UNIT-9 Diet and Disease

Learning Outcomes

By the end of this unit the learner will be able to:

- ✓ Identify the risk factors causing diseases like; cardiovascular disease, cancer, diabetes and celiac disease
- ✓ Discuss the rationale for current dietary recommendations designed to prevent these diseases.

Unit 9

Diet and Disease

A healthy diet may help to prevent certain long-term (chronic) diseases, such as, heart disease, stroke, and diabetes. It may also help to reduce your risk of developing some cancers and help you maintain a healthy weight. Your body needs energy to work normally and keep you alive. You obtain this energy from nutrients in the food that you eat - mostly, carbohydrates, fats and proteins. Minerals and vitamins are other nutrients that are also important in your diet to help your body stay healthy. It is important to find the right balance between these different nutrients to achieve maximum health benefits.

Three main types of dietary recommendations may be produced by public health agencies: dietary allowances (DRVs), dietary goals, and dietary guidelines.

Dietary Allowances are quantitative guidelines for different population subgroups for the essential macro and micro-nutrients to prevent nutritional deficiencies.

Dietary Goals are quantitative national targets for selected macronutrients and micronutrients aimed at preventing long-term chronic disease e.g. Coronary Heart Disease, stroke, and cancer. They are usually aimed at the national population level rather than the individual level.

Dietary Guidelines are broad targets aimed at the individual to promote nutritional well-being. They were initially introduced for macronutrients but are now being used for micronutrients. Dietary guidelines can be expressed as quantitative targets (e.g. five servings of fruit and vegetables/day) or as qualitative guidelines (e.g. eat more fruit and vegetables).

Cardiovascular Disease

CVD is caused by a build-up of fatty streaks and cholesterol in the blood vessels. Natural wear and tear to blood vessels makes it easier for fatty cholesterol to leak in and get stuck to the artery walls. This build-up causes the arteries to narrow, reducing the heart's ability to pump blood through them to the body. If they become completely blocked, it will cause a heart attack or a stroke if the blockage occurs in the brain's blood vessels. Importantly, not all cholesterol is bad. There are two types of cholesterol in the bloodstream: LDLs and HDLs. LDLs create the build-up in arteries, while high HDL levels are a good sign that the person is not at risk of CVD. The umbrella term for diseases that affect the heart or the blood vessels is cardiovascular disease.

The Arteries

The arteries are the large blood vessels that carry blood away from the heart to tissues. They do the high pressure work in the body and therefore need to be elastic, flexible and strong. Artery walls are made of smooth muscle and connective tissue and it is this that gives them strength and flexibility. A lot of activity takes place in the lining of arteries: it can constrict or dilate and release chemicals. It has been said that

you are as old as the health of your arteries. If the condition of the arteries is poor, disorders such as atherosclerosis and hypertension (or high blood pressure) can develop.

Heart Health

Atherosclerosis

Atherosclerosis is the form of hardening of the arteries where cholesterol, fats, and calcium are deposited into the walls of the arteries. If they are not stopped or removed, these deposits can become hard plaques, which may block the arteries and lead to heart attack or stroke.

Cholesterol

Cholesterol is the starting material for all of our steroid hormones. These include oestrogen, progesterone, testosterone, and the stress hormone cortisol, which is made by the adrenal glands. If someone has an infection and he needs the anti-inflammatory properties of cortisol, his blood cholesterol levels rise. Though cholesterol has its uses in the body, oxidised and damaged cholesterol is found in processed foods that have been heated to high temperatures, such as powered eggs and milk. This kind of cholesterol blocks the arteries is typically oxidised and damaged cholesterol.

Lipoproteins

The other substance in the blood test that is often labelled bad is Low- Density Lipopotein (LDL). It is often referred to as *bad cholesterol*. Its counterpart, HDL or High Density Lipoprotein, is called *good cholesterol*. Doctors sometimes tell patients that they want to see their levels of bad cholesterol lowered and higher levels of their good cholesterol. LDL and HDL are not only cholesterol. They are lipoproteins (substances that are proteins bound with fats). They act as carriers in the blood. Blood is watery and it is the transport medium throughout the body. Fat and water don‘t mix so if fatty substances need to be transported via the blood, they need to be escorted by other substances that are more soluble.

Risk Factors

Some risk factors are strongly associated with CVD but are potentially reversible or can be modified:

- being overweight;
- increased levels of LDL cholesterol;
- low HDL cholesterol;
- smoking ;
- high triglycerides (caused by the build up of fats derived from foods eaten or made in the body from other energy sources);
- large waist circumference (being 'apple-shaped') ;
- high blood pressure;
- inactivity; and
- diabetes

Dietary Changes

Making small changes in the diet is one of the simplest and most effective ways to reduce the risk of CVD.

This can be done by:

- reducing fat in the diet, especially **saturated and trans-fats**
- eating more **fruit and vegetables**, **wholegrain food, and soluble fibre**
- drinking **alcohol** in moderation
- reducing **salt** to maintain a lower blood pressure

Fat

Reducing the proportion of fat in the diet, especially saturated fat, can help to reduce blood cholesterol levels. There's a strong link between high blood cholesterol levels and the risk of heart disease. For those who don't have CVD or aren't considered to be at a high risk of CVD, normal blood cholesterol levels are below 5mmol/litre. People with average energy needs should aim to consume no more than 70g/day of fat and less than 20g/day of saturated fat.

Trans-fatty acids are a particular kind of fat that are naturally occurring in meat and dairy products but may also be produced when plant-based oils are hydrogenated to produce solid spreads, such as margarines. They're often found in confectionery and processed food like pastry, biscuits and cakes. They've been found to have the same effect on cholesterol levels as saturated fat and should be avoided as much as possible. Thankfully, many manufacturers have now modified processing techniques to keep these fats to a minimum. When reducing total fat, it's important not to cut out the heart healthy fats from the diet including mono and poly-unsaturated fats and omega-3, mostly found in plant and fish oils.

Fat intake can be reduced or modified by:

- sing butter and other spreads sparingly;
- choosing lean cuts of meat or trim fat off;
- grilling, baking or steaming food rather than frying;
- swapping saturated fats such as butter for unsaturated oils such as sunflower, rapeseed, or olive oil;
- limiting the intake of trans-fats from processed food; and
- eating two to three portions of oily fish each week (e.g. sardines, mackerel, fresh tuna, and salmon)

Essential Fatty Acids

Essential Fatty Acids, such as, omega-3s, which are found in oily fish, have been shown to reduce the risk of CVD by lowering blood triglycerides, reducing blood clotting, and regulating heart rhythm. For general heart health, eating two portions of fish per week, (one of which should be oily) is recommended.

Stanols and Sterols

Certain plant-derived compounds, called stanol or sterol esters, have been shown to reduce cholesterol levels. Spreads, yoghurts, drinks, and soya 'dairy alternatives' are now available containing these products. These sterol enriched foods may be particularly useful for those with raised blood cholesterol which has remained elevated even after making other dietary changes. Clinical trials show that when used regularly, they can reduce high cholesterol levels.

Fruits and Vegetables

Fruits and vegetables are rich in many essential nutrients including vitamins C and E and carotenoids (which are all antioxidants). They may help to protect the heart by limiting the damaging effects of cholesterol on body tissues. One should aim for at least five servings of fruit and vegetables a day.

Wholegrain and Fibre

Studies of large groups of people in the US have shown that diets rich in wholegrain food can reduce the risk of CVD by up to 30 per cent. This can be done by including wholegrain food in every meal by choosing wholemeal bread and wholegrain varieties of pasta and rice.
Soluble dietary fibre, found in oats, beans and pulses, can help to lower LDL cholesterol. These foods should be included as part of an overall healthy balanced diet, at least two to three times each week.

Soya Protein

A diet that includes at least 25g of soya per day has been associated with reductions in LDL cholesterol and CVD. Soya in particular has been shown to reduce CVD risk as they inhibit the growth of cells that form artery-clogging plaque. Soya protein is also an excellent substitute for meat and is available in a convenient and tasty form in many ready-made meals. Another good source of soya protein is soya milk and yoghurt.

Cancer

What is Cancer?

The growth and function of all the cells in our body are carefully controlled by many processes. The term cancer is used when these control systems go wrong and our cells start to grow out of control. The process usually involves damage to the DNA in cells, which can be caused by chemicals found in cigarette smoke, radiation and even some viruses. The food we eat also affects DNA function, but the exact mechanisms are unclear. In most cases, cancer is caused by many different factors, with several processes being involved in DNA damage in cells.

Risk Factors

The most important risk factor for lung cancer is, of course, smoking, which is thought to be responsible for about 30% of cancer deaths. Exposure to sunlight is the most important risk factor for skin cancer. Diet is also thought to play a risk factors of about one-third of cancers, but identifying components

of diet which could increase or decrease the risk is remarkably difficult. High fat diets are associated with an increased risk of cancers at various sites including the colon, breast, and prostrate.

The population, which consumes large amounts of saturated fat, which appears to be at increased risk of cancer. High intake of polyunsaturated fats may increase the risk of cancer by causing damage to cell membranes through the production of free radicals. However, an adequate intake of anti-oxidant nutrients (e.g. beta-carotene, selenium, and vitamins C and E) helps to prevent damage to cell membranes caused by free radical.

Food and the Prevention of Cancer

The link between diet and cancer is complicated, and scientists have not yet unravelled the exact mechanisms involved. This is because diets are made up of different foods containing many nutrients that interact in different ways in individuals.
Nutrition scientists need to study very large groups of people over many years to give us more specific answers to how and what foods increase the risk of cancer. These studies are ongoing, but the **World Cancer Research Fund** has examined all the existing evidence. It has produced recommendations on food, nutrition and physical activity to help reduce the risk of cancer, based on current scientific evidence.

Achieving and Maintaining a Healthy Weight

One should aim to stay in the healthy **body mass index** range of 18.5kg/m2 to 25kg/m2. Excess body fat is a particular risk factor for cancers of the oesophagus, pancreas, colon, rectum, endometrium, and kidney, as well as, postmenopausal breast cancer.
Cutting calories by reducing dietary fat and eating plenty of fruit and vegetables, and foods rich in fibre can help. Sugary drinks should be avoided and portion sizes must be checked.

Developing Regular Physical Activity Habits

One should aim for at least 30 minutes of moderate activity a day, then, they can build up to either 60 minutes of moderate activity or 30 minutes of intense activity every day. Activity not only helps protect against weight gain but also decreases the risk of colon cancer and possibly endometrium and postmenopausal breast cancer. Moderate activity should raise the heart rate and breathing, but not make a person completely breathless and unable to talk. Examples of moderate activity include brisk walking, gardening and dancing. Examples of intense activity include jogging and swimming.

Moderate Alcohol Intake

Men should not exceed two drinks a day and women no more than one. Over the past few years, research has shown alcohol increases the risk of cancer, especially of the breast and colon.

Limiting Intake of Red Meat and Avoiding Processed Meat

One should try to eat no more than 500g (18oz) each week and have very little, if any, processed meat, such as, bacon and salami. Red meat is an important source of nutrients, especially **iron**, but we only need to eat red meat in modest amounts, probably no more than two to three times a week.

Eating Foods that mostly come from Plants

This means eating more fruits, vegetables, and unrefined cereal foods and pulses, as they are mostly rich in fibre, low in calories, and packed with the nutrients that lower the risk of cancer.

Limiting Consumption of Salty Foods

Salt and salt-preserved foods are linked to an increased risk of stomach cancer.

Using Supplements Wisely

Following the principles of **healthy eating** should provide most individuals with the nutrients they need to minimise the risk of cancer. There's no good evidence to show supplements will protect the general population from cancer. Some studies have shown beneficial effects of supplements in groups of people who have a high risk of developing certain cancers, but these findings can't be applied to the general population.

Cancer Patients and Diet

The person who has been diagnosed with cancer should continue to eat well during treatment, as it will help to:

- cope with the treatment;
- withstand infections;
- reduce the risk of nutritional deficiencies; and
- generally improve the quality of life

Maintaining a good dietary intake can be challenging because tumour growth can increase energy needs. Also, physical symptoms such as difficulty swallowing, sore mouth, taste changes, nausea, vomiting, or diarrhoea make it difficult to eat well and maintain a good weight. In this situation some of these practical solutions may also be helpful.

The cancer patients should:

- try to regain any weight lost during acute treatment periods;
- keep ready-meals in the freezer for when too tired to cook ;
- eat regularly - keep nutritious snacks to hand; and
- add an extra dash of olive oil in cooking or on salads

Eating Difficulties

Some patients may find that they cannot eat normally because of the side effects of radiotherapy or chemotherapy. Multivitamin and mineral supplements may be required either because the patient is not eating normally or because there is a risk of nutrient deficiency due to the drug treatment.
Nausea and vomiting are common side effects of chemotherapy – and sometimes, the cancer itself and patients may find the following advice useful:

- eating small, frequent meals rather than three large meals;
- eating bland foods such as bread, toast, crackers, scrambled eggs, and potatoes which are less;
- likely to induce nausea than spicy or fatty foods;
- avoiding the smell of cooking food; and
- drinking fluid in between meals rather than with meals to prevent feeling too full

Alternative Diets for Cancer Prevention and Treatment

There are many so-called anti-cancer diets that claim to prevent and in some ways, cure cancer. They often recommend excluding whole groups of foods or eating only a few specific foods. These diets are not supported by robust scientific evidence and tend to be based on anecdotal reports of success, the patients should avoid those which:

- suggest excessive food restrictions;
- are based on eating raw foods only; and
- recommend single large doses of supplements

Diabetes

Diabetes is a condition where blood glucose (sugar) levels are poorly controlled. Diabetes cannot be cured but it can be successfully treated. People with diabetes have a high level of glucose in their blood.

This can be caused by:

- Too little insulin being produced by the pancreas;
- The body not accepting or using the insulin it produces; or
- A combination of both.

People with diabetes need to keep their blood sugar levels within a healthy range. Blood sugar levels are controlled through diet, physical activity, and, for some people, medication or insulin injections.

Understanding Insulin

When we eat foods that are primarily carbohydrates, they metabolise to a sugar called glucose. When we think of carbohydrates as our major source of energy, the energy source is really glucose. This is the only form of sugar that our body can utilise. After the carbohydrates are metabolised into glucose, the sugar enters into the blood stream. But glucose cannot be used for energy while it is in our blood. It is only on a journey and needs to reach its intended destination. It must be taken out of the bloodstream and put into the cells, where it can be burned as energy. The only way it can do this is to have the hormone insulin present. Insulin acts as a carrier and escorts glucose into the cells. It is almost as if the inside of the cell is an exclusive club and the club will only allow glucose to enter if insulin escorts it in. Without insulin, the receptor site acts like a bouncer at the cell membrane's entrance and tells glucose: no, you can't come in. you should have insulin with you! This is the problem that diabetics have. Latest figures show that over two million people in the UK have diabetes and an estimated one million people are undiagnosed and don't realise they have diabetes.

There are two different types of diabetes:

Type 1

Type 1 Diabetes, which used to be called insulin-dependent diabetes, occurs when the body fails to produce the insulin it needs, the hormone required for controlling blood sugar levels. People with type 1 diabetes require regular insulin injections to correct this. All type 1 diabetes patients should have access to a qualified dietician, as diet is an important part of their clinical care. Type 1 diabetes usually affects young people, often in childhood and is the least common of the two forms of diabetes, accounting for between five to 15 percent of all people with this disease.

Type 2

Type 2 diabetes develops slowly. It's much more common than type 1 diabetes and accounts for at least 75 percent of all cases. Type 2 diabetes often develops later in life, although cases in obese children and young adults are becoming more common. It's most strongly related to being overweight. Although the body continues to secrete insulin, often in large amounts, people who have type 2 diabetes don‘t respond efficiently. This is known as insulin resistance. Later, insulin production declines and this signals the onset of type 2 diabetes. In the early stages, diet and lifestyle measures can often be sufficient to control and even reverse insulin resistance. In the later stages of the disease, some people will need tablets and later insulin injections to manage their diabetes. One can reduce the risk of developing type 2 diabetes by achieving and maintaining a healthy weight.

Studies show that, for overweight people, who are at risk of diabetes, losing just five percent of their body’s weight can reduce more than 50% chance of progressing to diabetes. It's worth noting that despite diabetes being a condition of sugar regulation, specific restriction of sugars isn‘t necessary, except as part of ensuring a balanced diet overall.

The person who is living with diabetes needs to reduce the risk of developing associated diseases such as coronary heart disease, kidney and eye disease. This means losing **weight**, keeping blood pressure and blood glucose levels as near normal as possible and having their **cholesterol** and triglycerides checked regularly.

What is the Glycemic Index?

The Glycaemic Index (GI) is a way of ranking carbohydrate foods based on how quickly they increase blood sugar levels. Low GI foods are especially helpful for people with diabetes, who need to have more control over their blood sugar levels than the general population.

Ideally, foods with a low GI, such as, those rich in soluble fibre like oats and legumes, should be eaten more frequently than those with a high GI. But the texture, type of cooking or processing used, and the amount and type of sugars present can all affect the GI. Since foods are often consumed as part of a meal or snack, it can be difficult to calculate the GI. Focusing on unrefined, high-fibre, whole grain cereals and minimising rapidly absorbed, refined cereals, and sugary foods will all help to lower the GI of the diet.

Why is the Glycemic Index Important?

Our body performs best when our blood sugar is kept relatively constant. If our blood sugar drops too low, we become lethargic and/or experience increased hunger. And if it goes too high, the brain signals our pancreas to secrete more insulin. Insulin brings our blood sugar back down, but primarily by converting the excess sugar to stored fat. Also, the greater the rate of increase in our blood sugar, the more chance that the body will release an excess amount of insulin, and drive the blood sugar back down too low.

Therefore, when we eat foods that cause a large and rapid glycemic response, we may feel an initial elevation in energy and mood as our blood sugar rises, but this is followed by a cycle of increased fat storage, lethargy, and more hunger!

Although increased fat storage may sound bad enough, individuals with diabetes (diabetes mellitus, types 1 and 2) have an even worse problem. Their bodies inability to secrete or process insulin causes their blood sugar to rise too high, leading to a host of additional medical problems. The theory behind the Glycemic Index is simply to minimize insulin-related problems by identifying and avoiding foods that have the greatest effect on the blood sugar.

Should All High GI foods be avoided?

For non-diabetics, there are times when a rapid increase in blood sugar (and the corresponding increase in insulin) may be desirable. For example, after strenuous physical activity, insulin also helps move glucose into muscle cells, where it aids tissue repair. Because of this, some coaches and physical trainers recommend high-GI foods (such as sports drinks) immediately after exercise to speed recovery.

Also, it's not Glycemic Index alone that leads to the increase in blood sugar. Equally important is the amount of the food that we consume. The concept of Glycemic Index combined with total intake is referred to as "Glycemic Load".

How Glycemic Load Improves the Glycemic Index

Although most candy has a relatively high Glycemic Index, eating a single piece of candy will result in a relatively small glycemic response. Why? Well, simply because our body's glycemic response is dependent on both the type and the amount of carbohydrate consumed.
Glycemic Load is calculated this way:

GL = GI/100 x Net Carbs

(Net Carbs are equal to the Total Carbohydrates minus Dietary Fibre) Therefore, we can control your glycemic response by consuming low-GI foods and/or by restricting our intake of carbohydrates

Glycemic Indexes and Glycemic Loads for Common Foods

GI and GL for Common Foods

Food	GI	Serving Size	Net Carbs	GL
Peanuts	14	4 oz (113g)	15	2
Bean sprouts	25	1 cup (104g)	4	1
Grapefruit	25	1/2 large (166g)	11	3
Pizza	30	2 slices (260g)	42	13
Low fat yogurt	33	1 cup (245g)	47	16
Apples	38	1 medium (138g)	16	6
Spaghetti	42	1 cup (140g)	38	16
Carrots	47	1 large (72g)	5	2
Oranges	48	1 medium (131g)	12	6
Bananas	52	1 large (136g)	27	14
Potato chips	54	4 oz (114g)	55	30
Snickers Bar	55	1 bar (113g)	64	35
Brown rice	55	1 cup (195g)	42	23
Honey	55	1 tbsp (21g)	17	9
Oatmeal	58	1 cup (234g)	21	12
Ice cream	61	1 cup (72g)	16	10
Macaroni and cheese	64	1 serving (166g)	47	30
Raisins	64	1 small box (43g)	32	20
White rice	64	1 cup (186g)	52	33
Sugar (sucrose)	68	1 tbsp (12g)	12	8
White bread	70	1 slice (30g)	14	10

Watermelon	72	1 cup (154g)	11	8
Popcorn	72	2 cups (16g)	10	7
Baked potato	85	1 medium (173g)	33	28
Glucose	100	(50g)	50	50

The table above shows the values of the Glycemic Index (GI) and Glycemic Load (GL) for a few common foods. GI's of 55 or below are considered low and 70 or above are considered high. GL's of 10 or below are considered low and 20 or above are considered high.

Dietary Management

Diet plays a crucial role in the management of both types of diabetes. Recommendations of the British Diabetic Association are:

- Reduce and maintain body weight in the ideal range;
- Complex carbohydrates should make up 50-55% of the dietary energy intake;
- Sugar is allowed up to 25g a day provided that it is a part of the diet low in fat and high in NSP and that it is consumed as part of a meal'
- NSP intake should be 18g a day(equivalent to 30g of dietary fibre), concentrating on soluble NSP;
- Fat intake should not exceed 30% of the energy intake and saturated fat should not exceed 10% of energy intake;
- Cholesterol intake should not exceed 300mg a day;
- Protein intake should comprise about 10-15% of energy intake; and
- Salt intake should be limited to 6g a day

The main aims in the dietary management of diabetes are:

- To reduce weight in the overweight patient;
- To maintain blood glucose levels as near to normal as possible; and
- To maintain blood lipid levels as near as normal as possible

The main factors to consider the diabetic diet are body weight, the amount and types of carbohydrate and fat in the diet and the level of alcohol consumption.

Eating a Balanced Diet

By choosing to eat a **healthy balanced diet** one can initiate to manage diabetes, by helping to control the blood glucose levels, blood fats and blood pressure. It will also help to regulate the body weight. If the person is overweight it's especially important to try and achieve and maintain a lower weight.

Even small weight losses lead to surprisingly big reductions in the risk of diabetes and will also reduce the risk of heart disease, high blood pressure, and stroke.
Finding the balance between the amount of carbohydrates and fat is important. Cutting down on the amount of fat a person eats can also help – particularly, saturated (animal) fats, as this type of fat is linked to heart disease. One should choose monounsaturated fats, e.g. olive oil and rapeseed oil and should aim to eat a portion of oily fish at least twice a week.

Carbohydrates

Starchy foods are important for patients with diabetes because complex carbohydrates can slow down the absorption of glucose from gastrointestinal tract. If glucose is absorbed slowly, less insulin is released. The consumption of NSP also influences the post-prandial rise in blood glucose. The type of NSP is also important. Foods that are rich in soluble NSP (e.g. pulses and oats) produce a smaller (e.g. Butter) glycaemic response than those containing insoluble NSP (eg wheat products) soluble NSP also has a beneficial effect on blood lipid levels, lowering both total and LDL cholesterol. Although insoluble NSP has less of an effect on blood glucose and lipid levels, it is still an important part of the diabetic diet. Patients with diabetes should therefore be encouraged to eat wholemeal bread and cereals, oats and oat products, pulses such as lentils, chickpeas and red kidney beans, and plenty of fruits and vegetables.

Sugar

The British Diabetic Association recommends that sugar intake should be limited to 25g a day and that it should be consumed as part of a whole meal or snack. Sugar consumed as part of the meal has less of an effect on blood glucose level than sugar consumed on its own. Sugar in drinks should be avoided. If sweetness is desired, an energy free sweetener should be used. Sweeteners providing energy such as fructose, sorbitol, and maltodextrin should be restricted.
Whether diabetic or not, an adult needs the following foods daily, in order to be healthy:

- two servings of protein foods e.g. lean meat, fish, eggs, or pulses (e.g. lentils);
- at least five servings of starchy carbohydrate foods;
- at least five servings of fruit and vegetables; and
- three servings of low-fat dairy foods

Alcohol

As alcohol contains calories it should be kept to a minimum to help lose weight. An unit is a small glass of wine or half a pint of beer, or a pub measure of spirits. If the patient is taking tablets to help control his blood sugars, he must remember that alcohol can make hypoglycaemia (low blood sugars) so he should never drink on an empty stomach.

Exercise

Being **fit and active** reduces the risk of diabetes. Patients with diabetes should be encouraged to take regular exercise just the same as everyone else. Physical activity, when combined with a healthy balanced diet, will help to manage the diabetes and prevent long-term complications.

Smoking

People with diabetes are at an increased risk of **Cardiovascular Disease**. Stopping smoking will help to decrease the risk of Cardiovascular Disease and minimise the chance of developing other complications of diabetes.

Medication

People with diabetes may often need additional treatments to work alongside their healthy lifestyle, such as, medication to control their diabetes. This may be in the form of tablets or insulin.

Coeliac's Disease

People with Coeliac's disease cannot eat foods containing gluten, a protein found in wheat, rye, barley and some other grains. In people with Coeliac's disease, the body's immune system responds to gluten by damaging the lining of the small intestine. Most of the nutrients in food are absorbed through the small intestine. Damage to the small intestine means nutrients cannot be fully used by the body. This can lead to nutrient deficiencies.

Diagnosis

The condition is genetic. If an immediate family member has Coeliac's disease, the chance increases to 1 in 22. Because so many cases of Coeliac's disease go undiagnosed, family history alone is not always an accurate gauge. Some symptoms of Coeliac's disease include:

- Gas;
- Diarrhoea;
- Stomach pain;
- Fatigue;
- Joint pain;
- Weight loss; and
- An itchy skin rash called dermatitis herpetiformis

There are dozens of symptoms associated with Coeliac's disease and vary from person – to - person. Symptoms may occur in the digestive system or in other parts of the body. Properly diagnosing Coeliac's disease requires a medical review of the symptoms. It also involves a blood test to look for high levels of certain auto-antibodies and a biopsy of tissue from the small intestine. Though Coeliac's disease cannot be cured, the condition can be managed. People with Coeliac's disease can lead long, healthful lives.

The only treatment for Coeliac's disease is to eat a gluten-free diet. There are plenty of foods that are naturally gluten-free, including fruits, vegetables, beef, poultry, fish, nuts, eggs and more. A growing number of foods are being developed by manufacturers to answer consumers' increasing interest in gluten-free products.
However, managing Coeliac's disease is not just about eliminating gluten from the diet. It also involves making sure that one gets all the vitamins and nutrients he need — particularly iron, calcium, fibre and the B-vitamins thiamine, riboflavin, niacin, and folate—and watching weight gain. Weight gain can be a side

effect for people with celiac disease once they start following a gluten-free diet. This is because the body is absorbing more nutrients and calories from food.

Obesity

What is Obesity?

Obesity is a condition in which excess fat leads to impairments in health. It's usually defined as a Body Mass Index (BMI) greater than 30 kg/m² where excess weight is gained due to energy intake exceeding energy expenditure.

Risks

Both being obese and being overweight increase the risk of a range of diseases that can have a significant health impact on individuals.

The risks are higher as BMI increases for those with the following diseases -

- diabetes - the risk of developing type 2 diabetes is about 20 times greater for people who are very obese, compared with healthy weight individuals.
- cancer - 10 percent of all cancer deaths among non-smokers are related to obesity.
- coronary heart disease - leading to heart attack and stroke
- hypertension - 85 percent of hypertension is associated with a BMI greater than 25.
- liver disease - up to 90 percent of people who are obese will have fatty liver disease, which may lead eventually to cirrhosis.

Causes of Obesity

There are many reasons for obesity. While its cause is definitely tied to an imbalance of calories taken in versus calories burned through physical activity, it also can be affected by:

- Family history and genes;
- Medications. Some antidepressants, anti-seizure medications, diabetes medications, steroids, and beta blockers may cause weight gain;
- Social networks and economics Research suggests people may be at greater risk for being overweight or obese if their friends are; other data shows people at lower economic levels have a greater chance of being obese;
- Lifestyle habits, eating behaviours, and stress;
- Too little sleep. This can affect hormones that increase appetite; and
- Medical problems, such as hypothyroidism, Prader-Willi and Polycystic Ovary Syndrome.

Approach to Weight Loss

Weight loss therapy should be based on three components:

1. Diet,
2. Physical activity, and

3. Behaviour therapy, such as,recognizing triggers for eating or learning to pinpoint obstacles that hold you back from making lifestyle changes.

This combination has been found to be more successful than using any one intervention alone.

Healthy Eating Plan

A dietician creates a plan based on the medical history, lifestyle and food preferences and also explores how the person's habits, emotions and environmental issues affect his diet. A weight loss plan should also include a discussion on:

- **Calories**.

  No weight loss effort can work long-term without a close and constant look at the calories one eats each day. The goal should be to establish a new balance between calories in and calories out (burned through physical activity).

- **Protein**.

  The protein we eat supports our muscles. It is important to get enough protein and exercise to keep—and even grow—muscle strength and mass. Foods rich in protein such as meats, fish, low-fat and fat-free dairy foods, nuts and beans are also satisfying. When part of a well planned diet, protein can delay hunger and keep one feeling full longer.

- **Fibre**.

  Foods rich in fibre such as whole fruits, vegetables, beans and whole grains tend to offer plenty of vitamins and minerals without plenty of calories. High-fibre foods satisfy hunger and keep the person feeling full longer than processed foods. They are tasty, nutritious "filler foods."

- **Eating a Variety of Foods**.

  A healthful weight loss plan includes a variety of foods from all the food groups: fruits, vegetables, grains, dairy, meat, and beans, plus a moderate amount of healthy fats.

Osteoporosis

Osteoporosis means 'porous bones'. The texture inside our bones is like honeycomb and over the years, the holes in the honeycomb become larger as they lose bone mineral. This is called osteoporosis, and it weakens bones and makes them more vulnerable to breaking. Often osteoporosis is called 'the silent disease' as it can remain undetected until someone has a broken bone as a result of a fall or accident.

Osteoporosis can strike at any age, but occurs mostly in people over 50. One in two women and one in four men older than age 50 will experience an osteoporosis-related bone fracture during their lifetime. Taking steps to build bone health while one is young can save people from this disease. However, at every age, a bone-building diet and regular physical activity are important. They help ensure bone tissue continues to be built.

What Causes Osteoporosis?

We often think of bones as being 'static', but we're constantly making new bone and breaking down old bone. There are two kinds of cells that help in this process. During childhood and up to our 20s, the 'building' cells dominate over the 'destruction' cells. After the age of about 30, the 'building' cells slow down and by the age of around 40 the 'destruction' cells dominate. This means we lose bone mineral faster than we replace it, and the end result is osteoporosis.

It's important to build up as much bone mineral as we can while we're growing because our 'building' cells are at their peak.

Who's Particularly at Risk?

Our genes play a role in bone health, so a family history of osteoporosis means a greater risk. Other risk factors include:

- Early menopause or hysterectomy;
- Taking corticosteroids (steroids) for conditions such as asthma, arthritis, or inflammation;
- bowel disease;
- Illness and inability to move much;
- Conditions that affect absorption of foods, such as Coeliac's disease;
- Excessive drinking;
- Smoking; and
- Being very underweight

How to Minimise the Risk of Osteoporosis

There are many ways to help our bodies build strong and healthy bones, especially during childhood and adolescence. After about the age of 30, it's difficult to increase bone mass, but protecting the bones can begin at any age.

Bone Health and Diet

Bones may seem dry and dull, but they are far from it. They are constantly under construction; certain cells break down bone tissue and other cells use the calcium and nutrients in the foods we eat to build new bone. If we are not physically active and getting the nutrition we need, our bones will suffer. Over time they will become less dense, weaker and more likely to fracture.

Bone Building Nutrients

Calcium, the major nutrient needed to form new bone cells, is vital for bone health. Our bones store more than 99 percent of the calcium in the body. Good sources include dairy products, almonds, dark green leafy vegetables and calcium-fortified foods such as cereals and fruit juice. Broken wrists, hips, and spinal bones are the most common fractures, which is a direct result of osteoporosis.
Here are a number of ways to build and maintain healthy bones:

- **Getting Active** - regular weight-bearing activity can help maintain bone strength and reduce the rate of loss of bone mineral. Activities such as brisk walking, climbing stairs, or jogging are good

examples of weight-bearing exercise. Short bouts of high-impact activity, such as jumping up and down, are helpful for building bones when one is young.

- **Boosting Calcium Intake** - calcium is important for healthy bones, and a mature adult skeleton contains about 1,200g. Many foods contain calcium, but the richest and most easily absorbed source is found in dairy products. One should aim for about three servings of these a day to meet our calcium needs, such as a glass of milk, a small matchbox-sized piece of cheese and a 150g pot of yogurt. Fish eaten with bones, pulses, cereals, nuts, seeds, dried fruit and green vegetables also contain calcium.

Age (years)	Calcium requirement (mg/day)	
0 to 12 months	525	
1 to 3 years	350	
4 to 6 years	450	
7 to 10 years	550	
11 to 14 years	Male	Female
15 to 18 years	1000	800
19+ years	1000	800
	700	700

Calcium cannot build bones alone. It works with other nutrients to increase bone strength. These include:

- Vitamin D;
- Vitamin K;
- Potassium;
- Fluoride; and
- Magnesium

Soaking up Vitamin D – Vitamin D helps our bodies to absorb calcium from the digestive system. Most of the vitamin D we need comes from exposing our skin to sunlight. It's also found in oily fish and fortified margarines. Some groups - such as older people, those who aren't able to go outside or those who cover up completely when outside - might need a daily supplement (10 micrograms) of vitamin D.

- **Choosing plenty of fruit and vegetables** - fruit and vegetables (particularly green, leafy vegetables) contain vitamin K, which is thought to have a role in building healthy bones. Fruit and vegetables also make the body less acidic, which helps to keep calcium in bones.
- **Watching the intake of certain foods** - animal protein foods, salt, fizzy drinks, alcohol and caffeine can all work to leech minerals out of bones
- **Keeping a healthy body weight** - a very low body weight can affect bone health and increase the risk of osteoporosis. Heavier people tend to have a higher bone mass, but being too overweight has other effects on health.
- **Smoking** - smoking prevents the bone-building cells from working as efficiently as they should.

Further Reading:

- ✓ *Prevent and Reverse Heart Disease: The Revolutionary, Scientifically Proven, (2007), By Caldwell B. Esselstyn*
- ✓ *Diet, Life Expectancy, and Chronic Disease : Studies of Seventh-Day, (2003), By Gary E. Fraser Loma Linda University*
- ✓ *Diet, Demography, and Disease: Changing Perspectives on Anemia, (1992), edited by Patricia Stuart-Macadam, Susan Kent*