

NUTRITION FOR WEIGHT LOSS

SUBJECT GUIDE

COURSE AIM

To explain all aspects of how diet and nutrition affects weight control and weight loss. It is an ideal course for people working within the health care or nutrition industry; working with people of all ages who are keen to learn the fundamental aspects of obesity and how control weight loss through nutrition. It is a good course for individuals wanting to understand their own nutritional needs and to learn how to alter their eating habits for self-improvement and enhancement of their health.

CONTENTS

There are 8 lessons in this module as follows:

1. Understanding Obesity
2. Nutrition and Obesity
3. Diets
4. Preventing Obesity
5. Treating Obesity
6. Modifying Eating Behaviour
7. Restricting Calorie Intake
8. Obesity Related Medical Conditions and Treatments

UNDERSTANDING OBESITY

AIM

Develop an understanding of modern day causes of obesity and recognise its significance to health. Be able to evaluate the weight status and body composition of an individual.

WHAT IS OBESITY

Introduction

Obesity is the term used to describe a physical state in which a person is excessively overweight and their health is almost definitely jeopardised as a result. The energy intake from consumed foods is stored as fat as the body does not use it.

Obesity is one of the leading preventable causes of death worldwide. There is high and increasing rates of obesity among children and adults and authorities view it as one of the most serious public health problems of the 21st century. Degenerative diseases are directly and indirectly linked with obesity. There are also mental and emotional health problems and deterioration associated with obesity. In most westernised cultures obesity is negatively stigmatised. People who are obese suffer from harmful social exclusion, discrimination and victimisation. Sadly, social, medical and personal problems which are all factors relating or leading to obesity in many people, are often ignored.

Obesity is not new. Historical records show people have experienced obesity for many centuries.

One example of this comes from Ancient Egypt. It is thought, the Ancient Egyptians, considered obesity to be a disease. This has been discovered by through ancient drawings depicting obese people displayed alongside those with other diseases.

Conversely, in certain cultures and areas where food is scarce and poverty is prevalent obesity was, and sometimes still is, perceived as a symbol of wealth and social status or even fertility. Some African tribes purposely increase the weight of a bride-to-be to prepare her for child bearing. Before the wedding date can be set or ceremonial arrangements made, a slim bride is pampered with extravagant foods in order to gain weight until she reaches the suitable weight – being overweight or obese.

Over the years, although there has been increasing awareness of the causes of obesity and prevention techniques, it has now reached such high levels it is referred to as an 'epidemic'. It is only recently, that alarming rates of obesity have caused enormous concern within the medical world as it is now seen as a public health problem.

UNDERSTANDING WEIGHT

An accurate measurement of weight is an essential part of a health assessment.

When someone is being weighed they should keep all variables constant e.g. they should always weigh themselves at the same time of day or if they start weighing themselves in clothes they should continue to be weighed in clothes each time. People can easily become obsessed with their weight during a weight loss program, but it is suggested they don't weigh themselves more than once a week. Normal fluctuations in body weight occur from day to day depending on water intake or the menstrual cycle, for example.

If a person starts following an exercise program at the same time as attempting to lose weight they can become discouraged – this is often as a result of increasing muscle mass which literally weighs more than fat. In other words, as muscles become stronger, lengthened or toned and the body appears to look leaner, weight can increase.

Body Composition

Fat is located in different parts of the bodies of men and women. Men experience fat deposits mostly in their upper arms, shoulders, chest and stomach, whereas women find excess fat stored mainly in hips, buttocks and thighs. That said - we understand weight gain and fat deposits can be found all over the human body when someone is overweight. Most people have heard the terms 'apple shaped' or 'pear shaped'. These terms are used to describe the body shapes of people who are carrying excess weight. Unfortunately for those people who tend to carry excess weight around their stomach or abdomen i.e. apple shaped, they are at increased risk of future health problems linked with cardiovascular diseases or diabetes. Body shape is genetic, and there is not much which can be done to change it. Nonetheless people can control their weight to ensure their body shape or excess weight does not become extreme, thus harming their health.

Evaluation Techniques – Body Mass Index (BMI)

A healthy weight can be determined or defined according to someone's Body Mass Index, abbreviated to BMI, which is calculated as a ratio of weight to height.

Calculating Body Mass Index:

$$\text{Body Mass Index (BMI)} = \frac{\text{Weight kg}}{\text{Height m}^2}$$

Divide weight in kilograms by height squared (height in metres multiplied by height in metres).

BMI	Classification
<18.5	underweight
18.5-24.9	normal weight
25.0-29.9	overweight
30.0-34.9	class I obesity
35.0-39.9	class II obesity
>40.0	class III obesity

The World Health Organisation (WHO) advises that someone with a BMI of 25 to 30 is overweight. People with a BMI located between 30-35, are obese and those with a BMI over 35 are morbidly obese.

HEALTH RISKS OF OBESITY

As someone's weight increases, so do their health risks – disease and premature death. Carrying too much weight increases strain on vital organs of the body such as the heart. There is much greater risk of cardiovascular disease, high blood pressure, respiratory disease and even some cancers. Carrying excess weight around on the body put strain on weight bearing joints like the hips and knees for example. There is also increased risk of developing osteoarthritis – a degenerative joint disease which is not linked to age.

Being obese increases the risk of deadly complications during and after surgical procedures. Researchers have found that obese patients have a significantly higher risk of postoperative complications, such as heart attack, wound infection, nerve injury, and even urinary tract infections. Very obese (sometimes known as morbidly obese) patients were nearly twice as likely to die as a result of complications following non-cardiac surgery. Researchers

analysed postoperative complications among 6,773 patients treated between 2001 and 2005 from the University of Michigan anaesthesiology department. Of the patients who experienced complications, about 33% were obese and nearly 15% were morbidly obese. The results showed obese patients had much higher rates of postoperative complications than normal weight patients, such as:

- ✓ Five times higher rate of heart attack
- ✓ Four times higher rate of peripheral nerve injury
- ✓ Two times higher rate of wound infection
- ✓ One and half times higher rate of urinary tract infection

Dietary Trends and the Incidence of Obesity

“The global epidemic of overweight and obesity - "globesity" - is rapidly becoming a major public health problem in many parts of the world... the increasing prevalence of overweight and obesity is associated with many diet-related chronic diseases including diabetes mellitus, cardiovascular disease, stroke, hypertension and certain cancers”.

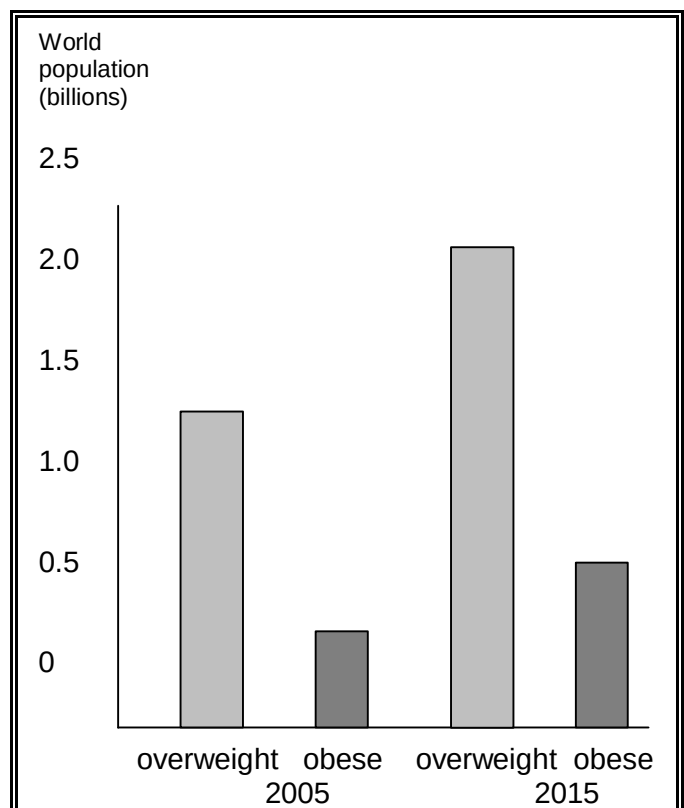
This quote is taken from The World Health Organisation (W.H.O), April 2009, and clearly outlines the increase in obesity as global trend (in developed countries) and emphasises the ensuing health implications as a consequence of its epidemic proportions.

The following tables show current rates of obesity in a number of different counties and the global forecast for obesity rates. Studies have also shown that children are becoming increasingly vulnerable to overweight and obesity around the world e.g the International Obesity Taskforce estimates that one in 10 children are now overweight, a total of 155 million. Within this figure around 30-45 million are classified as obese - accounting for 2-3% of the world's children aged 5-17.

Recently recorded global obesity rates in males and females over 20 years old:

Country	% Obesity in Males	% Obesity in Females
Australia	18	18
England	17	20
Russia	11	28
Italy	7	6
America	20	25
Morocco	18	6
Columbia	9	12
India	0	2
Japan	3	3

Global Obesity Forecast:



‘Types’ of Obesity – Hyperplasia or Hypertrophy of Fats Cells

There are two types of obesity – this theory is based on differences between the anatomical characteristics of adipose tissues. Adipose tissue is the loose connective tissue which is responsible for energy storage in the form of fat (lipids). It also provides insulation from heat and cold and offers protective padding around vital organs e.g. the liver.

Adipose tissue contains several cell types, with the highest percentage of cells being adipocytes (more commonly known as fat cells), which contain fat droplets. The two different types of obesity are seen in children and adults, with one more predominately identified in children and the other predominately found in adults.

Children

Hyperplasia of adipose cells – this is an increase in the number of fat cells. The number of cells can be as much as five times greater than those found in a healthy child of average weight. Fat cells can also show some enlargement, but this is not vast. The core and extremities of the human body experience hyperplasia of adipose cells.

Adults

Hypertrophy of adipose cells – this is when adipose cells are greatly enlarged or ‘hypertrophied’. The number of fat cells may be same or may increase slightly in adults. Fat distribution is mostly centralised in this type.

Some time ago, as detailed in the table, it had been thought that fat cell numbers only increased during childhood and adolescence; then increased in size during adulthood. It has been found that the numbers of fat cells in adults can in fact increase, but this is only really found to happen once the existing fat cells have reached their maximum size.

As a result of this finding, it can be assumed that the onset of obesity in adulthood, if followed by weight loss, would increase the likelihood for the weight of the individual to return to normal before that of the hyperplastic type (more commonly found in childhood obesity). This means children and adolescents who have experienced obesity and therefore have an increased number of adipocytes, may struggle to attain an average healthy weight, as the properties of the cells mean they have a biological tendency to retain fat molecules and there are more of them to begin with.

Research into this area is enormous. Although we have outlined the very basic characteristics of types of obesity in relation to fat cells – it must be noted that the type of adipose tissue obesity is not a predictor of success in achieving and maintaining weight loss.

Factors that influence food intake

Before looking into the causes of obesity, it is important to consider factors that influence our food intake. The intake of food depends on complex interrelated body signals, external behavioural influences and environmental factors.

Food habits are formed early in life are often dependant on economic, social and cultural influences during that time. Food habits can be changed over time, even though we may assume a habit cannot be changed. We can adopt new attitudes towards food and thereby cultivate new values. The next part of this lesson discussed the physiological, environmental and behavioural factors which play a role in determining food intake and the forming of habits.

Physiological factors which determine food intake:

Hunger: This is a feeling experienced when a person desires eating. It is controlled by the hypothalamus in the brain. It has been likened to a computer centre which receives and sends messages based on the incoming information. Hunger is often understood to be an unpleasant sensation. The sensation of hunger generally occurs 2-3 hours after eating and can be alleviated by consuming more food. It is a fluctuation in hormones which result in the body's motivation for food. After extreme lengths of times the person may start to experience 'hunger pangs' which are a physical contraction of the stomach muscles. Each individual contraction only last for around 30 seconds and may continue for approximately 30 minutes. The feeling of hunger then reduces or completely subsides for a while – often up to as long as 150 minutes.

Appetite: There is a difference between appetite and hunger – appetite signals guide the selection of food someone chooses. It is influenced by both metabolic factors and hedonic factors. Appetite is – “what do I want to eat?” Influences in appetite include the persons already learned preferences of food; hedonic factors of palatability, taste and odour; environmental influences such as temperature i.e. if a person feels cold they are more likely to desire hot food; suffering from a disease, for example cancer sufferers will definitely experience changes in appetite and therefore, alter food choices; and also metabolic choices as a result of neurotransmitter levels or hormones.

Hedonism: The palatability of food based on its texture, smell, taste and smell and the surroundings in which the food is consumed. Taste differs from person to the next. Some foods might taste too salty to some, whereas just right for others. The taste and smell of food are directly linked. Interestingly, if someone holds their nose whilst eating most of the taste of the food would be lost. Often smell is a trigger to consume food. If food can be smelled – we will often start to desire food. Some foods are often rejected because of their odour; other foods are desired because of the aroma. Smell has a huge role to play in deciding on which foods to consume.

Environmental and behavioural factors which determine food intake:

Culture: Culture has influenced food choices for decades. Often food patterns reflect social organisation, or the economy, or family attitudes. Food choices within the home may reflect the environment within which parents grew up from the geographic region, their level of education, religious background and income.

Economic Influences: household incomes will affect the food intake choices. Over recent decades there has been an increase in the number of women, who have families, going to work. If there is a father figure in the household there will be a double wage and therefore generally, food can be afforded and often luxury items may be bought. If there is a lone parent household, money can often be limited therefore food choices and the amount of food bought can also be restricted.

Religious and Moral: Some religions place regulations on food intake. Certain foods are forbidden by religious regulation, for example, pork is forbidden to Orthodox Jews and Muslims. Food is often used in ceremonies and celebrations. Generally, the role of food in religious beliefs and practices is complex and varies among individuals and communities. Moral attributes are often ascribed to foods – someone may eat something because they believe it is good for them. Food is also often given as a reward. Food rewards are often given to children or adults may reward themselves with an expensive meal if they believe they have deserved it.

Emotional outlet: Eating is known to provide gratification. It also helps to relieve life stresses. Food is not seen as a fuel needed for the body to sustain life. Turning to food is a way of helping us deal with our emotions. This goes right back to when adults were children and our parents gave us something sweet or a biscuit as a way to make us feel better. Food is used to celebrate special occasions, to relieve boredom and to comfort us in times of sadness or grief. Foods can be used to regulate mood also.

Age and Gender: Some influences on what people eat are as a direct result of their age – jelly and ice-cream is most often enjoyed by children, whereas coffee or olives are more commonly foods which are appropriate and/or liked by adults. Sometimes it is thought that there are differences between the food preferences between men and women – often men enjoy meals like pies, potatoes and meat dishes, whereas women often choose lighter meals, for example, fruit or vegetable meals. This is recognised this is not true for everyone and is a simple generalisation of different food choices between genders.

NUTRITIONAL NEEDS ACROSS THE LIFESPAN

In the last section we discussed a range of factors that affect our intake of foods. We shall now consider how nutritional needs vary across our lifespan. This is also important as obesity can often result from us not meeting our changing nutritional requirements.

Infancy, childhood and puberty

Throughout infancy (from birth to 3 years old), children will experience a period of rapid growth – during this time babies require an increased amount of kilojoules to ensure normal development during this rapid period of growth. Enormous changes can be seen in the bodies of infants during this time. Throughout childhood, children's kilo-joule needs vary depending on activity levels or periods of illness etc. During this time it is the responsibility of parents and carers to ensure children eat well and remain active.

Sometimes children have special nutritional needs, but all children require a healthy diet. In nutrition, the diet is the sum of the food consumed by a body. Proper nutrition for a human requires vitamins, minerals, proteins, and fuel in the form of carbohydrates and fats. Unfortunately, in today's language, diet is equated with a regime to lose weight – or something that is restrictive. It is therefore important that children understand what it is that is being said about their eating.

During puberty and throughout adolescence there is another period of rapid growth which requires increased kilo-joule and nutrient intake. Adolescents also need extra calcium for bone development. If children do not intake enough kilo-joules at this stage it can have long term detrimental effects on his or her growth and sexual development. Teenage girls specifically should get enough iron to build red blood cells. This is especially important during menstruation. Increasing kilo-joule intake during puberty should not result in the child becoming obese if they remain active. The child should avoid watching too much TV or video computer games to excess.

Adulthood and pregnancy

Nutrition throughout adulthood should be altered at times when requirements are different e.g. throughout times of illness or pregnancy for example. During illness, if someone is sedentary they will require fewer kilojoules to maintain their energy requirements. During pregnancy a woman, it is necessary for a woman to slightly increase her kilo-joule intake and to be careful when preparing and cooking some food to ensure the health of their unborn

baby. During pregnancy many women weights will increase – they can expect to put on as much as 10-13 kg throughout the entire pregnancy.

If the woman was overweight at the beginning of the pregnancy it is likely she can expect to gain 6-8 kg throughout the pregnancy. Much of the weight being carried is as a result of retained fluids in the mother's body and of course the weight of the baby itself. Carrying excess weight throughout a pregnancy can increase the risk of back problems, varicose veins and complications such as pre-eclampsia. Excess weight during pregnancy is more difficult to lose after the birth of the baby.

Middle years, menopause and elder years

During adults' middle years, their nutritional requirements can change as a result of decreased metabolism and/or menopause. There is a reduction in muscles mass during this time and metabolic rate (which is discussed further in the next lesson) decreases. Moderate exercise maintains muscle mass and therefore the metabolic rate remains steady.

During the menopause, women can try to prevent the consequences of low oestrogen levels by eating plenty nutrient-rich foods. Nutrient rich foods may help reduce symptoms and prevent post-menopausal problems such as bone disease osteoporosis. When oestrogen levels decline women's risk of cardiovascular disease increases to same level of risk faced by men. It is therefore important their diet contains 'good' HDL cholesterol and less 'bad' LDL cholesterol.

As people age over 70 years and over, generally their dietary needs remain the same for those in their 50-70's. Dietary deficiencies are common as often their appetites have changed and are smaller which is why it is important they eat nutrient rich foods. Physical disabilities effect their motivation and ability to stay active, but it is important to encourage this where possible. Emotional changes resulting from grief or loneliness often cause older people to lose their appetite or in some rare cases, increase their food consumption as a comforter.

CAUSES OF OBESITY

The causes of obesity are complex – it is often not as simple as ingesting more kilojoules than are expended by the body. By having an understanding of the different causes of obesity we can begin to find ways to treat it and prevent it.

Genetics

Research has shown that children of obese parents are more likely to become obese than children of lean, normal weight people. There are links between body shape and obesity in children – children whose parents are endomorphic (soft, round body shapes) are more likely to become obese than children of parents who are ectomorphic (lean and slender). Weight gain, leading to obesity, is not inevitable in endomorphs, however, these people do gain weight easily and so they must be careful to watch their weight.

This information discovered about obese parents and patterns in their children begs the question - Is there a fat gene? Genetics inherited from parents do affect (in part) the metabolism of children. If we consider the fact there has been no change in the human gene pool in recent times, we have still seen a huge rise in the numbers of obese people – especially in North America and the United Kingdom – which would tell us obesity is more than likely linked to environmental influences than genetics.

There is one example of a genetic link between appetite, energy expenditure and obesity and that is via the production hormone Leptin. Leptin plays a role in regulating energy expenditure, appetite and metabolism.

Leptin is secreted into the blood from the adipose tissue in various parts of the body. It binds to the hypothalamus in the brain – the hypothalamus has been known as the 'appetite centre'. Leptin signals that the body has had enough food to eat. Unfortunately, there is a minority of people who have a genetic mutation on their DNA in the 'area' responsible for the controlling the production of this hormone, which leads the hormone not being produced as normal.

Lifestyle and Exercise

Lifestyle choices are characteristic choices which determine the way someone lives. For example, someone may choose to drive the car to the shop rather than walk or cycle; someone else may choose to go for a run instead of watching a movie. A lifestyle typically also reflects an individual's attitudes, values or worldview.

Points to consider within lifestyle and exercise are:

- ✓ Activity levels
- ✓ Eating Out
- ✓ Snacking
- ✓ Drinking alcohol
- ✓ Medical and dental checkups
- ✓ Frequency and number of meals per day

Lifestyle factors, exercise and dietary habits that increase risk of obesity in children and adolescents include:

- ✓ Too much fast-food and take away dinners
- ✓ Lack of family dinners – children who rarely enjoy sit down family dinners are more likely to have poor consumption of fruit, vegetables and dairy
- ✓ Too many soft drinks. These are packed full of sucrose and for each soft drink a child consumes each day they dramatically increase their risk of obesity
- ✓ Poor role models. Overweight and obese parents tend to have poor dietary habits and children take note of this. They are less likely to stock healthy foods in the house, more

likely to have junk food snacks and in some cases are less concerned if their child is overweight

- Poor parental expectations. When a child is raised with little or no expectation on how they eat, they are more likely to have trouble with their weight. Parents may show little concern if junk food is consumed, if meals are nutritionally poor, if weight is being gained, if fluid consumption is low or from poor sources and so on.
- Divorce and traumatic events. Stress and depression can trigger comfort eating in children if they have no healthy outlet for their emotions. In tense, acrimonious divorces parents may try to win favour with children by offering sweets and junk food among other things. Relationship break-ups can be a source of stress and upset in teenagers, and children may develop poor eating habits when trying to cope with a death in the family, an illness in the family, abusive or tense family environments, trouble at school (poor academic performance, bullying, trouble with teachers etc).
- Junk food in packed lunches. Some children will have a piece of fruit in their lunch; however more will have junk food. There is also little way of parents knowing whether fruit provided is being eaten, especially if children have their own money to spend on food available at school canteens.
- Portion sizes. Super-sized portions from fast food outlets are a classic example, and can provide many times a child's daily sodium requirement, and contain large amounts of trans-fats and saturated fats as well as sugar (many fast food burger buns are packed with sugar). Meat is often of questionable quality also. At home, many parents offer portion sizes much too large for children, and then insist children clean their plates, so as not to waste their food, or in order to have a sweet or dessert.

Eating Habits and Water Consumption

Often eating habits and patterns are to blame. Simply eating too much becomes a habit for many people. This can be as a result of large portion size or adding unnecessary extras to meals e.g. bread with dinner or heavy desert after a main meal. Often people will eat high carbohydrate meals like pasta and sauce for dinner as that is often cheaper than buying fresh vegetables and making a vegetable dish.

Eating habits generally remain the same for long periods of time (often years) instead of a person altering their eating habits to suit their energy needs. Many people don't take account of the fact that their basal metabolic rate gradually decreases each year. Other people may not consider changes in their diet which are needed when they move from one occupation to another. In one role, maybe they were required to be active, whereas in a new job they might not move around as much – possibly if they sit at a desk all day.

Sometimes thirst is mistaken for hunger. People should aim to drink a glass of water when they feel hungry as this may reduce the feelings of hunger. Also drinking a large glass of water before a meal normally gives a feeling of fullness earlier and helps people to eat smaller meals.

Medical Conditions and Disease

Several medical conditions can cause weight gain. Below are only a few examples for your notes:

Chronic stress: When someone lives with anxiety, stress, or grief, their body can produce chemical substances, for example, cortisol, which is a hormone which is more likely to make the body store fat, especially around the waist.

Cushing's syndrome: This happens when the adrenal glands produce too much cortisol, which leads to a build up of fat in the face, upper back, and abdomen.

Hypothyroidism: If the thyroid gland is under active, the body may not produce enough thyroid hormone to help burn stored fat. As a result, metabolism is slower the body will store more fat than it burns - especially if the person is not physically active.

Polycystic ovary syndrome (PCOS): This disease is much more common than many people realise. Symptoms are irregular menstrual bleeding, acne, excessive facial hair, thinning hair, difficulty getting pregnant, and weight gain that is not caused by excessive eating.

Metabolic Syndrome X: Also called insulin resistance or hyperinsulinemia (high insulin levels), syndrome X goes hand-in-hand with weight gain. Syndrome X is a cluster of health conditions thought to be rooted in insulin resistance. When the body is resistant to the hormone insulin, other hormones that help control metabolism don't work as well.

Depression: Many people who are depressed turn to eating to ease their emotional distress. Some women may gain weight at times in their lives when there is a shift in their hormones - at puberty, during pregnancy and at menopause.

The other side of this to consider is - can taking medication affect weight?

The answer is yes! The reasons certain medications cause weight gain can vary and are not always known.

Antipsychotic drugs, for example, may increase appetite as well as lower the metabolic rate which inevitably leads to someone becoming overweight if they are continued over a long period of time.

Beta-blockers (used for sufferers of heart conditions) are thought to lower a person's metabolic rate by about 80 calories a day and hormone replacement therapy increases the body's level of oestrogen, a fat-storing hormone. Of course there are many more examples we could discuss, however this part of the lesson is included only to give you an introduction to this idea - a concept many people tend to forget when thinking about causes for obesity.

Medications may cause weight gain in both men and women, but because women gain weight more easily than men in general, and have a harder time losing it, they may notice more added pounds than men taking the same medication.

Psychological Factors

People often experience bullying, and torment from other people as a result of their weight. It can be either direct or indirect. Sometimes people will stare, or hold a look too long, and the obese person picks up on that. So how does the social stigma attached to being fat affect people?

In work settings people who are overweight or obese are viewed as lacking self-control, lazy and even less competent than others. These attitudes held by colleagues and employers and affect the chances of promotion or pay increases. This research has gone as far to identify that an obese person who holds exactly the same qualifications as a slim person will lose out to a new job based on their weight. This kind of discrimination is very well known to exist in school environments where children experience rejection from peers and even biased attitudes from their teachers.

Sadly this discrimination does exist and add to the ongoing problem as people who suffer exclusion and loneliness are likely to turn to food for comfort. If someone is bored or lonely or feeling depressed, they may use food as a comforter. They find solace in food. Food

becomes their focal point, offering them something to look forward to and enjoy when they feel there is little else in their lives.

SET READING

Spend up to 1 hour reading over resources that you have access to, looking at anything that you can find which is relevant to the stated aim for this lesson.

These resources may include one or more of the following:

- ✓ Books in your possession
- ✓ Books you find in a library
- ✓ Brochures, plant catalogues etc.
- ✓ Web sites

ASSIGNMENT

1. In your own words, define 'obesity' and discuss what the differences can be seen in the adipose tissues of an obese person. Write 100-200 words.
2. List at least 2 factors which influence food intake and write a descriptive paragraph of about 100 words for each.
3. Consider the health risks associated with obesity – write what you know about three health risks linked to being obese. (Write 3 paragraphs)
4. Report on your set task:
 - a) Describe the person you evaluated (write between 50 and 150 words only!)
 - b) List 2 or 3 items of equipment that you believe someone who is attempting to manage weight would find a useful purchase (List the cost of each).
5. Describe 2 common body shapes and how to assess body fat composition and weight.

NUTRITION AND OBESITY

AIM

Explain the relationship between nutrition and obesity.

WHY WE NEED FOOD

Food is essential to fuel our body's and provide us with energy to carry out everyday functions in life. Food is essential as it provides the building blocks of life. By this we are talking about the chemical elements provided in food are the same chemical elements which make up the cells and tissues of your body – approximately 96%. The remaining 4% of the human body is made of minerals – mostly calcium and phosphorus.

Food is complex; it is made up of around 50 different chemical compounds which are required to nourish the human body. The nutritional values of food vary between each one.

Nutrients from food are required for healthy growth and development during childhood and for sustaining a healthy body throughout life into adulthood. These nutrients are primarily fats, proteins, carbohydrates, vitamins and minerals. A healthy diet provides us with all the nutrients we need from a variety of food sources.

UNDERSTANDING DIGESTION AND ABSORPTION

How we process food

The food we eat travels through our digestive system in order to be broken down and, thus enabling the nutrients in food to enter the blood stream and be used by the body as required.

This mechanical breakdown process starts in the mouth as a result of chewing. Saliva containing mucus, which acts as a lubricant to swallow food, and the enzyme amylase is secreted from salivary glands which are found around mouth. The enzyme amylase begins the initial stages of food breakdown – digestion.

Food then reaches the stomach as a result of muscular contractions of the oesophagus pushing it along. Glands lining the stomach secrete hydrochloric acid that dissolves food particles and a digestive enzyme which is specifically designed to break down proteins – pepsin.

The final stages of digestion and almost all of the nutrient absorption occur in the small intestine. It is here that nutrients from food are absorbed by the body into the bloodstream through the intestinal wall. The pancreas (a large gland located behind the stomach) secretes further digestive enzymes and another fluid rich in to neutralise the acid from

SOME COMMON TERMS IN NUTRITION

Recommended Dietary Intake (RDI): the average daily dietary intake level required to meet the nutrient requirements of individuals

Estimated Energy Requirement (EER): the average dietary energy intake required to maintain balance between food intake and physical activity. This also takes account of age, gender, weight and height.

Upper Intake Limit (UIL): Usual intakes above this level may place an individual at risk of adverse side effects of excessive intake.

Adequate Intake (AI): used when there is not enough information about a nutrient to determine an EER or an RDI.

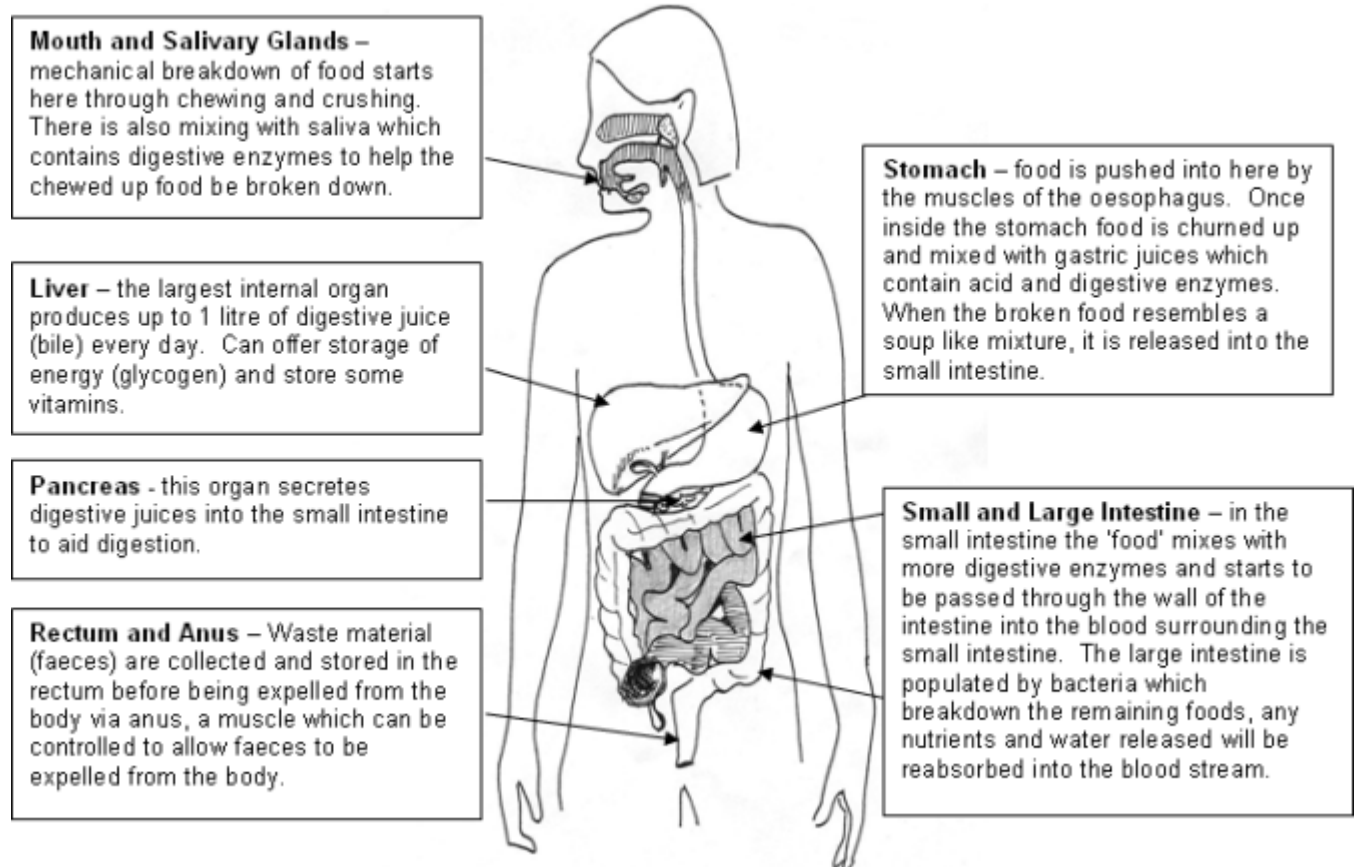
Note: these terms are commonly used in Australia, in other countries this terminology may vary slightly

stomach, into the small intestine. The liver secretes bile into the small intestine. Bile contains ions to neutralise acid from the stomach and bile salts to help break down fats.

Undigested material is passed to the large intestine, where reabsorption of salts and water (and few nutrients) take place. Finally, contractions of rectum, the last part of large intestine, expel the faeces through the anus. Faeces are expelled from the body anything between one to three days after eating the food.

See the diagram below to locate the different organs of the digestive system.

Basic Roles of Major Digestive Organs



FOOD COMPOSITION

Carbohydrates

Carbohydrates contain carbon, hydrogen and oxygen. As a cheap source of energy, they are widely consumed, and form the basis of the diet of much of the human population.

- ✓ Complex carbohydrates (long chains of sugar molecules) – take longer to be broken down by the human body, and are found in foods such as bread, rice, pasta and potatoes.
- ✓ Simple carbohydrates (short chains or single molecules) – generally known as sugars, they are broken down more quickly in the body. They are found in foods such as honey, glucose syrup, dried fruits and soft drinks.
- ✓ Dietary Fibre – this is sometimes classified as a carbohydrate, and sometimes not. Dietary fibre comes from plant cells and is important for digestion. Fibre is found in wholegrain food products such as brown rice and wholemeal bread.

Proteins

Proteins are molecular compounds containing carbon, hydrogen, oxygen and nitrogen atoms; and often also sulphur and some phosphorus. Every cell in the body is partly composed of proteins. Protein is a structural material required for growth and repair, and replacement of damaged tissues. It is also required for the process of living, for glandular secretions, enzymes and hormones. Excess protein can be broken down and converted to variety metabolic products, and can be used to contribute to energy cycles in the body. When broken down efficiently, protein typically accounts for 10-15% of energy generated in cells. Nitrogen which is not used by the body during energy production is excreted (removed) from the body as a waste product in urine. It is for the reasons outlined above, that protein is important to athletes.

Plants manufacture their own protein, but humans cannot do this. People must be provided with ready made protein either in animal or plant foods. Protein is commonly divided up into plant and animal proteins. Foods high in protein include all meats, fish, peas, beans, legumes, egg, milk and cheese.

Proteins consist of a chain of hundreds or more amino acid units – amino acids are the building blocks of protein held together by bonds. There are only approximately 20 different amino acids found in food and body proteins. By being linked together in different combinations and proportions, an almost endless variety of different proteins can be formed.

The body has limited powers of converting one amino acid into another as the need arises. There are, however 8 amino acids which cannot be manufactured by the body in sufficient quantities, and these 8 are known as "essential amino acids". They must be provided in the diet of every adult human. The essential amino acids for adults are: Isoleucine; Leucine; Lysine; Methionine; Phenylalanine; Threonine; Tryptophan; and Valine.

The amount of protein required depends on both your level of exercise and your overall weight.

Fats

Fats are also compounds of carbon, hydrogen and oxygen but they contain less oxygen than carbohydrates. Fats are solid at room temperature, whereas oils are liquid. Humans convert excess carbohydrate into fat.

Fats have various roles in the body and are vital in maintaining human health through maintaining body temperature and promoting cell function. With regards to nutrition, fats do serve as an energy source for the body. As stated above, fats converted from carbohydrates or fat molecules can be directly stored in adipose (fat) tissue can be broken down in the body to release glycerol and fatty acids. The glycerol can be converted to glucose by the liver and therefore can be used as a source of energy.

Fatty acids (one of the components of fats), depending on their molecular structure, can be termed saturated, unsaturated, mono-saturated or polyunsaturated.

Most fats contain both saturated and unsaturated fatty acids but in widely varying proportions, e.g.

Butter	60% saturated	35% unsaturated fatty acids by weight
Soft margarine	31% saturated	66% unsaturated fatty acids by weight
Cheddar Cheese	60% saturated	35% unsaturated fatty acids by weight
Olive oil	14% saturated	81% unsaturated fatty acids by weight

Lamb (average)	48% saturated	43% unsaturated fatty acids by weight
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Fats with a high percentage of unsaturated fatty acids are usually liquid at room temperature. Under controlled conditions unsaturated fatty acids can be converted to saturated fatty acids by a process known as hydrogenation. Hydrogenation is used in the manufacture of margarine, to turn liquid oil into a solid.

Fats are found in foods as visible fats, e.g. in butter, margarine, oils and the fat on meat as well as invisible fats in milk, nuts, lean meat, some fish etc.

Fibre

Fibre is essential for maintaining the health of the digestive system. Plants and plant products are the sources of fibre in the diet. There are two types of fibre – water soluble and insoluble fibre. Water soluble means the fibre can dissolve in water, whereas as insoluble means the fibre doesn't dissolve or breakdown in water. Why is this relevant?

Soluble fibre is needed to slow the breakdown of carbohydrates into simple sugars. By doing so, simple sugars are released into the blood stream more slowly and thus blood sugar levels are stabilised. Also, as this type of fibre moves through the digestive tract, it forms a thick gel-like mass on which cholesterol molecules bind. This therefore reduces the level of cholesterol entering the blood.

Insoluble fibre helps keep the digestive tract, specifically the colon, healthy by not being digested or absorbed by the body which means it moves through the colon encouraging regular bowel movements. This is important as a build up of faecal matter in the colon can lead to toxins entering the blood stream. This type of fibre also draws water in, making stools larger and easier to expel from the body.

The benefits of fibre are clear from the information outlined above; however, there is one extremely important reason why we should increase fibre consumption – cancer prevention. The bacteria which live in the colon can breakdown (digest) some fibre, by doing so they create an acidic environment inside the colon. Researchers have found that an acidic environment in the colon decreases the risk of colon (colorectal) cancer developing. This is currently a cancer which commonly leads to death.

The Need for Fluids

Every cell in the human body needs water. Water is vital for cellular functions and much more. It is needed to regulate body temperature and provide a means for nutrients to travel to cells and organs via the blood. Water also transports oxygen to cells, and removes waste from cells. In biological terms it is needed for most digestive, absorptive, circulatory and excretory functions.

There are so many different opinions stating how much water a person should drink each day. Often you may hear people say 6-8 glasses per day, but a glass is not a volumetric measure as all glasses are different sizes! Some other people recommend water intake based on the individuals weight - someone who weighs more needs more water. If we were to say what the recommended water intake should be, we suggest drinking between 2-3 litres every day. If the person is active, they should drink an additional litre for every half hour of vigorous exercise.

Water is lost from the body in many ways – perspiration (sweating), urinating, faeces and through exhalation. If someone does not drink enough water they may experience tiredness, headaches, dry eyes and mouth and experience a difficulty concentrating.

The Glycaemic Index (GI)

The Glycaemic Index (GI) represents the effect a particular food has upon the rate and increased concentration of sugar molecules in the blood, in other words, it classifies foods according to how fast they release glucose (sugar) into the bloodstream.

A high GI food, for example, a carbohydrate meal, will usually lead to a rapid rise in blood sugar levels, and usually within an hour. Apart from the carbohydrate content, the physical form of the food (small or large particles), and whether the food is raw or cooked will affect the glycaemic index. The glycaemic index of a given food may also vary between individuals.

Generally, foods high in simple carbohydrates have a high glycaemic index because they lead to a rapid rise in blood sugars. Some starchy foods also have the same properties. On the other hand, high fibre foods have a low glycaemic index. Fructose or fruit sugar actually has a low glycaemic index, and is used in sports drinks for this reason. The baseline is 100, which is the equivalent of eating pure glucose.

Foods with a high Glycaemic Index (>85)	Foods with a medium Glycaemic Index (60-85)	Foods with a low Glycaemic Index (<60)
Glucose	Banana	Fructose
Sucrose	Grapes	Apple
Honey	Orange juice	Cherries
Sugared lollies	Pasta	Kidney beans
Corn Flakes	Rice	Chick peas
Potatoes, carrots	Whole grain rye bread	Lentils
Raisins	Yams	Dates
White/whole wheat Bread	Corn	Figs
Potato Chips	Baked Beans	Ice cream
Plums, peaches	Beetroot	Milk
Sugared soft drinks or sports drinks	Shortbread	Yoghurt

CALCULATING ENERGY REQUIREMENTS

Protein, carbohydrates, fibre, vitamins and minerals, fats – how much does someone need?

Energy requirements change throughout life and are dependant on a multitude of factors. The most commonly recognised factors are age (whether or not someone is experiencing a growing phase), gender and physical activity. People's energy requirements are also affected by pregnancy and breastfeeding, illness or infection, sleeping patterns, levels of stress or hormone levels, to name a few. To work out energy requirements it is important to take account of the many potential factors affecting a person's life at that time.

Energy in food is measured in kilojoules (kJ). This measurement used to be calories, but kilojoules are the metric unit for quantifying food energy now. You may still find calories on some food packaging, but use of this should be avoided where possible. One kilojoule is equal to 0.238 kilocalories.

People need to work out their kilojoule requirements based on their weight. Firstly, it should be noted that this varies enormously from person to person depending on what conditions they are under. One measure suggests that the average person requires each day 140 kilojoules of food intake for each 1kg of weight. Using this method if you weighed 80kg you would need 11,200 kJ to maintain your existing weight.

People trying to lose weight should aim to decrease the amount of kilojoules by 15-20% each day. So they should first work out the number of kilojoules needed to maintain their weight then deduct up to 20% to give a reasonable and achievable target for daily kilojoule intake.

FOOD PYRAMID AND RECOMMENDED DAILY INTAKE (RDI)

What is the recommended intake of nutrients?

There are many different authorities around the world that publish and promote recommendations.

These recommendations can vary from one authority to the next. As new information comes to light, and our understanding of the human body grows, we find recommendations are continuously modified.

In the light of these considerations, you cannot be excessively strict in your adoption of recommendations; but you should always give serious consideration to recommendations made by enlightened and educated experts.

There are limitations of recommended daily intake population based nutrient recommendations which are outlined below. It is wise to become familiar with these to demonstrate your understanding that every individual is different and have specific needs which can't always be addressed by following population based dietary recommendations.

- ✓ Individuals have widely varying nutrient requirements - both from person-to-person and from day-to-day general dietary recommendations must, therefore, be used with caution in assessing an individual's diet.
- ✓ General dietary recommendations do not allow for illness, medications or the effects of major life stresses, smoking, and alcohol abuse.

- ✓ They do not allow for adaptation to high or low intakes of some nutrients (e.g. iron, calcium, energy) for the individual.
- ✓ They do not address the minor vitamins and trace elements (it is assumed that if the intake of the main nutrients is adequate, then the requirements for the others will automatically be covered).

POPULATION BASED NUTRIENT REQUIREMENTS

Another method of calculating daily energy requirement is to use average energy requirements for the general population. For example, the UK Department of Health has published estimated average requirements (EARs) of 1940 calories a day for women and 2550 for men. Average energy requirements can also be given by age range, gender and daily activity level. For example in Australia the estimated energy requirement (EER) for an 18 year old boy is 4000KJ per day.

In addition to providing a daily energy prescription, population based nutrient recommendations are also useful in dietary planning by helping to show the amount of different nutrients required for good health.

There are limitations of recommended daily intake population based nutrient recommendations, however, and some of these are outlined below.

It is wise to become familiar with these to demonstrate your understanding that every individual is different and have specific needs which can't always be addressed by following population based dietary recommendations.

- Individuals have widely varying nutrient requirements - both from person-to-person and from day-to-day general dietary recommendations must, therefore, be used with caution in assessing an individual's diet.
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- They do not address the minor vitamins and trace elements (it is assumed that if the intake of the main nutrients is adequate, then the requirements for the others will automatically be covered).

To help us achieve the recommended intake of nutrients pictorial guides have been developed to show the type and proportions of food the average person should eat on an average day to achieve good nutritional intake, this includes the food pyramid, originally developed in the US and the UK Eatwell plate.

The Eatwell plate divides a plate like a pie, showing the size of each 'slice' of different kinds of food. Cereals and fruits and vegetables have the largest slices while two other categories: dairy foods, and meat, fish, eggs and beans are considerably smaller and foods high in sugars and fats have a very narrow purple-edged slice. The slices have a coloured rim to make the proportions of each food on the plate easy to see.

The US food pyramid follows the same principles as the Eatwell plate.

In this instance different food groups are represented by different levels of the pyramid. The food group with the highest number of recommended daily servings (bread, cereal, and pasta group) form the base of the pyramid; the group with the lowest recommended number of servings (fats, oils, and sweets) form the apex of the pyramid. The food pyramid is used in a number of countries including Australia and New Zealand.

The United States Department of Agriculture (USDA) has recently turned their food pyramid on its side. It now shows a child walking up the stairs of the pyramid as a way to incorporate exercise into the nutritional eating habits of children. The pyramid also incorporates a new colour scheme.

Released in April 2005, the new Dietary Guidelines from the USDA continues to reflect the tense interplay of science and the powerful food industry.

Several of the new recommendations represent important steps in the right direction:

- ✓ The new guidelines emphasize the importance of controlling weight, which was not adequately addressed in previous versions. And they continue to stress the importance of physical activity.
- ✓ The recommendation on dietary fats makes a clear break from the past, when all fats were considered bad. The guidelines now emphasize that intake of trans-fats should be as low as possible and that saturated fat should be limited. There is no longer an artificially low cap on fat intake. The latest advice recommends getting between 20% and 35% of daily calories from fats and recognises the potential health benefits of monounsaturated and polyunsaturated fats.
- ✓ Shows the importance of fibre as opposed to simple sugars, urging an increase in wholegrain and limiting sugary sweets.

These changes which have been implemented have come about because research showed that American children and children in other countries have had a drastic increase in weight since the food pyramid had started decades ago. Also, the food pyramid was a one size fits all and now has altered itself to include gender differences, age differences, as well as taking into account the amount of physical activity that the person exercises. The food pyramid is broken down into groups of foods. The basics of the food guide pyramid for servings are as follows:

- ✓ Fats, oils and sweets group - Limit servings
- ✓ Milk group - 2 servings
- ✓ Meat group - 2 servings
- ✓ Vegetable group - 3 servings
- ✓ Fruit group - 2 servings
- ✓ Grain group - 6 servings

As well as being a guideline for sources and groups the Food Pyramid and Eat well plate both convey the most important elements of a healthy diet:

- ✓ Proportion - simply by the shape of the food pyramid at a glance would indicate that fruits, vegetables and grains should make up a majority of a diet.
- ✓ Moderation - meat and dairy products, in moderate amounts, contribute to a healthy diet. The tip of the pyramid consists of fats, which is not omitted from healthy eating but is by far the smallest section on the food pyramid.
- ✓ Variety - choosing different foods from each food group every day will likely guarantee someone is consuming a greater variety of foods needed to maintain a healthy diet.

CHILDHOOD OBESITY

Increasingly, obesity is being documented in children, and even toddlers. This is unusual because of the natural propensity of toddlers and young children to be active and inquisitive. Most young children love to run, jump, move and play. However television, and with older children computer games are replacing physical activity as a favoured past time for children. This may be due to busy, stressed parents who have neither the time nor energy to play outdoors with their children, because parents are concerned for the safety of their children, and feel unable to supervise outdoor activities sufficiently, preferring children are indoors instead.

Lack of physical activity is not the only cause of childhood obesity. Diet is a very important factor. The availability of calorie dense, nutrient poor food, the often cheaper prices of such foods over fresh whole grains, organic products and quality meat cuts, marketing of junk food to children, and the reliance of fast-foods and take outs all contribute to the increasing prevalence of overweight and obesity in children. The problem has become so bad, that in some places that the percentage of overweight/obese children has more than doubled in as little as 10 or 15 years.

Other factors to consider include genetics, depression and family habits and cultural food preferences. Genetics is not usually a key factor in childhood obesity. It is true that in some families, there is a tendency to obesity, and children in such settings may be at increased risk of becoming obese, but with the exception of a handful of genetic diseases, genes are generally not the cause of obesity. Depression is an increasing problem in children and adolescents and can trigger comfort eating and dependence on food which in turns leads to weight gain. This is a vicious cycle where the increasing weight worsens self-image and self-worth, leading to increasing depression and a greater reliance on comfort foods.

Childhood obesity is complex in its causes, and yet, most can be approached simply and effectively to bring weight back within healthy limits or to ensure weight never increases to unhealthy levels in the first place. Simply increasing physical activity (60 minutes a day for children), removing calorie dense, nutrient poor foods from the diet, and maintaining good quantities of grains, fruits and vegetables along with quality lean meat and dairy can keep children at healthy weights, and also ensure good muscle strength, bone density and cardiovascular fitness. In the case of toddlers and very young children, excess weight may not be a major cause for concern. As activity levels increase and they experience growth spurts most toddlers, assuming they have a good diet and get plenty of opportunity to play will grow into their weight.

Obesity dramatically reduces a person's quality of life. For children it can leave them feeling isolated from their peers, prevent them participating in games and activities, make them the target of bullying and leave them susceptible to depression, anxiety and other mental health problems. They are often sick due to poor immune function, take longer to recovery from injury and to feel exhausted and suffer problems with concentration and behaviour. Greater awareness of the severity of medical conditions in obese children, and the impact obesity has on their physical and psychological well-being is important in combating childhood obesity and making those dealing with children more aware and responsible.

Obese children are at much higher risk of:

- Type II diabetes which in turn increases risk of micro vascular problems, fat accumulation on organs, and early development of atherosclerotic plaques (inflammation of the walls blood vessels arteries) and so on.
- Early entry into puberty which puts further stress on the child's body, which must now make additional hormones, provide not only energy but a full range of nutrients to fuel growth and maturation, and in girls increases iron requirements.
- Sleep apnoea (snoring). Children are often left tired and lethargic during the day and experience episodes of low blood oxygenation when their breathing is temporarily obstructed. They often perform at below their best at school, suffer headaches, may show behavioural problems and can often require surgery to remove the tonsils. Surgery is more risky in obese people.

- Cardiomyopathy and irregular heart beat/palpitations. In obese children, the heart has to work much harder to pump blood effectively. Cardiomyopathy is a disease of the heart muscle that has several causes; one being the stress on the heart in obese people. Cardiomyopathy increases the risk of heart attack and arrhythmia (irregular heart beat). Nutrient deficiencies and toxicities can also affect heart function, particularly, high sodium intake and low potassium, magnesium and calcium intake.
- Nutrient deficiency or toxicity symptoms leads to chronic illness due to poor immune system, skin conditions such as dermatitis and eczema, lethargy, diarrhoea, constipation, poor hair and nail condition and so on.

SET READING

Spend up to 1 hour reading over resources that you have access to, looking at anything that you can find which is relevant to the stated aim for this lesson. These resources may include one or more of the following:

- Books in your possession
- Books you find in a library
- Brochures, plant catalogues etc.
- Web sites

ASSIGNMENT

1. Outline your understanding as to why we need food. This should only be a paragraph, but should still be informative and demonstrate your understanding.
2. Describe the process of digestion in the human body. Use any available resources to help you to formulate your answer. Write no more than half a page.
3. What foods do you or people you know commonly eat, that could be contributing in a negative way toward weight control? List six such foods and for each one, suggest a substitute that would be a better choice and have less impact upon weight gain, while still providing nutritional requirements the body needs.
4. From your set task, where you identified popular foods, list the carbohydrate, protein and fat contents of at least 3 foods and rank them in order of which is the least healthy, stating why.
5. How many kilojoules should someone who weighs 105 kg and is 170 cm in height consume every day in order to lose weight? (Assuming they are otherwise generally fit and healthy).

Lesson 3

DIETS

AIM

To develop an understanding of a range of weight reducing diets and to evaluate how 'healthy' different diets are in terms of nutrient balance and consider how practical the diets are to follow

DIETS – FADS AND FACTS

The twentieth century saw an explosion of weight reducing diets, each claiming to help us to lose weight and feel healthier. Some of these diets have been followed by celebrities and have received a large amount of publicity on television and in the popular press. Before advocating a particular dietary plan it is important to know whether it will enable sensible weight loss over a sustained period of time and whether this weight loss can be maintained.

Unfortunately there are many fad diets that have poor compliance and often promote 'Yo Yo' dieting – a situation where the dieter goes on many different diets and each time regains any weight they have lost. 'Yo Yo' dieting is a particular concern because the situation puts additional strain on the heart and makes successive attempts at losing weight more difficult. 'Yo Yo' dieters also tend to regain more weight than they have lost previously. Meanwhile following restrictive faddy diets carries a potential risk of developing nutritional deficiencies.

Choosing the best dietary plan is important at any stage in life but in childhood a well balanced diet is particularly crucial. Some weight reducing diets can deprive the body of essential nutrients while following starvation or extreme dieting during childhood and adolescence can cause life long problems with weight control

In the following section we shall briefly examine some of the more popular dietary plans, as you read through the notes you may like to consider how healthy each plan is in terms of nutrient balance and the practicalities of long term adherence.

A REVIEW OF POPULAR APPROACHES TO WEIGHT LOSS AND CONTROL

Vegetarian diets

There is research to show that vegetarians are less likely to be overweight than non vegetarians. This is due to the fact that, on average, vegetarians consume less fat and fewer calories than non vegetarians. It is important to realise that switching to a vegetarian diet does not, however, guarantee weight loss. Vegetarian diets must be planned to ensure they have good balance of nutrients. For example, it is important that vegetarians eat a range of protein sources to ensure they obtain all the essential amino acids needed for health. Vitamin B12 may also be lacking if eggs and dairy foods are avoided, in this case a vitamin B12 supplement will be required.

Starvation

This is the most severe form of dieting and involves a severe reduction in energy vitamin and nutrient intake. Prolonged starvation can cause permanent organ damage and eventual death. Starvation for shorter periods also causes problems. When the body goes into

starvation mode, metabolism slows down in an effort to conserve energy, and thus calories are burned at a much slower rate.

Very Low Calorie and Liquid Diets

These usually provide between 400 and 600kcal/day in the form of liquid shakes. The benefit of these diets is that they offer rapid weight loss for those with a lot of weight to lose - over 19 Kg. Side effects include diarrhoea and weight loss. Low calorie liquid diets are also generally low in dietary fibre and can be lacking in essential nutrients. In addition, Studies have also shown that weight loss achieved while following a low calorie liquid diet plan is rarely sustained, many dieters regain as much as 75% of weight lost, within 3 years. Due to the low calorie content, these liquid diets are unsafe unless medically prescribed and supervised and are not suitable for children.

Commercial Low Calorie Meal Substitutes

Meal substitutes offer a calorie controlled nutritionally complete plan. The benefit of these plans is that they are easy to follow and remove 'decision anxiety' over what to eat. These diets are useful for people who don't prepare meals. Potential problems include taste fatigue and problems with long term adherence to the diet.

Commercial Pre-Prepared Meals

There are a wide range of pre-prepared meals available in supermarkets and health food stores. Some of these meals are healthy choices providing a balance of protein, carbohydrate, fat and fibre. The advantage of these meals is that they offer preset portions and nutritional information including calories and fat is readily available on the package label. On the downside, pre prepared meals can be expensive and as with low calorie meal substitutes, they do not teach habits for long term weight control. Some pre prepared meals also have a high salt content which can potentially raise blood pressure

Blood type diet

This diet claims blood type determines what foods you should eat e.g. people with blood type 'O' should follow a high protein low carbohydrate diet to clear the blood of lectins, sugar binding proteins, which cause ill health. Some foods are avoided according depending on your blood type. The weight loss plans provide approximately 4200kJ (1000 kcal) per day and supplements are recommended to ensure the diet is nutritionally adequate. The main drawback to this diet is that there are no controlled trials or evidence to support claims that lectins and health and weight control are linked. Excluding food groups also causes potential nutrient deficiencies.

Food combining

The basis for this diet is that protein and carbohydrates are not mixed at the same meal. Advocates of the diet claim that mixing foods causes poor digestion and slows down metabolism. On the plus side, followers of this diet have shown weight loss that is comparable with healthy eating plans. The food combining diet also allows you to eat a variety of foods so that overall, you will receive all the macronutrients (carbohydrates, fats, protein) and vitamins and minerals needed for good health. On the downside, scientists believe that any success from this diet is due to a reduction in calories rather than the food combining element itself. There is no scientific evidence to support the theory behind food combining diets that we are unable to digest protein at the same time as carbohydrate. Also many foods that we think belong into the protein or carbohydrate category actually fall into both e.g. bread and pulses.

Detox diets

Generally permit fruit, vegetables, herbs, pulses, nuts, seeds, wheat free grains and cereals, oils and water. These diets claim to make us feel healthier with weight loss being an added benefit. These diets may be nutritionally inadequate which is of concern if the diet is followed for long or frequent periods. Weight loss is often promoted however there is no evidence to suggest that weight loss is due to anything other than reduced calorie intake.

Low carbohydrate diets

Examples include Atkins, Protein Power and Carb Addicts. Short term effects include rapid initial weight loss, mostly associated with loss of body fluids, headaches, lethargy, loss of appetite (helpful for weight loss) Constipation. In the long term loss of body fat may be achieved although many studies indicate that weight loss results from an involuntary reduction in daily calorie intake rather than a consequence of the carbohydrate restriction itself. When considering the use of this diet with children it is important to realise that the diet involves virtually cutting out an entire food group.

Carbohydrates provide the body with the fuel it needs for physical activity and for proper organ function. Carbohydrate-rich foods are also rich sources of vitamins (particularly B-vitamins and folate), minerals (including Iron and Zinc), as well as fibre and phytochemicals (other natural components of food found to be beneficial for health). At present it is also unclear re the effects of following low carbohydrate diets in the longer term and we must await the results of long term studies into the effect of these diets on heart, bone and bowel health.

Low Glycaemic index diet (low GI)

Rather than cutting out carbohydrates, there is better evidence to support the benefit of modifying the type of carbohydrates in our diet by following a low GI diet. The basis of this diet is that some carbohydrate foods such as white bread, sugary drinks, and pastries are rapidly digested causing a rapid but short lived rise in your blood sugar level. This leaves you lacking in energy and feeling hungry after a relatively short period of time. Thus people who regularly choose high GI foods are more likely to snack between meals and are more susceptible to overeating and weight gain and may contribute to weight gain, interfere with weight loss and increase our risk of developing diabetes and heart disease.

Against this, foods with low GI value slowly release sugar into the blood, providing you with a steady supply of energy, leaving you feeling satisfied longer so that you're less likely to snack. Foods with a low GI value include apples, porridge, whole meal spaghetti and chick peas. One drawback to the GI diet is that the GI tables can prove confusing and it is hard to identify the GI value of a meal. Some foods with a low GI value are also high in fat and/or salt and contain few nutrients for example, chocolate and crisps, have a low GI value but are high in fat and contain few vitamins and minerals. It is therefore important that advice to follow a low GI diet is supported with low fat dietary guidelines.

Sweeteners

Many foods with a high GI have added sugars e.g. boiled sweets, fizzy drinks and sugar coated cereals. Sugar also provides 'empty calories' i.e. calories but no other nutrients. Our intake of added sugars can also add up to quite a few calories in one day e.g. 1 heaped teaspoon of sugar has around 25 calories. This may not seem much but someone who has 6 cups of tea a day with 2 teaspoons of sugar in each cup, would be having 300kcal / day

from added sugar alone. In this instance switching to a calorie free artificial sweetener would be a useful way of reducing calorie intake while still allowing a sweet taste.

Due to the calories saved, artificial sweeteners can be helpful for weight loss and dieting. There are problems, however, firstly, sweeteners are much sweeter than sugar e.g. Saccharin is 300 times sweeter than sugar and Acesulfame-K is 200 times sweeter than sugar. As such sweeteners can increase our taste for sweet things. Some more recent research also indicates that users of artificial sweeteners tend to gain weight not lose it. It is believed this is because artificial sweeteners may slow down digestion and increase appetite.

Low fat diets

Limiting high fat foods in our diets has been shown to be very helpful in achieving sustainable weight loss. The basis of this diet is that high fat foods have the most calories - 9 calories per gram compared to 4 calories per gram for carbohydrates. Limiting fat intake will therefore reduce calorie consumption and aid weight loss. Limiting your fat intake is also important for your long term cardiovascular health. Low fat diets also help steer you towards a balanced diet of unprocessed foods and high nutritional value. Following a low fat diet also allows you to have a varied diet including lean meats and low fat dairy products. The only downsides to this diet is that there is a possibility that people who cut down on fats may substitute fatty foods with low fat equivalents that may be high in sugars and hence calories. It is also possible to cut down on fats too far and possibly cause vitamin and mineral deficiencies

Fat substitutes

For example Olestra, Simplesse and Avicell can also be helpful in reducing fat and calorie intake and therefore, helpful in weight loss diets. Fat substitutes are compounds based on carbohydrates, protein or fats and are used in variety of foods to replace fats. It is possible to buy a variety of foods that are usually high in fat that contain a fat substitute e.g. biscuits, ice-cream, cheese, sweets and margarine. Although fat substitutes may have a role to play in weight reducing diets, it is important that they are not consumed excessively. Products containing fat substitutes still contain calories and fat and for this reason must still be eaten in moderation. There are also concerns about the effect fat substitutes may have. For instance, olestra is known to cause stomach cramping and there is also concern re reductions in the absorption of fat soluble vitamins A, D, E, and K.

Fat burning diets

A fat burning diets is one like the 'cabbage soup diet' or 'grapefruit diet. Advocates of these plans claim that certain foods have fat burning properties and in this respect eating large quantities of these foods can help with weight loss. Unfortunately the benefit of these diets has not been supported by large scale research. No foods are capable of 'burning fats' and where people lose weight following these plans, it is because they are following a very low calorie diet. In the long term these diets become unpalatable and relying on one food group also makes them nutritionally deficient.

Supplements

There are a range of supplements available that are claimed to help us to lose weight. Examples include Conjugated Linoleic Acid (claimed to stimulate fat breakdown), Hydroxycitrate (a fruit extract claimed to inhibit our metabolism of fats) Chitosan (claimed to reduce fat absorption) and green tea (claimed to increase metabolic rate). Unfortunately, the research behind these products can be limited and where trials exist they have usually been

done on animals rather than human beings. As a result it is not advisable to recommend products until more independent research has highlighted a benefit.

Summary

So far in this lesson we have looked at a range of different diets. We have seen, how some 'fad diets' may be nutritionally inadequate or have other limitations. When designing a successful weight loss plan we must therefore, ensure that this plan is nutritionally balanced and varied and encourages weight maintenance through a life long change in eating habits. The healthiest type of diet plan includes foods from all the food groups. It is also helpful to make suggestions that are based on what people are already eating. Working from a diet diary will assist you in this respect, as you will be able to tailor healthy eating advice to an individual's existing meal patterns and food choices. We will examine meal planning in greater detail in subsequent lessons.

GUIDELINES FOR CHILDHOOD WEIGHT LOSS

It is crucial for children who are obese to lose weight. In extreme cases, they will not tolerate exercise for very long, and dietary intervention will be one of the first steps in treatment. An obese body requires a lot more calories each day than a lean body (if activity levels are the same). Any changes made must be gradual. Children will respond poorly to sudden, dramatic changes in their diet, and may feel they are being punished. Family support is important and changes made to the child's diet should be made to all the family's diet. Gradually reducing junk foods while introducing, trialling and experimenting with whole grains (to satisfy appetite and prevent hunger re-appearing rapidly as it does when sugary foods are eaten), fresh fruits and vegetables and legumes are the best approach.

Fresh fruit and vegetables are important to help build levels of vitamins and minerals that the child will most likely be quite deficient in. Salt should not be added to cooking or at the table as most obese children will be consuming far too much sodium, which is found in high levels in processed meats, snack foods and just about all pre-packaged items. High sodium levels increase the risk of hypertension, cardiac problems and accelerate development of atherosclerosis.

As with diet, changes in exercise patterns and levels should be made gradually. Putting an obese child on a treadmill and insisting they run can lead to fainting or irregular heart beat, joint damage or in severe cases even a heart attack. Start with walking – walk to school or home again, walk the family dog (or get one to walk from a neighbour or friend), park further away from shops or other destinations and walk. Spend time outdoors, kick a ball, throw a Frisbee, walk along the beach or do gentle walking trails. Swimming is also a good exercise, as the water helps support the body weight and takes the stress off joints. Walking in water is an excellent resistance exercise.

As fitness improves, try bike riding, longer or faster paced walks, slightly higher intensity games and sports and continue to increase intensity and duration in line with the child's improving cardiovascular fitness and reduced weight. Try to keep exercise fun, try to avoid arguments and having to force the child to exercise. If they aren't interested, try something else. Try to combine with activities they already enjoy. Again, don't single children out, have the whole family participate. Find a sporting team or a class (yoga, karate, dancing etc), that the child can join with friends and so on.

It is important to avoid crash dieting and don't set goal weights. Teasing children, mocking or belittling them for their size and inability to perform activities or for cravings or secret snacking is not appropriate and will serve only to alienate the child and make them feel even

worse than they likely already do. Parents, friends and care-givers need to be supportive. Young children don't instinctively over-eat, choose poor quality foods and lie on the couch all day. Obesity in young children is not their fault but a product of poor nutrition, role-models and availability of foods, lack of knowledge of nutrition, depression and many other factors.

To encourage continued improved diet look for improvements in the child's overall health, physical and psychological condition. Comment on improvement in school work, condition of hair and skin, increased mood and energy levels, as well as their weight loss. Help them to notice the positive changes occurring because of their dedication to dietary change and increased activity. Remind them of how far they have come (from puffing after walking a block to riding comfortably to and from school for example). When children feel better, look better (in terms of their physical condition) are aware of their improvements and feel those around them appreciate the efforts they are making they are more likely to lose weight healthily and to develop long term healthy habits that will see them remain at a healthy weight long term. When children slip, or go backwards, don't focus on it, but rather, focus on encouraging them to keep trying.

When dealing with parents of obese children it is important to remain non-judgemental and to assume they have good intentions and desire to help assist their child to lose weight, while improving the family's nutritional habits and activity levels. It is important firstly to inform parents about nutrition and the nutritional requirements of children, to provide information in a friendly and understandable way and to suggest changes to diet and lifestyle that seem easy for the family to make. If parents feel overwhelmed are burdened by guilt or feel changes are going to be too hard to make they can feel helpless and will be less able to help their children. Parents need support and encouragement (but not appear patronising) to make changes.

Nutritionists need to be tactful and compassionate and focus on the future and the changes that need to be made, rather than past mistakes, misunderstandings or misconceptions. Issues such as time management will need to be addressed as so many families have sedentary lifestyles rely on take out foods and packaged foods because they can't seem to find time to prepare meals from scratch or attend exercise classes etc. Creativity can be needed to find ways to incorporate changes into family life.

SET READING

Spend between 1 and 2 hours reading over resources that you have access to, looking at anything that you can find which is relevant to diets or dieting.

These resources may include one or more of the following:

- ✓ Books in your possession
- ✓ Books you find in a library
- ✓ Brochures, plant catalogues etc.
- ✓ Web sites

ASSIGNMENT

1. What are the dangers of turning “vegetarian” purely to loose weight?
2. Under what circumstances, if any, would each of the following diets be appropriate or inappropriate?
3. Fill in the following boxes stating either examples of where it could be appropriate and inappropriate; or if never: write “never”.

Approach to Weight Control	When it is Appropriate	When it is Inappropriate
Crash Diet		
Low Carbohydrate Diet		
Grapefruit diet		
High Protein Diet		
Commercial Low Calorie Meal Substitutes		

4. Report back on the two diets investigated for your set task, commenting on positive and negative aspects of each.

PREVENTING OBESITY

AIM

Determine appropriate actions to manage eating habits in individuals and in demographic groups for prevention of obesity.

Introduction

In the last lesson we looked at various diets to help to treat obesity. While the treatment of obesity is of clear importance, it is also essential to look at the causes of obesity and develop strategies to prevent it happening in the first place. Targeting the behaviours that lead children to become overweight can be helpful in preventing childhood obesity. These include unhealthy eating habits and a lack of physical activity and exercise.

In this lesson we shall consider which aspects of our biology and behaviour are linked with an increased risk of becoming overweight and obese. We will then discuss some tips to assist with weight management. In the second part of this lesson we will then consider how these tips can be incorporated into weight management programs before discussing the potential impact of these programs.

Tips, both to prevent obesity include:

- 1) Portion control, Portion control is the cornerstone of weight management as you can eat all the right foods but if you are eating too much, this will eventually lead to weight gain.
- 2) Reducing snacking. It is important to establish daily meal and snack times rather than allow children to graze on snacks during the day. Where snacks are provided healthy options should be encouraged e.g. fruit and vegetables, low fat yoghurt, cereals
- 3) Encourage physical activity, Successful health promotion help support healthy lifestyles for all children at home, in school, and in the community
- 4) Encourage healthy food choices- prevention of obesity requires children and adults to choose to follow a healthy balanced diet and see high fat and high sugar snacks as 'treats' to have in moderation.
- 5) Identify those who are likely to become overweight - this will involve early identification of people at most risk and the development of effective intervention strategies.
- 6) Help your metabolism work for you.

Basal Metabolic Rate

To work out their energy requirements, people must firstly work out their own basal metabolic rate. The basal metabolic rate (BMR) is the percentage of calories ingested which are used solely for cellular functioning, heart rate and breathing rate. Generally speaking, healthy people of a normal weight and are active, in line with national averages, use approximately 65% of their calorific intake on maintaining body functions.

Due to increased muscle mass, men normally tend to have a higher BMR than women – muscle cells require more energy to function than other cells e.g. fat cells. Also, older people generally have a lower BMR than young people.

The table below shows if someone does not follow a normal and healthy eating pattern of three main meals per day, their BMR can be affected – decreased. From this evidence we can conclude by eating frequenting (and small meals), grazing, not bingeing, blood glucose levels stay steady and this maintains a higher metabolic rate. If you don't eat for long periods of time, the body stores food it takes in as fat as it is fooled into the idea the body is under famine conditions. In summary, the BMR should remain higher (normal) and blood sugar levels should remain steady by eating small meals often.

	Meal Pattern	BMR
	No breakfast; no lunch; yes to dinner	Decrease BMR by 5.9 %
	No breakfast; yes to lunch and dinner	Decrease BMR by 4.9%
	Small breakfast; yes to lunch and dinner	Decrease BMR by 2.4%
	Yes to breakfast, lunch and dinner (evenly)	No decrease in BMR

Metabolism – Keeping the Metabolic Rate Stable

The word metabolism doesn't refer to the speed in which we use energy; it is the way in which the body uses available energy sources. So rather than talking about 'faster' or 'slower' metabolism – metabolism should be referred to as efficient or inefficient, functional or dysfunctional. There are 3 basic key points to know about in order to understand metabolism and energy expenditure:

1. Basal metabolic rate – this is the percentage of calories ingested which are used solely for cell functioning. You use approximately 65% of your calorific intake on maintaining your body functions.
2. Thermic effect of food – you use 10% of your calorie intake for maintaining the body at the correct temperature. You may have heard of extreme weight loss ideas in which people submerge themselves in ice cold baths in order to 'burn' calories (to maintain body temperature), thus by doing so they experience weight loss. This is definitely not recommended or recognised as safe practice, but is seen only as an example of how people will try extreme methods in the weight loss battle.
3. Physical activity – approximately 25% of calories ingested are expended on muscle contractions and movement.

In order to lose weight, a person needs to reduce their calorific intake and increase their basal metabolic rate.

Tips to increase metabolic rate:

- ✓ To increase the basal metabolic rate, you need to increase muscle mass. Muscle cells are up to eight times more metabolically active than fat cells. In other words, muscle cells require up to eight times more energy to function than fat cells due to the nature of their role and so they burn more calories than fat does. A person can increase muscle mass by weight-training or resistance exercising.

- ✓ To increase the thermic effect of food, you need to focus on changing your diet to eat more high quality protein rather than carbohydrates or fats. However, you should note that complex carbohydrates burn more calories than simple carbohydrates. The difference between complex and simple carbohydrates can be described as a long chain of sugar molecules and a short chain of sugar molecules respectively. The long chain molecule, the complex carbohydrate e.g. high-fibre cereals and vegetables – require more energy to be broken down and therefore more calories are burned to break them down. The process of the breakdown of the sugar molecules releases heat energy thus increases the thermic effect of food.
- ✓ Avoid dehydration, as it can contribute to an inefficient metabolism, by affecting body temperature. If someone is dehydrated, their body temperature drops slightly, and causes your body to store fat as a way to help raise or maintain the temperature. So the advice is drink approximately 2-3 litres of water per day and an additional litre for every 30 minutes of strenuous exercise so avoid this metabolic pitfall.
- ✓ Increase exercise. By increasing physical activity and aerobic exercises, it is thought that someone's resting metabolism is increased as muscles need to repair and recover and energy is needed in order to do so.

The increase in energy expenditure due to regular moderate exercise does not appear to be accompanied by a compensatory increase in appetite and energy intake. The biochemistry of the obese diabetic is also improved by regimes including regular physical activity.

Making the best food choices

Healthy eating, snack foods and food portion sizes:

Fast food and Junk Food: No nutrition course would be complete without mentioning the growing indulgence in food that does not have much nutritional content – most fast food and junk food. Unfortunately in today's world children are exposed not only to advertising selling soft drinks, candy, and other nutritional devoid foods, but also advertising for foods that are deep fried and full of saturated fats. Regrettably, youngsters are exposed to virtually thousands of junk food television commercials each year and parents and caregivers might as well accept the fact that occasionally their children are going to head for a fast food restaurant.

Much of this food has little or no nutritional value but is desired by the children because of advertising and social influences. Most of the foods served in fast food restaurants have fat as their main source of calories. Even milk shakes are often made with highly saturated coconut oil. In addition, their foods are usually low in iron, fibre, and vitamins, and extremely high in sodium as well as being filled with additives, flavourings, and preservatives. It can be the best policy to have moderation in allowing fast and junk foods and when possible to educate the child on the lack of health benefits.

NUTRITIONAL EDUCATION

Nutritional education can focus on people of any age. While the link between being overweight as a child and becoming overweight or obese as an adult, has resulted in many recent education programs targeting their work at children and their families. Here we shall examine the nutritional education of children and young people in greater detail.

Infants and babies are primarily a captive audience solely reliant on parents and caregivers for their nutrition so when targeting this age group, nutritional education must focus primarily

on parents and care givers. School age children and especially adolescents are a different story. From this age children become susceptible to peer pressure and advertising, as well as tending to go through a phase of rebellion against parents. Parents are one (and often not a very popular one) source of information and guidance. Further, as teenagers begin to take on part time jobs, they have a disposable income, which means they are no longer relying on their parents to pay for their food. Coupled with their increasing independence, parents begin to lose control and influence over food choices. This is why it is so important to establish healthy eating habits and patterns early in life. It is difficult trying to convert an adolescent from a lifelong poor diet to a healthy diet.

Like a lot of early behaviours, children learn how to eat, what to eat, when to eat and how much to eat. They learn what is safe to eat and not, what is palatable and not based on their immediate surroundings – the family home. Culture, family habits, role-models, available and supplied foods, family etiquette around food all influence what children learn to be acceptable ways of eating. This is challenged when they enter kindergarten or school and are surrounded by peers who likely have different cultural norms regarding food, different food supplied to them and different habits about eating that have developed through their interactions and observations of their family and care-givers. In some situations, children may find they are the odd one out in terms of eating habits, and without strong role-models at home, or a good basic understanding of foods and nutrition, they may start to re-learn new, less appropriate eating habits and preferences that challenge those parents have worked to establish during their first years.

Parents may combat this by ensuring they provide fun, educational activities to develop children's understanding of nutrition and food choices. Cooking together, talking, telling stories with positive nutritional morals or principles, going shopping together etc can all involve children and help them feel empowered and knowledgeable about food and their bodies. Parents may also seek out kindergartens and schools that supply a standard healthy lunch for all students, or who offer for sale only healthy lunch and snack options and drinks. In some countries, including Australia, governments are bringing in legislation to regulate the sale of junk food in school canteens and some private kindergartens and schools may set restrictions on foods allowed into the school to try and encourage healthy lunch boxes.

Teaching Healthy Eating Habits to Children

- Give children activities and fun, interactive learning experiences that promote positive nutritional habits and attitudes toward foods.
- Educate children about the need for healthy foods to help them grow and develop and have the energy to enjoy physical activities (games, sports etc)
- Set a good example. Don't single children out, when family habits are not good, everyone should make a change, not just the children
- Try to surround children with other role-models and sources of good nutritional information by selecting care-givers, kindergartens and schools that actively promote and encourage healthy eating and/or who have staff educated in childhood nutrition.
- Promote good nutrition with the care-givers and family members your child associates with. Provide them with information and be frank about what you do and don't want your child to be fed when you are not around.
- Listen to children and try to make healthy eating and healthy meals that they enjoy. Consider colour, presentation, smell and taste of dishes, and take children's (healthy)

preferences into account. If they like a particular vegetable, try to include it, or use it more often than less preferred vegetables.

- Try not to use food as a reward or to comfort a child.

Health Initiatives Targeting Obesity

We have previously looked at factors linked to the prevention of obesity. In this section we will look at examples of programs aimed at reducing obesity rates and consider their possible impact.

The first point to note is that the prevention and management of childhood obesity requires the co-ordination of a wide ranging health initiatives and government policy measures to improve health and physical activity. These measures must also target people across the entire lifespan from pregnant women to early years to schools, families and communities. Initiatives have for example, focused on encouraging and supporting healthy eating and physical activity, particularly in schools; targeting antenatal nutrition; media campaigns; and treating those children who have become overweight or obese.

Frequently, health initiatives are linked to government legislation; this may provide them with additional funding and may also help them reach a wider target audience. Some examples of UK government backed health initiatives are shown below:

- Infant feeding – In this the Department of Health has developed a policy to increase breast feeding among disadvantaged groups. Recent research links breastfeeding to a reduced risk of childhood obesity.
- Compulsory nutrition standards for school lunches were reintroduced in England and Wales in 2001. Another school based policy is the National school fruit scheme (NSFS), which entitles all 4-6 year olds to a free piece of fruit each day.
- The National Child Measurement Program is a key part of the Government's work to tackle obesity. The program aims to record the height and weight of all children in Reception Year and Year 6. This data will help local health care providers plan services to support schools and target resources more effectively; it also provides vital data to analyse trends at national and local levels.

Public Health Information

The best hope for the prevention of obesity is through expanded, free and readily available health information and community based education programs which are available for all.

The pattern for obesity is often set during a child's infant years. In the past, new mothers were led to believe 'a fat baby is a healthy baby'. Whilst, it is true babies need a high intake of nutrients, it is wrong to believe over feeding children from a young age could ever possibly encourage healthy eating patterns in later years – through childhood and into adulthood.

Education of new mothers and fathers in terms of health and weight control for their children is paramount in preventing obesity in future.

In the meantime, national public health strategies which emphasise prevention are needed and should be brought into focus and made more prevalent. It is general practitioners,

functioning at the individual level, who need to advise and treat their patients who are overweight or obese. Less than half of obese adults in the USA report being advised to lose weight by health care professionals, let alone helped to do so.

Public health information *is* available from doctors and general practitioners. It is available on local and national government websites and from their offices for those people who do not have internet access. It can be accessed on request.

Legislative controls

What we have seen in the past is that politicians' focus on health and obesity related legislation is often not completely implemented within the short timeframes which exist within a parliamentary cycle.

Nothing can really be done until the health professionals, including the medical profession, engage politicians and media opinion leaders to create a climate that will force politicians to respond to public opinion. Targeting the protection of children's health, presenting clear analyses of the financial cost of political inertia, and highlighting the need to resist short-term commercial interests is the way to engage high-level politicians.

The prevention of obesity requires coordinated policy and legislative changes, with greater attention given to transportation infrastructure and workplace opportunities for education and exercise. Governments should commit to optimising opportunities for exercise. A politically driven, coordinated approach in health, finance, education, sports and agriculture can contribute to reversing the underlying causes of the obesity epidemic.

Suggested regulatory measures to prevent obesity include:

- Ban all marketing of food to children, including television advertisements
- Establish strict food and physical activity requirements for schools
- Remove junk food and drinks from all publicly funded premises e.g. hospitals
- Require clear food labelling on all foods and drinks
- Adjust policies which control the prices of foods and drinks in favour of fruit and vegetables
- Encourage use of bicycling routes and footpaths for pedestrians and cyclists

SET READING

Spend up to 1 hour reading over resources that you have access to, looking at anything that you can find related to an obesity management.

These resources may include one or more of the following:

- ✓ Books in your possession
- ✓ Books you find in a library
- ✓ Health booklets/ posters/advertising campaigns
- ✓ Web sites

SET TASK

Investigate policies followed by two different organisations in your community which are geared to helping people control obesity.

These might (for example) be:

- a) Public education through PR by a government or semi government body
- b) Food policy at a school, College, University, Sporting Club or some other organisation
- c) Hospital / primary care initiatives- this may be activities carried out at your local health centre or doctors surgery.

Spend 1-2 hours undertaking this task

ASSIGNMENT 4

1. Write a policy for food management in a school – a letter/leaflet to be sent to parents that states what foods children are permitted to or prohibited from bringing to school....what can & cannot be sold at the school canteen etc.
2. Write a policy for diet management for a sporting club
3. How can diet be managed in a retirement home/village, to help older people maintain healthy weight management (voluntarily and/or through regulatory means)
4. Discuss the ways in which government legislation can impact upon obesity control, and consider the effectiveness of such measures (Write half a page only)

Lesson 5

TREATING OBESITY

AIM

To determine appropriate treatments for treatment of obesity

METHODS WHICH WORK

There are essential components in the treatment of obesity which may be somewhat obvious. Essentially people need to modify their behaviour and eating patterns, restrict or reduce the amount of kilojoules ingested, initiate an exercise program and undergo a process of education to ensure developed knowledge of obesity, how to keep the excess weight off and not forget about the severe associated health risks. Treating obesity is complex and requires the knowledge and skills of trained professionals to see individuals through what can be a challenging time in their life.

Assessment of Clients or Patients

It is important each patient or client is assessed in terms of their emotional stability and medical and dietary history. This is important as some client's may have self-motivation or, alternatively, they may require additional support can be identified from the outset of the treatment. Psychological assessment should be assessed as extreme weight loss during a program designed to treat obesity can be mentally draining and many people need coping strategies implemented to succeed.

Modifying Behaviour

Anything which has been learned can be changed or worked on for future change. Initially all clients or patients should be asked to keep a food diary of food intake and patterns. Only once this has been done can specific problem areas be identified and strategies implemented to overcome them.

Often nutritionists or dieticians will suggest behavioural approaches to weight control – for example:

- ✓ Eating at specific times and places
- ✓ Eating more slowly
- ✓ Omitting other activities normally associated with food (e.g. watching TV)
- ✓ Using small plates and altering portion size

Prescribing Diets

The main treatment for obesity must be prescribing a calorie restricted diet. As outlined in previous lessons here are many diets available. The best diets are those which bring about a steady loss of excess weight and help to establish good eating habits. Diets must be palatable and must be able to fit into the current framework of family food habits. Diets must also not require extra time or additional expense. There are some basic considerations when prescribing the right diet:

- ✓ Energy – a diet which provides the 15-20% daily reduction in kilo-joule intake leads to a gradual and healthy loss of weight. This avoids severe hunger; nervous exhaustion and weakness which is commonly found to be linked with severe weight loss regimes.

- ✓ Protein – it is suggested that during a weight loss program protein intake should be increased to approximately 1.5 g per Kg of body weight per day. Protein is known to improve the feeling of fullness throughout the diet.
- ✓ Fat and carbohydrate – many diets will drastically cut both fat and carbohydrate intake to encourage the body to use its fat stores/reserves as a source of energy instead thus increasing weight loss.
One kilogram of body fat equates to approximately 32000 kilojoules. So if you have a kilojoule deficit of 4500 (meaning that you burn 4500 kilojoules more than you eat each day) you would lose almost one kilogram per week: $4500 \times 7 = 31,500 \text{ kJ}$ (31.5 MJ). Clients used to working out weight loss in stones and pounds and energy intake in terms of kilocalories (kcal). It may be explained that 1lb of fat is equal to a 3500 kcal.
- ✓ Minerals and Vitamins – if the diet is extremely limited in terms of kilojoule intake, multivitamin, iron salts and calcium should be recommended. Increased vitamin and mineral intake should be a priority when prescribing diets for obese children.

Life Coach and Personal Trainer

The second most important way of treating obesity (other than changing diet) is definitely increasing or starting a thorough exercise routine. A personal trainer is simply someone who helps people exercise properly to ensure the desired outcome is achieved. Many personal trainers work through local fitness centres, personal training studios and health clubs. Others may work as a private company and are available for sessions in a client's home, or serve as instructors for fitness classes.

Trainers are generally needed to demonstrate various exercises and help clients improve their exercise techniques. Due to the interpersonal contact between a trainer and a client versus a general gym setting, a trainer is more readily able to provide motivation and support to an individual in an exercise program, in addition to proper technical instruction. A trainer may keep records of their clients' exercise sessions to help monitor progress, and may also advise their clients on how to modify their lifestyle outside of the gym to improve their fitness. Many people who have struggled to stick to fitness regimes in the past find personal trainers extremely helpful.

Dietary counselling offers motivation and psychological support. Weight loss success is dependant on effective self-motivation and suitable knowledge. Motivation can come from the individual's own drive to lose weight, but often a nutritionist or dietician or life coach can help to initiate the motivation. They can provide encouragement and guidance. A counsellor will work with the individual to help them gain insight into the reasons behind their desire for food and look closely at the causes for obesity. This can prove to be a difficult experience for many people attending a counsellor as they are forced to consider past events or experiences which may have attributed to their weight gain indirectly through comfort eating, for example.

Weight Loss Hypnosis

This is a technique used by some people who often feel they have exhausted other avenues, other than weight loss surgery possibly. Hypnosis may be a powerful tool for weight loss as it has the potential to help build new healthy habits. Hypnosis helps create and modify behaviour at a subconscious level. The process of hypnosis can be a natural, safe and convenient way for behaviour modification.

People can go to a hypnotist in person for treatment or can purchase audio CD systems to help them lose weight. Audio systems guide people into a peaceful and enjoyable relaxation while delivering suggestions to your subconscious mind for:

- ✓ Healthier eating habits
- ✓ Smaller portions
- ✓ Stopping when full
- ✓ Eliminate unhealthy foods
- ✓ Improve confidence and self esteem
- ✓ Motivation for physical activity

Self-help Groups

Self-help often takes place on the basis of self-reliance or of support groups where people in similar situations join together. Groups associated with health conditions and obesity may consist of patients and/or their carers, as well as physicians, other health professionals, dieticians or nutritionist and even psychologists.

As well as featuring long-time members sharing experiences, support groups can become an opportunity to offer educational knowledge or the sharing of research findings relating to obesity. Those who help themselves by learning about obesity and health problems exemplify self-help, while one might better regard help in this context as peer-to-peer support.

Some people find group support guided weight loss very helpful. A self-help group can be held at a place where the obese person attends in person, or a person can join online groups and discussion forums to seek support. These are often a valuable aid in helping the individual to continue a weight-loss reduction program. Group sessions are effective because people can compare their progress, share ideas or problems and exchange their views.

Research has shown weight loss is greater in people who only need to lose a small amount of weight. Weight loss at the time of attending the support group can be good; however there is no evidence that weight loss is maintained once the person leaves the support group.

Health Clubs, Health Farms and Holiday Retreats

Health farms or retreats are a great place to overhaul your lifestyle in a healthy environment. They can be of huge benefit for people who would like to rest, detoxify their system, lose weight, de-stress and improve their overall lifestyle. The benefit is that everyone staying there have the same goals, so it can be a very motivating experience.

Different resorts offer different packages but most have naturopaths, dieticians and health and fitness consultants. Many also offer workshops on different topics which will teach people how to get motivated, lose weight and stay healthy. Generally health farms or retreats are a relaxing environment with gentle yoga or stretching classes, a swimming pool which can be used at the guests' leisure, and a social atmosphere which encourages interaction with others. They can be expensive to stay in and don't appeal to the needs and likes of everyone.



Another approach to weight loss is for a person to attend a more extreme type of environment – like a weight loss boot camp. This type of retreat is focussed on increasing fitness, body detoxification and the implementation of life long changes in behaviours.

Programs at a fitness/weight loss boot camp may include some of the following:

- Group and/or individual exercise activities every day - mostly twice each day (gymnasium use for strength training or cardiovascular exercises routines)
- Health and nutrition educational events
- Health and fitness assessment
- Designed exercise plan for you to take home created by a personal trainer who knows your background
- Massage, physiotherapy or body wraps to stimulate detoxification under the skin
- Daily walks or cycling with other guests
- Internal cleansing (colonic therapy) or detoxification to kick-start the liver and digestion system
- Cooking lessons
- Encouraged use of sauna, steam room and swimming pools
- Optional life coaching sessions or counselling (could be charged for in addition to the set program of events)

Some of the programs can be intensive. This should create quickly visible results and encourage someone to continue on their mission to lose weight after they return home.

A Holistic Approach

There are many people who claim that by loving the body as it is; being content and happy within oneself; getting plenty of rest and making time for relaxation; and by following a normal healthy eating pattern, people can be slim and strong without really trying to be.

The holistic approach to treating obesity takes the whole person into account. By that we mean their physical needs, emotional state, mental strains and spiritual needs. Researchers into this area have found, when obese people are asked to discuss 'why they eat or over eat', hunger is often found to be one of the last points mentioned if at all.

A holistic approach to treating obesity and controlling weight is outlined briefly below:

- People should love themselves regardless of their weight or body issues – when people feel good they treat themselves well
- People should try to connect with their bodies desires – this means the body can communicate to us what it needs through illness for example. People should aim to learn what the body needs and eat accordingly. Over time, this will result in a natural weight loss.
- People should only eat when they are hungry and stop before they are full – the human body is very clever. When the body needs fuel from food it tells us i.e. we feel hungry! Eat in response to your body's needs and stop before you are full. If people stop before they feel uncomfortable and full, this is when they body can carry out its optimum digestion and again they body will naturally move towards an ideal weight as a result.
- People should learn the reasons why they eat – the journey to achieving an ideal weight is also a journey of self-discovery. People can view this as a time to learn about themselves. What triggers them? What needs are they satisfying when they turn to food? How else can they achieve satisfaction in their life without food?
- People should aim to eradicate self-judgement – don't get caught up in goals and targets, this too often leads to failure. Welcome self-discovery and learning during the weight loss program and don't allow negative judgements of yourself, this will only lead to negative emotions and a feeling of depression or even failure.

- ✓ People should not assess success only based on weight loss seen on scales – this only focuses on the negative too often. People should aim to focus on how good they are feeling, seeing visible results and take motivation from when others comment on weight loss or how they are looking.
- ✓ People should eat what they want – it is an old saying that we always want what we can't have. If intake of pleasurable and enjoyed foods is limited or removed then this encourages binge eating. The body learns that no foods are off limits and so people naturally gravitate towards eating what the body craves.

SET READING

Spend up to 1 hour reading over resources that you have access to, looking at anything that you can find which is relevant to the stated aim for this lesson.

These resources may include one or more of the following:

- ✓ Books in your possession
- ✓ Books you find in a library
- ✓ Brochures, plant catalogues etc.
- ✓ Web sites

ASSIGNMENT 5

1. If you had to lose a large amount of weight, what would be the best way to motivate you? Why? (Write 100-200 words)
2. Report on the set task.

Do not give the name of the person (for confidentiality reasons).
Describe the person and their issues.
Present your assessment of the situation
Describe the possible actions you considered, and the reaction you received when discussing each with the person.
What action would you recommend this person takes?
3. Suggest why it is important for a nutritionist to regularly check information on diet and nutritional guidelines. Write one or two paragraphs.
4. Choose one of the suggested ways which may be implemented to treat obesity. List the advantages and disadvantages of your chosen treatment method.

MODIFYING EATING BEHAVIOUR

AIM

To compare different techniques for modifying eating behaviour in order to control obesity

BEHAVIOUR CHANGES

Before someone can think about modifying their eating behaviour, they must evaluate their current eating habits and lifestyle. In order to create new habits, promoting an active and healthy lifestyle, someone must follow some key stages in changing their normal behaviour patterns.

To follow through with long lasting changes, someone must first ask a series of questions – Why am I doing this? Will I experience a significant improvement in health? What is going to help me be successful? Can I deal with failure? Who can I rely on to support me? Can I maintain these changes in the long term?

Key Stages in Behaviour Changes

The first stage is really when someone recognises a problem and confirms within their own mind that a change has to be made. The next part of this stage is the real contemplation of change. At this time someone may do research trying to find answers to the questions mentioned in the previous paragraph, for example, will my health improve by doing this? This stage may also go as far as the person deciding what kinds of things they might change e.g. replacing sweet snacks with fresh fruit.

The second stage is about the preparation of action. If, like suggested above, someone will change their snacking habits – they will first need to consider how they shop for food. They will need to change their shopping habits before they can change their eating habits. They must think about the times of day when they eat and thus buy appropriate foods for each time. It helps someone at this stage to look at different dietary plans and recipes to get ideas about new or replacement foods which they can introduce into their diet.

The third stage is when the changes are being initiated. This is the time plans are put into action. Lots of small changes are easier to undertake than radical big changes. The key is to start small and be motivated by the changes seen in the body. These changes will then encourage the person to undertake larger changes or even just continue to form and stabilise new habits. It's also about considering other changes during this phase. Such as, if someone enjoys a meal out in the evening, they should compensate for a possible load of extra kilojoules by participating in a form of exercise at some point during the day before the meal.

The only potential problem with this is some people may be inclined to eat more or will order a less healthy option as they feel they deserve the reward for undertaking in the exercise! It really comes down to shifting thoughts and attitudes as well as patterns and habits.

The fourth and final stage is all about maintaining new habits. This stage is about ensuring all the effort put into changing eating habits thus far, can and do continue. During this stage people are likely to lapse back into old habits – this is only ok if that lapse is brief and can be overcome again. During this stage people should look to others for support and motivation by talking to others about what they have already achieved and by sharing their

accomplishments they are less likely to go back to old ways – there are too many people holding expectations of them so they will not want to have to explain how or why they were then unsuccessful in seeing it through.

Cultural food patterns

The food patterns for a given group of people are established as a result of their origin and the availability of foods in their area or country in which they live. Many factors affect food culture – extensive advertising, promotions and marketing of foods and food producers; advances in agricultural processes and food technology; communication and easy transportation of goods and products globally; improved education and increased social pressure to adopt healthy lifestyles.

Dietary counsellors and nutritionists must recognise food habits can vary dramatically even within one cultural group. Counsellors must avoid making judgments when working with people whose food related culture is much different from their own. They must understand and appreciate the concerns of others and be able to make reliable and informed suggestions based on their knowledge of the culture from which the person belongs.

HOW TO MAKE LIFELONG CHANGES

Often people who are overweight and obese have tried and failed dieting many times. They need to recognise that in order to lose weight and live a healthier, more active and more fulfilling life, they need to make life long changes to their diet and lifestyle. They need to look into the reasons why have they have become overweight in the first place and deal with each of those issues in order to move on and make real changes. This is a long process which takes both time and consistent effort. There are stages in making lifelong lasting changes, it is not something someone can just decide on a do – when people try changing within planning, assessing and receiving support – they fail. This then effects their motivation to try again and they often fall into a cycle where failure becomes normal and they lose hope for change.



The next part of this lesson outlines the 3 main clearly identified areas which, if followed, can lead to positive change. This includes suggestions for people who *really* want to make lasting changes which will help them lose excess weight and live as they desire.

1. Assess Current Diet (patterns and nutritional value)

At this point people need to take time to assess their current diet. This stage should really take place over a matter of weeks. The most useful suggestion which has been utilised and proven to be effective in the past, is for people to write a food journal. This sounds like a fairly basic concept, write down everything they eat in a day to fully become aware what is eaten and how much. It is also a good idea to write down times of eating.

We suggest this is taken to a higher level to deepen understanding of people's needs and desire for food. In the journal, people should include comments about the way they were feeling each day. For example, sometimes when we feel low, we may seek sugary or fattening foods as a comforter (chocolate or ice-cream). This is normal and often subconscious in most people. During menstruation, desires may alter, during times of high

activity or stress you may not eat much or turn to take-out meals as time is unavailable for cooking. Often people are able to stress patterns emerge which relate diet and appetite to mood and emotion.

Once someone has written down their current food intake, they should compare the foods they eat to the main nutritional guidelines. They should assess which areas they are doing well in and which areas they are lacking.

Another very useful thing to do at this stage is look back over recent months, and years if possible, to try to establish if food patterns and habits have changed at all over a long period of time or have they always been the same. There is a social factor to consider here. Often, people are influenced by those around them. Someone may work in an environment where other people bring in sweet snacks to share for example, when working in that office, did the person's weight change – were they influenced by other people's habits? Alternatively consider a medical factor, were there ever times of illness or injury which resulted in changes in food patterns? A food journal should be a true and honest look back at old and current food habits which should allow the person to learn more why food plays the role it does in their life.

2. Plan for Change

No lasting change will ever take place without careful and worthwhile planning. Stage one (the assessment stage) helps in the planning by preparing someone's way of thinking about food in the first place. Based on their assessment of their diet – goals and objectives can now be set along with a plan on how to achieve their goals. People should write down the goals. It wouldn't be recommended for someone to write down the end goal. Goals should be in small steps, almost like a week by week goal. Pick one food group at a time and try to make gradual changes to that over the first few weeks. Additionally, they could write down their target weight loss for the week. An interesting suggestion is for a person to write down the amount of weight they wish to lose in a week and not their target weight at the end of the week. By doing this it allows the person to focus on the positive i.e. the weight they have lost! Someone may be encouraged by their weight loss, rather than standing on scales and still seeing an enormous way to go.

Meal planning is a very useful technique to help someone actually achieve their goal. Planning involves looking ahead at meals for one week at a time. They may buy 'healthy' choice recipe books or find recipes online for free for new ideas of healthy and tasty meals. Often people wrongly think that when they are dieting food may be bland, but this is not true. By planning meals this helps with the task of grocery shopping too, which undoubtedly is another major part of getting the change right. If someone has demonstrated they lack will-power, they should simply avoid aisles in the supermarket which contain food products which may tempt them. For some this task may be enormous. For others they will follow this suggestion and avoid putting themselves in a situation which they may find difficult.

It is not a recommended idea to completely remove previous pleasures from food – food should still be enjoyed and seen as pleasurable. Otherwise, if food becomes something which cannot be enjoyed, views surrounding food become or remain negative, where what the person is trying to achieve overall is an understanding of the nutritional value of food, and seeing food as something which can be enjoyed healthily – it should not be linked with negativity.

The stage of planning is ongoing. After some time, there should be a period of evaluation of the overall progress being made. Goals should be assessed to find out if they are achievable or should they become more challenging? Has the person been consistent or if

there have been times of failure working how why that happened and how can it be prevented from happening again? Only through evaluation can ongoing change take place.

3. Seek Motivation and Support from Others

Most people will find the process of losing weight extremely difficult and even emotionally draining. Some people feel like they are in a constant battle with themselves; battling against their inner desires and changing old habits requires vast amounts of effort – continuously! People are often only successful when they are supported by others.

To be able to talk with someone who is experiencing similar thoughts and feelings at the same time or has done in the past, is often a great help, as sharing stories and experiences let's the person know they are not alone in their battle with their weight. This can be done in a group setting which the person attends. This could also be online support and discussion groups (chat rooms etc). There are some excellent websites set up for the sole purpose of helping people who are on a weight loss challenge. This is a time of great difficulty for many people and there are support services available which allow people to tell their stories, share their experiences, discuss their challenges and even find answers to questions if they are unsure of anything. Some people may be motivated by hearing other people's stories of success.

People who are trying to lose weight will have different motivation behind their decision to make the change. Motivation can be something offered by people who care about the individual or it can be something the person develops within themselves. By creating an analogy of what it is like to carry excess weight, people can take on a different perspective of being overweight, say a more health conscious idea, and thus become encouraged. For example, if someone carried 4 bags of potatoes or a 20kg bag of cement around with them everywhere they went, they would start to realise how much strain is placed on the body as a result of being overweight and this may become a motivational factor. Motivation should be personal but can be actively sought from others – most definitely someone trustworthy and compassionate. It should be clear that psychological support from peers and family during the changing process is hugely important.

Possibly most importantly, dietary counselling will educate people about the change they are making and what is the value of making such changes – the health benefits. Dietary counsellors have thorough knowledge of food science, nutritional information and food preparation principles. A counsellor will use their ability to draw out information from their client to help them develop an understanding of what influences their food choices and behaviour. Counsellors use their knowledge of food and their knowledge of the individual to help them arrive at necessary decisions which encourage change. People should be encouraged by being reminded that any change is better than no change at all.

IMPROVING HEALTH THROUGH FOOD



The next part of this lesson focuses on preventing obesity related health problems by following diet plans and making positive food choices. Healthy eating can help to treat obesity related problems. Below is a brief definition of each health risk and suggestions which can be made to help sufferers of these diseases or illnesses make changes to improve their health. There are too many digestive disorders linked to obesity to discuss here. You are expected to find out more about these disorders and the suggested treatment during your personal study of the lesson topics.

Diseases Linked to Obesity

- ✓ *Cardiovascular disease* – this is any disease which affects the heart or associated blood vessels (veins and arteries). Excessive amounts of cholesterol in the blood is a major contributing factor to cardiovascular disease, therefore the first priority of anyone suffering from this should be to lower their cholesterol level. To do this someone should decrease the amount of saturated fats in their diet and increase poly- and mono-saturated fats which can help to lower blood cholesterol levels. This person would also benefit from reducing sodium (salt) in their diet and should look to increase their consumption of potassium, calcium and fibre rich foods.
- ✓ *Respiratory Disorders* – this is any disorder or disease which affects the lungs or airways thus affecting how much air passes into the blood. An example linked to obesity and being overweight is sleep apnoea, which is when breathing is interrupted by the tissues and muscles of the throat relaxing thus blocking the normal flow of air to the lungs. The best way to treat this condition is to lose weight by following an achievable weight loss plan – don't snack late at night, use fresh fruit or vegetables as a snack during the day, be aware of portion size – are all suggestions to help the person achieve their weight loss target. The sufferer should also avoid alcohol and smoking too.
- ✓ *Digestive Disorders* – this is any disorder of the digestive tract (from mouth to anus) and the associated organs. Common digestive disorders include diarrhoea, constipation, indigestion, peptic ulcers, Crohn's disease, Coeliac disease, gall stones, irritable bowel syndrome (IBS) and gastro-oesophageal reflux disease (GORD). Someone who is obese is very likely to suffer from GORD – when acidic stomach juices are regurgitated into the oesophagus and leading to indigestion. The main causes of GORD are poor strength of the oesophageal sphincter (the ring of muscle at the end of the oesophagus at the opening of the stomach) and increased pressure on the stomach as a result of being obese. In this condition, it is important for the sufferer to follow a low-fat eating plan as high fat meals tends to decrease sphincter pressure, thus opening the sphincter and exposing the oesophagus to stomach juices.
- ✓ *Urinary Disorders* – this is any disorder which affects the kidneys, bladder, and associated vessels, ureters and urethra, the 'tubes' which link the kidneys to the bladder and the bladder to the site of excretion from the body. There are no clear direct links between obesity and Urinary disorders; however, kidney failure is often linked with diabetes or high blood pressure and these are linked closely with obesity. Urinary incontinence becomes a common and often distressing problem for obese people. Difficulty with bladder control often leads to depression and an unwillingness to be active (or far from a toilet), thus causing a cycle of events possibly leading to further eating – remember depression was a reason people turn to food in the first place.
- ✓ *Bone and Joint Disorders* – this is any disorder affecting bones and joints either leaving them weak, less dense and brittle, or making joints inflamed and sore. Common bone and joint disorders include osteoporosis, osteomalacia and rickets and arthritic conditions. Osteoarthritis (OA) is commonly linked to obesity. This is a non-age related degenerative disease – degeneration of the joints, specifically cartilage which covers the ends of bones (within joints) and causes the bones to rubs together when moving. Generally this leads to swelling, stiffness and pain. Obese people experience this normally in their knee and hip joints as a result of the pressure upon them.

- *Diabetes* – this is a condition which affects how the body uses carbohydrates for energy resulting in abnormally high blood sugar levels. Blood sugar levels are normally controlled by the hormone insulin which is produced by the pancreas. There are 2 main types of Diabetes. Type 1 Diabetes is an autoimmune disease and tends to present in younger people, while Type 2 diabetes is associated with older age, obesity, family history of diabetes, previous history of gestational diabetes, physical inactivity, and ethnicity. About 80 percent of people with type 2 diabetes are overweight. Serious long-term complications of diabetes include cardiovascular disease, chronic kidney failure, eye damage, nerve damage, and damage to blood capillaries, which may cause erectile dysfunction in men and poor wound healing. Poor healing of wounds, particularly of the feet, can lead to gangrene, and possibly to amputation in extreme cases. Being obese increases the risk of developing diabetes as the body cannot make enough insulin to keep blood sugar levels normal. Losing weight can improve insulin resistance and help to correct and maintain blood sugar levels.

- *Cancer* – this is a group of diseases characterised by the uncontrolled growth and spread of abnormal cells throughout the body. Cancer risk is influenced by external and internal factors, e.g. tobacco smoke or genetics. Someone's physical state (age, weight, diet) all influence the likelihood of developing cancer. Scientific evidence, from Australian based research; shows approximately one-fifth of deaths from cancer are associated with poor nutrition and/or physical inactivity – leading to obesity. The research which was carried out on 900, 000 people, men and women, shows that if the person had a BMI greater than 40 i.e. they were classed as obese/morbidly obese, there was an increase of at least 52% in the death rate being caused by cancer. Sensible food choices and good nutrition are central to avoiding or preventing cancer – the advice is not new. Cut down on fatty foods to avoid the risk of increasing weight and obesity and instead reach for fruit and vegetables. These are beneficial as they contain phytochemicals (plant derived chemical compounds) which have been proved to fight cancer. For example, some phytochemicals protect DNA from damage and promotes repair of damaged DNA (damaged DNA leads to abnormal cells and cell division). The World Cancer Research Fund has estimated nearly 20% of cancers can be prevented by eating at least 5 portions of fruit and vegetables every day.

Changing Unhealthy Habits

This lesson is about modifying eating behaviour, and should have explained that by doing so overall health is inevitably improved. So the message of the kinds of things obese and overweight people need to do in order to lose weight is hopefully clear. We could suggest a huge list of foods to avoid and foods to consume to control weight, lose weight, alter weight... but modifying eating behaviour is not simply about modifying what we eat, people must think about and modify *how they eat*.

Suggestions for improved eating behaviours:

- ✓ Don't eat on the run, eat meals sitting at a table and if possible with other people, to encourage eating to be pleasurable and avoid digestive problems.
- ✓ Eat small meals more often to avoid binging when hungry and to encourage only eating until feeling full. This will stabilise blood sugar levels. The longer someone goes without a meal the more blood sugar levels drop, as blood sugar levels drop, people experience sweet cravings.
- ✓ Alter daily eating patterns to ensure the largest meal of the day is breakfast. In the morning the body has possibly not consumed any food for 12 hours, therefore at this time people are likely to feel most hungry and have the highest need for energy. It's a good suggestion to eat when feeling hungry!
- ✓ Eat less fast food by making time for food preparation and cooking. If still eating out, choose healthier options from alternative restaurants.
- ✓ Don't eat after 6pm in the evening if possible. Blood gathers in the digestive organs and sleep quality is reduced as a result.
- ✓ Don't snack in front of the TV. Drink water instead.
- ✓ Don't cut out all food pleasures, this will only create a desire for things that are no longer available.

SET READING

Spend up to 1 hour reading over resources that you have access to, looking at anything that you can find which is relevant to the stated aim for this lesson. These resources may include one or more of the following:

- ✓ Books in your possession
- ✓ Books you find in a library
- ✓ Brochures, plant catalogues etc.
- ✓ Web sites

ASSIGNMENT

1. List the key stages you see as necessary when someone is modifying their eating behaviour. Briefly describe these stages in no more than half a page (total).
2. Research dietary counselling services in your area – this kind of service may only be available at your local health centre – and write about the service(s). What can someone expect to gain from such a service? How much does it cost? Do people need a referral from a health professional to attend a dietary counsellor? Does a dietary counsellor perform the same role as a nutritionist?
Write about your findings as a short report on the services available. State whether or not you think the service(s) available is of use.

Report on your set task. Discuss your findings from your investigation into the relationships between food, weight and one of the following conditions. You may want to start by writing about the relationship between food and the condition or disease and then expand your report by writing how that particular condition leads to increase in weight in the first place. Write no more than one page.

- ✓ Cardiovascular disease
- ✓ Respiratory Disorders
- ✓ Digestive Disorders
- ✓ Urinary Disorders
- ✓ Bone and Joint Disorders
- ✓ Diabetes
- ✓ Cancer

Lesson 7

RESTRICTING CALORIE INTAKE

AIM

To analyse the calorie intake of an individual and recommend changes in order to manage obesity.

UNDERSTANDING ENERGY AND METABOLISM

Calorie restriction or a calorie restricting diet is a dietary regimen thought to improve health and slow the aging process in some animals and fungi by limiting dietary energy intake below the average needs. Calorie restriction diets must not only reduce the calorific intake but increase vitamins, minerals and other essential nutrients.

Evidence supporting this dates as far back as 1935, when Cornell scientist Clive McCay unexpectedly discovered that rats on a calorie-restricted diet lived nearly 30% longer than those on "normal" diets. According to a Cornell press release, scientists have been testing the impact of a calorie-restricted diet on everything from mice and spiders, to dogs and primates.

Professor Mark Mattson, Chief of Neurosciences at the National Aging Institute in Maryland, U.S.A has claimed;

"There seem to be two mechanisms by which a restricted-calorie diet increases life span... There is a lot of evidence to support the benefits of a restricted-calorie diet in rats and mice and other species," says Mattson. "And we can assume that because calorie restriction is important in mice and rats, it's probably important in humans as well, because rats and mice have the same physiology as humans -- they get diabetes and cancers and many of their causes of death are the same as humans."

This evidence emphasises that by consuming a low calorie diet, we can expect to live longer and be generally healthier as a result, and possibly even prevent or avoid many of the obesity related diseases.

Metabolism

Metabolism can be defined as all the chemical reactions which take place in cells in order to maintain life. Metabolism can be divided into 2 clear categories:

1. Catabolism – when organic matter is broken down into its component parts for energy production e.g. cellular respiration
2. Anabolism – when energy is used in synthesis of materials or to construct components of cells.

The speed of metabolism, the metabolic rate, also influences how much food an organism will require.

In nutrition, metabolism is used in a broad sense to include all the processes nutrients from food undergo, including digestion, absorption and cellular processes.

Resting metabolism is another term to become familiar with. It refers to energy expenditure at rest under normal conditions.

Energy Metabolism

Energy is the capacity to do work. All energy available to humans comes from the plant and animal material they eat. Carbohydrates, fats and proteins are energy-yielding substances consumed by most people on a daily basis. When foods supply more energy than is required by the body, the excess is stored as fat and the result is weight gain. This store of energy is available for use in the body at times when a fresh supply, a new energy intake, is reduced and there are too few kilojoules being consumed to maintain the body's activities.

In an earlier lesson, you were introduced to the basal metabolic rate or BMR. This is the amount of energy required to carry on the involuntary work of the body is known as the basal metabolic rate. It includes all the functional activities of the various organs such as the heart, liver, kidneys, lungs, brain, glands, and muscular movements of the digestive system, cellular activity in resting tissues and the maintenance of temperature. The average BMR has been calculated as 4.2 kJ per kg per hour for men and 3.8 kJ per kg per hour for women.

Certain factors influence the basal metabolic rate:

- ✓ Body size and shape – 15% of heat loss occurs from the skin. As heat loss is proportional to the skin surface, the basal heat production is directly proportional to the surface area. In other words, a tall thin person has a greater skin surface area than someone of the same weight but less height, therefore a tall thin person will have a higher basal metabolic rate.
- ✓ Gender – women have a metabolic rate of approximately 10% lower than men. It is thought that women of generally have less muscle mass than men and therefore have less metabolically active tissue i.e. women generally have more adipose tissue than men. In addition, the different sex hormones in males and females may account for some of the difference.
- ✓ Age – per unit of body surface area, the BMR is undoubtedly highest during the first two years of life. It gradually decreases during childhood and adolescence. The rapid growth rate explains the high metabolic rate in childhood. In later life, the reduction in muscle mass accounts for the lower metabolic rate. We will look into age related metabolism in greater detail more later in this lesson.
- ✓ Activity of the endocrine glands – the thyroid gland regulates the rate of energy metabolism and this is reflected in the in the BMR. If the thyroid gland is overactive (hyperthyroidism) the BMR can be raised by between 70-100%. If the gland's activity is decreased (hypothyroidism), then metabolism may be reduced by 30-40%.
- ✓ Stress - hormones are released during times of stress and anxiety which can cause a rapid increase in energy expenditure. When a person is said to be "on edge" or nervous they are in a state of high alert, different chemicals circulate the blood vessels and communicate to cells to break down energy stores ready to provide a greater supply of energy. Other hormones secreted from endocrine glands e.g. the pancreas also affect energy metabolism.
- ✓ Amount of sleep – during sleep the metabolic rate is approximately 10% lower than during the waking hours. This can be variable depending on the soundness of the sleep or movement of the individual during sleep.
- ✓ Body temperature – an increase or decrease in body temperature affects BMR. It is quite simple, if the body is too cold, more energy must be used to maintain temperature, and if the body temperature is elevated above 37°C the body must work to bring it back to normal, thus also increasing energy expenditure and raising the BMR (sometimes by as much 13%)

- ✓ State of nutrition – fasting or prolonged under-nourishment leads to a drop in the basal metabolic rate. In some cases the decrease is proportional to the loss in weight, however it can also be attributed to a loss in muscle mass

Age (Growth and Aging) and Metabolism

It is thought changes in metabolism are a direct response to changes in body mass over time.

During infancy, childhood and adolescence, humans undertake periods of rapid growth. Their metabolism alters (only slightly) in line with the requirements of energy of their cells to divide during this growth. The building of new tissue during growth phases requires significant amounts of protein in the diet. If fed a balanced diet and participation in exercise is regular, children and adolescents generally will not increase their weight to obese levels. As you have already learned, when eating patterns are unhealthy children gain weight leading to an increase in the number of fat cells found in their adipose tissues.

Young adulthood requires a slight change in diet as the metabolism begins to slow down. This starts to happen from aged 30 in most people. It is a completely natural and unavoidable process. It is estimated the rate at which the body burns food for energy decreases by around 2-4% each decade.

This means during this stage of life, as the body uses less energy, excess energy will be stored as fat – that is if the intake of food remains the same during this time. It is during these years that many people begin to put on weight until they become so overweight their BMI classifies them as obese.

Once someone has become heavier, they naturally become less energetic. Not participating in exercise only exacerbates the problem. By this stage, people have become at risk of serious health problems associated with obesity – heart disease and diabetes.

This cycle of events can become extremely difficult to break. As the human body would be acquiring more fat cells over time further metabolism changes take place in response to that. It is suggested that metabolism changes are a direct response to changes in body composition. As people age, they tend to lose muscle and gain fat. Since muscle burns a lot of energy, our energy needs diminish as we lose muscle, and our metabolism slows.

But most of this metabolic slowdown is our own doing – the major cause of loss of muscle mass is inactivity. The more inactive we become with age, the less lean muscle we have. The less lean muscle we have, the more inactive we become. Over the years, the two feed on each other, and our metabolism plummets.

Old age related changes in appetite are associated with delayed gastric emptying and altered hormonal and neurotransmitter regulation of food intake. Protein-energy malnutrition can in turn, contribute to immune deficiencies, anaemia, cognitive deficits, osteopenia, altered drug metabolism, and sarcopenia (excess loss of muscle mass).

Activity and Metabolism

Secondary to the BMR, physical activity requires the next highest energy expenditure by the body. Vigorous exercise or work conditions means that people have higher energy requirements than those who have sedentary jobs or lifestyles.

As outlined in the earlier part of the lesson, exercise is essential in maintaining or increasing metabolism. A good tip here is to work out the calories being burned during different exercises. Whilst any exercise will burn calories, having some knowledge of just how many

calories can be burned during exercise can be motivating. There are many online resources available which detail information relating to exercise, creating calorie deficits and advice on different types of training programs.

Calorie Restricted Diets

One of primary problem facing our populations today is obesity. Its prevention though requires a balance of energy intake and energy output. Such prevention must begin early in life when good habits are formed.

When people diet, it is difficult for them to ensure the required nutrients are included at the recommended levels in their new eating regime. It is often more appropriate to increase exercise than decrease energy intake.

Also in this first instance when people are attempting to reduce their calorific intake, they should first aim to increase the quality of the foods they are eating. Once a diet consists primarily of nutrient-dense, calorie-sparse foods, a person can safely and slowly begin to reduce their total calorie intake.

Many people will lose weight simply by changing their diet to include less high calorie foods. This process should be undertaken slowly. The reason for this may surprise many people; human body's store pesticides and toxins in fat tissues. If fat is lost too quickly, all the stored toxins are flushed into your bloodstream and the detoxification organs such as the liver and kidneys are unable to remove them effectively. People can then suffer from an increase in toxins in the blood. The recommended transition time from one diet to another i.e. from calorie rich to nutrient rich, is 6-9 months minimum. Changing a diet should be more like changing a lifestyle and can take 1-2 years to implement fully and form new healthy habits.

The key to this kind of diet regime is to replace calorie-dense foods with calorie-sparse foods which are nutrient dense. During this kind of diet, obese people are likely to see the highest percentage weight loss.

Outlined below are some healthy tips for following a restricted calorie diet.

- ✓ Reduce your intake of simple carbohydrates as they contain very little nutrition for their calorie content. They are also absorbed quickly by the body, with a sudden peak in blood glucose levels, leaving the person feeling tired later after blood sugar levels return to normal or fall
- ✓ Eat both green leafy (salad) and other vegetables as they contain the highest content of a wide variety of nutrients for their calorie content. By volume (and often by calories), vegetables are the major component of many calorie restricted but not nutrient deficient diets.
- ✓ People should carefully select protein foods choosing leaner cuts of meat and removing skin from game foods and poultry, this will help reduce fat and therefore calorie content.
- ✓ Eat more fibre as it has been shown to increase the feeling of being full and this decrease food intake Eating more high-fibre foods such as fruits, vegetables and whole grains is a nutritionally sound way to not feel as hungry when reducing calorie intake.
- ✓ Start the day with breakfast as it acts as the metabolism's wake-up call, kicking it into action.
- ✓ People should aim to reduce their intake of saturated fats as these are primarily associated with heart disease. Some saturated fats can be replaced with unsaturated fats (monounsaturates and polyunsaturates) which are healthier for the heart. However, it is important to realise that all types of fat are high in calories so it is important to reduce total fat intake to allow for weight loss.

ASSIGNMENT

1. How would you explain metabolism to a friend who is struggling to lose weight? What advice could you provide to help them to improve their metabolism and chance of successful weight loss?
2. Report on your set task. Write about the experiences of the two people you talked to about being on a calorie restricted diet. You will need to include some personal information to give the background as to the reasons why they decided to go on the weight management/loss plan.

You should include their age, gender, weight at the start, general health, their reasons for going on the diet plan, the target weight they set out to achieve (i.e. their target weight or target weight loss total), how successful they were and things they would change in the future. Do not submit their name or any information which may give their identity – their personal information should be dealt with as confidential data.

OBESITY RELATED MEDICAL CONDITIONS & TREATMENTS

AIM

To describe how medical conditions and medications can cause obesity and also examine the role of medications in the prevention and treatment of obesity

NUTRITION DURING DISEASE

For most obese people, excess weight is not caused by poor diet and lack of exercise. There are, however, instances when obesity is caused by a specific medical condition or the medications taken to treat it.

Medication can cause obesity in several ways:

Metabolism changes: Some drugs can alter the body's metabolism causing calories to be burned more slowly.

Corticosteroids: Corticosteroids are known to stimulate appetite while reducing the body's ability to absorb glucose, which can promote central obesity.

Beta-blockers: Beta-blockers can cause shortness of breath and fatigue, making it difficult for patients to exercise.

Calcium channel blockers: Calcium channel blockers taken for high blood pressure can cause users to retain water.

Antipsychotic medications: Drugs used to treat psychiatric conditions and mood disorders, like depression and bipolar disorder, are among those most closely associated with weight gain. Among the more common drugs associated with weight gain are quetiapine (Seroquel), olanzapine (Zyprexa) and risperidone (Risperdal).

The side effects of a few drugs include appetite stimulation. Tranquillizers, anti-depressants and some diabetic medications can increase appetite therefore lead to weight gain. Some medications influence nutrient absorption through various mechanisms, including transit time of food through the digestive tract, pH and bile acid activity as examples. Weight gain caused by prescribed medication can be very upsetting and sometimes weight loss can be very difficult. Where people gain weight after starting a particular medication, it is very important that they discuss this with their doctor and they should on no account stop taking their medication.

DRUGS AND HORMONES PRESCRIBED FOR WEIGHT MANAGEMENT

In addition to the effect medications may have on causing weight gain, there are also medications that may assist with weight loss. Obesity medication and weight loss drugs refer to all medications and hormones, which reduce or control weight. These drugs alter one of the fundamental processes of the human body, weight regulation, by reducing appetite, altering metabolism, or reducing the absorption of calories. The side effects of obesity drugs vary and may include headaches, restlessness or nervousness, insomnia, diarrhoea or constipation.

There have been reports of people experiencing high blood pressure, seizures and even strokes but these incidences are extremely rare. The potential side effects to a person's health are a real risk which should be considered, therefore it is recommended that anti-obesity drugs only be prescribed for obesity where it is hoped that the benefits of the treatment outweigh its risks. People should be fully informed before making a decision which drugs is best for them. The following table shows a range of medications used in the treatment of obesity, their mechanism of action and the advantages and disadvantages of each type of medication.

Drug	Mechanism for Action	Advantages and Disadvantages
Orlistat (Xenical, Alli)	Works by interfering with the action of gastrointestinal (GI) lipase in the gastrointestinal tract. As a result 30% of ingested dietary fat is not absorbed and energy intake from fats is therefore reduced.	Advantages: Promotes gradual sensible weight loss reducing body weight by an average of 5-10%. Can lower the level of total cholesterol and triglycerides in the blood, lower blood pressure, and improve blood sugar levels Is non addictive Disadvantages: High rate of unpleasant gastrointestinal side effects, such as oily spotting, flatus with discharge, faecal urgency, fatty/oily stool- incidence of these increases the higher the fat content of the diet Decreases the absorption of some fat-soluble vitamins and beta-carotene. You should take a multivitamin supplement containing vitamins A, D, E, and K to ensure good nutrition Is quite expensive and requires 3 doses a day.
Phentermine	Used as an appetite suppressant, has the basic chemical structure of an amphetamine, which means that it acts as a stimulant	Advantages: Phentermine is considered to be a prescription strength appetite suppressant for fighting obesity. Can be useful in individuals with severe obesity. Disadvantages: Because it is an amphetamine, individuals may develop an addiction to it. It is classified as a controlled substance in many countries and is internationally considered a schedule IV drug under the Convention on Psychotropic Substances. Common side effects include: increased heart rate increased alertness increased blood pressure increased heart rate palpitations restlessness insomnia and addiction.
Sibutramine (Meridia)	Acts somewhat like an antidepressant. It decreases the appetite by blocking reuptake	Advantages: Reduces appetite and can assist sensible weight loss if a healthy eating plan is adopted. It is also easy to take since it only involves taking one oral pill a day.

	of nerve transmitters (norepinephrine, serotonin and dopamine) in brain synapses.	Disadvantages: Can cause small increases in blood pressure (1 to 3 mm Hg) with increases in pulse rate of four to five beats per minute. Side effects that may occur include headache, constipation, back pain, insomnia, drug mouth and nervousness.
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The table above shows three medications commonly prescribed in the treatment of obesity. It may be useful for you to do further reading on these medications for more information relating to costs/ dosages and effects. In addition to these medications, there are also a number of drugs that have a history of unsafe and inappropriate use in the treatment of obesity. These drugs include diuretics, growth hormone amphetamines and thyroxine.

It is important to realise that many of these medications should only be prescribed for individuals with specific medical conditions and they are not recommended solely for the treatment of obesity. Some further information on these medications has been included here for your interest.

Thyroid Hormone

Hypothyroidism is a condition characterised by abnormally low thyroid hormone production. There are many disorders that result in hypothyroidism. These disorders may directly or indirectly involve the thyroid gland. Because thyroid hormone affects growth, development, and many cellular processes, inadequate thyroid hormone has widespread consequences for the body. Thyroid disorders can be controlled and sometimes the symptoms lessened by treating with thyroid hormones, however, it has been found that thyroid hormones can potentially contribute to development of obesity.

Many studies have shown that excess thyroid hormone treatment can help produce more weight loss than can be achieved by dieting alone. This of course is good news for obesity sufferers, but it is by no means a solution. Once thyroid hormone intake is stopped, the excess weight which has been lost is almost always regained. During the time when fat is being lost from the body, so too is muscle mass. This is not a good outcome when trying to lose weight over the long term because, as you may remember, muscle tissue uses more energy than other tissue, thus increasing the BMR by building muscle mass through exercise!

Somatropin (Growth Hormone)

Primarily this hormone is used to treat childhood and adult growth hormone deficiency. Reported side effects for taking this hormone include decreased body fat and increased muscle mass. Some others experience increased bone density, increased energy levels, improved skin tone and texture and immune function.

A dose of growth hormone can be prescribed to help obese people lose weight. Studies have shown that obese people often have lower-than-normal levels of growth hormone in their body, which may make it harder for them to lose weight. Researchers found that by giving obese women low doses of growth hormone helped, they lost fat whilst maintained muscle mass. This is a huge break through in terms of weight loss, as normally people lose muscle mass and fat tissue.

The study consisted of 59 obese men and women, whose average BMI was 37. The participants gave themselves injections containing 200 µg of growth hormone for one month. For the next five months, the dosage of growth hormone was increased to 400 µg per day in men and 600 µg in women.

The increase in dosage was necessary because prior studies show resistance to the drug can develop over time, especially among women. Both groups were prescribed a diet and were instructed on lifestyle modification and exercise. Among the 39 people who completed the 6 month treatment, it was found people had lost an average of about 12 kg of body fat.

Human growth hormone works by increasing the amount of IGF-1 (insulin-like growth factor 1) that a person's liver excretes. IGF-1 prevents insulin from transporting glucose to cells. After eating, the pancreas normally secretes the amount of insulin necessary to breakdown carbohydrates to glucose. Your body then has three choices – glucose is used immediately in our cells for energy, some is sent to the liver and stored there for use at a later stage, however, excess glucose is stored in other cells as fat. Growth hormone induced IGF-1 prevents insulin from storing this excess glucose in cells, therefore forces the body to burn fat for energy instead of any glucose.

Normally, a person's body uses all of their glucose for energy before seeking that energy from their fat reserves. Human growth hormone forces the body to seek energy from the fat reserves first. This results in significant weight loss.

SURGERY PROCEDURES - COSMETIC ENHANCEMENT OR LIFE-SAVING TREATMENT?

Weight Loss Surgery

Many people with excessive weight problems are turning to weight loss surgery. It is fast becoming a popular option when other weight loss methods, such as diet, exercise and supplementation has failed. Failure of these methods means that a person is unable to maintain a healthy weight and in many cases, the weight is regained. As you have learned, if excessive weight is not dealt with, obese people are likely to suffer from health risks such as cardiovascular disease etc. This is possibly the strongest case for opting for surgery. It should be noted, weight loss surgery is major and carries risks – this is not cosmetic surgery.

Below is an outline of the common surgeries carried out on obese people:

Laparoscopic Gastric banding	This surgery involves an adjustable hollow band (filled with saline solution) placed around the upper end of the stomach, which in turn creates a small pouch and narrowed passage way into the remainder of the stomach. The band can be tightened or loosened over time to increase or decrease the passage way into the stomach. Usual weight loss is between 50-60% over 18-24 months. <table> <tr> <td><u>Advantages</u></td><td><u>Disadvantages</u></td></tr> <tr> <td>Keyhole surgery; less scarring; quick return to work; adjustable; reversible; no malabsorption</td><td>Small portions until banding removed; no guaranteed success – chocolate and fattening foods can still be consumed; problems with the band e.g. slippage from set position</td></tr> </table>	<u>Advantages</u>	<u>Disadvantages</u>	Keyhole surgery; less scarring; quick return to work; adjustable; reversible; no malabsorption	Small portions until banding removed; no guaranteed success – chocolate and fattening foods can still be consumed; problems with the band e.g. slippage from set position
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Gastric bypass	This surgery involves the creation of a small pouch in place of the stomach to restrict food intake. A section of the small intestine is attached to the pouch to carry food from there to the second segment of the small intestine. This bypassing of the lower stomach and majority of the small intestine means there is a reduction in the nutrients being absorbed and thus calorie intake is lessened. Weight loss can be between 60-70% over 24 months. <table> <tr> <td><u>Advantages</u></td><td><u>Disadvantages</u></td></tr> <tr> <td>Good operation for sweet eaters, avoiding the 'empty' calories they provide; people tend to lose more weight this was than gastric banding</td><td>Open surgery, therefore higher risk; not reversible; nutritional/mineral supplements required; some weight gain after 2-5 years</td></tr> </table>	<u>Advantages</u>	<u>Disadvantages</u>	Good operation for sweet eaters, avoiding the 'empty' calories they provide; people tend to lose more weight this was than gastric banding	Open surgery, therefore higher risk; not reversible; nutritional/mineral supplements required; some weight gain after 2-5 years
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Gastric balloon	This surgery involves placing a 'balloon' inside the stomach. This idea is the presence of the balloon makes the person feel full prematurely by reducing the volume of the stomach. Poor weight loss is reported – 25-40%, this procedure is becoming less and less common, and is rarely recommended by GP's anymore. <table> <tr> <td><u>Advantages</u></td><td><u>Disadvantages</u></td></tr> <tr> <td>Balloon is made of material which is strong and resistant to gastric acidity;</td><td>There is a risk of blockages of the bowels; frequent stomach ulceration; poor weight loss reported; removable</td></tr> </table>	<u>Advantages</u>	<u>Disadvantages</u>	Balloon is made of material which is strong and resistant to gastric acidity;	There is a risk of blockages of the bowels; frequent stomach ulceration; poor weight loss reported; removable
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Biliopancreatic diversion (BPD)	This surgery involves the exclusion (sometimes via removal) of up to two thirds of the stomach with a very long intestinal bypass, almost skipping the small intestine completely. The body struggles to cope with large amounts of fat after this operation e.g. fries and burger, therefore diarrhoea is a common complaint from patients. Weight loss can be between 70-90% over				

24 months.

Advantages

Can enjoy larger sized meals than those who opt for gastric banding; best weight loss of all procedures; adjustable by further surgery; good option when other techniques have failed

Disadvantages

Risks associated with open operation; long recover – 6-8 weeks; lifelong requirement to take multivitamins and supplements; flatulence when fatty foods consumed; increased bowel movements (up to 4 times per day).

The financial costs involved in any types of weight loss surgery are extremely costly. There is the cost of the surgery and immediate after care, counselling and medical consultations before and after, in health and life insurance and potential lost earnings during the recovery process.

Some weight loss surgery may be covered by health insurance, cosmetic surgery procedure are generally not.

Lipoplasty (Liposuction)

Liposuction is a cosmetic surgery procedure which removes fat from major areas of the body e.g. thighs, flanks, buttocks etc. It is thought that liposuction is not a good treatment for obesity due to its ineffectiveness. Obese people need to dramatically reduce their calorific intake and increase exercise, not simply remove the fat they already carry – that does not solve the problem long term.

It has been found that when liposuction has been used in an attempt to treat obesity, there has been a significant increase in the incidence of serious surgical complications. It is not safe to remove huge amounts of fat by liposuction - if as much 5 Kg of fat is removed in one day; there can be serious consequences for the patient, such as fluid imbalance. Liposuction in an obese patient is only seen as a reasonable option when the patient is struggling to improve body contours in one particular area.

On the other hand, an overweight person whose weight has been stable for many years and has certain problem-areas of fat may be a good candidate for liposuction as there are some areas on the body where fat seems resistant to diet and exercise – most commonly on the buttocks and hips.

Accumulations of fat in these areas and often inherited, liposuction offers a solution to realistically changing body shape in people who struggle to lose weight from these problem areas. In effect, liposuction is equivalent to being able to focus the effects of dieting to specific areas of the body.

Remember back in the first lesson you learned that in adults who become obese the number of fat cells don't increase, people become fat as their cells increase in size.

We also said this is the case until those fat cells cannot physically become any larger – only then there is an increase in the number of fat cells. When a patient loses a substantial amount of weight by dieting, the fat cells simply shrink in size but do not necessarily diminish in number. Thus, if liposuction is done on a patient who had previously been obese but who had lost a considerable amount of weight by the time of liposuction, then the surgeon will typically need to remove the same number of fat cells as if the person had remained obese.

Abdominoplasty (Tummy tuck)

This type of cosmetic surgery is used primarily to make the abdomen area more firm after major weight loss. The surgery involves the removal of excess skin, fat and retained fluids from the middle and lower abdomen. By doing so the stress placed on skin is reduced (some people, in extreme cases, experience splitting or tearing of the skin as a result of the excess weight being carried), and the muscles of the abdominal wall tighten. This, like liposuction, is not an answer to weight loss in obese people. This surgery is a cosmetic procedure with aim being on improving body contours and appearance.

EATING DISORDERS

Anorexia Nervosa

Body image, dieting, and eating disorders all play a role in society today as you will now be aware of by studying a course in nutrition. Eating disorders such as Anorexia Nervosa and Bulimia have increased in the last decades as ideal images of how women and men should look and what the media sees as ideal body images. These unrealistic portrayals of the “ideal image” have programmed unhealthy ideals of the child and adolescent population. These two eating disorders are more common in young girls than boys; however the number of boys developing the conditions is increasing, while the average age of sufferers continues to decrease.

Anorexia Nervosa is a wasting condition caused by the purposeful restriction of calories to a level insufficient to support the energy requirements of the body. Calorie intake is typically extremely low resulting in dramatic weight loss, along with symptoms of severe nutrient deficiencies (weak bones, muscle twitching, poor immune system function, muscle wasting, mental abnormalities including paranoia, depression, anxiety etc). It is characterised by a skeletal appearance, the growth of fine downy hair on the body known as lanugo and a distorted perception of body size. An unusually small appetite, hiding of food, sudden weight loss, excessive exercising, irritability, and in girls cessation of menstrual cycle can all indicate anorexia.

An anorexic can see their reflection in the mirror, and still believe they are overweight. Anorexics typically require both counselling and hospitalisation to gradually increase their weight, help correct the underlying psychological issues and ensure a balanced, nutritionally adequate diet is achieved and maintained. Some anorexics will eventually die of the condition and it should never be taken lightly. Anorexics may deprive themselves of food in order to feel a sense of control over their lives, to punish themselves or because they believe they are ugly, overweight, or somehow worthless or useless.

Bulimia Nervosa

Bulimia nervosa is a distinct eating disorder, which may manifest for the same reasons as anorexia. However, instead of starving themselves, bulimics binge eat and then purge, by self-induced vomiting. Like anorexia, the sufferer will display symptoms of severe nutrient deficiency and rapid weight loss. They will also tend to have poor breath, and can cause damage (typically ulceration) to their oesophagus and mouth due to the acidic stomach contents being regurgitated regularly. Their teeth can also be severely damaged.

Binge eating periods are generally a complete loss of control, and this is followed by a self-loathing in the person's lack of control, resulting in the purging of food. Like anorexics, bulimics will generally have very low self-esteem and a completely distorted perception of their body size and shape. Signs of bulimia include secretive eating habits, disappearing after meals, rapid weight loss, excessive exercising, and irritability, and in girls the menstrual cycle may cease.

There are currently more than 4 million Americans affected binge eating. Following a binge eating episode, in which a person eats an excessive amount of food in a short period of time, the person often experiences feelings of guilt, depression, embarrassment, and disgust. Beyond the emotional distress caused by binge eating, people who binge-eat are at a higher risk for more serious health problems associated with weight gain.

These health problems may include high blood pressure, diabetes, heart disease, high cholesterol, and certain types of cancer. Thus, seeking effective treatment for binge eating disorder is vital to an affected person's overall physical and mental well-being. Managed weight loss programs, combined with certain forms of psychotherapy, have shown success in providing the direction and proper motivation to eat healthily and to prevent future binge eating episodes.

Assessments will include a history of any medical illness, height and weight measurements, and an eating disorder evaluation. Participants will also answer several questionnaires about self-esteem, feelings of depression, emotion and eating.

SET READING

Spend up to 1 hour reading over resources that you have access to, looking at anything that you can find which is relevant to the stated aim for this lesson.

These resources may include one or more of the following:

- ✓ Books in your possession
- ✓ Books you find in a library
- ✓ Brochures, plant catalogues etc.
- ✓ Web sites

ASSIGNMENT

1. From what you have learned in this lesson, list 3 medical conditions which can lead to obesity in adults.
2. From what you have learned in this lesson, list 3 medical treatments of disease which can lead to obesity through the use of certain medications.
3. Suggest a five-day dietary plan for a child of 9 years old who is suffering from Cohen's Syndrome, (which often leads to obesity). Consider what you already know about reducing other health risks associated with obesity (you may want to refer to information provided in the previous lesson).
4. Discuss two common surgical methods of reducing obesity in adults. You should include the advantages and disadvantages of each in your answer.
5. Obtain information from any places which carry out surgical weight reduction/weight loss procedures. You may choose to contact such places via email or telephone to find out the following –
 - ✓ Is it possible to have surgery paid for by health insurance or local health authority?
 - ✓ Is the patient given any counselling before or after the surgery?
 - ✓ What is the average cost (for your chosen procedure)?
 - ✓ Do people need to be referred by their GP or can they arrange an appointment themselves?
 - ✓ What is involved in the surgery and how much information, including the risks, does the patient receive beforehand?
 - ✓ What is your own opinion on weight reduction surgery?

This kind of surgery could be – liposuction, gastric band surgery etc. Submit information on only one type of procedure from one place.