

Guideline Summary NGC-10720

Guideline Title

Pharmacological management of obesity: an Endocrine Society clinical practice guideline.

Bibliographic Source(s)

Apovian CM, Aronne LJ, Bessesen DH, McDonnell ME, Murad MH, Pagotto U, Ryan DH, Still CD. Pharmacological management of obesity: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab.* 2015 Feb;100(2):342-62. [153 references] [PubMed](#) 




Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- **June 14, 2016 – Canagliflozin (Invokana, Invokamet) and Dapagliflozin (Farxiga, Xigduo XR)** : The U.S. Food and Drug Administration (FDA) has strengthened the existing warning about the risk of acute kidney injury for the type 2 diabetes medicines canagliflozin (Invokana, Invokamet) and dapagliflozin (Farxiga, Xigduo XR). Based on recent reports, they have revised the warnings in the drug labels to include information about acute kidney injury and added recommendations to minimize this risk.
- **April 8, 2016 – Metformin-containing Drugs** : The U.S. Food and Drug Administration (FDA) is requiring labeling changes regarding the recommendations for metformin-containing medicines for diabetes to expand metformin's use in certain patients with reduced kidney function. The current labeling strongly recommends against use of metformin in some patients whose kidneys do not work normally. FDA concluded, from the review of studies published in the medical literature, that metformin can be used safely in patients with mild impairment in kidney function and in some patients with moderate impairment in kidney function.
- **December 4, 2015 – SGLT2 Inhibitors** : A U.S. Food and Drug Administration (FDA) safety review has resulted in adding warnings to the labels of a specific class of type 2 diabetes medicines called sodium-glucose cotransporter-2 (SGLT2) inhibitors about the risks of too much acid in the blood and of serious urinary tract infections. Both conditions can result in hospitalization.

Scope

Disease/Condition(s)

Obesity

Guideline Category

Management

Prevention

Risk Assessment

Treatment

Clinical Specialty

Endocrinology

Family Practice

Internal Medicine

Intended Users

Advanced Practice Nurses

Nurses

Physician Assistants

Physicians

Guideline Objective(s)

To formulate clinical practice guidelines for the pharmacological management of obesity

Target Population

Adult patients who are overweight or obese

Interventions and Practices Considered

1. Diet, exercise, and behavioral modification to be included in all obesity management
2. Pharmacotherapy (as indicated)
 - Initiating therapy (dose escalation based on efficacy and tolerability)

- Assessment of efficacy and safety
3. Bariatric surgery (as indicated)
 4. Consideration of alternatives (weight-neutral and weight-losing medications) to drugs that cause weight gain

Major Outcomes Considered

- Weight change (expressed in absolute and relative terms)
- Side effects of medications

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The Endocrine Society's Task Force commissioned a systematic review (SR) of published data (see the "Availability of Companion Documents" field) and considered several other existing meta-analyses, randomized trials, and observational studies to support the guideline.

The SR compared a list of 54 commonly used drugs chosen a priori by the Task Force (drugs suspected of having weight implications) that were compared to placebo in randomized controlled trials (RCTs). For trials to be included, the length of treatment had to be ≥ 30 days. The outcome of interest for the review was weight change (expressed in absolute and relative terms). The Task Force also used evidence derived from existing SRs, randomized trials, and observational studies on the management of medications for other conditions that may result in weight gain.

Methods

Search and analysis methods, eligibility criteria, and the outcomes of interest were specified in advance in a protocol developed by study investigators with input from the expert panel from The Endocrine Society. This protocol is described in detail and has been published elsewhere.

To make this review of a large number of weight-affecting drugs feasible, and due to the availability of multiple SRs of these drugs, the reviewers conducted an umbrella search strategy to identify eligible RCTs. The umbrella strategy differs from a regular systematic search approach in that the umbrella strategy identifies studies from previous SRs as opposed to the primary literature. To this extent, they searched for any SR that included RCTs comparing the drugs of interest to placebo. The list of the most relevant drugs was developed by members from The Endocrine Society. This list consisted of commonly prescribed drug families and specific drugs that have been associated with weight gain (obesogenic) or weight loss (leptogenic). Eligible SRs were used as a source to identify relevant RCTs. Considering that multiple published SRs and meta-analyses have already summarized and appraised the evidence supporting the efficacy of antiobesity drugs such as orlistat and phentermine, these drugs were not included in this summary.

Search Methods and Selection of SRs

The first author searched MEDLINE, DARE, and the Cochrane Database of SRs for at least two SRs per drug through January 2013. An expert reference librarian provided assistance throughout the process.

When multiple SRs evaluated the same drug, the reviewers chose the one with the most recent search date. When more than two SRs shared a similar search date (< 1 y apart), they chose the one with the largest number of included RCTs that were most clinically relevant to the typical application of the drug. For example, although sertraline has a therapeutic indication for eating disorders, its major clinical use is in depression and obsessive-compulsive disorder. When there was no clear difference in the frequency of the use of drugs by a specific condition, the reviewers included the SRs without considering this criterion (for example, beta blockers for myocardial infarction or for essential hypertension). When the reviewers found more than two SRs with no clear rationale to select one over the other, they included all of them.

Eligibility Criteria for RCT

The reviewers included parallel or crossover RCTs that enrolled adults (≥ 18 y old) and evaluated any drug listed in Supplemental Table 1 of the systematic review as an intervention as long as the length of treatment was at least 30 days. Studies that investigated combinations of drugs (except for the listed ones) were excluded. They also excluded studies that reported only subjective outcome measures (self-reported weight change). The reviewers elected not to include observational or quasi-randomized studies.

Agreement among the reviewers was measured using the kappa (κ) statistic. A reference management system (DistillerSR) was used for study selection, providing real-time agreement statistics. The first author monitored the agreement between evaluators during the trial selection in order to discuss disagreements and clarify the protocol and selection criteria when needed. The whole selection team met with the first author and the senior author five times during the selection process.

Search Results and Study Description

The reviewers identified 99 relevant SRs that included 3548 RCTs, which were viewed and from which they selected 257 eligible RCTs (see Figure 1 in the systematic review). These RCTs evaluated weight change associated with 54 different drugs and enrolled more than 84,696 patients. During the full-text screening, the reviewers had excellent agreement (average κ coefficient, 0.87). The main reasons for exclusion were nonrandomized study design and lack of weight change assessment.

Number of Source Documents

The reviewers identified 99 relevant systematic reviews (SRs) that included 3548 randomized controlled trials (RCTs), which were viewed and from which they selected 257 eligible RCTs.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Quality of the Evidence

- +OOO Denotes very low quality evidence
- ++OO Denotes low quality evidence
- +++O Denotes moderate quality evidence
- ++++ Denotes high quality evidence

Methods Used to Analyze the Evidence

Meta-Analysis of Randomized Controlled Trials
 Review of Published Meta-Analyses
 Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

The Endocrine Society's Task Force commissioned a systematic review (SR) of published data (see the "Availability of Companion Documents" field) and considered several other

existing meta-analyses, randomized trials, and observational studies to support the guideline.

Data Extraction and Management

Using a standardized, piloted, and web-based data extraction form and working in duplicate, the reviewers abstracted the following descriptive data from each study: full description of participants enrolled, the interventions received (dose, frequency, route), the monitoring for efficacy or adherence, and the measure of outcome (specifically defined as event rate or continuous measure and time frame). For studies with more than one follow-up period, they selected the longest.

When necessary, the reviewers calculated needed data elements from other reported statistics such as confidence intervals (CIs), *P*, or *t* values. When this was not possible, they imputed the missing values, such as standard deviation, from one large study (another randomized controlled trial [RCT] or a SR) with a similar population and intervention.

Assessment of Risk of Bias in Included Studies and Confidence on the Estimates

The reviewers assessed the methodological quality of RCTs using the Cochrane Risk of Bias tool to determine: how the randomization sequence was generated; how allocation was concealed; whether there were important imbalances at baseline; which groups were blinded (patients, caregivers, data collectors, outcome assessors, data analysts); what was the loss to follow-up; whether the analyses were by intention to treat; and how missing outcome data were handled. They also analyzed the adequacy of the outcome measurement process, assigning higher confidence to the RCTs that evaluated weight changes using a specific predefined protocol. No scoring system was derived for risk of bias assessment.

The reviewers used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) framework to rate the confidence on the evidence supporting the weight change effect associated with each drug. This rating reflects the Task Force's confidence in the pooled estimate. They rated the confidence downward based on methodological limitations, imprecision, indirectness, inconsistency, and reporting and publication biases. Factors that led to rating the confidence upward were large magnitude of effect and the presence of a dose-duration response gradient. The confidence in the estimates was rated as high, moderate, low, or very low (see the "Rating Scheme for the Strength of the Evidence" field).

Meta-Analysis

The reviewers defined a clinically important weight change (for either weight gain or loss) as a change ≥ 2 kg or $\geq 5\%$ from the baseline, defined by Stevens et al. The outcomes of this meta-analysis were:

1. Absolute weight change (Abs WC)—weight loss or gain assessed as a continuous outcome expressed as a mean difference in the absolute weight change in kilograms or as a body mass index (BMI) change in kilograms/(meter)²
2. Percentage weight change (Per WC)—weight loss or gain assessed as a continuous outcome expressed as a mean difference in the relative weight change in kilograms or as a BMI change in kilograms/(meter)² from the baseline weight or BMI
3. Weight gain/weight loss (WG/WL) $\geq 5\%$ —an important change in weight of 5% or more as described by Stevens et al (for example, 7 to 10%), either for weight gain or loss, from the baseline weight (this outcome is presented as a relative risk)
4. Any WG/WL—weight change rate assessed as a dichotomous outcome, defined as a number of patients with increased or decreased weight over the total number of patients in each group (this outcome is presented as a relative risk)

The precision of estimates of drug effects on weight is reflected in 95% CIs around such estimates. The reviewers extracted and evaluated outcomes by analyzing participants in the groups in which they were randomized (i.e., intention to treat). For studies with loss to follow-up, they used the number of patients randomized as a denominator for the risk estimate, preserving randomization benefits in balancing prognosis of trial arms, realizing that this may underestimate the effect size.

The reviewers conducted random-effects meta-analysis using the DerSimonian and Laird method to pool treatment effects from included studies. They used the I^2 statistic and Cochran's Q test to assess heterogeneity across studies. The reviewers assessed publication bias by the Begg adjusted rank correlation test and visual examination of funnel plots whenever there were at least 10 included studies with no considerable heterogeneity (defined as less than 70% of I^2 according to the Cochrane collaboration). Analysis was conducted using STATA version 12.0 (StataCorp).

Subgroup and Sensitivity Analysis

The reviewers planned to explore a few subgroup interactions to explain inconsistency in results across trials including subgroup analyses based on:

1. BMI status—obese (BMI ≥ 30 kg/m²) vs non obese (BMI < 30 kg/m²)
2. Risk of bias of the included studies (low and unclear risk of bias vs high risk of bias)
3. Gender (male vs female)

Due to the lack of data about gender variation and BMI status within each included RCT, they could not perform these subgroup analyses. Most of the included studies presented serious or very serious methodological limitations; therefore, they did not perform a subgroup analysis based on the risk of bias.

The reviewers conducted a meta-regression to test whether the effect size (weight change) was affected by daily drug dose. This review is reported in accordance with the recommendations set forth by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) work groups.

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Participants

An Endocrine Society-appointed Task Force of experts, a methodologist, and a medical writer. This guideline was co-sponsored by the European Society of Endocrinology and The Obesity Society.

Evidence

This evidence-based guideline was developed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) system to describe the strength of recommendations and the quality of evidence.

Consensus Process

One group meeting, several conference calls, and e-mail communications enabled consensus. Committees and members of the Endocrine Society, the European Society of Endocrinology, and The Obesity Society reviewed and commented on preliminary drafts of these guidelines.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendations

- 1 - Indicates a strong recommendation and is associated with the phrase "The Task Force recommends."
- 2 - Denotes a weak recommendation and is associated with the phrase "The Task Force suggests."

Cost Analysis

Economic analyses and cost effectiveness studies were not reviewed or considered as a basis for the recommendations.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Committees and members of the Endocrine Society, the European Society of Endocrinology, and The Obesity Society reviewed and commented on preliminary drafts of these guidelines.

Recommendations

Major Recommendations

Definitions for the quality of the evidence (**+000**, **++00**, **+++0**, and **++++**); the strength of the recommendation (**1** or **2**); and for the difference between a "recommendation" and a "suggestion" are provided at the end of the "Major Recommendations" field.

Care of the Patient Who Is Overweight or Obese

The Task Force recommends that diet, exercise, and behavioral modification be included in all obesity management approaches for body mass index (BMI) ≥ 25 kg/m² and that other tools such as pharmacotherapy (BMI ≥ 27 kg/m² with comorbidity or BMI over 30 kg/m²) and bariatric surgery (BMI ≥ 35 kg/m² with comorbidity or BMI over 40 kg/m²) be used as adjuncts to behavioral modification to reduce food intake and increase physical activity when this is possible. Drugs may amplify adherence to behavior change and may improve physical functioning such that increased physical activity is easier in those who cannot exercise initially. Patients who have a history of being unable to successfully lose and maintain weight and who meet label indications are candidates for weight loss medications. (**1|++++**)

In order to promote long-term weight maintenance, the Task Force suggests the use of approved* weight loss medication (over no pharmacological therapy) to ameliorate comorbidities and amplify adherence to behavior changes, which may improve physical functioning and allow for greater physical activity in individuals with a BMI ≥ 30 kg/m² or in individuals with a BMI of ≥ 27 kg/m² and at least one associated comorbid medical condition such as hypertension, dyslipidemia, type 2 diabetes (T2DM), and obstructive sleep apnea. (**2|++00**)

In patients with uncontrolled hypertension or a history of heart disease, the Task Force recommends against using the sympathomimetic agents phentermine and diethylpropion. (**1|+++0**)

The Task Force suggests assessment of efficacy and safety at least monthly for the first 3 months, then at least every 3 months in all patients prescribed weight loss medications. (**2|++00**)

If a patient's response to a weight loss medication is deemed effective (weight loss $\geq 5\%$ of body weight at 3 mo) and safe, the Task Force recommends that the medication be continued. If deemed ineffective (weight loss $< 5\%$ at 3 months) or if there are safety or tolerability issues at any time, the Task Force recommends that the medication be discontinued and alternative medications or referral for alternative treatment approaches be considered. (**1|++++**)

If medication for chronic obesity management is prescribed as adjunctive therapy to comprehensive lifestyle intervention, the Task Force suggests initiating therapy with dose escalation based on efficacy and tolerability to the recommended dose and not exceeding the upper approved dose boundaries. (**2|++00**)

In patients with T2DM who are overweight or obese, the Task Force suggests the use of antidiabetic medications that have additional actions to promote weight loss (such as glucagon-like peptide-1 [GLP-1] analogs or sodium-glucose-linked transporter-2 [SGLT-2] inhibitors), in addition to the first-line agent for T2DM and obesity, metformin. (**2|++++**)

In patients with cardiovascular disease who seek pharmacological treatment for weight loss, the Task Force suggests using medications that are not sympathomimetics such as lorcaserin and/or orlistat. (**2|+000**)

*Approval in the United States is based on Food and Drug Administration (FDA) determination. Approval in Europe is based on European Medicines Agency (EMA) determination.

Drugs That Cause Weight Gain and Some Alternatives

The Task Force recommends weight-losing and weight-neutral medications as first- and second-line agents in the management of a patient with T2DM who is overweight or obese. Clinicians should discuss possible weight effects of glucose-lowering medications with patients and consider the use of antihyperglycemic medications that are weight neutral or promote weight loss. (**1|+++0**)

In obese patients with T2DM requiring insulin therapy, the Task Force suggests adding at least one of the following: metformin, pramlintide, or GLP-1 agonists to mitigate associated weight gain due to insulin. The first-line insulin for this type of patient should be basal insulin. This is preferable to using either insulin alone or insulin with sulfonylurea. The Task Force also suggests that the insulin therapy strategy be considered a preferential trial of basal insulin prior to premixed insulins or combination insulin therapy. (**2|+++0**)

The Task Force recommends angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs), and calcium channel blockers rather than β -adrenergic blockers as first-line therapy for hypertension in patients with T2DM who are obese. (**1|++++**)

When antidepressant therapy is indicated, the Task Force recommends a shared decision-making process that provides patients with quantitative estimates of the expected weight effect of the antidepressant to make an informed decision about drug choice. Other factors that need to be taken into consideration include the expected length of treatment. (**1|+++0**)

The Task Force recommends using weight-neutral antipsychotic alternatives when clinically indicated, rather than those that cause weight gain, and the use of a shared decision making process that provides patients with quantitative estimates of the expected weight effect of the alternative treatments to make an informed decision about drug choice. (**1|+++0**)

The Task Force recommends considering weight gain potential in choosing an antiepileptic drug (AED) for any given patient, and the use of a shared decision-making process that provides patients with quantitative estimates of the expected weight effect of the drugs to make an informed decision about drug choice. (**1|+++0**)

In women with a BMI > 27 kg/m² with comorbidities or BMI > 30 kg/m² seeking contraception, the Task Force suggests oral contraceptives over injectable medications due to weight gain with injectables, provided that women are well-informed about the risks and benefits (i.e., oral contraceptives are not contraindicated). (**2|+000**)

The Task Force suggests monitoring the weight and waist circumference of patients on antiretroviral therapy due to unavoidable weight gain, weight redistribution, and associated cardiovascular risk. (**2|+++0**)

The Task Force suggests the use of nonsteroidal anti-inflammatory drugs and disease-modifying antirheumatic drugs when possible in patients with chronic inflammatory disease like rheumatoid arthritis because corticosteroids commonly produce weight gain. (**2|+++0**)

The Task Force suggests the use of antihistamines with less central nervous system activity (less sedation) to limit weight gain. (**2|++00**)

Off-Label Use of Drugs Approved for Other Indications for Chronic Obesity Management

The Task Force suggests against the off-label use of medications approved for other disease states for the sole purpose of producing weight loss. A trial of such therapy can be attempted in the context of research and by healthcare providers with expertise in weight management dealing with a well-informed patient. (Ungraded Best Practice Recommendation)

Definitions

Quality of the Evidence

+000 Denotes very low quality evidence

++00 Denotes low quality evidence

+++O Denotes moderate quality evidence

++++ Denotes high quality evidence

Strength of Recommendations

1 - Indicates a strong recommendation and is associated with the phrase "The Task Force recommends."

2 - Denotes a weak recommendation and is associated with the phrase "The Task Force suggests."

Clinical Algorithm(s)

None provided

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate pharmacological management of patients with obesity

Potential Harms

Adverse side effects of the weight loss medications (see Table 4 in the original guideline document for common side effects of specific weight loss medications)

Contraindications

Contraindications

See Table 4 in the original guideline document for contraindications of specific weight loss medications.

Qualifying Statements

Qualifying Statements

- Clinical Practice Guidelines are developed to be of assistance to endocrinologists and other health care professionals by providing guidance and recommendations for particular areas of practice. The Guidelines should not be considered inclusive of all proper approaches or methods, or exclusive of others. The Guidelines cannot guarantee any specific outcome, nor do they establish a standard of care. The Guidelines are not intended to dictate the treatment of a particular patient. Treatment decisions must be made based on the independent judgment of health care providers and each patient's individual circumstances.
- The Endocrine Society makes no warranty, express or implied, regarding the Guidelines and specifically excludes any warranties of merchantability and fitness for a particular use or purpose. The Society shall not be liable for direct, indirect, special, incidental, or consequential damages related to the use of the information contained herein.
- In several of the recommendations, the Task Force used evidence derived from randomized clinical trials about the benefits of shared decision making in terms of improving patients' knowledge, reducing decisional conflict and regret, and enhancing the likelihood of patients making decisions consistent with their own values. Although there is abundant evidence for the value of shared decision making across several clinical scenarios, specific evidence for obesity management is scant. This highlights a limitation of the existing literature and poses a challenge for implementing a specific strategy for shared decision making in managing obesity.

Implementation of the Guideline

Description of Implementation Strategy

Implementation Remarks

Because phentermine and diethylpropion are associated with elevations in mean blood pressure (BP) and pulse rate in treated populations, the Task Force does not advocate their prescription in patients with a history of cardiovascular disease and suggests caution and careful monitoring in patients with hypertension history. Thus, caution is advised in prescribing these agents in patients with hypertension, history of cardiac arrhythmia, or seizures. A serotonin receptor agonist such as lorcaserin would be a better choice in a patient with these conditions.

Another example is the patient with obesity and depression on a selective serotonin reuptake inhibitor (SSRI) or serotonin-norepinephrine reuptake inhibitor (SNRI). In these patients, lorcaserin would not be the best choice due to the potential for serotonin syndrome. A better choice would be phentermine/topiramate or phentermine alone. Orlistat is likely to be safe in all instances due to its mechanism of action. Other cautionary instances are outlined in Table 4 of the original guideline document.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

Apovian CM, Aronne LJ, Bessesen DH, McDonnell ME, Murad MH, Pagotto U, Ryan DH, Still CD. Pharmacological management of obesity: an Endocrine Society clinical practice guideline. *J Clin Endocrinol Metab.* 2015 Feb;100(2):342-62. [153 references] [PubMed](#) 

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2015 Feb

Guideline Developer(s)

The Endocrine Society - Professional Association

Source(s) of Funding

Funding for this guideline was derived solely from The Endocrine Society, and thus the Task Force received no funding or remuneration from commercial or other entities.

Guideline Committee

Pharmacological Management of Obesity Guideline Task Force

Composition of Group That Authored the Guideline

Task Force Members: Caroline M. Apovian (*Chair*), Louis J. Aronne, Daniel H. Bessesen, Marie E. McDonnell, M. Hassan Murad, Uberto Pagotto, Donna H. Ryan, Christopher D. Still

Financial Disclosures/Conflicts of Interest

The Endocrine Society maintains a rigorous conflict-of-interest review process for the development of clinical practice guidelines. All Task Force members must declare any potential conflicts of interest, which are reviewed before the members are approved to serve on the Task Force and periodically during the development of the guideline. The conflict-of-interest forms are vetted by the Clinical Guidelines Subcommittee (CGS) before the members are approved by the Society's Council to participate on the guideline Task Force. Participants in the guideline development must include a majority of individuals without conflict of interest in the matter under study. Participants with conflicts of interest may participate in the development of the guideline, but they must have disclosed all conflicts. The CGS and the Task Force have reviewed all disclosures for this guideline and resolved or managed all identified conflicts of interest.

Conflicts of interest are defined by remuneration in any amount from the commercial interest(s) in the form of grants; research support; consulting fees; salary; ownership interest (e.g., stocks, stock options, or ownership interest excluding diversified mutual funds); honoraria or other payments for participation in speakers' bureaus, advisory boards, or boards of directors; or other financial benefits. Completed forms are available through The Endocrine Society office.

Financial Disclosures of the Task Force

Caroline M. Apovian, MD (chair)—Financial or Business/Organizational Interests: none declared; Significant Financial Interest or Leadership Position: Zafgen, Inc., MYOS Corporation, Eisai, Vivus, Orexigen Therapeutics, Takeda, NIH grantee or reviewer

Louis J. Aronne, MD, FACP—Financial or Business/Organizational Interests: American Board of Obesity Medicine; Significant Financial Interest or Leadership Position: Jamieson Laboratories, Pfizer Inc., Healthcare Research Consulting Group, Marwood Group, Novo Nordisk A/S, Eisai Inc., Rhythm, Johnson & Johnson, Ethicon Endo-Surgery Inc., GI Dynamics, Zafgen Inc., GLG, VIVUS Inc., MYOS Corporation, and BMIQ

Daniel H. Bessesen, MD—Financial or Business/Organizational Interests: The Obesity Society, NIH Grantee and Reviewer, PCORI contract recipient, Enteromedics Inc.; Significant Financial Interest or Leadership Position: none declared

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Donna Ryan, MD—Financial or Business/Organizational Interests: The Obesity Society; Significant Financial Interest or Leadership Position: Vivus, Eisai, Eisai Inc., Janssen, Novo Nordisk, Takeda, Scientific Intake

Christopher D. Still, DO, FACP, FACP—Financial or Business/Organizational Interests: Obesity Action Coalition, American Board of Physician Nutrition Specialists (ABPNS Board Member); Significant Financial Interest or Leadership Position: none declared

*Evidence-based reviews for this guideline were prepared under contract with The Endocrine Society.

Guideline Endorser(s)

European Society of Endocrinology - Medical Specialty Society

The Obesity Society - Disease Specific Society

Guideline Status

This is the current release of the guideline.

This guideline meets NGC's 2013 (revised) inclusion criteria.


Guideline Availability

Electronic copies: Available from [The Endocrine Society Web site](#) .

Print copies: Available from The Endocrine Society, 2055 L St, NW, Suite 600, Washington, DC 20036; Phone: 202-971-3636; Email: Societyservices@endo-society.org.

Availability of Companion Documents

The following is available:

- Domecq JP, Prutsky G, Leppin A, Sonbol MB, Altayar O, Undavalli C, Wang Z, Elraiyah T, Juan Pablo Brito JB, Mauck KF, Lababidi MH, Prokop LJ, Asi N, Wei J, Fidahusseini S, Montori VM, Murad MH. Drugs commonly associated with weight change: a systematic review and meta-analysis. *J Clin Endocrinol Metab.* 2015 Feb;100(2):363-70. Electronic copies: Available to subscribers from the [Journal of Clinical Endocrinology & Metabolism Web site](#). 


Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on July 17, 2015. The information was verified by the guideline developer on September 15, 2015. This summary was updated by ECRI Institute on December 11, 2015 following the U.S. Food and Drug Administration advisory on SGLT2 Inhibitors. This summary was updated by ECRI Institute on April 15, 2016 following the U.S. Food and Drug Administration advisory on Metformin-containing Drugs. This summary was updated by ECRI Institute on July 4, 2016 following the U.S. Food and Drug Administration advisory on Canagliflozin (Invokana, Invokamet) and Dapagliflozin (Farxiga, Xigduo XR).

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