Weight loss

Weight loss continues to be a difficult problem for people with HIV. Studies have shown that even a small amount of unwanted weight loss increases the chance of getting sick and dying. Whenever weight is lost, some comes from stored body fat and some from lean tissue. How much is lost from those two compartments depends on the underlying cause of the weight loss.

When weight loss is due to not consuming enough calories—called *starvation* in medical terms—about 40% of the weight lost comes from lean mass and 60% from fat. When there is an infectious process with fever, the body develops a stress response to the infection and up to 80% of the weight lost will be from lean mass and only 20% from fat. This is because the body is rapidly breaking down muscle to provide the ingredients needed to fight infection. This type of weight loss is more serious and more difficult to reverse.

In HIV disease there are many factors that cause weight loss, but not consuming enough calories is generally the driving force. If you have any symptoms or side effects that make it hard to eat, talk with your doctor or dietitian right away. It is important to prevent weight loss and the downward spiral of malnutrition. See Chapter 6 for ideas on how to deal with these and other issues.

The primary strategy for treating weight loss is to increase macro-nutrient intake to the level needed to promote weight gain. This is achieved with a high-calorie, high-protein diet and a multivitamin-mineral supplement (see “Weight loss and wasting,” Chapter 6).

### Weight gain

Being overweight or obese is increasingly common among people with HIV, as it is among the general Canadian population. The reasons for



*Be sure to do something about unwanted or unexpected weight loss right away.*



*If you are overweight or obese, losing even 5% of your weight will have health benefits.*

this are unclear but may be related to the fact that people with HIV are living longer and better. Obesity—defined as a BMI over 30—comes with its own set of health risks, including heart disease, diabetes, high blood pressure, gallbladder disease, fatty liver disease, loss of bladder control and some cancers. Years ago it was unheard of to recommend that a person with HIV lose weight but it is now clear that the health risks of obesity outweigh the risk of developing wasting in the future.

Losing weight and keeping it off is difficult and takes dedication. There is no shortage of weight-loss diets, and the best ones emphasize healthy, balanced eating that can be sustained over a long period. Many of the so-called fad diets work initially, but they are so restrictive that before long people go back to their old eating habits and regain all the weight they lost.

When considering a weight-loss diet that eliminates food groups or includes only a few foods, ask yourself if this will meet your needs to stay healthy. Rather than “going on a diet,” which tends to be short-lived, try to see this as a long-term project for improved health. And think about including some exercise. In fact, the best predictor of long-term success in weight loss is physical activity. Exercise builds lean body mass but most importantly uses energy, which means burning calories.

## Working on weight loss

### *Getting started*

- Losing weight requires patience and commitment.
- Get some professional help to be sure weight goals are realistic and nutritional needs for HIV are not compromised.
- Get physical—exercise is the best predictor of success.

### *Other tips*

- Become more aware of your food choices and eating behaviour. Think about what you are eating instead of operating on automatic. Some people find it helpful to keep a food journal and write down everything they eat.
- When eating, focus on it; don't watch TV, read or do other activities. Be aware of tastes and textures and feelings of satisfaction or fullness.
- Identify and change the things that stop you from making healthy food choices or getting exercise (e.g. don't keep foods that you are trying to avoid, like potato chips or chocolate bars, in your home). Decide which are most important and then work on one at a time.
- Set realistic goals that will work and make them specific (e.g. instead of “I will eat more vegetables,” say “I will eat 3 portions of vegetables today”).



- Select three favourite low-calorie emergency snack foods and have them available for those times when you get hungry. Plan ahead so you don't act on impulse when you get hungry.
- Portion your food out on a plate rather than eating from the package. You'll be less likely to overeat.
- Try to plan meals and snacks. Make sure the groceries you buy help you eat according to your plan.
- Move your body. Walk, swim, bike or use the stairs more often. Regular daily exercise is the best way to lose weight and keep it off. Plus, you will be stronger, healthier and have better mental health.
- A slip is just a slip. Everyone has days when it's hard to stick to the eating plan. Try to see it as a slip, not a failure, and start over again.



*Try to be physically active every day for improved energy, strength and health.*

## Exercise

Physical activity is a vital part of health and well-being. Maintaining daily activity increases energy, strength and independence and can also help to reduce stress. People who are active and have generous amounts of body cell mass also recover more quickly from illness. *Canada's Food Guide* recommends getting 30 to 60 minutes of physical activity every day. This does not have to be done all at once but can be added up in 10 minute increments.

The main types of exercise are resistance training (e.g. weight lifting), cardio or aerobic exercise (e.g. swimming or biking), and balance and flexibility exercise (e.g. yoga). Each type has different benefits. Get professional advice on the combination of exercises that is right for you.

**Resistance training** uses weight to increase body cell mass by building muscle mass. Weight lifting is the fastest way to build muscle but it is not the only way. Resistance exercises can also be done using stretch bands, exercise balls and the body's own weight (e.g. push ups). Muscle burns more energy (calories) than fat, so increasing muscle mass increases the number of calories your body uses up in a day.

**Cardio or aerobic exercise**, which includes activities like running, walking fast, biking, skating and swimming, benefits heart health and improves insulin sensitivity. This type of exercise promotes weight loss. To get the most benefits cardio needs to be done 3 to 4 times per week for at least 20 minutes.

**Balance and flexibility exercises**, such as yoga or Tai Chi, help prevent injury and falls and should be included in your exercise program. For more information, see "Let's Get Physical," in the Spring/Summer 2005 issue of CATIE's *The Positive Side*, available at [www.positiveside.ca](http://www.positiveside.ca).)

## Moving your body

### *Getting started*

- Build activity into daily living as much as possible. Even if you're not feeling well, try to keep as active as you can. Muscle mass is quickly lost if it's not used.

### *Other tips*

- Discuss any plans to start an exercise program with your doctor. And if exercise is new for you, get some advice from a trainer or physiotherapist.
- Start slowly and increase exercise level gradually to avoid injury.
- Take the time to warm up and stretch before and after exercising.
- It is not necessary to go to a gym for resistance exercise. Stretch bands and dumbbells can be used at home. Second-hand stores are good places to find dumbbells at low prices.
- Check with your local community centre for interesting programs or facilities. Some community centres offer reduced or free admission to people on disability pensions or income assistance.
- Find an exercise buddy to help keep you motivated.

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# Part Two: À la Carte

Have a craving for something in particular? The chapters in this section cover specific issues related to HIV and nutrition. Each stands alone and can be read without reference to the others. Think of this part of the guide as a buffet of more advanced information on selected topics. Choose what you need for now, and when you get hungry again, come back for seconds.

## 4. Vitamins, Minerals and Supplements

Vitamins and minerals are called *micronutrients* because they are needed in very small amounts. They cannot adequately be made by the body and must be obtained from diet and/or supplements. Vitamins and minerals do not provide energy but perform vital functions that regulate the many activities and chemical reactions that take place inside the body. Without adequate intake of these micronutrients, symptoms of a deficiency can develop. If not treated, some deficiencies can cause sickness and death.

Recommended intake levels have been developed for each vitamin and mineral to give guidance as to how much should be taken every day to prevent deficiency. These are usually described as the RDA (recommended daily allowance). For many micronutrients, experts have also set an Upper Tolerable Limit (UL), which is the maximum daily amount a person should consume. Remember that these recommendations are set for the general population and do not take into consideration any disease state, like HIV. In this chapter, we try to provide guidance about your specific needs as a person living with HIV.

### Micronutrients and HIV

A person with HIV might be deficient in a micronutrient for any number of reasons: side effects make it hard to eat, nutrients from food are not absorbed, or the body needs more nutrients to fight the virus. Several studies have shown that people with HIV are at increased risk of developing micronutrient deficiencies. In turn, these deficiencies can increase the rate of HIV disease progression to AIDS and can increase the risk of dying. For this reason it is believed that the micronutrient requirements for people with HIV are higher than the RDAs for the general population.

However, there are still unresolved issues. Some scientists and healthcare experts say that micronutrients have therapeutic value at very high doses, up to 10 times the RDA, but others disagree and prefer to take a more conservative approach. Studies are difficult to interpret, but recent clinical trials of multivitamins have demonstrated benefits, and many healthcare providers now believe that everyone living with HIV



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*Be well informed when choosing supplements. And involve your healthcare team in your decision.*



*Consider taking a multivitamin-mineral each day.*

will benefit from taking a multivitamin-mineral each day. When making decisions about supplementation, be well informed and involve your healthcare team in your decisions.

### Antioxidants and HIV

*Antioxidants* are molecules made by the body or found in some foods and supplements. Antioxidants protect the body by neutralizing other, unstable molecules, called *free radicals*, that are produced during normal cell functioning.

Long-term infections such as HIV can upset this balance by causing the body to produce more free radicals than usual. In turn, this can lead to a condition known as *oxidative stress*, in which the body cannot deal with all the free radicals it produces. Oxidative stress can cause a lot of damage to cells. Two ways to lessen the effects of oxidative stress are to increase antioxidant intake and to decrease exposure to things that increase oxidative stress, such as pollution and cigarette smoke.

### Boosting antioxidants

- Eat lots of colourful fruits and vegetables to get the antioxidants found in the pigments and the phytochemicals contained in the whole food. Try to include blue, purple, green, orange, red and yellow foods to get the full complement of beneficial substances.
- Black and green tea, mushrooms, red wine and dark chocolate are also thought to be good sources of antioxidants. Keep in mind that alcohol might not always be a good choice for some people.
- Antioxidant supplements include vitamins C and E, the minerals zinc and selenium, as well as coenzyme Q<sub>10</sub>, alpha lipoic acid and N-acetyl cysteine.

### The big chart of vitamins and minerals

The table on the following page lists the RDA (recommended daily allowance), UL (upper tolerable limit) and experimentally high dose, toxicity, function and food sources. The RDA usually includes all intake, from both food and supplements, while the UL is from supplements only. **Caution should be exercised when taking doses above the UL.**

Nutrient	RDA	UL *	Experimental high dose**	Potential toxic effects	Main function	Best food sources
<b>Vitamin A</b>	Men: 3,000 IU Women: 2,300 IU	10,000 IU	3,000-10,000 IU	Liver toxicity, dry rough skin and cracked lips, irritability, headache, birth defects	Healthy immune barriers and epithelial tissue, growth, reproduction, bone and red blood cell formation, vision	Foods high in beta carotene, fortified foods, liver
<b>Beta carotene</b>	ND	ND	5,000-25,000 IU	Possibly increased lung cancer in smokers, harmless orange skin colour	Antioxidant, source of vitamin A, immune booster, possible cancer prevention, vision	Orange, yellow, red and green vegetables and fruits
<b>Vitamin D</b>	9-50 years: 200 IU 51-70 years: 400 IU >70 years: 600 IU osteopenia/osteoporosis: 1,000 IU	2,000 IU	1,000 IU	Heart/liver/kidney toxicity, hypercalcemia (excess calcium in the blood)	Calcium metabolism, bone mineralization, possible cancer prevention	Fortified milk, fatty fish
<b>Vitamin E</b>	22 IU	1,500 IU	200 IU	Possible increase in heart disease, excess bleeding	Antioxidant, anticoagulant, protection from heart disease, possible cancer prevention	Wheat germ, vegetable oils, nuts
<b>Vitamin K</b>	M: 120 mcg W: 90 mcg	ND	ND	Interaction with blood thinners	Bone mineralization, blood clotting	Green leafy vegetables
<b>Vitamin C</b>	M: 90 mg W: 75 mg smokers add 35 mg	2,000 mg	500-2,000 mg	Pro-oxidant, excess iron absorption, diarrhea	Antioxidant, immunity, antiviral in test-tubes, possible cancer prevention, increases iron absorption	Fruits and vegetables, especially peppers and citrus fruits
<b>Thiamine (B<sub>1</sub>)</b>	M: 1.2 mg W: 0.9 mg	ND	30-100 mg	Very high doses may promote tumour growth	Energy metabolism, mood, nervous system	Whole grains, brown rice, fortified foods, legumes, pork, oysters
<b>Riboflavin (B<sub>2</sub>)</b>	M: 1.3 mg W: 1.1 mg	ND	30-100 mg	ND	Energy metabolism, antioxidant, possible migraine prevention	Dairy products, leafy greens, oysters
<b>Niacin (nicotinic acid)</b>	M: 16 mg W: 14 mg	35 mg	500-1,000 mg	Itching, skin flushing, liver toxicity, insulin resistance	Energy metabolism, lowers LDL cholesterol and triglycerides, raises HDL cholesterol	Poultry, red meat, fish, legumes, peanut butter, nuts
<b>Vitamin B<sub>6</sub></b>	M: 1.3-1.7 mg W: 1.3-1.5 mg	100 mg	100 mg	Nerve damage (neuropathy)	Protein metabolism, immunity, neurotransmitter synthesis (e.g. serotonin and dopamine), treats peripheral neuropathy and PMS	Meat, fish, poultry, eggs, potatoes, fortified cereals, peanuts, soybeans
<b>Folate</b>	0.4 mg	1 mg	0.4-1.0 mg	High dose can mask B <sub>12</sub> deficiency leading to nerve damage	Cell division, prevents neural tube defects and perhaps other birth defects, lowers homocysteine, possible cancer prevention	Leafy greens, legumes, oranges, broccoli, cauliflower
<b>Vitamin B<sub>12</sub> (cobalamin)</b>	2.4 mcg	ND	1,000 mcg weekly or monthly for deficiency	Rare cases of eye damage	Cell division, amino acid metabolism, nervous system, mental function	Fish, shellfish, meat, fortified soy and rice milk, fermented soy products
<b>Calcium</b>	1,000-1,200 mg	2,500 mg (from food and supplements)	1,000-1,500 mg	Calcium deposits in soft tissues	Bone mineralization, muscle contraction	Dairy products, fortified soy and rice milk, fish bones
<b>Magnesium</b>	M: 400 mg W: 320 mg	350 mg	350 mg	Diarrhea, decreased calcium absorption	Bone mineralization, active in more than 300 chemical reactions in the body	Whole grains, nuts, green vegetables, legumes
<b>Iron</b>	M: 8 mg W: 18 mg	45 mg	Use only to treat iron deficiency anemia	Iron overload disorders, heart disease, liver cirrhosis	Makes hemoglobin which carries oxygen, makes energy in the mitochondria	Meat, legumes, tofu, leafy greens, breakfast cereals
<b>Zinc</b>	M: 11 mg W: 8 mg	40 mg	40 mg	Immune suppression, nausea, metallic taste, copper deficiency	Growth, immunity, wound healing, taste, sperm production, antioxidant, prostate health	Oysters, meat, poultry, fish
<b>Selenium</b>	55 mcg	400 mcg	100-400 mcg	Brittle hair and nails, irritability, garlic breath, fatigue, nausea	Antioxidant, immunity, possible cancer prevention, viral infections	Whole grains from selenium-rich soils, poultry, meat, dairy

**RDA** recommended daily allowance (from all sources); **UL** upper tolerable limit (from supplements only); **ND** not determined; **IU** international unit; **mg** milligram; **mcg** microgram

\* Caution should be exercised when taking doses above the UL.

\*\* There is little to no evidence of efficacy with these high doses. Discuss your options with your doctor and dietitian.

### Key vitamins and minerals for HIV

This section deals with some vitamins, minerals and other nutrients that have been studied in HIV. You will also find information in “The big chart of vitamins and minerals” on the previous page. Before beginning to take any of these supplements, be sure to discuss it with your doctor and other members of your healthcare team.

Several studies have shown that vitamin and mineral supplements can have many benefits in people living with HIV. Taking a multivitamin every day is an important part of a nutritional health plan. Check out Appendix E for a list of studies looking at the affect of micro-nutrient supplements in people with HIV/AIDS.

**B vitamins** may help slow disease progression in people with HIV. They are also important for healthy *mitochondria*, the power-producing structures in cells, and may help decrease the impact of mitochondrial toxicity (see “Mitochondrial toxicity,” Chapter 5). B vitamins are depleted quickly in times of stress, fever or infection, as well as with high consumption of alcohol. Keep in mind that the RDA is very low and taking a total of 50 mg of B<sub>1</sub>, B<sub>2</sub> and B<sub>3</sub> will more than cover B-vitamin needs. Check the multivitamin you take; if it has 30 to 50 mg of these vitamins, you don’t have to take a B-complex supplement in addition to the multivitamin.

Levels of vitamin B<sub>12</sub> in the blood may be low in people with HIV. It can also be low in people over the age of 50 years. B<sub>12</sub> deficiency is associated with an increased risk of peripheral neuropathy, decreased ability to think clearly, and a form of anemia. People with low B<sub>12</sub> levels usually feel extremely tired and have low energy. This deficiency is also linked with HIV disease progression and death. Ask your doctor to check your blood levels. If they’re low, ask about B<sub>12</sub> injections to get them back into the ideal range.

If you get B<sub>12</sub> shots and your vision is getting worse, mention it to your doctor, especially if you are a smoker. Some forms of injectable B<sub>12</sub> can damage your eyes if you have a rare genetic condition called Lerber’s hereditary optic atrophy.

**Vitamin C** is one of the most important antioxidants. It is very effective at cleaning up molecules that damage cells and tissues (see “Antioxidants and HIV,” this chapter). Vitamin C has been studied for cancer prevention and for effects on immunity, heart disease, cataracts and a range of other conditions. Although vitamin C cannot cure the common cold, supplements of 1,000 mg per day have been found to decrease the duration and severity of symptoms.

In people with HIV, there is some evidence that vitamin C can inhibit replication of the virus in test-tube experiments, but it is unclear what this means in the human body. The most important benefit for people with HIV is the widespread antioxidant action of vitamin C. The daily experimental high dose is between 500 mg and 2,000 mg, the upper tolerable limit.

**Calcium** – see “Bone health,” Chapter 5.

**Vitamin D** is emerging as a very important nutrient, with more diverse functions than just its traditional role in calcium metabolism. Mounting evidence suggests that 1,000 IU per day should be the recommended daily intake.

Vitamin D is found in some foods, but these sources generally do not provide enough vitamin D on a daily basis. Also, people who live in northern climates (like Canada) probably do not get enough sun exposure to make adequate vitamin D. And the use of sunscreen, which is highly recommended to prevent skin cancer, blocks the skin's ability to make vitamin D.

For people with HIV, vitamin D supplements are a sure way to get the recommended daily allowance. Vitamin D is found in multivitamins and calcium supplements as well as individual vitamin D pills. Look for vitamin D<sub>3</sub>; it is the active form of the vitamin. Be sure to add up all the vitamin D from different supplements to be sure you are not getting too much.

**Vitamin E** has been used as an antioxidant, typically at doses of 400 IU per day. However, studies have found that people who take more than 200 IU per day may be at higher risk of developing heart disease. Until this is fully studied, it may be a good idea to reduce vitamin E supplements to 200 IU unless your doctor suggests you take more.

Vitamin E deficiency is associated with faster HIV disease progression. People with poor fat absorption or malnutrition are more at risk of being deficient in vitamin E. Use supplements from natural sources and those with “mixed tocopherols” for better effect.

**Iron** supplements to treat iron-deficiency anemia (low levels of red blood cells) should only be taken if prescribed by your doctor. Iron-deficiency anemia is diagnosed by having a low hemoglobin level in the blood. This can be confusing in someone on HAART because some anti-HIV drugs, especially AZT, can cause low hemoglobin levels. There are other blood tests that can help determine whether there really is an iron deficiency. The important point is to not take high doses of iron unless they are prescribed. Iron is a *pro-oxidant* (the opposite of an antioxidant), which means it can damage different tissues in the body (see “Antioxidants and HIV,” this chapter).

**Zinc** is a critical mineral for the immune system; a deficiency can cause severe immune suppression. People with chronic diarrhea, new immigrants from refugee camps and malnourished people with HIV, especially children, are at high risk of having a deficiency. Be aware that high doses of zinc supplements in people who are not deficient can *decrease* immune function.

**Selenium** helps regenerate glutathione, the major antioxidant in cells. Studies have shown that low selenium levels in the blood are associated with an increased risk of disease progression and death. Deficiency is associated with low CD4+ cells. One small study found that a daily supplement of 200 micrograms might have a positive effect in some people with HIV. Studies of the general population suggest that selenium supplementation may provide some protection from cancer.

### Multiplying the benefits of multivitamins

#### *Getting started*

- Take a multivitamin-mineral once a day.

#### *Other tips*

- Get some advice from a health professional with knowledge about supplements for people with HIV.
- Protect your bones by getting enough calcium and vitamin D.
- Boost your antioxidant defense system with vitamin E, vitamin C and selenium.
- Keep doses below the Upper Tolerable Limit.

### Other supplements for HIV

This section covers some of the other supplements used by people with HIV. In some cases, the benefits of these supplements have been described in small human studies, animal studies and case reports. The therapeutic doses are not really known for HIV disease and recommendations given here are based on doses used for other conditions or in studies.

These and other supplements can be quite expensive and should not be seen as a replacement for a healthy diet and lifestyle. Before starting any new supplement, get information from a knowledgeable healthcare professional. And be sure to discuss it with your doctor.

Also, it is best to start only one new supplement at time, so you can be more aware of any side effects.



**Alpha lipoic acid** is a powerful antioxidant made by the body that is used to regenerate glutathione (the major antioxidant in cells) as well as the activated form of vitamins C and E. It also plays an important role in energy production in the mitochondria. Lipoic acid is used to treat diabetic neuropathy (a nerve condition associated with diabetes) and liver disorders, and it may also have a role in slowing the hardening of the arteries (arteriosclerosis). The dose recommended for diabetic neuropathy is 100 mg 3 times per day; the dosage for HIV is unknown.

**Carnitine** (also known as L-carnitine) is a natural substance found in foods and made by the body. It works with the mitochondria to process fats and produce energy for the cells. It does this mainly by supplying the building blocks needed by the mitochondria to make an energy molecule called *ATP*, the basic fuel for cells. Most of the research suggests that carnitine has a protective effect on the central and peripheral nervous systems and the heart, probably because of its role in mitochondrial function. It may be helpful in the treatment of *peripheral neuropathy* (numbness, tingling or burning in the feet and sometimes hands), dementia and mitochondrial toxicity (see Chapter 5).

Over-the-counter supplements may contain a version of carnitine called acetyl-l-carnitine, but beware that some have very little L-carnitine in them; be sure to buy from a reliable source. In Canada, L-carnitine is available by prescription and is called Carnitor. Prescription L-carnitine is very expensive and usually not covered by insurance plans for any of these indications. Check with your private insurer or provincial provider for more details.

The therapeutic dose for L-carnitine is somewhere between 500 and 3,000 mg daily. The dosage is not defined because it has not been studied enough or approved for these applications. Some people with HIV who have mitochondrial toxicity and/or peripheral neuropathy appear to benefit from 1,500 mg of acetyl-l-carnitine once or twice daily for many months. Carnitine supplements should be spread out over 3 daily doses to prevent side effects, most commonly diarrhea.

**N-acetyl cysteine (NAC)**, a derivative of the amino acid L-cysteine, is a potent antioxidant that regenerates glutathione in the cell (see “Antioxidants and HIV,” this chapter). In this role, NAC protects liver cells by decreasing oxidation. Cysteine appears to decline in people with HIV who have low CD4+ cell counts and in those with wasting (see “Weight loss and wasting,” Chapter 6). NAC supplements may be able to replenish low glutathione and improve the antioxidant capacity of cells. Study doses have been as high as 2,000 mg per day, but this is expensive and may not be well tolerated. Side effects include nausea, vomiting, diarrhea and headache. The most beneficial dose is not certain, although a dose of 500 mg per day may offer some benefit with a reduced risk of toxicity.

**L-glutamine** is an amino acid that is used to provide fuel for intestinal cells, muscle cells and immune cells. It plays an important role in immunity because it helps to maintain the intestinal barrier and is a preferred fuel for various cells of the immune system. Glutamine levels decline during periods of physiological stress like opportunistic infection, surgery, burn and cancer. It may have a therapeutic role in treating intestinal disease and wasting, and some people with HIV have found it to be a good treatment for chronic diarrhea. The dose for treating diarrhea is 10 to 30 grams per day; the maintenance dose is 5 grams per day. It is best absorbed if dissolved in water and taken on an empty stomach.

**Probiotics** are live organisms, including the bacteria *Lactobacillus* and *Bifidobacterium* and yeasts. They help build a healthy population of good bacteria (microflora) in the intestines. Microflora keep the gut healthy by preventing the growth of disease-causing bacteria and maintaining the intestinal barrier. Probiotic supplements are helpful after a course of antibiotics because they replace the microflora that were damaged by the antibiotic. Probiotics may also reduce chronic diarrhea and improve symptoms of irritable bowel syndrome. The most common type of probiotic is *L. acidophilus* but some products now contain mixed organisms. These are found in foods that contain live culture, such as yogurt and kefir. Purchase supplements that are refrigerated and have a long shelf life.

**Coenzyme Q<sub>10</sub> (CoQ<sub>10</sub>)** is a substance that plays a role as an antioxidant as well as a cofactor in mitochondrial energy production. It has been used to treat congestive heart failure and gum disease (gingivitis) and may help protect the heart and nerves. Statins, a class of cholesterol-lowering drugs, reduce CoQ<sub>10</sub> levels. The usual CoQ<sub>10</sub> dosage range is 60 to 240 mg daily.

CATIE provides fact sheets on many vitamins and supplements used by people with HIV. Also, its *Practical Guide to Herbal Therapies* covers many common herbal therapies used by People with HIV. To find out more, visit [www.catie.ca](http://www.catie.ca) or call 1-800-263-1638 to speak with a treatment information educator. Also, check out the Web resources listed in Appendix D.

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## 5. Managing the Effects of HIV and Meds on the Body

### Food-drug interactions

The interactions between you, HIV, medication and nutrition are complex. Nutrients and substances in foods can interact with drugs—both your anti-HIV meds and other meds—either enhancing or diminishing the effect of the medication. In addition, some foods can change the absorption of drugs. This is why following food requirements for certain drugs is so important. By not following recommendations, the level of the drug in your blood may decrease to the point where it is like missing a dose. This can lead to viral resistance and the need to change therapy.

Generally, having something to eat when taking medications, as long as this is allowed, can improve tolerance and reduce side effects.

### Balancing food and meds

- Be sure to know the food requirements for all your medications. Following food guidelines is part of succeeding with your therapy.
- Unless meds must be taken without food, try to eat something with each dose. This will make the meds easier to tolerate, especially with the morning dose.
- Talk to your healthcare team about how to deal with side effects. See Chapter 6 for ideas on how food can help.



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*Following the food guidelines for your meds will reduce the chance of resistant virus. Check with your doctor or pharmacist about food requirements.*

### Lipodystrophy

*Lipodystrophy* syndrome (lipo for short) is the name for a group of separate, but related, conditions that are associated with HAART. The term lipodystrophy actually refers to several distinct problems, including abnormal fat loss or gain and metabolic complications. These may occur separately or together. CATIE's *Practical Guide to HIV Drug Side Effects* also addresses lipodystrophy. Find it at [www.catie.ca](http://www.catie.ca). Or call 1-800-263-1638 to speak with a treatment information educator.

#### Abnormal fat distribution

**Fat loss** – *Lipoatrophy* means a loss of subcutaneous fat (the fat just below the skin) in the face, arms, legs, buttocks and sometimes the trunk. Lipoatrophy (loss of fat) is distinct from muscle wasting (loss of lean body mass). While it can be disturbing to lose body fat, muscle



*Lipodystrophy can be difficult to treat. Talk with your doctor.*

wasting is a much more serious medical condition (see “Weight loss and wasting,” Chapter 6). If you notice a thinning of the limbs or buttocks, rather than assume this is purely due to fat loss it is important to assess whether any muscle loss is also happening. Talk with your doctor about this.

Lipoatrophy is difficult to reverse, and nutrition therapy is not an effective treatment. It is important to realize that any weight loss will worsen fat loss, especially in the face, and that fat may not come back even if the weight is regained. Talk to your doctor about ways to manage lipoatrophy.

**Fat gain** – In another aspect of lipodystrophy, fat can accumulate in different parts of the body, including in the abdominal cavity around the organs, in the breasts, as a pad of fat between the shoulder blades or on the back of the neck (sometimes called “buffalo hump”), and sometimes as subcutaneous fat on the back, particularly in women.

This accumulation of fat is not the same as normal weight gain. Although it can be difficult to treat, some people have been able to reduce stomach fat accumulation with diet and exercise. Talk with your doctor about ways to manage fat gain.

### Metabolic complications

There are many risk factors for developing heart disease, which remains the number one cause of death in the developed world. Some of these can't be changed, like age, gender, ethnicity and family history. Other risk factors can be modified, including having abnormal blood cholesterol or triglyceride levels, diabetes or insulin resistance, high blood pressure, being obese or having a big waist circumference, smoking and not exercising. Some anti-HIV drugs may increase these risk factors by altering blood fat levels, causing insulin resistance and increasing abdominal fat.

**Dyslipidemia and heart disease** – *Dyslipidemia* is the term used to describe abnormal levels of fats (called lipids) in the blood. The different types of lipids in the blood that are routinely measured include HDL cholesterol, LDL cholesterol, triglycerides, and total cholesterol. HDL (high-density lipoprotein) cholesterol is the “good” cholesterol—it removes fats from the blood. LDL (low-density lipoprotein) cholesterol and triglycerides are the so-called “bad” fats. Total cholesterol is a measure of both types of cholesterol (HDL and LDL) in the blood together. There is a range of values that is considered healthy for each lipid. If your lipid levels fall outside the normal range, you may be at increased risk of problems.

Because what you recently ate affects the levels of lipids in your bloodstream, it is important to have your lipids tested while you are fasting (no food or drink for at least 8 to 12 hours before the test, and no alcohol for a couple of days before).

Normal lipid levels for adults	
Total cholesterol	3.0–5.5 mmol/L
Triglycerides	0.4–2.0 mmol/L
LDL	2.4–3.4 mmol/L
HDL men	0.7–1.9 mmol/L
women	0.9–2.4 mmol/L
Cholesterol/HDL ratio	< 5.0

Nutrition and lifestyle factors are always the first line of treatment for abnormal blood lipids. Even if lipid-lowering medications like statins or fibrates are needed, it is still important to work on diet and exercise. Keep in mind that some people with dyslipidemia are underweight and some of the following nutritional strategies promote weight loss. If unwanted weight loss occurs, talk with your doctor and seek personalized advice from a qualified dietitian or nutritionist.



*Good nutrition can help protect your heart.*

### Taking care of your heart

- Limit fat intake because dietary fat directly affects both the type and amount of fat in the blood. Choose lower-fat products; avoid greasy, fried and fatty foods; and limit the amount of fat added to foods. Prepared snacks and fast foods tend to be very high in fat.
- Choose better fats like olive oil, canola oil, avocado and nuts. Choose low-fat dairy products and lean meats. Avoid trans fats, found in hydrogenated oils, some margarines, snack and packaged foods. Become good at reading labels.
- Almonds and walnuts may have cholesterol-lowering properties and are a good source of calories (and protein).
- Eat less sugar because when the body receives large amounts of sugar it processes them into triglycerides. Concentrated sugar is found in fruit juice (even pure), soft drinks, candy and sweets.
- Increase omega-3 fatty acids, which are found in fish, flax seeds and walnuts. Eating fatty fish (e.g. salmon, mackerel, trout, herring, sardines) twice a week has been shown to benefit heart health. Omega-3 supplements, usually salmon oil or a blend of fish oils (not liver oil), at a dose of 6 grams or more a day may decrease triglycerides. This amount can aggravate diarrhea or cause indigestion and may need to be decreased. Flax seeds or flax oil provide a vegetarian source of omega-3 fatty acids but do not seem to be as effective at lowering triglycerides. Be sure to tell your doctor if you are taking concentrated sources of omega-3 fatty acids, such as fish oil pills, because at high doses they can thin your blood.
- Increase fibre, especially soluble fibre like psyllium, oats and legumes (dried peas and beans), to reduce cholesterol absorption and provide alternatives to sugars and meats.

- Eat more soy products, such as soy milk, tofu and soy beans. They are high in compounds called phytoestrogens, which reduce the risk of cardiovascular disease if you get enough. You need about 25 grams of soy protein a day, which is about 4 glasses of soy milk or 8 ounces of tofu.
- Limit alcohol to a couple of drinks per week because it directly increases triglycerides. Alcohol is also hard on the liver.
- Quit or cut back smoking because it is one of the most powerful risk factors for heart disease, and lung and other cancers.
- Cocaine has been shown to increase progression of heart disease and may increase the risk of having a heart attack.
- Exercise, especially aerobic/cardio exercise, helps reduce triglycerides in the blood, increase HDL cholesterol and improve cardiovascular fitness.
- Flavenoids, which are found primarily in fruits and vegetables, have a wide range of health benefits, including protection against heart disease. It is best to get them from colourful foods rather than supplements in order to get the wide range of beneficial nutrients found in the food.
- B<sub>12</sub>, B<sub>6</sub> and folate lower homocysteine levels in the blood. High levels of homocysteine have been associated with an increased risk of heart disease.
- In some people, niacin is effective at reducing triglycerides and LDL cholesterol and increasing HDL cholesterol, but it can cause itching and skin flushing, as well liver toxicity and insulin resistance. Talk with your doctor about niacin before trying it on your own.
- Read "Keep Your Ticker Tocking" in the Winter 2011 issue of CATIE's *The Positive Side*, available at [www.positiveside.ca](http://www.positiveside.ca).



*Diet and exercise are the first line of treatment for abnormal levels of lipids and blood sugar.*

**Insulin resistance and diabetes** – Some studies have suggested that people with HIV on HAART have a higher risk of developing *diabetes* or its precursor, *insulin resistance*. These are conditions that occur when the body is unable to process blood sugar properly and the level of sugar in the blood remains high for long periods of time. If not treated, this can cause serious damage to the blood vessels.

The kinds of food you eat can have a huge impact on what happens to blood sugar levels, and so nutrition can play a significant role in helping insulin work properly and keeping blood sugar in the ideal range. Carbohydrates, especially simple carbs, affect blood sugar levels quickly. Proteins and fats tend to slow down the digestion and absorption of carbohydrates, and so will slow changes in blood sugar levels.

Anyone who has been diagnosed with diabetes should attend a diabetes education centre to get as much information as possible on the management of this disease.

## Helping to keep blood sugar in the normal range

- Carbohydrates are the foods that need to be controlled. Limit simple carbohydrates, such as sugars and starchy foods like potatoes, white rice and pasta. Choose more whole grains and fibre because these don't affect blood sugar as strongly.
- Take a minute to figure out what a portion size is for a particular food. *Canada's Food Guide*, found at the back of this guide, can help.
- Try spreading out carbohydrates throughout the day. This will help you avoid having a large portion at any one time.
- Always have proteins and a small amount of fat with carbohydrates. This will slow digestion.
- Have regular eating habits with consistent meals and snacks at regular intervals throughout the day.
- Exercise as many days as possible. Exercise after a meal helps blood sugar come down more quickly.
- Read "La Dolce Vita – The sweet lowdown on blood glucose levels" in the Spring/Summer 2005 issue of CATIE's *The Positive Side*, available at [www.positiveside.ca](http://www.positiveside.ca).

## Mitochondrial toxicity

*Mitochondria* are often called the “power plants” of human cells. All cells contain these microscopic structures, which produce energy for the cell to do its work and stay healthy. Mitochondria convert fats and carbohydrates into a molecule called ATP, the basic fuel for cells. Some cells, like nerve, heart and muscle cells, need a lot of ATP, so they have a lot of mitochondria.

One of the most troublesome toxicities of anti-HIV drugs is that they can damage mitochondria. Some anti-HIV drugs damage the DNA so that the cell can't produce new mitochondria. When cells get low on mitochondria, they can't make enough energy to function properly. This condition is called *mitochondrial toxicity*. It wreaks havoc throughout the body and is thought to contribute to nerve damage (neuropathy), muscle damage (myopathy), heart muscle damage (cardiomyopathy), fat wasting (lipoatrophy) and other health problems. Two anti-HIV drugs associated with the highest risk of mitochondrial toxicity—d4T (stavudine, Zerit) and ddI (didanosine)—are used much less frequently now that we have newer, safer drugs that are less likely to cause this effect.

People experiencing mitochondrial toxicity often have elevated levels of lactate (lactic acid) in the blood. High lactate levels can cause nausea,

headaches and fatigue and can make you feel full on a small amount of food (early satiety). Very high lactate levels, called *lactic acidosis*, can be fatal. If lactic acidosis has occurred or is suspected by your doctor, HAART must be stopped temporarily. Once the acidosis subsides, you may restart HAART with a different combination of anti-HIV drugs.

There are no specific nutrition guidelines for treating mitochondrial toxicity, but some small studies have shown a benefit from B vitamins and L-carnitine supplementation. As well, treatment options for children born with defective mitochondria may provide some guidance. In these children, experts often recommend supplementation with all the cofactors that help the mitochondria function properly. Although there is no scientific evidence that this strategy works for mitochondrial toxicity in HIV, it may offer benefits in terms of feeling better and being able to stay on medications.

### Helping your mitochondria work better

- Mitochondrial toxicity can be very dangerous and requires medical attention. Talk with your doctor before you decide to take any of the following supplements.
- Try the following supplements: B complex vitamins, coenzyme Q<sub>10</sub>, alpha lipoic acid, vitamins C and E, zinc.
- Consider taking L-carnitine (see “Key vitamins and minerals for HIV,” Chapter 4).

### Bone health

In recent years, low bone mass and density, called *osteopenia* or *osteoporosis*, has become a widespread problem among people with HIV. Osteopenia is an early stage of bone mineral loss in which the bones become less dense and weaker. This condition does not cause pain or limit movement and is usually treated with diet and exercise rather than medications. Osteoporosis, the more advanced form of the disease, results in fragile bones that can fracture easily. The fracture causes pain, limits movement and reduces quality of life. Osteoporosis is sometimes treated with medications as well as diet and exercise. Note that osteoporosis medications may not be suitable for all people, especially women of childbearing age.

It is still not clear whether bone problems are caused by HAART or by the virus itself. However, many other factors are well known to increase the risk of developing osteopenia or osteoporosis. These include genetics (e.g. your mother had osteoporosis); getting older; low physical activity; being underweight; malnutrition; not enough calcium, vitamin D or protein; poor absorption of nutrients; diseases of the liver, gut or kidneys; and low levels of hormones such as estrogen or testosterone.





Some doctors recommend that people with HIV should have their bone density measured every two years by a special X-ray technique called a DEXA scan. The DEXA compares bone density to standards called T-scores. If the T-score is -1.0 to -2.5, it is considered osteopenia; if it's below -2.5 (for example, -3.2), it is considered osteoporosis.

Nutrition is always the first line of treatment for osteopenia or osteoporosis, and studies have shown that increasing calcium and vitamin D can restore some bone mineralization.

*Getting enough calcium, vitamin D and protein helps to keep your bones healthy.*

## Protecting your bones

- Take care of your nutritional needs. There are many vitamins and minerals, as well as protein, involved in keeping bones strong.
- Maintain a healthy body weight with a BMI between 20 and 25.
- Get enough calcium from food plus supplements. (See “The big chart of vitamins and minerals,” Chapter 4, for food sources.)
  - For prevention, aim for 1,000 mg of calcium a day.
  - During menopause, aim for 1,200 mg a day.
  - As treatment, aim for 1,500 mg a day.
- Take calcium supplements with food and spread them over several meals for better absorption. Calcium carbonate is the most common form of supplement and the most concentrated, which means fewer pills to take. However, some people find it constipating and bloating. Calcium citrate may be better absorbed and tolerated.
- Magnesium is a component of bone and interacts with calcium. Whether it needs to be supplemented is not certain. If calcium supplements are constipating, add 350 to 500 mg magnesium per day. If loose stools are a problem, reduce magnesium supplements.
- Get enough vitamin D. Sunshine is not a reliable source of vitamin D and dietary intake can't be counted on. Current recommendations are for 1,000 IU daily. Calcium supplements and multivitamins contain vitamin D, so be sure to add up the D from all sources.
- Weight-bearing exercise is critical to maintaining strong bones. This includes activities like walking, running, skipping rope, weight lifting and skating. Even a few minutes of skipping rope a day will stimulate bones to take up minerals.
- Try to do less of the things that decrease bone health, like smoking, drinking alcohol, consuming caffeine and eating salt.
- Read “Boning Up on Bone Health” in the Summer 2011 issue of CATIE's *The Positive Side*, available at [www.positiveside.ca](http://www.positiveside.ca).

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## 6. Managing Symptoms and Side Effects

Symptoms and side effects are common with HIV. They can be due to HIV infection itself, to co-infection or opportunistic infection, or to HAART. It is important to discuss with your doctor any symptoms you are experiencing, as they may indicate an underlying problem that requires medical treatment. Likewise, make sure you discuss with your healthcare team any side effects you experience—particularly those from anti-HIV drugs—because managing side effects is an important part of staying on your therapy. There are many ways to help you. This section of the guide provides dietary strategies for managing the most common symptoms or side effects.

CATIE also publishes a *Practical Guide to HIV Drug Side Effects*. Find it online at [www.catie.ca](http://www.catie.ca) or call 1-800-263-1638 to speak with a treatment information educator.

### Constipation

Constipation occurs when the remains of digestion move too slowly through the intestinal tract. Too much water gets reabsorbed in the colon, making the stools hard to pass. People on methadone and those in recovery from some street drugs frequently report constipation problems. The main dietary strategy to counter constipation is to speed movement through the tract by increasing fibre, fluids and exercise.

#### Figuring out fibre

There are two kinds of fibre, and each kind acts differently in the gut. **Insoluble fibre** is found in foods like wheat bran, the roughage in whole grains and the skins and seeds of fruits and vegetables. This kind of fibre does not dissolve in water and makes food and waste move more quickly through the intestines. Therefore, it is the best kind for treating constipation. **Soluble fibre**, on the other hand, will absorb water and swell. It is found in foods like oatmeal and some fruits. Soluble fibre is good for treating diarrhea and high cholesterol or blood sugar levels. It will not speed up movement through the gut, but it helps constipation by increasing the bulk of the stool.

### Keeping your bowels moving

- Increase fibre intake with wheat bran, high-fibre cereals, psyllium, whole grains, legumes (beans and peas), fruits and vegetables. Dried fruits (e.g. figs, prunes, dates, raisins) and bran cereals like All Bran Fibre and 100% Bran are particularly effective.
- Be sure your fluid intake is at least 8 to 10 cups per day (see “Don’t forget the fluids,” Chapter 2).

- Increase activity level. Walking is particularly good, especially after a meal.
- Take your time on the toilet, and try to go at the same time every day.
- If you take calcium supplements, counter their constipating effect with magnesium.
- Avoid using laxatives more than once in a while. If you use them often, the bowel can become dependent on them.

## Diarrhea

Diarrhea can occur from HIV infection of some immune cells within the intestine, an opportunistic infection or the side effect of medications. It can result in poor absorption of carbohydrates, fats, proteins and micronutrients, especially if it persists for a long time. Diarrhea occurs when substances pass through the intestines too quickly. There is not enough time to absorb all the nutrients, water and electrolytes. The end result is liquid stools and inadequate absorption. The main dietary strategies to counter diarrhea are to decrease the intake of substances that irritate the intestines and to slow down passage through the tract.

## Calming the gut

- Limit your consumption of high-fat foods, sweet drinks, alcohol, caffeine, tobacco and stimulants.
- Limit your intake of insoluble fibre or roughage, such as wheat bran, berries, seeds and the skins of many fruits and vegetables.
- Add more soluble fibre to your meals. Good sources are oatmeal, rice, cream of wheat, applesauce and mashed potatoes. Make rice porridge by cooking 1 cup white rice in 6 cups water or broth for 1 hour or longer. Eat the rice and starchy broth.
- Eat foods high in potassium, such as bananas and potatoes, and salty foods such as canned soups.
- Some people benefit from 500 mg calcium twice a day.
- A daily glutamine supplement of 10 to 30 grams may be beneficial.
- Avoid magnesium supplements and high doses of vitamin C.
- Find out if any complementary or alternative medicines you take are contributing to the diarrhea. Consult *CATIE's Practical Guide to Herbal Therapies* for more information.
- Replenish fluids by drinking plenty of liquids such as diluted juices or sport drinks (e.g. Gatorade). Or try this recipe for a homemade hydration drink: Mix 1 cup orange juice with 3 cups water and 1/2 teaspoon salt.

- Try a lactose-free diet by avoiding milk, cheese, yogurt and ice cream. After 2 to 4 weeks, slowly add back yogurt with live culture, then hard cheese, then Lactaid brand milk. Lactose intolerance can develop with prolonged diarrhea.
- Probiotics such as acidophilus and bifidobacter can help replenish the good bacteria in the gut. These are found as supplements and in yogurts with live culture.

### Gas and bloating

Intestinal gas is a normal by-product of digestion and absorption. When it occurs in normal amounts, it may cause some discomfort but is usually quite manageable. The main dietary strategies to treat gas are 1) avoid foods and beverages that create more gas, and 2) eat in a way that regulates contractions of the bowel. While gas and bloating are common side effects of some anti-HIV drugs, they may also be the result of another gastrointestinal problem. If you are experiencing these symptoms, be sure to tell your doctor, as they may require investigation.

### Decreasing tummy rumbles

- Eat at regular times to help the bowel become more regulated in its contractions.
- If constipation or diarrhea is a problem, see those sections (in this chapter) for more information.
- Eat slowly and chew food well to aid in digestion and to avoid swallowing air.
- Chew less gum and drink fewer carbonated beverages, especially beer, as these add air into the stomach.
- Some very healthy foods like legumes (dried peas and beans), onions, garlic, broccoli and cabbage produce a lot of gas. Instead of dropping them from your diet, try a product like Beano when you eat these foods. Fennel seeds (as a tea, in your cooking or just chewed alone) will also reduce gas and aid indigestion.
- Try to identify the foods that increase the problem. When gas attacks, think of what you ate at the previous meal. Look for patterns. Then see if it helps to reduce or avoid the suspect food.
- Lactaid enzymes taken with dairy products may help.
- Try acidophilus supplements or commercial over-the-counter products that contain simethicone (e.g. GAS-X).

## Lack of appetite

Not eating enough due to a lack of appetite is often the driving force behind weight loss and wasting in HIV disease. Lack of appetite may arise due to illness, fatigue, depression, drug side effects or addiction. It is a very common problem and can be difficult to overcome. Dealing with persistent lack of appetite can be depressing and a source of anxiety and stress. In some cases, in spite of best efforts, it is not possible to overcome the lack of appetite, and nutritional status continues to decline.

## Eating when not hungry

- Eat often; small amounts add up over the course of the day.
- Consider meal replacement drinks like Boost, Resource or Ensure. These products may be covered by your drug insurance program. Talk with your healthcare professional or insurer to find out more.
- Eat on a schedule. To remind yourself to eat, use external cues such as an alarm clock, a favourite TV show, the mealtime of a partner or other family members, break times at work or school, or the time you feed the dog or cat.
- Notice when you have your best time of day and eat the most nourishing foods at that time.
- Fresh air or light activity may stimulate appetite, so try to get outside.
- Make every bite count by emphasizing wholesome, nutrient-dense foods.
- Make eating more pleasurable (e.g. share a meal with friends or family).
- Take advantage of offers of help and meal programs.

## Boosting the appetite

Appetite stimulants may be effective at improving food intake and promoting weight gain. Sometimes a short course of appetite stimulants can help restore normal appetite. Discuss this option with your doctor if you think you need more help with an appetite problem.

Megestrol acetate (Megace) is an appetite stimulant that has been used for many years to improve appetite in people with HIV. Studies of Megace in HIV disease have found that people do gain weight, although most of the weight gained is fat, not lean tissue. In spite of this, food intake increases and people feel stronger and more able to be active, which will eventually restore lean body mass. Megace is a drug that mimics the female sex hormone progestin. It should not be used for a long period, as it may affect the levels of other hormones, testosterone in particular.

Marinol, a derivative of THC (the active compound in marijuana), decreases nausea and sometimes increases appetite but has not been found to be that effective at promoting weight gain in people with HIV.

The side effects are sleepiness and impaired ability to think clearly, which some people find unacceptable. Taking it at night may decrease these side effects and make it more tolerable.

Marijuana is effective at treating nausea and increasing appetite. In Canada, it is possible to obtain a permit from the federal government to possess and grow marijuana for its therapeutic value. Smoking or eating marijuana prior to meals and snacks increases food intake, but the food choices may not always be the healthiest. Planning ahead can ensure that the appetite-stimulating effects are used to the best nutritional benefit. For more information on medicinal marijuana, read “Cultivating Compassion” in the Summer 2007 issue of CATIE’s *The Positive Side*, available at [www.positiveside.ca](http://www.positiveside.ca).

### Nausea and vomiting

Nausea can occur from stomach disorders, opportunistic infections and most commonly as a side effect of many medications. Vomiting, though not as common, is more serious because it can result in nutrient loss and dehydration. The main strategy to counter nausea is to eat foods that are easy to tolerate and to eat often enough to get adequate nutrition.

Nausea is one condition for which it can be best to follow your culture’s habits and treatments. For example, people who eat a typical North American diet often prefer bland foods. People who eat a South Asian diet often turn to sweet, salty, sour or bitter foods to settle an upset stomach.

### Keeping food down

- Eat small amounts frequently, at least every 2 to 3 hours. Low blood sugar, which occurs when you don’t get enough nutrients, can make nausea worse.
- Cold or room-temperature foods may be easier to tolerate.
- If you are vomiting, remember to drink at least 8 cups of fluid each day.
- Wear loose clothes when eating.
- Try to avoid cooking smells.
- Don’t lie down for at least 20 minutes after eating.
- Ginger may be helpful. Drink some flat ginger ale. Stir it to remove the bubbles. To make your own homemade ginger ale, simmer fresh ginger in hot water. Add sugar, maple syrup or honey to taste. Cool and add water or club soda to serve.

## Problems in the mouth or throat

People with HIV may experience problems in the mouth or throat due to side effects of medications, damaged or diseased teeth and gums, or opportunistic infections like thrush, chancres or herpes. Anti-HIV drugs sometimes cause abnormal tastes or dry mouth. The most common cause of swallowing problems is esophageal candidiasis (thrush in the throat). The overall strategy to address painful chewing and swallowing is to adjust textures and tastes for more soothing foods and beverages.

### Dealing with painful chewing

- If it hurts, don't eat it.
- Don't eat citrus fruits and tomato products, because the acidity in them may irritate mouth sores.
- Choose soft, moist, bland, non-irritating foods, such as oatmeal, pasta, avocados, soups, stews, mashed yams or potatoes, bananas, custards, puddings and fish. Moisten foods with gravy and sauces.
- Try using a straw to drink liquids.
- Try to avoid smoking and alcohol, as they irritate inflamed tissues in the mouth.
- Thrush (*Candida*) thrives on sugar, so limit sweets or rinse your mouth well after sweet foods and drinks.

### Dealing with dry mouth and altered tastes

- Choose moist foods or moisten foods with gravy, sauces, water or broth.
- Brush teeth after meals with a soft toothbrush.
- Drink plenty of fluids, especially while eating.
- Avoid commercial mouthwashes, as they can irritate the mouth.
- Try a mouth rinse using 1/2 teaspoon baking soda to 1 cup cool water. Swirl it in your mouth and then spit it out. Do not swallow.
- Use lip balm.
- For altered tastes, adjust the flavouring of foods to enhance pleasant flavours.
- Try masking unpleasant tastes with marinades, sauces, salt and spices.
- Chocolate and vanilla are good taste and smell stimulants.
- Sugar masks salty tastes and salt masks sweet tastes.
- Use plastic utensils to decrease a metallic taste and use sugar-free gum and candies to cover up a bitter taste.

## Dealing with swallowing problems

- Choose softer foods with fewer chunks. Soft, mashed foods and thick liquids like milkshakes and meal replacement drinks are usually easier to tolerate. It may be necessary to puree food in a blender if swallowing is very painful.
- If there is a sensation of choking while eating or drinking, you may be at risk of aspirating food into the lungs. Be sure to discuss this right away with your healthcare team.

## Weight loss and wasting

Severe weight loss is called *wasting syndrome*. While wasting has several definitions, the following criteria can be used to diagnose wasting:

- loss of 10% of body weight in 6 months or less OR
- 7.5% loss in 3 months or less OR
- 5% loss in 1 month OR
- BMI decreases to below 20 OR
- loss of 5% of body cell mass

Unwanted weight loss remains a serious risk for people with HIV because, as discussed in Chapter 3, even small losses of body cell mass can be dangerous. The primary strategy for treating weight loss and wasting is to increase food intake to the level needed to promote weight gain. This is achieved with a high-calorie, high-protein diet and a daily multivitamin-mineral supplement.

## Increasing calories and protein

- Eat often, at least 5 to 6 times per day.
- Eat high-calorie and high-protein foods like dairy products, nuts, peanut butter and dried fruits. For example, 1/2 cup of nuts has about 400 calories.
- Drink fluids with calories, such as milk, chocolate milk, soy milk, juices, homemade milkshakes, fortified malted drinks (e.g. Horlick's, Ovaltine) and meal replacement drinks (e.g. Ensure, Boost, Nutren, Resource).
- Try a calorie supplement like Polydose Powder.
- Eat fats as you can. Fats are high in calories but may be hard to digest and can raise blood cholesterol levels.
- Fortify foods and fluids with skim milk powder. One cup of powder has 250 calories and 24 grams of protein.



## Nutrition support

Sometimes, no matter how hard a person with HIV tries, it is impossible to gain weight. For people who cannot eat enough, who continue to lose weight or who remain seriously underweight, nutrition support is an option. Nutrition support can be delivered through a feeding tube into the stomach or via an intravenous line directly into the bloodstream. Feeding tubes are used when the digestive system is working but the person is malnourished and cannot eat enough.

For short-term use, a nasogastric tube is placed through the nose and into the stomach. This is most often used during a hospital admission. For the longer term, especially for home-tube feeding, a gastrostomy tube, or *PEG* (percutaneous endoscopic gastrostomy), is surgically placed through the abdominal wall. Special formula is dripped into the stomach and may provide total nutrition or be a supplement to regular food intake.

Most people are reluctant to have a feeding tube because it is seen as invasive and psychologically is a symbol of serious illness. However, studies have shown that people with HIV who do accept this type of feeding gain weight and body cell mass, have improved functional ability and better quality of life. This type of nutrition support can save your life if you really need it.

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## 7. Pregnancy and Breastfeeding

### Pregnancy

If you are pregnant, good nutrition can help you have a healthier newborn. This is especially important if you are HIV positive because pregnant women with HIV are at higher risk of giving birth before they are due and having a newborn that is underweight.

Pregnant women with HIV, like all pregnant women, need more calories, protein and micronutrients, especially folic acid and iron. But it is sometimes hard to meet those needs, especially if you're HIV positive; morning sickness and side effects of HAART may make it hard to eat enough or to keep food down.

Taking HAART while you are pregnant greatly reduces the risk of infecting your baby. Women taking HAART may be at higher risk of developing *gestational diabetes*, a type of diabetes that occurs only during pregnancy. Talk to your healthcare team about this. Dietary strategies may help decrease this risk.

### Recommendations for pregnancy

- Get good prenatal care. Try to find a doctor who has experience with pregnant women with HIV.
- If considering pregnancy, take 1 mg folic acid daily and eat plenty of fruits and leafy green vegetables.
- When pregnant take a daily prenatal vitamin. Prenatal vitamins are different than regular vitamins in that they have higher amounts of folic acid and iron and lower amounts of vitamin A.
- In the first trimester, add 100 calories a day to your diet.
- In the second trimester, add another 200 calories to what you were eating during the first trimester. Also add 20 grams of protein.
- In the third trimester, add another 4 grams of protein a day.

### Recommended amounts of weight gain depend on pre-pregnancy BMI

- If you are underweight (BMI less than 20), expect to gain 12.5 to 18 kg (27.5 to 39 lbs).
- If your weight is in the ideal range (BMI between 20 and 25), expect to gain 11.5 to 16 kg (25 to 35 lbs).
- If you are overweight (BMI more than 25), expect to gain 7 to 11.5 kg (15 to 25 lbs).

## Dealing with the discomforts of pregnancy

- To deal with **morning sickness** or **nausea** from anti-HIV drugs:
  - Eat bland, low-fat foods. As well, salty foods, room-temperature foods and dry foods might also be easier to tolerate.
  - Eat every 2 to 3 hours to prevent low blood sugar.
  - Don't brush your teeth immediately after eating.
  - Ginger may be helpful (ginger ale, ginger tea or ginger supplements).
  - If iron supplements increase nausea, take the supplement with plenty of food.
  - Ask your doctor about Diclectin, an anti-nausea medicine that is safe to use during pregnancy and can be taken with HAART.
  - See "Nausea and vomiting," Chapter 6, for more ideas.
- For **heartburn**, eat small meals of foods that are not spicy or acidic. Avoid foods like black pepper, tomatoes, oranges and lemons.
- For **constipation**, increase fibre and fluids. Try high-fibre bran cereals once or twice a day (see "Constipation," Chapter 6).
- Limit your intake of juice, soft drinks and sugar. This will help your insulin work well and will minimize the chance of developing gestational diabetes.
- Keep active and get plenty of rest.
- Alcohol, street drugs and tobacco are all harmful to the developing infant. Stopping use or cutting down during pregnancy will increase your chances of having a healthy baby.

## Breastfeeding

When an HIV-positive mother breastfeeds her baby, there is a risk of at least 16% that the baby will become HIV positive. In Canada, mothers with HIV are advised to completely avoid breastfeeding and to feed the baby commercial infant formula. Some provinces have subsidized formula programs that help pay for the formula. Ask your healthcare team about the programs in your province.



*Do not breastfeed your children if you have HIV.*

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## 8. Children with HIV/AIDS

Thanks to better testing of pregnant women for HIV and more effective anti-HIV treatment, fewer HIV-positive infants are born in Canada than in the time before HAART. And many children who were born with HIV are now reaching their teenage years and adulthood.

Children with HIV are like other children—their bodies are especially sensitive to nutrition. All children must eat well to grow properly. On top of the normal demands of growth, HIV-positive children must cope with the extra demands that the virus places on their body.

Meeting these demands can sometimes be hard because children living with a chronic disease such as HIV can have a poor appetite and little interest in food and can feel full quickly. They often eat very slowly and tend to be picky eaters. Like HIV-positive adults, they experience problems such as diarrhea and nausea, which make it harder to eat. They can also have metabolic problems with blood lipids and fat redistribution.

As a parent or guardian of a child with HIV, it is easy to worry about your child's nutritional needs. This can sometimes make meals very difficult. Not being able to get enough good food can make it even harder.

As children grow into their teenage years, the challenges continue. They gain independence but also must begin to take responsibility for their chronic condition. Good nutrition and even adhering to their HAART regimen may become less important to teens as they grapple with all the complexities of living with a chronic disease like HIV—and being a teenager.

HIV-positive children should have ongoing nutritional care at a pediatric centre to make sure they stay healthy and grow properly. If growth is slow, boosting nutrition will be an integral part of the treatment plan. The first step will be to change the child's diet to increase calories and protein.

In more severe cases where the child still doesn't gain weight or grow quickly enough or even loses weight, a feeding tube may be required. A PEG (percutaneous endoscopic gastrostomy) is the preferred method because children often need extra help for a long time.



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*Children living with HIV need ongoing nutritional care and support.*

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## 9. Addiction and Recovery

### Active use

People who use street drugs usually don't get enough nutrition (macronutrients or micronutrients). In HIV-positive users, problems with nutrition, such as wasting, may be driven more by drug use than HIV status. Some people who regularly use substances such as heroin, cocaine, crack and crystal methamphetamine don't have a regular place to live and may find it hard to get food and to get the care they need for their health problems. And when it comes time to decide how to spend limited money, food is often a low priority. The downside is that malnutrition, HIV infection and addiction together place HIV-positive drug users at high risk of becoming sick and needing to go to the hospital. Eating better may help you stay healthier while you are using.

### Maintaining nutritional health while actively using

- Drink high-calorie fluids like meal replacement drinks, milkshakes, chocolate milk, fortified malted drinks or soy milk.
- Take a daily multivitamin-mineral supplement.
- Eat as well as you can when you're not high.
- Find out about food programs in your neighbourhood.
- Try to purchase some groceries that last a long time. Stock up on peanut butter, oatmeal, powdered milk and canned stews and soups before spending money on drugs.

### Detoxification

When people begin to detox from active use, they often feel sick to their stomach or throw up and can find it impossible to eat certain foods. During this time it is important to drink enough fluids and to eat bland, low-fat foods that are easy to digest. Remember that detoxification is just a phase. It may last from a few days to a few weeks, but it will pass. And it is an important first step.

### Eating through detox

- Start with clear fluids. Rehydration drinks like Gatorade may help.
- Move on to high-calorie fluids and gradually to a full diet.
- Eat small meals and snacks frequently.
- Limit caffeine intake.
- Take a daily multivitamin-mineral supplement.

## Recovery

Recovery goes on for life and many recovering addicts relapse from time to time. It is important to remember that if it happens, it is a normal part of recovery.

People in recovery sometimes gain a lot of weight. This can be due to having an insatiable appetite in early recovery, uncontrollable sugar cravings or a shift in the addiction from drugs to food.

When eating during recovery, the goals are to 1) set up a normal eating pattern, 2) keep levels of sugar in the blood as steady as possible, and 3) eat lots of healthy foods that replenish the body.

### Recovering with nutrition

- Eat 3 meals and 2 to 3 snacks at regular times each day. Don't miss meals, as this can trigger binge eating.
- Emphasize complex carbohydrates to enhance serotonin levels in the brain. Have grains, breads and cereals at every meal and snack.
- Snack on fruits rather than sweets.
- Limit coffee to 2 cups daily.
- If constipated, increase fibre, especially wheat bran and bran cereals (see "Figuring out fibre," Chapter 6).
- Drink plenty of fluids. Drink more water and limit soft drinks, juices and powdered fruit drinks.
- Work hard on curbing sugar cravings. For example, try sugar substitutes in coffee.
- Get regular exercise, such as walking. This will improve mental and physical well-being and help decrease weight gain.
- Get plenty of rest to allow the body to heal.
- Learn to deal with stress. It is a natural part of life. Explore techniques such as yoga, Tai Chi, meditation, exercise, visualization, group support and counselling.
- Take a daily multivitamin-mineral supplement.

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## 10. Hepatitis C Co-infection

Many people living with HIV are also living with hepatitis C, a virus that attacks and damages the liver. In people who are co-infected, the liver inflammation and damage may progress faster than in people who have hepatitis C alone; and sometimes the complications from the hepatitis are more severe than the state of their HIV disease.

The nutritional requirements of hepatitis C infection are generally similar to those for HIV infection. Increased amounts of protein are required to provide the materials the liver needs to nourish and repair liver cells. However, check with your doctor before adding more protein to your diet.

If you have advanced liver disease and a brain condition called encephalopathy, your liver doctor might tell you to decrease the amount of protein you eat. If your doctor does make this recommendation, it is a good idea to talk with a dietitian who specializes in liver disease to make sure your nutritional needs are being met.

As liver disease progresses, there is a high risk of developing malnutrition, because the liver is the centre of food and nutrient metabolism. A damaged liver has widespread effects on nutrition. Added to this is the fact that people with advanced liver disease generally eat poorly.

Obesity and hepatitis are a dangerous combination. Liver scarring (fibrosis)—which occurs in hepatitis infection—progresses faster in obese people. Both obesity and hepatitis C also increase the risk of developing diabetes.



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*A damaged liver can affect your nutritional needs. Check with your doctor.*

### Nourishing the liver

- Be as well nourished as possible. Eating well will provide nutrients for the liver to stay as healthy as possible.
- Make sure you get enough protein, but check with your doctor before starting a high-protein diet.
- Choose a multivitamin without iron unless your doctor tells you something different (see “Key vitamins and minerals for HIV,” Chapter 4).
- Antioxidants like vitamin C, vitamin E and alpha lipoic acid may be beneficial (see Chapter 4). Keep vitamin C intake below 1,000 mg per day because high doses of vitamin C promote iron absorption, which is not good for the liver.
- Avoid alcohol completely, as this most certainly will cause liver disease to progress faster and increase the chance of getting liver cancer.
- Nutrition tips for hepatitis C can be found at [www.hepCinfo.ca](http://www.hepCinfo.ca).

## Appendix A: Food Sources of Protein

	Serving size	Protein (grams)
<b>EXCELLENT SOURCES</b>		
<b>Vegetarian</b>		
Cooked dried beans, peas or lentils	1/2 c	8
Beans, refried	1/2 c	8
Tofu	1/2 c	10
Soy beverage	1 c	7
Nuts or seeds	1/4 c	8
Peanut butter	2 tbsp	9
<b>Foods from animals</b>		
Red meat	100 g	21
Chicken	100 g	21
Fish	100 g	21
Large egg (whole)	1	7
Yogurt	3/4 c	8
Cheese	30 g	7
Milk	1 c	8
<b>"OK" SOURCES</b>		
<b>Staples</b>		
Rice (white or brown)	1/2 c	3
Pasta	1 c	7
Bread	1 slice	1-5
Flour tortilla	1	3
Corn	1/2 c	3
Yucca	1/2 c	3
Plantain	1/2 c	2
<b>Vegetables</b>		
Cooked broccoli	1/2 c	2
Cooked cabbage	1/2 c	1
Raw spinach	1/2 c	1
Tomato paste	1/2 c	2



## Appendix B: Calculating Protein, Calorie and Fluid Needs

Use the following table to determine how many calories you need to eat and how many grams of protein and cups of fluid you should try to include in your daily diet.

Weight in kg [pounds]	Fluid cups per day	Protein grams per day	Calories women	Calories men
45 [100]	8	45–65	1,800	1,800
50 [110]	8	50–75	1,800	1,900
55 [120]	8	55–80	1,900	2,040
59 [130]	9	60–90	2,065	2,210
64 [140]	9	65–95	2,210	2,380
68 [150]	10	70–100	2,244	2,400
73 [160]	10	75–110	2,336	2,410
77 [170]	10	75–110	2,464	2,540
82 [180]	10	80–120	2,500	2,624
86 [190]	10–11	85–125	2,500	2,750
90 [200]	10–11	90–135	2,500	2,750
95 [210]	10–11	95–135	2,500	2,750
100 [220]	10–11	100–150	2,500	2,750

*Use the higher number for protein if you are wasting or fighting an opportunistic infection.*

Here are suggestions on the number of servings of food groups required to meet calorie needs.

	1,800 calories	2,000 calories	2,200 calories	2,400 calories	2,600 calories	2,800 calories
<b>Food group</b>						
Grains	6	6	7	8	9	10
Fruits and vegetables	7	7	8	8	8	8
Dairy or substitute	2–3	2–3	2–3	2–3	3	3
Meats and alternatives	2–3	3	3–4	3–4	4	4
Fats and oils	5 tbsp	6 tbsp	6 tbsp	7 tbsp	7 tbsp	8 tbsp

In the box below, write down your specific needs.

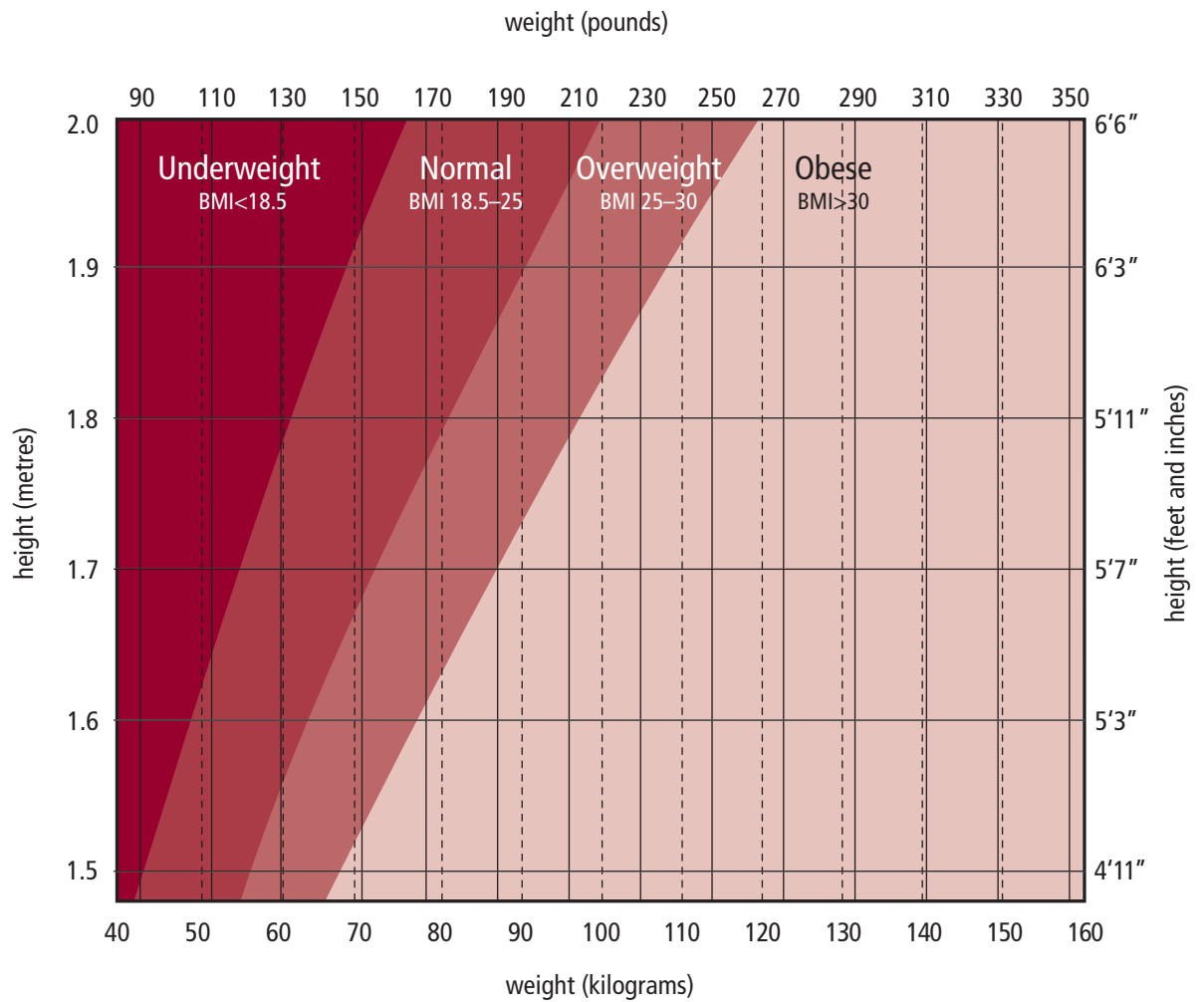
### MY PLAN

Daily needs		Food group	Servings
Fluids		Grains	
Protein		Fruit and vegetables	
Calories		Dairy or substitute	
		Meats and alternatives	
		Fats and oils	

# Appendix C: BMI Chart

To determine your BMI (body mass index):

1. Find your height on the side (in metres on the left and in feet on the right) and draw a horizontal line across the chart.
2. Find your weight (in kilograms across the bottom or in pounds across the top) and draw a vertical line across the chart.
3. The shaded area where the 2 lines meet is your BMI.



Or calculate your BMI directly 
$$\text{BMI} = \frac{\text{your weight (kg)}}{\text{your height (m)} \times \text{your height (m)}}$$

BMI (kg/m <sup>2</sup> )	Classification
under 18.5	underweight
18.5 to 24.9	normal
25 to 29.9	overweight
over 30	obese

## Appendix D: Web Resources

### CATIE Resources

*The Positive Side* has several articles on nutrition, including recipes.  
[www.positiveside.ca](http://www.positiveside.ca)

Fact sheets on supplements, vitamins and herbs  
[www.catie.ca/supple-e.nsf](http://www.catie.ca/supple-e.nsf)

*A Practical Guide to HIV Drug Side Effects*  
[www.catie.ca/sideeffects\\_e.nsf](http://www.catie.ca/sideeffects_e.nsf)

Up-to-date nutrition Web resources  
[www.catie.ca/vertical.nsf](http://www.catie.ca/vertical.nsf)

### General Web Resources

*Living+* magazine from the British Columbia Persons With AIDS Society often publishes articles on nutrition  
[bcpwa.baremetal.com/empower\\_yourself/living\\_positive/](http://bcpwa.baremetal.com/empower_yourself/living_positive/)

Nutrition and treatment fact sheets by Lark Lands  
[www.larklands.net/larktreatments.htm](http://www.larklands.net/larktreatments.htm)

“Diet, Nutrition and HIV” from TheBody.com  
[www.thebody.com/index/dietnut.html](http://www.thebody.com/index/dietnut.html)

“HIV Nutrition and Health” from Tufts University  
[www.tufts.edu/med/nutrition-infection/hiv/health.html](http://www.tufts.edu/med/nutrition-infection/hiv/health.html)

### Recipes and Practical Tips

Jon Kaiser’s Recipes to Aid Your Immune System  
[www.jonkaiser.com/educate/recipe/index.html](http://www.jonkaiser.com/educate/recipe/index.html)

*For the Pleasure of Eating* by La Maison du Parc  
[maisonduparc.org/f7.html](http://maisonduparc.org/f7.html)

### Guides and Fact Sheets

New York Buyers Club (information on nutrition, herbal and homeopathic supplements)  
[www.newyorkbuyersclub.org/index.html](http://www.newyorkbuyersclub.org/index.html)

*Nutrition* by NAM  
[www.aidsmap.com/cms1187580.asp](http://www.aidsmap.com/cms1187580.asp)

*Recipe for Living: Nutrition and HIV* from the AIDS Community Research Initiative of America

[www.acria.org/treatment/treatment\\_edu\\_springupdate2002.html](http://www.acria.org/treatment/treatment_edu_springupdate2002.html)

Resources from the Association of Nutrition Service Agencies

[www.aidsnutrition.org](http://www.aidsnutrition.org)

*Living Well with HIV: A manual on nutritional care and support for people living with HIV/AIDS* from the Food and Agricultural Organization of the United Nations

[www.fao.org/DOCREP/005/Y4168E/Y4168E00.htm](http://www.fao.org/DOCREP/005/Y4168E/Y4168E00.htm)

**If you do not have Internet access, we can help you obtain these resources. Call us at 1-800-263-1638.**

## Appendix E: Studies Involving Micronutrients and HIV

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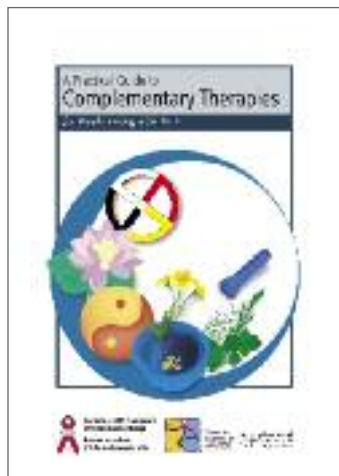
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# A Practical Guide to **Nutrition** *for People Living with HIV*

This guide is one of a series of practical guides for people living with HIV.  
The other titles in the series are:

- *A Practical Guide to Complementary Therapies*
- *A Practical Guide to HIV Drug Treatment*
- *A Practical Guide to HIV Drug Side Effects*



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information

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web: [www.catie.ca](http://www.catie.ca)  
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Production of this guide has been made possible  
through financial contributions from the Public  
Health Agency of Canada.

CATIE Ordering Centre No: ATI-40012  
(aussi disponible en français, ATI-40013)