

Nutrition

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Contact NAM to find out more about the scientific research and information used to produce this booklet.

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Nutrition

This booklet is intended to answer some of the most commonly asked questions about food, nutrition and living with HIV. It outlines how to eat well to stay well, as well as covering some of the dietary changes you may need to make to maximise absorption of anti-HIV drugs or deal with certain side-effects of HIV treatment. It also gives advice on how to maintain a healthy weight and on food safety.

The information in this booklet isn't intended to replace discussion with your doctor about your HIV treatment and care, but it may help you to think about questions you would like to ask your healthcare team.

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General nutritional advice

Healthy eating

Good nutrition is important for everyone's health. Nutrition plays an important role in the health of the immune system and its ability to fight infection. Healthy eating also helps you become and stay a healthy weight, and can help reduce the risk of developing heart disease, diabetes, cancer and osteoporosis.

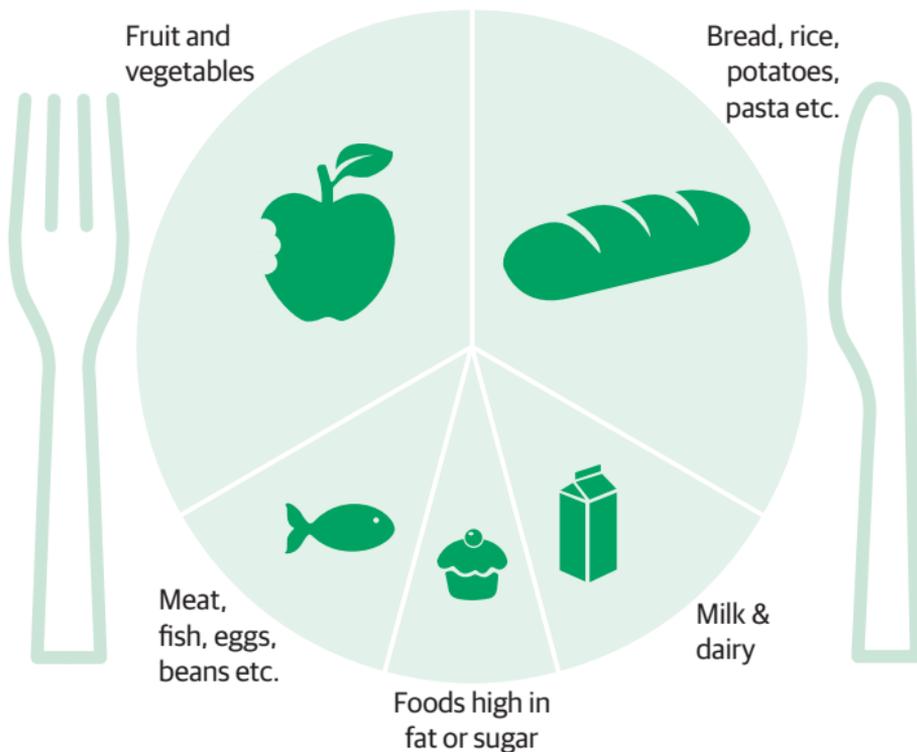
Having HIV is unlikely to mean that you have to make big changes to your diet. However, it is important to get enough nutrients to help you stay well. Good nutrition is important during the time before you start HIV treatment. It is also an important part of helping anti-HIV drugs work as well as possible once you are taking them.

If you are taking anti-HIV drugs it is important to eat a healthy, balanced diet, as HIV medication can cause changes to the way the body metabolises some fats and sugars.

A good diet will consist of a balance of the following types of food:

Starchy foods such as bread, cassava, cereals, green banana, millet, maize meal, potatoes, pasta, rice and yam. Starchy foods should form the basis of your diet – about a third of your food intake each day. They provide carbohydrates for energy, as well as minerals, vitamins and fibre. Wholegrain versions of rice, pasta and bread contain more fibre and often more vitamins and minerals as well.

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Fruit and vegetables provide vitamins, minerals and fibre. Try to eat five or more portions of fruit or vegetables each day. A portion is 80g, or roughly equal to:

- one medium-sized piece of fruit (such as an apple, pear or orange)
- two small pieces of fruit (such as a satsuma or plum)
- a large slice of a larger fruit such as pineapple
- three heaped tablespoons of vegetables (these can be fresh, tinned or frozen).
Vegetables such as potatoes and yams do not count towards your five-a-day target as they are counted as starchy foods.

- three heaped tablespoons of beans or pulses (only one portion of these counts towards your five-a-day target)
- a handful of dried fruit or a small glass of fresh fruit juice (like beans and pulses, juice only counts as one portion even if you drink more than a glass).

Fruit and vegetables can help protect against certain cancers and heart disease. They are low in fat, so increasing the proportion of your diet made up of them is helpful if you are trying to lose weight.

Dairy products, such as milk, cheese and yoghurt, provide vitamins, minerals and especially calcium. Some dairy foods are high in

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saturated fats, so should only be eaten in small quantities, or you could eat lower-fat versions of milk, cheese and yoghurt. If you cannot tolerate milk, then fortified soya, rice or oat milk, dark green leafy vegetables, dried figs, apricots and nuts are all good sources of calcium.

Meat, poultry, fish, eggs, beans and nuts

provide protein, minerals and vitamins (particularly B12 from meat). Around 15% of your food intake should be from protein-rich food each day, or two portions a day. Try to eat two portions of fish a week, including at least one portion of oily fish.

Fats from cooking oils, butter and margarine, meat and other protein-based foods provide energy, essential fatty acids and fat-soluble

vitamins (A,D,E,K). Try to eat 'unsaturated' fats, such as those found in oily fish, nuts and seeds, avocados, olive oils and vegetable oils. The 'saturated' fats, found in meat, cheese, butter and many processed foods can raise cholesterol (see p.32). These should only be eaten in small amounts.

Food and drinks high in fat or sugar should only be a small part of your diet. Too much of most sorts of food - but especially fats and sugars - can lead to unhealthy weight gain. See p.10 for more information on maintaining a healthy weight.

Salt and salty foods can lead to high blood pressure, if eaten in large amounts, and this can increase the possibility of having a stroke or

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developing heart disease. Adults and children over eleven should eat no more than 6g of salt a day, and younger children less.

Some foods are high in salt (for example, bacon, cheese, anchovies, gravy granules and stock cubes, ham, prawns, salami, salted and dry-roasted nuts, smoked meat and fish, salt fish, olives, soy sauce and yeast extract). Try to eat these less often or in smaller amounts.

Bread and breakfast cereals can add a lot of salt to your diet, especially if you eat a lot of them. Where possible, check the labels of foods such as sauces and dressings, breakfast cereals, crisps and tinned foods and choose varieties with lower levels of salt (and sugar).

Reduce the amount of salt you use in cooking. You could use more spices, fresh herbs, garlic and lemon to add flavour, for example.

Ready-made meals and other convenience foods are often high in salt, sugar and fat. Eating these too often can make it hard to have a healthy and balanced diet.

You can find out more about eating a balanced diet on the NHS Choices website at: www.nhs.uk/livewell/goodfood.

Vitamins and minerals

Vitamins and minerals are nutrients that our body needs in order to work properly. These nutrients occur naturally in food.

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Most people can get all the vitamins and minerals they need by eating a balanced, varied diet that includes plenty of fruit and vegetables.

You can find out more about key vitamins and minerals, what foods they are found in, and recommended daily levels on the NHS Choices website at www.nhs.uk/conditions/vitamins-minerals.

Pregnant and breastfeeding women have slightly different nutritional needs. Your healthcare team can talk to you about these. A dietitian can give you advice on food safety during pregnancy, as well as information on managing your weight while you are pregnant. You can also find more information at www.nhs.uk/livewell/pregnancy.

Supplements

Many people with HIV may consider supplementing their diet with additional vitamins, nutrients, and herbal remedies in the hope of protecting or strengthening their immune system, or maintaining or promoting their general health, weight or body shape.

HIV specialists advise that a healthy, balanced diet is enough. Evidence that many of these supplements have any effect is limited. Mega dosages of any nutritional supplement are not recommended (see p.7).

However, many people with HIV have low levels of vitamin D, and this has been associated with an increased risk of some health problems (see p.38 for more

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information on osteoporosis, one of these potential problems). Your vitamin D levels should be monitored as part of your routine HIV care, and your doctor may prescribe supplements if your levels are very low. Vitamin D is found in food, but you get most of your vitamin D from sunlight on your skin, so levels can also vary at different times of the year and depending on the colour of your skin. A dietitian can also advise you on dietary sources of vitamin D and on safe sun exposure.

High doses of vitamins and minerals

Some people take high doses of certain vitamins and minerals because they believe that they may boost their immune system. Although vitamins and minerals play an essential role in staying well, research has

shown that large doses of some can be harmful.

All the following vitamins and minerals are important in maintaining your immune system, but can cause health problems if you have too much:

- Vitamin A (also called beta carotene): large amounts can cause liver and bone damage, vomiting and headache. Doses above 0.7mg for men or 0.6mg for women may be harmful. Doses of more than 1.5mg may increase the risk of osteoporosis. Pregnant women should not take supplements containing vitamin A without consulting their doctor as high intake can be harmful to the developing baby.

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- Vitamin C (ascorbic acid): doses above 1000mg per day may lead to kidney stones, diarrhoea and hardening of the arteries. Large doses of vitamin C have been shown to reduce concentrations of indinavir (*Crixivan*) in the blood, and it's possible that there may be similar interactions between high-dose vitamin C and other protease inhibitors.
- Vitamin E: doses above 800mg per day are associated with adverse effects; special care is needed if you are taking an anticoagulant or if you have haemophilia.
- Zinc: high doses have been linked to copper deficiency, changes in LDL:HDL cholesterol ratios, neutropenia (low white blood cells) and anaemia (low red blood cells). A daily

dose of 25mg a day as a supplement is considered the safe upper level for long-term use.

- Vitamin B6 (pyridoxine): more than 2g per day has been associated with nerve damage, with lower, long-term daily doses (from 500mg to 50mg) linked to neuropathy (although vitamin B6 is also used to prevent or treat neuropathy in some situations).

Herbal remedies

Many people use herbal remedies to supplement their diet. It is always important to do this with caution and to tell your doctor and/or HIV pharmacist what you are taking. Some supplements can stop anti-HIV drugs working properly.

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Garlic capsules, which are frequently taken because they are believed to protect the heart, stop the HIV drug saquinavir (*Invirase*) working properly. Saquinavir is a type of HIV drug called a protease inhibitor and it is thought that garlic capsules could have a similar effect on other protease inhibitors. (Garlic taken in food does not have this effect.)

St John's wort, the herbal antidepressant, was also shown to be inappropriate for people taking protease inhibitors and another type of HIV drug called NNRTIs (non-nucleoside reverse transcriptase inhibitors). The herb was shown to lower levels of the protease inhibitor indinavir (*Crixivan*) and researchers concluded that it should not be taken with any other protease inhibitors, NNRTIs or maraviroc (*Celsentri*), as

the body processes all of them in the same way. Commonly prescribed NNRTIs include efavirenz (*Sustiva*, also in the combination pill *Atripla*) and nevirapine (*Viramune*).

Test-tube studies have shown that African potato and Sutherlandia, two herbs sometimes used to treat HIV in Africa, interfere with the body's ability to process protease inhibitors and NNRTIs.

There is also a theoretical risk of an interaction between anti-HIV drugs and many other herbal preparations, including borage oil, DHEA, ginkgo biloba, liquorice, milk thistle and valerian.

Your HIV pharmacist can give specific advice about potential interactions between your anti-HIV drugs and herbal remedies. It is very

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important that you tell your doctor, pharmacist and dietitian exactly what supplements you are taking or thinking of taking.

Maintaining a healthy weight

As for anyone, it's important to maintain a healthy body weight when you have HIV. Being overweight or underweight can cause problems for your health.

Maintaining a healthy weight is about balancing the energy you take in and use up. If you consume more energy (calories) than you use, you're likely to gain weight. On the other hand, if you burn more calories than you eat, the chances are you'll lose weight. Finding the right balance over time allows you to achieve and maintain a healthy body weight.

Working out your body mass index (BMI) can provide an approximate idea of how healthy your body weight is. This is calculated using your height and weight. A BMI between 18.5 and 25 is considered to be within the healthy range. A useful tool that helps you to calculate your BMI is available on the NHS Choices website at: www.nhs.uk/tools/pages/healthyweightcalculator.aspx

Being overweight

The anti-HIV drugs commonly used today are much less likely to cause the body-shape changes (lipodystrophy) that some older drugs did. So if you notice an increase in your weight and accumulations of soft fat around your belly or in other parts of your body, this is likely to be routine fat gain associated with eating too much

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and not doing enough exercise. Indeed, obesity is becoming more common in people with HIV.

Obesity is when a person is carrying too much weight for their height. Someone with a BMI over 30 is considered to be obese.

It can cause a number of health problems, such as type 2 diabetes (a condition caused by too much glucose in the blood; see p.37), high blood pressure and heart disease (see p.36), and an increased risk of developing certain cancers.

Being overweight or obese can shorten life expectancy by as much as six or seven years.

Obesity is treated by losing weight, which will usually involve healthy, calorie-controlled

eating and increasing the amount of exercise you do. This may mean you have to make some quite challenging lifestyle changes, but there is lots of help available. Talk to your healthcare team about the support they can offer, or see the end of the booklet for contacts of other organisations that may be able to help.

In some cases, where people are severely obese and find they cannot lose weight in other ways, there is the option of surgery. Like any operation, this has some risks attached and may not be suitable.

Being underweight

Weighing too little can weaken your immune system, cause bone problems (see p.38) and cause you to lack energy.

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If you experience an unintended drop in your body weight, especially if it's accompanied by symptoms such as diarrhoea, vomiting, fevers or pain, you should mention this to your doctor so the possible causes can be investigated.

There's more information on maintaining a healthy body weight if you are ill later in this booklet (see p.31).

Managing your weight

How and what you eat can help influence both your weight and the levels of fats and sugars in your blood (see p.32).

There's lots of advice and help available on eating well, and on choosing a healthier lifestyle to help you lose weight or maintain a healthy weight. You could start with the

information on NHS Choices, at www.nhs.uk/livewell/goodfood or on the British Dietetic Association's Weight Wise website: www.bdaweightwise.com.

The HIV organisation The Food Chain provides more information on eating well. Resources such as factsheets and recipes are available on its website. The Food Chain also offers a range of services, including free healthy eating courses and practical cookery classes, for people living with HIV in London.

Contact The Food Chain on 020 7354 0333, email info@foodchain.org.uk, or visit its website: www.foodchain.org.uk.

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Eating well on a budget

If you are having difficulty affording food, or buying food that you need for a special diet, a member of your healthcare team can put you in contact with sources of help. The website www.moneysavingexpert.com has some useful advice on budgeting and shopping carefully.

Here are some tips to help you shop and eat well without spending a lot of money:

- Small shops and convenience stores are often more expensive than larger supermarkets.
 - Many supermarkets offer large packs of foods that keep a long time (e.g. rice) for less money per kilo than smaller packets. This can save you a lot of money in the long
- term. You could buy larger bags of rice or flour and split them with a friend or neighbour.
- Larger supermarkets have 'value' ranges to help reduce the cost of regular items used every day. And you can often save money on fruit, vegetables and staple foods at the cheaper supermarkets.
 - Check 'best before' or 'use by' dates – sometimes food near this date will be reduced in price, especially towards the end of the day. But make sure you can use it before it goes off.
 - Look for special offers on food that will keep, such as pasta, rice or cereals. But beware of offers in supermarkets that might tempt you to buy things you don't really need.

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- Fruit and vegetables are often cheaper if you buy them loose, rather than packaged, and if they are in season. They can also be cheaper if you buy them from a market rather than a supermarket (and you may find a greater variety of foods from different cultures in some markets). But be careful not to buy more fruit or vegetables than you can use before they go bad, as you may have to throw them out.
- Frozen, tinned or dried fruit, vegetables and beans are nutritious, last longer and can be much cheaper than fresh. Tinned fish is also a good option. Try to choose the types with little or no added salt or sugar, and buy tinned fruit in juice rather than syrup.
- Making meals at home will often be cheaper – and healthier – than buying a ready-made version, especially if you are cooking for several people.
- Plan your shopping, try to stick to your shopping list, and try not to go shopping when you are hungry!

Dietitians

You can get advice on nutrition from a specially trained health professional called a dietitian. Some HIV clinics have specialist dietitians, or can refer you to dietitians, who can:

- Make sure your diet is fulfilling all your individual nutritional requirements.

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- Give you advice about your diet if you are experiencing metabolic changes due to your HIV treatment.
 - Regularly check your weight and ensure that the proportion of fat to muscle is appropriate.
 - Advise you on any dietary changes you may need to make if you become ill.
 - Help you avoid food poisoning.
 - Offer advice on symptom control, such as how to manage changes in taste caused by medication.
 - Give advice for managing conditions such as diabetes, obesity, hyperlipidaemia
- (high levels of fat in the blood) and poor absorption of food.
- Give advice on your nutritional requirements during pregnancy and while breastfeeding.
 - Help you identify and manage any food allergies and intolerances.
 - Advise you on your nutrition needs based on your exercise levels or sporting activity.
 - Provide information and advice on the use of vitamins and minerals and complementary therapies.
- Some dietitians use a variety of tests to assess how much muscle and fat there is in your body.

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If these tests are done regularly your dietitian may be able to spot changes in weight and body composition before you do. However, you may be the first to notice changes in your weight or body shape – for instance, if your clothes become too loose or tight. These may be important times to talk to your dietitian about making changes to your diet or exercise.

Alcohol

There is no evidence that moderate alcohol consumption by people with HIV is harmful unless they have other medical conditions, such as hepatitis. Many people find that moderate drinking (one or two units a day) helps relieve stress and anxiety and acts as an appetite stimulant. A unit of alcohol is around:

- a third of a pint of beer or lager (at 5 to 6% alcohol)
- half a standard glass of wine (a standard glass is 175ml)
- a single pub measure of spirits (25ml)
- a small glass of sherry or port (50ml).

There is also some evidence that drinking a unit or two of alcohol daily can help protect against heart disease, stroke and diabetes. It is recommended that men drink no more than three or four units of alcohol a day and women a maximum of two or three units a day.

Drinking too much can make it harder for you

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to take your drugs in the right way, at the right time (this is often called 'adherence').

The increases in blood fats (such as cholesterol and triglycerides) that can be caused by some anti-HIV drugs can be made worse by heavy drinking.

Heavy drinking is linked to hepatitis (inflammation of the liver) and liver damage. It is particularly important that people with HIV take care of their liver, not least because the liver plays an important part in how the body processes anti-HIV drugs. People who are co-infected with either hepatitis B or C should be aware that drinking even a small amount of alcohol is not advisable.

Drinking too much alcohol can sometimes lead to vomiting. If you vomit within an hour of taking

your HIV treatment, you should retake the dose.

Binge drinking can also be harmful to general health, so don't drink all your weekly units in one day. Also remember that alcohol can contain a lot of calories, so you need to take how much you drink into account if you are trying to lose weight.

The NHS Choices website has a lot of information about alcohol, and a tool to help you keep track of how many units you're drinking. You can find this at www.nhs.uk/livewell/alcohol.

Water and other fluids

It is important to stay properly hydrated to ensure that the body has enough fluid

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(liquid) to function properly. In the UK, it's recommended we drink about 1.2 litres of fluids a day – that's six to eight glasses. It is especially important to drink plenty of fluids if you are taking certain anti-HIV drugs, such as atazanavir and indinavir, to help the body process them properly and avoid side-effects.

If you have a fever, or have diarrhoea, then it is important to drink extra fluids. Similarly, if you are exercising, you should increase your water or other fluid intake.

You can take some of your daily fluids as fruit juice, squash diluted with still or fizzy water, tea or coffee. However, you should be aware that coffee, cola and, to a lesser extent, tea dehydrate the body, as does alcohol.

Tap water in the UK is safe to drink and there really aren't any special considerations about the UK's drinking water for people with a CD4 cell count above 200.

But if you have a very low CD4 cell count, a little more caution may be needed and it's a good idea to talk to your doctor or another member of your healthcare team about any special steps you may need to take to make sure you don't acquire an infection from your drinking water.

Food safety

If you have a strong immune system, your risk of getting food poisoning is no greater than it is for an HIV-negative person.

If you have a low CD4 cell count, you may be

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more vulnerable to food poisoning. Taking HIV treatment will help strengthen your immune system and reduce the risk of infections.

Following general advice about the preparation, cooking and storage of food can also help reduce the risk of food poisoning.

The following tips might be useful:

- Avoid raw meat, raw fish, raw eggs, and undercooked chicken, poultry or pork.
- Avoid unpasteurised and blue cheeses (such as Brie or Stilton), and unpasteurised milk and yoghurt.
- Avoid live yoghurt and probiotic drinks and

supplements.

- Cooked stews should be kept in the fridge and eaten within two days. Portions should be frozen if you wish to keep them for longer.
- Make sure that food is thoroughly reheated if it has already been cooked.
- Avoid food that is mouldy or has passed its sell-by date, and eggs that have cracked.
- Wash fruit and vegetables thoroughly.
- Keep cutting and preparation surfaces clean.
- Make sure that uncooked food is kept separate from cooked food.

Your diet and anti-HIV drugs

Choosing your treatment

Choosing a drug combination that you can fit into your existing eating habits is usually easier than trying to adjust your eating habits to fit the drugs.

There are some simple things you can do to help you take your drugs on time, and you can find out more about these in NAM's booklet *Adherence & resistance*. You can also talk to your healthcare team or an HIV support organisation if you would like more help with taking your treatment in the right way.

Anti-HIV drugs are becoming easier to take and many drugs do not have any special food

requirements – you can take them with or without food. But some drug combinations may require one of the following:

- Taking your drugs with food.
- Taking your drugs on an empty stomach.

Interactions between drugs and food

The following is an overview of dietary requirements for currently available HIV drugs. When you are prescribed a new drug you should be given written information about how to take it, including information about dietary restrictions. Ask your doctor, pharmacist or dietitian if you would like any further information about your diet and HIV drugs.

Your diet and anti-HIV drugs

Drug and food interactions - nucleoside/nucleotide reverse transcriptase inhibitors (NRTIs/NtRTI)

Drug	Food requirements	Liquid requirements
3TC (lamivudine, <i>Epivir</i>)	May be taken with or without food.	No special requirements.
abacavir (<i>Ziagen</i>)	May be taken with or without food.	No special requirements.
AZT (zidovudine, <i>Retrovir</i>)	May be taken with or without food, though taking with food may reduce nausea.	No special requirements.
d4T (stavudine, <i>Zerit</i> , now rarely used)	May be taken with or without food.	No special requirements.
Enteric-coated ddi (<i>Videx EC</i> , didanosine capsules, now rarely used)	Essential to take on an empty stomach, at least two hours before and two hours after eating or drinking anything except water.	Cold water recommended.
FTC (emtricitabine, <i>Emtriva</i>)	May be taken with or without food.	No special requirements.
tenofovir (<i>Viread</i>)	Take with food.	No special requirements.

Your diet and anti-HIV drugs

Drug and food interactions - combination pills

Drug	Food requirements	Liquid requirements
<i>Atripla</i> (efavirenz, FTC and tenofovir combined)	Take on an empty stomach (preferably at bedtime), to reduce the incidence of side-effects (particularly avoid taking it soon after a high-fat meal as this increases the risk of side-effects).	No special requirements.
<i>Combivir</i> (AZT, 3TC combined)	May be taken with or without food, although taking with food may reduce nausea.	No special requirements.
<i>Kivexa</i> (3TC, abacavir combined)	May be taken with or without food, although taking with food may reduce nausea.	No special requirements.
<i>Trizivir</i> (AZT, 3TC, abacavir combined)	May be taken with or without food.	No special requirements.
<i>Truvada</i> (tenofovir, FTC combined)	Take with food.	No special requirements.

Your diet and anti-HIV drugs

Drug and food interactions - non-nucleoside reverse transcriptase inhibitors (NNRTIs)

Drug	Food requirements	Liquid requirements
efavirenz (<i>Sustiva</i>)	Take on an empty stomach (preferably at bedtime), to reduce the incidence of side-effects (particularly avoid taking it soon after a high-fat meal as this increases the risk of side-effects).	No special requirements.
etravirine (<i>Intence</i>)	Take with or after food (within two hours after a main meal or within half an hour after a snack).	No special requirements.
nevirapine (<i>Viramune</i>)	Take with or without food.	No special requirements.

Your diet and anti-HIV drugs

Drug and food interactions - protease inhibitors

Drug	Food requirements	Liquid requirements
atazanavir (<i>Reyataz</i>)	Take with or after food (within two hours after a main meal or within half an hour after a snack).	No special requirements.
darunavir (<i>Prezista</i>) (always taken with ritonavir)	Take with or after food (within two hours after a main meal or within half an hour after a snack).	No special requirements.
fosamprenavir (<i>Telzir</i>) (usually taken with ritonavir)	May be taken with or without food.	Alcohol should be avoided by people on the liquid formulation.
indinavir (<i>Crixivan</i> , now rarely used)	Take on an empty stomach, or with a light, low-fat snack, or at least two hours after and one hour before a meal.	Increase fluid intake (try to drink at least 1.5 litres of non-alcoholic fluids a day) to reduce the chances of developing kidney stones.

Your diet and anti-HIV drugs

Drug and food interactions – protease inhibitors *continued*

Drug	Food requirements	Liquid requirements
lopinavir/ritonavir (<i>Kaletra</i>) tablets	Take with or without food.	No special requirements.
lopinavir/ritonavir (<i>Kaletra</i>) liquid	Should be taken with food to increase its effectiveness.	No special requirements.
ritonavir (<i>Norvir</i>)	May be taken with or without food, but taking with a fatty meal minimises the risk of nausea (this is less of a problem with the low dose [100mg] of ritonavir).	No special requirements.
saquinavir (<i>Invirase</i>) (must be taken with ritonavir)	Take within two hours of food to increase its effectiveness.	No special requirements.
tipranavir (<i>Aptivus</i>) (must be taken with ritonavir)	Take with or after food to reduce the incidence of side-effects.	No special requirements.

Your diet and anti-HIV drugs

Drug and food interactions - fusion and entry inhibitors

Drug	Food requirements	Liquid requirements
maraviroc (<i>Celsentri</i>)	May be taken with or without food.	No special requirements.
T-20 (enfuvirtide, <i>Fuzeon</i>)	Administered by injection. No food restrictions.	No special requirements.

Drug and food interactions - integrase inhibitors

Drug	Food requirements	Liquid requirements
raltegravir (<i>Isentress</i>)	May be taken with or without food. Do not chew, crush or split tablets.	No special requirements.

Managing side-effects that interfere with eating

Like all medicines, the drugs used to treat HIV can cause side-effects. These are most likely to occur when you first start taking a drug, but they are often mild and usually lessen or go away completely with time. You can find more information on possible side-effects and how to manage them in NAM's patient information booklet *Side-effects*.

Nausea and vomiting

Some anti-HIV drugs can cause you to feel or be sick. Your doctor should offer to prescribe anti-nausea medication (antiemetics) at the start of any course of treatment that may cause these side-effects. Taking an anti-

nausea medicine about 30 minutes before your anti-HIV drugs can help to prevent these symptoms.

Diarrhoea

Diarrhoea is a possible side-effect of most anti-HIV drugs. It often goes away after a few weeks or months of taking the drug. It can normally be controlled by anti-diarrhoea medication. Your doctor should offer to prescribe this for you if you are starting a treatment that can cause diarrhoea, or it can be bought over the counter at a pharmacy.

If you have diarrhoea for more than a few days, especially if you feel unwell, you should see your doctor. They may suggest you have a stool sample checked for infections.

Managing side-effects that interfere with eating

Changes in diet have little effect on protease inhibitor and other drug-related diarrhoea. However treatments are available from doctors to try and control diarrhoea caused by drugs. These include *Imodium* (loperamide). This is available on prescription from your doctor or can be bought over the counter from chemists. Stronger anti-diarrhoea drugs, such as lomotil or octreotide, can be prescribed by your doctor.

Usually diarrhoea will settle down after a few days. Try and avoid coffee, raw vegetables and spicy food as they can make diarrhoea worse.

As diarrhoea may result in excessive loss of salts and water from the body it is important to drink plenty of fluids or special rehydration

drinks. Eating foods like bananas, potatoes, chicken and fish will help you replace potassium, levels of which are commonly reduced in people with severe diarrhoea. Soluble fibre from natural sources like pulses, oats, bananas, apples and pears has also been shown to be effective against diarrhoea.

In many cases, avoiding foods that are high in fat, bulky fibre or lactose may help reduce the symptoms of diarrhoea.

If you are losing weight because of diarrhoea, it is important to speak to a dietitian as soon as possible who will work with you to develop a diet which is more appetising, or easy to absorb.

Managing side-effects that interfere with eating

Increasing or decreasing the fibre content of your diet may help if you have irritable bowel syndrome, as might anti-spasmodic therapies such as *Colofac*.

Unpleasant taste

This may be a direct consequence of the disintegration of drug capsules or tablets in the mouth, in which case strong mints or sweets, or brushing your teeth, may help take the taste away. Swallowing the medicines with a full glass of cold, still (non-carbonated) water can also help.

However, some drugs have been reported to cause changes in taste after the body has metabolised them. In some cases these are temporary and disappear after a few weeks,

but in other cases they persist. You could try food flavourings or avoid foods which have become unpleasant. Or you may choose to talk to a dietitian, or speak to your doctor about changing your drugs, especially if you are taking your first anti-HIV combination.

Avoiding and managing weight loss

The improvements in health that accompany treatment with anti-HIV drugs include improvements in body weight.

However, weight loss can be a very serious issue for people with HIV, especially if they have a low CD4 cell count or are ill because of the virus. Unintentionally losing just 3% of your body weight can significantly increase your chances of becoming ill because of HIV.

When you become ill you often lose your appetite. However, your energy requirements are likely to be greater when you are sick. Losing too much weight can be dangerous as it

reduces the body's ability to fight infection and recover. Changes in your appearance because of weight loss can also be difficult to cope with.

If you are ill, or are recovering from illness, what you eat is likely to be very important to how you fight illness and the speed at which you recover. If you are concerned about your nutritional requirements during this period, speak to a member of your healthcare team as soon as possible as it is very easy to start missing out on essential nutrients.

Above all, don't think that eating problems or unintentional weight loss are trivial. They are not, and it is always better to see someone early to prevent problems later.

Avoiding and managing weight loss

Unintended weight loss should always be taken seriously. If you cannot face eating or if you are finding it difficult to keep food down, a dietitian will not bully you into eating your food. Rather, they will work with you to try to help you regain your appetite, recommend smaller, more nutritious meals, or look at other solutions.

Causes of weight loss

An important first step is to identify any medical cause of the problem. Loss of weight can be an important warning sign of the presence of an infection or other condition, and is often noticeable before other more specific symptoms become apparent. It is unusual for a person with HIV to lose weight if there is not an underlying medical problem, although lack of appetite, worry and depression can be causes.

It is important to try and minimise unhealthy weight loss during illness and to put weight back on as lean muscle mass if you lose it during an illness.

Tips on eating when you are ill

Always have food available in your home. Canned foods, long-life products and frozen, ready-made meals can be helpful when you are feeling unwell. If you are unable to afford food then seek help and advice from your local council, HIV treatment centre or an HIV support agency.

Snacking through the day may be easier than eating three main meals; it can also be less tiring to prepare and eat food in this way.

Easy-to-swallow full-fat drinks and yoghurt may provide a useful source of energy and calories.

Your clinic will be able to provide food supplements that contain a balance of the nutrients you need, which may help you boost your energy intake if you are very unwell.

HIV treatment, metabolic changes and ageing

Anti-HIV drugs can cause changes inside your body, known as metabolic changes. These can include:

- changes to blood fats (also called lipids), such as having too much low-density (LDL, or 'bad') cholesterol; having too little high-density (HDL, or 'good') cholesterol; or having high triglycerides
- a change in the way the body processes sugar, known as insulin resistance.

These sorts of metabolic changes are also caused by lifestyle factors, such as smoking,

HIV treatment, metabolic changes and ageing

lack of exercise and being overweight. These changes are associated with an increased risk of diabetes and cardiovascular (heart) disease.

People can have any one of these changes on their own, but there is often a link between them. For example, insulin resistance can lead to diabetes, and both diabetes and weight gain are associated with an increased risk of cardiovascular disease.

You will be monitored for these changes as part of your routine HIV care. If you develop any of these problems, you can talk to your healthcare team about the sort of changes you may need to make to your eating habits and lifestyle to deal with them.

If you have high cholesterol, it is recommended that you cut down on saturated fats. These come from animal products such as red meat (beef, lamb and pork), dairy products such as butter, cream, whole milk, cheese and full-fat yoghurt, and the vegetable fats palm oil and coconut cream or oil (see p.1 for more information on a healthy, balanced diet).

Everyone is recommended to eat at least five portions of fruit and vegetables a day, and having plenty of fresh fruit and vegetables is especially important if you need to reduce your weight or high lipid (blood fat) levels.

To help prevent blood clots and reduce triglyceride levels, it's a good idea to increase your intake of a type of polyunsaturated fat

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called omega-3 fats. These are found in oily fish like mackerel, herring, salmon and sardines.

Regular exercise can also help reduce levels of blood fats. Resistance training (using muscle strength, such as lifting weights) and aerobic exercise (activities that increase your heart rate and make you breathe faster, such as running, walking and swimming) are particularly effective.

The glycaemic index (GI) is a way of rating foods by how fast they cause a rise in your blood sugar levels. High GI food will produce a sudden rush, while low GI food keeps blood sugar levels more stable. If you are experiencing these metabolic changes, you may be advised to follow a low GI diet. A dietitian can help you with this.

With the right treatment and care, people with HIV can expect to live well into old age. In fact, some doctors think that the life expectancy of many people more recently diagnosed with HIV is now near normal.

However, there is evidence that some of the diseases associated with ageing occur at a younger age in people with HIV compared to the general population. The reasons for this are unclear but, in many cases, could be either because of the effect of HIV itself on the body, or the side-effects of HIV treatment.

Nutrition has an important part to play in both the risk of developing these diseases (and preventing them) and how they can be managed if you have them.

HIV treatment, metabolic changes and ageing

Conditions related to metabolic changes and ageing

Lipodystrophy

Some older anti-HIV drugs are associated with changes in body shape (a condition called lipodystrophy), involving fat loss or fat gain in certain parts of the body. These drugs, called d4T (stavudine, *Zerit*) and AZT (zidovudine, *Retrovir*, which is also included in pills called *Combivir* and *Trizivir*) are rarely used for long-term treatment in the UK any more.

You can find out more about this in the NAM booklet, *Side-effects*.

A combination of resistance training (lifting weights) and aerobic exercise (walking, running, swimming, cycling) can help with

body shape. Aerobic exercise improves your heart's ability to pump and your muscles' ability to use oxygen.

Resistance training builds muscles which burn triglycerides stored in body fat. Activities like yoga and swimming do provide some resistance, but the most efficient way is to use free weights or weight machines in a gym. Working on large muscle groups brings the most benefit. To improve muscle strength you need to load your muscles quite heavily. Therefore it's a good idea to do a warm-up using a light weight and then do a small number of repetitions using relatively heavy weights.

It's a good idea to seek advice on using weights before you begin. If you use a gym there should

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be staff available who can advise you and help you to plan your training. Your training weight needs to be increased as your strength increases to make sure your muscles continue to experience resistance.

Cardiovascular disease

Untreated HIV can increase the risk of cardiovascular (heart) disease. The risk of heart disease and other serious illnesses is reduced by starting HIV treatment. For that reason, it's recommended that you should start HIV treatment when your CD4 cell count is around 350.

Starting treatment at this time is especially recommended for people who have any other risk factors for cardiovascular disease, such as

a family history, or being a smoker. People with additional risk factors may be recommended to start earlier.

But treatment with some anti-HIV drugs, particularly drugs in the protease inhibitor class and older drugs of the NRTI class that are rarely used today, has been linked to metabolic changes that can increase the long-term risk of cardiovascular disease (see p.32).

Your heart can be damaged if you are overweight, or by eating too much of certain foods, such as saturated fats. These can clog the arteries that supply the heart with blood, restricting the blood supply to the heart. This damage can lead to heart conditions such as

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angina (a syndrome which causes chest pains) and eventually to heart attack.

Smoking, lack of exercise, drug use and heavy drinking can also contribute to cardiovascular disease.

Eating a balanced, healthy diet and taking regular exercise can reduce the effect of treatment-related metabolic changes and of developing cardiovascular disease. See p.1 for more information on healthy eating.

Diabetes

People living with HIV have a higher risk of developing diabetes, a condition where the amount of glucose (a type of sugar) in the blood is too high because the body cannot use it properly.

Type 1 diabetes usually occurs earlier in life. This happens when the body is unable to produce enough insulin – the hormone that controls blood sugar.

Type 2 diabetes starts as a person gets older (generally over 40 – although it can appear earlier, especially in people of Asian and African-Caribbean origin). With this type of diabetes, enough insulin is produced, but it is prevented from working properly (a state called insulin resistance).

Type 2 diabetes is the more common type and is linked to being overweight (generally, carrying too much weight around the middle of the body) and not exercising. It is becoming more prevalent in the UK. Some of the older

HIV treatment, metabolic changes and ageing

anti-HIV drugs have also been associated with an increased risk of diabetes.

With management, diabetes can be prevented and controlled. Your clinic can test for warning signs of diabetes.

Usually, the first treatment suggested will be to reduce your weight, especially any excess weight around your middle, through healthy eating and increased physical activity. This can, if successful, bring the diabetes under control. In some cases, drugs may be used together with the eating and exercise plans.

See p.1 for more information on healthy eating.

Osteoporosis

Many people with HIV are at risk of osteoporosis – a progressive thinning of the bones. Most experts now believe that HIV infection and antiretroviral treatment can both cause bone loss. Other things that can increase the risk for people with HIV include smoking, heavy drinking, a low body weight, and a low testosterone level. The risk increases with age and, for women, with the menopause.

Nutrition and exercise can both reduce the risk of developing osteoporosis and help deal with bone loss if it occurs.

Calcium and vitamin D are essential to bone formation, so you should try to get plenty of both.

HIV treatment, metabolic changes and ageing

Many foods are rich in calcium, including milk and other dairy products, leafy green vegetables such as kale and broccoli, beans such as soy and baked beans, nuts, sesame seeds, and many types of fish, such as salmon and sardines.

Vitamin D is found in oily fish and eggs, as well as in foods that are specially fortified, such as some breakfast cereals.

You get most of your vitamin D from sunlight on your skin. People with brown or black skin may have lower levels of vitamin D than people with fairer skin, as can people who aren't exposed to much sun. However, too much sunlight exposure resulting in reddening or burning of the skin can increase the risk of developing skin

cancers. For safer exposure, it's recommended that you regularly go outside for a few minutes around the middle of the day without sunscreen. This should be enough to raise your vitamin D levels, although this depends on the time of year, the colour of your skin, and how much clothing you wear. Ask at your clinic for further advice on healthy sun exposure.

A dietitian can help you look at your eating habits and see how you can increase the amounts of both vitamin D and calcium in your diet. In some cases, to make sure you get enough of these nutrients you may want to consider taking supplement tablets. You should talk to someone at your HIV clinic or your GP about what you might need to take to correct any deficiency.

Other conditions

Resistance, or weight-bearing, exercise can reduce the risk of osteoporosis, and help once it is diagnosed by encouraging new bone to grow. This means any type of exercise in which your muscles are forced to work against gravity. (If you are at risk of bone fracture because of osteoporosis, you should get advice about the sort of exercise that may be safe for you.)

Other conditions

Hepatitis and other liver disease

The liver has many important functions in the body. For people with HIV, it plays a vital role in processing the drugs used to treat HIV.

Some people with HIV also have hepatitis B or hepatitis C, viruses that can cause inflammation of the liver. Some medicines, including some anti-HIV drugs, can also affect your liver, as can heavy drinking (see p.16) and drug use.

If you have hepatitis, you will not usually need to change what you eat if you already eat a healthy, varied diet. Controlling your weight by eating well and exercising will help, as being

Other conditions

overweight may raise the risk of developing fatty deposits on the liver.

If your liver is badly damaged, your doctor may suggest limiting how much salt you eat, to avoid fluid retention putting too much strain on your liver. Your healthcare team will give you advice on what this might involve.

If you have hepatitis, or another form of liver disease, you may be advised to limit or avoid drinking alcohol.

Having hepatitis C can increase your risk of cardiovascular disease and of diabetes, so you will have your blood fats and sugar, and blood pressure, monitored regularly.

See NAM's booklet *HIV & hepatitis* for more information.

Kidney disease

HIV treatment has been associated with kidney problems and sometimes HIV can cause a form of kidney disease. Diabetes and high blood pressure can both cause damage to the kidneys.

At first, kidney disease is usually treated with lifestyle changes, aimed at maintaining a healthy weight, through eating a balanced diet and exercising regularly. You should be particularly careful about the amount of salt in your diet, in order to avoid increasing your blood pressure. You may be advised to avoid foods with high levels of potassium as well,

Other conditions

and to eat a diet with a moderate amount of protein (not a high- and not a low-protein diet), but you should only do this with the assistance of a dietitian.

The kidneys remove waste products from our body. If they are not working properly, however, the waste products can build up, causing the symptoms of kidney disease (these include feeling ill and tired, shortness of breath, itching and swelling of the legs). By altering what you eat, you may be able to reduce the levels of certain waste products and reduce the severity of some symptoms. Your healthcare team will be able to tell you what this might involve.

As kidney disease progresses, you may have to limit the amount of fluid you drink – but

you should drink normally until you are told to make this change by your healthcare team.

Summary

- If your normal diet is balanced, this should be sufficient to meet your nutritional requirements – HIV alone rarely means that people have to make major changes to their diet.
- People with HIV rarely need to take special nutritional supplements, some of which can be harmful or stop HIV drugs working properly.
- Eating a balanced diet, and maintaining a healthy weight can keep you well and help reduce the risk of illnesses such as cardiovascular disease or diabetes.
- Like everyone else, you should take care with food and water safety to avoid picking up infections, particularly if your CD4 count is low.
- HIV treatment is becoming easier to take. But some anti-HIV drugs have special dietary requirements – these should be explained to you when you start or change treatment.
- It is important to continue to eat and drink properly even if you experience side-effects or are ill because of HIV – a dietitian may be able to help.

This booklet is part of NAM's information series for HIV-positive people. The whole series is freely available on our website, **www.aidsmap.com**, as well as our other resources, news, FAQs, and information on HIV services.

The screenshot shows the AIDSmap website interface. At the top, the browser address bar displays "http://www.aidsmap.com". The website header features the "nam aidsmap" logo and the tagline "HIV & AIDS - sharing knowledge, changing lives". A search bar is located in the top right corner. Below the header is a navigation menu with links for Home, News, HIV Basics, Topics, Resources, Translations, E-atlas, and About us, along with a "Donate" button and a ribbon icon. The main content area has a sub-header: "NAM works to change lives by sharing information about HIV and AIDS. We believe independent, clear and accurate information is vital in the fight against HIV and AIDS. More about us >". The primary news section is titled "International AIDS Society Conference" and includes a grid of photos of delegates, a paragraph of text, and a list of links: "Read NAM's daily conference bulletins", "Revolutionary and luminary: meet Eric Fleutolet", and "Get all of our news from the conference". To the right of this section are four buttons: "Sign up for our emails", "Recently diagnosed", "Find an HIV service", and "Our resources". At the bottom, there are five smaller article thumbnails with titles: "International AIDS Society Conference", "Paying people to be healthy", "Task shifting of care", "No one forced into treatment", and "Preventing HIV". A "Connect with NAM" button with social media icons is at the bottom right.

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International AIDS Society Conference

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HIV helplines

THT Direct

From the Terrence Higgins Trust

Telephone 0808 802 1221

Opening hours Monday-Friday, 10am-10pm

Saturday & Sunday, 12pm-6pm

African AIDS Helpline

Telephone 0800 0967 500

Opening hours Monday-Friday, 10am-6pm

HIV i-Base Treatment Phonenumber

Telephone 0808 800 6013

Opening hours Monday-Wednesday, 12pm-4pm

NAM information series for HIV-positive people - visit www.aidsmap.com/booklets

The booklet series includes: ● Adherence & resistance ● Anti-HIV drugs ● CD4, viral load & other tests
● HIV & children ● HIV & hepatitis ● HIV, mental health & emotional wellbeing ● HIV & sex
● HIV & stigma ● HIV & TB ● HIV & women ● HIV therapy ● Side-effects

More from NAM

aidsmap.com

NAM's website aidsmap.com hosts a huge range of useful resources on key HIV topics. With booklets, factsheets, frequently asked questions about HIV, news and a map of local services, you can keep up to date and find information to support the decisions you make about your treatment and health. It is a reliable source of independent information that you can trust.

HIV Health Support Service

NAM supports THT in providing one-to-one and group skills sessions on health and treatments to people living with HIV. Call THT Direct for details.

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About NAM

NAM is a charity that works to change lives by sharing information about HIV & AIDS. We believe that independent, clear, accurate information is vital to those living with HIV.

Please help us

If you would like to support our work and help us to continue to provide resources like this one, please donate today at www.aidsmap.com/donate or call us on 020 7840 0050.