

Appendix A2: Summary of evidence from surveillance

2018 surveillance of [Obesity: identification, assessment and management](#) (2014) NICE guideline CG189

Summary of evidence from surveillance

Studies identified in searches are summarised from the information presented in their abstracts.

Feedback from topic experts who advised us on the approach to this surveillance review, and from stakeholders following consultation, was considered alongside the evidence to reach a final decision on the need to update each section of the guideline.

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
1.1 Generic principles of care		
<p>2011 surveillance summary</p> <p>In previous surveillance of this guideline, no studies relevant to this section of the guideline were identified.</p>	<p>Topic expert feedback indicated that obesity is recognised as a disease by the World Health Organisation and the World Obesity Federation, and that the evidence for this should be discussed, but no references were cited or retrieved in the surveillance review.</p>	<p>Treatment preference</p> <p>The new evidence on treatment preference is largely consistent with recommendation 1.1.2, to discuss and agree the choice of interventions for weight management with the person.</p> <p>Primary care clinics</p> <p>The new RCT evidence indicating that a secondary care based childhood obesity clinic was transferable</p>

2018 surveillance summary

Primary care clinics

A pilot RCT(1) (n=152) examined whether a secondary care based childhood obesity clinic, comprising a consultant, dietitian and exercise specialist, could be transferable and effective as a nurse-led clinic in primary care. Results were similar between secondary and primary care for mean change in body mass index (BMI), quality of life, adherence and satisfaction, but the statistical significance of the results was not fully reported in the abstract.

Primary care childhood obesity surveillance

An RCT(2) (n=118) assessed whether general practice surveillance for childhood obesity, followed by obesity management across primary and tertiary care settings using a shared care model, improves body mass index and related outcomes in obese children aged 3 to 10 years. The shared care model of primary and tertiary care management did not lead to better BMI or other outcomes for the intervention group compared with the control group.

Treatment preference

A secondary analysis(3) of an RCT (n=250) assessed treatment preference prior to but independently of randomisation into either low-carbohydrate or low-

and effective in primary care is based on a small pilot study with limited reporting of data, and may require further larger studies to substantiate the findings.

The new evidence indicating that a shared care model of primary and tertiary care management did not lead to better weight loss outcomes among children is consistent with the guideline, which does not recommend a shared care model.

Family based lifestyle interventions

The collective new evidence and topic expert feedback is largely consistent with recommendations 1.1.4-1.1.7 for generic principles of care in children, specifically in coordinating care around individual and family needs. New evidence on the specific family interventions is inconclusive, and is unlikely to impact on Recommendation 1.1.6. This advises involvement of both the child and family in decision making about care, and tailoring interventions to the needs and preferences of the child and the family.

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>fat diets. Treatment preference was a predictor of weight loss but not weight retention. Participants who received their preference lost less weight than participants who did not receive their preference and participants who did not report a strong preference at baseline. Treatment preference did not modify the effect of the treatment on weight loss.</p> <p>An RCT(4) (n=144) found that over 12 months, adults with obesity and type 2 diabetes showed no difference in having either a choice of diet or a prescribed diet. Men were observed to lose more weight in prescribed diet group, while women lost more weight with a choice between diets. The statistical significance was not reported in the abstract however.</p> <p>Family based lifestyle interventions</p> <p>An RCT(5) (n=208) evaluated a primary care-based, multicomponent lifestyle intervention specifically tailored for overweight adolescent females. The gender and developmentally tailored intervention included a focus on adoptable healthy lifestyle behaviours and was reinforced by ongoing feedback from the individual's family physician. The decrease in the primary outcome, BMI z-score, over the 12 month follow up was significantly greater for</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>intervention participants compared with usual care participants. The 2 groups did not differ in secondary metabolic or psychosocial outcomes. Compared with usual care, intervention participants reported less reduction in frequency of family meals and less fast-food intake.</p> <p>A systematic review(6) (20 RCTs, including 3057 participants) assessed the efficacy of diet, physical activity and behavioural interventions delivered to parents only for the treatment of overweight and obesity in children aged 5 to 11 years. Parent-only interventions were effective when compared with waiting list controls over the longest follow up period of 10 to 24 months. Parent-only interventions had similar effects compared with parent-child interventions and compared with those with minimal contact controls. However, the evidence is at present limited; some of the trials had a high risk of bias with loss to follow-up being a particular issue and there was a lack of evidence for several important outcomes. The systematic review also identified 10 ongoing trials that have a parent-only arm, which were considered important to future updates.</p> <p>An RCT(7) (n=151) assessed an adolescent weight management intervention and evaluated the effect</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>of additional therapeutic contact 12 months into the programme. In the first 2 months (phase 1), intervention participants received 7 adolescent and parent weekly sessions focused on lifestyle modification. From 2 to 24 months (phase 2), adolescents attended booster sessions once every 3 months. During phase 2, adolescents randomised to the additional therapeutic contact arm also received telephone coaching and electronic communications once every 2 weeks. The intervention produced a significant but modest reduction in BMI z-score and improved psychosocial outcomes at 12 months.</p> <p>A secondary analysis(8) of the same RCT found that the adjunctive additional therapeutic contact did not provide further benefits to the intervention.</p> <p>A systematic review(9) (18 studies n=3,358) assessed the effectiveness of paediatric weight management interventions in primary care settings. The studies included a treatment and comparison group and targeted individuals or families for treatment. The overall effect size for change in BMI in primary care weight management interventions compared to control groups was small but statistically significant. The number of treatment contacts, treatment months, and visits with a paediatrician emerged as significant moderators of</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>outcome, such that BMI reduction was positively related to greater contact.</p> <p>A systematic review(10) (42 studies, n=6956), found that, among children and adolescents with overweight or obesity, lifestyle based interventions with an estimated 26 hours or more of contact consistently demonstrated mean reductions in excess weight compared with usual care or other control groups after 6 to 12 months, with no evidence of causing harm.</p> <p>An RCT(11) (n=721) of 2 to 12 year old children with obesity tested enhanced primary care (e.g. flagging of children with BMI 85th percentile, clinical decision support tools for paediatric weight management, parent educational materials, a Neighbourhood Resource Guide, and monthly text messages) versus enhanced primary care plus contextually tailored, individual health coaching (twice-weekly text messages and telephone or video contacts every other month) to support behaviour change and linkage of families to neighbourhood resources. Both interventions resulted in improved family-centred outcomes for childhood obesity and improvements in child BMI, compared to control. However there were no significant differences between the interventions.</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>A secondary analysis(12) of an RCT (n=441) examined 2-year changes in age- and sex-specific BMI z-scores and obesity-related behaviours among children who were overweight or obese and age 2-6 years at enrolment. The intervention included a more intensive 1-year intervention period (four in-person visits and two phone calls) followed by a less intensive 1-year maintenance period (two in-person visits). The results showed that the intervention, compared with usual care, did not affect BMI z-scores or obesity-related behaviours after 2 years.</p> <p>An RCT(13) (n=115 families, 128 children) found that a 10-week community-based family programme addressing parenting, lifestyle change and social and emotional development was neither effective nor cost-effective for the management of obesity, compared with usual care. Primary outcomes were 12-month change in children's BMI z-score and incremental cost per quality-adjusted life-year gained.</p> <p>An RCT(14) (n=320) found that a family-centred brief intervention targeting physical activity and nutrition generated slightly but significantly better obesity-related health outcomes than usual care alone, measured by BMI and cholesterol levels at 12 months.</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p><u>1.3 Assessment</u></p>		
<p>2011 surveillance summary</p> <p>Through the high level RCT search 6 studies (15–20) relevant to this section were identified and assessed using the abstract.</p> <p>The studies assessed various anthropometric measures, and no evidence was found to indicate that waist circumference (WC) or bioelectrical impedance was superior to BMI for measuring adiposity change, and no evidence was found that BMI was inferior to other methods of assessment for measuring adiposity change.</p> <p>2018 surveillance summary</p> <p>Predictive and diagnostic value of BMI in adults</p> <p>A diagnostic study(21) (n=2,409) aimed to determine the diagnostic performance of BMI and to detect the optimal BMI cut-off points to define adiposity in women of various ages. BMI had a high specificity but a low sensitivity to detect adiposity, and it failed to identify nearly half of women with</p>	<p>Topic experts highlighted that a proactive approach of informing people of their BMI is needed as it was thought that this is not being undertaken even in situations where BMI is being calculated e.g. every hospital in-patient.</p> <p>Experts also advised that instructions to clinicians, especially GPs, to measure BMI should be firmer; updated NICE-accredited Commissioning Guidance was cited, which recommends that BMI and waist circumference measurement by GPs needs to be routine in primary care, specifically if BMI is less than 35 kg/m².</p> <p>The fact that NICE guideline CG189 did not explicitly recommend this was considered by the expert to be detrimental to NICE quality standard QS127, in which quality statements 1 and 2 refer to BMI without stipulating measuring BMI. NICE guideline CG189 was also considered to be discrepant with guidance from the United States, which states that BMI should be actively measured:</p>	<p>Measures of overweight and obesity</p> <p>NICE guideline CG189 advises using BMI as a practical estimate of adiposity in adults, but to interpret BMI with caution because it is not a direct measure of adiposity.</p> <p>It also advises consideration of using waist circumference, in addition to BMI, in people with a BMI less than 35 kg/m².</p> <p>The collective new and previous surveillance evidence is partially consistent with NICE guideline CG189 in highlighting the value of WC in addition to BMI. However, new evidence and expert feedback indicating the superior discriminatory value of WHtR as an alternative measure of adiposity has a potential impact on recommendations 1.2.2 and 1.2.3, to review the alternative measures. The potential value of WHtR, as a proxy for central adipose tissue and a marker for early health risk, may also require exploration, although further studies may be needed to substantiate the evidence for this.</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>excess fat mass. The optimal cut off point corresponded to a lower BMI than is commonly used among women. No comparator test was reported in the abstract.</p> <p>A secondary analysis(22) (n=4109) of a diagnostic study tested the relevance of adding WC to BMI for the estimation of visceral adiposity (VAT) and cardiometabolic risk (CMR). Both BMI and WC were measured, whereas VAT and liver fat were assessed by computed tomography. A composite CMR score was calculated. Significant discordance was observed between BMI and WC, driven by the substantial variability in VAT for a given BMI. Within each BMI category, WC was cross-sectionally associated with VAT, liver fat, and CMR factors. Increasing gender-specific WC tertiles within each BMI category were associated with significantly higher VAT, liver fat, and with a more adverse CMR profile.</p> <p>Waist to height ratio</p> <p>A systematic review(23) (31 studies, 26 cross sectional, 5 prospective, n=123,231 men and n=182,620 women) assessed the potential of waist-to-height ratio (WHtR) and WC for measuring adult cardiometabolic risk in people of different nationalities and to compare both with BMI. WHtR</p>	<p>Management of Overweight and Obesity Working Group, Department of Veterans Affairs UDoD. VA/DoD Clinical Practice Guideline for Screening and Management of Overweight and Obesity Clinical Practice Guideline for Screening and Management of Overweight and Obesity.</p> <p>During guideline development, the guideline committee members felt that there should be a mechanism for routine collection of BMI data on every patient at least periodically.</p> <p>Further advice indicated that it may be useful to consider whether there is evidence to amend 1.2.1, which was seen as problematic; the advice to use clinical judgement to judge whether to measure height and weight, was considered discrepant with evidence that health professionals are not able to make this judgement accurately. A study was cited but preceded the search period for the surveillance review and did not meet the surveillance inclusion criteria, and was therefore not included.</p> <p>Topic experts also advised that recommendation 1.2.1 be updated to incorporate active case finding to detect obesity in black, Asian and other minority ethnic groups. The rationale is that there is an increased risk of adverse health conditions in this</p>	<p>Topic expert feedback and commissioning guidance also indicates that recommendation 1.2.1, advising the use of clinical judgement to decide when to measure a person's height and weight, requires review due to evidence indicating that health professionals are unable to make this judgement. Experts also advised that instructions to clinicians, especially GPs, to measure BMI should be firmer, to facilitate the implementation of NICE quality standard QS127. There is therefore a potential impact to consider these areas in an update of the guideline.</p> <p>It is also proposed that recommendation 1.2.1 be updated to incorporate active case finding to detect obesity in black, Asian and other minority ethnic groups. The rationale is that there is an increased risk of adverse health conditions in this population at different thresholds compared to other populations. There is a risk that adverse health conditions in black, Asian and other minority ethnic groups may not be identified using opportunistic identification as currently recommended in NICE guideline CG189.</p> <p>Topic expert feedback indicates that a more proactive approach to informing adults of their BMI is needed, indicating an implementation issue with</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>had significantly greater discriminatory power compared with BMI. Compared with BMI, WC and WHtR significantly improved discrimination of adverse outcomes. Statistical analysis of the within-study difference showed WHtR to be significantly better than WC for diabetes, hypertension, cardiovascular disease (CVD) and all outcomes in men and women.</p> <p>A retrospective analysis of National Diet and Nutrition survey data(24) (n=1453) compared how the adult UK population is classified using a 'matrix' of BMI and WC versus WHtR, using a boundary value of 0.5. The study also compared cardiometabolic risk factors in adults with 'healthy' BMI divided according to whether they have WHtR below or above 0.5. The results indicated that using a simple boundary value for WHtR of 0.5 identified more people at 'early health risk' than the more complex 'matrix' favoured by Public Health England, which uses boundary values for BMI and WC. The analysis of cardiometabolic risk factors within the group with 'healthy' BMI showed that some of these factors were significantly increased if WHtR was 0.5 or higher, thus supporting the definition of WHtR above 0.5 as an indicator of 'early health risk'.</p>	<p>population at different thresholds compared to other populations.</p>	<p>recommendation 1.2.10, which advises that adults should be given information about their classification of clinical obesity and the impact this has on risk factors for developing other long-term health problems. This will be passed to the NICE implementation team for consideration.</p> <p>Children and young people</p> <p>The conflicting evidence on the value of BMI as the most effective measure of obesity is unlikely to impact on NICE guideline CG189 recommendations, to use BMI (adjusted for age and gender) as a practical estimate of adiposity in children and young people. A lack of conclusive evidence to support other measures specifically in children is also consistent with recommendation 1.2.5, which advises against the use of WC as a routine measure and should be limited to use in providing additional information on risk of developing other long-term health problems. Further evidence may be required on the value of WHtR as an alternative measure of adiposity before an impact can be established.</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>Children and adolescents</p> <p>A cross sectional study(25) (n=2,303) evaluated whether a combination of WC and BMI would more accurately predict percentage body fat than either alone in primary school children aged 6-13. A quadratic polynomial combination of WC and BMI led to a better prediction of body fat compared with the two measures alone. Both BMI and WC were found to be good predictors in primary school children. However, the composite score incorporating both measures increased sensitivity at a constant specificity as compared to the individual measures.</p> <p>A systematic review(26) (37 studies, n=53,521) assessed the diagnostic performance of BMI to detect adiposity in children up to 18 years. The results indicated that BMI had high specificity but low sensitivity to detect excess adiposity and did not identify over a quarter of children with excess body fat percentage. No comparator test was reported in the abstract.</p> <p>A systematic review(27) (6 studies, n=11,214) assessed the performance of neck circumference (NC) for the assessment of overweight and obesity in children and adolescents, aged 6-18 years. NC showed moderate pooled sensitivity and specificity</p>		

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<p>to detect high body mass index, with a significant diagnostic odds ratio. No comparator test was reported in the abstract.</p> <p>A cross-sectional population-based study(28) (n=7703) investigated the agreement between BMI and WC and the waist-height ratio (WHtR) when used to identify overweight among 5 year old children. The results showed moderate agreement between BMI and measures of WC on the presence of overweight among 5-year-olds. However, the use of BMI data and its widely used cut-offs, resulted in the omission of some children identified as overweight according to WC and the WHtR.</p> <p>A health technology assessment including systematic reviews and meta-analyses(29) (37 studies, 22 cohorts and 23 studies, 16 cohorts) aimed to investigate the ability of simple measures, such as BMI, to predict the persistence of obesity from childhood into adulthood and to predict obesity-related adult morbidities. A further aim was to investigate how accurately simple measures diagnose obesity in children, and how acceptable these measures are to children, carers and health professionals.</p> <p>The results indicated that childhood obesity (measured using BMI) was associated with</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>moderately increased risks of adult obesity-related morbidity. However, the increase in risk was not large enough for childhood BMI to be a good predictor of the incidence of adult morbidities. The results also indicated that childhood obesity (measured using BMI) is strongly associated with adult obesity. This strong association was matched by a strong persistence of childhood obesity into adulthood. No studies were identified on tracking of obesity into later adulthood, when most obesity-related morbidities are likely to occur. BMI had potential use for identifying a group of obese or overweight children who may benefit from intervention, but did not identify all children at risk of obesity and obesity-related morbidities in adulthood. BMI was found to have good diagnostic value for obesity during childhood, with stronger specificity than sensitivity. This result was, however, based mostly on studies using Dual-energy X-ray absorptiometry (DEXA), which is not generally regarded as a gold standard for diagnosing obesity. There was a lack of evidence to help determine whether or not any simple measure is better or worse than BMI for assessing childhood weight status, either for diagnosing obesity in childhood or for predicting adult obesity or obesity-related morbidities.</p>		

2011 surveillance summary

In previous surveillance of this guideline, 34 studies relevant to this section of the guideline were identified(30–63). The surveillance decision in 2011 concluded that they had no impact on current recommendations. For further information, see [previous review decision](#).

2018 surveillance summary

Commissioning

A systematic review(64) (109 new studies) was undertaken to develop updated commissioning guidance for primary or secondary care weight assessment and management clinics in patients needing specialist care for severe and complex obesity. New elements added to the previous guidance were multidisciplinary team pathways for children or adolescent patients and their transition to adult care, anaesthetic assessment and recommendations for ongoing shared care with general practitioners, as a chronic disease management pathway. As very few examples of effective structures and clinical pathways existed, the current evidence base for optimal assessment and management of bariatric surgery patients was used to reach a consensus.

A systematic review(65) (14 studies) examined the characteristics, impact and practice implications of

Tier 3 obesity services

Topic expert feedback highlighted that section 1.3 on assessment, and all subsequent references in recommendations relating to tier 3 obesity services, require a thorough review to account for any new evidence emerging on outcomes. A systematic review(65) was cited that highlights policy and operational changes which have affected delivery of such services, including the de-specialisation of surgery and transfer of responsibilities to CCG level. Further commissioning guidance and the related systematic review on the specification of obesity services was also highlighted(64) and is covered in the evidence summary. Additional new guidance was also cited:

British Obesity and Metabolic Surgery Society [Commissioning guide: Weight assessment and management clinics \(tier 3\)](#)

NHS England [Commissioning Guidance to support devolution to CCGs of Adult Obesity surgical services in 2016/17](#)

With respect to tier 3 services for children and families, experts advised of the need to consider the relevancy of the guideline. It was advised that an update should revisit whether there is evidence to support the development of such services and consider recommendations which connect child obesity services to other relevant services at a local

Commissioning of Tier 3 services

The collective new and previous evidence, expert feedback and updated [NICE-accredited Commissioning Guidance](#) and [NHS England commissioning guidance](#) indicate that there is a potential need for recommendations 1.3.7, 1.3.10-1.3.12 to cross refer to the commissioning guidance relating to tier 3 services, to include a definition of tier 3 and 4 services. The commissioning of services falls outside the remit of NICE guidance, but a cross referral has the potential to link the guideline recommendations with developments in specialist weight management services for adults, children and families, including multidisciplinary team composition in delivering these services.

The NHS England commissioning guidance sets out draft service specification, clinical commissioning guidance for surgery and revision surgery documents to support Clinical Commissioning Group (CCG) commissioning decisions. This may address gaps in the care pathway, and the issue of access to surgery being dependent on CCGs commissioning Tier 3 services.

Patient consultation

Topic expert feedback highlighting the ongoing [BWEL](#) study, indicating that patients do not mind

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<p>specialist weight management services for adults in the UK. Multidisciplinary team composition and eligibility criteria varied and dropout rates were reportedly high. Results indicated that multicomponent interventions, delivered by a specialist multidisciplinary team, achieved a statistically significant reduction in mean BMI over time and in mean weight changes. There was reportedly evidence for improved outcomes in diabetics, although the data was not reported for this subgroup in the abstract.</p>	<p>level i.e. child mental health services and child social services.</p> <p>Patient consultation</p> <p>Topic expert feedback highlighted the need to include results from the ongoing Breast Cancer Weight Loss Study (BWEL), and that patients do not mind GPs raising the topic of weight in a consultation. The results of BWEL will be monitored for publication.</p>	<p>GPs raising the topic of weight in a consultation. This will be monitored for publication and potential impact on recommendation 1.3.4 in relation to patient consultation.</p>
<p><u>1.4 Lifestyle interventions</u></p>		
<p>2011 surveillance summary</p> <p>In previous surveillance of this guideline, 69 studies were identified relevant to this section of the guideline (66–134). General lifestyle interventions were associated with moderate weight loss. Support from family, friends or the internet was not associated with increased weight loss. Hospital inpatient/outpatient intervention was successful at promoting weight loss.</p>	<p>None</p>	<p>2011 surveillance</p> <p>The surveillance decision in 2011 concluded that the new evidence on general lifestyle intervention, support from family, friends or the internet and hospital inpatient/outpatient interventions had no impact on current recommendations.</p> <p>2018 surveillance</p> <p>The collective new evidence on the following interventions is either inconclusive or based on</p>

2018 surveillance summary

Family based lifestyle interventions

These interventions are covered in the evidence summary for [generic principles of care RQ01](#)

Brief interventions

A systematic review(135) (12 studies) examined the effect of brief, primary care interventions for paediatric weight management on BMI compared to any control intervention. Compared with usual care or control treatment, brief interventions feasible for primary care were associated with a significant but small reduction in BMI z-score and a nonsignificant effect on body satisfaction.

An RCT(136) (n=1882) examined whether physician brief intervention was acceptable and effective for reducing bodyweight in patients with obesity. In the active intervention, the physician offered referral to a weight management group (12 sessions of 1 hour each, once per week) and, if the referral was accepted, the physician ensured the patient made an appointment and offered follow-up. In the control intervention, the physician advised the patient that their health would benefit from weight loss. The primary outcome of weight change at 12 months was significantly greater in the active intervention group. Reactions of the patients to the brief interventions did not differ significantly

single RCTs of limited sample sizes, and is therefore unlikely to impact on NICE guideline CG189:

- Sugar sweetened beverages, non-caloric beverages and non-nutritive sweetened beverage
- home environment interventions longer than 6 months
- Stepped-care weight loss interventions
- Commercial diets

Technology-mediated interventions

The totality of new evidence for technology mediated interventions is inconclusive and therefore it is difficult to make conclusions about their effectiveness. Some interventions indicate potential value, but are based on small or unspecified sample sizes. Due to the lack of long term follow up, the findings are unlikely to impact on the guideline until they can be substantiated by further evidence. These include:

- Web-based weight management interventions supported by practice nurses in primary care, peer-led discussion or professional email counselling
- mobile phone, including text message based interventions, with or without coaching

between the study groups in terms of appropriateness or helpfulness.

An RCT(137) (n=537) found that a brief intervention, comprising a 10 top tips leaflet delivered through primary care, was effective in achieving short-term weight loss among adults with obesity over 3 months, but not over 24 months, compared to usual care. It was however, a low-cost option over 24 months, although cost effectiveness was not reported in the abstract from an NHS perspective.

Non-caloric sweetened beverages

An RCT(138) (n=224) assessed the effect on weight gain of an intervention that included the provision of non-caloric beverages at home for overweight and obese adolescents. The experimental group received a 1-year intervention designed to decrease consumption of sugar sweetened beverages, with follow-up for an additional year without intervention. The primary outcome, the change in mean BMI at 2 years, did not differ significantly between the two groups, although they did at 1 year, in favour of the intervention.

An RCT(139) (n=303) found that in people with overweight and obesity, water and non-nutritive sweetened (NNS) beverages were superior to water for weight loss and weight maintenance in regular users of NNS beverages who either maintained or

- combined technologies including social media, mobile apps, text messaging, emails, a website, and technology-mediated communication with a health coach.
- wearable devices.

Multicomponent interventions

The collective new evidence and topic expert feedback indicates that multicomponent interventions, including diet, physical activity and behaviour change, are effective in reducing weight over short and longer term periods. This is consistent with recommendation 1.4.1, which advises that multicomponent interventions are the treatment of choice, and should include behaviour change strategies (see recommendations 1.5.1–1.5.3) to increase people's physical activity levels or decrease inactivity, improve eating behaviour and the quality of the person's diet, and reduce energy intake.

There is inconclusive evidence on the use of the transtheoretical stages of change model for lifestyle interventions, due to the low quality of available studies, and no impact is anticipated until further studies are conducted to provide more definitive evidence.

Intensive lifestyle interventions

discontinued consumption of these beverages and consumed water during a structured weight loss programme.

Technology-mediated interventions

A total of 9 systematic reviews examined the use of technology mediated interventions for obesity and overweight.

A systematic review(140) (11 studies) found that the addition of computer-based technology to weight loss education or support interventions led to statistically greater weight loss in overweight or obese adults compared to standard intervention control, but that the magnitude was small and not sustained in follow up of more than 6 months.

A Cochrane review(141) (14 studies, n=2537) found that compared to in-person interventions, interactive computer-based interventions resulted in smaller weight losses and lower levels of weight maintenance in overweight or obese people over 6 months. Compared to minimal interventions, however, computer based interventions led to greater weight loss and maintenance over 6 months.

A systematic review(142) (8 studies, n=1487) examined the evidence for BMI improvements in eHealth overweight and obesity intervention RCTs for children and adolescents, where parents or carers were an agent of change. None of the studies found a statistically significant difference in BMI or

The collective new evidence supports the use of intensive lifestyle interventions over longer term periods of 4 to 8 years, in older people with obesity and in people with obesity and type 2 diabetes. However, recommendation 1.4.2 advises that the person's individual preference and social circumstance and the experience and outcome of previous treatments, as well as level of risk and comorbidities need to be taken into account when choosing treatments. The new evidence is unlikely to impact on this recommendation which allows for the diverse range of factors influencing the choice of intervention.

Brief interventions and extended care

The guideline committee noted that a challenge was how to define a 'brief intervention'. Across the literature, different studies have given diverse definitions of 'brief interventions'. The guideline defined a brief intervention as providing no more than four sessions. It was also noted that what is meant by 'brief' can be reported as 'extended' in another study.

The new evidence is unlikely to impact on guideline recommendations, due to being derived from single studies, those with small or unspecified sample sizes (as reported in the abstract), or with definitions of brief and extended interventions that were unclear or contrary to the guideline definition.

BMI z-score between the intervention and control groups at post-intervention, and the overall meta-analysis demonstrated no significant difference in the effects of parent-focused eHealth obesity interventions compared with a control on BMI/BMI z-score. The interventions were not clearly described in the abstract.

An economic evaluation and systematic review(143) assessed the cost-effectiveness of e-learning devices as a method of promoting weight loss via dietary change. Decision modelling techniques were used for the economic analysis. Outcomes were expressed in terms of Quality-Adjusted Life-Years (QALYs) and costs were estimated from a health services perspective. The results suggested that e-learning devices for managing the weight of obese individuals are unlikely to be cost-effective unless their fixed costs are much lower than estimated or future devices prove to be much more effective. The number of studies included by the systematic review was not reported in the abstract.

A systematic review(144) (12 studies, n=unreported) compared the efficacy of mobile phone applications (apps) compared with other approaches to promote weight loss and increase physical activity. Controlled studies that assessed a mobile phone app intervention with weight-related health measures (i.e., body weight, body mass index, or waist circumference) or physical activity outcomes were included. Compared with the

Rate of weight loss

New RCT evidence indicates that neither rapid nor gradual weight loss impact on weight loss maintenance. This is consistent with the guideline, which does not make recommendations on rate of weight loss.

control group, use of a mobile phone app was associated with significant changes in body weight (kg) and BMI, but not in physical activity.

A systematic review(145) (84 studies) evaluated the effectiveness of eHealth interventions for the prevention and treatment of overweight and obesity in adults. The eHealth interventions were predominantly delivered using the Internet, but also email, text messages, monitoring devices, mobile applications, computer programs, podcasts and personal digital assistants. The meta-analyses demonstrated significantly greater weight loss (kg) in eHealth weight loss interventions compared with control or minimal interventions, and in eHealth weight loss interventions with extra components or technologies compared with standard eHealth programmes. There was insufficient evidence for the effectiveness of eHealth interventions for weight loss maintenance or weight gain prevention.

A systematic review(146) (6 studies n=632) found that mobile electronic device interventions, particularly mobile phones, were effective in achieving weight loss among overweight and obese adults. Due to small sample sizes, however, further research with larger samples was considered necessary.

A systematic review(147) (23 studies comprising 8697 participants) found that the Internet component in obesity treatment programmes had a

modest but significant additional weight-loss effect compared with non-Web user control groups. In comparison with the control group, stratified analysis indicated that using the Internet as an adjunct to obesity care was effective, but that using it as a substitute for face-to-face support was not. The relative effect was diminished with longer educational periods and was insignificant in studies with educational periods of 12 months or more.

A systematic review(148) (12 studies) found a reduction in overweight and obesity in school-aged children with the implementation of web-based weight reduction interventions as part of a multi-component intervention. Types of interventions were web-based programs including, but not limited to, the Internet, social networking media, mobile applications, and email.

A further 8 RCTs(149–156) covered the following specific technologies, but found insufficient or weak evidence to support these interventions, and were based on small sample sizes:

- Web-based weight management intervention supported by practice nurses in primary care
- text message based weight maintenance intervention
- mobile phone with or without coaching

- Facebook, mobile apps, text messaging, emails, a website, and technology-mediated communication with a health coach
- web-based intervention supplemented by peer-led discussion or professional email counselling
- wearable technology devices for young adults aged 18-35, in addition to a standard behavioural intervention.

A further RCT(157), and associated economic analysis(158) (n=818) assessed the effectiveness and cost-effectiveness of an internet-based behavioural intervention ('POWeR+') combined with brief practice nurse support in primary care. Results indicated that compared with the control group, the estimated additional weight reduction was significant. By 12 months the mean weight loss was not statistically significantly different between groups. However, with no increase in health service costs, the intervention, supplemented with remote nurse support, was dominant compared with the control group in terms of cost effectiveness.

Multicomponent interventions

A total of 9 systematic reviews examined multicomponent interventions for obesity and overweight.

A Cochrane systematic review(159) (3 studies, n=2971) assessed the effectiveness of dietary intervention or physical activity interventions, or

both, and other interventions based on the transtheoretical model (TTM) stages of change (SOC) to produce sustainable (one year and longer) weight loss in overweight and obese adults. The evidence to support the use of TTM SOC in weight loss interventions was inconclusive and was limited by risk of bias and imprecision.

A systematic review(65) (14 studies) examined the characteristics, impact and practice implications of specialist weight management services for adults in the UK. Multidisciplinary team composition and eligibility criteria varied and dropout rates were reportedly high. Results indicated that multicomponent interventions, delivered by a specialist multidisciplinary team, achieved a statistically significant reduction in mean BMI over time and in mean weight changes. There was reportedly evidence for improved outcomes in diabetics, although the data was not reported for this subgroup in the abstract.

A systematic review(160) (70 RCTs n=8461) found that multi-component behaviour-changing interventions that incorporate diet, physical activity and behaviour change were beneficial in achieving small reductions in BMI, BMI z-score and weight in children aged 6 to 11 years, over six months to three years. However, the quality of the evidence was low or very low. The heterogeneity observed

across all outcomes was not explained by subgrouping.

Two systematic reviews(161,162) (covering a total of 33 RCTs with 12 linked reports, 24 non-randomised reports, five economic evaluations with two linked reports, and 22 qualitative studies) assessed evidence-based management strategies for treating obesity in men and investigated how to engage men in obesity services by integrating the quantitative, qualitative and health economic evidence base. Men were more likely than women to benefit if physical activity was part of a weight-loss programme. Reducing diets tended to produce more favourable weight loss than physical activity alone. The type of reducing diet did not affect long-term weight loss. A reducing diet plus physical activity and behaviour change gave the most effective results. Low-fat reducing diets, some with meal replacements, combined with physical activity and behaviour change training gave the most effective long-term weight change in men after 4 years.

A systematic review and network meta-analysis(163) (22 studies n=3521) found moderate-quality evidence that combined diet and exercise resulted in a significantly more pronounced reduction in body weight, waist circumference and fat mass than diet or exercise alone in adults with obesity, over 12 months or longer.

A systematic review(164) (8 studies, n=1022) examined the clinical effectiveness of combined behavioural weight management programmes (BWMPs) targeting weight loss in comparison to single component programmes for overweight and obese adults (BMI at least 25). Compared with diet-only or physical activity-only programmes with at least 12 months of follow-up. Pooled results showed no significant difference in weight loss from baseline or at 3 to 6 months between the BWMPs and diet-only arms. However, at 12 months, a significantly greater weight-loss was detected in the combined BWMPs. Pooled results between the BWMPs and physical activity alone showed significantly greater weight loss in the combined BWMPs at 3 to 6 months and 12 to 18 months.

An RCT(165) (n=201) determined effectiveness of maintenance therapy after a weight loss programme in severely obese adults. The 17-week weight loss programme followed by a one-year maintenance programme was not effective in maintaining weight loss compared to a weight loss programme without subsequent maintenance intervention. The components of the programme were not reported in the abstract.

Children and Adolescents

A systematic review(166) (7 studies n=923) assessed the effects of diet, physical activity and behavioural interventions for the treatment of

overweight or obese children up to the age of 6 years. The children in the included trials were followed up for between six months and three years. In trials comparing a multicomponent intervention with usual care, enhanced usual care, or information control, we found a greater reduction in BMI z-score in the intervention groups at the end of the intervention. Weak evidence suggested that dairy interventions may be effective in the longer term, but not energy-restricted diets, compared with control at 36 months follow up.

A systematic review(167) (44 studies n=4781) assessed the effects of diet, physical activity and behavioural interventions for the treatment of overweight or obese adolescents aged 12 to 17 years. Most of the trials used a multidisciplinary intervention with a combination of diet, physical activity and behavioural components. The content and duration of the intervention, its delivery and the comparators varied across trials. Low quality evidence indicated that multidisciplinary interventions involving a combination of diet, physical activity and behavioural components reduced measures of BMI and moderate quality evidence indicated that they reduced weight in overweight or obese adolescents, mainly when compared with no treatment or waiting list controls.

A systematic review(168) (33 studies) examined the impact of lifestyle interventions incorporating a dietary component on both weight change and

cardio-metabolic risks in overweight and obese children up to 18 years old. Results indicated that lifestyle interventions produced significant weight loss, measured as BMI and BMI z-score, compared with no-treatment control conditions. Studies comparing lifestyle interventions to usual care also resulted in significant immediate and posttreatment effects on BMI up to 1 year from baseline.

A further 9 RCTs(169–177) and a secondary analysis(178) of an RCT found evidence to support the following interventions:

- interdisciplinary treatment over 12 months
- comprehensive lifestyle modification programme: web-based Individual Health Management with 3-month reduction phase plus 9-month maintenance phase
- combined physical activity and diet, including:
 - task based weight management
 - six-week day-camp intervention plus family intervention
- task-based weight management programme, eight weekly group sessions that combined dietary and physical activity, advice and self-monitoring in a group-oriented intervention in primary care was more cost effective than nurse led usual care.

- community-based weight loss programmes for older adults
- six-week day-camp intervention focusing on increased physical activity, and healthy diet followed by a subsequent one-year family-based intervention, for 11-13 year olds
- enhanced brief lifestyle counselling comprising quarterly primary care provider visits plus monthly behavioural counselling provided by a trained auxiliary health-care provider, plus weight loss medications or meal replacements.

But evidence did not support:

- extensive lifestyle intervention, with more extensive group advice and more frequent follow up over 1 and 2 years

Commercial providers

A systematic review(179) (12 RCTs n=2559) examined the efficacy of the Atkins, South Beach, Weight Watchers, and Zone diets, with a particular focus on sustained weight loss of at least 12 months for adults with obesity. Results showed that data are conflicting and insufficient to identify one popular diet as being more beneficial than the others.

A total of 6 RCTs(180–186) including a secondary analysis(180) found conflicting evidence of the value of commercial weight loss programmes over

12-24 months. The largest 2 RCTs(181,184) supported the potential value and cost effectiveness of Weight Watchers programme over 12 months, but not for any longer period as a single intervention.

Home environment

An RCT(187) (n=201) evaluated a comprehensive weight-loss programme that targeted both an individual's behaviour and his or her physical and social home environment. Behavioural weight loss (BWL) and home environment changes produced better 6-month weight losses than BWL alone. At 18 months, no weight-loss differences were observed and rates of regain were equivalent. Treatment response was moderated by gender. Women lost more weight in the combined intervention at 6 and 18 months, whereas men in BWL alone lost more weight than those in combined intervention at 18 months.

An RCT(188) (n=211) found that a home-based tailored lifestyle intervention in obese, sedentary primary care patients was effective in promoting weight loss and increasing moderate to vigorous physical activity, with the effects peaking at 12 months but no longer significant at 18 to 24 months.

Stepped care approach

An RCT(189) (n=363) assessed whether a stepped-care weight loss intervention compared with a standard behavioural weight loss intervention would result in greater weight loss among overweight and obese adults. The difference in mean weight loss than was non-significant over 18 months, but the stepped care approach was less expensive to implement.

A secondary analysis(190) of the same RCT examined the amount of objectively measured moderate-to-vigorous physical activity and light physical activity that was associated with long-term weight loss and the maintenance of clinically significant weight loss. Moderate to vigorous physical activity of greater than 10 minutes per metabolic equivalent for 200-300 min per week, coupled with increased amounts of light physical activity, improved long-term weight loss over 18 months.

[Intensive lifestyle interventions \(ILI\)](#)

A systematic review(191) (10 studies n=5795) assessed the effectiveness of lifestyle-based weight loss interventions for adults with type 2 diabetes. Results showed that lifestyle-based weight loss interventions achieved modest reductions in weight, but results were heavily influenced by one trial.

A secondary analysis(192) of an RCT Look Ahead research grp (n=5145) assessed the effects of

intentional weight loss on cardiovascular morbidity and mortality in overweight or obese adults with type 2 diabetes, randomly assigned to an ILI or usual care (diabetes support and education [DSE]). The intervention provided comprehensive behavioural weight loss counselling over 8 years; DSE participants received periodic group education only. Both the ILI and usual care produced significant weight loss ($\geq 5\%$) from baseline to year 8 in patients with type 2 diabetes. The lifestyle intervention resulted in greater weight loss and participants reported greater practice of several key weight-control behaviours than the usual care group, but the statistical significance of the differences were not clearly reported in the abstract.

A further secondary analysis(193) (n=5,145) of the Look AHEAD RCT found that the ILI, compared with usual care, resulted in significant weight loss of at least 5% in overweight/obese participants with type 2 diabetes and maintain this loss in more than 45% of patients at 4 years. The ILI comprised approximately weekly group or individual treatment in year 1; continued but less frequent contact was provided in years 2-4.

A secondary analysis(194) of an RCT examined the effect of an intensive lifestyle intervention (ILI) on weight loss, CVD risk, and programme adherence in participants with type 2 diabetes who were severely obese compared with overweight (BMI 25 to <30

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>kg/m(2)), class I (BMI 30 to <35 kg/m(2)), and class II (BMI 35 to <40 kg/m(2)) obese participants. Severely obese participants in the ILI group had similar adherence, percentage of weight loss, and improvement in CVD risk compared with less obese participants over 1 year. The sample size was not reported in the abstract.</p> <p>A further secondary analysis(195) of the same study showed that, at year 4, severely obese lifestyle participants lost a similar amount of weight to class I and class II obese participants, and significantly greater than overweight participants.</p> <p>An RCT(196) (n=1053) found that in older people with type 2 diabetes, an ILI targeting weight loss and increased physical activity was effective in overweight and obese older individuals to produce sustained weight loss, measured by waist circumference over 4 years.</p> <p>Rate of weight loss</p> <p>An RCT(197) (n=204) found that a 12-week rapid weight loss intervention and a 36-week gradual programme, both aimed at 15% weight loss, resulted in weight regain of most of the lost weight among obese people at 144 weeks.</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<u>1.5 Behavioural interventions</u>		
<p>2011 surveillance summary</p> <p>In previous surveillance of this guideline, 69 studies were identified relevant to this section of the guideline (66–134). Behavioural interventions were found to be successful at promoting weight loss among the majority of studies, and that group based behavioural interventions are superior to individual interventions. Cognitive based interventions were successful at promoting weight loss. Motivational interviewing was a beneficial adjunctive intervention for treating obesity.</p> <p>2018 surveillance summary</p> <p>General behavioural interventions</p> <p>A systematic review(198) (37 studies, n>16,000) evaluated the effectiveness of behavioural weight management programmes and examined how programme characteristics affected mean weight loss. Meta-analysis showed no evidence that supervised physical activity sessions, more frequent contact or in-person contact were related to programme effectiveness at 12 months. Calorie counting, contact with a dietitian and use of</p>	<p>Topic experts highlighted that emerging evidence on 3rd wave psychological therapies needs consideration for this section of the guideline, including mindfulness based and acceptance based CBT. No studies additional to those identified through the surveillance search were cited.</p>	<p>Behavioural weight management programmes</p> <p>New systematic review evidence, and evidence identified in previous surveillance, indicates that behavioural programmes, including those delivered through primary care, are effective in weight loss for obesity. However, the evidence indicates that supervised physical activity sessions, more frequent contact or in-person contact are not related to effectiveness at 12 months. Calorie counting, contact with a dietitian and use of behaviour change techniques are key components in programme effectiveness. This is consistent with recommendations 1.5.1-1.5.3, advising the inclusion of support from an appropriately trained health professional, in addition to the use of a range of strategies.</p> <p>Further new evidence and previous surveillance evidence identified on the following behaviour change techniques is also largely consistent with these recommendations and is unlikely to impact:</p> <ul style="list-style-type: none"> • self-monitoring for both adults and children • motivational interviewing

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>behaviour change techniques that compare participants' behaviour with others were associated with greater weight loss.</p> <p>A systematic review(199) (45 studies n=7788) assessed approaches to supporting maintenance of weight loss in obese adults. Behavioural interventions that deal with both diet and physical activity showed small but significant benefits on weight loss maintenance at 12 months.</p> <p>A systematic review(200) (31 studies, 29 behavioural, 2 pharmacological and behavioural) examined the evidence of behavioural and pharmacological weight-management interventions on BMI, BMI z-score and the prevalence of overweight and obesity in children and youth. Both intervention types showed a significant effect on BMI or BMI z-score in favour of treatment, with behavioural interventions showing a slightly greater effect than combined interventions. The evidence was rated as low-to-moderate-quality.</p> <p>A systematic review(201) (8 studies) found moderate quality evidence showing that overweight and obese adults benefitted from behavioural interventions for weight maintenance following weight loss. However, there was insufficient evidence on the long-term sustainability of these</p>		<ul style="list-style-type: none"> • coaching and counselling, including learning stability skills • parent and child interventions • portion control <p>Mindfulness based and acceptance based CBT</p> <p>Topic expert feedback indicated the need to consider 3rd wave psychological therapies. However, the new evidence on mindfulness based and acceptance based CBT was based on studies with small sample sizes and further studies with larger samples may be needed to substantiate the findings before a definite impact on the guideline can be established.</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>benefits. Compared with control participants, intervention participants regained less weight, regardless of whether the intervention was behavioural or pharmacologic plus behavioural. Intervention participants also showed better weight maintenance than the control participants in terms of waist circumference and BMI. Participants undergoing pharmacologic plus behavioural interventions were more likely to maintain a loss of 5% or more of initial body weight than those in the control group.</p> <p>An RCT(202) (n=1269) assessed whether a 52-week referral of obese adults to an open-group weight-management programme would achieve greater weight loss and improvements in a range of health outcomes and be more cost-effective than the current practice of 12-week referrals. A brief intervention, including advice and self-help materials was included as an additional comparator. The primary outcome was weight at 1 year of follow-up. Participants in the behavioural programme lost more weight than those in the brief intervention. The 52-week programme was more effective than the 12-week programme. Differences between groups were still significant at 2 years. Modelling suggested that the 52-week programme</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>was cost-effective in the longer term, despite being more expensive.</p> <p>An RCT(203) (n=415) examined the effects of two behavioural weight-loss interventions in obese adults with at least one cardiovascular risk factor. One intervention provided patients with weight-loss support remotely--through the telephone, a study-specific Web site, and e-mail. The other intervention provided in-person support during group and individual sessions, along with the three remote means of support. There was also a control group in which weight loss was self-directed. Both the behavioural interventions achieved and sustained clinically significant weight loss over a period of 24 months.</p> <p>Monitoring</p> <p>An RCT(204) (n=250) aimed to determine the effectiveness of various monitoring strategies on weight loss, body composition, blood markers, exercise, and psychosocial indices in adults with overweight and obesity following a 12-month weight loss programme. Participants were assigned to one of 4 monitoring groups or control; brief, monthly, individual consults, daily self-monitoring of weight, self-monitoring of diet using MyFitnessPal, self-monitoring of hunger, or control over 12</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>months. All groups received diet and exercise advice. No significant differences in weight, body composition, blood markers, exercise, or eating behaviour were apparent between those in the four monitoring groups and the control condition at 12 months.</p> <p>An RCT(205) (n=210) aimed to determine if self-monitoring diet using a PDA only or the PDA with daily tailored feedback, was superior to using a paper diary on weight loss and maintenance. Results showed that PDA and feedback use resulted in a small weight loss at 24 months and that PDA use resulted in greater adherence to dietary self-monitoring over time.</p> <p>An RCT(206) (n=130) examined the effect of adding individual self-efficacy enhancement sessions to standard behavioural weight loss treatment among adults with obesity. Both groups achieved clinically significant weight loss. The group receiving an intervention targeting enhanced self-efficacy had greater weight loss maintenance whereas the standard behavioural group demonstrated significant weight regain.</p> <p>A post hoc analysis(207) (n=414) of an RCT found that after 30 months of a personal contact maintenance intervention for obesity, continuation</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>for another 30 months provided no additional benefit over self-directed participants. However, across the entire study, weight loss was slightly but statistically significantly greater in those originally assigned to personal contact.</p> <p>A secondary analysis(208) (n=277) of a lifestyle intervention RCT assessed the accuracy of self-reported weights entered online by participants. Results indicated that underestimation of self-reported weights increased significantly from 6 months to 24 months. Participants who achieved the study weight loss goal at 24 months (based on clinic weights) had lower absolute differences compared to those who did not meet this goal.</p> <p>An RCT(209) n=3768 found that encouraging people who have recently lost weight to weigh themselves regularly prevented some weight regain over 12 months. Intervention participants received two telephone calls, the offer of free weighing scales, encouragement to weigh themselves weekly and record this on a card.</p> <p>An RCT(210) (n=167) examined the role of self-monitoring on weight loss during an initial 6-month intervention period and a 12-month extended care period among women with obesity. No significant differences in self-monitoring frequency between</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>groups were observed during the first 6 months, but significant differences between all three groups were observed during months 6-12. High success participants completed the most self-monitoring records, followed by the moderate group. The low success group completed the least number of records.</p> <p>An RCT(211) (n=183) examined the efficacy of daily self-weighing as an intervention for weight loss but found only a non-significant difference over 3 months follow up compared to control. There was no evidence that self-weighing frequency was associated with more weight loss.</p> <p>Primary care and community based interventions</p> <p>A systematic review(212) (15 studies n=4539) estimated the effect of behavioural interventions delivered in primary care on body weight in overweight and obese adults. Small but significant weight loss was observed at 12 months and at 24 months. The studies were heterogeneous with respect to inclusion criteria and type of intervention. Few studies reported interventions informed by behavioural science theory.</p> <p>An RCT(213) (n=612) evaluated the effects and costs of three doses of behavioural weight-loss</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>treatment delivered in rural communities. The moderate-dose treatment produced 2-year weight losses similar to the high-dose condition and significantly larger than the low-dose and control groups. The percentages of participants who achieved weight reductions of at least 5% at two years were significantly higher in the moderate-dose and high-dose conditions compared with low-dose and control groups.</p> <p>An RCT(214) n=390 found that a behavioural weight loss intervention delivered in a primary care setting resulted in significant weight loss, with corresponding improvements in eating restraint and energy expenditure.</p> <p>Motivational interviewing</p> <p>An RCT(215) (n=187) assessed whether the short-term (12-month) impact of family paediatrician-led motivational interviews on the BMI of overweight children (4-7 years old) could be sustained in the over 24 months, in the absence of any other intervention. The primary outcome was individual variation in BMI between the baseline visit and the 24-month follow-up, assessed by paediatricians. After the 12-month intervention period, BMI in the intervention group increased significantly less than</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>in the control group. At the 24-month follow-up, the difference had disappeared.</p> <p>A further analysis of the same data(216) showed that motivational interviewing had no effect in boys or in children whose mothers had a low educational level. Positive changes in parent-reported lifestyle behaviours occurred more frequently in the motivational interviewing group than in the control group.</p> <p>An RCT(217) (n=864) tested a motivational interviewing intervention delivered by a nurse trained by an expert psychologist, in 32 sessions, 1 to 12 fortnightly, and 13 to 32, monthly, on top of their standard programmed diet and exercise. The control group, received the usual follow-up. Weight reduction was statistically significant in the second year of the 2 year follow up in favour of the intervention group.</p> <p>A systematic review(218) assessed whether behavioural treatment strategies (e.g. goal setting, motivational interviewing, relapse prevention, cognitive restructuring etc.) improve adherence to lifestyle intervention programmes in adults with obesity. Behavioural treatment interventions had a significant positive effect on percentage of session attendance and physical activity (total min/week) in</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>adults with obesity. No weight change outcomes were reported in the abstract, however.</p> <p>An RCT(219) (n=170) assessed a 12-month motivational interviewing intervention to support weight loss maintenance, among adults aged 18-70 years with a current or previous BMI of ≥ 30 kg/m² who could provide evidence of at least 5% weight loss during the previous 12 months. The intensive arm received six face-to-face sessions followed by nine telephone sessions. The less intensive arm received two face-to-face sessions followed by two telephone sessions. The control arm received a leaflet advising them on healthy lifestyle. The intensive intervention led to a statistically significant difference in weight, but other outcomes were non-significant, including waist circumference, waist-to-hip ratio, physical activity, proportion maintaining weight loss, diet, quality of life, health service resource usage, binge eating and well-being. The study was not powered to assess cost-effectiveness, but results suggested that neither the intensive or less intensive intervention as currently delivered are likely to be cost-effective in routine practice.</p> <p>An RCT(220) (n=398) found that online motivational interviewing chat sessions were not effective in</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>increasing weight loss at 6 or 18 months for people with obesity and overweight.</p> <p>Mindfulness-based interventions</p> <p>An RCT(221) (n=194) tested whether adding mindfulness-based eating and stress management practices to a diet-exercise programme improved weight loss and metabolic syndrome components in adults with obesity. The programme did not show significant weight loss benefit over 12 or 18 months.</p> <p>A systematic review(222) (15 studies, n=560) found that mindfulness-based interventions for adults who are overweight or obese resulted in therapeutic effects for BMI, anxiety, eating attitudes and eating behaviours, which remained significant when examining results from higher quality randomized control trials alone. However the small sample sizes limited the impact of the results.</p> <p>Coaching and counselling</p> <p>A systematic review(223) (12 studies, n=3893) assessed behavioural counselling for overweight and obese patients recruited from primary care, as delivered by primary care practitioners working alone or with trained interventionists. The interventions that prescribed both reduced energy</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>intake (e.g., at least 500 kcal/d) and increased physical activity (e.g. at least 150 minutes a week of walking), with traditional behavioural therapy, generally produced larger weight loss than interventions without all 3 specific components. The statistical significance of these results was not reported in the abstract, however.</p> <p>An RCT(224) (n=481) tested whether a small-changes intervention, delivered in groups or via telephone, promoted greater weight loss than standard obesity treatment in a predominantly male, high-risk older population. The intervention comprised twenty-eight sessions with a non-clinician coach via telephone or in-person groups using a small-changes obesity treatment approach compared to a 15-30-session standard programme. Group-based delivery of the weight management programme was significantly more effective in reducing weight than either telephone approach or standard care.</p> <p>RCT(225) n=381 found no significant difference in mean weight loss between a structured one-to-one behaviour change programme and control group. The intervention was delivered over 14 visits during 12 months by trained advisors in three primary care</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>centres and was compared with usual care in general practice.</p> <p>A secondary analysis(226) of an RCT (n=407) assessed the effectiveness of a tailor-made weight loss intervention in achieving weight loss in overweight (BMI \geq 27 kg/m²) women aged 50-60 years in a primary care setting. Compared to an unspecified control group, the intervention was effective in achieving statistically significant weight loss in overweight women aged 50-60 over a 12-month period, but not over 30 months.</p> <p>An RCT(227) (n=267) examined whether learning a novel set of "stability skills" before losing weight improved long-term weight management. Stability skills were designed to optimise individuals' current satisfaction with lifestyle and self-regulatory habits while requiring the minimum effort and attention necessary. Compared to standard weight loss and maintenance care, intervention participants lost the same percentage of initial weight during the 6-month intervention period but regained significantly less weight during the 12-month follow-up period (6-18 months).</p>		

Acceptance based interventions

An RCT(228) (n=190) evaluated the efficacy, as well as potential moderators and mediators, of a revised acceptance-based behavioural treatment for obesity, relative to standard behavioural treatment. The intervention comprised 25 sessions over 12 months. Participants assigned to acceptance based treatment attained a significantly greater 12-month weight loss and were also more likely to maintain a 10% weight loss at 12 months.

Cognitive behavioural therapy (CBT)

An RCT(229) (n=163) tested the long-term efficacy of an enhanced CBT of obesity among women, including a virtual reality module aimed at both unlocking the negative memory of the body and to modify its behavioural and emotional correlates. A standard behavioural inpatient programme, alone or with CBT, achieved similar weight loss, eating behaviour, and body dissatisfaction outcomes to the intervention at 1 year follow up. However, the virtual reality enhanced intervention had a greater probability of maintaining or improving weight loss at 1 year follow-up than standard treatment.

Parent and Child interventions

An RCT(230) (n=105) found that concurrently targeting preschool-aged overweight and obese youth and their parents in primary care with a

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>behavioural intervention resulted in greater decreases in child BMI, z-BMI, and parent BMI compared with an information control targeting weight control only in the child.</p> <p>An RCT(231) (n=549) found that an intervention that included computerised clinical decision support for paediatric clinicians and support for self-guided behaviour change for families resulted in improved childhood BMI in 6 to 12 year old children with obesity. Where the decision support was augmented by individualised family coaching, this had a non-significant effect on BMI.</p> <p>An RCT(232) (n=206) found that BMI at 24 months was significantly lower in 4 to 8 year old children receiving a tailored care intervention compared with children receiving usual care. The intervention families attended a single multidisciplinary session to develop specific goals suitable for each family, then met with a mentor each month for 12 months, and every third month for another 12 months to discuss progress and provide support.</p> <p>RCT(233) (n=1,125) found a high prevalence of overweight/obesity among parents of children and adolescents aged 3-22 entering childhood obesity treatment. Family-based childhood obesity treatment with a focus on the child had a significant</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>positive effect on parental BMI with both mothers and fathers losing weight.</p> <p>An RCT(234) (n =336) assessed whether additional parent training would lead to an improved long-term weight course of obese children following inpatient lifestyle treatment. Additional parent training did not lead to better results in 12 month weight maintenance or to better psychosocial well-being compared to written psycho-educational material.</p> <p>Extended care</p> <p>A systematic review(235) (13 studies) assessed the effect of extended care on maintenance of weight loss following behavioural interventions for obesity. The results indicated a significant effect of extended care on weight loss maintenance, over an average of 17.6 months post-intervention in participants provided extended care compared with control.</p> <p>An RCT(236) (n=504) found that a weight loss maintenance programme resulted in a mean weight regain over 56 weeks that was statistically significantly lower than in usual care among obese adults.</p>		

Portion control

An RCT(237) n=197 found that a weight management intervention using portion controlled meals resulted in both weight loss and increased diet quality scores among obese or overweight adults over 6, 12 and 18 months. The statistical significance of the weight loss effect size was not reported in the abstract, however.

RCT(238) (n=106) found that in a primary care population with portion controlled meals, continued in-person visits as well as telephone calls between visits during the 12 month weight loss maintenance phase led to greater weight loss than contact by mail.

RCT(239) (n=186) found that incorporating instruction on portion-control strategies within a 1-year behavioural programme did not lead to a greater weight loss than standard advice among women with obesity or overweight. Using pre-portioned foods enhanced early weight loss, but this was not sustained over time.

An RCT(240) (n=120) found that a portion-controlled, nutritionally-balanced, low-fat weight-loss plan resulted in significantly greater reductions in body weight and fat compared with a food based diet after 1 year.

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<u>1.6 Physical activity</u>		
<p>2011 surveillance summary</p> <p>In previous surveillance of this guideline, no studies relevant to this section of the guideline were identified. For further information, see previous review decision.</p> <p>2018 surveillance summary</p> <p>Exercise in Children and adolescents</p> <p>A systematic review of meta-analyses(241) (14 and 17 studies, n=481 and n=701) found that exercise is efficacious for reducing percent body fat in overweight and obese children and adolescents. However, there was insufficient evidence to suggest that exercise reduces other measures of adiposity, including BMI and body weight were non-significant.</p> <p>A systematic review(242) (10 studies, n=835) found that exercise improved BMI z-score in overweight and obese children and adolescents. On average, exercise took place 4 times per week for 43 minutes per session over 16 weeks. The intensity of the exercise was not reported.</p>	None	<p>The physical activity section was not updated at the time of developing NICE guideline CG189, with the recommendations carried forward from the original NICE guideline CG43 Obesity prevention (December 2006). In order to provide up to date advice for physical activity, it is proposed that recommendations 1.6.1-1.6.8 be reviewed. This should include an evidence review on physical activity specific to obesity. The revised recommendations should also align with national advice from the Chief Medical Office (CMO) and link to NICE public health guidance on physical activity if judged relevant.</p> <p>Exercise for children and adolescents</p> <p>New systematic review evidence indicates that exercise, as part of combined interventions or alone, is effective in reducing body fat among children and adolescents, but may not impact on BMI and body weight. However, these findings were derived from small studies of unknown exercise intensity and are therefore unlikely to impact on recommendations</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>A systematic review(243) (12 trials n=555) found that concurrent aerobic plus resistance exercise, versus aerobic exercise alone, improved body composition, metabolic profiles, and inflammatory state in obese children.</p> <p>A systematic review(167) (44 studies n=4781) assessed the effects of diet, physical activity and behavioural interventions for the treatment of overweight or obese adolescents aged 12 to 17 years. Most of the trials used a multidisciplinary intervention with a combination of diet, physical activity and behavioural components. The content and duration of the intervention, its delivery and the comparators varied across trials. Low quality evidence indicated that multidisciplinary interventions involving a combination of diet, physical activity and behavioural components reduced measures of BMI and moderate quality evidence indicated that they reduced weight in overweight or obese adolescents, mainly when compared with no treatment or waiting list controls.</p> <p>Exercise in adults</p>		<p>1.6.4-1.6.8 to encourage children to increase their physical activity. The new evidence indicating the value of concurrent aerobic plus resistance exercise is consistent with recommendation 1.6.4 to encourage children to do at least 60 minutes of moderate or greater intensity physical activity each day, and also with recommendation 1.6.8 to make the choice of activity with the child, and ensure it is appropriate to the child's ability and confidence.</p> <p>Exercise for adults</p> <p>New evidence suggesting that combined interventions including exercise may be effective is based on small sample sizes, and appeared to differ depending on individual factors. This is consistent with the recommendation 1.6.3 to take into account the person's current physical fitness and ability for all activities. Therefore, no impact is anticipated on the recommendations.</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>An RCT(244) (n=288) found that 18-month physical activity and weight loss programme resulted in a significant reduction in percent body fat with a concomitant increase in percent body lean mass.</p> <p>An RCT(245) (n=195) found significantly sustained weight loss one year after completing a weight loss programme with and without exercise in overweight postmenopausal women. Although the mainly exercise group maintained more physically active compared to the diet group, maintenance of weight loss did not differ between groups.</p> <p>An RCT(246) (n=195) found that for adults with obesity, a standard behavioural weight loss programme with an additional strategy including instructed exercise, at predetermined times over the intervention period, enhanced 18-month weight loss.</p> <p>Exercise intensity</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>A systematic review (247) (5 studies, n=7,351) examined the effects of reallocating time spent in sedentary behaviours in different activity intensities on youth's adiposity. Moderate-to-vigorous physical activity was statistically associated with total body fat percentage but not with body mass index or waist circumference. In subgroup analysis, the greatest magnitude of association was observed from studies where 60 min of sedentary behaviour was reallocated to 60 min of moderate-to-vigorous physical activity.</p> <p>A systematic review(248) examined the effects of selected types of exercise (aerobic, strength training, both) on BMI z-score in overweight and obese children and adolescents. Aerobic exercise and combined aerobic exercise and strength training were associated with significant reductions in BMI z-score, but not strength training alone. Median exercise occurred 3 times per week, 50 minutes per session over a 12-week period.</p> <p>A systematic review(249) (15 studies, n=741) found that combined aerobic and resistance training, compared to either modality alone, was most effective in reducing body weight, waist circumference and fat mass in overweight and obese adults.</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>A systematic review(250) (18 studies) found that training at high intensity is superior to improve cardiopulmonary fitness and to reduce percent body fat in adults with obesity compared to traditional exercise.</p> <p>Wearable technology</p> <p>A systematic review(251) (Fourteen studies, n=2972) found that accelerometers (activity monitors, providing objective, real-time feedback on physical activity with wearable motion-sensing technology) demonstrated small positive effects on physical activity and weight loss. The small sample sizes with moderate to high heterogeneity limit the impact of the results.</p> <p>An RCT(156) (n=471) found that among young adults (aged 18-35) with a BMI between 25 and less than 40, the addition of a wearable technology device to a standard behavioural intervention resulted in less weight loss over 24 months. The primary outcome of weight was measured over 24 months at 6-month intervals. Both groups had significant improvements in body composition, fitness, physical activity, and diet, with no significant difference between groups.</p> <p>Yoga</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>A systematic review(252) (30 studies, n=2173) found no effects of yoga on weight, BMI, body fat percentage or waist circumference among adults with and without obesity. In studies with overweight/obese participants only, effects relative to usual care were found for BMI. Effects however were not robust against selection bias; and publication bias could not be ruled out.</p> <p>Group sports</p> <p>A systematic review(253) found that group sports improved body composition, cardiorespiratory endurance, and hand grip strength of overweight or obese youth up to 18 years old. However, the number and size of included studies was not reported in the abstract.</p>		
<p><u>1.7 Dietary</u></p>		
<p>2011 surveillance summary</p> <p>In previous surveillance of this guideline, 27 studies(97-124) relevant to this section of the guideline were identified. Diets were found to be beneficial for weight loss, and adherence to the diet was found to be more important than the composition of the diet.</p>	<p>Topic expert highlighted that in 2018 results of the DROPLET and DiRECT trials on low energy liquid diets will be published, and may impact on the recommendations.</p> <p>Further expert feedback highlighted the need to review the new data regarding dietary approaches in particular partial and full meal replacements.</p>	<p>The new and previous systematic review evidence supporting the use of low energy diets is consistent with recommendation 1.7.5 and the advice in recommendation 1.7.6 to consider low energy diets but to be aware of nutritional completeness. The new evidence suggesting that very low calorie diets are effective is limited by small sample sizes and risk of bias among included studies, and is unlikely to</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>Low carbohydrate diets were not superior to other diets in terms of weight loss, but may have improved CVD risk factors and provide additional benefits for people with insulin resistance.</p> <p>Very low Calorie Diets were unable to maintain weight loss over the longer term.</p> <p>2018 surveillance summary</p> <p>Diet types</p> <p>Low energy and Very low energy diets</p> <p>A total of 10 systematic reviews(254–263) investigated low energy and very low energy diets.</p> <p>A systematic review(254) (13 studies) assessed whether very-low-carbohydrate ketogenic (VLCK) diets (i.e. A diet with no more than 50g carbohydrates per day) achieve better long-term body weight reduction, triglyceride and diastolic blood pressure but increased cholesterol levels, when compared with individuals assigned to a conventional low-fat diet.</p> <p>A systematic review(255) found that compared with participants on low fat diets, participants on low carbohydrate diets (not defined in abstract) experienced a greater reduction in body weight, but</p>	<p>Experts also advised an assessment of recent evidence on specific dietary guidance for overweight children. Three studies were cited, 1 of which was ineligible for inclusion, and the other 2 are included in the evidence summary(299,300).</p>	<p>impact on recommendation 1.7.8, which advises VLEDs to be considered only as part of a multicomponent strategy for a maximum of 12 weeks.</p> <p>Low energy liquid diets</p> <p>New evidence indicating non-inferiority of LELD diets compared to low energy carbohydrate diets may require further studies to substantiate the findings. The ongoing DROPLET study and longer 2 year results of the DiRECT trial on LELDs will be monitored for publication and potential impact on the guideline.</p> <p>Children and adolescents</p> <p>The new evidence indicating the value of dietary interventions in children as part of a multicomponent strategy is consistent with recommendation 1.7.12, which advises against the use of diet alone and advises a combined multicomponent approach.</p> <p>New evidence, also highlighted by topic expert feedback supporting specific low energy and low glycaemic index diets for children and adolescents is consistent with recommendation 1.7.14, which states that for overweight and obese children and young people, total energy intake should be below</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>a greater increase in HDL-cholesterol and LDL-cholesterol.</p> <p>A systematic review (256) (24 studies, n=1063) compared energy-restricted, isocaloric, high-protein, low-fat diets with standard-protein, low-fat diets. Compared with an energy-restricted standard protein diet, an isocalorically prescribed high protein diet provided modest but significant reductions in body weight. Mean duration of diet was 12 weeks.</p> <p>A systematic review(257) (12 studies, n=974) examined the efficacy and safety of the use of very-low-energy diets (VLEDs) for weight loss, in contexts applicable to how they may be applied in a general medical setting. A VLED together with a behavioural programme led to a significantly greater weight loss than a similar behavioural programme alone at 12 months and 24 months (6 trials). There were limited data at longer follow-up (4 studies) which did not show a significant weight loss for VLED plus a behavioural programme. However weight was not regained during 38-60 months. Most studies were classified as at unclear risk of bias because they did not report aspects of trial methods now expected by CONSORT standards.</p> <p>A systematic review(259) (12 studies n=1827) found significant associations between restricted</p>		<p>their energy expenditure, and that changes should be sustainable. The recommendation provides for specific low energy and low glycaemic index diets as options to be considered by clinicians and parents.</p> <p>Specific diet types</p> <p>The evidence supporting vegetarian, Mediterranean and commercial diets is unlikely to impact on recommendation 1.7.1, which advises tailoring dietary changes to food preferences and allowing for a flexible and individual approach to reducing calorie intake. These specific diets are encompassed within this broad recommendation.</p> <p>Additional Dietary approaches</p> <p>New evidence on the following interventions is either inconclusive or based on single studies of limited sample sizes, and is therefore unlikely to impact:</p> <ul style="list-style-type: none"> • ALA • (L) Carnitine • Flaxseed • Poly unsaturated fatty acids • Phaseolus vulgaris herbal supplement

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>energy diet and BMI, blood pressure and diastolic blood pressure in metabolically healthy obese people.</p> <p>A systematic review(260) (19 studies, n=3209) found that similar weight loss was achieved over 2 years irrespective of whether the diet was low carbohydrate or isoenergetic balanced (undefined in abstract).</p> <p>A systematic review(261) (54 RCTs n=30,206) found that weight reducing diets, usually low in fat and saturated fat, with or without exercise advice or programmes, reduced premature all-cause mortality in adults with obesity. Interventions had a beneficial effect on weight change after one year, although heterogeneity was very high, reflecting the wide diversity of weight loss interventions and their effects on weight.</p> <p>A systematic review(262) (48 studies n= 7286) found that among obese or overweight adults, compared with no diet, the largest weight loss was associated with low-carbohydrate and low fat diets at 6-month and 12-month follow-up. Weight loss differences between individual diets were minimal.</p> <p>A systematic review(263) (53 studies, n=68,128) found that the long-term effect of low-fat diet</p>		<p>New evidence does not support the following interventions for reducing weight among people with obesity</p> <ul style="list-style-type: none"> • Chromium supplementation • Green tea • Probiotics • Dietary fibre, including glucomannan • Vitamin D for adults and D3 for women with obesity or overweight.

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>intervention on bodyweight depended on the intensity of the intervention in the comparison group. When compared with dietary interventions of similar intensity, evidence from RCTs did not support low-fat diets over other dietary interventions for long-term weight loss beyond 1 year. Low-carbohydrate interventions led to significantly greater weight loss than did low-fat interventions. Low-fat interventions did not lead to differences in weight change compared with other higher-fat weight loss interventions, and led to a greater weight decrease only when compared with a usual diet.</p> <p>A total of 5 RCTs(264–268) and a secondary analysis(269) of an RCT also covered low carbohydrate diets. The results indicated that:</p> <ul style="list-style-type: none"> • For adults without CVD and diabetes a low-carbohydrate diet was more effective for weight loss and cardiovascular risk factor reduction than a low-fat diet. • In a group of obese patients, the VLCK diet was significantly more effective than a standard LC diet. At one year follow-up in the group with VLCK diet, most of the patients lost more than 10% of their initial weight. 		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<ul style="list-style-type: none"> • Compared with exercise, moderate calorie restriction did not significantly decrease visceral adipose tissue or lean mass in older adults at high risk for cardiometabolic disease. It did reduce total body fat and cardiometabolic risk factors without significantly more adverse events. • Among obese adults at risk of diabetes, weight loss after 1 year was associated with increases in carbohydrate intake, specifically dietary fibre, and decreases in total fat and saturated fat intake. • Limiting dietary variety of different non-nutrient-dense, energy-dense foods decreased intakes in the targeted area but did not affect weight loss among adults with obesity over 18 months. • Obese women prescribed 1,000 kcal/day lost more weight than those prescribed 1,500 kcal/day at 12 month follow up. <p>Low energy liquid diets</p> <p>A systematic review(270) (5 studies n=569) found that weight losses with liquid-formula diets are very similar for VLCD and low energy liquid formula diets</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>(LELD) for obese adults with or without type 2 diabetes.</p> <p>An RCT(271) (n=306) assessed whether intensive weight management within routine primary care would achieve remission of type 2 diabetes. The intervention comprised withdrawal of antidiabetic and antihypertensive drugs, total diet replacement (825–853 kcal/day formula diet for 3–5 months), stepped food reintroduction (2–8 weeks), and structured support for long-term weight loss maintenance. At 12 month follow up, mean bodyweight fell significantly in the intervention group. Diabetes remission was achieved by significantly more people in the intervention group.</p> <p>High and Low protein</p> <p>An RCT(272) (n=256) found that a higher protein content of an ad libitum diet improved weight loss maintenance in overweight and obese adults over 12 months.</p> <p>Vegetarian</p> <p>A systematic review(273) (15 studies), found that prescription of vegetarian diets was associated with a mean weight reduction among obese adults, based on variable quality studies. Greater weight loss was reported in studies with higher baseline weights,</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>smaller proportions of female participants, older participants, or longer durations, and in studies in which weight loss was a goal.</p> <p>A systematic review(274) found that vegetarian diets had significant benefits on weight reduction compared to non-vegetarian diets. Consuming vegetarian diets with energy restriction revealed a significantly greater weight reduction than those without energy restriction. The weight loss for subjects with follow-up of <1 year was greater than those with follow-up of >=1 year.</p> <p>Specific diets</p> <p>Commercial</p> <p>A systematic review(275) compared weight loss, adherence, and harms of commercial or proprietary weight-loss programmes versus control/education (no intervention, printed materials only, health education curriculum, or <3 sessions with a provider) or behavioural counselling among overweight and obese adults. At 12 months, Weight Watchers, Jenny Craig and Nutrisystem diet participants achieved greater weight loss than those assigned to control or education. Very-low-calorie programmes resulted in greater short-term weight loss than counselling, but some attenuation of</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>effect occurred beyond 6 months when reported. Atkins resulted in greater weight loss at 12 months than counselling. The statistical significance of the results was not reported in the abstract.</p> <p>Mediterranean</p> <p>A systematic review(276) (5 studies, n=998) found that the Mediterranean diet results in similar weight loss and cardiovascular risk factor level reduction as comparator diets in overweight or obese adults.</p> <p>A systematic review(277) (9 studies n=1178) found that the Mediterranean-style diet improved outcomes of glycaemic control, body weight and cardiovascular risk factors in Type 2 diabetes patients, compared with control diets.</p> <p>A systematic review(278) (2 studies) found that increasing fruit and vegetable intake, without a compensatory reduction in total energy intake, did not significantly influence weight loss.</p> <p>A sub-study(279) of an RCT (n=828) found that increasing fruits, vegetables, and low-fat dairy achieved significant weight loss and maintenance over 30 months for overweight and obese people. People who substituted protein for fat lost a</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>significant amount of weight per 1% increase in protein.</p> <p>RCT(280) 2014 (n=120) found increased vegetable intake reduced weight in the first 3 months among overweight adults. The change in weight was significantly correlated with higher proportions of energy consumed as vegetables, compared to a lower vegetable diet. The effect was not maintained over 12 months.</p> <p>Fasting</p> <p>A secondary analysis(281) of an RCT found that among older adults, the intake of certain, unspecified nutrients improved during diet-induced weight loss, incorporating partial meal replacements,. However there was inadequate intake of several vitamins and minerals over 18 month follow up.</p> <p>An RCT(282) (n=100) found that among obese adults, alternate-day fasting did not produce superior adherence, weight loss, weight maintenance, or cardio-protection versus daily calorie restriction.</p>		

<p>Dietary supplements</p> <p>Vitamin D</p> <p>A systematic review(283) (26 studies, n=42,430) found that among adults supplementation with vitamin D showed no effect on BMI, weight or fat mass among adults over 18 with unspecified obesity status.</p> <p>Flaxseed</p> <p>A systematic review(284) (45 studies) found a significant reduction in body weight, BMI and waist circumference following flaxseed supplementation in overweight and obese participants.</p> <p>Dietary fibre</p> <p>3 systematic reviews(285–287) focused on dietary fibre and weight reduction:</p> <p>The first (285) (32 studies) found significant increases in weight loss among overweight adults treated with various forms of dietary fibre supplementation. The difference was non-significant for glucomannan.</p> <p>The second(286) (9 studies) reported that the evidence from available RCTs does not show that glucomannan intake generates statistically significant weight loss.</p>		
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Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>The third(287) (6 studies) found that in otherwise healthy overweight or obese adults (5 studies), there was some evidence that in the short term, up to 8 weeks, glucomannan reduced body weight, but not BMI. There was insufficient evidence on the intervention in children (1 study). The sample sizes of included studies were not reported in the abstract.</p> <p>Herbal supplements</p> <p>A systematic review(288) (6 studies) found insufficient evidence to support the use of phaseolus vulgaris herbal supplement in weight reduction, based on poor quality RCTs.</p> <p>Probiotics</p> <p>A systematic review(289) (9 studies) found no significant effect of probiotics or foods containing probiotics on body weight and BMI for obesity.</p> <p>Food supplementation</p> <p>A systematic review(290) 16 studies found that food supplementation resulted in greater weight loss in dietary trials comparing groups supplemented with a food and a control without</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>food supplementation. Food supplementation may improve adherence to dietary interventions.</p> <p>Polyunsaturated fatty acids</p> <p>A systematic review(291) (11 studies n=617) found that n-3 PUFA might effectively reduce waist circumference and triglyceride levels in overweight and obese adults, but not body weight. Given the small number and poor quality of RCTs included in the meta-analysis, the results were inconclusive.</p> <p>Diet follow up</p> <p>A systematic review(292) (20 studies, n=3017) found that anti-obesity drugs, meal replacements, and high-protein diets were associated with improved weight-loss maintenance after a very-low-calorie diet or low calorie diet period, whereas no significant improvements were seen for dietary supplements and exercise. The age and obesity status of trial participants was not reported in the abstract.</p> <p>Supplements</p> <p>(L) Carnitine</p> <p>A systematic review(293) (9 studies n=911) found that (L-)carnitine resulted in weight loss among</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>adults. The results of duration of consumption revealed that the magnitude of weight loss resulted by carnitine supplementation significantly decreased over time.</p> <p>Chromium</p> <p>A Cochrane review(294) (9 studies, n=622) found no firm evidence and no dose gradient when comparing different doses of Chromium picolinate with placebo for various weight loss measures (body weight, body mass index, percentage body fat composition, change in waist circumference). Based on low quality evidence, across all chromium picolinate doses investigated (200 mug, 400 mug, 500 mug, 1000 mug) the results indicated an effect on body weight in favour of Chromium picolinate after 12 to 16 weeks of treatment.</p> <p>A systematic review(295) (11 studies) found that chromium supplementation for overweight and obese people generated statistically significant reductions in body weight. The magnitude of the effect was small and there was high statistical heterogeneity.</p> <p>ALA</p> <p>A systematic review(296) (12 studies) found that supplementation with ALA slightly but significantly</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>decreased body weight and BM among obese adults. However, its effects on Waist Circumference (WC) was not significant.</p> <p>Green Tea</p> <p>A Cochrane review(297) (14 studies, n=1562) found that green tea preparations induced a small, statistically non-significant weight loss in overweight or obese adults. Green tea had no significant effect on the maintenance of weight loss.</p> <p>Vitamin D3</p> <p>An RCT(298) (n=218) found that vitamin D3 supplementation during weight loss did not increase weight loss or associated factors compared with placebo, among overweight or obese women.</p> <p>Dietary interventions for children</p> <p>A systematic review(299) (14 studies) examined the effectiveness of weight management interventions comparing diets with varying macronutrient distributions on BMI and cardiometabolic risk factors in overweight or obese children and adolescents. The results indicated that compared to a low-fat ($\leq 33\%$ energy or $< 40\text{g/day}$) diet, an isocaloric or ad libitum low-carbohydrate diet ($< 20\%$ energy or $< 60\text{g/day}$) achieved a greater reduction</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>in BMI in the low-carbohydrate group immediately after dietary intervention. No differences in outcomes were observed between increased and standard protein diets, or between increased and standard fat diets. Longer term outcomes were not reported in the abstract.</p> <p>A systematic review(300) (9 studies, n=1,065) examined the effects of low glycaemic index or low glycaemic load dietary regimens on anthropometric parameters, blood lipid profiles, and indicators of glucose metabolism in children and adolescents. Results indicated that, compared to diets providing a high glycaemic index, low glycaemic index protocols resulted in significantly more pronounced decreases in serum triglycerides and HOMA-index, a surrogate marker for insulin resistance. Other parameters under investigation were not affected by either low or high glycaemic indices.</p> <p>A systematic review(167) (44 studies n=4781) assessed the effects of diet, physical activity and behavioural interventions for the treatment of overweight or obese adolescents aged 12 to 17 years. Most of the trials used a multidisciplinary intervention with a combination of diet, physical activity and behavioural components. The content and duration of the intervention, its delivery and the</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>comparators varied across trials. Low quality evidence indicated that multidisciplinary interventions involving a combination of diet, physical activity and behavioural components reduced measures of BMI and moderate quality evidence indicated that they reduced weight in overweight or obese adolescents, mainly when compared with no treatment or waiting list controls.</p> <p>A systematic review(166) (7 studies n=923) assessed the effects of diet, physical activity and behavioural interventions for the treatment of overweight or obese children up to the age of 6 years. The children in the included trials were followed up for between six months and three years. In trials comparing a multicomponent intervention with usual care, enhanced usual care, or information control, we found a greater reduction in BMI z-score in the intervention groups at the end of the intervention. Weak evidence suggested that dairy interventions may be effective in the longer term, but not energy-restricted diets, compared with control at 36 months follow up.</p> <p>An RCT(301) (n=102) found that diets with modified carbohydrate intake were as effective as a portion controlled diet for weight management in obese</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>children aged 7-12 years. However, there was lower adherence to the low carbohydrate diet.</p>		
<p><u>1.8 Pharmacological interventions</u></p>		
<p>2011 surveillance summary</p> <p>In previous surveillance of this guideline, 24 studies relevant to this section of the guideline were identified(302-326).</p> <p>For orlistat, which is licensed and recommended in NICE guideline CG189, 3 studies found a beneficial effect in adults(308,317,325) and 2 studies found a beneficial effect in children(323,324). Other studies identified(301-6,308-15, 317-321,324-325) covered drugs that were and remain unlicensed for the indication of weight loss (metformin, taranabant, sibutramine, rimonabant), or were the subject of NICE technology appraisals:</p> <p>TA494 Naltrexone-bupropion for managing overweight and obesity (December 2017).</p> <p>Obesity - phentermine (with topiramate)</p> <p>Obesity - lorcaserin</p>	<p>Experts highlighted that 2 new pharmacological treatments, liraglutide and combined bupropion/naltrexone, are now licensed for obesity treatment and that the pharmacotherapy section would need updating.</p>	<p>Liraglutide</p> <p>NICE guideline CG189 recommends considering pharmacological treatment for people who have not reached their target weight loss or have reached a plateau on dietary, activity and behavioural changes. The guideline recommends orlistat as a pharmacological treatment option only as part of a weight management plan in adults who are obese or have a BMI of 28 kg/m² or more with associated risk factors, such as type 2 diabetes. Liraglutide (Saxenda) is not specifically mentioned in NICE guideline CG189, but it is another potential pharmacological treatment option for use in line with its marketing authorisation (at a dose of up to 3.0 mg), for adults for whom lifestyle and behavioural approaches have not been effective and for whom the potential benefits of treatment outweigh the risks. However, as reported in the European public assessment report for liraglutide</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>These studies were passed to the TA team for consideration when the topic underwent the review proposal process.</p> <p>2018 surveillance summary</p> <p>Liraglutide</p> <p>The NICE evidence summary ES14: Obese, overweight with risk factors: liraglutide (Saxenda) was retrieved which summarised 4 RCTs(327–330). These RCTs included adults who were obese or overweight with a variety of weight-related comorbidities including dyslipidaemia, hypertension, type 2 diabetes and sleep apnoea. All of the studies compared liraglutide with placebo. There were no published double-blind RCTs which compared liraglutide (Saxenda) to other medicines for weight management.</p> <p>The evidence summary concluded that studies have shown statistically significant weight losses with liraglutide compared with placebo in people with and without type 2 diabetes. However, as reported in the European Public Assessment Report (EPAR) for liraglutide (Saxenda) it is unlikely that any potential weight loss would be sustained after treatment with liraglutide is stopped. There were high drop-out rates in both the liraglutide and</p>		<p>(Saxenda), it is unlikely that any potential weight loss achieved with liraglutide would be sustained after treatment is stopped. The summary of product characteristics (SPC) for liraglutide (Saxenda) does not provide further information on how long treatment (at a dose of up to 3.0 mg) should be continued for in people who have lost at least 5% of their initial body weight after 12 weeks' treatment. There were high drop-out rates in all of the studies so continuation with the treatment may be problematic in practice. Nevertheless, in view of the new evidence supporting the use of liraglutide, there is a potential impact on the guideline to update the pharmacological treatment section.</p> <p>Combined naltrexone and bupropion</p> <p>NICE guideline CG189 does not make recommendations on combined naltrexone and bupropion. NICE pathways bring together everything NICE has said on a topic in an interactive flowchart. The NICE pathway for obesity includes the technology appraisal TA494 Naltrexone–bupropion for managing overweight and obesity (December 2017), which does not recommend Naltrexone–bupropion within its marketing authorisation for managing overweight and obesity in adults alongside a reduced-calorie diet and</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>placebo groups in all of the studies so continuation with treatment may be a problem in practice.</p> <p>Two systematic reviews(331,332) examined liraglutide for obesity.</p> <p>The first review(331) (28 studies, n= 29,018) compared weight loss and adverse events among drug treatments for obesity. Among overweight or obese adults, orlistat and liraglutide 3mg, compared with placebo, were each associated with achieving at least 5% weight loss at 52 weeks. Liraglutide was associated with higher odds than orlistat of achieving at least 5% weight loss. However, liraglutide was also associated with the highest risk of adverse effect-associated discontinuation.</p> <p>The second review(332) (25 studies, n= 6411) found that treatment with GLP-1 receptor agonists exenatide or liraglutide (1.2mg or 1.8mg) resulted in weight loss in overweight or obese patients with or without type 2 diabetes. GLP-1R agonists were associated with nausea, diarrhoea, and vomiting, but not with hypoglycaemia. Control interventions assessed were placebo, oral antidiabetic drugs, or insulin. The effect sizes for specific drugs were not reported in the abstract, however.</p>		<p>increased physical activity. No impact on the guideline is anticipated.</p> <p>Combined phentermine and topiramate</p> <p>NICE guideline CG189 does not make recommendations on combined phentermine and topiramate, and there is unlikely to be any impact on the guideline from the new evidence, due to the absence of a marketing authorisation for this drug combination.</p> <p>Lorcaserin</p> <p>NICE guideline CG189 does not make recommendations on lorcaserin, and there is unlikely to be any impact on the guideline from the new evidence, due to the absence of a marketing authorisation for this drug.</p> <p>Centrally acting drugs</p> <p>The collective new evidence and previous surveillance evidence is consistent with NICE guideline CG189 recommendations, which advises orlistat as a pharmacological treatment option only as part of a weight management plan in adults who are obese or have a BMI of 28 kg/m² or more with associated risk factors, such as type 2 diabetes. Both sibutramine and rimonabant have been</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>A further 2 secondary analyses(333,334) (n=2210) of an RCT found that liraglutide 3.0mg, plus diet and exercise, was associated with short and long-term (3 years) improvements in health related quality of life (HRQoL) in adults with obesity or overweight with comorbidity, versus placebo.</p> <p>A systematic review(335) (124 studies) of evidence from observational studies reflecting real-world clinical practice demonstrated that liraglutide therapy (1.2mg or 1.8mg) improved glycaemic control with a low risk of hypoglycaemia, and was associated with significant weight loss in patients with type 2 diabetes. The beneficial glycaemic and weight effect of liraglutide therapy in patients with type 2 diabetes was maintained for at least 12 months.</p> <p>An RCT (336) (n=665) found that liraglutide (1.2 or 1.8 mg) provided greater sustained glycaemic control and body weight reduction over 52 weeks for type 2 diabetes, compared to sitagliptin 100 mg/day. The absolute difference in weight loss was 1.5kg to 2.5kg.</p> <p>An RCT(337) (n=1091) found that, in patients with type 2 diabetes, liraglutide (1.2 or 1.8 mg) and metformin provided sustained glycaemic control over 2 years, was well tolerated, and was associated</p>		<p>withdrawn because of safety concerns relating to potential treatment-induced fatal adverse events, and the evidence on these drugs is therefore unlikely to impact. New evidence suggesting effectiveness of diethylpropion, fenproporex, mazindol and sibutramine for weight loss in obese premenopausal women is unlikely to impact due to being derived from a single RCT, and due to the risk of serious adverse events.</p> <p>Topiramate monotherapy</p> <p>The new evidence indicating that topiramate monotherapy is effective in weight reduction for obesity is unlikely to impact due to the risk of serious adverse events observed in the studies.</p> <p>Children and adolescents</p> <p>The new systematic review evidence indicating that pharmacological interventions (metformin, sibutramine, orlistat and fluoxetine) may reduce BMI and bodyweight in obese children and adolescents is unlikely to impact on the guideline, due to licensing status of all of the interventions and only weak underlying evidence. Orlistat is the only drug licensed for obesity in children and adolescents, and the evidence supporting this is consistent with recommendation 1.8.6.</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>with weight loss in comparison with glimepiride and metformin, and metformin monotherapy.</p> <p>Combined naltrexone and bupropion A total of 1 systematic review (331), 1 IPD meta-analysis (338) and 5 RCTs(339–343) examined Naltrexone–bupropion. The recommendations in this area are covered by the technology appraisal TA494 Naltrexone–bupropion for managing overweight and obesity (December 2017). This information will be passed onto the TA team for consideration when the topic undergoes the review proposal process.</p> <p>Combined phentermine and topiramate A total of 1 systematic review(331) and 2 RCTs(344,345) covered combined phentermine and topiramate for obesity. However, guidance on phentermine and topiramate is the subject of an ongoing technology appraisal - Obesity - phentermine (with topiramate). This information will be passed onto the TA team for consideration.</p>		

Topiramate monotherapy

A systematic review(346) (5 studies) found that topiramate monotherapy reduced weight and BMI in obese type 2 diabetes patients, but increased adverse events including serious adverse events.

Lorcaserin

A total of 2 systematic reviews(331,347) and 2 RCTs(348,349) covered lorcaserin for obesity. Guidance on lorcaserin is the subject of an ongoing technology appraisal - [Obesity - lorcaserin](#). This information will be passed onto the TA team for consideration.

Centrally acting drugs

A systematic review(350) (94 studies, n= 24,808) evaluated the clinical effectiveness and cost-effectiveness of orlistat, sibutramine and rimonabant, within their licensed indications for the treatment in obese patients. The comparators were lifestyle or exercise advice (standard care), placebo or metformin. The mixed treatment meta-analysis showed that all the active treatments are effective at reducing weight and BMI. In the case of sibutramine, the higher dose (15 mg) resulted in a greater reduction than the lower dose (10 mg). The economic results showed that, compared with placebo, the treatments are all cost-effective when using a threshold of £20,000 per QALY, and that

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>sibutramine 15mg dominates the other interventions, including sibutramine 10mg. However, it was noted that both sibutramine and rimonabant have been withdrawn because of safety concerns relating to potential treatment-induced fatal adverse events.</p> <p>A further systematic review(351) also found that orlistat, sibutramine and rimonabant were all effective in achieving weight loss for obesity.</p> <p>An RCT(352) (n=174) found that centrally acting drugs diethylpropion, fenproporex, mazindol and sibutramine were significantly more effective than placebo in promoting weight loss in obese premenopausal women. Fluoxetine was not more effective than placebo. All the drugs resulted in significantly more adverse effects than placebo.</p> <p>Children and adolescents</p> <p>A Cochrane systematic review(353) (21 studies, n=2484) found that pharmacological interventions (metformin, sibutramine, orlistat and fluoxetine) had small but significant effects in reduction in BMI and bodyweight in obese children and adolescents. However, many of these drugs are not licensed for the treatment of obesity in children and adolescents, or have been withdrawn. Trials were</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>generally of low quality with many having a short or no post-intervention follow-up period and high dropout rates.</p> <p>A systematic review(200) (31 studies, 29 behavioural, 2 pharmacological and behavioural) examined the evidence of behavioural and pharmacological weight-management interventions on BMI, BMI z-score and the prevalence of overweight and obesity in children and youth. Both intervention types showed a significant effect on BMI or BMI z-score in favour of treatment, with behavioural interventions showing a slightly greater effect than combined interventions. The evidence was rated as low-to-moderate-quality.</p>		
<p><u>1.9 Continued prescribing and withdrawal</u></p>		
None	None	None
<p><u>1.10 Surgical interventions</u></p>		
<p>2011 surveillance summary</p> <p>In previous surveillance of this guideline, 10 studies relevant to this section of the guideline were identified(354–363). They found a beneficial effect</p>	<p>Topic expert noted that more evidence is emerging on bariatric surgery and long term benefits.</p> <p>Topic experts stated that NICE guideline CG189 has made no difference to current practice and noted</p>	<p>The collective new and previous surveillance evidence indicates that surgery for obesity results in greater weight loss than conventional treatment in the short term up to two years post-surgery. Furthermore, the weight loss is associated with</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>of bariatric surgery on weight loss and mortality (via reduction of risk factors) in adults, and in children. Bariatric surgery was also found to be cost effective. No evidence was identified to indicate that the recommended cut offs for referral for bariatric surgery should be changed.</p> <p>Some studies were identified that compared interventions prior to surgery to improve the outcome following surgery, and some studies were found comparing the effectiveness of different types of surgery. Both these issues were considered to be outside the scope of this guideline and so no further consideration was given to them.</p> <p>The surveillance decision in 2011 concluded that the evidence had no impact on current recommendations.</p> <p>2018 surveillance summary</p> <p>A systematic review(65) (14 studies) examined the characteristics, impact and practice implications of specialist weight management services for adults in the UK. Multidisciplinary team composition and eligibility criteria varied and dropout rates were reportedly high. Results indicated that multicomponent interventions, delivered by a specialist multidisciplinary team, achieved a</p>	<p>that the NHS bariatric surgery rate has gone down since publication of the guideline, as reported in the The United Kingdom National Bariatric Surgery Registry. Experts considered there to be significant barriers to implementation due to a lack of responsibility for obesity care. A study was cited but did not meet the surveillance review inclusion criteria and was therefore excluded. Experts also highlighted the perceived failure of commissioning of Tier 3 secondary care clinics which denies access to possible surgery as patients can't be referred directly to surgery. A study(65) was cited and is included in the evidence summary.</p> <p>A further barrier to implementation was considered to be the very large numbers (over at least 2.6 million people) that are above the BMI threshold for referral. Guidance was considered necessary to prioritise the referrals into manageable proportions.</p>	<p>reductions in comorbidities, such as diabetes, metabolic syndrome and sleep apnoea, although the benefits for hypertension and improvement in lipid profiles are less clear. However, there is a lack of evidence on the longer-term effects of surgery in comparison with conventional treatment on weight loss, comorbidities and health-related quality of life, so it is unclear if the benefits are maintained over time. Overall, the evidence is consistent with NICE guideline CG189 recommendations 1.10.1-1.10.17, which provide for the use of bariatric surgery in adults and children conditional to specific criteria being met.</p> <p>Topic expert feedback and related evidence indicating the implementation issues concerning commissioning of Tier 3 secondary care clinics and referral for bariatric surgery is unlikely to impact on recommendation 1.10.1, because commissioning falls outside the remit of NICE guideline CG189. However, a cross referral to the new commissioning guidance is required (see Assessment in adults and children).</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>statistically significant reduction in mean BMI over time and in mean weight changes. There was reportedly evidence for improved outcomes in diabetics, although the data was not reported for this subgroup in the abstract.</p> <p>A Cochrane review(364) (22 studies, n=1798) found that bariatric surgery in adults resulted in greater improvement in weight loss outcomes and weight associated comorbidities compared with non-surgical interventions, regardless of the type of procedures used. When compared with each other, certain procedures resulted in greater weight loss and improvements in comorbidities than others. Outcomes were similar between Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy, and both of these procedures had better outcomes than adjustable gastric banding. For people with very high BMI, biliopancreatic diversion with duodenal switch resulted in greater weight loss than RYGB. Across all studies adverse event rates and reoperation rates were generally poorly reported. Most trials followed participants for only one or two years.</p> <p>A systematic review(365) (31 RCTs n=2619) found that bariatric surgery was efficacious compared to standard care in reducing BMI. Weight losses were</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>greatest with diversionary procedures, intermediate with diversionary/restrictive procedures, and lowest with those that were purely restrictive. Compared with Roux-en-Y gastric bypass, adjustable gastric banding had lower weight loss efficacy, but also led to fewer serious adverse effects.</p> <p>A systematic review(366) (11 studies, n=796) found that compared with non-surgical treatment of obesity, bariatric surgery leads to greater body weight loss and higher remission rates of type 2 diabetes and metabolic syndrome. However, results are limited to two years of follow-up and based on a small number of studies and individuals.</p> <p>A systematic review(367) (25 studies, n=1194) found that weight loss and diabetic remission significantly improved among bariatric surgical patients rather than those receiving non-surgical treatments. Length of follow up was not reported in the abstract.</p> <p>A cohort study and cost effectiveness analysis(368) evaluate the costs and outcomes of increasing access to bariatric surgery for severe and morbid obesity. Primary care electronic health records from the UK Clinical Practice Research Datalink were analysed (n= 3045 participants who received bariatric surgery and n=247,537 general population</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>controls). The findings indicated that bariatric surgery was associated with increased immediate and long-term health-care costs but these were exceeded by expected health benefits to obese individuals with reduced onset of new diabetes, remission of existing diabetes and lower mortality.</p> <p>Children and adolescents</p> <p>A systematic review(369) (1 study n=50) found low quality evidence that laparoscopic gastric banding led to greater body weight loss compared to a multi component lifestyle programme for 14-18 year old adolescents. There was insufficient data to assess efficacy across populations from different countries.</p> <p>Preoperative interventions</p> <p>A systematic review(370) (n=6686) found insufficient evidence to support or refute the routine use of preoperative weight reduction in bariatric surgery.</p> <p>An RCT(371) (n=143) found that a pre-surgery lifestyle intervention did not improve weight loss at 24 months after bariatric surgery, compared to usual care.</p>		

Quality of life

A systematic review(372) (72 studies n=9,433) found that bariatric surgery had a significant positive influence on quality of life in general. The impact varied considerably across studies with bariatric surgery showing a significantly greater positive influence on physical quality of life compared to mental quality of life.

Revisional surgery

A systematic review(373) (36 studies, n=2617) found no RCT data but from observational studies found that revisional bariatric surgery following failed laparoscopic adjustable gastric banding (LAGB) surgery was associated with generally good outcomes similar to those experienced after primary surgery.

A systematic review(374) found that failed LAGB was most effectively managed with conversion to another bariatric procedure; laparoscopic sleeve gastrectomy (LSG), laparoscopic RYGB, and laparoscopic biliopancreatic diversion and duodenal switch (BPDDS). Mean excess weight loss was observed with all 3 procedures over 12-24 months. Study quality was low, however.

1.11 Bariatric surgery for people with recent-onset type 2 diabetes

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>2011 surveillance summary</p> <p>Bariatric surgery for people with recent-onset type 2 diabetes was a new section in NICE guideline CG189, and therefore it was not covered in previous surveillance of this guideline.</p> <p>2018 surveillance summary</p> <p>A total of 3 systematic reviews(375–377) (3 studies, n=170;54 studies; 6 studies, n=410) Assessed bariatric surgical procedures versus non-surgical treatments for obese patients with type 2 diabetes.</p> <p>Compared with medical therapy, bariatric surgery for type 2 diabetes significantly decreased the levels of HbA1c, fasting blood glucose, weight, triglycerides, while increasing the rate of diabetes remission. However, long term data were lacking.</p> <p>One of the systematic reviews(377) found that RYGB surgery specifically was superior to medical treatment for short-to medium-term remission of type 2 diabetes, reduction of BMI, WC and cardiovascular risk factors.</p> <p>A cost effectiveness analysis(378) based on computer modelling found that LAGB is likely to be</p>	<p>Topic experts advised that recommendation 1.11.2 for bariatric surgery to be considered for BMI 30-35 needs to be made stronger in view of the publication of additional evidence for type 2 diabetics undergoing bariatric surgery published since 2014. At the time of the 2014 guidance there were only two RCTs in this BMI range. A consensus statement was cited, but was not based on a systematic review and was therefore excluded. No other evidence was cited.</p>	<p>New evidence and topic expert feedback indicates that bariatric surgery is effective for people with type 2 diabetes and obesity. Additional long term follow up data may be needed to substantiate the evidence from a single RCT and non-randomised studies indicating the long term effectiveness of bariatric surgery, before a definite impact to strengthen recommendation 1.11.2 can be established. This may also depend on the cost effectiveness of offering bariatric surgery in this context.</p> <p>Topic expert feedback and related evidence indicating the implementation issues concerning commissioning of Tier 3 secondary care clinics and referral for bariatric surgery is unlikely to impact on recommendations 1.11.1-1.11.13, because commissioning falls outside the remit of NICE guideline CG189. However, a cross referral to new commissioning guidance is required (see Assessment in adults and children).</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>considered cost-effective from the healthcare payer perspective when compared with standard medical treatment of obesity in patients with type 2 diabetes in the UK setting. The incremental cost-effectiveness ratio in the base case fell considerably below commonly quoted willingness-to-pay thresholds in the UK setting.</p> <p>A systematic review and economic evaluation (379) (2 studies) found that bariatric surgery was clinically effective and cost-effective for people with class I or II obesity who also have type 2 diabetes but is less likely to be cost-effective for people with class I obesity.</p> <p>A cohort study and cost effectiveness analysis(368) evaluated the costs and outcomes of increasing access to bariatric surgery for severe and morbid obesity. Primary care electronic health records from the UK Clinical Practice Research Datalink were analysed (n= 826 participants with type 2 diabetes who received bariatric surgery). The findings indicated that bariatric surgery was associated with increased immediate and long-term health-care costs but these were exceeded by expected health benefits to obese individuals with remission of existing diabetes and lower mortality. A limitation of the analysis was that intervention effects were</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>derived from a randomised trial with generally short follow-up and non-randomised studies of longer duration.</p> <p>A post hoc analysis(380) of an RCT (n=150) found that 5-year outcome data indicated that, among patients with type 2 diabetes and a BMI of 27 to 43, bariatric surgery plus intensive medical therapy was more effective than intensive medical therapy alone in decreasing body weight, triglyceride level, high-density lipoprotein cholesterol level, use of insulin and quality-of-life measures. No major late surgical complications were reported except for one reoperation.</p>		
<p><u>1.12 Follow-up care</u></p>		
<p>2011 surveillance summary</p> <p>Follow-up care was a new section in NICE guideline CG189, and therefore it was not covered in previous surveillance of this guideline.</p> <p>2018 surveillance summary</p> <p>A systematic review(381) (9 studies) found that patients attending psychotherapeutic interventions</p>	<p>None</p>	<p>Recommendation 1.12.1 advises that psychological follow up support should be tailored to the individual. The collective new evidence on psychological follow up interventions is unlikely to impact, due to conflicting findings and poor study quality.</p> <p>The new evidence supporting compliance with follow up care is consistent with recommendations 1.12.1 and 1.12.2, to offer people who have had</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>or support groups following bariatric surgery experienced greater weight loss results than patients treated with bariatric surgery alone. Study quality was reportedly poor, however.</p> <p>A systematic review(382) (four studies, n=365) found an increase in the percentage of excess weight loss at 1-year post gastric bypass surgery when patients were compliant with follow-up. Follow up interventions were not specified in the abstract.</p> <p>An RCT(383) (n=162) found that psychological support pre and post bariatric surgery had no impact on weight loss as measured by BMI and change in BMI by 1 year, compared to treatment as usual. The health psychology-led bariatric rehabilitation service involved three 50-min one-to-one sessions with a health psychologist and provided information, support and mentoring pre and post-surgery addressing psychological issues such as dietary control, self-esteem, coping and emotional eating.</p> <p>An RCT(384) (n=117) found that a videoconferencing-based psychoeducational group intervention in patients after bariatric surgery did not result in any differences in weight loss, EWL, HRQOL, or self-efficacy between study groups at 1</p>		<p>bariatric surgery a follow-up care package for a minimum of 2 years within the bariatric service.</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>year after surgery. However, patients with clinically significant depression symptoms at baseline assigned to the intervention group had a significantly better HRQOL and lower depression scores compared to conventional postsurgical visits.</p>		
<p>Areas not currently covered in the guideline Additional treatments for obesity</p>		
<p>2018 surveillance summary</p> <p>Acupuncture</p> <p>4 systematic reviews(385–388) examined acupuncture for obesity.</p> <p>The first(385) (23 studies n=1808) found that acupuncture for obesity exhibited significant BMI reduction when compared with untreated or placebo control groups and in combination with lifestyle interventions including basic therapy of both treatment and control groups.</p> <p>The second(386) (9 studies) found that auricular acupuncture compared to no treatment or sham acupuncture resulted in no statistical difference in weight loss for obesity. However, auricular</p>	<p>None</p>	<p>The new evidence on the following interventions is unlikely to impact on the guideline due to either conflicting results, small sample sizes or potential methodological weaknesses of included studies in systematic reviews:</p> <ul style="list-style-type: none"> • acupuncture • tapas acupressure technique • percutaneous electrical neurostimulation • balneotherapy.

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>acupuncture plus diet was more effective than diet alone, and when combined with diet and exercise was more effective than diet and exercise.</p> <p>The third(387) (96 studies, n=4861) found that traditional Chinese medicine and acupuncture were more effective than placebo or lifestyle modification in reducing body weight among people with obesity. They had a similar efficacy as anti-obesity drugs (sibutramine, fenfluramine or orlistat) but with fewer reported adverse effects. However, the findings were limited by small sample sizes and low quality of methodologies.</p> <p>The fourth(388) (11 studies, n=643) found that auricular and electro acupuncture were both able to reduce BMI and body fat mass in obese patients, compared to sham acupuncture. Body weight was not significantly different, and adverse events were not reported in included studies.</p> <p>An RCT(389) (n=285) tested the efficacy of a novel mind and body technique, tapas acupressure technique, for weight-loss maintenance among obese adults. The main outcome measure was change in weight from the beginning of the weight loss maintenance intervention to 12 months later. There was no significant difference in weight regain</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>between the two groups, and secondary outcomes were also non-significant.</p> <p>Percutaneous electrical neurostimulation</p> <p>An RCT(390) (n=135) found that conventional percutaneous electrical neurostimulation of dermatome T6 was associated with an appetite reduction and, along with a proper diet, achieved a significantly greater weight reduction compared to diet alone in morbidly obese patients.</p> <p>Balneotherapy</p> <p>An RCT(391) (n=257) found that a 3-week balneotherapy programme provided a significant one-year benefit over the usual GP dietary advice for overweight and obese patients. No adverse reaction was observed for patients attending balneotherapy. However the methodology of the RCT is an unconventional zelen design that may have impacted on the risk of bias for randomisation, thereby limiting the impact of the results.</p>		
<p>Research recommendation 1</p>		

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
Do post-operative lifestyle intervention programmes (exercise, behavioural or dietary) improve weight loss and weight-loss maintenance following bariatric surgery?		
<p>New evidence relevant to the research recommendation was found but an update of the related review question is not planned because the new evidence is insufficient to trigger an update.</p>	None	This research recommendation will be considered again at the next surveillance point.
<p>Research recommendation 2</p> <p>What is the long-term effect of bariatric surgery on diabetes-related complications and quality of life in people with type 2 diabetes compared with optimal medical treatment?</p>		
<p>New evidence relevant to the research recommendation was found but an update of the related section is not planned because the new evidence is insufficient to trigger an update.</p>	None	This research recommendation will be considered again at the next surveillance point.

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>Research recommendation 3</p> <p>What are the long-term outcomes of bariatric surgery in children and young people with obesity?</p>		
<p>The research recommendation would be answered by an observational study design that was not included in the search for the related section of the guideline.</p>	<p>None</p>	<p>This research recommendation will be considered again at the next surveillance point.</p>
<p>Research recommendation 4</p> <p>What is the best way to deliver obesity management interventions to people with particular conditions associated with increased risk of obesity (such as people with a physical disability that limits mobility, a learning disability or enduring mental health difficulties)?</p>		
<p>No new evidence relevant to the research recommendation was found and no ongoing studies were identified.</p>	<p>None</p>	<p>This research recommendation will be considered again at the next surveillance point.</p>

Summary of new evidence from previous and 2018 surveillance	Intelligence gathering	Impact
<p>Research recommendation 5</p> <p>What are the long-term effects of using very-low-calorie diets (VLCDs) versus low-calorie diets (LCDs) on weight and quality of life in patients with a BMI of 40 kg/m² or more, including the impact on weight cycling?</p>		
<p>No new evidence relevant to the research recommendation was found and no ongoing studies were identified.</p>	<p>None</p>	<p>This research recommendation will be considered again at the next surveillance point.</p>

Overlaps with other guidelines

NICE's surveillance team assessed the extent of overlaps between [Obesity](#) (NICE guideline CG189) and related guidelines in the areas of lifestyle, behavioural and physical activity interventions. The rationale and summary of proposed changes to address overlaps are as follows.

Lifestyle Interventions

PH53: Weight management: Lifestyle services for overweight or obese adults

There is overlap between NICE guideline CG189 and NICE guideline PH53 [Weight management: lifestyle services for overweight or obese adults](#) (May 2014). The overlap relates to the core components of lifestyle programmes for effective weight loss, choice and preference of treatment, and training of health professionals. NICE guideline PH53 provides additional information in these areas, and therefore it is proposed that NICE guideline CG189 Section 1.4 recommendations 1.4.1, 1.4.2 and 1.4.5 should cross refer to NICE guideline PH53 for additional information on lifestyle interventions for adults. The additional information on lifestyle weight management programmes for effective weight loss covers:

- The multi-component elements, addressing dietary intake, physical activity levels and behaviour change (specifically relevant to NICE guideline CG189 recommendation 1.4.1).
- Programme development by a multidisciplinary team. This includes input from a registered dietitian, registered practitioner psychologist and a qualified physical activity instructor.
- Ensuring staff are trained to deliver them and they receive regular professional development sessions (specifically relevant to NICE guideline CG189 recommendation 1.4.5).
- Focussing on life-long lifestyle change and the prevention of future weight gain.
- Duration of at least 3 months, and with sessions offered at least weekly or fortnightly to include a 'weigh-in' at each session.
- Ensuring that achievable goals for weight loss are agreed for different stages – including within the first few weeks, for the end of the programme or referral period (as appropriate) and for 1 year.
- Ensuring specific dietary targets are agreed (for example, for a clear energy [calorie] intake or for a specific reduction in energy intake) tailored to individual needs and goals.
- Ensuring discussions take place about how to reduce sedentary behaviour and the type of physical activities that can easily be integrated into everyday life and maintained in the long term (for example, walking).

- Ensuring any supervised physical activity sessions are led by an appropriately qualified physical activity instructor and take into account any medical conditions people may have. Instructors should be on the Register of Exercise Professionals (or equivalent) at level 3 or above (specifically relevant to NICE guideline CG189 recommendation 1.4.5).
- Using a variety of behaviour-change methods. These should address: problem solving; goal setting; how to carry out a particular task or activity; planning to provide social support or make changes to the social environment; self-monitoring of weight and behaviours that can affect weight; and feedback on performance (specifically relevant to NICE guideline CG189 recommendation 1.4.1 and section 1.5 for including behaviour change strategies).
- Tailor programmes to support the needs of different groups. For example, programmes should provide men- or women-only sessions as necessary; provide sessions at a range of times and in venues with good transport links or used by a particular community; and consider providing childcare for attendees (specifically relevant to NICE guideline CG189 recommendation 1.4.2 for taking into account individual preferences and social circumstances).
- Monitoring weight, indicators of behaviour change and participants' personal goals throughout the programme.
- Adopting a respectful, non-judgemental approach.

PH47: Weight management: lifestyle services for overweight or obese children and young people

There is overlap between NICE guideline CG189 and NICE guideline PH47 [Weight management: lifestyle services for overweight or obese children and young people](#) (October 2013). The overlap relates to the core components of lifestyle programmes for effective weight loss, choice and preference of treatment, training of health professionals and encouraging adherence. It is proposed that recommendations 1.4.1, 1.4.2, 1.4.5, 1.4.12 and 1.4.13 should cross refer to NICE guideline PH47 for additional information on lifestyle interventions for children. The additional relevant information in NICE guideline PH47 covers:

Core components of lifestyle programmes (specifically relevant to NICE guideline CG189 recommendation 1.4.1)

- Ensuring all lifestyle weight management programmes for overweight and obese children and young people are multi-component, including:
 - diet and healthy eating habits
 - physical activity
 - reducing the amount of time spent being sedentary

- strategies for changing the behaviour of the child or young person and all close family members.
- Ensuring the following core components, developed with the input of a multidisciplinary team are included:
 - Behaviour-change techniques to increase motivation and confidence in the ability to change. This includes strategies to help the family identify how changes can be implemented and sustained at home.
 - Positive parenting skills training, including problem-solving skills, to support changes in behaviour.
 - An emphasis on the importance of encouraging all family members to eat healthily and to be physically active, regardless of their weight.
 - A tailored plan to meet individual needs, appropriate to the child or young person's age, gender, ethnicity, cultural background, economic and family circumstances, any special needs and how obese or overweight they are. This should include helping them and their family to set goals, monitor progress against them and provide feedback.
 - Information and help to master skills in, for example, how to interpret nutritional labelling and how to modify culturally appropriate recipes on a budget.
 - Help to identify opportunities to become less sedentary and to build physical activity into their daily life (for example, by walking to school and through active play).
 - A range of physical activities (such as games, dancing and aerobics) that the children or young people enjoy and that can help them gradually become more active.
 - Information for family members who may not attend the programme itself to explain the programme's aims and objectives and how they can provide support.
 - Ongoing support and follow-up for participants who have completed the programme.

Choice and preference of treatment and adherence to programmes (specifically relevant to NICE guideline CG189 recommendations 1.4.2, 1.4.12 and 1.4.13)

- Developing a tailored plan to meet individual needs
- Encouraging adherence to lifestyle weight management programmes

Training of health professionals (specifically relevant to NICE guideline CG189 recommendation 1.4.5)

Ensuring staff are trained to deliver the weight management programme they will be working on.

Ensuring programme staff treat overweight and obese children, young people and their families with empathy, by making them aware of reasons for difficulty in managing weight, experiences, anxieties, perceptions and cultural issues relating to weight management.

Training staff:

- to accurately measure and record height and weight and to determine BMI centile using age- and gender-specific charts
- to help parents and carers recognise that their child is overweight or obese and the benefits of addressing their weight
- to use a locally approved comorbidities assessment tool, where available, to determine whether lifestyle weight management programmes are appropriate, or whether they should see their GP for a referral to a specialist obesity service or other specialist services (for example, paediatric services)
- to identify any concerns about a child or young person's mental wellbeing and how to refer them to their GP for onward referral to CAMHS
- in how to comply with statutory requirements and local policies relating to safeguarding and information governance.

Behavioural interventions

PH49: Behaviour change: individual approaches

There is a degree of overlap between NICE guideline CG189 and NICE guideline PH49 Behaviour change: individual approaches (January 2014) in the area of using proven behaviour change techniques in designing interventions, and ensuring interventions meet individual needs. NICE guideline CG189 recommended behaviour change approaches are specific to obesity, whereas NICE guideline PH49 does not explicitly cover behaviour change for obesity. However, a general cross referral from NICE guideline CG189 recommendation 1.5.1 to NICE guideline PH49 for adults and children is proposed for further information on delivering behavioural interventions with the support of an appropriately trained professional.

There is overlap between NICE guideline CG189 and NICE guideline PH49, relating to high intensity lifestyle interventions. It is proposed that NICE guideline CG189 recommendation 1.4.11 should cross refer to NICE guideline PH49 recommendation 9 for further information on high intensity interventions for obesity in adults at high risk of causing harm to their health and wellbeing, such as adults with a BMI more than 40. Recommendation 1.4.11 advises that the level of intensity of the intervention should be based on the level of risk and the potential to gain health benefits. A cross referral to NICE guideline PH49 Recommendation 9 will expand on this recommendation for people assessed as being at high risk. In progress NICE guidance [Behaviour change: technology-based interventions](#) should also be monitored for potential cross referral.

Editorial and factual corrections identified during surveillance

During surveillance editorial or factual corrections were identified.

- Generic principles of care

An editorial correction is needed. Expert feedback indicates that the cross reference in recommendation 1.1.4 should include more recent changes to policy including Public Health England's guides on weight management and the Childhood Obesity Plan:

Public Health England. Collection: [Weight management: guidance for commissioners and providers](#). 2017.

HM Government. [Childhood Obesity a Plan for Action](#). (2016 (updated 2017))

These more recent policy documents should replace the cross reference to Department of Health's [A call to action on obesity in England](#).

- Assessment

An editorial correction is needed. The collective new evidence, expert feedback and updated [NICE-accredited BOMSS Commissioning Guidance](#) and [NHS England commissioning guidance](#) indicate that there is a need for recommendations 1.3.7, 1.3.10-1.3.12 to cross refer to the commissioning guidance relating to tier 3 services, to include a definition of tier 3 and 4 services. The commissioning of services falls outside the remit of NICE guidance, but a cross referral has the potential to link the guideline recommendations with developments in specialist weight management services for adults, children and families, including multidisciplinary team composition in delivering these services.

The proposed amendment is:

1.3.7 Consider referral to tier 3 services[6] if:

- the underlying causes of being overweight or obese need to be assessed
- the person has complex disease states or needs that cannot be managed adequately in tier 2 (for example, the additional support needs of people with learning disabilities)
- conventional treatment has been unsuccessful
- drug treatment is being considered for a person with a BMI of more than 50 kg/m²
- specialist interventions (such as a very-low-calorie diet) may be needed
- surgery is being considered. [2006, amended 2014]

[6] For more information on tier 3 services, see NHS England's report on Joined up clinical pathways for obesity. For information on commissioning of tier 3 services, see British Obesity and Metabolic Surgery Society [Commissioning guide: Weight assessment and management clinics \(tier 3\)](#), and NHS England's [Commissioning Guidance to support devolution to CCGs of Adult Obesity surgical services in 2016/17](#).

1.3.10 Consider referral to an appropriate specialist for children who are overweight or obese and have significant comorbidities or complex needs (for example, learning disabilities or other additional support needs). New footnote [2006, amended 2018]

1.3.11 In tier 3 services, assess associated comorbidities and possible causes for children and young people who are overweight or who have obesity. Use investigations such as:

- blood pressure measurement
- lipid profile, preferably while fasting
- fasting insulin
- fasting glucose levels and oral glucose tolerance test
- liver function
- endocrine function.

Interpret the results of any tests used in the context of how overweight or obese the child is, the child's age, history of comorbidities, possible genetic causes and any family history of metabolic disease related to being overweight or obese. New footnote [2006, amended 2018]

1.3.12 Make arrangements for transitional care for children and young people who are moving from paediatric to adult services. New footnote [2006, amended 2018]

New footnote: For information on commissioning of tier 3 services and how to set up specialist children's and adolescent Weight Assessment and Management Clinics, see British Obesity and Metabolic Surgery Society [Commissioning guide: Weight assessment and management clinics \(tier 3\)](#).

- Lifestyle interventions

The following editorial corrections are needed:

- The reference to NHS Choices in recommendation 1.4.8 and footnote 7 should be removed, and replaced with a reference and link to the Public Health England [Eatwell guide](#). NICE's position across all of its guidelines is not to cross refer to NHS Choices and instead to signpost to more direct sources where possible.

- Recommendations 1.4.1, 1.4.2 and 1.4.5 should cross refer to NICE guideline PH53 [Weight management: lifestyle services for overweight or obese adults](#) (May 2014) for additional information on lifestyle interventions for adults. The update of this section should also consider related Public Health England guidance [A guide to Delivering and Commissioning Tier 2 Adult Weight Management Services](#) (2017).

The recommendations should be followed immediately by the following text:

please see NICE's guideline on [managing overweight and obesity in adults](#) for further information on lifestyle interventions for adults.

- Recommendation 1.4.11 should cross refer to NICE guideline PH49 [Behaviour change: individual approaches](#) (January 2014) for further information on high intensity interventions. The recommendation should be followed immediately by the following text:

See NICE's guideline on [Behaviour change: individual approaches for further information on high intensity interventions](#)

- Recommendations 1.4.1, 1.4.2, 1.4.5, 1.4.12 and 1.4.13 should cross refer to NICE guideline PH47 [Weight management: lifestyle services for overweight or obese children and young people](#) (October 2013) for additional information on lifestyle interventions for children. The update of this section should also consider related Public Health England guidance [A guide to commissioning and delivering tier 2 weight management services for children and their families](#) (2017). The recommendations 1.4.1, 1.4.2 and 1.4.5 should be followed immediately by the following text:

Please see NICE's guideline on [Weight management: lifestyle services for overweight or obese children and young people](#) for further information on lifestyle interventions for children.

- Recommendations 1.4.12 and 1.4.13 should be followed immediately by the following text:

Please see NICE's guideline on [weight management: lifestyle services for overweight or obese children and young people](#) for further information on encouraging adherence to lifestyle weight management programmes.

- Behavioural interventions

The following editorial corrections are needed:

- Recommendation 1.5.1 should cross refer to NICE guideline PH49 [Behaviour change: individual approaches \(January 2014\)](#).

Recommendation 1.5.1 should be followed immediately by the following text:

Please see NICE's guideline on [behaviour change: individual approaches](#) for further information on training and skills for health professionals.

- Dietary

- Recommendation 1.7.1 advises tailoring dietary changes to food preferences and allowing for a flexible and individual approach to reducing calorie intake. It does not recommend specific commercial diets, although NICE's guideline on [Weight management: lifestyle services for overweight or obese](#)

[adults](#) states in recommendation 12 that certain commercial diets have been shown to be cost effective. A cross referral from NICE guideline CG189 to NICE guideline PH43 should be considered to link to the advice on commercial diets. This should be informed by expert input, as part of the update.

- Surgery

An editorial correction is needed. A cross referral from recommendations 1.10.1, 1.11.1, 1.11.12 and 1.11.3 and footnote 10 to the new commissioning guidance is required. The revised footnote should be identical to the proposed footnote under Assessment above:

[6] For more information on tier 3 services, see NHS England's report on [Joined up clinical pathways for obesity](#). For information on commissioning of tier 3 services, see British Obesity and Metabolic Surgery Society [Commissioning guide: Weight assessment and management clinics \(tier 3\)](#), and NHS England's [Commissioning Guidance to support devolution to CCGs of Adult Obesity surgical services in 2016/17](#).

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