

# What is healthy eating?

# A

This section gives the main healthy eating messages for most individuals, explains the beneficial effects of food on health, and provides practical tips on how people on low incomes can achieve a healthier diet. This information can be used by a range of health professionals, including primary care professionals to help in consultations, and by physical activity specialists to help in the management of clients who are overweight or obese. Please note that some individuals have additional nutritional needs, such as people with certain illnesses, the very elderly, and children aged under 5. If there are any concerns, a GP, dietitian or practice nurse should be consulted.

Most people can improve their health by achieving long-term changes in the balance of foods that they eat, to ensure that starchy carbohydrates (cereals, bread and potatoes) and fruit and vegetables make up the main part of most meals and snacks.

## Eating healthily – messages for individuals

The main messages for healthy eating for adults and children over the age of 5 years are:

- Enjoy your food! Healthy eating can be tasty and interesting. The key is to eat a variety of different foods.
- Eat at least 5 portions of a wide variety of fruits and vegetables a day.



**See Tool A3** *What is a portion of fruit and vegetables?*

- Eat lots of starchy foods. Base your healthy eating on foods such as bread, potatoes, rice and pasta. Eat a variety of foods from this group.
- Increase the amount of fibre you eat by choosing wholegrain or wholemeal starchy foods and increasing your fruit and vegetable intake.
- Eat moderate amounts of meat, fish and alternatives. Choose the leanest meat you can afford and choose lower fat products when you can. Aim to eat at least 1 portion a week of oily fish such as sardines, pilchards, salmon or mackerel.
- Eat moderate amounts of milk and dairy foods. Choose low-fat options such as skimmed milk, low-fat yogurt and lower fat cheese where possible.
- Try not to have foods and drinks that are high in sugar too often and when you do have them, have them in small amounts. Choose reduced-sugar or diet options where possible.
- Eat small amounts of foods that are high in fat. Choose low-fat options where possible.
- Eat small amounts of foods that are high in salt. Avoid adding salt during cooking and before tasting. Use herbs and spices as an alternative seasoning.
- If you drink alcohol, drink within the sensible limits.

The basic principles of healthy eating are summarised in *The Balance of Good Health*. This translates the government's nutrient-based dietary recommendations for healthy eating into food-based guidelines. The government's nutrient-based recommendations (outlined in Tool C4 of Section C) are geared to the population as a whole. The food-based *Balance of Good Health* is targeted at individuals and aims to help people adapt to healthier eating.

The *Balance of Good Health* identifies five main food groups and provides a guide to the proportions of food from each group that needs to be consumed on a regular basis to form a healthy diet. The five main food groups are:

- Bread, other cereals and potatoes
- Fruit and vegetables
- Milk and dairy foods
- Meat, fish and alternatives
- Foods containing fat, and foods and drinks containing sugar.

Eating a variety of foods from each of the food groups, in the proportions indicated in the *Balance of Good Health*, will enable individuals to achieve the recommended nutrient intake levels outlined in the population dietary recommendations. The *Balance of Good Health* applies to most of the population, except for those with special dietary needs including children under 5 and those on therapeutic diets for medical reasons.



**See Tool A1** *Research evidence of the benefits of healthy eating*, for details of the main research findings behind the healthy eating messages.

**See Tool A2** *The Balance of Good Health*. The *Balance of Good Health* summarises the basic principles of healthy eating. Tool A2 is a short version of this, for use by health professionals. Copies of the full version can be obtained from the Food Standards Agency (address on page 159).

## Managing weight

Body weight is determined by the balance between energy consumed from food and drink (calories) and energy used up through maintaining the body's functions and physical activity. Individuals vary in the amount of food they need to eat, but regardless of the amount they need, the proportions of food from the five food groups will be the same.

Everyone should try to maintain a healthy body weight. The Body Mass Index (BMI) provides an indication of whether a person is the right weight for their height. It is calculated by dividing a person's weight in kilos by their height in metres squared, using the units kg/m<sup>2</sup>. As a guide, adults should aim to maintain a BMI of between 20 and 25 and not increase this during adult life. Height/weight charts allow people to see if they are overweight and also what their ideal weight is. However, for people who are obese, losing even 10kg will greatly improve their health.<sup>1</sup> (See Section B.)



**See Tool A8** *Height/weight chart for adults*.

As children are growing, the normal range of BMI varies with age and sex. International cut-off points for BMI for overweight and obesity have been developed for children between the ages of 2 and 18 years. These children's cut-off points have been developed by sex, and are linked to the corresponding adult cut-off points for overweight (25kg/m<sup>2</sup>) and obesity (30kg/m<sup>2</sup>).<sup>2</sup> Children's weight can also be assessed by using new height/weight charts.



**See Tool A9** *Children's BMI charts*.

Body shape is also important for good health. People who put on weight around their abdomen, so that their stomach girth is larger than their hips, are at higher risk of developing diabetes and heart disease. This is known as central obesity. As a guide, adult men should maintain a waist measurement of under 37 inches (94cm) and adult women a waist measurement of under 32 inches (80cm).<sup>3</sup> (To measure waist circumference, place a tape measure around the abdomen at the mid-point between the last rib and the hip. The tape should be snug but should not compress the skin. It should also be parallel to the floor. Take the measurement at the end of a normal expiration.)

This toolkit does not concentrate on weight loss. However, there are many programmes and

publications on weight loss, including *Tackling Obesity: A Toolbox for Local Partnership Action*, which is available from the Faculty of Public Health.<sup>4</sup> For details of other publications and programmes on weight loss, see Section F *Resources*.

## Checking the labels

You cannot tell what pre-prepared foods contain unless you check their labels. These always have a list of their ingredients, which are listed in descending order of amount. They may also have a summary of their nutritional content in terms of fat, salt (sodium) and sugar. Sugars are a type of carbohydrate, so they will be listed as *Carbohydrates (of which sugars)* on food labels.

Ready meals and pre-prepared foods often have high levels of hidden salt (sodium) and fat in them. Salt content may be expressed as 'salt' or 'sodium'. As a rough guide the amount of salt is roughly two and a half times the sodium value. Table 4 gives a quick guide to reading food labels in order to choose healthier options.

<b>Table 4 Checking food labels</b>		
	<b>A lot:</b> These amounts or more	<b>A little:</b> These amounts or less
Sugars	10g	2g
Fat	20g	3g
Saturated fat	5g	1g
Sodium	0.5g	0.1g
Salt	1.3g	0.3g

The figures are for a single serving of a food. Where foods are eaten in small amounts, check the 'per 100g' amount given on the label. Adapted and reproduced with permission of the Food Standards Agency.

## Guideline Daily Amounts

Guideline Daily Amounts outline the target dietary intake levels for key nutrients, for the average-sized man and woman with an average level of physical activity. They are based on the government's nutrient-based recommendations for the population (see Tool C4), and cover fat, saturates, sodium, fibre and sugar. Although there are no population-based recommendations for energy, approximate values are often listed on labels: the average man is estimated to need 2,500Kcal per day and the average woman 2,000Kcal per day. Guideline Daily Amounts are provided on food labels by some retailers and manufacturers in the UK to help consumers understand the information in the context of the recommended diet.<sup>5</sup>

<b>Table 5 Guideline Daily Amounts for men and women in the UK</b>		
	<b>Men</b>	<b>Women</b>
Fat	95g	70g
Saturates	30g	20g
Sodium	2.5g	2g
Fibre	20g	16g
Sugar	70g	50g

Source: See reference 5.

## Why and how to eat healthily

Some of the key problems people on low incomes face when it comes to healthy eating include the prohibitive cost of certain foods, poor variety and availability of healthier options at their local food stores, and lack of opportunities to experiment and develop cooking skills. These and other barriers to healthy eating are covered in detail in Section D *Developing a local nutrition and food poverty strategy*. Below is a summary of how different foods affect health, and practical tips on how people on low incomes can achieve a healthier diet.

It is not necessary to achieve the recommended balance of foods at every meal. It would be good to aim to achieve it every day, but it would also be acceptable to achieve it over a period of a week or two.



**See the leaflets and booklets in the pocket at the end of this toolkit.** These are examples of publications, targeted at different population groups, which explain the main messages for healthy eating in terms that can be easily understood.

## Starchy foods are good for your health!

Eat lots of starchy foods (carbohydrates). They include cereals such as breakfast cereals, bread, pasta, rice, noodles, maize and millet. Potatoes, yam and plantain are also included in this food group, as are beans and pulses.

Starchy foods provide energy, and should form the main source of energy in the diet. As they are derived from complex plant structures, starchy foods also provide fibre (see below), some calcium, iron and B vitamins. Diets that are high in starchy foods tend to be filling and are digested more slowly, helping to reduce the urge to snack between meals. They may also be lower in fat.

### Fibre

Brown, wholegrain and wholemeal varieties of cereals, as well as beans, pulses, fruit and vegetables, are all good sources of dietary fibre (non-starch polysaccharide, or NSP). A diet high in soluble fibre (found in pulses and in some fruit and vegetables) can also help in the control of blood cholesterol, reducing the risk of developing cardiovascular disease. Fibre also reduces colon/bowel cancer and pancreatic cancer risk. It leads to faster throughput of food in the intestines and increased stool weight, decreasing the risk of constipation.

### Practical tips

- Where possible, go for wholemeal or wholegrain bread, pasta and cereals, to increase your fibre intake.
- Choosing beans and pulses adds variety and fibre to the diet and they can be used to make more expensive ingredients such as meat and poultry go further.
- Avoid having fried starchy foods too often – such as chips. Where possible go for alternatives such as baked potatoes or oven chips.
- Avoid adding too much fat to starchy foods – for example, adding butter to potatoes, or having thickly spread butter or margarine on bread.
- Avoid adding rich sauces and dressings – such as cream or cheese sauce on pasta.
- When increasing fibre in the diet, increase your fluid intake – by drinking plenty of water – to avoid getting constipation.



**See Tool A4** *Sources of dietary fibre.*

# Fruit and vegetables are good for your health!

Healthy eating involves eating lots of fruit and vegetables. The recommendation is to eat at least 5 portions of a variety of fruit and vegetables a day. Fruit and vegetables contain several substances – including vitamin C, carotenes, folates, fibre, and some carbohydrate – which are known to be good for health. It is important to eat a variety of fruit and vegetables as part of a healthy diet because different fruits and vegetables are rich in different nutrients. For example, *citrus fruits* such as oranges, tangerines and grapefruits are rich sources of vitamin C; *dark green vegetables* such as kale, broccoli, Brussels sprouts and green beans are rich sources of folates; and *orange and yellow fruit and vegetables* such as carrots, squash, and peaches are good sources of carotenes.

## Practical tips to reach at least 5 portions of fruit and vegetables a day

- One portion of fruit is, for example, one apple or 2 small satsumas or half a large grapefruit. One portion of vegetables is, for example, 3 heaped tablespoonfuls of cooked carrots or peas or sweetcorn.
- Beans and pulses count but only once each day.
- Potatoes do not count as they belong to the starchy food group.
- 100% or pure fruit juice counts, but only for 1 portion each day.
- Less expensive varieties such as frozen and canned fruit and vegetables all count.
- Seasonal fruit and vegetables can be less expensive to buy.
- Fruit and vegetables in convenience foods such as ready meals, pasta sauces, soups and puddings can contribute towards 5 portions a day. But convenience foods can also be high in salt, sugar and fat – which should be eaten in moderation. It is always important to check the labels.
- Some food packets may feature the 5 A DAY logo. This means that a typical serving of the product contains at least 1 portion of fruit or vegetables. For further information see the 5 A DAY booklet *Just Eat More (Fruit and Veg)*, in the pocket at the end of this toolkit.

## Tips for children

- Children can eat smaller portions than adult-sized ones.
- Bite-sized portions of fruit and vegetables are perfect for children. And they make great party foods.
- The natural sweetness in sweetcorn, strawberries, grapes and cherry tomatoes makes these popular with children.
- Try blending cooked vegetables into casseroles, soups and sauces, or giving them raw.
- Liven up lunchboxes with brightly coloured fruit or vegetables such as carrots.
- Add fruit to jelly.
- Treat your children to bite-sized fruits such as strawberries and grapes instead of sweets.



**See Tool A3** *What is a portion of fruit and vegetables?*

**See the booklet** *Just Eat More (Fruit and Veg)*. A copy is included with this toolkit. The booklet is also available from [www.dh.gov.uk](http://www.dh.gov.uk)

## Preparing fruit and vegetables in a healthy way

When preparing vegetables avoid adding extra fat, salt or rich sauces. For example, avoid glazing carrots with butter. When preparing fruit, avoid adding sugar or a rich dressing. Drain sugary syrups from tinned fruit before serving.

# Meat, fish and alternatives

Eat moderate amounts of meat, fish and alternatives such as eggs, beans, pulses and nuts as part of a healthy diet. These are good sources of protein, iron and B vitamins – especially vitamin B<sub>12</sub>, zinc and magnesium.

## Meat

Meat is a good source of protein, vitamin B<sub>12</sub>, zinc, magnesium and easily absorbed iron. Foods in this group include red meat, chicken, pork, offal such as liver, and processed products such as ham. Meat – particularly cuts that are not lean, and processed meat products such as pies and sausages – are high in saturated fat. Some processed meat products may also be high in salt. Excessive meat intake is associated with an increased risk of colon cancer, and may possibly increase the risk of other cancers.<sup>6</sup> Therefore, as a rough guide, people should eat no more than 140g of meat per day, which is roughly the equivalent of 2 portions.



**See Tool A6** *Portion sizes of meat.*

## Fish is good for your health!

Fish is an excellent source of protein. White fish, such as cod and haddock, is naturally low in fat compared with some meats. White fish is low in fat as long as it is not coated and fried, or served with a fatty sauce. Oily fish are also rich sources of omega-3 fatty acids. Omega-3 fatty acids have been shown to protect against coronary heart disease, through improving the blood lipid profile and preventing thrombosis (clotting) and inflammation in the blood vessels. Oily fish includes sardines, mackerel, salmon, trout, herring and fresh tuna. The recommendation for healthy eating is to eat at least 2 portions of fish each week, one of which should be an oily fish.

## Meat and fish alternatives

Eggs are rich sources of protein, vitamin B<sub>12</sub> and other minerals, making them an excellent alternative to meat. They are inexpensive and versatile, but it is important to avoid adding too much fat through frying them etc. Beans, pulses and nuts – including dried and tinned varieties of kidney beans, haricot beans (the type used in baked beans), soya beans, lentils, dhal, chickpeas and peanuts – are good sources of protein, carbohydrates and iron, making them good alternatives to meat or fish. Soya mince, quorn and tofu are also good sources of protein. All meat and fish alternatives can be used to bulk up meat dishes. Beans and pulses in particular have the advantage of being high in fibre and low in fat. Meat and fish alternatives are often cheaper than traditional meat or fish products.

## Practical tips on eating foods from the meat, fish and alternatives food group

Selecting a mix of options from the meat, fish and alternatives food group will add variety and help with eating healthily:

- Check the labels and choose low-fat and low-salt varieties of meat, fish and alternatives where possible. Choose the leanest meat you can afford and make it go further by using more pulses and vegetables in dishes such as casseroles and stir-fries.
- Avoid eating breaded or battered coatings on deep-fried foods such as fish, as these soak up lots of fat. Don't eat the visible fat or skin on meat and poultry. If possible, remove any fat or skin before cooking.
- Fish provide an excellent low-fat alternative to processed meat. Cheaper varieties such as canned sardines or frozen fish fingers or cod fillets are just as good as fresh varieties.
- Eat at least 1 portion of oily fish a week. As a rough guide, oily fish have dark rather than white

flesh. Examples include mackerel, sardines, salmon and fresh tuna. Canned oily fish are inexpensive sources of omega-3 fat, except for canned tuna. Canned tuna does not count as an oily fish (because much of the omega-3 fat is lost during the processing), but is still a good low-fat alternative to meat.

- Choose unsalted nuts and avoid eating excessive amounts, as they are also high in fat.

### Preparing meat, fish and alternatives in a healthier way

- Grill, bake, steam or microwave fish, and grill or bake meat instead of frying or roasting with oil. Stir-frying foods with tiny amounts of oil is also better than frying.
- Trim the visible fat and skin off meat and poultry (such as chicken or turkey). This can substantially reduce the total fat content. For example, roast chicken with skin on is 14% fat, while roast chicken with skin off is 5% fat.
- If cooking mince, heat it in a saucepan then drain off the excess fat before continuing with the recipe.
- Add beans and pulses to stews and casseroles. Add extra vegetables.
- Skim the fat off stews and casseroles during cooking or before serving.
- Drain the salty water or oil from canned fish before serving.
- Avoid adding extra salt during cooking. Use herbs and spices as an alternative seasoning to salt.

## Milk and dairy foods

---

The *Balance of Good Health* recommends that people eat or drink moderate amounts of milk and dairy products and choose low-fat options where possible. Milk and dairy products include milk, cheese, yogurt and fromage frais. They are rich sources of calcium, protein, vitamin B<sub>12</sub> and vitamins A and D. An adequate intake of calcium and good plasma vitamin D levels are essential to maintain healthy bones.

The average level of calcium intake for adults in the UK is above the recommended level of 700mg per day. However, intakes among young women and women from households in receipt of benefits are lower than the recommended level.<sup>7</sup> Calcium intakes are also low among teenage girls and boys.<sup>8</sup> People on a low-fat diet which excludes dairy foods may also be at risk.



**See Tool A7** *Sources of dietary calcium and vitamin D.*

### Practical tips

- Eat some foods from this food group every day.
- Check the labels to compare the fat content.
- Choose lower fat versions of milk (semi-skimmed or skimmed milk) and dairy products wherever possible – for adults and children over the age of 5 years.
- Choose low fat (0.1g per 100g) yogurt and fromage frais.

## Foods containing sugar, fats and salt

---

### Fats

Most people in the UK eat twice or three times as much fat as their bodies actually need. Fat is high in calories and a high-fat diet can make it easy to overeat and consume excess calories, leading to overweight and obesity. Obesity is associated with an increased risk of coronary heart disease, diabetes and some cancers. A high-fat diet can also raise blood cholesterol, increasing the risk of heart attack and stroke.

There are three main types of fat – saturated fats, polyunsaturated fats and monounsaturated fats. *Saturated fats* raise cholesterol levels, leading to the development of atheroma which forms in the walls of the arteries, restricting the flow of blood. This causes coronary heart disease, stroke and peripheral vascular disease depending on the arteries affected. Saturated fats are not essential to the body, so it is best to limit your intake of them as far as possible. Saturated fats are found mainly in animal products such as sausages, burgers, hard cheeses and cooking fats such as lard, as well as hard margarines.

Small amounts of *monounsaturated fats* and *polyunsaturated fats* including the essential fatty acids – omega-3 fatty acid and omega-6 fatty acids – are required for health. These types of fat have beneficial effects on blood lipid/cholesterol levels. Sources of polyunsaturated fats include some soft margarines, and vegetable oils. Omega-3 fatty acids are found in oily fish (see *Meat, fish and alternatives* on page 28) and omega-6 fatty acids are found in cooking oils such as corn oil and sunflower oil. Sources of monounsaturated fats include some margarines and spreads, olive oil, rapeseed oil (canola), walnut oil and avocado.

Daily guidelines for fat intake will depend on whether or not you are trying to lose weight or lower your cholesterol level. However, as a rough guide, for people who are seeking to maintain their current weight and cholesterol levels, men should be eating less than 95g of fat a day and women less than 70g a day.

### Practical tips for reducing fat intake

- Limit intake of fat and fatty foods (see *Checking the labels* on page 25).
- Avoid cooking with lard or hard margarines altogether.
- Grill or bake instead of frying.
- Replace saturated fats – such as butter and lard – with polyunsaturated and monounsaturated fats, such as margarines labelled high in polyunsaturates/monounsaturates, sunflower oil and olive oil. Whichever spread you choose, use it sparingly.
- Be aware that some processed foods have high levels of hidden fat – such as cakes and biscuits and pastry-based dishes. Check the labels and limit intakes of high-fat foods.
- Some animal-based products such as meat and hard cheese are good sources of other nutrients, despite being high in saturated fat. Therefore rather than avoiding them altogether, choose low-fat options and eat moderate amounts to limit saturated fat intake. For further information see *Meat, fish and alternatives* on page 28.
- Remember that, while *small* amounts of polyunsaturated and monounsaturated fats are required for health, foods and oils rich in these are also high in calories, so do not eat or use excessive amounts in your diet.



**See Tool A5** *Choosing healthier fats*. This shows the effects of different types of fat on cholesterol levels, and describes which foods contain which fats.

### Sugars

Sugars are one of the two main types of carbohydrates; the other type is the starches. Sugars are simple carbohydrates and as a result have no nutritional value apart from adding calories. They include table sugar and added sugars in pre-prepared foods and drinks. If consumed too frequently, they can lead to tooth decay. Calories from sugars are rapidly available to the body due to their simple structure. As sweetened foods are pleasant to eat, it is easy to eat too much of them, and they can contribute to weight gain and obesity.

### Practical tips for consuming less sugar

- Try not to have foods and drinks that are high in sugar too often, and when you do have them have them in small amounts.



- Choose reduced-sugar or diet options where available.
- Avoid having sugary drinks, snacks and dried fruits (which stick to teeth) between meals, to avoid tooth decay.

## Salt (sodium)

Sodium plays an important role in the functioning of healthy cells and muscles in the human body. However, most people in the UK eat too much sodium – much of it in the form of salt. The recommended salt intake for adults is 6g (2.4g sodium per day), but most adults are consuming around 50% more at 9g per day. High levels of sodium in the diet lead to high blood pressure (essential hypertension) which is an important risk factor for coronary heart disease, stroke and kidney disease.

Around three-quarters of the salt we eat is hidden within pre-prepared foods. Soups, stock cubes, sauces such as soy sauce, ham, bacon, pre-prepared meals and savoury snacks are particularly high in salt. However, even bread, breakfast cereals and biscuits can have a high salt content. For example, some cornflakes have the same salinity as sea water! People should try to limit the amount of salt they eat.

The daily maximum recommended levels for children for salt are lower than the adult recommendation of 6g.<sup>9</sup> (See Table 6.)

<b>Table 6 Target salt intakes</b>	
<b>Adults:</b>	6g a day
<b>Children:</b>	
11-14 years	6g a day
7-10 years	5g a day
4-6 years	3g a day
1-3 years	2g a day
7-12 months	1g a day
0-6 months	Less than 1g a day

As a rough guide, 1g sodium = 2.5g salt.

The target salt intakes set for adults and children are substantially greater than the salt intake required to maintain the sodium content of the body. They do not represent ideal or optimum consumption levels, but achievable population goals.

Source: See reference 9.

## Practical tips for limiting salt intake and the effects of sodium

- Avoid adding salt to foods during cooking. Use herbs and spices as an alternative seasoning.
- Stock cubes can be high in salt. Choose 'low-salt' versions, or make your own stock. Or use herbs and spices instead.
- Limit your intake of salty foods and snacks such as crisps and bacon and pre-prepared sauces and soups.
- Choose canned vegetables and pulses that are marked 'no added salt'.
- Cut down on sauces such as soy and brown sauce, as these are high in salt.
- Don't add salt to food before tasting it.
- Check the labels on savoury foods such as sauces and meat products for other forms of sodium such as monosodium glutamate and sodium bicarbonate. These are used as preservatives or flavour enhancers but can contribute to excessive sodium intakes.
- Eat plenty of fruit and vegetables. Many are good sources of potassium. This can help control blood pressure by counteracting the effects of sodium from dietary salt.
- To help control blood pressure, keep to a healthy weight and be physically active.

## Other minerals and vitamins, and dietary supplements

Most people are able to meet their nutritional needs by eating a balanced, varied diet including plenty of fruit and vegetables, and therefore do not need to take dietary supplements. The exceptions are as follows.

- Women intending to become pregnant are advised to take a daily 400 microgram supplement of folic acid before conception up to the 12th week of pregnancy, to help prevent neural tube defects.
- Asian women and girls who follow the tradition of wearing clothes that cover up most of the body are routinely advised to take supplements of vitamin D as they are more prone to deficiency.
- Older people may need extra iron, calcium and vitamin D.
- Teenage girls and young women may benefit from calcium and iron supplements.
- Women who are pregnant or breastfeeding may benefit from vitamin D supplements in order to ensure that their infants get enough vitamin D.

As a safety net, vitamin supplements are available for women and children on the Welfare Food Scheme. These contain vitamin A (low dose) and vitamins C and D.

There is a need to exercise caution in the use of high doses of purified supplements of vitamins and minerals as their impact on long-term health may not have been fully established and they cannot be assumed to be without risk. Anyone concerned about their diet should speak to their doctor or practice nurse or to a dietitian.

For more information on vitamins and minerals see the British Nutrition Foundation website [www.nutrition.org.uk/information/energyandnutrients](http://www.nutrition.org.uk/information/energyandnutrients)

## Alcohol

Alcohol can add enjoyment to life, but only if it is drunk in moderation. Long-term, light to moderate consumption of alcohol has been shown to lower the risk of coronary heart disease and stroke in men over 40 and in postmenopausal women. However, excessive alcohol consumption (heavy or binge drinking) is associated with crime and accidents in the short term, as well as excessive calorie intake, raised blood pressure and increased risk of liver cirrhosis and some cancers in the long term.<sup>10</sup>

The optimum health advantage for men and women is associated with a daily alcohol consumption level of between 1 and 2 units.<sup>10</sup> The recommended daily benchmarks for sensible/moderate alcohol intake are a maximum of between 3 and 4 units a day for men, and between 2 and 3 units a day for women. This works out as 21 units a week for men and 14 units a week for women.

In Britain, 38% of men and 24% of women exceed the maximum recommended alcohol consumption levels each week. Binge drinking among young people is a particular cause for concern as 54% of young men and 50% of young women aged 19-24 exceed the maximum recommended weekly alcohol intake levels every week.<sup>11</sup>

**Table 7 Number of units of alcohol in common drinks**

Drink	Number of units
Half a pint of standard strength beer, lager, or cider	1
One small glass of wine	1
Alcopops	1.5
One standard measure of spirits	1

### Practical tips for sensible drinking

- If you drink, keep within the recommended limits.
- If you are pregnant or trying to get pregnant, drink no more than one or two units, once or twice a week.
- If you are breastfeeding, avoid having alcohol immediately before a feed.
- Go for diet mixers or sugar-free mixers.
- Avoid alcohol if you intend to drive, do energetic physical activity or operate machinery.
- After an episode of binge drinking, avoid alcohol for at least 48 hours, to allow the body's tissues to recover.

## Undernutrition

Although the main dietary problems in the UK are caused by overnutrition, there are still some groups of people who are at risk from undernutrition. The risk factors for undernutrition include:

- severe physical illness
- times before, during and after admission to hospital
- physical difficulty in eating
- vulnerable psychosocial situations
- psychological illness
- poverty or social isolation.

It is important for primary care professionals to recognise those groups of people who are particularly vulnerable to undernutrition and to be able to assess whether action is needed. The messages for individuals described on pages 26-31 may not apply to people who are undernourished. Undernourished people may need nutrient-dense foods such as fortified milk products and milky drinks. They may also find starchy foods too filling and will need to get more of their calories from fatty foods.



**See Tool A10** *Assessing undernutrition* for more information on the groups of people vulnerable to undernutrition.

**See Tool A11** *Malnutrition Universal Screening Tool (MUST tool)*. This is a screening tool to identify adults who are malnourished, at risk of malnourishment or obese. It can be used in hospitals, community and other care settings and can be used by all care workers.

## References

- 1 Scottish Intercollegiate Guidelines Network. 1996. *Obesity in Scotland. Integrating Prevention with Management*. Edinburgh: Scottish Intercollegiate Guidelines Network.
- 2 Cole TJ, Bellizzi MC, Flegal KM, Dietz WH. 2000. Establishing a standard definition for child overweight and obesity worldwide: international survey. *British Medical Journal*; 320: 1240-43.
- 3 Lean M, Han S, Seidell J. 1998. Impairment of health and quality of life in people with large waist circumference. *Lancet*; 351: 853-56.
- 4 Maryon Davis A, Giles A, Rona R. *Tackling Obesity: A Toolbox for Local Partnership Action*. London: Faculty of Public Health Medicine.
- 5 Rayner R, Scarborough P, Williams C. (In press.) The origin of Guideline Daily Amounts and the Food Standards Agency's guidance on what counts as 'a lot' and 'a little.' *Public Health Nutrition*.
- 6 Department of Health. 1998. *Nutritional Aspects of the Development of Cancer. Report of the Working Group on Diet and Cancer of the Committee on Medical Aspects of Food and Nutrition Policy*. London: HMSO.
- 7 Food Standards Agency. 2003. *National Diet and Nutrition Survey: Adults Aged 16-64. Volume 3*. London: Food Standards Agency.
- 8 Office for National Statistics Social Survey Division. 2000. *National Diet and Nutrition Survey: Young People Aged 4-18. Volume 1*. London: The Stationery Office.
- 9 Scientific Advisory Committee on Nutrition. 2003. *Salt and Health*. London: The Stationery Office.
- 10 Department of Health. 1995. *Sensible Drinking. The Report of an Inter-Departmental Working Group*. Accessed from: [www.doh.gov.uk/alcohol/pdf/sensible\\_drinking.pdf](http://www.doh.gov.uk/alcohol/pdf/sensible_drinking.pdf)
- 11 Food Standards Agency. 2003. *National Diet and Nutrition Survey: Adults Aged 16-64. Volume 2*. London: Food Standards Agency.

## Tools

	page
A1 Research evidence of the benefits of healthy eating	35
A2 The Balance of Good Health	39
A3 What is a portion of fruit and vegetables?	41
A4 Sources of dietary fibre	43
A5 Choosing healthier fats	45
A6 Portion sizes of meat	47
A7 Sources of dietary calcium and vitamin D	49
A8 Height/weight chart for adults	51
A9 Children's BMI charts	53
A10 Assessing undernutrition	55
A11 Malnutrition Universal Screening Tool (MUST tool)	57

## Research evidence of the benefits of healthy eating

This section outlines the research evidence for the beneficial effects of food on health. It contains data from various interventional and epidemiological studies, as well as reviews. All the research is referenced in full on page 37.

### Reducing overall mortality

- Among men who had had a heart attack, those who were advised to eat oily fish had a 29% reduction in two-year all-cause mortality compared with those who did not receive this advice.<sup>1</sup>
- Obese patients who lose just 10kg of weight have a 20%-25% decrease in overall mortality.<sup>2</sup>

### Reducing sudden cardiac death

- Among previously healthy people, eating 2 portions of fish a week reduces the risk of sudden cardiac death by up to 50% in men<sup>3</sup> and 30% in women.<sup>4</sup>
- Linolenic acid (e.g. from soya and rapeseed oils) reduces fatal heart attacks in women by 45%, but does not reduce non-fatal heart attacks.<sup>5</sup>

### Reducing the risk of coronary heart disease and stroke

- Fruit and vegetables have a strong protective effect against stroke and a weaker protective effect against coronary heart disease.<sup>6</sup>
- Eating another portion of fruit or vegetables a day decreases the risk of coronary heart disease by 4% and stroke by 6%.<sup>7</sup>
- Among obese people, the cardiovascular benefits that can be achieved from 5%-10% weight loss are:<sup>8</sup>
  - symptoms of angina reduced by 91%
  - 33% increase in exercise tolerance
  - a fall of 30%-50% in fasting plasma glucose
  - a fall of 10mmHg systolic and diastolic blood pressure
  - a fall of 15% in LDL cholesterol; a fall of 30% in triglycerides; an increase of 8% in HDL cholesterol.
- Advice to reduce dietary sodium intake may enable people with well-treated hypertension to stop taking their medicines and remain normotensive.<sup>9</sup>
- Reducing dietary sodium intake further lowers both systolic and diastolic blood pressure in those already on the 'DASH' diet – a diet rich in fruit and vegetables, and with low-fat dairy products and a reduced overall fat intake.<sup>10</sup>
- Following a low-fat diet on average lowers blood cholesterol by 5.3% after six months.<sup>11</sup>
- Healthy diets can reduce the risk of a second heart attack. For example, the Lyon diet (low fat, olive oil, lots of fruit and vegetables and starchy foods) was associated with a reduction in the risk of deaths from heart attacks by 35% as well as deaths from all causes by 44%.<sup>12</sup>
- 0.8mg of folic acid a day reduces serum homocysteine by 3mmol. This leads to a 16% reduction in coronary heart disease, a 25% reduction in deep venous thrombosis, and a 24% reduction in stroke.<sup>13</sup>
- Increased wholegrain consumption is associated with a decrease in the risk of coronary heart disease of up to 25%.<sup>14</sup>

### Reducing the risk of diabetes

- In people with impaired glucose tolerance, dietary intervention led to a 31% reduction in the incidence of diabetes. Diet plus exercise led to a reduction of 42%.<sup>15</sup>
- In people with impaired glucose tolerance, lifestyle intervention to increase physical activity and reduce weight led to a reduction in diabetes of 58%<sup>16</sup> and was significantly more effective than metformin (a drug used to treat people with diabetes).<sup>17</sup>

### Reducing the risk of cancer

- Childhood fruit consumption may have a long-term protective effect on cancer risk in adults.<sup>18</sup>
- Higher levels of energy intake in childhood increase the risk of mortality from non-smoking-related cancer in adult life: an increased energy intake of 240Kcal per day is associated with a 20% increased risk of mortality.<sup>19</sup>
- Around 40% of endometrial cancer, 25% of kidney cancer and 10% of breast and colon cancers would be avoided by maintaining a healthy weight with a BMI of under 25.<sup>20</sup>
- In people aged under 75 years, changing to a diet that is high in fruit and vegetables is associated with a decreased risk of cancer at many sites, particularly colorectal, stomach and breast cancer, in the following 10 years.<sup>21</sup>
- Increased dietary fibre is associated with a decreased risk of colorectal and pancreatic cancer.<sup>22</sup>
- The risk of developing colorectal cancer among high consumers of red and processed meats – i.e. those eating an average of 140g cooked weight or more a day – may be almost double that of average consumers who eat 90g a day.<sup>22</sup> (140g per day is equivalent to about 12-14 portions a week.)



### See Tool A6 *Portion sizes of meat*, for examples of how much meat is in 90g and 140g.

- High intakes of red or processed meat may also increase the risk of breast, lung, prostate and pancreatic cancer.<sup>22</sup>

### Reducing arthritis and osteoporosis

- Weight loss of 5%-10% in obese people leads to a marked improvement in mobility and reduction in musculoskeletal pain.<sup>8</sup>
- Dietary supplementation with calcium and vitamin D in older people is effective in reducing hip and other non-vertebral fractures. The reduction is around 5% and starts within eight months for hip fractures and three months for other non-vertebral fractures.<sup>23</sup>

### Improving sense of well-being

- In obese people, 5%-10% weight loss leads to:<sup>8</sup>
  - a marked improvement in both quality and quantity of sleep, with reduced snoring, and
  - increased regularity of menstrual cycle and improved fertility.

### Improving mental health

- Improving the vitamin C intake of older people improves mental function.<sup>24</sup>

## References

---

- 1 Burr ML et al. 1989. Effects of changes in fat, fish, and fibre intakes on death and myocardial reinfarction: Diet and Reinfarction Trial (DART). *The Lancet*; 2: 757-61.
  - 2 Jung RT. Obesity as a disease. 1997. *British Medical Bulletin*; 53 (2): 307-21.
  - 3 Albert CM et al. 1998. Fish consumption and risk of sudden cardiac death. *Journal of the American Medical Association*; 279 (1): 23-28.
  - 4 Hu FB et al. 2002. Fish and omega-3 fatty acids intake and risk of coronary heart disease in women. *Journal of the American Medical Association*; 287; 1815-21.
  - 5 Hu FB et al. 1999. Dietary intake of alpha-linolenic acid and risk of fatal ischemic heart disease among women. *American Journal of Clinical Nutrition*; 69; 890-97.
  - 6 Ness AR, Powles JW. 1997. Fruit and vegetables, and cardiovascular disease: a review. *International Journal of Epidemiology*; 26 (1): 1-13.
  - 7 Josphipura KJ, Hu FB, Manson JE et al. 2001. The effect of fruit and vegetable intake on risk for coronary heart disease. *Annals of Internal Medicine*; 134: 1106-14.
  - 8 Working Party of the Royal College of Physicians. 2002. *Nutrition and Patients. A Doctor's Responsibility*. London: Royal College of Physicians.
  - 9 Hooper L et al. 2002. Systematic review of long term effects of advice to reduce dietary salt in adults. *British Medical Journal*; 325: 628.
  - 10 Sacks FM et al, for the DASH-Sodium Collaborative Research Group. 2001. Effects on blood pressure of reduced dietary sodium and the Dietary Approaches to Stop Hypertension (DASH) diet. *New England Journal of Medicine*; 344: 3-10.
  - 11 Tang JL et al. 1995. Systematic review of dietary intervention trials to lower blood total cholesterol in free-living subjects. *British Medical Journal*; 316: 1213-20.
  - 12 de Lorgeril M et al. 1999. Mediterranean diet, traditional risk factors, and the rate of cardiovascular complications after myocardial infarction. Final report of the Lyon Diet Heart Study. *Circulation*; 99: 779-85.
  - 13 Wald DS, Law M, Morris JK. 2002. Homocysteine and cardiovascular disease: evidence on causality from a meta-analysis. *British Medical Journal*; 325: 1202-06.
  - 14 Liu S et al. 1999. Whole-grain consumption and risk of coronary heart disease: results from the Nurses' Health Study. *American Journal of Clinical Nutrition*; 70 (3): 412-419.
  - 15 Pan XR. 1997. Effects of diet and exercise in preventing NIDDM in people with impaired glucose tolerance. The Da Qing IGT and Diabetes Study. *Diabetes Care*; 20 (4): 537-44.
  - 16 Tuomilehto J et al. 2001. Prevention of Type 2 diabetes mellitus by changes in lifestyle among subjects with impaired glucose tolerance. *New England Journal of Medicine*; 344: 1343-50.
  - 17 Diabetes Prevention Program Research Group. 2002. Reduction in the incidence of Type 2 diabetes with lifestyle intervention or metformin. *New England Journal of Medicine*; 346: 393-403.
  - 18 Maynard M et al. 2003. Fruit, vegetables and antioxidants in childhood and risk of adult cancer: the Boyd Orr cohort. *Journal of Epidemiology and Community Health*; 57: 218-25.
  - 19 Frankel S et al. 1998. Childhood energy intake and adult mortality from cancer: the Boyd Orr cohort study. *British Medical Journal*; 316: 499-504.
  - 20 Bianchini F, Kaaks R, Vainio H. 2002. Overweight, obesity and cancer risk. *The Lancet Oncology*; 3 (9): 565.
  - 21 Department of Health. 2000. *The NHS Cancer Plan*. London: The Stationery Office.
  - 22 Department of Health. 1998. *Nutritional Aspects of the Development of Cancer: Report of the Working Group on Diet and Cancer of the Committee on Medical Aspects of Food and Nutrition Policy*. London: HMSO.
  - 23 Department of Health. 1998. *Nutrition and Bone Health with Particular Reference to Calcium and Vitamin D. Report of the Subgroup on Bone Health, Working Group on the Nutritional Status of the Population of the Committee on Medical Aspects of Food and Nutrition Policy*. London: The Stationery Office.
  - 24 Gale CR, Martyn CN, Cooper C et al. 1996. Cognitive impairment and mortality in a cohort of elderly people. *British Medical Journal*; 312: 608-11.
-

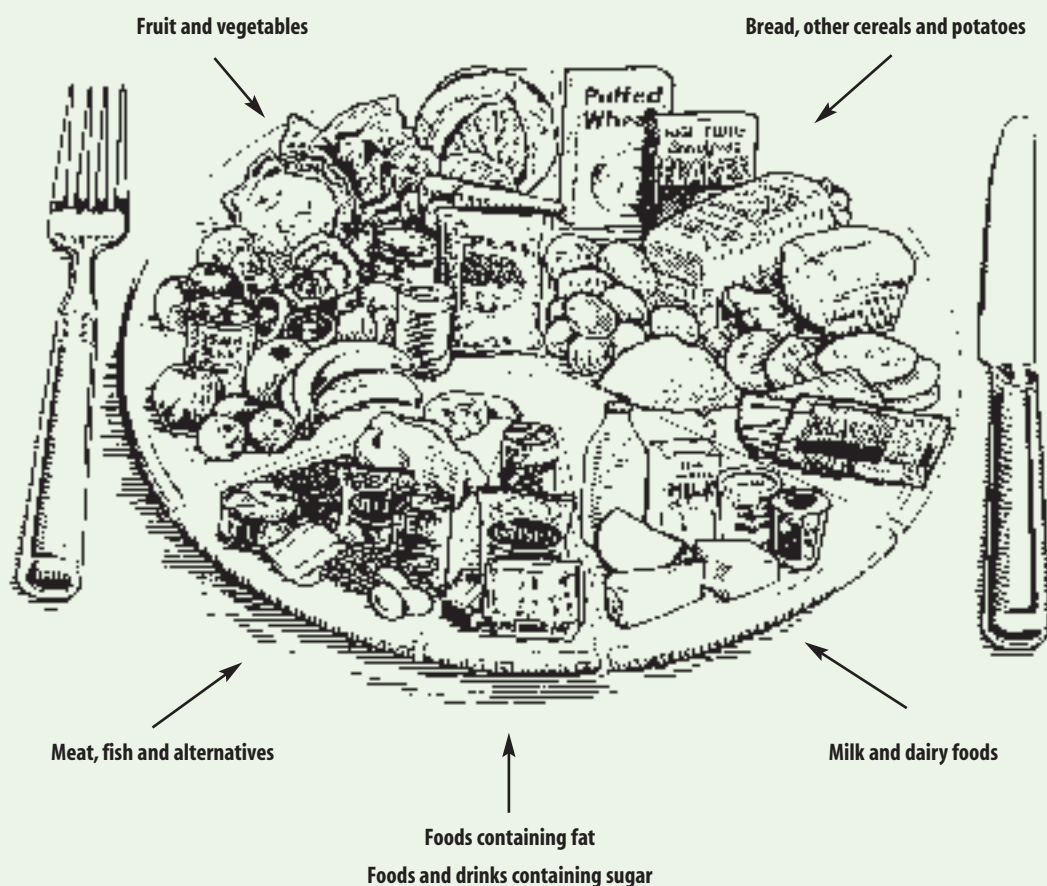




## The Balance of Good Health

The *Balance of Good Health*, a pictorial representation of the recommended balance of foods in the diet, aims to help people understand and enjoy healthy eating. It shows that people don't have to give up the foods they most enjoy for the sake of their health – just eat some in smaller quantities or less frequently. Variety, and changing towards more vegetables, fruit, bread, breakfast cereals, potatoes, rice and pasta are what matters. Snacks as well as meals count towards a healthy balance.

**There are five main groups of valuable foods.**



See overleaf for information about each of the food groups.

Reproduced with kind permission of the Food Standards Agency

# The five food groups

	<b>What's included</b>	<b>Main nutrients</b>	<b>Message</b>	<b>Recommendations</b>
<b>Bread, other cereals and potatoes</b>	Other cereals means foods such as breakfast cereals, pasta, rice, oats, noodles, maize, millet and commeal. This group also includes yams and plantains. Beans and pulses can be eaten as part of this group.	Carbohydrate (starch) 'Fibre' (NSP*) Some calcium and iron B vitamins	Eat lots.	Try to eat wholemeal, wholegrain, brown or high-fibre versions where possible. Try to avoid: <ul style="list-style-type: none"> <li>• having them fried too often (e.g. chips)</li> <li>• adding too much fat (e.g. thickly spread butter, margarine or low-fat spread on bread)</li> <li>• adding rich sauces and dressings (e.g. cream or cheese sauce on pasta).</li> </ul>
<b>Fruit and vegetables</b>	Fresh, frozen and canned fruit and vegetables and dried fruit. A glass of fruit juice also counts. Beans and pulses can be eaten as part of this group.	Vitamin C Carotenes Folates 'Fibre' (NSP*) and some carbohydrate	Eat lots – at least 5 portions a day. Fruit juice counts as only 1 portion, however much you drink in a day. Beans and pulses count as only 1 portion, however much you eat in a day.	Eat a wide variety of fruit and vegetables. Try to avoid: <ul style="list-style-type: none"> <li>• adding fat or rich sauces to vegetables (e.g. carrots glazed with butter, or parsnips roasted in a lot of fat)</li> <li>• adding sugar or syrupy dressings to fruit (e.g. stewed apple with sugar, or chocolate sauce on banana).</li> </ul>
<b>Milk and dairy foods</b>	Milk, cheese, yogurt and fromage frais. This group does not include butter, eggs and cream.	Calcium Protein Vitamin B12 Vitamins A and D	Eat or drink moderate amounts and choose lower fat versions whenever you can.	Lower fat versions means semi-skimmed or skimmed milk, low-fat (0.1% fat) yogurts or fromage frais, and lower fat cheeses (e.g. Edam, half-fat Cheddar and Camembert). Check the amount of fat by looking at the nutrient information on the labels. Compare similar products and choose the lowest – for example 8% fat fromage frais may be labelled 'low fat', but is not actually the lowest available.
<b>Meat, fish and alternatives</b>	Meat, poultry, fish, eggs, nuts, beans and pulses. Meat includes bacon and salami and meat products such as sausages, beefburgers and pâté. These are all relatively high-fat choices. Beans, such as canned baked beans and pulses, are in this group and they are a good source of protein for vegetarians. Fish includes frozen and canned fish such as sardines and tuna, fish fingers and fish cakes. Aim to eat at least 1 portion of oily fish such as sardines or salmon each week.	Iron Protein B vitamins, especially B12 Magnesium	Eat moderate amounts and choose lower fat versions whenever you can.	Lower fat versions means things like meat with the fat cut off, poultry without the skin, and fish without batter. Cook these foods without added fat. Beans and pulses are good alternatives to meat as they are naturally very low in fat.
<b>Foods containing fat; foods and drinks containing sugar</b>	<i>Foods containing fat</i> Margarine, butter, other spreading fats and low-fat spreads, cooking oils, oil-based salad dressings, mayonnaise, cream, chocolate, crisps, biscuits, pastries, cakes, puddings, ice cream, rich sauces and gravies. <i>Foods and drinks containing sugar</i> Soft drinks, sweets, jam and sugar, as well as foods such as cakes, puddings, biscuits, pastries and ice cream.	Fat, including some essential fatty acids, but also some vitamins.	Eat foods containing fat sparingly and look out for the low-fat alternatives. Foods and drinks containing sugar should not be eaten too often as they can contribute to tooth decay.	Some foods containing fat will be eaten every day, but should be kept to small amounts, for example, margarine and butter, other spreading fats (including low-fat spreads), cooking oils, oil-based salad dressings and mayonnaise.  Foods containing fat such as cakes, biscuits, pastries and ice cream should be limited and low-fat alternatives chosen where available.  All foods and drinks containing sugar should be eaten mainly at mealtimes to reduce the risk of tooth decay.

\* Fibre is more properly known as non-starch polysaccharides (NSP).

Reproduced with kind permission of the Food Standards Agency.

## What is a portion of fruit and vegetables?

### **Eat at least 5 portions of a variety of fruit and vegetables a day.**

Fresh, frozen, chilled, canned, and dried fruit and vegetables, and 100% juice, all count.

To get the maximum benefits, you need to eat different types as they all contain different combinations of fibre, vitamins, minerals and other nutrients.

100% or pure fruit juice counts, but only for 1 portion a day, no matter how much you drink. (This is because drinking too much is not recommended because of its high sugar content. Also, in some cases there is less fibre in fruit juice than in whole fruit.)

Beans and pulses count only once a day, however much you eat.

Potatoes do not count as they are a starchy food.

Fruit and vegetables in takeaways and pre-prepared foods can also count. However, these foods are often high in salt, sugar and added fat.

For more information see the five a day website at [www.dh.gov.uk](http://www.dh.gov.uk)

### **FRUIT**

**Portion equivalent to 80g** *As eaten. Edible portion, and drained if canned.*

Apple, dried rings	4 rings	Fruit salad, fresh	3 heaped tablespoons
Apple, fresh	1 medium apple	Fruit smoothie	1 x 150ml
Apple, purée	2 heaped tablespoons	Gooseberries	1 handful
Apricot, canned	6 halves	Grapefruit segments, canned	3 heaped tablespoons (8 segments)
Apricot, dried	3 whole	Grapefruit, fresh	half a grapefruit
Apricot, fresh	3 apricots	Grapes	1 handful
Apricot, ready to eat	3 whole	Kiwi fruit	2 kiwi fruit
Avocado	half an avocado	Kumquat	6-8 kumquats
Banana chips	1 handful	Lychee, canned	6 lychees
Banana, fresh	1 medium banana	Lychee, fresh	6 lychees
Blackberries	1 handful (9 to 10 blackberries)	Mandarin orange, canned	3 heaped tablespoons
Blackcurrants	4 heaped tablespoons	Mandarin orange, fresh	1 medium orange
Blueberries	2 handfuls (4 heaped tablespoons)	Mango	2 slices (2-inch slice)
Cherries, canned	11 cherries (3 heaped tablespoons)	Melon	1 slice (2-inch slice)
Cherries, dried	1 heaped tablespoon	Mixed fruit, dried	1 heaped tablespoon
Cherries, fresh	14 cherries	Nectarine	1 nectarine
Clementines	2 clementines	Orange	1 orange
Currants, dried	1 heaped tablespoon	Passion fruit	5 to 6 fruit
Damsons	5 to 6 damsons	Paw paw (papaya), fresh	1 slice
Dates, fresh	3 dates	Peach, canned	2 halves or 7 slices
Fig, dried	2 figs	Peach, dried	2 halves
Fig, fresh	2 figs	Peach, fresh	1 medium peach
Fruit juice	1 x 150ml	Peach, ready to eat	2 halves
Fruit salad, canned	3 heaped tablespoons	Pear, canned	2 halves or 7 slices

*Continued overleaf.*

Pear, dried	2 halves	Raisins	1 tablespoon
Pear, fresh	1 medium pear	Raspberries, canned	20 raspberries
Pear, ready to eat	2 halves	Raspberries, fresh	2 handfuls
Pineapple, canned	2 rings or 12 chunks	Rhubarb, canned chunks	5 chunks
Pineapple, crushed	3 tablespoons	Rhubarb, cooked	2 heaped tablespoons
Pineapple, dried	1 heaped tablespoon	Satsuma	2 small satsumas
Pineapple, fresh	1 large slice	Sharon fruit	1 sharon fruit
Plum	2 medium plums	Strawberry, canned	9 strawberries
Prune, canned	6 prunes	Strawberry, fresh	7 strawberries
Prune, dried	3 prunes	Sultanas	1 heaped tablespoon
Prune, ready to eat	3 prunes	Tangerine	2 small tangerines

## VEGETABLES

Portion equivalent to 80g *As eaten. Edible portion, and drained if canned.*

Ackee, canned	3 heaped tablespoons	Lettuce (mixed leaves)	1 cereal bowl
Artichoke	2 globe hearts	Mangetout	1 handful
Asparagus, canned	7 spears	Mixed vegetables, frozen	3 tablespoons
Asparagus, fresh	5 spears	Mushrooms, button	14 button or 3 handfuls of slices, 3-4 heaped tablespoons
Aubergine	1/3rd aubergine	Mushrooms, dried	2 tablespoons or handful porcini
Beans, black eye, cooked	3 heaped tablespoons	Okra	16 medium
Beans, broad, cooked	3 heaped tablespoons	Onion, dried	1 heaped tablespoon
Beans, butter, cooked	3 heaped tablespoons	Onion, fresh	1 medium onion
Beans, cannelloni, cooked	3 heaped tablespoons	Parsnips	1 large
Beans, French, cooked	4 heaped tablespoons	Peas, canned	3 heaped tablespoons
Beans, kidney, cooked	3 heaped tablespoons	Peas, fresh	3 heaped tablespoons
Beans, runner, cooked	4 heaped tablespoons	Peas, frozen	3 heaped tablespoons
Beansprouts, fresh	2 handfuls	Pepper, canned	Half a pepper
Beetroot, bottled	3 'baby' whole, or 7 slices	Pepper, fresh	Half a pepper
Broccoli	2 spears	Pigeon peas, canned	3 heaped tablespoons
Brussels sprouts	8 Brussels sprouts	Radish	10 radishes
Cabbage sliced	1/6th small cabbage or 2 handfuls	Spinach, cooked	2 heaped tablespoons
Cabbage, shredded	3 heaped tablespoons	Spinach, fresh	1 cereal bowl
Carrots, canned	3 heaped tablespoons	Spring greens, cooked	4 heaped tablespoons
Carrots, fresh, slices	3 heaped tablespoons	Spring onion	8 onions
Carrots, shredded	1/3 cereal bowl	Sugarsnap peas	1 handful
Cauliflower	8 florets	Swede, diced and cooked	3 heaped tablespoons
Celery	3 sticks	Sweetcorn, baby	6 baby corn
Chick peas	3 heaped tablespoons	Sweetcorn, canned	3 heaped tablespoons
Chinese leaves	1/5th head of Chinese leaves	Sweetcorn, on the cob	1 cob
Courgettes	Half a large courgette	Tomato purée	1 heaped tablespoon
Cucumber	2-inch piece	Tomato, canned plum	2 whole
Curly kale, cooked	4 heaped tablespoons	Tomato, fresh	1 medium, or 7 cherry
Karela	Half a karela	Tomato, sundried	4 pieces
Leeks	1 leek (white portion only)		
Lentils	3 tablespoons		

These lists are available at [www.dh.gov.uk](http://www.dh.gov.uk)

This information is reproduced with permission of the Department of Health.

## Sources of dietary fibre

**Adults are advised to eat 18g of dietary fibre a day.**

Sources of dietary fibre include:

- **Wholegrain cereals** – brown rice, wholewheat pasta, wholemeal bread
- **Wholegrain or bran-enriched breakfast cereals** – muesli, bran flakes, etc
- **Beans, peas and lentils**
- **Fruit** – fresh, frozen, canned or dried
- **Vegetables** – fresh, frozen or canned.

The list below indicates the amount of dietary fibre contained in some average portions of commonly eaten foods.

FOOD	AMOUNT OF DIETARY FIBRE	WEIGHT OF PORTION OF FOOD
<b>Cereals</b>		
All Bran	9.8g	40g
Fibre 1 breakfast cereal	9.2g	30g
Muesli	3.8g	50g
Cornflakes	0.3g	30g
Weetabix	1.9g	20g
Rice, white, boiled	0.3g	150g
Wholemeal spaghetti	7.7g	220g
Wholemeal bread	2.2g	38g
White bread, sliced	0.5g	36g
Pitta bread, white	1.6g	75g
<b>Pulses</b>		
Lentil dhal	4.2g	210g
Baked beans	5.1g	135g
Kidney beans	3.7g	60g
<b>Vegetables</b>		
Sweet potato, baked	4.3g	130g
Carrots, boiled	1.5g	60g
Baked potato with skin	4.9g	180g
Peas, frozen	3.5g	70g
Sweetcorn	1.9g	85g
Cabbage	2.6g	95g
Broccoli	2.0g	90g
New potatoes in skins	2.6g	175g
Tomato, raw	0.9g	85g
<b>Fruits</b>		
Baked apple, no skin	3.2g	190g
Apricots, dried, ready to eat	2.5g	40g
Oranges	2.7g	160g
Fruit salad	2.1g	140g
Apple, e.g. Cox	2.0g	100g
Kiwi fruit	1.4g	60g
Banana	1.1g	100g
Plums, raw	1.0g	55g
Pears	4.1g	170g
Blackcurrants, stewed	4.3g	140g

This information is reproduced, with permission of the Department of Health, from: *Nutritional Aspects of the Development of Cancer, Report of the Working Group on Diet and Cancer of the Committee on Medical Aspects of Food and Nutrition Policy*. Published by HMSO, London, in 1998.



## Choosing healthier fats

The chart below shows how to choose healthier fats and so improve cholesterol levels in the blood. Most cholesterol is made in our bodies from fats in our food. Cholesterol levels can be improved by:

- cutting down on overall fats and
- eating smaller amounts of saturated fats.

A high-fibre diet may also help in the control of blood cholesterol.

The risk of heart attack and stroke increases with the blood levels of total cholesterol, LDL cholesterol and triglycerides, and decreases with higher levels of HDL cholesterol. That is why HDL cholesterol is often referred to as 'good' or 'protective' cholesterol.

### Choosing healthier fats

To help reduce your cholesterol level, cut down on saturated fats and replace them with small amounts of monounsaturated and polyunsaturated fats. Omega-3 fats are good for your heart too.

	UNSATURATED FATS			SATURATED FATS
	Monounsaturated fats	Polyunsaturated fats	Omega-3 fats	
<b>What do they do?</b>	Monounsaturated fats can help lower LDL levels and do not lower the HDL cholesterol level (the 'protective' cholesterol).	Polyunsaturated fats can help lower LDL cholesterol, but they also lower HDL cholesterol.	Omega-3 fats are a particular type of polyunsaturated fat. They can help prevent blood clotting, and help reduce triglyceride levels.	Saturated fats increase LDL cholesterol levels.
<b>Which foods are they found in?</b>	<p>Monounsaturated fats are found in:</p> <ul style="list-style-type: none"> <li>• olive oil</li> <li>• walnut oil</li> <li>• rapeseed oil</li> <li>• avocado.</li> </ul> <p>Some margarines and spreads are made from monounsaturated fats.</p>	<p>Polyunsaturated fats are found in:</p> <ul style="list-style-type: none"> <li>• cornflower oil</li> <li>• sunflower oil</li> <li>• soya oil</li> <li>• fish oil.</li> </ul> <p>Some margarines and spreads are made from polyunsaturated fats.</p>	<p>Omega-3 fats are found in:</p> <ul style="list-style-type: none"> <li>• fish oil</li> <li>• oily fish such as herring, kippers, mackerel, pilchards, sardines, salmon, trout and fresh tuna.</li> </ul> <p>Our bodies can also make omega-3 fats from rapeseed oil, and from the oil in walnuts and soya.</p>	<p>Saturated fats are found in:</p> <ul style="list-style-type: none"> <li>• butter</li> <li>• hard cheese</li> <li>• lard</li> <li>• dripping</li> <li>• suet</li> <li>• ghee</li> <li>• coconut oil</li> <li>• palm oil.</li> </ul>





## Portion sizes of meat

People in the UK eat on average 90g of cooked red and processed meat per day. If you eat more than this amount, and especially if you eat more than 140g a day, you should consider reducing the amount you eat.

### 90g

**Examples of a 90g-size portion of cooked meat** (Examples are approximate only.)

**1 x 90g portion =**

about 3 slices of roast beef, lamb or pork  
 1 small portion of meat sauce on pasta  
 2 rashers of back bacon and 1 large sausage  
 2 standard beefburgers and 1 slice of streaky bacon  
 1 lamb chump chop  
 1 pork rib end chop  
 1 lean pork escalope  
 1 average beef minute steak

### 140g

If you are eating more than 140g of cooked red and processed meat a day, you should consider reducing the amount you eat. Below are some examples of what would make up 140g of meat – for example from a breakfast and dinner, or from a lunch and dinner.

**Examples of 140g of cooked meat** (Examples are approximate only.)

**140g =**

2 rashers of back bacon or 2 slices of ham in a salad or sandwich	<i>plus</i>	about 3 slices of roast beef, lamb or pork
1 sausage and 2 rashers of back bacon	<i>plus</i>	1 individual (or 1 portion of) steak and kidney pie
1 sausage and 1 rasher of bacon	<i>plus</i>	1 portion of spaghetti bolognese, lasagne, moussaka or shepherd's pie
1 individual pork pie	<i>plus</i>	1 quarter-pound burger
1 individual (or 1 portion of) steak and kidney pie		
4 standard beefburgers		
3-4 sausages		
2 large lamb cutlets		
2 average lamb or pork chops		
1 raw-weight steak 6-7oz (170-200g)		

This information is reproduced, with permission of the Department of Health, from: *Nutritional Aspects of the Development of Cancer, Report of the Working Group on Diet and Cancer of the Committee on Medical Aspects of Food and Nutrition Policy*. Published by HMSO, London, in 1998.



# Sources of dietary calcium and vitamin D

---

## Calcium

---

### Good sources of calcium include:

- hard cheeses, cheese spread, soya cheese
  - canned sardines or salmon, drained and mashed up with the bones
  - fish paste
  - tofu (soya bean)
  - milk or yogurt
  - soya drink with added calcium
  - soya mince
  - egg yolk
  - bread (except wholemeal bread), crumpets, muffins, plain and cheese scones
  - beans, lentils, chickpeas
  - ready-to-eat or stewed figs and apricots.
- Adults should opt for low-fat forms of dairy foods.
  - White flour has added calcium, so products (such as bread) which are made from white flour will have a higher calcium content than those made with wholemeal flour. However, it is inadvisable for most people to rely on products made from white flour as a source of calcium at the expense of wholemeal products. Wholemeal products are good sources of fibre and most adults in the UK are failing to achieve the recommended fibre intakes of 18g per day.<sup>1</sup>
  - Chapattis decrease the absorption of calcium because yeast is not added to them during preparation, resulting in high levels of phytic acid. Phytic acid binds with calcium and prevents it from being absorbed. Yeast (which is added to leavened breads) neutralises phytic acid. Phytic acid also combines with iron, making it difficult to absorb iron, too.

---

## Vitamin D

---

There are no recommended intake levels for vitamin D as most people will have sufficient levels from exposure of their skin to sunlight. Those most at risk from vitamin D deficiency include:

- pregnant and breastfeeding women
  - elderly people living in institutions – due to lack of exposure to sunlight
  - Asian women and children – due to lack of exposure to sunlight and limited dietary intake of vitamin D from vegetarian diets.
- Vitamin D supplements are available to women and children on the Welfare Food Scheme.
  - Most vitamin D in our diets is from fortified foods such as margarine and other spreading fats and cereals. Oily fish, meat and eggs are good natural sources.
  - Remember that some of these foods – margarine, other spreading fats and meat – are also high in saturated fats, so use low-fat versions whenever you can.

For details of the calcium and vitamin D content of foods and dishes see Annex 4 of *Nutrition and Bone Health*.<sup>2</sup>

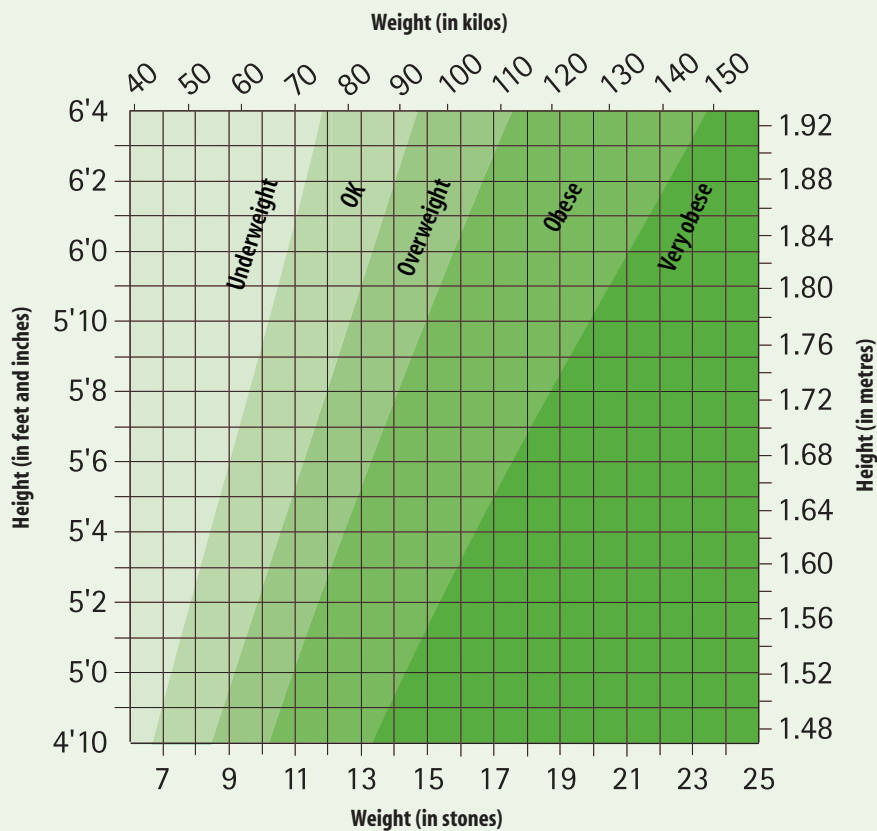
## References

---

- 1 Food Standards Agency. 2003. *National Diet and Nutrition Survey: Adults Aged 19 to 64 Years*. Volume 2. London: The Stationery Office.
- 2 Department of Health. 1998. *Nutrition and Bone Health with Particular Reference to Calcium and Vitamin D. Report of the Subgroup on Bone Health, Working Group on the Nutritional Status of the Population of the Committee on Medical Aspects of Food and Nutrition Policy*. London: The Stationery Office.



# Height/weight chart for adults



Take a straight line across from the person’s height (without shoes), and a line up or down from their weight (without clothes). Put a mark where the two lines meet to find out if the person needs to lose weight.

### **Underweight**

More food may be needed. In cases of very low weight a doctor should be consulted.

### **OK**

The right quantity of food is being eaten to maintain energy balance. If a person falls into the lower end of the weight range, they should maintain their weight and not be tempted to aim for the underweight category.

### **Overweight**

Some loss of weight might be beneficial to health.

### **Obese**

There is a need to lose weight.

### **Very obese**

There is an urgent need to lose weight. It is advisable to consult a doctor or dietitian.

The chart above is reproduced with kind permission of the British Heart Foundation. It is adapted from *Treat Obesity Seriously* by J Garrow. Published by Churchill Livingstone, in 1981.



# Children's BMI charts

## BOYS BMI CHART

**Body Mass Index (BMI)**  
 BMI is used in growth monitoring to assess fatness. Although highly correlated with fatness, BMI is not a direct measure of body fat. It should therefore be interpreted with caution. Rapid changes in BMI can occur during normal childhood growth. Intervention or referral should not be based on the BMI alone.

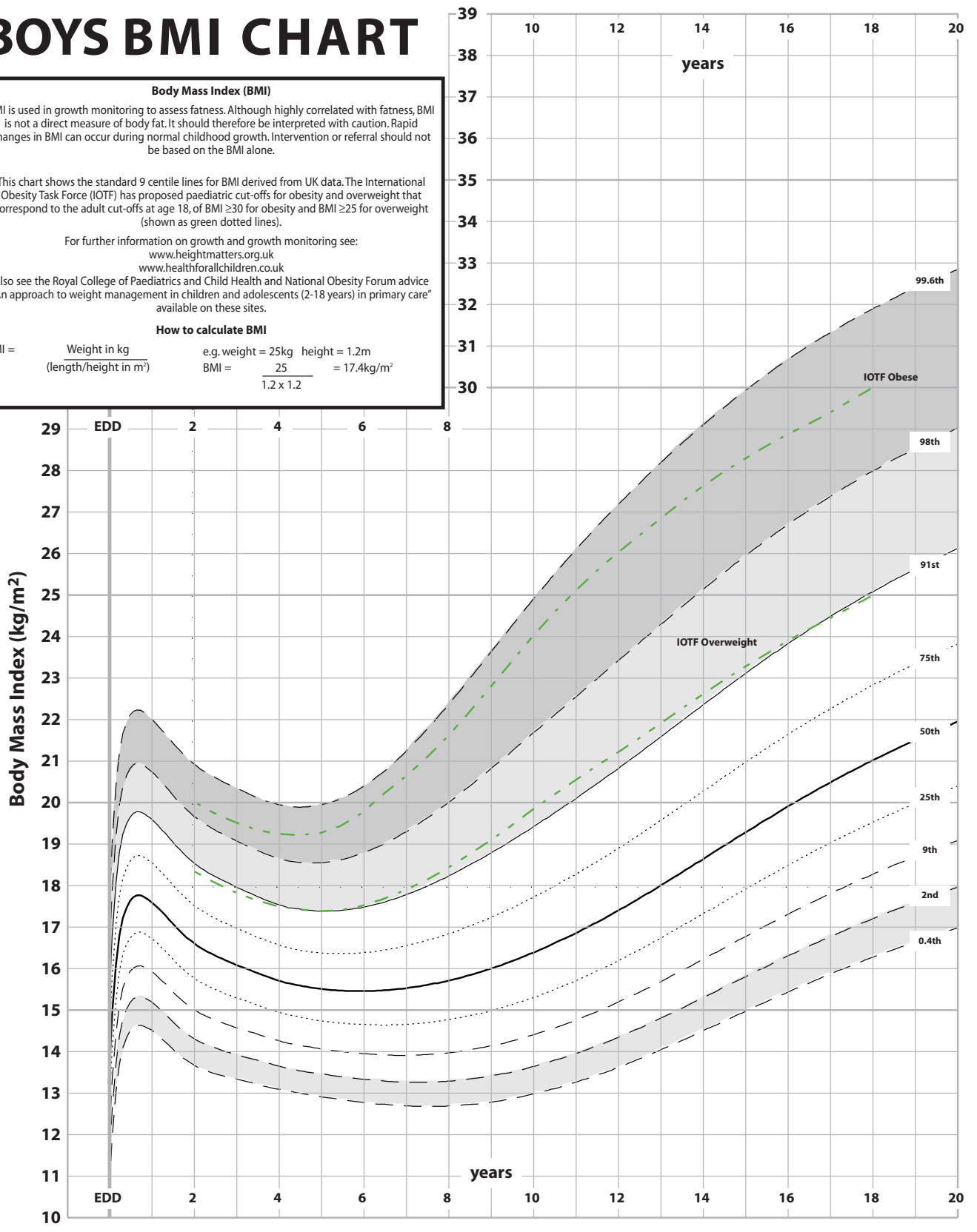
This chart shows the standard 9 centile lines for BMI derived from UK data. The International Obesity Task Force (IOTF) has proposed paediatric cut-offs for obesity and overweight that correspond to the adult cut-offs at age 18, of BMI  $\geq 30$  for obesity and BMI  $\geq 25$  for overweight (shown as green dotted lines).

For further information on growth and growth monitoring see:  
[www.heightmatters.org.uk](http://www.heightmatters.org.uk)  
[www.healthforallchildren.co.uk](http://www.healthforallchildren.co.uk)

Also see the Royal College of Paediatrics and Child Health and National Obesity Forum advice "An approach to weight management in children and adolescents (2-18 years) in primary care" available on these sites.

**How to calculate BMI**

BMI =  $\frac{\text{Weight in kg}}{(\text{length/height in m}^2)}$       e.g. weight = 25kg    height = 1.2m  
 $\text{BMI} = \frac{25}{1.2 \times 1.2} = 17.4 \text{kg/m}^2$



This chart is reproduced with permission of the Child Growth Foundation.

# GIRLS BMI CHART

## Body Mass Index (BMI)

BMI is used in growth monitoring to assess fatness. Although highly correlated with fatness, BMI is not a direct measure of body fat. It should therefore be interpreted with caution. Rapid changes in BMI can occur during normal childhood growth. Intervention or referral should not be based on the BMI alone.

This chart shows the standard 9 centile lines for BMI derived from UK data. The International Obesity Task Force (IOTF) has proposed paediatric cut-offs for obesity and overweight that correspond to the adult cut-offs at age 18, of BMI  $\geq 30$  for obesity and BMI  $\geq 25$  for overweight (shown as green dotted lines).

For further information on growth and growth monitoring see:

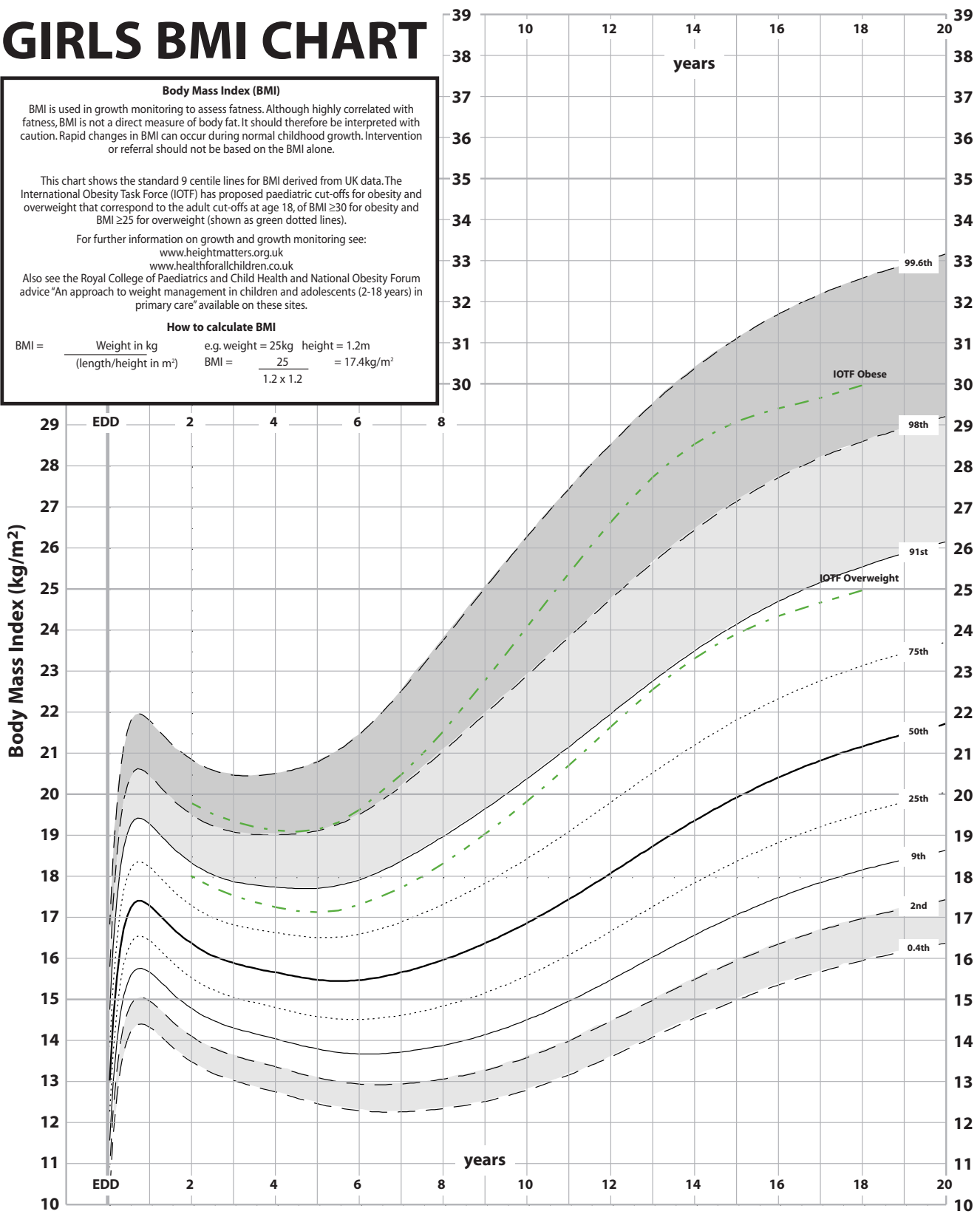
[www.heightmatters.org.uk](http://www.heightmatters.org.uk)  
[www.healthforallchildren.co.uk](http://www.healthforallchildren.co.uk)

Also see the Royal College of Paediatrics and Child Health and National Obesity Forum advice "An approach to weight management in children and adolescents (2-18 years) in primary care" available on these sites.

## How to calculate BMI

$$\text{BMI} = \frac{\text{Weight in kg}}{(\text{length/height in m})^2}$$

e.g. weight = 25kg height = 1.2m  
 $\text{BMI} = \frac{25}{1.2 \times 1.2} = 17.4 \text{kg/m}^2$



This chart is reproduced with permission of the Child Growth Foundation.



# Assessing undernutrition

## Groups of people vulnerable to undernutrition

### **People with illness-related undernutrition**

- Those with severe disorder of any body system
- Those with malignant disease

### **People in need of nutritional support before or after surgery**

- People with undernutrition which is correctable before surgery
- Those convalescing after major surgery or severe illness

### **People with difficulty in eating**

Those with:

- poor dentition or a sore mouth
- chewing or swallowing disorders
- sensory loss
- disorder of the upper limbs.

### **Those in a vulnerable psychosocial situation**

- Elderly people living alone, especially after the loss of a spouse
- People with learning disabilities who are living alone
- Those affected by poverty or social isolation
- People in nursing or residential homes

### **People suffering from psychological illness**

- Those with depression or other mental disorders
- People with behavioural eating disorders

Information on how to treat and who can help can be found in *Nutrition and Patients: A Doctor's Responsibility* by the Royal College of Physicians (see details below).



# Malnutrition Universal Screening Tool ('MUST')

## 'MUST'

'MUST' is a five-step screening tool to identify **adults**, who are malnourished, at risk of malnutrition (undernutrition), or obese. It also includes management guidelines which can be used to develop a care plan.

It is for use in hospitals, community and other care settings and can be used by all care workers.

### This guide contains:

- A flow chart showing the 5 steps to use for screening and management
- BMI chart
- Weight loss tables
- Alternative measurements when BMI cannot be obtained by measuring weight and height.

## The 5 'MUST' Steps

### Step 1

**Measure height and weight to get a BMI score using chart provided. *If unable to obtain height and weight, use the alternative procedures shown in this guide.***

### Step 2

**Note percentage unplanned weight loss and score using tables provided.**

### Step 3

**Establish acute disease effect and score.**

### Step 4

**Add scores from steps 1, 2 and 3 together to obtain overall risk of malnutrition.**

### Step 5

**Use management guidelines and/or local policy to develop care plan.**

Please refer to *The 'MUST' Explanatory Booklet* for more information when weight and height cannot be measured, and when screening patient groups in which extra care in interpretation is needed (e.g. those with fluid disturbances, plaster casts, amputations, critical illness and pregnant or lactating women). The booklet can also be used for training. See *The 'MUST' Report* for supporting evidence. Please note that 'MUST' has not been designed to detect deficiencies or excessive intakes of vitamins and minerals and is of **use only in adults**.

# Malnutrition Universal Screening Tool ('MUST')

## Step 1 BMI score

BMI kg/m <sup>2</sup>	Score
>20(>30 Obese)	= 0
18.5 -20	= 1
<18.5	= 2

+

## Step 2 Weight loss score

Unplanned weight loss in past 3-6 months	
%	Score
<5	= 0
5-10	= 1
>10	= 2

+

## Step 3 Acute disease effect score

If patient is acutely ill and there has been or is likely to be no nutritional intake for >5 days  
**Score 2**

If unable to obtain height and weight, see page 61 for alternative measurements and use of subjective criteria.

## Step 4 Overall risk of malnutrition

Add Scores together to calculate overall risk of malnutrition.  
Score 0 Low Risk    Score 1 Medium Risk    Score 2 or more High Risk

## Step 5 Management guidelines

### 0 Low Risk Routine clinical care

- Repeat screening  
Hospital – weekly  
Care Homes – monthly  
Community – annually for special groups e.g. those >75 yrs

### 1 Medium Risk Observe

- Document dietary intake for 3 days if subject in hospital or care home
- If improved or adequate intake – little clinical concern; if no improvement – clinical concern - follow local policy
- Repeat screening  
Hospital – weekly  
Care Home – at least monthly  
Community – at least every 2-3 months

### 2 or more High Risk Treat\*

- Refer to dietician, Nutritional Support Team or implement local policy
- Improve and increase overall nutritional intake
- Monitor and review care plan  
Hospital – weekly  
Care Home – monthly  
Community – monthly

\* Unless detrimental or no benefit is expected from nutritional support e.g. imminent death.

#### All risk categories:

- Treat underlying condition and provide help and advice on food choices, eating and drinking when necessary.
- Record malnutrition risk category.
- Record need for special diets and follow local policy.

#### Obesity:

- Record presence of obesity. For those with underlying conditions, these are generally controlled before the treatment of obesity.

**Re-assess subjects identified at risk as they move through care settings.**

See *The 'MUST' Explanatory Booklet* for further details and *The 'Must' Report* for supporting evidence.

# Malnutrition Universal Screening Tool ('MUST')

## Step 1 – BMI score (and BMI)

		Height (feet and inches)																							
		4'10 <sup>1</sup> / <sub>2</sub>	4'11	5'0	5'0 <sup>1</sup> / <sub>2</sub>	5'1 <sup>1</sup> / <sub>2</sub>	5'2	5'3	5'4	5'4 <sup>1</sup> / <sub>2</sub>	5'5 <sup>1</sup> / <sub>2</sub>	5'6	5'7	5'7 <sup>1</sup> / <sub>2</sub>	5'8 <sup>1</sup> / <sub>2</sub>	5'9 <sup>1</sup> / <sub>2</sub>	5'10	5'11	5'11 <sup>1</sup> / <sub>2</sub>	6'0 <sup>1</sup> / <sub>2</sub>	6'1	6'2	6'3		
100	46	44	43	42	41	40	39	38	37	36	35	35	34	33	32	32	31	30	30	29	28	28	15	10	
99	45	44	43	42	41	40	39	38	37	36	35	34	33	33	32	31	31	30	29	29	28	27	15	8	
98	45	44	42	41	40	39	38	37	36	36	35	34	33	32	32	31	30	30	29	28	28	27	15	6	
97	44	43	42	41	40	39	38	37	36	35	34	34	33	32	31	31	30	29	29	28	27	27	15	4	
96	44	43	42	40	39	38	38	37	36	35	34	33	32	32	31	30	30	29	28	28	27	27	15	2	
95	43	42	41	40	39	38	37	36	35	34	34	33	32	31	31	30	29	29	28	27	27	26	15		
94	43	42	41	40	39	38	37	36	35	34	33	33	32	31	30	30	29	28	28	27	27	26	14	11	
93	42	41	40	39	38	37	36	35	35	34	33	32	31	31	30	29	29	28	27	27	26	26	14	9	
92	42	41	40	39	38	37	36	35	34	33	33	32	31	30	30	29	28	28	27	27	26	25	14	7	
91	42	40	39	38	37	36	36	35	34	33	32	31	31	30	29	29	28	27	27	26	26	25	14	5	
90	41	40	39	38	37	36	35	34	33	33	32	31	30	30	29	28	28	27	27	26	25	25	14	2	
89	41	40	39	38	37	36	35	34	33	32	32	31	30	29	29	28	27	27	26	26	25	25	14		
88	40	39	38	37	36	35	34	33	32	31	30	30	29	28	28	27	27	26	26	25	25	24	13	12	
87	40	39	38	37	36	35	34	33	32	31	30	29	29	28	27	27	26	26	25	25	24	24	13	10	
86	39	38	37	36	35	34	33	32	31	30	30	29	28	28	27	27	26	25	25	24	24	24	13	8	
85	39	38	37	36	35	34	33	32	31	30	29	29	28	27	27	26	26	25	25	24	24	24	13	6	
84	38	37	36	35	34	33	32	31	30	30	29	28	28	27	27	26	25	25	24	24	23	23	13	3	
83	38	37	36	35	34	33	32	31	30	29	29	28	27	27	26	26	25	25	24	23	23	23	13	1	
82	37	36	35	35	34	33	32	31	30	30	29	28	28	27	26	26	25	25	24	24	23	23	12	13	
81	37	36	35	34	33	32	32	31	30	29	29	28	27	27	26	26	25	24	24	23	23	22	12	11	
80	37	36	35	34	33	32	31	30	30	29	28	28	27	26	26	25	25	24	24	23	23	22	12	8	
79	36	35	34	33	32	32	31	30	29	29	28	27	27	26	26	25	24	24	23	23	22	22	12	6	
78	36	35	34	33	32	31	30	30	29	28	28	27	26	26	25	25	24	24	23	23	22	22	12	4	
77	35	34	33	32	32	31	30	29	29	28	27	27	26	25	25	24	24	23	23	22	22	21	12	1	
76	35	34	33	32	31	30	30	29	28	28	27	26	26	25	25	24	23	23	22	22	22	21	11	13	
75	34	33	32	32	31	30	29	29	28	27	27	26	25	25	24	24	23	23	22	22	21	21	11	11	
74	34	33	32	31	30	29	28	28	27	26	26	25	24	24	23	23	22	22	21	21	21	20	11	9	
73	33	32	32	31	30	29	29	28	27	26	26	25	25	24	24	23	23	22	22	21	21	20	11	7	
72	33	32	31	30	30	29	28	27	27	26	26	25	24	24	23	23	22	22	21	21	20	20	11	4	
71	32	32	31	30	29	28	28	27	26	26	25	25	24	23	23	22	22	21	21	21	20	20	11	3	
70	32	31	30	30	29	28	27	27	26	25	25	24	24	23	23	22	22	21	21	20	20	19	11		
69	32	31	30	29	28	28	27	26	26	25	24	24	23	23	22	22	21	21	20	20	20	19	10	11	
68	31	30	29	28	27	27	26	25	25	24	24	23	23	22	22	21	21	20	20	19	19	19	10	10	
67	31	30	29	28	27	26	26	25	24	24	23	23	22	22	21	21	20	20	19	19	19	19	10	7	
66	30	29	28	27	26	26	25	25	24	23	23	22	22	21	21	20	20	19	19	19	19	18	10	6	
65	30	29	28	27	27	26	25	25	24	24	23	22	22	21	21	20	20	19	19	18	18	18	10	3	
64	29	28	28	27	26	26	25	24	24	23	23	22	22	21	21	20	20	19	19	18	18	18	10	1	
63	29	28	27	26	25	25	24	23	23	22	22	21	21	20	20	19	19	19	18	18	17	17	9	13	
62	28	28	27	26	25	24	24	23	22	22	21	21	20	20	20	19	19	18	18	18	17	17	9	10	
61	28	27	26	26	25	24	24	23	23	22	22	21	21	20	20	19	19	18	18	18	17	17	9	8	
60	27	27	26	25	25	24	23	23	22	22	21	21	20	20	19	19	19	18	18	17	17	17	9	6	
59	27	26	26	25	24	24	23	22	22	21	21	20	20	19	19	19	18	18	17	17	17	16	9	4	
58	26	26	25	24	24	23	23	22	22	21	21	20	20	19	19	18	18	18	17	17	16	16	9	1	
57	26	25	25	24	23	23	22	22	21	21	20	20	19	19	18	18	18	17	17	16	16	16	9		
56	26	25	24	24	23	22	22	21	21	20	20	19	19	18	18	18	17	17	16	16	16	16	8	11	
55	25	24	24	23	23	22	21	21	20	20	19	19	18	18	17	17	16	16	16	16	15	15	8	8	
54	25	24	23	23	22	22	21	21	20	20	19	19	18	18	17	17	16	16	16	15	15	15	8	7	
53	24	24	23	22	22	21	21	20	20	19	19	18	18	17	17	16	16	16	15	15	15	15	8	4	
52	24	23	23	22	21	21	20	20	19	19	18	18	17	17	16	16	16	15	15	15	14	14	8	3	
51	23	23	22	22	21	20	20	19	19	19	18	18	17	17	16	16	16	15	15	15	14	14	8	0	
50	23	22	22	21	21	20	20	19	19	18	18	17	17	17	16	16	16	15	15	14	14	14	7	13	
49	22	22	21	21	20	20	19	19	18	18	17	17	17	16	16	16	15	15	14	14	14	14	7	10	
48	22	21	21	20	20	19	19	18	18	17	17	17	16	16	16	15	15	14	14	14	14	13	7	7	
47	21	21	20	20	19	19	18	18	17	17	17	16	16	16	15	15	14	14	14	13	13	13	7	6	
46	21	20	20	19	18	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	13	7	3	
45	21	20	19	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	13	12	7	1	
44	20	20	19	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	13	12	6	13	
43	20	19	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	12	12	12	6	11	
42	19	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	12	12	12	12	6	8	
41	19	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	12	12	12	12	11	6	6	
40	18	18	17	17	16	16	16	15	15	15	14	14	14	13	13	13	12	12	12	12	11	11	6	4	
39	18	17	17	16	16	16	15	15	15	14	14	13	13	13	13	12	12	12	12	11	11	11	6	1	
38	17	17	16	16	16	15	15	14	14	14	13	13	13	13	12	12	12	11	11	11	11	11	6		
37	17	16	16	16	15	15	14	14	14	13	13	13	13	12	12	12	11	11	11	11	10	10	5	11	
36	16	16	16	15	15	14	14	14	13	13	13	12	12	12	12	11	11	11	11	10	10	10	5	9	
35	16	16	15	15	14	14	14	13	13	13	12	12	12	12	11	11	11	11	10	10	10	10	5	7	
34	16	15	15	14	14	14	13	1																	

# Malnutrition Universal Screening Tool ('MUST')

## Step 2 – Weight loss score

### Weight before weight loss (kg)

	Score 0 Wt Loss <5%	Score 1 Wt Loss 5-10%	Score 2 Wt Loss >10%
34 kg	<1.70	1.70 – 3.40	>3.40
36 kg	<1.80	1.80 – 3.60	>3.60
38 kg	<1.90	1.90 – 3.80	>3.80
40 kg	<2.00	2.00 – 4.00	>4.00
42 kg	<2.10	2.10 – 4.20	>4.20
44 kg	<2.20	2.20 – 4.40	>4.40
46 kg	<2.30	2.30 – 4.60	>4.60
48 kg	<2.40	2.40 – 4.80	>4.80
50 kg	<2.50	2.50 – 5.00	>5.00
52 kg	<2.60	2.60 – 5.20	>5.20
54 kg	<2.70	2.70 – 5.40	>5.40
56 kg	<2.80	2.80 – 5.60	>5.60
58 kg	<2.90	2.90 – 5.80	>5.80
60 kg	<3.00	3.00 – 6.00	>6.00
62 kg	<3.10	3.10 – 6.20	>6.20
64 kg	<3.20	3.20 – 6.40	>6.40
66 kg	<3.30	3.30 – 6.60	>6.60
68 kg	<3.40	3.40 – 6.80	>6.80
70 kg	<3.50	3.50 – 7.00	>7.00
72 kg	<3.60	3.60 – 7.20	>7.20
74 kg	<3.70	3.70 – 7.40	>7.40
76 kg	<3.80	3.80 – 7.60	>7.60
78 kg	<3.90	3.90 – 7.80	>7.80
80 kg	<4.00	4.00 – 8.00	>8.00
82 kg	<4.10	4.10 – 8.20	>8.20
84 kg	<4.20	4.20 – 8.40	>8.40
86 kg	<4.30	4.30 – 8.60	>8.60
88 kg	<4.40	4.40 – 8.80	>8.80
90 kg	<4.50	4.50 – 9.00	>9.00
92 kg	<4.60	4.60 – 9.20	>9.20
94 kg	<4.70	4.70 – 9.40	>9.40
96 kg	<4.80	4.80 – 9.60	>9.60
98 kg	<4.90	4.90 – 9.80	>9.80
100 kg	<5.00	5.00 – 10.00	>10.00
102 kg	<5.10	5.10 – 10.20	>10.20
104 kg	<5.20	5.20 – 10.40	>10.40
106 kg	<5.30	5.30 – 10.60	>10.60
108 kg	<5.40	5.40 – 10.80	>10.80
110 kg	<5.50	5.50 – 11.00	>11.00
112 kg	<5.60	5.60 – 11.20	>11.20
114 kg	<5.70	5.70 – 11.40	>11.40
116 kg	<5.80	5.80 – 11.60	>11.60
118 kg	<5.90	5.90 – 11.80	>11.80
120 kg	<6.00	6.00 – 12.00	>12.00
122 kg	<6.10	6.10 – 12.20	>12.20
124 kg	<6.20	6.20 – 12.40	>12.40
126 kg	<6.30	6.30 – 12.60	>12.60

### Weight before weight loss (st lb)

	Score 0 Wt Loss <5%	Score 1 Wt Loss 5-10%	Score 2 Wt Loss >10%
5st 4lb	<4lb	4lb – 7lb	>7lb
5st 7lb	<4lb	4lb – 8lb	>8lb
5st 11lb	<4lb	4lb – 8lb	>8lb
6st	<4lb	4lb – 8lb	>8lb
6st 4lb	<4lb	4lb – 9lb	>9lb
6st 7lb	<5lb	5lb – 9lb	>9lb
6st 11lb	<5lb	5lb – 10lb	>10lb
7st	<5lb	5lb – 10lb	>10lb
7st 4lb	<5lb	5lb – 10lb	>10lb
7st 7lb	<5lb	5lb – 11lb	>11lb
7st 11lb	<5lb	5lb – 11lb	>11lb
8st	<6lb	6lb – 11lb	>11lb
8st 4lb	<6lb	6lb – 12lb	>12lb
8st 7lb	<6lb	6lb – 12lb	>12lb
8st 11lb	<6lb	6lb – 12lb	>12lb
9st	<6lb	6lb – 13lb	>13lb
9st 4lb	<7lb	7lb – 13lb	>13lb
9st 7lb	<7lb	7lb – 13lb	>13lb
9st 11lb	<7lb	7lb – 1st 0lb	>1st 0lb
10st	<7lb	7lb – 1st 0lb	>1st 0lb
10st 4lb	<7lb	7lb – 1st 0lb	>1st 0lb
10st 7lb	<7lb	7lb – 1st 1lb	>1st 1lb
10st 11lb	<8lb	8lb – 1st 1lb	>1st 1lb
11st	<8lb	8lb – 1st 1lb	>1st 1lb
11st 4lb	<8lb	8lb – 1st 2lb	>1st 2lb
11st 7lb	<8lb	8lb – 1st 2lb	>1st 2lb
11st 11lb	<8lb	8lb – 1st 3lb	>1st 3lb
12st	<8lb	8lb – 1st 3lb	>1st 3lb
12st 4lb	<9lb	9lb – 1st 3lb	>1st 3lb
12st 7lb	<9lb	9lb – 1st 4lb	>1st 4lb
12st 11lb	<9lb	9lb – 1st 4lb	>1st 4lb
13st	<9lb	9lb – 1st 4lb	>1st 4lb
13st 4lb	<9lb	9lb – 1st 5lb	>1st 5lb
13st 7lb	<9lb	9lb – 1st 5lb	>1st 5lb
13st 11lb	<10lb	10lb – 1st 5lb	>1st 5lb
14st	<10lb	10lb – 1st 6lb	>1st 6lb
14st 4lb	<10lb	10lb – 1st 6lb	>1st 6lb
14st 7lb	<10lb	10lb – 1st 6lb	>1st 6lb
14st 11lb	<10lb	10lb – 1st 7lb	>1st 7lb
15st	<11lb	11lb – 1st 7lb	>1st 7lb
15st 4lb	<11lb	11lb – 1st 7lb	>1st 7lb
15st 7lb	<11lb	11lb – 1st 8lb	>1st 8lb
15st 11lb	<11lb	11lb – 1st 8lb	>1st 8lb
16st	<11lb	11lb – 1st 8lb	>1st 8lb
16st 4lb	<11lb	11lb – 1st 9lb	>1st 9lb
16st 7lb	<12lb	12lb – 1st 9lb	>1st 9lb

# Malnutrition Universal Screening Tool ('MUST')

## Alternative measurements and considerations

### Step 1: BMI (Body Mass Index)

#### If height cannot be measured

- Use recently documented or self-reported height (if reliable and realistic).
- If the subject does not know or is unable to report their height, use one of the alternative measurements to estimate height (ulna, knee height or demispan).

#### If height & weight cannot be obtained

- Use mid-upper arm circumference (MUAC) measurement to estimate BMI.  
If MUAC is <23.5cm, BMI is likely to be <20kg/m<sup>2</sup>.  
If MUAC is >32.0cm, BMI is likely to be >30kg/m<sup>2</sup>.

### Step 2: Recent unplanned weight loss

If recent weight loss cannot be calculated, use self-reported weight loss (if reliable and realistic).

### Subjective criteria

If height, weight or BMI cannot be obtained, the following criteria which relate to them can assist your professional judgement of the subject's nutritional risk.

#### 1. BMI

- Clinical impression – thin, acceptable weight, overweight. Obvious wasting (very thin) and obesity (very overweight) can also be noted.

#### 2. Unplanned weight loss

- Clothes and/or jewellery have become loose fitting (weight loss).
- History of decreased food intake, reduced appetite or swallowing problems over 3-6 months and underlying disease or psycho-social/physical disabilities likely to cause weight loss.

#### 3. Acute disease effect

- No nutritional intake or likelihood of no intake for more than 5 days.

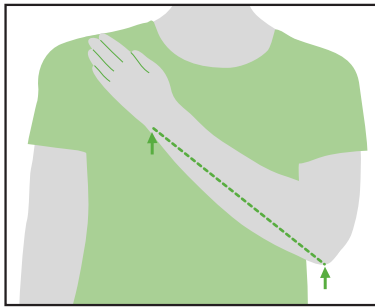
Further details on taking alternative measurements, special circumstances and subjective criteria can be found in *The 'MUST' Explanatory Booklet*. A copy can be downloaded at [www.bapen.org.uk](http://www.bapen.org.uk) or purchased from the BAPEN office. The full evidence-base for 'MUST' is contained in *The 'MUST' Report* and is also available for purchase from the BAPEN office.

# Malnutrition Universal Screening Tool ('MUST')

## Alternative measurements: instructions and tables

If height cannot be measured use length of forearm (ulna) to calculate height using tables below. (See The 'MUST' Explanatory Booklet for details of other alternative measurements (knee height and demispan) that can be used to estimate height).

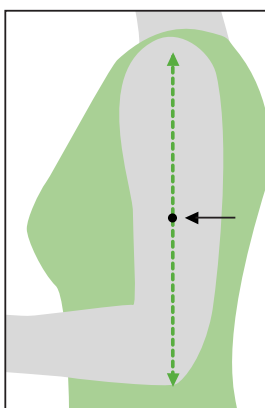
### Estimating height from ulna length



Measure between the point of the elbow (olecranon process) and the midpoint of the prominent bone of the wrist (styloid process) (left side if possible).

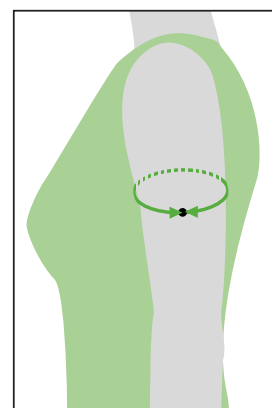
HEIGHT (m)	Men (<65 years)	1.94	1.93	1.91	1.89	1.87	1.85	1.84	1.82	1.80	1.78	1.76	1.75	1.73	1.71
	Men (>65 years)	1.87	1.86	1.84	1.82	1.81	1.79	1.78	1.76	1.75	1.73	1.71	1.70	1.68	1.67
	Ulna length (cm)	32.0	31.5	31.0	30.5	30.0	29.5	28.5	28.0	27.5	27.0	26.5	26.5	26.0	25.5
HEIGHT (m)	Women (<65 years)	1.84	1.83	1.81	1.80	1.79	1.77	1.76	1.75	1.73	1.72	1.70	1.69	1.68	1.66
	Women (>65 years)	1.84	1.83	1.81	1.79	1.78	1.76	1.75	1.73	1.71	1.70	1.68	1.66	1.65	1.63
HEIGHT (m)	Men (<65 years)	1.69	1.67	1.66	1.64	1.62	1.60	1.58	1.57	1.55	1.53	1.51	1.49	1.48	1.46
	Men (>65 years)	1.65	1.63	1.62	1.60	1.59	1.57	1.56	1.54	1.52	1.51	1.49	1.48	1.46	1.45
	Ulna length (cm)	25.0	24.5	24.0	23.5	23.0	22.5	22.0	21.5	21.0	20.5	20.0	19.5	19.0	18.5
HEIGHT (m)	Women (<65 years)	1.65	1.63	1.62	1.61	1.59	1.58	1.56	1.55	1.54	1.52	1.51	1.50	1.48	1.47
	Women (>65 years)	1.61	1.60	1.58	1.56	1.55	1.53	1.52	1.50	1.48	1.47	1.45	1.44	1.42	1.40

### Measuring from mid upper arm circumference (MUAC)



The subject's left arm should be bent at the elbow at a 90° angle, with the upper arm held parallel to the side of the body. Measure the distance between the bony protrusion on the shoulder (acromion) and the point of the elbow (olecranon process). Mark the mid-point.

Ask the subject to let arm hang loose and measure around the upper arm at the mid-point, making sure that the tape measure is snug but not tight.



BAPEN Office, Secure Hold Business Centre, Studley Road, Redditch, Worcs, B98 7LG. Tel: 01527 457 850. Fax: 01527 458 718. bapen@sovereignconference.co.uk BAPEN is a registered charity number 1023927. www.bapen.org.uk

Published November 2003 by MAG the Malnutrition Advisory Group, a Standing Committee of BAPEN. Review date December 2004 and annually thereafter. 'MUST' is supported by the British Dietetic Association, the Royal College of Nursing and the Registered Nursing Home Association.