

Clinical Guidelines for Weight Management in New Zealand Adults

This guideline represents a statement of best practice based on the available evidence and expert consensus. It is not intended to replace practitioners' judgement. In each case, practitioners should consider the individual's clinical state, age and co-morbidities; the individual's and their family/whānau preferences.

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Foreword

Evidence shows that poor diet, excess weight and physical inactivity are three major modifiable risk factors that contribute to early death, illness and disability in New Zealanders. Identifying and supporting people who require help with weight management will help empower them to ‘live well, stay well, and get well’, consistent with the New Zealand Health Strategy (Ministry of Health 2016b).

Health practitioners working in community and primary health care settings are often the first point of contact with the health system. They are well placed to identify whether an adult is overweight or obese, support them to attain and maintain a healthy weight, and coordinate referral to specialist services if required.

This limited update of the *Clinical Guidelines for Weight Management in New Zealand Adults* will equip health practitioners with the most up-to-date tools to monitor, assess manage and support overweight and obese adults to attain and maintain a healthy weight. The aim of the guidance is to improve health outcomes and equity of health outcomes for those with excess weight.

The guidance is our interpretation of key international evidence for the New Zealand context. We encourage health practitioners and others to use this information as the basis for helping New Zealand adults to attain and maintain a healthy weight.

Chai Chuah
Director-General of Health

Acknowledgements

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The Guidelines Technical Advisory Group comprised eight members with technical expertise in weight management:

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Executive summary

This document provides clinical guidance for health practitioners and others who provide advice on weight management for New Zealand adults. This guideline updates those published in 2009 (Ministry of Health and Clinical Trials Research Unit 2009a), hereafter referred to as the 2009 Guidelines.

These Guidelines only include references to research that has been published since the 2009 Guidelines. A Guidelines Technical Advisory Group (GTAG) was commissioned to consider New Zealand population-specific research, and review recent meta-analyses, systematic reviews and large randomised controlled trials. It did not undertake a formal Grading of Recommendation, Assessment, Development and Evaluation (GRADE) analysis for this update. For earlier references and more detailed background, including on GRADE analysis, refer to the 2009 Guidelines.

The GTAG found that, in general, recent evidence supported and/or strengthened the 2009 Guidelines recommendations. A notable new addition to the evidence is recognition of the association between sufficient sleep and a healthy weight for adults.

These Guidelines present a four-stage pathway designed to facilitate clinical decision-making for the identification and management of unhealthy weight in adults. We acknowledge that health practitioners may not have time during a single consultation to complete a full assessment or develop a weight management plan. However, a practitioner can provide brief motivational advice with follow-up as appropriate during subsequent consultations, and/or refer to other relevant services if required. Starting points and approaches may differ, depending on existing relationships between people and practitioners.

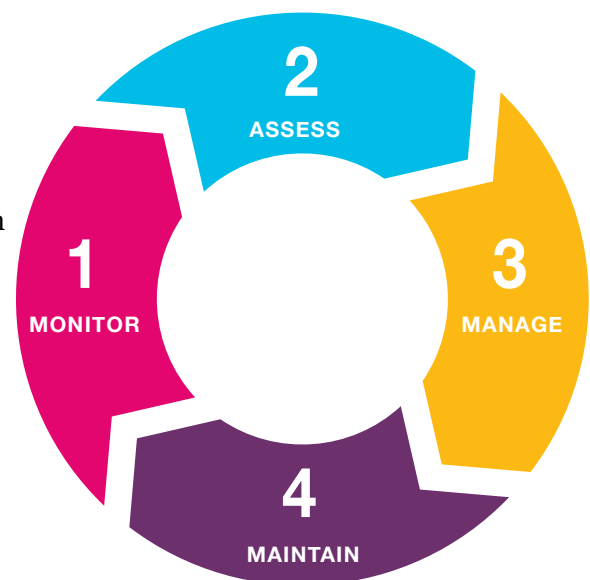
The four stages

1. Monitor: Because the effectiveness of most weight-loss strategies and plans, particularly in the longer-term, is limited, practitioners should regularly monitor all adults' weight, to identify excess weight gain and suggest small diet and activity changes before someone becomes overweight or obese.

2. Assess: The assessment stage involves taking a full history and examination for adults with a Body Mass Index (BMI) over 30kg/m², or BMI 25-29.9 and waist circumference over 88cm for women or 102cm for men, to identify co-morbidities, and possible underlying causes or contributing factors.

3. Manage: Health practitioners work with patients and their family/whanau to develop a weight management plan. The key components of management are FAB: Food and drink, Activity (including reducing sedentary time, and supporting sufficient sleep), and Behavioural strategies.

4. Maintain: Management of weight is a life-long journey. After achieving weight loss, people need to continue to undertake long-term follow-up and monitoring to maintain positive changes and make use of additional support.



A summary of the key information in the Guidelines is available online in the Practice Essentials: Weight Management for Adults. Practical advice and sleep tips for the public are available separately.

An accompanying updated clinical guideline for weight management in New Zealand Children and Young People was published in 2016. The two sets of guidelines sit alongside the *Eating and Activity Guidelines for New Zealand Adults* (Ministry of Health 2015b) and the *Food and Nutrition Guidelines for Healthy Children and Young People* (Ministry of Health 2012 [partially revised 2015]), which provide advice on healthy eating and being physically active to achieve, maintain and support good health and a healthy body weight.

In order for the system to improve the equity of health outcomes for New Zealand adults, it is important that all health practitioners are culturally competent. By providing appropriate weight management support, we can help all New Zealand adults to improve their wellbeing and live longer, healthier lives.

Background

Excess weight gain can have serious health consequences (Table 1). Obesity in adults is associated with a number of health conditions, including type 2 diabetes, ischaemic heart disease, stroke, several common cancers, osteoarthritis, sleep apnoea and reproductive abnormalities.

Table 1: Risk factors and co-morbidities of overweight and obesity in New Zealand adults

Body system	Risk factor or co-morbidity
Cardiovascular	Hypertension and hyperlipidaemia Coronary heart disease, including coronary artery disease Congestive heart failure and left ventricular hypertrophy Thrombophlebitis and deep venous thrombosis Varicose veins and venous stasis ulcers Pulmonary embolism
Endocrine	Insulin resistance and type 2 diabetes Polycystic ovary syndrome
Gastrointestinal and hepatobiliary	Abdominal hernia Gastro-oesophageal reflux disease Gallstones Non-alcoholic fatty liver disease Colorectal cancer
Genito-urinary	Stress urinary incontinence Urinary tract infections Prostate cancer
Musculoskeletal	Cellulitis and carbuncles Carpal tunnel syndrome Degenerative joint disease (eg, osteoarthritis) Gout
Neurologic and psychiatric	Anxiety and depression Idiopathic intra-cranial hypertension Stroke
Obstetric and gynaecologic	Infertility Miscarriage Gestational diabetes
Pulmonary	Dyspnoea Asthma Obesity hypoventilation syndrome Obstructive sleep apnoea

Source: Ministry of Health and Clinical Trials Research Unit 2009

Overweight and obesity are prevalent in all population groups, but variation exists in their distribution across the New Zealand population.

In 2015–2016, adult obesity rates¹ were highest in Pacific (67%) and Māori (47%) and lowest in Asian (15%). After adjusting for age and sex differences, Pacific and Māori adults were more likely to be obese than non-Pacific and non-Māori adults respectively, and Asian adults were less likely to be obese than non-Asian adults (Ministry of Health 2016c).

Of those living in the most deprived areas, 42 percent were obese, compared with 22 percent in the least deprived areas.

There has been a significant increase in mean waist circumference between 2006/07 and 2015/16 for all age groups (15 years and over), and all ethnic groups (Māori, Pacific, Asian and European/Other).

Health practitioners can help improve health outcomes and the equity of health outcomes by offering weight management support in partnership with the patient in a way that they understand, and that is culturally appropriate.

Health literacy in the context of weight management

The term ‘health literacy’ refers to a person’s ability to obtain, process, understand and act on basic health information and services to make appropriate health decisions (Ministry of Health 2010). Health literacy includes the extent to which an individual is able to navigate and interact with our health system. The term also covers their expectations about health and wellbeing; their understanding of health messages, medicine labels and nutrition information; and their ability to fill out forms or talk with their doctor or nurse.

Health literacy applies to services, as well as users of services. A health literate service recognises that good health literacy practice contributes to improved health outcomes and reduced health costs.

Health practitioners should develop their ability to assist people with different levels of health literacy, including their ability to tailor the style of communication. Practitioners should endeavour to maintain a culturally competent practice.

The Ministry of Health’s Framework for Health Literacy supports a culture shift whereby health literacy becomes core business at all levels of the health system.

In the context of health literacy regarding weight management, health practitioners should:

- establish long-term trust relationships with patients to build a shared understanding of values, priorities and weight management strategies
- routinely review weight management plans
- use relevant support services to address identified barriers
- develop collaborative partnerships with Māori health providers, Whānau Ora providers and other community-based organisations that provide weight management education and services to ensure advice is consistent, relevant and comprehensive (Ministry of Health 2014).

1. The New Zealand Health Survey defines obesity as having a BMI of 30kg/m² or over.

For more information on health literacy, see these publications:

- *Health Literacy Review: A guide* (Ministry of Health 2015c)
- *A Framework for Health Literacy* (Ministry of Health 2015a)
- *Three steps to better health literacy – a guide for health professionals* (Health Quality & Safety Commission 2014).

Cultural competence

Culturally competent health practitioners are aware of cultural diversity and have the ability to engage effectively and respectfully with people of different cultural backgrounds. They also acknowledge their own biases and how these biases manifest when they treat patients.

Health practitioners can support engagement and health literacy by learning, appreciating, developing and applying a culturally responsive approach. In primary care, this approach should extend to the practice as a whole, including receptionists, general practitioners, nursing staff and other health practitioners.

To support cultural competence, each stage of the Guidelines includes good practice points. They aim to provide achievable actions that will enhance practitioners' engagement with their patients/clients.

The Ministry of Health offers a free online foundation course in cultural competence for all people working in the New Zealand health sector (<http://learnonline.health.nz/course/category.php?id=84>).

Guideline stages



1. Monitor

Regular monitoring of weight is important for the early identification of people who may need extra support and weight management.

Body mass index (BMI) is a simple weight to height ratio (kg/m^2) that practitioners use to classify overweight and obese (Table 2). Underweight is defined as a BMI less than $18.5 \text{ kg}/\text{m}^2$. Being underweight can increase disease risk, but is not the focus of these Guidelines. (See Appendix 1 for more information on how to measure BMI.)

BMI may not be as accurate an indicator of overweight in highly muscular people, or in ethnic groups with smaller body stature. In Asians, for example, practitioners should consider lowering the treatment threshold in the presence of central/abdominal obesity (as determined by waist circumference) or additional risk factors. There is no evidence that higher cut-offs for Māori and Pacific are justified with regard to cardiometabolic risk factors (Taylor et al 2010).

Measuring waist circumference provides a simple estimate of the degree of central adiposity in an individual with acceptable levels of agreement with total abdominal fat as measured by laboratory-based techniques (eg, DEXA and CT). The accumulation of fat around the trunk has been shown to be an important risk factor for numerous negative health outcomes, including cardiovascular disease and type 2 diabetes. Table 2 summarises the recommended cut-off points for overweight or obesity, and the association with disease risk. The reliability of waist circumference depends on the experience of the measurer. (See Appendix 1 for more information on how to measure waist circumference.)

Table 2: Combined recommendations of body mass index and waist circumference cut-off points made for overweight or obesity, and association with disease risk

Classification	Body mass index (kg/m^2)	Class	Disease risk* relative to normal weight and waist circumference (WC)	
			Men WC = 94–102 cm	Men WC >102 cm
			Women WC = 80–88 cm	Women WC >88 cm
Normal weight ⁺	18.5–24.9	–	–	–
Overweight	25.0–29.9	Increased		High
Obese				
Mild	30.0–34.9	I	High	Very high
Moderate	35.0–39.9	II	Very high	Very high
Extreme	$\geq 40.0+$	III	Extremely high	Extremely high

* For type 2 diabetes, hypertension and cardiovascular disease.

+ Increased waist circumference can also be a marker for increased risk even in people of normal weight.

Source: NHLBI Obesity Education Initiative 2000.

Good practice points for engagement

- Ensure a welcoming environment (eg, a friendly greeting from the receptionist, a waiting room space for family/whānau, information available in te reo Māori or another appropriate language).
- Acknowledge the role of the broader family/whānau and other environmental factors in the person's care, and engage in discussions to discover concerns, provide support and to celebrate improved health outcomes. Do not assume it is appropriate to involve family/whānau – always ask.
- Spend time getting to know the person and their family/whānau during their visit. Building a relationship allows a greater understanding of their life situation or lived realities; if they are comfortable with you, they are more likely to feel comfortable asking questions and coming back for further advice.
- Take your time to listen, and to explain things at a pace that allows time for individual contribution. Take your cues from the person, and from his or her family/whānau.
- Acknowledge when you are uncertain about cultural processes.
- Know who to contact for support, translation and cultural advice.

Be aware of cultural sensitivities to body parts and body image when measuring height and weight. Consider using the term 'unhealthy weight'. If using the term 'obesity', emphasise that 'obesity' is a clinical term with health implications, rather than a judgement of how one looks.

Evidence update

A meta-analysis of 89 prospective cohort studies found significant associations for overweight with the incidence of type 2 diabetes; all cancers except oesophageal (female), pancreatic and prostate cancer; all cardiovascular diseases (except congestive heart failure); asthma; gallbladder disease; osteoarthritis; and chronic back pain. The meta-analysis found statistically significant associations for obesity with the incidence of type 2 diabetes; all cancers except oesophageal and prostate cancer; all cardiovascular diseases; asthma; gallbladder disease; osteoarthritis; and chronic back pain. Both overweight and obesity as defined by body mass index (BMI) were most strongly associated with the incidence of type 2 diabetes in females (Guh et al 2009).

A 2016 review by The World Cancer Research Fund International found that there is strong, convincing evidence that overweight and obesity as defined by BMI is associated with an increased risk of cancers of the oesophagus (adenocarcinoma only), pancreas, liver, colorectum, post-menopausal breast, endometrium and kidney and a probable increased risk of cancers of the stomach (cardia cancer only), gallbladder, ovary and prostate (World Cancer Research Fund 2016).

The ratio of fat to lean mass may be relatively higher in South Asian population groups than in other population groups; Chinese population groups fall between Indian and European groups (Rush et al 2009; Wulan et al 2010).

A World Health Organization expert consultation on waist circumference and waist-hip ratio (World Health Organization 2011) found that: 'With respect to ethnicity-specific cut-off points, there was substantial evidence of population-dependent variations in association of disease risk with measures of abdominal obesity. However, other evidence discouraged the development and use of ethnically based cut-off points. The populations of greatest interest in this respect are of Asian descent, because risks of certain diseases (eg, diabetes) are notably higher in these populations than would be expected from their mean BMI levels.'

Recommendations

To monitor people's weight according to best practice, practitioners should take the following steps.

1. Record height using a stadiometer.
2. Measure weight (with shoes and heavy clothing removed) and calculate and record BMI regularly (eg, annually).
3. Use waist circumference to provide useful additional information, especially if you suspect excess intra-abdominal fat in people who are overweight but not obese.

To measure waist circumference:

- Ask the person to hold the end of a measuring tape and to turn around. The tape should be horizontal and lie loosely against the skin.
- Record waist circumference midway between the lower rib margin and the iliac crest to the nearest 1 cm.

Disease risk is increased when waist circumference is over 80cm for women or 94cm for men. Disease risk is considered high when waist circumference is over 88cm for women, or 102cm for men (Table 2). Consider lowering these thresholds for patients of Asian ethnicities.

For more information on how to accurately measure height and weight and waist circumference refer to Appendix 1.

Next steps

Monitor weight opportunistically (ideally annually) if BMI is:

If BMI is 18.5 to 25kg/m² and stable

- Monitor weight opportunistically (ideally annually)

If BMI is less than 25kg/m² but trending upwards or if BMI between 25kg/m² and 29.9kg/m², and waist circumference is less than 88cm (women) or 102cm (men)²

- Offer brief food and activity advice
- Monitor weight and waist circumference opportunistically (ideally every 6 to 12 months)

If BMI is between 25kg/m² and 29.9kg/m² and waist circumference is over 88cm (women) or 102cm (men) or if BMI is over 30kg/m²

- Discuss current and long-term health risks³

→ Proceed to Stage 2: Assess

-
2. Consider lowering the waist circumference threshold for people of Asian ethnicities due to their higher ratio of fat to lean mass.
 3. Healthy people with a high amount of muscle mass, such as athletes, may be classified as obese.

2. Assess

Assessment should determine current health risks along with lifestyle habits that may be susceptible to positive change; identify barriers and enablers, contributing factors or conditions; and exclude endocrine and other causes of obesity.



Good practice points for engagement

- It is important that everyone understands what is being said. Avoid jargon, and explain any health terms clearly. If English is a patient's second language, consider using a translator.
- Thoughtful and individualised communication builds effective relationships. Reflect on your own communication preferences; think about what messages your body language might be giving, as well as the words and tone that you use.
- Use the 'teach back' technique – keep checking that your information is being understood eg, by asking the patient to explain what you've told them. For more information see *Three steps to better health literacy* www.healthliteracy.org.nz/wp-content/uploads/2013/11/Health-literacy-information-booklet.pdf.
- Consider undergoing training on how to talk about weight issues with family/whānau (eg, Healthy Conversation Skills training: www.healthystartworkforce.auckland.ac.nz/en/our-education-programmes/healthyconversations.html).

Recommendations

To assess a person's individual health risks, conduct a full history and clinical examination for adults with a BMI of:

- 30 kg/m² or higher, or
- between 25kg/m² and 29.9kg/m² and waist circumference over 88cm (women), or 102cm (men)².

Refer to Background section for Table 1: Risk factors and co-morbidities of overweight and obesity in New Zealand adults.

- Undertake screening and further laboratory studies as necessary:
 - cardiovascular disease (CVD) risk assessment and diabetes screen
 - further laboratory studies and radiological procedures.

Unless otherwise indicated by the history and examination, note adiposity and consider weight management strategies.

History

In taking a history, consider the person's:

- age, sex and ethnicity
- **current physical** (eg, snoring, joint problems, abdominal pain, or breathing difficulties) **and social consequences** (eg, affecting activities of daily living, employment, self-esteem, body image, depression) of their body size
- **family history** of cardiovascular disease (CVD), type 2 diabetes and genetic lipid disorder
- **co-morbidities** such as diabetes, CVD risk factors
- **mental health and well-being** including presence of **eating disorders** (eg, binge eating disorder, bulimia or night eating syndrome) and depression or other mood disorders
- **smoking status and alcohol use**
- possible pregnancy
- contributing factors - precipitating events, injuries or **medications** (eg, antipsychotics or mood stabilisers) that may have contributed to the weight gain
- assess their **readiness** and motivation to make lifestyle changes, including actions they have already taken to address the weight gain, and beliefs and values
- usual **eating patterns** (eg, by asking about the types of foods they eat, how much they eat, when they eat, whether they eat at night, and whether they have adhered to restrictive or fad diets)
- usual **physical activities, sedentary behaviours** and routines. Consider occupational, recreational, transport, home and incidental activities
- **sleep patterns:** Ask about usual sleep length, patterns, and shift work
- **disordered sleep:** Ask questions to identify whether the person is affected by **sleep apnoea:**
 - Do they fall asleep during the daytime, or have excessive daytime sleepiness?
 - Do they snore?
 - Has anyone witnessed them stop breathing during their sleep?
 - Do they wake up short of breath or feeling like they are being choked?
 - Do they have night sweats?
 - Do they have a morning headache?
 - Do they wake multiple times in the night?
- Use relevant tools to assess a person's sleep apnoea or daytime sleepiness, such as the Narcolepsy Support Group's screening questions (www.narcolepsy.org.nz/_data/assets/pdf_file/0006/6099/ScreeningQuestions.pdf) or the Epworth Sleepiness scale Epworth Sleepiness Scale⁴ (a self-administered eight-question scale).⁵

4. Epworth Sleepiness Scale ([www://epworthsleepinessscale.com/about-the-ess/](http://www.epworthsleepinessscale.com/about-the-ess/)). Note that a license is required to use the Epworth Sleepiness Scale.

5. Source: Ministry of Health and Clinical Trials Research Unit 2009

Clinical examination

Record:

- waist circumference (if not already done as part of Stage 1: Monitor)
- the average of two seated blood pressure measures and pulse
- results of other examinations (as appropriate), such as:
 - an examination of the head and neck, including the thyroid if indicated and neck circumference if the practitioner suspects obstructive sleep apnoea (>42cm is a risk factor)
 - a cardiovascular examination, looking for evidence of cardiomegaly and vascular bruits
 - an examination of the abdomen for hepatomegaly and abdominal panniculus
 - an examination of the extremities for oedema, joint deformities, cellulitis, and osteoarthritic changes.

Undertake a CVD risk assessment and diabetes screen if the person:

- is asymptomatic and has no known risk factors: from age 45 for men and 55 for women
- is Māori, Pacific, or Indo-Asian:⁶ from age 30 for men and 40 for women
- has known CVD risk factors or is at high risk of diabetes: from age 30 for men and 40 for women
- has diabetes mellitus, in which case CVD risk should be assessed annually.
- has a severe mental illness and is over 25 years.

Undertake the following laboratory tests to assess CVD risk and diabetes status:

- single non-fasting total cholesterol (TC): high-density lipoprotein (HDL) ratio. If the TC or TC:HDL ratio is above 8 mmol/L, repeat the test
- single non-fasting glycated haemoglobin HbA1c
- serum creatinine (to calculate the estimated glomerular filtration rate).

Screening and laboratory studies

Further investigations may include:

- liver function tests and, if there is a suspicion of liver disease, an ultrasound
- a mammography or colonoscopy, if the practitioner suspects post-menopausal breast cancer or colon cancer
- an exercise electrocardiogram to investigate ischaemic CVD
- a sleep study for sleep apnoea, if the person is a regular snorer and has an Epworth Sleepiness⁴ score over 10.

6. Indo-Asian peoples include Indian (including Fijian Indian), Sri Lankan, Afghani, Bangladeshi, Nepalese, Pakistani and Tibetan people.

3. Manage

The aim for management is to improve current health and wellbeing, and reduce future risks to health. This can be achieved by addressing the underlying contributing factors to weight gain, preventing further weight gain, and supporting weight loss.

If, based on the assessment (history and clinical examination), there are significant comorbidities or complex needs, consider referral to a multidisciplinary team, appropriate specialist or specialist services (eg, a dietitian) [NICE 2006 (amended 2014)].

For all other patients, realistic goals aimed at changes in Food, Activity (including sleep), and Behavioural strategies (FAB) should be jointly agreed between the practitioner, the individual and, where appropriate, their family/whānau. A plan to regularly review and monitor (ideally every three to six months) progress will also be needed.



Good practice points for engagement

- See good practice points for Step 2 – Assess on page 7.
- Build relationships with Māori and Pacific health providers, Whānau Ora providers and other community-based organisations.
- Ensure that weight management support is consistent, and that the practice offers a range of local and community support options to everybody.

Recommendations

To manage overweight or obese people's weight according to best practice, consider one or some of the following interventions, with priority given to formulating a weight management plan. The subsections below discuss the respective interventions in more detail:

- a weight management plan
- diet
- commercial weight loss programmes
- physical activity and exercise
- sleep
- behavioural strategies
- weight loss drugs
- bariatric surgery
- referral to specialist services.

Discuss health risks with patients and their family/whānau if their BMI is 30kg/m² or over (unless weight is due to being highly muscular), or 25 to 29.9kg/m² with a waist circumference over 102cm for men or 88cm for women (consider lowering the waist circumference threshold for people of Asian ethnicities), and explain the benefits of reducing their weight. In particular:

- interpret measurement results for patients, explain BMI and tell them why their weight could be an issue, especially if they already have a weight-related illness
- inform patients that losing even 5 percent of their body weight would benefit their health
- talk through the patient's eating, physical activity, and sleep habits with them, and motivation to make changes.

Evidence update

A meta-analysis of 32 studies (Rose et al 2013) found that weight loss advice by primary care providers appears to have a significant positive impact (odds ratio = 3.85; 95% confidence interval = 2.71, 5.49; $P < 0.01$) on patient attempts to change behaviours related to their weight.

A synthesis review by Kirk et al (2012) of five systematic reviews and meta-analyses identified that multi-component interventions lead to greater weight loss, whereas single-component interventions are more effective in improving targeted behaviour such as diet or physical activity. Kirk et al also found that three-component interventions (involving diet, physical activity and behaviour change/counselling) were more likely to be successful than one- or two-component interventions.

A clinical effectiveness review of 12 studies found that long-term multi-component (diet, physical activity and behaviour change) weight management interventions were generally shown to promote small changes in weight loss in overweight or obese adults; however, review findings are limited by the heterogeneity of interventions (Loveman et al 2011).

Weight loss interventions for obese men

A systematic review of evidence-based management strategies for obese men found that men preferred more factual information on how to lose weight and more emphasis on physical activity programmes than women did. They also preferred interventions delivered in social settings to those delivered in health-care settings (Robertson et al 2014, Robertson et al 2016). Robertson et al concluded that weight reduction for men is best achieved and maintained with the combination of a reducing diet, physical activity advice or a physical activity programme, and behaviour change techniques.

Weight loss interventions for different ethnic groups

Direct evidence is now emerging of the effectiveness of diet and physical activity interventions for weight management in South Asian population groups (Brown et al 2015). There is a growing body of literature illustrating the effectiveness of lifestyle interventions for diabetes prevention in Māori with pre-diabetes (McAuley et al 2003).

Weight loss interventions for older obese adults

Batsis et al (2017) undertook a systematic review of 19 studies (six to 18 months duration) of obese older adults (aged 60 years and over). Diets were reduced in energy by 500–1,000 kilocalories per day and physical activity study arms included aerobic and resistance exercise. Dietary interventions were consistently associated with weight loss, and improved function whereas exercise alone interventions led to better function but no significant weight loss. Combined diet and exercise interventions were generally better for achieving weight loss, protecting lean body mass and improving metabolic control such as glucose, bone density, as well as cognition; and for improved quality of life.

A weight management plan

Develop a weight management plan in partnership with the person. This should include achievable lifestyle goals, and a plan for review and monitoring. It might also include a target weight loss, which will vary by individual (some people might most realistically and positively aim to maintain their current weight).

Advise people (and especially those with increased CVD risk) that lifestyle changes that produce even modest, sustained weight loss (eg, 5 percent of body weight) produce clinically meaningful health benefits, and greater weight losses produce greater benefits.

Through a weight management plan, help an overweight person to identify lifestyle changes that they would like to make. The plan should encourage small changes initially, to increase a person's confidence and their chance of success (eg, for those not regularly active, the plan could start with 5 or 10 minutes' exercise a day). A food-related goal might be to not buy a sugar sweetened drink when grocery shopping, or to switch from toast-sliced bread to sandwich-sliced bread. Figure 1 has further examples of switches.

Figure 1: Easy Healthy Changes Poster

The poster is titled "Easy Healthy Changes" and is divided into two columns: "Swap this" and "for that". It lists 13 items to be swapped, each with an icon and a description of the healthier alternative.

Swap this	for that
Fizzy drinks	Chilled water with a slice of lemon
Fruit juice	Chilled water and a piece of fruit
Full-fat milk	Reduced-fat milk
White bread	Higher fibre, whole grain bread
Muesli bars	Fresh fruit or a small handful of unsalted nuts
Chippies with creamy dip	Raw vegetable sticks with hummus, or homemade popcorn
Dried fruit	Fresh fruit
High-fat cheese	Reduced-fat cheese such as edam
Butter	Margarine
Coconut cream	'Lite' coconut cream or milk, or half water and half coconut cream
Coconut oil	Small amount of canola, olive, sunflower or rice bran oils
Lard or Dripping	Small amount of canola, olive, sunflower or rice bran oils

At the bottom of the poster, there is a logo for "BIG CHANGE STARTS SMALL", the website "www.myfamily.kiwi", the "hpa health promotion agency" logo, and the text "NPA156 | March 2017".

<https://order.hpa.org.nz/collections/eating-activity/products/easy-healthy-changes-poster>

The plan should take a lifestyle approach, involving a combined rather than single-factor approach to weight loss (illustrated by the FAB concept). Together, a healthy diet, increased physical activity and behavioural strategies are the first line of treatment for reducing overweight and obesity. Such lifestyle changes need to become firmly established habits over the long term.

Diet

Evidence update

Low-energy, very low-energy, low glycaemic index and modified macronutrient diets, coupled with nutrition advice, can all achieve similar weight losses of about 4 kg over 12 months (Vink et al 2016), although weight loss depends on the individual, and may range from weight maintenance to weight losses of over 10 kg.

Johnston et al (2014) reviewed 48 randomised trials and reported that, while both low carbohydrate and low fat diets resulted in significant weight loss at 6 and 12 months, there was no significant difference between the two dietary approaches. Behavioural support had a statistically significant influence on weight loss at 6 months but not at 12 months follow-up, while exercise only resulted in a statistically significant weight loss at 12 months follow-up.

A systematic review and meta-analysis (Stelmach-Mardas and Walkowiak 2016) found that energy restricted diets resulted in a reduction in body mass index (BMI), blood pressure and triglycerides in metabolically healthy obese adults, but no specific diet was identified as the most suitable for healthy obese adults.

Johnston et al (2014), and Stelmach-Mardas and Walkowiak (2016) provide evidence to support the concept that a range of different energy restricted dietary approaches, provided a patient adheres to them can result in weight loss.

Tailor dietary advice to the person and their family/whānau, taking into account co-morbidities, income, access to advice, and previous weight-loss experiences or attempts.

In terms of nutrition in general, advise an overweight or obese person to:

- reduce their total energy intake (by decreasing their overall consumption of foods and drinks that are energy dense and nutrient poor)
- modify the types of foods and drinks they consume (eg, by reducing their intake of sugar-sweetened drinks, alcohol, confectionery or fast food)
- improve the quality of fats and carbohydrates they consume (see Diet recommendations on page 19).

In offering advice, consider whether proposed changes can be maintained long-term, and individual preferences. Explore the cultural connotations certain foods or eating habits may have for particular people, especially Māori, Pacific, and Asian people. Consider:

- types of food available in different contexts (eg, a marae or church-based activities, and festivals)
- seasonal availability of foods.

Dietary approaches

In general, the most important factors to consider when determining the success of a diet are whether nutritional needs are being met and whether a person can maintain positive changes long-term. Dietary recommendations (page 19) outline evidence-based eating recommendations consistent with the Eating and Activity Guidelines (Ministry of Health 2015). Should a person prefer to follow a particular diet, a very brief summary is provided below.

Very-low energy diets

There is some evidence from systematic reviews that very-low energy diets (VLEDs) (diets with a median energy content of 1937 kJ/day (463 kcal/day),⁷ with a median duration 10 weeks) can lead to long-term weight loss, reduced CVD risk and obesity co-morbidities (Mullholland et al 2012, Johansson et al 2014, Parretti et al 2016).

The most frequently reported adverse events after a VLED were transient alopecia, tiredness, dizziness and cold intolerance. One case of gallstones leading to removal of the gallbladder was the only serious adverse event reported in any of the studies (Parretti et al 2016).

Practice points for very-low energy diets

Consider the following if recommending a VLED.

- Follow a VLED for only short periods (such as six to 12 weeks) at a time.
- People on VLEDs need regular follow-up.
- People on VLEDs need to continue a weight maintenance programme to reduce weight regain after transition to non-meal replacements.
- Discuss the following with people on VLEDs:
 - options to supplement meal replacements (eg, non-starchy vegetables and fruits)
 - the importance of achieving ketosis to suppress hunger and self-testing urine for ketosis
 - the importance of avoiding carbohydrate supplementation
 - the need for a small quantity of fat each day (eg, 1 tablespoon of olive oil on salad or vegetables) to contract the gall bladder and prevent gallstones
 - the importance of drinking water/tea when thirsty
 - the importance of abstaining from alcohol and sugar sweetened drinks.
- VLEDs are unsuitable for pregnant or lactating women; children (aged under 16); older people (aged over 65 years); people with moderate to severe renal insufficiency (GFR <45ml/min); and people with severe psychological disturbances, alcohol or drug abuse, porphyria, recent myocardial infarction or unstable angina.

7. One kilocalorie is equivalent to 4.184 kilojoules

Modified macronutrient diets including Mediterranean and DASH diets

Modified macronutrient diets specify distribution ranges for energy intake from various sources that differ substantially from the ranges in the typical New Zealand diet (50–55 percent total energy from carbohydrate, 20–35 percent from total fat and 15–25 percent from protein). Five subcategories are:

- a low-carbohydrate diet ($\leq 40\%$ total energy from carbohydrate)
- a very low-carbohydrate diet [$< 20\%$ total energy from carbohydrate (20–60 g per day)]
- a low-fat diet ($\leq 10\%$ total energy from fat)
- a high-protein diet ($\geq 35\%$ total energy from protein)
- a high-carbohydrate diet ($\geq 65\%$ total energy from carbohydrate).

The Mediterranean diet is high in vegetables and fruit; monounsaturated fats mainly from olive oil; cereals and legumes; a moderate consumption of poultry, fish and dairy products, with little or no red meat.

The dietary approach to stop hypertension (DASH) diet is a diet high in vegetables, fruit, fish, nuts and low-fat dairy products. The DASH diet is a healthy eating pattern which studies have shown lowers blood pressure, contributes to better glycaemic control, lowers risk of cardiovascular diseases and cancer.

Evidence update

Sacks et al (2009) and Martinez et al (2014) looked at the effect of varying proportions of macronutrients in a low-energy diet and found no difference in weight loss. A meta-analysis by Johnston et al (2014) of diets across categories, found that all diets reviewed were better than none.

Evidence for Māori

A randomised control eight-week dietary intervention trial of 84 Māori at risk of type 2 diabetes (Brooking et al 2012) found that, while moderate weight loss occurred on both a high-protein diet and a fat-reduced, fibre-rich carbohydrate diet, the high-protein diet also resulted in a reduction in total body fat and waist circumference.

Low carbohydrate diets

Systematic reviews and meta-analyses (Naude et al 2014, Clifton et al 2014, and Boaz et al 2015) comparing low carbohydrate diets (either high fat or high protein variants) with either balanced (in macronutrient composition) or low fat weight loss diets have found similar levels of weight loss, and a similar effect on cardiovascular and diabetes risk factors between the different diets.

A meta-analysis by Mansoor et al (2016) comparing the effects of low-carbohydrate diets with low-fat diets on cardiovascular risk factors found a mixed effect: greater weight loss for those on low-carbohydrate diets but also a greater increase in HDL-cholesterol and LDL cholesterol.

Mediterranean diet

A systematic review of randomised controlled trials (Mancini et al 2016) of 12 or more months duration, found that the Mediterranean diet was more effective for weight loss, compared with low-fat diets, but similar to the low carbohydrate or American Diabetes diets. The Mediterranean diet resulted in greater improvements in triglyceride levels but all diets used showed similar changes in lipids and blood pressure. The Mediterranean diet improved glycaemic control in people with type 2 diabetes.

Dietary Approach to Stop Hypertension (DASH) diet

A systematic review and meta-analysis (Soltani et al 2016) of the energy restricted DASH diet reported significantly decreased body weight, BMI and waist circumference, and may be better than low-energy diets for reducing weight and body fat in overweight and obese people in the short-term.

Very low-carbohydrate (ketogenic) diets

A systematic review and meta-analysis comparing very low-carbohydrate (ketogenic) diets (VLCKDs) with low-fat diets with follow-up of at least 12 months found slightly greater weight loss on a VLCKD. However, the research did not consider the quality of the low-fat comparison diets (Bueno et al 2013).

Tay et al (2015) compared a high-fibre low-fat diet with a VLCD in adults with type 2 diabetes. Both achieved substantial weight loss at 12 months.

There is limited evidence on the long-term effects of a low-carbohydrate diet on mortality and other health outcomes. Data from the Nurses' Health Study (26 years follow-up) and Health Professionals' Follow-Up (20 years follow-up) cohort studies found that a low-carbohydrate diet based on animal sources was associated with higher all-cause mortality in both men and women, while a vegetable-based low-carbohydrate diet was associated with lower all-cause and cardiovascular disease mortality rates (Fung et al 2010).

Intermittent fasting diets

Intermittent fasting or intermittent energy restriction is a pattern of eating that cycles between periods of fasting and non-fasting. The most common example is the 5-2 diet, where a person eats normally for five days, and then aims for a much lower energy intake (approximately 2100–2500 kilojoules per day) on the remaining two days of the week. Intermittent fasting diets can be as effective as other energy restricted diets, and may be easier for people to adhere to. Little is known about their long-term impact on weight or health.

Evidence update

Systematic reviews and a meta-analysis (Davis et al 2016 and Headland et al 2016) comparing intermittent energy restriction⁸ (IER) with traditional daily energy restriction (DER), found that both were effective strategies for weight loss with comparable losses of fat mass and retention of lean body mass over the short and longer term. The exception being post-menopausal women who may lose more lean body mass on IER compared with the DER diet (Davis et al 2016). Weight loss appeared to plateau at six months (Headland et al 2016) so weight maintenance should also be a part of any weight loss programme.

A systematic review and meta-analysis (Alhamdam et al 2016) comparing alternate day fasting and very low calorie (< 800 kCal/day⁹) found that both diets resulted in short-term weight loss (3–12 weeks' duration). There was no significant difference between diets on body weight or lean body mass but alternate day fasting resulted in greater loss of fat mass.

Low glycaemic index/load diet

Glycaemic index measures a particular carbohydrate-containing food's effect on a person's blood glucose level. Low glycaemic index foods, eg, oatmeal, legumes, and most fruits and non-starchy vegetables are defined as 55 or under; medium, eg, quick oats, brown rice, pita bread as 56–69; and high, eg, white bread, corn flakes, starchy vegetables, shortgrain rice as 70 or over. Fat, fibre, how a food is prepared and ripeness can affect the GI of a food.

Evidence update

Meta-analyses have found that consumption of higher glycaemic index carbohydrates and glycaemic load are associated with an increased risk of myocardial infarction and type 2 diabetes (Jakobsen et al 2010; Bhupathiraju et al 2014). Several other reviews (American Diabetes Association 2013; Wu et al 2015; Gögebakan et al 2011) have reported similar findings.

Vegetarian diets for weight loss

Lacto-ovo vegetarian diets are diets that include dairy products and eggs. A vegan diet excludes all animal products.

Evidence update

A meta-analysis of 12 randomised controlled trials (Huang et al 2015) compared lacto-ovo vegetarian (included dairy products and eggs) and vegan (no animal products) diets with non-vegetarian diets (controls) over a median of 18 weeks. There was large heterogeneity amongst the non-vegetarian diets (low fat, low in simple sugars, lipid lowering and energy restricted) while the vegetarian diets studied were mostly very low fat (<10 % fat) and high carbohydrate. Weight loss was greatest in those on vegan diets, followed by lacto-ovo vegetarian diets, then non-vegetarian diets. Not surprisingly weight loss was greater with energy restricted diets. After one year follow-up, intervention effects were moderated but some benefits remained. It is not clear if the differences in weight loss between vegan and lacto-ovo vegetarian diets were due to differences in total energy intakes of the diets.

8. Intermittent energy restriction included days of restricted energy intake followed by periods of unrestricted energy intakes

9. 800 kCal is equivalent to 3347.2 kilojoules

Food or dietary supplements and weight loss

Food or dietary supplements may be defined as products intended for ingestion that contain one or more 'dietary ingredients' intended to add further nutritional value to (supplement) a diet or make up for a dietary deficiency.

Food supplementation may act as an incentive/reward to modify intakes and improve adherence on weight loss diets.

Evidence update

A systematic review and meta-analysis (Wibisono et al 2016) found that food supplements were associated with greater weight loss than control groups who did not receive supplements. However, the study design meant that it was difficult to separate the effect of dietary supplements from dietary counselling and frequent monitoring.

Diet recommendations

In general, offer overweight and obese people the following nutritional advice.¹⁰

- Eat smaller portion sizes, particularly of energy-dense foods.
- Enjoy a variety of nutritious foods every day, including:
 - plenty of vegetables and fruit
 - grain foods that are mostly wholegrain and naturally high in fibre
 - some milk and milk products, mostly low and reduced fat
 - some legumes, nuts, seeds, fish and other seafood, eggs, poultry (eg, chicken) and/or red meat with the fat removed.
- Choose and prepare foods and drinks:
 - with unsaturated fats (eg, canola, olive, rice bran or vegetable oil, or margarine) instead of saturated fats (eg, butter, cream, lard, dripping or coconut oil)
 - that are low in salt (sodium); if using salt, choose iodised salt
 - with little or no added sugar
 - that are mostly 'whole' and less processed.
- Make plain water your first choice over other drinks.
- If you drink alcohol, keep your intake low or stop altogether. Stop drinking alcohol if you could be pregnant, are pregnant or are trying to get pregnant.
- Buy or gather, prepare, cook and store food in ways that keep it safe to eat.
- Choose lean meat cuts, and limit processed meat products.

Commercial weight loss programmes

A commercial weight loss programme might provide a more intensive intervention for a person who wishes to achieve more rapid weight loss. Such a programme may also provide a more motivating and sustainable option.

10. For more information, see 'Food and physical activity' on the Ministry of Health's website: www.health.govt.nz/your-health/healthy-living/food-and-physical-activity

Evidence update

A systematic review of 45 studies on weight loss programmes observed that most studies had a moderate to high risk of bias, and most trials were short, with high attrition, and lacked blinding (Gudzune et al 2015). Compared with control groups and/or groups that received counselling, Gudzune et al found that people who took part in Jenny Craig (4.9%) or Weight Watchers (2.6%) achieved greater weight loss at 12 months follow-up.

Gudzune et al found that another weight loss programme, Nutrisystem, resulted in at least 3.8 percent greater weight loss at three months follow-up than control/education and counselling. Very-low-calorie programmes (Health Management Resources, Medifast and Optifast) resulted in at least 4.0 percent greater short-term weight loss than counselling, but some attenuation of the effect occurred beyond six months follow-up. The Atkins diet (a high-protein, high-fat, low-carbohydrate diet) resulted in 0.1–2.9 percent greater weight loss at 12 months than counselling, while results for SlimFast were mixed.

There is limited evidence that commercial weight loss programmes have any long-term effects on blood pressure and lipids (Mehta et al 2016).

Physical activity

Physical activity or exercise is an important component of weight-loss programmes, in combination with diet and some form of behavioural support. Higher-dose activity is associated with greater weight loss in comparison to low-dose activity.

The goal of physical activity or exercise in the context of weight loss is to increase energy expenditure and resting metabolic rate.

Practitioners should advise overweight and obese people to undertake a range of physical activities, rather than just one type, as different types of activities are good for health in different ways. For example, aerobic activities are good for the heart and lungs, and for reducing the risk of developing various non-communicable diseases. In contrast, resistance activities are good for strengthening muscles, increasing lean body mass and reducing the risk of falls. Both aerobic and resistance activities can help improve insulin sensitivity to varying degrees.

Evidence update

A systematic review and meta-analysis of 56 studies (Baillot et al 2015) examined the effect of lifestyle interventions incorporating a physical activity component in class II and III obese adults. Results included significant weight loss and improvements in various cardio metabolic risk factors (fat mass, waist circumference, blood pressure, total cholesterol, LDL-cholesterol, triglycerides and fasting insulin ($p < 0.01$)) without significant effect on HDL-cholesterol and fasting blood glucose. However, the authors noted that there was significant heterogeneity between studies.

A 2013 meta-analysis of eight studies provided evidence to support multi-component interventions that included diet, aerobic exercise and resistance training for modest weight loss and improved fasting plasma glucose in at-risk and pre-diabetic adults (Aguiar et al 2013).

Verheggen et al (2016) undertook a systematic review and meta-analysis of 117 studies comparing exercise training (low to vigorous aerobic exercise at least twice a week) and low energy diets (at least 10 percent less energy than habitual diet). Both interventions successfully reduced visceral body fat with the exercise training resulting in larger decreases in body fat, and the low energy diet significantly greater weight loss. During energy restriction both lean body mass and fat mass were lost resulting in weight loss. During exercise training, fat mass decreased while lean body mass and plasma volume increased. These data showed that changes during weight loss did not necessarily reflect changes in body fat, and exercise training conferred health benefits, such as for cardiovascular health, independent of weight loss.

A review of the evidence to support the American College of Sports Medicine Position Stand (Donnelly et al 2009) found that:

- 150 to 250 minutes per week of moderate-intensity physical activity is effective to prevent weight gain but will only produce modest weight loss unless used in combination with moderate diet restriction.
- Regular physical activity of over 250 minutes per week is associated with clinically significant weight loss.
- Resistance training may increase fat-free mass and increase loss of fat mass, and is associated with reductions in health risk, but it does not enhance weight loss.
- Health status is improved with endurance physical activity or resistance training even in the absence of weight loss.

Weight loss and activity in older adults

The importance of improved physical function independent of weight loss should not be underestimated in older adults. Preservation of lean body mass and strength, and prevention of sarcopenia and bone loss are important considerations when recommending weight loss for older obese adults.

The activity recommendations (page 21) guides practitioners in offering advice on physical activity and exercise.

Activity recommendations

In general, offer overweight and obese people the following advice on physical activity and exercise. They might also consider referral to exercise or physical activity programmes such as the Green Prescription programme (a practitioner provides a patient with a written referral allowing them access to support from an exercise professional, and associated community services for increasing their physical activity).

- If you are medically stable but have not recently been regularly active, you may wish to:
 - start with 5 or 10 minutes of exercise a day and work up to more
 - split physical activity into smaller bouts (eg, walking for 10 minutes after each meal) to reach a daily activity target, instead of undertaking it all at once.
- For weight loss, do at least 250 minutes of moderate-intensity aerobic physical activity (eg, brisk walking) spread over the week (eg, 50 minutes a day, five days a week).
- For weight maintenance, do 150 to 250 minutes of moderate-intensity aerobic physical activity spread over the week (eg, 30 minutes a day, five days a week).
- Reduce recreational screen time (watching television, videos or DVDs; playing on the computer; or playing inactive video games).
- Break up sitting time; move more, sit less.
- Be active in as many ways as possible (eg, in the context of work, leisure and travel) in activities you enjoy. Consider taking part in group-based activities. Use every opportunity to add physical activity to your daily life (eg, climbing stairs instead of using lifts and escalators).
- Include muscle-strengthening/resistance activities on two or more days of the week. Note that muscle-strengthening activities may result in initial weight gain, due to changes in muscle mass.
- For more tips, see ‘Starting physical activity when you haven’t been active’ on the Ministry of Health’s website: www.health.govt.nz/your-health/healthy-living/food-and-physical-activity/physical-activity/being-active-everyone-every-age/starting-physical-activity-when-you-havent-been-active
- For low- and no-cost ideas for physical activities, see ‘Types of activity’ on the Ministry of Health’s website: www.health.govt.nz/your-health/healthy-living/food-and-physical-activity/physical-activity/types-activity

Sleep

Evidence update

There is convincing evidence, predominantly from observational studies, that insufficient sleep is associated with increased energy intake and weight gain (Patel and Hu 2008). However, there are limitations in the evidence regarding the causality of this association, particularly with respect to temporality between exposure and outcome, possible bidirectional causal effects (eg, sleep apnoea), and possible confounders (Nielsen et al 2010).

Rotating night-shift work is a risk factor for both obesity and type 2 diabetes. This may be partly due to its negative impact on circadian rhythm, quality and quantity of sleep, diet and physical activity (Pan et al 2011).

There is insufficient evidence, to date, that teaching adults how to get a better night's sleep can lower their risk of obesity or help them lose weight.¹¹ Nevertheless, providing advice on recommended hours of sleep, together with sleep tips, may be of benefit and is unlikely to do harm. Sufficient sleep has other benefits, such as increased alertness, improved mood and enhanced quality of life.

Obstructive sleep apnoea

Being overweight or obese is a risk factor for obstructive sleep apnoea (OSA). This condition is caused by complete or partial obstruction of the upper airway. It is characterised by repetitive episodes of shallow or paused breathing during sleep, despite the effort to breathe, and is usually associated with a reduction in blood oxygen saturation. It can occur at any age. In children, it is often the result of enlarged tonsils or adenoids. In adults, OSA is more common in middle-aged and older people. It is more common in men than in women, although after menopause the risk becomes similar. Many, but not all, people with OSA are overweight. Being overweight can cause a narrowing of the throat due to fatty tissue, which contributes to the likelihood of OSA. Also, having a large waistline can make the lungs smaller during the night, which makes the throat more likely to collapse. Some people are born with a narrow throat, or have a facial structure that leads to narrowing of the throat.¹²

More detailed information on the diagnosis and management of OSA in New Zealand is available at BPAC (www.bpac.org.nz/BPJ/2012/november/apnoea.aspx).

11. See 'Waking Up to Sleep's Role in Weight Control' on Harvard School of Public Health's 'Obesity Prevention Source Website': www.hsph.harvard.edu/obesity-prevention-source/obesity-causes/sleep-and-obesity/ (accessed on 17 March 2017).

12. See the information sheet 'Obstructive Sleep Apnoea', available on the website of the Australasian Sleep Association: www.sleep.org.au (accessed 17 March 2017).

The sleep recommendations below guides practitioners in offering advice on sleep.

Sleep recommendations

In general, offer overweight and obese people the following advice on sleep.

Recommended hours of sleep for adults are:

- adults aged 18–65 years: 7 to 9 hours
- adults aged >65 years: 7 to 8 hours.

Some people naturally sleep slightly more or less than the recommended hours. For more information, see the National Sleep Foundation.¹³

If OSA is suspected, an overnight sleep study may be required to confirm the diagnosis. Contact your DHB for information about the availability of sleep clinic services.

Offer the following general sleep advice to patients:

- Maintain a regular sleep pattern, including on the weekends.
- Remember that beds are for sleeping, not entertainment. Remove distractions like televisions and portable electronic devices from the bedroom. Don't stay in bed when you're wide awake.
- Relax and unwind before bed.
- Keep the bedroom quiet and dark, with comfortable bedding and good temperature control.
- Avoid alcohol, caffeine and cigarettes before bed.
- Avoid daytime naps, if you have trouble sleeping at night.
- Don't lie awake watching the clock.
- Avoid sleeping pills except in exceptional circumstances.¹⁴

For more information, see the Australasian Sleep Association website: <https://sleep.org/>

For advice on common sleep mistakes, see Sleep Health Foundation website: www.sleephealthfoundation.org.au/public-information/fact-sheets-a-z/222-sleep-mistakes.html

For sleep advice for shift workers, see 'Shiftwork' Sleep Health Foundation website: www.sleephealthfoundation.org.au/public-information/fact-sheets-a-z/236-shiftwork.html.

Behavioural strategies

Evidence update

Madigan et al (2015) carried out a systematic review and meta-analysis of 21 randomised controlled trials, and found that adding self-weighing to a behavioural weight loss programme might improve weight loss. The authors also found that behavioural weight loss programmes that included self-weighing were more effective than minimal interventions.

Britt et al (2014) found that motivational interviewing had a greater effect for certain ethno-cultural groups; particularly those that commonly experience marginalisation and societal pressure.

13. National Sleep Foundation (www.sleepfoundation.org/how-sleep-works/how-much-sleep-do-we-really-need). Accessed on 7 June 2017.

14. This and the preceding sleep tips are adapted from Sleep Health Foundation 2011.

Behavioural strategies draw on the principles of learning theory. In the context of weight loss, their goal is to alter eating and physical activity behaviours.

The challenge for practitioners seeking to support sustained behaviour change is to engage people through their beliefs and values. Engagement that focuses on action or inaction and what people do can often result in a 'blame' or 'deficit' type of discussion, rather than an empowering one (Ministry of Health 2010a).

One useful tool to support behaviour change is motivational interviewing. This process has four fundamental steps, each building the foundation for the subsequent step, as follows (adapted from Britt et al 2014).

1. Engaging – establishing or (re)establishing relationships/partnerships between the practitioner and the patient and their family/whānau. Acceptance, compassion and support are important in this step. Engagement needs to continue throughout the sessions, visits/appointments.
2. Focusing – the practitioner, the person and their family/whānau work together to focus on a particular area of potential change. This is not a one-off event – a practitioner may need to re-focus or negotiate a new focus if other seemingly important/relevant issues arise.
3. Evoking – the practitioner works to bring forth the underlying motivations for the person and their family/whānau wanting things to be different, and their desire for change. These motivations may emerge early on (if the person has already given thought to the possibility of change), or may emerge with time.
4. Planning – when the person and their family/whānau are ready to change, the practitioner works with them to identify how change may be brought about. This does not always occur immediately, or at all.

Even if a practitioner does not reach the 'planning' stage, by engaging in the first three steps he or she can increase the chances that a person may initiate behaviour change for themselves at a later point.

Behavioural strategies, either group based or individual, reinforce changes in lifestyle; particularly diet and physical activity. More intensive programmes produce greater weight loss at one year than less intensive programmes.

Whānau-based programmes focusing on behavioural strategies may increase weight loss by up to 2 kg compared with individual programmes (Ministry of Health and Clinical Trials Research Unit 2009). Such programmes might involve, at a minimum, the overweight person attending weight-loss meetings with their partner. Adding motivational interviewing to standard behavioural support strategies increases weight loss and reduces the chance of weight regain, but ongoing support may be crucial to maintaining an effect in minority populations. For more information, see BPAC 2008; Britt et al 2014, Healthy Start Workforce Project;¹⁵ and Rollnick et al 2014.

15. Healthy Start Workforce Project. 2016. Healthy Conversation Skills Training. URL: www.healthystartworkforce.auckland.ac.nz/en/our-education-programmes/healthyconversations.html (accessed 6 December 2017). (Note that the primary audience for this training is maternity and child health practitioners, and the material focuses on nutrition and physical activity behaviours in new mothers and children; however, the principles are generalisable to other population groups.)

The behavioural strategies recommendations guides practitioners in offering support.

Behavioural strategies recommendations

In general, offer overweight and obese people the following advice in the context of behavioural strategies.

- Recruit families/whānau, and especially partners, into supporting the weight loss plan; this may also involve the wider family/whānau, and the whole community.
- Identify what changes you wish to work on first (eg, 'increase my physical activity').
- Take part in electronically delivered or face-to-face weight loss or weight maintenance programmes that provide regular contact with a trained interventionist (eg, a clinical psychologist) who helps you engage in high levels of physical activity, monitor your body weight and consume smaller portions of energy-dense foods.
- Use problem solving and incremental goal-setting strategies to set yourself realistic targets (eg, walking 5 minutes per day for the first week, then 10 minutes per day in the second week).
- Identify activities you find enjoyable and are able to build into your everyday life.
- Give yourself appropriate rewards for meeting your goals.
- Treat unmet goals as opportunities to learn more about your current challenges.

The process of providing behavioural support involves identifying and specifying problem behaviours and the circumstances under which they occur. Practitioners can then establish specific, measurable and modest goals with the person, and revise these as they make progress. Encourage monitoring (usually self-monitoring) of target behaviours, to form a record of change. Behavioural strategies often include cognitive strategies to help modify a person's thoughts, which may be barriers to change.

Seven behavioural tools in the context of weight loss are: self-monitoring, stimulus control, stress management, problem solving, contingency management, cognitive restructuring and social support. See Appendix 2 for more information on these tools.

Mental health and weight

Evidence update

In the context of the association between weight loss and mental health, Gattineau and Dent 2011 found the following.

- There are bidirectional associations between mental health problems and obesity; levels of obesity, gender, age and socioeconomic status are key risk factors.
- The mental health of women is more closely related and affected by overweight and obesity than that of men.
- There is strong evidence to suggest an association between obesity and poor mental health in adults.
- Relationships between actual body weight, self-perception of weight and weight stigmatisation are complex, and vary across cultures, age groups and ethnic groups.
- The perception of being obese appears to be more predictive of mental disorders than actual obesity in both adults and children.
- Weight stigma increases vulnerability to depression, low self-esteem, poor body image, maladaptive eating behaviours and exercise avoidance.

As there are bidirectional associations between weight status and mental health, a weight management plan needs to include monitoring, and appropriate management of mental wellbeing.

Mental health and weight recommendations

Intervention strategies should consider both the physical and mental health of patients. Practitioners should monitor the weight of depressive patients and, similarly, monitor the mood of overweight or obese patients. This strategy could facilitate prevention, early detection and co-treatment for people at risk, ultimately reducing the burden of both conditions.

Weight-loss drugs

Weight loss medications may be useful in producing initial weight loss and preventing weight regain in longer-term management. The only medicines approved for weight loss in New Zealand are unsubsidised. Only recommend weight-loss drugs to an overweight or obese person if:

- lifestyle changes have not produced significant benefit after at least six months, and
- the person has a BMI of ≥ 30 kg/m².

Evidence (Yanovski and Yanovski 2014) suggests that orlistat (trade name Xenical: see further information below) can be beneficial if a person has a BMI of ≥ 27 kg/m² and there are significant co-morbidities (eg, type 2 diabetes and sleep apnoea), but this would be an off-label¹⁶ use.

People should always use weight loss drugs in conjunction with lifestyle changes.

16. Off-label use: prescribing an approved medicine for other than the intended indications.

Evidence update

Yanovski and Yanovski (2014) looked at pooled estimates from a meta-analysis of 15 orlistat trials (BMI range from 27 to 50 kg/m²) and found a one-year weight loss of between 3.4 kg (120 mg tds) and 2.5 kg (60 mg tds) greater than placebo-treated controls. Between 35 and 73 percent of those people on the 120 mg tds trials achieved a clinically meaningful weight loss: at least 5 percent of body weight. This dose was also associated with a significant improvement in CVD risk factors, including decreases in total and LDL cholesterol, fasting glucose and systolic and diastolic blood pressure after one year of treatment. However, due to gastrointestinal side effects (increased stool triglyceride), fewer than 10 percent of patients take orlistat for at least one year, and fewer than 2 percent for two years or more.

Evaluate the efficacy of medications after the first three months and regularly throughout the period of use, including careful monitoring for side effects (monthly for the first three months, then quarterly). If a person on a particular weight loss drug achieves a weight loss of <5 percent of initial body weight, then the practitioner should discontinue the treatment. Only orlistat is approved for long-term use in New Zealand.

While other medicines are licensed elsewhere, the two drugs registered for use for weight loss in New Zealand are orlistat and phentermine. The use of low-dose topiramate in combination with low-dose phentermine for weight loss is an off-label use of topiramate in New Zealand (topiramate is approved for the treatment of epilepsy and the prophylaxis of migraine).

Orlistat

Orlistat is a gastrointestinal lipase inhibitor. It binds with lipase in the stomach or small intestine and thereby prevents dietary fat from being broken down and digested.

When recommending orlistat:

- consider it only for people who have not reached their target weight loss through other methods, or have reached a plateau with dietary, activity and behavioural changes
- advise a low-fat diet alongside the drug, as gastrointestinal side effects, including faecal incontinence, are likely if a person eats high-fat meals when taking orlistat
- advise a nutritionally balanced mildly hypocaloric diet, rich in vegetables and fruit, in which the daily intake of fat, carbohydrate and protein is distributed over three main meals
- consider orlistat beyond three months only if the person has lost at least 5 percent of their initial body weight since starting drug therapy (noting that the rate of weight loss may be slower in people with diabetes)
- monitor coagulation parameters, such as international normalised ration values, in patients treated with concomitant oral anticoagulants.
- see the Medsafe data sheet for orlistat¹⁷ or the New Zealand Formulary's website (www.nzf.org.nz) for more information, cautions and drug interactions.

Phentermine

Phentermine is a sympathomimetic amine. It is a stimulant that acts on the central nervous system and suppresses appetite. When combined with topiramate, greater effects on appetite suppression are seen with a lower dose of phentermine; this is an off-label use of topiramate.

17. www.medsafe.govt.nz/profs/datasheet/x/Xenicalcap.pdf (accessed 21 March 2017).

Phentermine is registered for short-term (three-month) use in the management of obesity, as an adjunct to dietary management of obesity under medical supervision. It works by suppressing a person's hunger. Use phentermine with caution, as it is associated with a range of side effects, including tachycardia, hypertension and insomnia. It is available in New Zealand as a 15-mg dose (starting dose) and a 30-mg dose (maintenance dose) to be taken in the morning, to reduce insomnia. Phentermine is available only on prescription.

Refer to the Medsafe data sheet for duromine¹⁸ (Phentermine) or the New Zealand Formulary's website (www.nzf.org.nz) for more information, cautions and drug interactions.

Bariatric surgery

Evidence update

The effectiveness of bariatric surgery for weight loss is well established (Colquitt et al 2014; Chang et al 2014). In addition to reduced mortality due to cardiovascular disease and cancer, bariatric surgery has also been associated with improvements in the management of diabetes (Courcoulas et al 2015; Ding et al 2015; Mingrone et al 2015; Schauer et al 2014, Murphy et al 2017).

A five-year prospective study in New Zealand observed improvement and resolution rates at five years after laparoscopic sleeve gastrectomy for type 2 diabetes (79% resolution), hypertension (61%) and obstructive sleep apnoea (73%) (Lemanu et al 2015).

Giordano and Victorzon (2015) recently carried out a systematic review of 26 bariatric surgery studies (involving 8,149 patients) in people aged over 60 years, and reported similar mortality and complication rates as those for younger people. Diabetes resolved in 54.5 percent of cases and hypertension in 42.5 percent of cases, but the percentage excess body weight loss (53.7%) was less than that seen in younger patients. Additional concerns in older patients are the difficulty in realising a survival advantage at an advanced age, and loss of lean body mass, which has been linked to poor long-term health.

Bariatric surgery can help a person with obesity lose weight through various procedures such as sleeve gastrectomy (achieved by removing most of the stomach) or Roux-en-Y gastric bypass (where most of the stomach and a small part of the small intestine is disconnected from the passage of food). Both of these procedures are performed laparoscopically using minimally invasive techniques. Bariatric surgery provides the most successful long-term weight loss and improvement in people with co-morbidities, but is not without its issues.

Consider bariatric surgery as an adjunct to an overall lifestyle management approach, rather than as a separate and independent treatment for weight management. Advise patients that the surgery is not a quick fix, and that it requires lifestyle modification and supervision, including life-long nutritional monitoring.

The Ministry of Health has developed a set of criteria to identify people suitable for bariatric or weight-loss surgery.

Consider publicly funded bariatric surgery for people:

- with a weight of less than 160 kg and a BMI of less than 55kg/m²
- with a BMI of greater than 35kg/m² with medical co-morbidities (eg, diabetes, sleep apnoea, hypertension, hypercholesterolaemia, infertility or arthritis)

18. www.medsafe.govt.nz/profs/datasheet/d/durominecap.pdf (accessed 21 March 2017).

- with a stable adult life pattern and strong social supports
- without substance (including nicotine) addiction
- who are willing to accept life-long medical surveillance.

An expert team within each DHB will review each referral for surgery and score it against a national scoring system, to help determine which people could get the greatest benefit from the surgery.

In the first year after the surgery, a person's weight loss may reach 40–50 kg, with a BMI reduction of 10–18 kg/m² and a percentage excess body weight loss of 50–80%. There is also evidence of substantial improvements in major co-morbidities (eg, blood pressure, lipid levels and diabetes) and other conditions (eg, obstructive sleep apnoea, gastro-oesophageal reflux, stress incontinence and peripheral venous stasis) following bariatric surgery.

The surgery requires a specialised multidisciplinary team (including a surgeon, a dietitian, a nurse, a psychologist and a physician) that, in conjunction with a patient's primary care providers, assesses, treats, monitors and evaluates the person both before and after the surgery.

The Ministry of Health does not recommend pregnancy for at least two years following bariatric surgery.

Pre-operative care

Discuss the following with people considering bariatric surgery:

- the procedure and the post-operative requirements, including the need for lifestyle modification and supervision, including life-long nutritional monitoring
- outcomes of surgery, and possible complications
- the fact that excess skin folds may need to be surgically removed after the initial surgery
- the fact that the type of bariatric procedure used would be based on the surgeon's expertise, the hospital facilities and the person's and their family/whānau's characteristics and lifestyle
- the fact that the rate of perioperative death is very low, but varies by procedure.

Post-operative care

After bariatric surgery, practitioners should undertake the following for each patient:

- simple clinical assessments of micronutrient status; particularly vitamin B12, folate and iron (eg, by asking about the person's hair loss, neuropathic symptoms, skin and oral lesions and muscle weakness)
- simple blood tests (eg, a full blood count and tests for calcium, magnesium, phosphate and albumin) (formal biochemical measurements of micronutrient status are necessary only for patients with abnormalities)
- provide patients with support to increase their physical activity in a sustainable manner
- consider a standard dose of a multivitamin and micronutrient supplement after malabsorptive bariatric procedures.

Provide people with dietary counselling before and after surgery.

Referral to specialist services

Consider referring overweight or obese people to a specialist or specialist services if:

- they consider that a specialist needs to assess the underlying cause of a person's overweight or obesity
- the person has complex comorbidities or needs that the practitioner cannot adequately manage
- conventional treatment has been unsuccessful
- the practitioner considers that specialist interventions (eg, a very low-energy diet) may be necessary [NICE 2006 (amended 2014)].

Consider referring people to a dietitian for specialist nutrition or dietary advice if they have food allergies, or have been unsuccessful in their attempts to alter their eating/drinking behaviours.

4. Maintain

Good practice points for engagement

- Identify and promote local support services that encourage healthy lifestyle approaches.
- Develop collaborative partnerships with Māori health providers, Whānau Ora providers, Pacific health providers and other community-based organisations.



After they have achieved the weight loss they aimed for, patients require ongoing monitoring and support of their weight management. Patients can be encouraged to monitor their own weight management with support from a practitioner if required as needed. At regular visits, practitioners can monitor their BMI and waist circumference, and evaluate and manage lifestyle interventions.

Patients prescribed weight management medication, and bariatric surgery patients, require follow-up care specific to their treatment (see relevant sections above).

Evidence update

Donnelly et al (2009) reported that, based on cross-sectional and prospective studies, weight maintenance is improved with regular physical activity levels above 250 minutes per week.

Recommendations

To help people maintain a healthy weight according to best practice, take the following steps.

- Reinforce lifestyle change through regular brief contact (eg, ongoing clinical, family/whānau or community contact). Monitor BMI and waist circumference.
- Encourage people to weigh themselves regularly (eg, weekly), and maintain their own strategies for managing weight gain.
- Encourage the maintenance of a healthy diet, and at least 250 minutes per week of moderate-intensity physical activity (Donnelly et al 2009).
- Restart a person's weight management programme immediately if their weight gain increases by 1.5–2.0 kg over their goal weight.
- If a person is using weight-loss drugs, consider continuing them for weight-loss maintenance only if the person has lost at least 5 percent of their initial body weight in the first three months of starting the drug, and side effects are manageable (see 'Weight-loss drugs' above).

Weight-management support services and programmes

A number of weight-management support services and programmes are available; they range from nutrition and healthy-eating services to exercise and weight-loss programmes. The Ministry of Health, and DHBs, fund some of these.

Examples include:

- multi-disciplinary teams
- the Green Prescription programme

- referral to a dietitian
- whānau plans, in which Whānau Ora providers and collectives work to support whānau aspirations by setting goals and a pathway towards achieving them (and facilitating access to services)
- community-funded services and programmes, such as church exercise groups, Zumba Fitness classes, youth exercise programmes and programmes that specifically aim to increase physical activity in Māori and Pacific communities.

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Appendix 1: Measuring body mass index and waist circumference

Body mass index

Body mass index (BMI) is a measure of the weight of an individual standardised by their height. It is defined as body weight (kg) divided by height squared (m²), and is the most commonly used screening tool for classifying obesity.

Instructions for measuring body mass index

Practitioners should measure weight and height themselves, rather than relying on self-reporting.

To measure weight, have the person remove their shoes and heavy clothing and stand on the centre of calibrated scales, with their weight distributed evenly on both feet.

Measure height as follows.

- Have the person stand with their feet together and their heels, buttocks and upper back against a stadiometer (a device that measures height).
- Get them to take and hold a deep breath while looking straight ahead, and bring the headboard of the stadiometer down firmly on the head, compressing the hair as much as possible.
- If a stadiometer is not available, draw a vertical line on a wall (make sure it is vertical by, eg, using an existing structure for reference) and place a mark under a flat board positioned horizontally on the top of the head, then determine the distance between the mark and the floor using measuring tape.

Then use height and weight values to calculate BMI. For example, an adult who weighs 90 kg and whose height is 1.81 m will have a BMI of 27:

$$90 \text{ (kg)} / 1.81^2 \text{ (m}^2\text{)} = 27.5 \text{ (kg/m}^2\text{)}$$

Practitioners can use BMI to classify weight as follows:

- underweight: BMI < 18.5
- normal weight: BMI 18.5–24.9
- overweight: BMI ≥ 25
- obese: BMI ≥ 30.

Waist circumference

Measuring waist circumference provides a simple estimate of the degree of central adiposity in an individual.

Instructions for measuring waist circumference

Measure waist circumference with a 'constant tension' measuring tape, to prevent stretching. Ideally, practitioners should take measurements underneath a person's clothing (although over light clothing is acceptable).

Ask the person to hold the end of a constant tension measuring tape at their waist, and turn around. The tape should be horizontal and lie loosely against the skin at the midpoint between the lower part of the last rib and the top of the hip.

Take hold of the tape ends and have the person relax their arms at the sides, at the end of a normal expiration.

In adults, a central fat pattern associated with substantially increased metabolic risk is defined as a waist circumference greater than 102 cm in men and 88 cm in women. Consider lowering this threshold for people of Asian ethnicities.

Appendix 2: Behavioural tools

Self-monitoring

Self-monitoring involves recording food intake and physical activity, and can include regular self-weighing. It is a key step in behavioural approaches because it leads to increased awareness of patterns that a person can then adjust.

People can keep records of food intake and physical activity through a paper-based or electronic diary, a smartphone app, a smartwatch or a Fitbit. Current evidence is promising and continues to emerge on the potential of smartphone use within weight loss programmes; however, research is unable to keep up with the rapidly improving smartphone technology (Johnston and Thompson-Felty 2015; Pellegrini et al 2015).

Stimulus control

A person may use stimulus control to modify their eating and physical activity behaviours through limiting their exposure to high-risk situations. Examples of stimulus control are:

- learning to shop for healthier foods by understanding food labelling, including nutrition information panels
- keeping foods and drinks that are energy-dense and low in essential vitamins and minerals out of the house
- clearing high-energy foods out of kitchen cupboards and the fridge
- substituting high-energy foods with healthier options
- limiting the times and places of eating
- consciously avoiding situations in which overeating is likely to occur
- identifying times of the day when poor food choices are more likely (eg, mid-afternoon or before dinner) and creating diversions or activities to replace them
- using the stairs rather than lifts and escalators
- parking the car further away, or getting off the bus or train earlier, to walk
- removing energy-saving devices (eg, television remote controls) from the home.

Stress management

Stress can trigger poor eating patterns. Stress management techniques such as coping strategies, meditation and relaxation techniques can defuse situations that lead to overeating.¹⁹

¹⁹ For links to useful websites, see 'Stress' on the Ministry of Health's website: www.health.govt.nz/your-health/conditions-and-treatments/mental-health/stress (accessed 17 March 2017).

Problem solving

Problem solving involves identifying, planning and implementing healthier alternatives, and then evaluating the outcome of changes in behaviour. Problem solving approaches to weight loss include identifying problematic habits (eg, eating cheese and crackers or chippies while watching television) and then brainstorming possible solutions and choosing one (eg, buying only grated cheese or cottage cheese, or low-energy snacks).

Practitioners should encourage people to view setbacks as opportunities to learn, rather than occasions to punish. The question should be, 'What did I learn from this attempt?' Answering this question is more useful than dwelling on failures, which fosters poor self-esteem.

Contingency management

'Contingency management' refers to the planned use of rewards for specific activities that help weight loss or weight maintenance (eg, completing a certain physical activity, or losing a certain amount of weight). Rewards can come from others or from the person themselves.

Rewards should be intrinsically valuable to the person attempting to lose weight.

Cognitive restructuring

'Cognitive restructuring' refers to the process of modifying unrealistic goals and inaccurate beliefs about weight loss and body image to transform self-defeating thoughts and feelings. Encourage people to replace negative thoughts with rational responses. For example, the thought, 'I blew my diet this morning by eating that pie, so I may as well eat what I like for the rest of the day' could become 'Well, I ate that pie this morning, but I can still eat in a healthy manner by reducing the amount I eat at lunch and dinner'. One indiscretion is far less damaging than multiple indiscretions.

Social support

Strong systems of social support help people achieve weight loss; for example, through the positive reinforcement they may facilitate. Practitioners should help people identify positive support networks such as:

- family/whānau, friends and colleagues
- weight-reduction support groups
- lunchtime walking groups.