

## A SELECTION OF TEN READINGS ON TOPICS RELATED TO "BASIC OBESITY MANAGEMENT ACCREDITATION"

All are available as free full text, and some require payment

Selection of readings made by A/Prof Goh Lee Gan

### READING 1 – GROUP FAMILY-BASED INTERVENTION PROGRAMME SHOWED SHORT-TERM CLINICAL EFFECTIVENESS OF BETTER EATING HABITS AND WEIGHT REDUCTION

**Chew CSE(1), Oh JY(1), Rajasegaran K(1), Saffari SE(2), Lim CMM(3), Lim SC(4), Tan S(4), Kelly S(5). Evaluation of a group family-based intervention programme for adolescent obesity: the LITE randomised controlled pilot trial. Singapore Med J. 2019 Oct 8. PMID: 31598732.**

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Author information:

(1)Adolescent Medicine Service, KK Women's and Children's Hospital, Singapore. (2)Centre for Quantitative Medicine, Duke-NUS Medical School, Singapore. (3)Family Medicine Service, KK Women's and Children's Hospital, Singapore. (4)Department of Nutrition and Dietetics, KK Women's and Children's Hospital, Singapore. (5)Psychology Service, KK Women's and Children's Hospital, Singapore.

#### ABSTRACT

**INTRODUCTION:** This study aimed to evaluate the LITE (Lifestyle Intervention for Teenagers) group programme, a family-based behavioural lifestyle intervention for overweight and obese adolescents.

**METHODS:** We conducted a two-arm randomised controlled trial that recruited overweight and obese adolescents who attended a tertiary care weight management clinic. Participants were randomised to the LITE programme or usual care. The primary outcome assessed was body mass index (BMI) z-score. Secondary outcomes of anthropometric measurements, metabolic profile, parenting and adolescents' perception of family support were measured at baseline, three months and six months. Feasibility and acceptability of the LITE programme were also evaluated.

**RESULTS:** 61 adolescents were enrolled, with 31 in the LITE programme and 30 in usual care. At three months, participants in the programme had a greater reduction in weight ( $-0.18 \pm 2.40$  kg vs.  $1.48 \pm 1.97$  kg;  $p = 0.107$ ), waist circumference ( $-0.96 \pm 3.11$  cm vs.  $2.43 \pm 2.70$  cm;  $p = 0.016$ ), waist-height ratio ( $-0.01 \pm 0.02$  vs.  $0.01 \pm 0.02$ ;  $p = 0.040$ ) and systolic blood pressure ( $-3.81 \pm 13.7$  vs.  $5.69 \pm 13.1$ ;  $p = 0.119$ ) compared to the usual care group. There was no significant difference in BMI z-score. At six months, there were significant improvements in adolescents' perception of family support for eating habits in the LITE group compared to the usual care group. The LITE programme had a good attendance rate of 67.7 percent and was well-received.

**CONCLUSION:** The LITE programme showed feasibility and short-term clinical effectiveness in improving some clinical outcomes and improved adolescents' perception of family support.

### READING 2 – SELF-ADMINISTERED AURICULAR ACUPRESSURE INTEGRATED WITH A SMARTPHONE APP ACHIEVED WEIGHT REDUCTION AND SATISFACTION AS SHOWN IN RANDOMISED FEASIBILITY TRIAL

**Suen L(1), Wang W(2), Cheng KKY(3), Chua MCH(4), Yeung JWF(1), Koh WK(4), Yeung SKW(1), Ho JYS(1). Self-Administered Auricular Acupressure Integrated With a Smartphone App for Weight Reduction: Randomized Feasibility Trial. JMIR Mhealth Uhealth. 2019 May 29;7(5):e14386. PMID:31144666.**

**doi: 10.2196/14386. PMID: 31144666 (Free full text).**

Author information:

(1)School of Nursing, The Hong Kong Polytechnic University, Hong Kong, China (Hong Kong). (2)Alice Lee Centre for Nursing Studies, Yong Loo Lin School of Medicine, National University of Singapore, Singapore. (3)Department of Health Technology and Informatics, The Hong Kong Polytechnic University, Hong Kong, China (Hong Kong). (4)Smart Health Leadership Centre, Institute of Systems Science, National University of Singapore, Singapore.

**ABSTRACT**

**BACKGROUND:** Obesity is a common global health problem and increases the risk of many chronic illnesses. Given the adverse effects of anti-obesity agents and bariatric surgeries, the exploration of non-invasive and non-pharmacological complementary methods for weight reduction is warranted.

**OBJECTIVE:** The study aimed to determine whether self-administered auricular acupressure (AA) integrated with a smartphone app was more effective than using AA alone or the controls for weight reduction.

**METHODS:** This study is a three-arm randomised waitlist-controlled feasibility trial. A total of 59 eligible participants were randomly divided into either group 1 (AA group, n=19), group 2 (AA plus smartphone app, n=19), or group 3 (waitlist control, n=21). A total of six reflective zones or acupoints for weight reduction were chosen. The smartphone app could send out daily messages to the subjects to remind them to perform self-pressing on the six ear acupoints. A "date picker" of the eight-week treatment course was used to enable the users to input the compliance of pressing and the number of bowel movement daily instead of using the booklet for recordings. The app also served as a reminder for the subjects regarding the dates for returning to the center for acupoint changing and assessments. Treatment was delivered two times a week, for eight weeks. Generalised estimating equations were used to examine the interactions among the groups before and after intervention.

**RESULTS:** Subjects in group 2 expressed that the smartphone app was useful (7.41 out of 10). The most popular features were the daily reminders for performing self-pressing (88 percent), the ear diagram indicating the locations and functions of the six ear points (71 percent), and ear pressing method demonstrated in the video scripts (47 percent). Nearly 90 percent of the participants completed the eight-week intervention, with a high satisfaction toward the overall arrangement (8.37 out of 10). The subjects in group 1 and 2 achieved better therapeutic effects in terms of body weight, body mass index (BMI), waist circumference, and hip circumference and perceived more fullness before meals than the waitlist controls. Although no significant differences in the pairwise comparisons between the two groups were detected ( $P>.05$ ), the decrease in body weight, BMI, body fat, visceral fat rating and leptin level, and increase in adiponectin level were notable in group 2 before and after the intervention.

**CONCLUSIONS:** The high compliance rate and high satisfaction toward the trial arrangement indicate that AA can be used to achieve weight reduction and applied in future large-scale studies. AA integrated with the smartphone app has a more notable effect than using AA alone for weight reduction. Larger sample size should be considered in future trials to determine the causal relationship between treatment and effect.

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**READING 3 – ATTITUDES AND PERCEPTIONS OF THE GENERAL PUBLIC ON OBESITY AND ITS TREATMENT OPTIONS IN SINGAPORE**

**Lee PC(1), Ganguly S(2), Tan HC(2), Lim CH(3), Chan WH(3), Kovalik JP(4), Eng A(3), Tan J(3), Lim E(3), Chua J(5), Tham KW(2). Attitudes and perceptions of the general public on obesity and its treatment options in Singapore. Obes Res Clin Pract. 2019 Jul-Aug;13(4):404-407. PMID: 30975589.**

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**Author information:**

(1)Obesity and Metabolic Unit, Bowyer Block A Level 1, Singapore General Hospital, Outram Road, Singapore 169608, Singapore; Department of Endocrinology, Singapore General Hospital, 20 College Rd., Singapore 169856, Singapore. Electronic address: lee.phong.ching@singhealth.com.sg. (2)Obesity and Metabolic Unit, Bowyer Block A Level 1, Singapore General Hospital, Outram Road, Singapore 169608, Singapore; Department of Endocrinology, Singapore General Hospital, 20 College Rd., Singapore 169856, Singapore. (3)Obesity and Metabolic Unit, Bowyer Block A Level 1, Singapore General Hospital, Outram Road, Singapore 169608, Singapore; Department of Upper Gastrointestinal and Bariatric Surgery, Singapore General Hospital, 20 College Rd., Singapore 169856, Singapore. (4)Obesity and Metabolic Unit, Bowyer Block A Level 1, Singapore General Hospital, Outram Road, Singapore 169608, Singapore; Program in Cardiovascular and Metabolic Disorders, Duke-NUS Medical School, 8 College Road, Singapore 169857, Singapore. (5) Obesity and Metabolic Unit, Bowyer Block A Level 1, Singapore General Hospital, Outram Road, Singapore 169608, Singapore.

ABSTRACT

Data on attitudes and perceptions towards obesity are lacking in Asia. Participants who attended an obesity public forum were surveyed concerning obesity and its treatment options. Although obesity is generally accepted as a disease with biological underpinnings such as hormonal imbalances and slow metabolic rate, it is also regarded as an issue of personal responsibility. 65.1 percent believed that weight-loss medications are dangerous. 20.6 percent thought that pharmacotherapy is effective for weight loss, whereas 41.1 percent were unsure. Most believed that bariatric surgery could improve health (81.9 percent) and diabetes control (74.0 percent) although 64.1 percent were unsure of its risks.

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**READING 4 – WEIGHT WATCHERS MEETINGS IS CURRENTLY THE ONLY EVIDENCE-BASED, COMMERCIALY AVAILABLE, COST-EFFECTIVE OPTION FOR NON-SURGICAL WEIGHT LOSS**

**Finkelstein EA(1)(2), Verghese NR(1). Incremental cost-effectiveness of evidence-based non-surgical weight loss strategies. Clin Obes. 2019 Apr;9(2):e12294. PMID: 30677252.**

**doi: 10.1111/cob.12294. PMID: 30677252 (Payment required).**

Author information:

(1)Health Services and Systems Research, Duke-NUS Medical School, Singapore, Singapore. (2)Global Health Institute, Duke University, Durham, North Carolina.

ABSTRACT

Recent medical advancements have led to new modes of treatment for non-surgical weight loss, including several new medications.

Our aim was to conduct an incremental cost-effectiveness analysis for all commercially available, evidence-based non-surgical weight loss interventions for people with excess weight.

We identified interventions through a systematic review of randomised controlled trials that reported weight loss 12 months from baseline. We then meta-analysed the results, sourced costs and performed an incremental cost-effectiveness analysis from the payer perspective. Cost-effectiveness was presented in terms of cost per kilogram lost and quality-adjusted life years (QALY) gained. We further performed sensitivity analyses on costs and duration of benefits, and a probabilistic sensitivity analysis.

Ten interventions were identified for inclusion: six pharmaceutical products (Alli, Xenical, Qsymia, Contrave, Belviq and Saxenda), two lifestyle modification programmes (Weight Watchers Meetings and Online), one food replacement and lifestyle programme (Jenny Craig) and one intragastric balloon system (Orbera). At an incremental cost-effectiveness ratio of \$30,071 per additional QALY gained, only Weight Watchers Meetings was cost-effective. Sensitivity analyses revealed that for the medications to become incrementally cost-effective, costs would have to decrease by as much as 91 percent. Results are highly dependent on duration that benefits are maintained.

Despite several newly available interventions, Weight Watchers Meetings is currently the only evidence-based, commercially available, cost-effective option for non-surgical weight loss. Other interventions, specifically medications, are more effective but priced too high to be cost-effective.

**READING 5 – BARIATRIC SURGERY PRODUCES SIGNIFICANT WEIGHT LOSS, AND LEADS TO NORMAL GLYCAEMIC STATUS IN THOSE WITH PRE-DM AND MORBID OBESITY**

**Lee PC(1), Tan HC(1), Pasupathy S(2), Ganguly S(1), Eng AKH(3), Nadkarni N(4), Tham KW(1). Effectiveness of bariatric surgery in diabetes prevention in high-risk Asian individuals. Singapore Med J. 2018 Sep;59(9):472-475. PMID: 30310918.**

**doi: 10.11622/smedj.2018110. PMID: 30310918 (Free full text).**

Author information:

(1)Department of Endocrinology, Singapore General Hospital, Singapore. (2)Advanced Laparoscopic Surgery, Gleneagles Hospital, Singapore. (3)Department of Upper Gastrointestinal and Bariatric Surgery, Singapore General Hospital, Singapore. (4)Centre for Quantitative Medicine, Office of Clinical Sciences, Duke-NUS Medical School, Singapore.

ABSTRACT

**INTRODUCTION:** Obesity is a key risk factor in the development of Type 2 diabetes mellitus (T2DM). Bariatric surgery causes a large amount of durable weight loss in those with clinically severe obesity. We reported the effect of weight loss via bariatric surgery on DM prevention in those at high risk of developing DM.

**METHODS:** This was a retrospective cohort study of 44 patients with obesity (mean body mass index 43.8 kg/m<sup>2</sup>) and pre-DM who underwent bariatric surgery and were followed up for up to three years. We also reviewed a non-surgical cohort of patients with obesity and pre-DM seen at the weight management clinic.

**RESULTS:** 91 percent of patients attained normal glycaemic status at one year after bariatric surgery. At the three-year follow-up, 87.5 percent of the patients maintained normoglycaemia. None of the patients developed T2DM after surgery. 26.9 percent of patients achieved absolute weight loss at one year after bariatric surgery and maintained this at two and three years' post-surgery ( $p < 0.001$  vs. baseline). The homeostatic model assessment-insulin resistance index in patients also decreased from 5.50 at baseline to 1.20, 1.14 and 1.44 at one, two and three years, respectively ( $p < 0.001$ ).

**CONCLUSION:** Bariatric surgery produces significant weight loss, and leads to reversion from the pre-diabetic state to normal glycaemic status and reduction of the incident DM rate in those with pre-DM and morbid obesity.

**READING 6 – REVIEW OF EFFICACY AND SAFETY DATA FROM CLINICAL TRIALS, IN THE CLINICAL APPLICATION OF PHARMACOTHERAPY FOR PATIENTS WITH OBESITY**

**Gadde KM(1), Apolzan JW(2), Berthoud HR(2). Pharmacotherapy for Patients with Obesity. Clin Chem. 2018 Jan;64(1):118-129. PMID: 29054924.**

**doi: 10.1373/clinchem.2017.272815. PMID: 29054924 (Free full text).**

Author information:

(1)Pennington Biomedical Research Center, Baton Rouge, LA. kishore.gadde@pbrc.edu. (2)Pennington Biomedical Research Center, Baton Rouge, LA.

ABSTRACT

**BACKGROUND:** Although pharmacotherapy is not the cornerstone of obesity treatment, it is a valuable tool that could be considered for patients who have not had adequate benefit from lifestyle interventions or who have difficulty maintaining initial weight loss over longer periods.

**CONTENT:** This review focuses on the role of anti-obesity drugs, the mechanisms by which the drugs work, potential pharmacological targets in the neural control of food intake and regulation of body weight, the history of anti-obesity drugs, a summary of efficacy and safety data from clinical trials, and the clinical application of pharmacotherapy. Currently, five approved drug therapies are available in the US for long-term weight management, with only two of these meeting the stronger Food and Drug Administration (FDA) criteria of five percent weight loss relative to a placebo after one year and others receiving approval based on the categorical criterion of the proportions of patients achieving five percent weight loss. Interpretation of the results of clinical trials conducted before regulatory agency approval is limited by high dropout rates; thus, the results might not be replicable in clinical practice settings. Many patients who are suitable candidates for pharmacotherapy are not using the new drugs due to lack of insurance coverage and high out-of-pocket costs.

**SUMMARY:** With the availability of four new drugs since 2012, clinicians in the US now have more tools for long-term weight management. The quality of pharmacotherapy clinical investigations needs considerable improvement. Future research should focus on examining the mediators and moderators of response.

# **READING 7 – PROSPECTIVELY COLLECTED RETROSPECTIVE REVIEW OF 308 CASES IN SINGAPORE SHOWED LSG IS A SAFE OPTION FOR ADOLESCENTS WITH GOOD SHORT-TERM WEIGHT LOSS OUTCOMES AND REMISSION OF METABOLIC COMORBID CONDITIONS**

**Dargan D(1), Dolgunov D(1), Soe KT(2), Er P(3), Naseer F(3), Lomanto D(1)(2), So JB(1)(2), Shabbir A(1)(2). Laparoscopic sleeve gastrectomy for morbidly obese adolescents in Singapore. Singapore Med J. 2018 Feb;59(1):98-103. PMID: 28983580.**

**doi: 10.11622/smedj.2017086. PMID: 28983580 (Free full text).**

Author information:

(1)Department of Surgery, National University Hospital, Singapore. (2)Yong Loo Lin School of Medicine, National University of Singapore, Singapore. (3)Department of Dietetics, National University Hospital, Singapore.

## ABSTRACT

**INTRODUCTION:** Laparoscopic sleeve gastrectomy (LSG) outcomes among adolescents and factors associated with adolescent obesity in Singapore were evaluated.

**METHODS:** Prospectively collected data of patients aged 16-19 years who underwent LSG was retrospectively reviewed. A lifestyle questionnaire, Berlin and Epworth scores, and Patient Health Questionnaire-9 scores were collected. Preoperative anthropometrics, comorbidities, weight loss and body composition outcomes were recorded.

**RESULTS:** Among 208 LSGs, 13 (6.3 percent) were performed on obese adolescents. Mean age and body mass index (BMI) at first presentation were  $19.1 \pm 0.9$  (range 16.8-19.8) years and  $46.2 \pm 6.3$  (range 36-57) kg/m<sup>2</sup>, respectively. There was family history of obesity (n = 7) and regular consumption of high-calorie drinks (n = 12). Most patients had comorbidities (n = 12), including hypertension (n = 5), asthma (n = 4), diabetes mellitus (n = 3), hernia (n = 3) and obstructive sleep apnoea requiring continuous positive airway pressure support (n = 3). At one year, excess weight loss was 64.3 percent  $\pm$  34.7 percent (range 21.8 percent - 101.5 percent), while BMI and fat mass dropped to  $31.2 \pm 7.6$  (range 23-40) kg/m<sup>2</sup> and 17.4 kg, respectively. Pain score was 2/10 at 24 hours after surgery. Mean postoperative stay was 2.7 days. No complications or readmissions occurred. Remission of diabetes mellitus and hypertension was reported in two of three and four of five adolescents, respectively, within one year of surgery.

**CONCLUSION:** LSG is a safe option for adolescents with good short-term weight loss outcomes and remission of metabolic comorbid conditions.

# **READING 8 – PROGRESS AND CHALLENGES OF ANTI-OBESITY PHARMACOTHERAPY**

**Bessesen DH(1), Van Gaal LF(2). Progress and challenges in anti-obesity pharmacotherapy. Lancet Diabetes Endocrinol. 2018 Mar;6(3):237-248. PMID: 28919062.**

**doi: 10.1016/S2213-8587(17)30236-X. PMID: 28919062 (Payment required)**

Author information:

(1)School of Medicine, Division of Endocrinology, Metabolism and Diabetes, Denver Health Medical Center, University of Colorado, Denver, CO, USA. Electronic address: daniel.bessesen@ucdenver.edu. (2)Department of Endocrinology, Diabetology and Metabolism, Antwerp University Hospital, University of Antwerp, Antwerp, Belgium.

## ABSTRACT

Obesity is a serious and growing worldwide health challenge. Healthy lifestyle choices are the foundation of obesity treatment. However, weight loss can lead to physiological adaptations that promote weight regain. As a result, lifestyle treatment alone typically produces only modest weight loss that is difficult to sustain. In other metabolic diseases, pharmacotherapy is an



accepted adjunct to lifestyle. Several anti-obesity drugs have been approved in the USA, European Union, Australia, and Japan including sympathomimetics, pancreatic lipase inhibitors, GABAA receptor activators, a serotonin 2C receptor agonist, opioid antagonist dopamine-norepinephrine reuptake inhibitor, and glucagon-like peptide-1 (GLP-1) receptor agonists. These drugs vary in their efficacy and side-effect profiles but all provide greater weight loss than do lifestyle changes alone. Even though obesity is widespread and associated with adverse health consequences, and anti-obesity drugs can help people to lose weight, very few patients use these drugs partly because of concerns about safety and efficacy, but also because of inadequate health insurance coverage. Despite great advances in our understanding of the biology of weight regulation, many clinicians still believe that patients with obesity should have the willpower to eat less. The tendency to hold the patient with obesity responsible for their condition can be a barrier to greater acceptance of anti-obesity drugs as appropriate options for treatment. Physicians should be comfortable discussing the risks and benefits of these drugs, and health insurance companies should provide reasonable coverage for their use in patients who are most likely to benefit. Although few promising anti-obesity medications are in the drug-development pipeline, the most promising drugs are novel molecules that are co-agonists for multiple gut hormones including GLP-1, glucagon, and gastric inhibitory peptide.

### READING 9 – REVIEW OF MECHANISMS, PATHOPHYSIOLOGY, AND MANAGEMENT OF OVERWEIGHT OR OBESITY PATIENTS IN THE CLINICAL SETTING, ALONE OR IN COMBINATION WITH A CHRONIC DISEASE

Heymsfield SB(1), Wadden TA(2). Mechanisms, Pathophysiology, and Management of Obesity. *N Engl J Med.* 2017 Apr 13;376(15):1492. PMID: 28402780.

doi: 10.1056/NEJMc1701944 PMID: 28402780 (Full free text).

Author information:

(1)Pennington Biomedical Research Center, Baton Rouge, LA [steven.heymsfield@pbrc.edu](mailto:steven.heymsfield@pbrc.edu). (2)Perelman School of Medicine, Philadelphia, PA.

### SUMMARY

This review focuses on mechanisms, pathophysiology and management of overweight (BMI  $\geq 25$ ) or obesity in the clinical setting. **Mechanisms of obesity are:** (1) Positive energy balance from high-calorie, palatable foods, and decreasing time spent physical activities; (2) Energy-balance dysregulation: food intake reduction or increased physical activity leads to negative energy balance, result in a cascade of central and periphery compensatory adaptive functions which often create counter-regulatory increase in appetite and food intake associated with interventions e.g., exercise programmes. **Pathophysiological features:** (1) Excess adiposity results in excess weight, higher cardiac output, high blood pressure, obstructive sleep apnoea, esophageal reflux, Barrett's esophagus, and esophageal adenocarcinoma; (2) Adipocytes synthesise proinflammatory adipokines which creates a low-grade systemic inflammatory state; (3) Excess adiposity also result in co-morbidities: type DM, NAFLD, CAD, CKD, and OA; (4) Obesity is associated with an increased prevalence of mood, anxiety, and other psychiatric disorders. **Response to weight loss:** Weight loss leads to remission of diabetes, lowered BP, and other benefits. **Clinical care:** (1) Assess (BMI, waist circumference) for monitor these; (2) Treat patients to result in moderate weight loss through: (i) Behavioural therapy which is the core of lifestyle intervention, provides patients with techniques for adopting dietary and activity recommendations, (ii) Prevent weight regain, (iii) Use of pharmacotherapy as an adjunct to a reduced-calorie diet and increased activity for short and long-term weight management. **Conclusions.** Much more effort must be devoted to both prevention and treatment of obesity as part of the global campaign to rein in the chronic disease epidemic.

## READING 10 – MOH CPG ON OBESITY (2016)

**Lee YS(I), Biddle S(I), Chan MF(I), Cheng A(I), Cheong M(I), Chong YS(I), Foo LL(I), Lee CH(I), Lim SC(I), Ong WS(I), Pang J(I), Pasupathy S(I), Sloan R(I), Seow M(I), Soon G(I), Tan B(I), Tan TC(I), Teo SL(I), Tham KW(I), van Dam RM(I), Wang J(I). Health Promotion Board-Ministry of Health Clinical Practice Guidelines: Obesity. Singapore Med J. 2016 Jun;57(6):292-300. PMID: 27353244.**

**doi: 10.11622/smedj.2016103. PMID: 27353244 (Free full text).**

Author information:

(1)Changi General Hospital; College of Family Physicians Singapore; Gleneagles Hospital and Medical Centre; Health Promotion Board; Khoo Teck Puat Hospital; KK Women's and Children's Hospital; National Institute of Education; National University Hospital; Saw Swee Hock School of Public Health, National University of Singapore; Singapore General Hospital; Victoria University, Australia; Yong Loo Lin School of Medicine, National University of Singapore.

### ABSTRACT

The Health Promotion Board (HPB) has developed the Clinical Practice Guidelines (CPG) on Obesity to provide health professionals in Singapore with recommendations for evidence-based interventions for obesity. This article summarises the introduction, epidemiology and executive summary of the key recommendations from the HPB-MOH CPG on Obesity for the information of SMJ readers. The chapters and page numbers mentioned in the reproduced extract refer to the full text of the guidelines, which are available from the Health Promotion Board website: <http://www.hpb.gov.sg/cpg-obesity>. The recommendations should be used with reference to the full text of the guidelines. Following this article are multiple choice questions based on the full text of the guidelines.