

Adult Weight Management Guide

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Introduction

This is a brief guide to sustainable weight loss based on the available literature and medical evidence reviewed in early 2024. We offer a full, 12-month course with additional materials taking a holistic and evidence-based approach to sustainable weight loss and health risk reduction. If you wish to take part, please contact reception and book an introductory appointment.

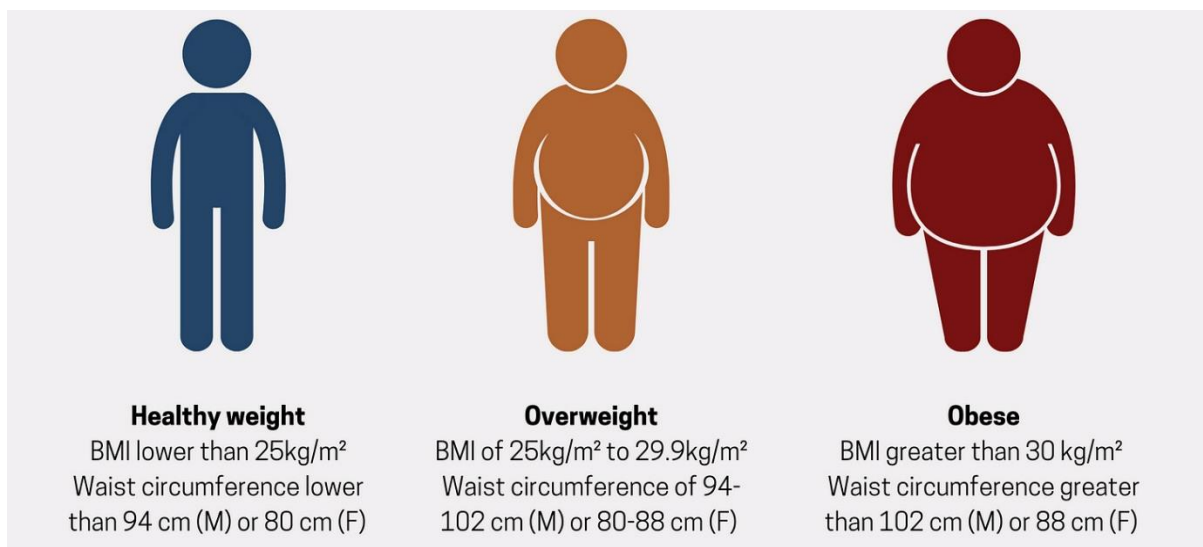
What is Overweight and Obesity?

Overweight is when you carry more fat than is optimal. It may be associated with health risks and may cause self-consciousness or body-image concerns. Being overweight can increase your risk of obesity.

Obesity is a condition where your weight affects your health. It is a long-term (chronic) condition with a wide range of causes. It usually develops over time.

Myth: Obesity is caused by being lazy. Studies show that on average people with obesity do more exercise than those without.

It is important to remember that obesity is not just about weight it is about health. Your BMI (body mass index) can tell you what range you are in (greater than 30 denotes a risk of obesity) but a more holistic approach must be taken to diagnose the disease.



It is also important how you carry your weight. If a greater proportion is carried centrally (around the waist) this has a greater significance when it comes to risk.

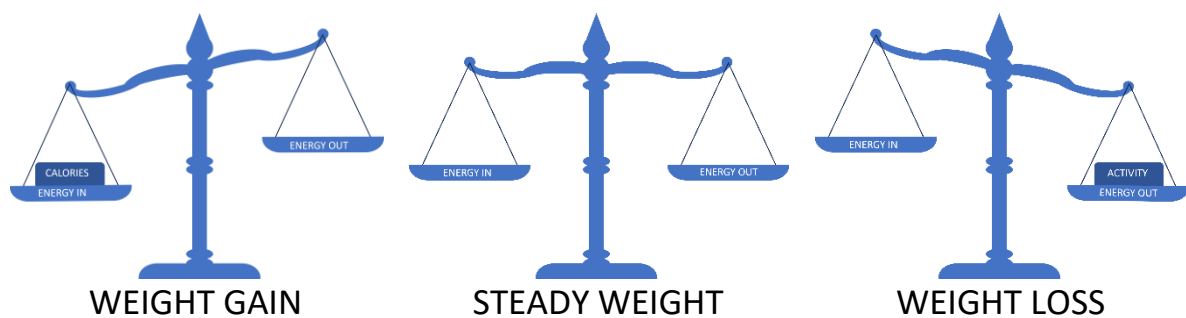
small weight losses can lead to impressive health improvements.

Our goal is to assist people in attaining a healthy weight, to improve their quality of life and reduce their risk of weight related conditions. Modest weight loss (5-10%) is associated with a profound effect on the risk of developing diabetes and improves cardiovascular disease risk, blood pressure,

sexual dysfunction, mobility, fertility, mood, and quality of life. One trial showed that a 7% reduction in weight led to a 58% reduction in developing diabetes despite half the weight being regained over 3 years. Even less weight loss was associated with significant improvements in risk factors, medication usage and hospitalisations over 8 years in another trial.

Managing Overweight and Obesity

An outdated approach to managing overweight and obesity was to simply advise eating less and exercising more. Although this is important it is now known that this advice alone is not effective in helping people to attain a healthy weight and does not address the complex and multi-factorial causes of overweight and obesity. It does, however, highlight an important concept, that of “**energy balance**”.



Your weight is determined, fundamentally, by your energy balance. If more energy is coming in through calories in food and drink than is being burned off through activity and exercise, then weight will increase. Similarly, if more is being burned off than is coming in then weight will reduce. If the energy in and energy out balance, then weight will remain steady. This is true in the same way as a law of physics is true but, a holistic approach will look at all the factors which may influence both the energy consumed and the energy burned off.

The illustration below shows some of these factors:

Each of these factors, and some others, may be implicated in weight management issues and obesity. To achieve long term weight loss these should be identified and addressed.

The Quick Fix

Unfortunately, and unsurprisingly, like with most things, there is no quick fix. If you are reading this, then it is likely that you have tried one or more 'fad' diets and you may have had short term success in the past. However, you wouldn't be reading this if they had worked. Extreme or 'fad' diets can be very effective for people to lose a bit of weight in the short term. Since they are unsustainable the weight is likely to return and often will overshoot the original weight which caused the initiation of a diet in the first place.

Losing weight sustainably is a marathon not a sprint, don't peak too soon!

All the evidence suggests that to adequately control weight over the long term the multifactorial causes must be addressed holistically. Diet is only one of these. If you are keen on a specific diet to achieve quick results, it is possible to integrate this into a personalised solution, but it is important to remember that a sustainable dietary plan will need to be adopted eventually.

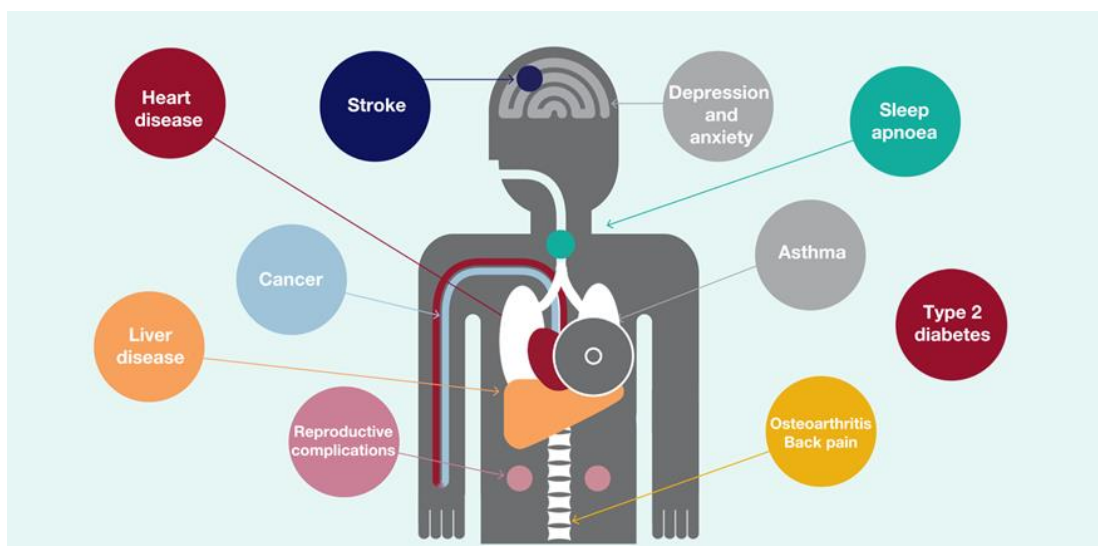


Remember that all interventions have side effects, even lifestyle change. You might decide to go to the gym regularly and suffer the side effects of muscle pains, injuries, and a lighter wallet! If your intervention is too extreme these side effects are likely to be greater and the chance of you tolerating them smaller. It is important to look for gradual, sustainable, and even enjoyable change. You want to make it easy to succeed. Weight loss can be broken into stages, the most rapid weight loss occurs early, both for physiological and psychological reasons, then we enter a stage of more gradual loss, then maintenance which is often followed by episodes of regaining weight. If you have good solutions for dealing with each of these stages, then your chance of maintaining a long-term weight loss and a healthier lifestyle is increased.

It is important to manage your expectations. Behavioural and lifestyle change is shown to have the potential to reduce weight by an average of 5-10%. You may do better, particularly with support, but it is likely that for more significant weight loss either medication or surgery are required.

Health Assessment

It is important to assess the effect that excess weight might be having on your body and the health risks it might lead to. The illustration below shows some of the common health effects of overweight and obesity.



Our assessment will include calculating your Body Mass Index (BMI), waist measurements, and assessing any health effects of your weight. This may include blood tests such as for cholesterol and diabetes. We will discuss lifestyle such as diet and exercise. Any health problems or risk factors

identified in the assessment will be discussed and a management plan established.

Dietician Assessment

We will often refer patients to a dietician for an in-depth assessment. This is part of the multidisciplinary (team) approach to weight management and is associated with better outcomes. This is particularly necessary if we are considering medical interventions to assist with weight control.

Body Mass Index (BMI)

Your Body Mass Index is calculated by dividing your weight in kilograms by your height in meters. A Body Mass Index higher than 30 is high risk for obesity.

See here for a BMI calculator; <https://www.safefood.net/bmi-calculator>

Mental Health and Weight

Your mental health is intimately linked to everything you do and cannot be simply separated from your physical health and should not be dismissed. Overweight and obesity have significant effects on your mental health and likewise your mental health can influence your weight.

Overweight, obesity and its effects can have a negative impact on quality of life. People who carry significant extra weight often have problems with occupational and physical functioning both due to their size and chronic ailments. Being physically unable to do the things you love, such as family trips or events, can lead to social isolation, depression, and loneliness. Chronic pain, a common side effect of weight, is also associated with an increased chance of depression.

Another aspect that affects mental health is discrimination. There are often negative societal perspectives on obesity, often based on myths and ignorance. These misperceptions could be widespread amongst family, friends, or work colleagues and even in health care settings. They can lead to discriminatory behaviour that can affect a person's self-esteem, employment opportunities and even the healthcare they receive.

All these factors can lead to a poor body image. Some people can be embarrassed about their weight or feel anxious about other's opinion of it.

Your mental health can also have a significant influence on your weight. It is common for people to use eating as a way to cope with stress, anxiety, and depression. When people are feeling low or stressed, they may also tend towards poor dietary choices to make them feel better. It is very common for people, when depressed, to avoid social situations and withdraw from activities leading to a more sedentary lifestyle. The serotonin deficiency associated with depression, anxiety and stress is also linked to cravings for carbohydrates which can cause weight gain.

A holistic and sustainable solution to overweight and obesity should look to address some of these issues.

Behavioural Factors

Behavioural modification can affect the energy balance by influencing the amount of energy taken in through food and the amount burned off through activity. There are lots of ways you can modify your behaviour that will be effective, but it takes time to form new habits.

Your brain works on a rewards system which can be helpful or destructive. For example, in an environment where food is scarce, if you come across energy dense food like honey, your brain will reward you with hormones that make you feel good. This encourages you to eat this type of food again and to seek it out. This is helpful in this scenario where health is likely to be negatively affected most by lack of food rather than excess. Of course, we no longer live in an environment where food is scarce, but the same system applies.

Recognising Triggers

Sometimes we eat, not when we are hungry but because there is a trigger or cue that encourages us to do so. Some examples could be:

“Everyone has gone out and I am on my own.”

“I always have a biscuit with my tea.”

“I eat more after I drink alcohol.”

The important thing is to recognise these triggers and to take some action to avoid creating a negative habit. You might decide to replace eating with a positive habit such as exercise. Remember that it will take at least 21 days to form a new habit so the trigger will continue to point towards the negative habit until you have mindfully diverted it for at least this time.

We can also use triggers to our advantage. Decide on a trigger that will encourage you to do something positive like go to the gym or take a walk. This could be something simple like a routine e.g., “work is over for the day so I will do my gym session before I go home”. Or “the dog wants out so I will go for a good walk with them”. If you work to make this a regular thing and reward yourself with positive thoughts, then it will soon become habitual.

Self-Monitoring

Self-monitoring can be a great way to keep yourself motivated. Some people are particularly interested in “their stats” and this can be useful, however you need to be careful that it doesn’t affect your motivation negatively.

Monitoring weight is best done a maximum of once a week at the same time, preferably morning. If you menstruate you should consider that your weight will vary over your cycle. Weight can then be more accurately assessed against your goals.

It is also possible to monitor exercise. Step counters (available stand alone or as an application for a phone) can help give good indications of exercise levels. There is a widespread belief that we should aim for 10,000 steps per day although there is little scientific basis for this. What is more important is that we can aim to have modest and sustainable increases over time.

Apps for the phone can also be used to monitor diet and calorie intake. This can be helpful when trying to learn about the calories in food and to maintain a healthy 600 calorie deficit when trying to lose weight. It tends not to be sustainable as a long-term approach as it is quite intensive and requires food to be weighed etc.

Some people choose to monitor other health indicators such as blood pressure, pulse and even ECGs. This may provide a degree of positive feedback but in general we will advise if we feel it would be helpful in your specific case.

Whatever you choose to monitor the key to using it effectively is to set reasonable, sustainable goals and to give adequate time between readings to filter out the ‘noise’.

Understanding your Mood

We don’t always eat because we are hungry. In fact, hunger can be one of the least important drivers for eating in some people. Compulsive or comfort eating can be a way of covering up negative feelings without needing to be

aware of them or dealing with them appropriately. If eating is no longer about getting the energy we need to function and stay healthy but rather about covering up emotions then hunger, or lack of hunger will no longer help to moderate it.

Try an exercise in being mindful of **why** you are eating. Think “am I hungry”. It may be helpful to keep a diary writing down what you are eating, what was going on at the time and how you felt. See if other emotions or feelings are affecting your eating e.g., thirst, boredom, or as a treat. Try making a list of alternative ways of coping with them and see which works best for you.

Goal Setting

The key to effective goal setting is to make sure goals are small, achievable, and realistic. Setting goals and achieving them taps into your brains reward system and increases the chance of sustained weight loss.

Be specific. Avoid setting vague goal such as “I will get fitter” or “I will be healthier”. Instead set specific goals such as “I will increase my step count from 6000 to 7000 average in the next week” or “I will be able to swim 10 lengths of the pool in 1 month”.

Make gradual goals that can be maintained e.g., instead of stopping putting sugar in your tea set goals to cut it down gradually. Put them in a calendar and tick off each achievement, there is satisfaction in this that triggers the brains reward system.

Long term sustained motivation is more likely when people take ownership of their behavioural changes and goals, and engage in them because they are deeply meaningful or enjoyable.

Make your goals achievable. If you set goals too high, then the failure to achieve them will demoralise you. E.g., instead of eating 5 portions of fruit and veg a day (as guidelines advise) you might want to start at 3 and build up.

Reward yourself. Noting your goals and ticking them off can be a reward in itself but you may wish to set points where you reward yourself with tangible things such as a day out, a magazine or just a relaxing bath. Be careful not to associate foods with rewards. It is easy to get into the habit of “treating

yourself” with food but you are then activating the reward system in your brain to work against your intended goal.

Don't overwhelm yourself with too many goals. Focus on the ones that are most important to you. Add new ones in as you achieve old ones.

Managing Failure

It is unreasonable to expect that you will maintain a perfect weight for the rest of your life without any 'blips'. Managing 'failure' is important. We are only human and thus we must expect to have setbacks from time to time. Planning for these, recognising them, and taking positive action is what will get us back on track quickly. Here are some strategies:

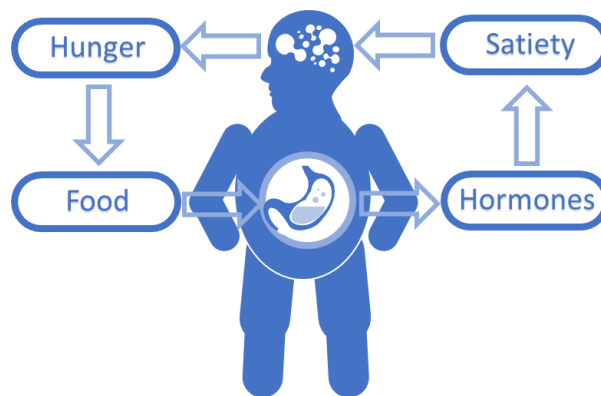
1. Set a weight limit for reactivating supports and stick to it. If you regain weight to this pre-set level then you re-engage with us, rope in a friend, attend a weight management group etc.
2. Develop plans for positively dealing with weight gain. Do this when you are early in your journey, positive and engaged. Your plan should support your future self with positive ideas for getting back on track.
3. Identify potential challenges in your future. Think about what might trip you up and think of strategies for dealing with it. E.g., Christmas might trip me up, I will plan to give away chocolate gifts to charity, have fun family events that involve exercise rather than TV, think up healthier and exciting changes to my normal Christmas meal and start my post-Christmas recovery earlier than New Year etc.
4. Cognitive restructuring. Develop ways to counteract negative or maladaptive thoughts such as “What's the point, I've failed again” or binge eating in response to putting on some weight. Recognise this pattern and learn to think up more positive responses like “I've put on a bit of weight but actually I'm still better than I was, and I can keep the general trend downwards”.

No plan survives contact with the enemy, adapt!

See here for further information on behavioural changes;
<https://www.hse.ie/eng/about/who/cspd/ncps/obesity/programme-resources/hse-talking-about-weight-guide-final-6.pdf>

Satiety

Satiety is just a way of saying “feeling full”. Many people who are overweight or obese have a dysfunction of their regulatory systems which communicates satiety (feeling full) to their brain.



When you feel hungry you will eat food. When this food arrives in the stomach it will initiate a process whereby hormones are released into the blood stream. These hormones communicate to the brain that food has been consumed and the brain develops a feeling of “being full” or satiety. If there are insufficient hormones released, or they are broken down, or there is a delay in their release, then the feeling of hunger will not be turned off and people will be prone to overeat.

What, and how you eat will have an effect on your satiety. Some foods are good at triggering this hormone and others are poor. By adjusting your diet so that you focus more on the foods that reduce hunger for longer you will naturally reduce the urge to eat. These foods tend to have the following properties;

- Low energy density, high nutrient density.
- High protein proportion of total calories.
- Contain fibre.
- Are not ‘decadent’ types of food that drive overeating.

Examples are fish and prawns, most vegetables, tofu, beans, pork loin. Boiled potatoes are high satiety but also high carbohydrate, they are great at making you feel full and if pre-boiled and cooled will have resistant starch which acts like fibre. Moderation is, of course, important.

How you eat is also important. Eating fast, while in front of the TV without hardly noticing your food, is bad for satiety. The Mediterranean style of eating as a family, at the table, slowly with conversation and mindful of the food, flavour and texture is best. It gives time for the hormones to be released and reach the brain and avoids that feeling of bloating that often occurs when food is eaten too quickly.

Some of the modern medicines are directed at this hormonal pathway (GLP1 agonists like Ozempic). They have the effect of boosting the hormone that communicates 'fullness' to the brain. In doing so they will reduce the appetite or feeling of hunger. Obviously, all medication has its down sides, so if you are interested in this option, we will discuss it in detail. It is important to note that this remains only a single factor in overweight and obesity so it is not just a matter of taking medication and losing weight, the other factors described here should also be addressed for a sustainable solution.

Exercise

Exercise affects the energy balance by increasing the amount of energy burned. Although its effect with regards to weight loss is negligible its overall effect with maintaining weight loss, improving health, fitness and quality of life should not be underestimated. Physical activity is an integral part of weight management with even moderate-intensity activity (about 150mins/week) having significant effects on visceral fat stores (dangerous belly fat surrounding organs) and cardiovascular risk.

Exercise will not change your body weight but will change your body type!

Exercise should be increased gradually and can be incorporated into everyday life such as walking, gardening, taking the stairs or cycling. Structured or supervised exercise programmes can be particularly beneficial. Modern phones and watches can help by keeping a record of step-count and inactivity time such as watching TV.

Lower your risk of early death by 30% with regular exercise.

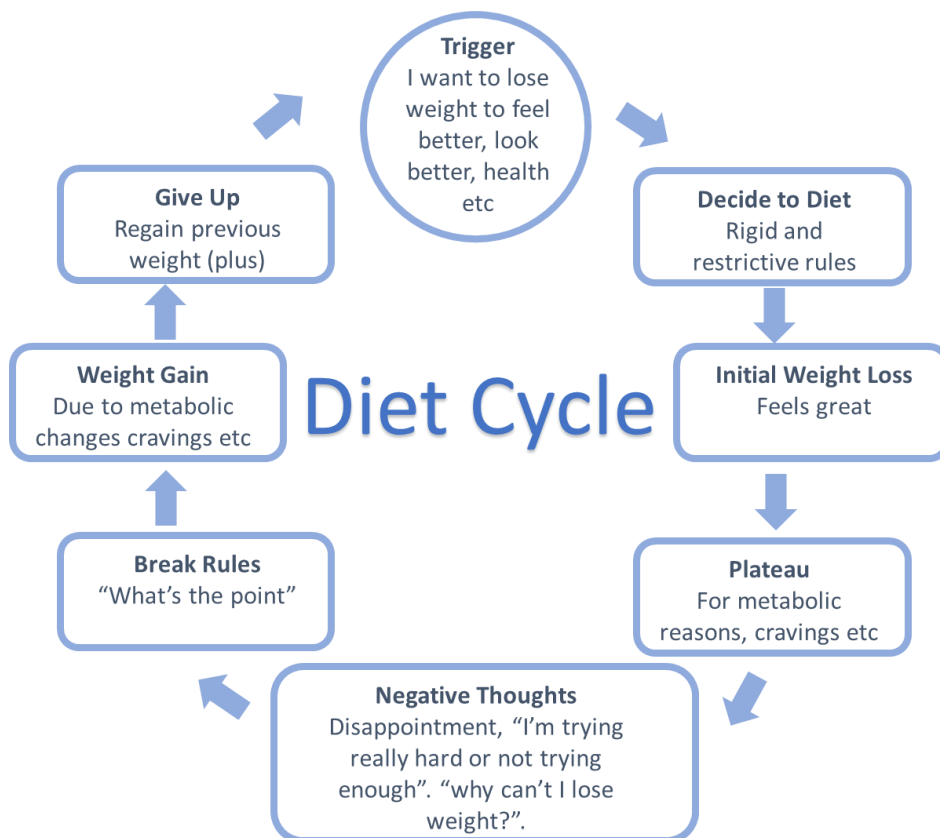
A combination of aerobic and resistive exercises will give the best results for weight loss although anaerobic exercises may help build muscle mass. Key recommendations;

- Start low and go slow. Build your exercise up gradually to avoid injury and to keep it fun and sustainable.
- Spread out the activity over the week rather than doing it all in one day.
- Adjust exercises according to your health and mobility e.g., if you have arthritis in the knees try cycling rather than jogging or move your arms to keep your heart rate up.
- Use behavioural life hacks to increase your chance of sustaining exercise, e.g., exercise with a friend (not going would let them down!).
- Try to go 50:50 on resistive (weights etc) and cardiovascular (running, cycling etc where heart rate is increased). Try to really push (a level of exercise where you feel like you could talk but don't want to) for a few minutes at a time (about 4 minutes) on and off for about 20% of your cardiovascular exercise.
- Do something you like such as tennis or dancing. Going to the gym may be effective but it is not for everyone.

Do not count calories from exercise as an increase in your dietary calorie allowance.

Diet

Numerous diets have been promoted for weight loss, some of which have risks associated with them and many of them have poor evidence for long term sustainability. It is common to get into the cycle of dieting as illustrated below. If you are reading this, you have probably been on a 'diet' and experienced this for yourself. Your diet (what and how you eat), rather than a specific 'diet' (such as 'carnivore' 'Atkins' etc) is very important for how you lose weight sustainably.



All dietary interventions work by reducing the dietary intake to create an energy deficit. It is common to aim for around 600 calories less than your usual daily intake. Low calorie diets (LCD 800-1600kcal/day) can be used for more rapid weight loss initially but it is important to keep them nutritionally complete. Very low-calorie diets (VLCD less than 800kcal/day) have significant health risks and should only be used under medical supervision. See here for more information; <https://www.indi.ie/all-food-facts-and-fact-sheets.html#Healthy>

Diet as part of a Healthy Lifestyle

Really, we should be looking at healthy eating as part of a healthy lifestyle rather than a specific diet. One of the most studied diets/lifestyles with good evidence for sustainability is that of the Mediterranean. It has been shown to have positive cardiovascular (heart) health effects as well as metabolic benefits that assist in long term weight control. Their diet is based on pulses (beans, peas lentils etc), vegetables, healthy fats (olive and rapeseed oils), oily fish (mackerel, salmon, anchovies, sardines, herring etc), nuts and fruit, reduced red meat.

Mediterranean people tend to eat together at the table instead of in front of the TV. There is a culture of enjoying food, the fresh local ingredients,

preparation, and consumption. Ultra-processed foods (factory made with ingredients you would not recognise in your pantry) are uncommon. Most food is prepared in the home from raw, unprocessed ingredients. If there is consumption of alcohol this tends to be only modest and generally consists of a glass of red wine with the meal. This naturally tends towards eating slowly, giving the body time to feel full, and eating healthier foods.

Of course, the climate and lifestyle in the Mediterranean also favours exercise outdoors. While we may have to modify things for where we live and our specific circumstances there is much we can learn from this. Small adjustments over time, learning new recipes and taking more of an interest both in preparing and consuming our food in a healthy way can lead to a sustainable and enjoyable adjustment to our lifestyle which will help maintain a healthy weight as well as body and mind.

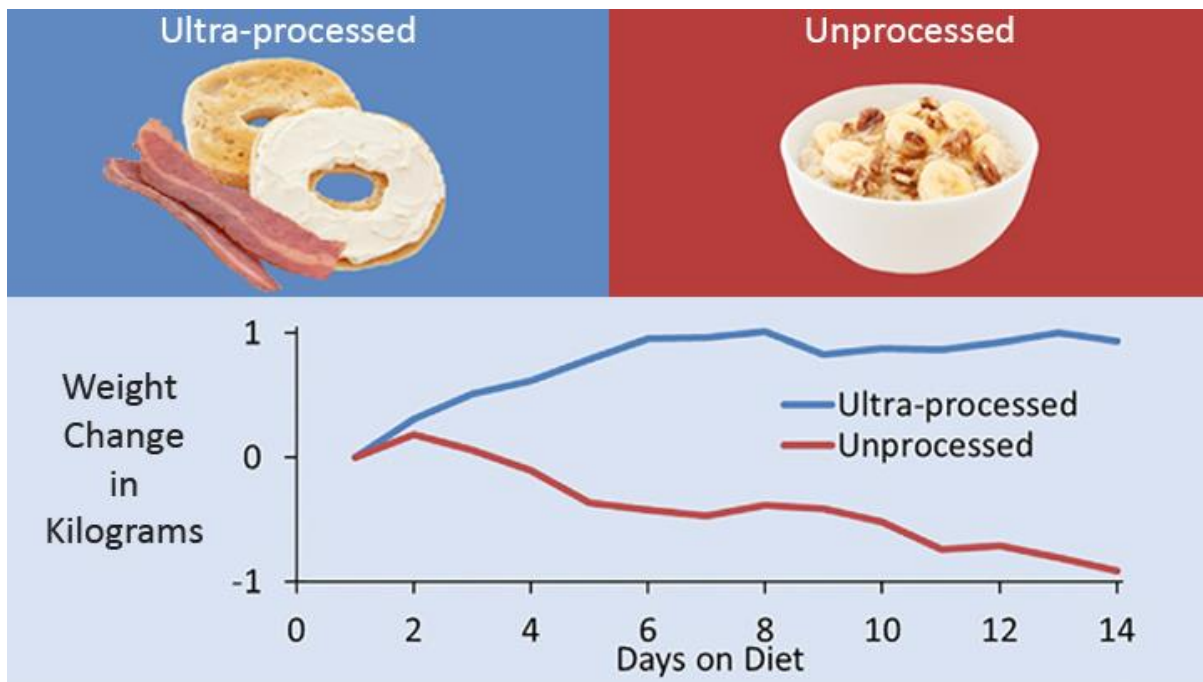
See here for more information;

<https://www.bhf.org.uk/information-support/heart-matters-magazine/nutrition/mediterranean-diet>

Ultra Processed Food

Ultra-processed food is, in short, generally found in plastic wrapping and contains at least one ingredient that you would not normally find in an average kitchen. It is likely that you currently get many of your calories from ultra-processed food. For example, most sandwiches use ultra-processed bread and sauces, almost all beverages, bars and snacks, ready meals etc are ultra-processed. Your body has not evolved to consume ultra-processed foods, they cause obesity, detrimental changes to your microbiome and are strongly associated with many inflammatory and cardiovascular diseases. Ultra-processed foods are addictive. An effective and sustainable way to lose weight is to reduce your consumption of ultra-processed foods.

Ultra-processed food causes obesity



Credit: Hall et al., Cell Metabolism, 2019

Microbiome

The gut microbiome consists of all the bacteria, fungus and viruses living in your gut. This sounds bad but in fact your microbiome can work with you to improve your health. The more diverse your microbiome the better your health will tend to be and the more likely you are to maintain a healthy weight. Transplanting the microbiome from a healthy individual to an unhealthy one has been shown to improve health and weight.

A diverse microbiome improves health and maintains a lower weight.

To help maintain your microbiome you should make your diet as diverse as possible with a focus on increasing fibre and fermented foods. Things of particular benefit include high fibre foods like, artichoke, peas, beans and pulses, fermented foods and drinks like, Kombucha, kefir, yoghurts, home-made sourdough, and food and drinks high in polyphenols such as berries, nuts, cocoa, coffee, herbs/spices and red wine.

The watchword should be variety! Of course, care should be taken not to eat lots of sweet chocolate or drink lots of red wine because it contains some

compounds which are beneficial, they also contain others which are harmful in excess.

Look after your microbiome and it will look after you.

Sleep

Not many people realise the importance of good sleep. When it comes to overweight and obesity sleep deprivation is associated with metabolic changes that affect the breakdown and metabolism of glucose (your body's fuel). It also affects hormones associated with satiety (feeling full) and hunger. The bottom line is that poor sleep is associated with an increased risk of overweight and obesity among other things.

Sleep Hygiene

For many of us lack of sleep is simply a matter of poor sleep hygiene. That is, we don't go to bed at the right times, get up at the right times, or take basic actions to wind down to sleep. Simple changes we make could have a big impact;

- Set a reasonable time for going to bed (smart phones or watches can often do this).
- Develop a routine of winding down such as turning off the TV, reading or listening to relaxing music and putting away screens.
- Avoid caffeine, too much fluid or food before bed.
- Develop a relaxation technique such as a breathing exercise, mindfulness or simply counting sheep in your head. Use this any time you are awake in bed.
- Make your bedroom a relaxing environment, removing screens and distractions.
- Get up at a regular time.

Insomnia

If you have more severe problems with your sleep such as insomnia you should discuss these in detail with us. It may be that you would benefit from cognitive behavioural therapy (CBT). There is a more complete guide to sleep here:

<https://web.nth.nhs.uk/selfhelp/leaflets/Sleeping%20Problems.pdf>

Obstructive Sleep apnoea

Obstructive sleep apnoea (OSA) is a medical condition which causes periods of stopping breathing when asleep and is often linked to overweight and obesity. The symptoms include, loud snoring, waking up a lot, making gasping, snorting or choking noises, breathing stopping and starting. People with OSA will often wake with a headache, will feel tired, lack concentration, and may have mood swings.

If you have concerns about OSA please discuss them with us. We can arrange assessment and treatment. Weight reduction is a very effective way of managing OSA, but you may require other interventions such as CPAP (a breathing device) until a healthy weight is achieved. Exercise is also helpful whereas smoking, alcohol and sleeping pills are all dangerous. Uncontrolled sleep apnoea can lead to cardiovascular and metabolic diseases.

Health

For many reasons, obvious and otherwise, your general health can influence your energy balance leading to overweight or obesity and vice versa your weight can have significant health implications. Common problems that can make you more likely to put on weight include arthritis, thyroid disorders, mobility issues, medications. Some of these make it more difficult, but not impossible, to get the recommended amount of exercise. Others may influence your appetite or metabolism.

It is important to discuss any health concerns you may have and how these may influence your weight. Sometimes these can be addressed through medications and other interventions and sometimes we must work out a way around them. In any assessment of overweight and obesity we will look for other associated health complications such as signs of high blood pressure, heart disease, diabetes, metabolic disorders. Blood tests and other investigations may be required for this and sometimes a referral will be required for specialist investigations.

Medical Interventions

Medication can be used to help with weight reduction and maintenance. This should only be started after medical assessment and in conjunction with dietary and lifestyle interventions. These include Orlistat (Xenical, Alli), Liraglutide (Saxenda, Victoza) and Semaglutide (Ozempic, Wegovy).

Orlistat (Xenical, Alli)

Orlistat is a tablet that inhibits fat digestion. It is taken with meals. Patients should take supplements of fat-soluble vitamins (A,D,E,K). It can cause steatorrhoea (loose fatty stools) if fat is not restricted from the diet. It has been shown to double effective weight loss in clinical trials when compared to lifestyle interventions only.

Liraglutide (Saxenda, Victoza)

Liraglutide is a daily injection that mimics a hormone released after you eat and thus regulates hunger. Its effect will cease once discontinued so it may need to be used for prolonged periods or indefinitely to maintain weight loss.

Liraglutide is available on the HSE to patients who meet strict criteria under the GMS and Drugs Payments Scheme. An application must be made for approval including BMI>35, prediabetes, and cardiovascular risk factors as well as evidence of significant lifestyle and behavioural modifications.

Semaglutide (Ozempic, Wegovy)

Semaglutide is a once weekly injection that mimics a hormone released after you eat and thus regulates hunger. Its effect will cease once discontinued so it may need to be used for prolonged periods or indefinitely to maintain weight loss. In trials it showed a greater effect than Liraglutide with a 12% weight reduction compared to placebo.

Bariatric Surgery

Surgery can help people to lose between 20 and 40% of their weight along with lifestyle modifications but it is normally reserved for people that have serious health problems caused by their weight and where other interventions have failed. People need long term follow-up after surgery as they can have digestive issues, gallstones, or vitamin deficiencies. Often blood tests are required to monitor, and lifestyle changes will need to be maintained to prevent weight gain. We can refer to appropriate clinics if you wish to consider this option.

Metabolism

Metabolism is the process by which your body converts food into energy. This is a complex process involving many stages and many communicating 'hormones' in the body. There is an obvious link between metabolism and

overweight and obesity but less well known is the link obesity has on your metabolism.

Traditionally it was understood that fat cells were simply an energy store. More recently research has revealed that your fat tissue acts more like an endocrine gland (hormone producer) and is involved in the mediation of many systems in your body, most importantly, your metabolism. The hormones secreted from adipose (fat) tissue influence energy homeostasis (balance), glucose and lipid metabolism, vascular homeostasis, immune response, and reproductive functions.

The hormone 'leptin' is produced in fat cells and should control appetite. However, people with obesity appear less sensitive to the effects of leptin and this leads to poor control of appetite. The exact cause is unknown, there may be a genetic component or perhaps the excess leptin production leads to a desensitisation.

Insulin, released by the pancreas is a hormone that regulates sugar uptake from the blood and is important in the metabolism of fat. People who are obese often have resistance to insulin and sometimes reduced production which can lead to type 2 diabetes.

The sex hormones such as oestrogen are important in the distribution of body fat. Oestrogen is produced in small amounts in fat tissues, and it is thought that excess fat tissue is a contributing factor in the development of PCOS (polycystic ovarian syndrome). In premenopausal state the extra oestrogen produced in women often cause fat to be distributed in the hips (pear shape) whereas post-menopausal lack of oestrogen can cause central weight gain (apple shape). This is more harmful and has greater health implications. HRT (hormone replacement therapy) in suitable individuals can help with this.

There is some evidence that being overweight or obese can lead to a 'resetting' of some of the hormones responsible for the formation and distribution of fat as well as hunger and appetite. It is hopeful that if weight loss can be managed in a sustainable way that these levels will return to normal and help maintain a healthy weight.

Conclusion

As can be seen overweight and obesity are complex conditions with many influencing factors as well as potential health consequences. Obesity needs to

be taken seriously as a disease. Like with many things there is no quick fix, but a holistic, sustainable, and well supported programme of change is shown to be most effective. Medications can support change and help to correct hormonal dysfunctions. A healthy lifestyle leads to improvements in weight, health, and quality of life. We are here to support you with regular reviews and evidence-based care throughout your journey.