Green Park Collaborative

A partnership for innovation and effectiveness

ANNOTATED BIBLIOGRAPHY

Methods for Evaluating the Comparative Effectiveness of Interventions for Obesity and Overweight

The Green Park Collaborative is a major initiative of the Center for Medical Technology Policy

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Annotated Bibliography Contents

I. SELECTED COVERAGE POLICIES FOR OBESITY INTERVENTIONS FOR ADULTS

A. CMS Medicare Coverage

CMS National Coverage Determination (NCD) for Treatment of Obesity (Manual Section Number 40.5) (Effective Date 2/21/06) (Version 3)

The NCD specifies that non-surgical services in connection with the treatment of obesity are covered when they are "an integral and necessary part" of a course of treatment for certain associated medical conditions (e.g., diabetes, hypertension). Supplemented fasting may be eligible on a case-by-case basis or pursuant to a local coverage determination where weight loss is necessary before surgery. Certain designated surgical services are covered and addressed in a separate NCD (§100.1). Treatments for obesity alone are otherwise non-covered. (But see NCD §210.12).

Link to full text: CMS NCD for Treatment of Obesity

CMS NCD for Bariatric Surgery for Treatment of Morbid Obesity (Manual Section Number 100.1) (Effective Date 9/24/13) (Version 5)

Beneficiaries who (a) have a BMI≥35, (b) have at least one co-morbidity related to obesity, and (c) have been previously unsuccessful with medical treatment are covered for the following surgical procedures:

- Roux-en-Y gastric bypass (open and laparoscopic)
- Biliopancreatic diversion with duodenal switch or gastric reduction duodenal switch (open and laparoscopic)
- Adjustable gastric banding (laparoscopic only)

Medicare beneficiaries are not covered for:

- Adjustable gastric banding (open)
- Sleeve gastrectomy (open or laparoscopic [if prior to June 27, 2012])
- Vertical banded gastroplasty (open or laparoscopic)
- Intestinal bypass surgery
- Gastric balloon

Medicare Administrative Contractors (MACs) have discretion to determine coverage of (1) stand-alone laparoscopic sleeve gastrectomy, and (2) any bariatric surgery procedures not specifically covered or non-covered in an NCD, if beneficiaries meet conditions (a) – (c) above.

Link to full text: CMS NCD for Bariatric Surgery for Treatment of Morbid Obesity (NCD §100.1)

Link to full text: Decision Memo for NCD §100.1, First Reconsideration, February 21, 2006

CMS NCD for Intestinal Bypass Surgery (Manual Section Number 100.8) (Version 1)
Intestinal bypass surgery is not covered because the procedure's safety has not been demonstrated and severe adverse reactions have sometimes occurred.
Link to full text: CMS NCD for Intestinal Bypass Surgery

CMS NCD for Gastric Balloon for Treatment of Obesity (Manual Section Number 100.11) (Effective Date 9/18/87) (Version 1)
Use of the gastric balloon is not covered because long term safety and efficacy have not been established.
Link to full text: CMS NCD for Gastric Balloon for Treatment of Obesity

CMS NCD for Intensive Behavioral Therapy for Obesity (Manual Section Number 210.12) (Effective Date 11/29/11) (Version 1)
CMS covers intensive behavioral therapy for obesity, defined as BMI≥30, for the prevention or early detection of illness or disability. The intensive behavioral therapy should include intensive counseling and high intensity interventions on diet and exercise, and must be provided by a qualified primary care physician or practitioner in a primary care setting. The NCD sets forth a schedule of covered face-to-face meetings, starting with weekly meetings and tapering to monthly. Beneficiaries must lose at least 3 kg (6.6 lbs) over the first six months to remain eligible for coverage.
Link to full text: CMS NCD for Intensive Behavioral Therapy for Obesity (NCD §210.12)
Link to full text: Decision Memo for NCD §210.12, November 29, 2011

B. State Medicaid Coverage

Lee JS, Sheer JLO, Lopez N, Rosenbaum S. Coverage of Obesity Treatment: A State-by-State Analysis of Medicaid and State Insurance Laws. Pub Hlth Rep 2010;125:596-604.
This 2010 systematic review reported that all state Medicaid programs covered at least one obesity treatment modality (of nutritional counseling, drug therapy, and bariatric surgery). Bariatric surgery was the most frequently covered treatment (45 states) while drug therapy was the least frequently covered (10 states).
Link to full text: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2882611/pdf/phr125000596.pdf

C. Private Insurers

i. UNITEDHEALTH GROUP

UnitedHealthcare Medical Policy: Bariatric Surgery (Policy Number 2014T0362T) (Effective 12/1/14)
Most Certificates of Coverage and many Summary Plan Descriptions for individuals and small groups explicitly exclude benefit coverage for bariatric surgery; some states mandate coverage, however. If not excluded, beneficiaries who (a) have a BMI≥40, or a BMI≥35 with at least one co-morbidity related to obesity, (b) have a documented history of at least six months of a motivated attempt to lose weight in a structured diet or weight loss program, and (c) have a satisfactory psychological evaluation are covered for the following surgical procedures:

- Roux-en-Y gastric bypass
- Biliopancreatic bypass or diversion with duodenal switch
- Adjustable gastric banding (laparoscopic)
- Sleeve gastrectomy (laparoscopic)
- Vertical banded gastroplasty

Therapies that are specifically not covered because they are considered investigational or unproven include: transoral endoscopic surgery; mini-gastric bypass; gastric electrical stimulation; vagus nerve blocking; intragastric balloon, total gastric vertical plication, and gastrointestinal liners.
Link to full text: UnitedHealthcare Medical Policy: Bariatric Surgery

Optum Obesity Screening and Counseling in Adults Reimbursement Policy (Policy Number 0064) (Approval Date 10/2014)
For eligible health plan members with obesity (BMI≥30), Optum will align reimbursement with Medicare.
Link to full text:
https://www.myoptumhealthphysicalhealth.com/Documents/Reimbursement%20Policies/0064_ObesityScreeningandCounselingReimbursementPolicy.pdf

ii. CIGNA

Cigna Health Insurance Plans in North Carolina: State Policy Disclosures, Exclusions and Limitations 2015

Except as required by law, plans do not provide coverage for "medical and surgical services, initial and repeat, intended for the treatment or control of obesity, except for treatment of clinically severe (morbid) obesity as shown in the policy. Medical and surgical services to alter appearance or physical changes that are the result of any surgery performed for the management of obesity or clinically severe (morbid) obesity; and weight loss programs or treatments, whether prescribed or recommended by a physician or under medical supervision are not covered, even when they are related to covered treatment for morbid obesity."

Link to full text: http://www.cigna.com/individuals-families/north-carolina.page (select "View State Policy Disclosures, Exclusions and Limitations," scroll to North Carolina, select "Exclusions and Limitations")

Cigna Medical Coverage Policy: Bariatric Surgery (Coverage Policy Number 0051) (Effective Date 5/15/14)

Notes that bariatric surgery is specifically excluded under many benefit plans. If not excluded, adult beneficiaries who (a) have a BMI≥40, or a BMI≥35 with at least one clinically significant obesity-related comorbidity, (b) have actively participated for at least three consecutive months within the last year in a weight-management program supervised by either a physician or registered dietician, and (c) have completed evaluations within the previous six months by a bariatric surgeon, physician, mental health provider, and dietician, are covered for:

- Roux-en-Y gastric bypass (open and laparoscopic)
- Biliopancreatic diversion with duodenal switch (open and laparoscopic) (BMI>50 only)
- Adjustable silicone gastric banding (open and laparoscopic)
- Sleeve gastrectomy (open or laparoscopic)
- Vertical banded gastroplasty (open or laparoscopic)

Therapies that are specifically not covered because they are considered experimental, investigational, or unproven include: gastric electrical stimulation; gastroplasty; intestinal bypass, intragastric balloon; mini-gastric bypass; endoscopic oral-assisted procedures; and vagus nerve blocking or stimulation.

Link to full text:
https://cignaforhcp.cigna.com/public/content/pdf/coveragePolicies/medical/mm_0051_coveragepositioncriteria_bariatric_surgery.pdf

Cigna Medical Coverage Policy: Gastric Pacing/Gastric Electrical Stimulation (GES) (Coverage Policy Number 0103) (Effective Date 11/15/14)
GES and gastric pacing are not covered for obesity because they are considered experimental, investigational, or unproven.
Link to full text:
https://cignaforhcp.cigna.com/public/content/pdf/coveragePolicies/medical/mm_0103_coveragepositioncriteria_enterra_therapy_gastric_pacing.pdf

Cigna Pharmacy Management Program Requirements and Participating Pharmacy Manual (Rev. December 2009); and What the CIGNA Plans Cover: Prescription Drug Benefits Under The CIGNA Plans (3/7/11)
Both documents note that anti-obesity drugs and anorexiants are typically excluded from benefits.
Link to full text:
http://www.cigna.com/assets/docs/pharmacy/PharmacyProgramRequirementsManual.pdf;
http://www.flexab.com/handbook/HealthCare/CIGNA/WhatTheCIGNAPlansCover.html#a1449641375_d41e674

Cigna Medical Necessity Criteria and Frequently Asked Questions: Cigna Behavioral Health Frequently Asked Questions (2015)
Notes that weight loss services are not typically covered as behavioral health benefits.
Link to full text:
http://apps.cignabehavioral.com/web/basicsite/consumer/customerService/whatIsCoveredFaqs.jsp

A Guide to Cigna's Preventive Health Coverage for Health Care Professionals (2012)
Preventive coverage for comprehensive preventive evaluation and management services includes counseling regarding obesity, weight loss, healthy diet, and exercise; coverage for preventive medicine individual counseling includes face-to-face encounters addressing diet and exercise; coverage for behavior change interventions may be limited to specific validated interventions of assessing readiness for change and barriers to change, advising a change in behavior, providing specific suggested actions and motivational counseling, and arranging for services and follow-up.
Link to full text: http://www.cigna.com/assets/docs/health-care-professionals/807467_d_PreventiveHealthCovGuide_v8_HR.pdf

iii. AETNA

Aetna Clinical Policy Bulletin: Obesity Surgery (Number 0157) (Last Review 11/04/14)
Notes that most Aetna HMO and QPOS plans exclude coverage surgical treatment of obesity. If not excluded, beneficiaries who (a) have a BMI>40, or a BMI>35 with a severe obesity-related comorbidity, (b) have attempted weight loss in the past without successful long-term weight reduction, and (c) meet strict criteria for having participated in a physician-supervised nutrition and exercise program or a multi-disciplinary surgical preparatory regimen, are covered for:

- Roux-en-Y gastric bypass (RYGB) (open or laparoscopic)
- Sleeve gastrectomy (open or laparoscopic)
- Biliopancreatic diversion with or without duodenal switch (open or laparoscopic)
- Adjustable silicone gastric banding (laparoscopic only)

Patients who meet the above criteria but are at increased risk of adverse consequences of a RYGB because of specified co-morbidities may be covered for vertical banded gastroplasty. Therapies that are specifically not covered because they are considered experimental and investigational include: gastrointestinal liners; gastroplasty; intragastric balloon; transoral endoscopic surgery; and vagus nerve blocking.
Link to full text: http://www.aetna.com/cpb/medical/data/100_199/0157.html

Aetna Clinical Policy Bulletin: Weight Reduction Medications and Programs (Number 0039) (Last Review 12/12/14)
Many Aetna benefit plans specifically exclude coverage of services and supplies related to treatment of obesity or for diet and weight control, including medications. If not excluded, weight reduction medications are covered for beneficiaries who (a) have a BMI≥30, or a BMI≥27 with specified serious obesity-related co-morbidities, and (b) have spent at least six months on a weight loss regimen that included (1) a low calorie diet, (2) increased physical activity, and (3) behavioral therapy, and have failed to lose at least one pound per week. With respect to weight reduction programs, if not excluded, beneficiaries who have a BMI≥30 are covered for up to 26 individual or group visits by any recognized provider per 12-month period for weight reduction counseling.
Link to full text: http://www.aetna.com/cpb/medical/data/1_99/0039.html

iv. BLUE CROSS BLUE SHIELD

Anthem Medical Policy: Surgery for Clinically Severe Obesity (Policy # SURG.00024) (Last Reviewed 11/14/13)

Beneficiaries who (a) have a BMI≥40, or a BMI≥35 with an obesity-related co-morbid condition, (b) have actively participated in non-surgical methods of weight reduction, and (c) have undergone specified pre-operative evaluations, are covered for:

- Roux-en-Y (up to 150 cm)
- Adjustable gastric banding (laparoscopic only)
- Vertical banded gastroplasty
- Biliopancreatic bypass with duodenal switch
- Sleeve gastrectomy

All other surgical gastric bypass/restrictive procedures are considered investigational and not medically necessary.

Link to full text: http://www.anthem.com/medicalpolicies/policies/mp_pw_a053317.htm

Blue Cross and Blue Shield of Louisiana Multi-State Plan (2015)

Weight reduction drugs are excluded from coverage.

Link to full text: http://www.bcbsla.com/docs/multi_state_brochure.pdf

Blue Cross and Blue Shield Service Benefit Plan: Federal Employees Health Benefits Program (2014)

Weigh reduction drugs are excluded from coverage.

Link to full text: http://www.opm.gov/healthcare-insurance/tribal-employers/plan-information/plan-codes/2014/brochures/71-005i.pdf

Blue Cross Blue Shield of Rhode Island Medical Coverage Policy: Intensive Behavioral Therapy (IBT) for Obesity (Last Updated 8/5/14)

Adopts Medicare standards (e.g., for beneficiaries with BMI≥30, no more than 22 IBT for obesity in a 12-month period and must demonstrate a weight loss of at least three kg in the first six months).

Link to full text:
https://www.bcbsri.com/sites/default/files/polices/Intensive_Behavioral_Therapy_for_Obesity.pdf

Blue Cross Blue Shield of Massachusetts: Fitness and Weight-Loss Reimbursement (2015)

Some plans reimburse beneficiaries for (a) health club membership fees or fitness classes at a qualified health club, and (b) qualified Weight Watchers® and hospital-based weight-loss programs.

Link to full text: Blue Cross Blue Shield of Massachusetts: Fitness and Weight-Loss Reimbursement

II. SELECTED FDA GUIDANCE DOCUMENTS AND MATERIALS ON OBESITY INTERVENTIONS

A. Medical Devices

Lerner H, Whang J, Nipper R. Benefit-risk paradigm for clinical trial design of obesity devices: FDA Proposal. Surg Endosc 2013;27:702-07. PubMed ID: 23247746

The article provides background for and presents a "new paradigm for systematic assessment of the risks and benefits associated with obesity devices that more formally takes into consideration sample size and study end point determinations based on the anticipated risks of the device." The paradigm first identifies categories of expected and unexpected events based on severity and relative risk. It then assigns devices a risk level based on the percentage of patients who experience each category of events in the year after device placement (level 1 to level 4, from lowest to highest risk). For each level of risk, there is a corresponding effectiveness target, with higher risk devices being expected to demonstrate greater benefit.
Link to abstract: http://www.ncbi.nlm.nih.gov/pubmed/23247746 (abstract only)

FDA (CDRH and CBER) March 28, 2012 Guidance: "Guidance for Industry and Food and Drug Administration Staff: Factors to Consider When Making Benefit-Risk Determinations in Medical Device Premarket Approval and *De Novo* Classifications"

This guidance applies generally to devices subject to premarket approval (PMA) applications or *de novo* classification petitions – not just to obesity devices. In assessing a device's benefits, FDA will examine the type of benefit, magnitude of benefit, probability of the patient experiencing one or more benefits, and the duration of effect. In assessing a device's risks, FDA will examine the severity, types, number, and rates of harmful events associated with use of the device, the probability of a harmful event, and the duration of harmful events. Other factors that FDA may consider include the degree of certainty of the benefits and risks, the characterization of the disease, patient tolerance for risk and perspective on benefit, the availability of alternative treatments or diagnostics, risk mitigation, postmarket data, and whether the device represents or incorporates breakthrough technologies and addresses an unmet medical need. The guidance provides both hypothetical and actual examples of how FDA applies these principles.
Link to full text:
http://www.fda.gov/downloads/MedicalDevices/DeviceRegulationandGuidance/GuidanceDocuments/UCM296379.pdf

FDA Home Page for Obesity Treatment Devices

Provides links for information on types of obesity treatment devices, FDA-approved obesity treatment devices, FDA activities related to obesity treatment devices, and reporting obesity treatment device problems.
Link to full text:
http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/ObesityDevices/default.htm

Information on CDRH Survey on Obese Patients' Risk Tolerance

FDA's Center for Devices and Radiological Health (CDRH) worked with the Research Triangle Institute Health Solutions (RTI-HS) to carry out the first national benefit-risk preference study to provide information on patient risk tolerance. The study surveyed 654 obese patients to assess how much risk they would tolerate in order to lose weight. In order to assess benefit-risk preferences before and after having a procedure, the survey included 23 patients who had previously undergone gastric bypass or banding procedures. In addition, the preferences of those patients who underwent gastric bypass or banding procedures were compared with those who did not. The results of this survey provide significant information on patient benefit-risk preferences, and will help the FDA evaluate the applicability of a patient risk tolerance survey as a tool in FDA's decision making process. The link provides information about the methodology of the study but does not provide the results.
Link to full text:
http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/MedicalDevices/MedicalDevicesAdvisoryCommittee/Gastroenterology-UrologyDevicesPanel/UCM302781.pdf

B. Drugs

Colman E. Food and Drug Administration's Obesity Drug Guidance Document: A Short History. Circ 2012;125:2156-64.

Written by Eric Colman, from the Division of Metabolism and Endocrinology Products, Office of Drug Evaluation II, Center for Drug Evaluation and Research, this article examines the origins and evolution of FDA's guidance document for the development of drugs to treat obesity. Starting in 1947, the article discusses advisory committee meetings, FDA approval decisions, the February 2007 Draft Guidance on developing obesity drugs for medical weight loss, and other developments.
Link to full text: http://circ.ahajournals.org/content/125/17/2156.full.pdf+html

FDA (CDER) February 2007 Draft Guidance: "Guidance for Industry: Developing Products for Weight Management"

Provides information about the clinical assessment of weight-management products, including trial design issues, efficacy endpoints, general safety assessment, statistical considerations, and labeling considerations, among other issues.
Link to full text: http://www.fda.gov/downloads/Drugs/Guidances/ucm071612.pdf

FDA (CDER) March 5, 2012 Background Memorandum to Members and Consultants, Endocrinologic and Metabolic Drugs Advisory Committee (EMDAC) March 28-29, 2012; and Slides from CDER Presentation to EMDAC, March 28, 2012

Provides background information on the epidemiology and health risks associated with obesity, FDA's approach to assessing obesity drugs, and issues relating to the cardiovascular assessment of obesity drugs, among other things.
Link to full text:
http://www.fda.gov/downloads/advisorycommittees/committeesmeetingmaterials/drugs/endocrinologicandmetabolicdrugsadvisorycommittee/ucm297240.pdf;

Link to full text:
http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/Drugs/EndocrinologicandMetabolicDrugsAdvisoryCommittee/UCM299133.pdf

FDA (CDER) Summary Minutes of the Endocrinologic and Metabolic Drugs Advisory Committee Meeting: March 28-29, 2012

Summarizes committee discussion and responses to FDA questions, including strengths and weaknesses of enriching phase 2 and 3 clinical trials with overweight and obese individuals at higher risk for cardiovascular events, strengths and weaknesses of various design parameters for a cardiovascular outcomes trial for an obesity drug, and whether obesity drugs without a theoretical risk or signal for cardiovascular harm should be required to rule out a certain degree of excess cardiovascular risk.
Link to full text:
http://www.fda.gov/downloads/AdvisoryCommittees/CommitteesMeetingMaterials/Drugs/EndocrinologicandMetabolicDrugsAdvisoryCommittee/UCM303352.pdf

FDA News Release: "FDA approves Belviq to treat some overweight or obese adults" (June 27, 2012)

Summarizes clinical data on which Belviq approval was based. In randomized placebo-controlled trials involving nearly 8000 patients treated for 52 to 104 weeks, average weight loss compared with placebo was 3% to 3.7%. 47% of patients without type 2 diabetes lost at least 5% of their body weight (v. 23% on placebo) and 38% of patients with type 2 diabetes lost at least 5% of their body weight (v. 16% on placebo).
Link to full text: http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm309993.htm

FDA News Release: "FDA approves weight-management drug Qsymia" (July 17, 2012)

Summarizes clinical data on which Qsymia approval was based. In randomized placebo-controlled trials involving around 3700 patients, treated patients had an average weight loss of 6.7% over placebo after one year of treatment with the recommended dose. On the highest daily dose, patients had an average weight loss of 8.9% over placebo after one year of treatment.
Link to full text: http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm312468.htm

FDA News Release: "FDA approves weight-management drug Contrave" (September 10, 2014)

Summarizes clinical data on which Contrave approval was based. In clinical trials involving around 4500 patients, treated patients without diabetes had an average weight loss of 4.1% over placebo after one year of treatment, and 42% lost at least 5% of their body weight (v. 17% on placebo). Treated patients with diabetes had an average weight loss of 2% over placebo at one year, and 36% lost at least 5% of their body weight (v. 18% on placebo).
Link to full text: http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm413896.htm

III. SELECTED GUIDELINES

A. 2013 AHA/ACC/TOS GUIDELINE FOR THE MANAGEMENT OF OVERWEIGHT AND OBESITY IN ADULTS

Reference: Jensen, M. D., et al. (2014). "2013 AHA/ACC/TOS guideline for the management of overweight and obesity in adults: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and The Obesity Society." Circulation **129**(25 Suppl 2): S102-138.

Link to full text:
http://circ.ahajournals.org/content/early/2013/11/11/01.cir.0000437739.71477.ee.full.pdf

B. VA/DoD CLINICAL PRACTICE GUIDELINE FOR SCREENING AND MANAGEMENT OF OVERWEIGHT AND OBESITY

This Clinical Practice Guideline (CPG) is designed to assist primary care providers in treating and managing overweight and/or obese patients. This CPG addresses the following elements: **Population.** The patient population of interest for this CPG is adults (men and women who are > 18 years old) that are eligible for care in the Veterans Health Administration (VHA) or the Department of Defense (DoD) healthcare delivery system. This CPG does not provide recommendations for the treatment of children, adolescents, or pregnant/lactating women. **Interventions.** This CPG provides information on both pharmacologic and non-pharmacologic therapies for overweight and obesity. Pharmacologic therapies are limited to available Food and Drug Administration (FDA) approved medications that are specifically indicated for use in treating overweight and/or obesity. These include lorcaserin, orlistat, or the combination phentermine/topiramate extended-release (P/T ER). Non-pharmacologic interventions include lifestyle (i.e., diet and exercise) and behavioral interventions (i.e., counseling).

Link to full text:
http://www.healthquality.va.gov/guidelines/CD/obesity/VADoDCPGManagementOfOverweightAndObesityFinal.pdf

IV. SELECTED META-ANALYSES AND SYSTEMATIC REVIEWS

Chang, S. H., et al. (2014). "The effectiveness and risks of bariatric surgery: an updated systematic review and meta-analysis, 2003-2012." JAMA Surg 149(3): 275-287.

IMPORTANCE: The prevalence of obesity and outcomes of bariatric surgery are well established. However, analyses of the surgery impact have not been updated and comprehensively investigated since 2003. OBJECTIVE: To examine the effectiveness and risks of bariatric surgery using up-to-date, comprehensive data and appropriate meta-analytic techniques. DATA SOURCES: Literature searches of Medline, Embase, Scopus, Current Contents, Cochrane Library, and Clinicaltrials.gov between 2003 and 2012 were performed. STUDY SELECTION: Exclusion criteria included publication of abstracts only, case reports, letters, comments, or reviews; animal studies; languages other than English; duplicate studies; no surgical intervention; and no population of interest. Inclusion criteria were a report of surgical procedure performed and at least 1 outcome of interest resulting from the studied surgery was reported: comorbidities, mortality, complications, reoperations, or weight loss. Of the 25,060 initially identified articles, 24,023 studies met the exclusion criteria, and 259 met the inclusion criteria. DATA EXTRACTION AND SYNTHESIS: A review protocol was followed throughout. Three reviewers independently reviewed studies, abstracted data, and resolved disagreements by consensus. Studies were evaluated for quality. MAIN OUTCOMES AND MEASURES: Mortality, complications, reoperations, weight loss, and remission of obesity-related diseases. RESULTS: A total of 164 studies were included (37 randomized clinical trials and 127 observational studies). Analyses included 161,756 patients with a mean age of 44.56 years and body mass index of 45.62. We conducted random-effects and fixed-effect meta-analyses and meta-regression. In randomized clinical trials, the mortality rate within 30 days was 0.08% (95% CI, 0.01%-0.24%); the mortality rate after 30 days was 0.31% (95% CI, 0.01%-0.75%). Body mass index loss at 5 years postsurgery was 12 to 17. The complication rate was 17% (95% CI, 11%-23%), and the reoperation rate was 7% (95% CI, 3%-12%). Gastric bypass was more effective in weight loss but associated with more complications. Adjustable gastric banding had lower mortality and complication rates; yet, the reoperation rate was higher and weight loss was less substantial than gastric bypass. Sleeve gastrectomy appeared to be more effective in weight loss than adjustable gastric banding and comparable with gastric bypass. CONCLUSIONS AND RELEVANCE: Bariatric surgery provides substantial and sustained effects on weight loss and ameliorates obesity-attributable comorbidities in the majority of bariatric patients, although risks of complication, reoperation, and death exist. Death rates were lower than those reported in previous meta-analyses.

Gloy, V. L., et al. (2013). "Bariatric surgery versus non-surgical treatment for obesity: a systematic review and meta-analysis of randomised controlled trials." BMJ 347: f5934.

OBJECTIVE: To quantify the overall effects of bariatric surgery compared with non-surgical treatment for obesity. DESIGN: Systematic review and meta-analysis based on a random effects model. DATA SOURCES: Searches of Medline, Embase, and the Cochrane Library from their inception to December 2012 regardless of language or publication status. ELIGIBILITY CRITERIA:

Eligible studies were randomised controlled trials with >/= 6 months of follow-up that included individuals with a body mass index >/= 30, compared current bariatric surgery techniques with non-surgical treatment, and reported on body weight, cardiovascular risk factors, quality of life, or adverse events. RESULTS: The meta-analysis included 11 studies with 796 individuals (range of mean body mass index at baseline 30-52). Individuals allocated to bariatric surgery lost more body weight (mean difference -26 kg (95% confidence interval -31 to -21)) compared with non-surgical treatment, had a higher remission rate of type 2 diabetes (relative risk 22.1 (3.2 to 154.3) in a complete case analysis; 5.3 (1.8 to 15.8) in a conservative analysis assuming diabetes remission in all non-surgically treated individuals with missing data) and metabolic syndrome (relative risk 2.4 (1.6 to 3.6) in complete case analysis; 1.5 (0.9 to 2.3) in conservative analysis), greater improvements in quality of life and reductions in medicine use (no pooled data). Plasma triglyceride concentrations decreased more (mean difference -0.7 mmol/L (-1.0 to -0.4) and high density lipoprotein cholesterol concentrations increased more (mean difference 0.21 mmol/L (0.1 to 0.3)). Changes in blood pressure and total or low density lipoprotein cholesterol concentrations were not significantly different. There were no cardiovascular events or deaths reported after bariatric surgery. The most common adverse events after bariatric surgery were iron deficiency anaemia (15% of individuals undergoing malabsorptive bariatric surgery) and reoperations (8%). CONCLUSIONS: 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.

Johnston, B. C., et al. (2014). "Comparison of weight loss among named diet programs in overweight and obese adults: a meta-analysis." JAMA 312(9): 923-933.

IMPORTANCE: Many claims have been made regarding the superiority of one diet or another for inducing weight loss. Which diet is best remains unclear. OBJECTIVE: To determine weight loss outcomes for popular diets based on diet class (macronutrient composition) and named diet. DATA SOURCES: Search of 6 electronic databases: AMED, CDSR, CENTRAL, CINAHL, EMBASE, and MEDLINE from inception of each database to April 2014. STUDY SELECTION: Overweight or obese adults (body mass index >/=25) randomized to a popular self-administered named diet and reporting weight or body mass index data at 3-month follow-up or longer. DATA EXTRACTION AND SYNTHESIS: Two reviewers independently extracted data on populations, interventions, outcomes, risk of bias, and quality of evidence. A Bayesian framework was used to perform a series of random-effects network meta-analyses with meta-regression to estimate the relative effectiveness of diet classes and programs for change in weight and body mass index from baseline. Our analyses adjusted for behavioral support and exercise. MAIN OUTCOMES AND MEASURES: Weight loss and body mass index at 6- and 12-month follow-up (+/-3 months for both periods). RESULTS: Among 59 eligible articles reporting 48 unique randomized trials (including 7286 individuals) and compared with no diet, the largest weight loss was associated with low-carbohydrate diets (8.73 kg [95% credible interval {CI}, 7.27 to 10.20 kg] at 6-month follow-up and 7.25 kg [95% CI, 5.33 to 9.25 kg] at 12-month follow-up) and low-fat diets (7.99 kg [95% CI, 6.01 to 9.92 kg] at 6-month follow-up and 7.27 kg [95% CI, 5.26 to 9.34 kg] at 12-month follow-up). Weight loss differences between individual diets were minimal. For example, the Atkins diet resulted in a 1.71 kg greater weight loss than the Zone diet at 6-month follow-up.

Between 6- and 12-month follow-up, the influence of behavioral support (3.23 kg [95% CI, 2.23 to 4.23 kg] at 6-month follow-up vs 1.08 kg [95% CI, -1.82 to 3.96 kg] at 12-month follow-up) and exercise (0.64 kg [95% CI, -0.35 to 1.66 kg] vs 2.13 kg [95% CI, 0.43 to 3.85 kg], respectively) on weight loss differed. CONCLUSIONS AND RELEVANCE: Significant weight loss was observed with any low-carbohydrate or low-fat diet. Weight loss differences between individual named diets were small. This supports the practice of recommending any diet that a patient will adhere to in order to lose weight.

Kushner, R. F. and D. H. Ryan (2014). "Assessment and lifestyle management of patients with obesity: clinical recommendations from systematic reviews." JAMA 312(9): 943-952.

IMPORTANCE: Even though one-third of US adults are obese, identification and treatment rates for obesity remain low. Clinician engagement is vital to provide guidance and assistance to patients who are overweight or obese to address the underlying cause of many chronic diseases. OBJECTIVES: To describe current best practices for assessment and lifestyle management of obesity and to demonstrate how the updated Guidelines (2013) for Managing Overweight and Obesity in Adults based on a systematic evidence review sponsored by the National Heart, Lung, and Blood Institute (NHLBI) can be applied to an individual patient. EVIDENCE REVIEW: Systematic evidence review conducted for the Guidelines (2013) for Managing Overweight and Obesity in Adults supports treatment recommendations in 5 areas (risk assessment, weight loss benefits, diets for weight loss, comprehensive lifestyle intervention approaches, and bariatric surgery); for areas outside this scope, recommendations are supported by other guidelines (for obesity, 1998 NHLBI-sponsored obesity guidelines and those from the National Center for Health and Clinical Excellence and Canadian and US professional societies such as the American Association of Clinical Endocrinologists and American Society of Bariatric Physicians; for physical activity recommendations, the 2008 Physical Activity Guidelines for Americans); a PubMed search identified recent systematic reviews covering depression and obesity, motivational interviewing for weight management, metabolic adaptation to weight loss, and obesity pharmacotherapy. FINDINGS: The first step in obesity management is to screen all adults for overweight and obesity. A medical history should be obtained assessing for the multiple determinants of obesity, including dietary and physical activity patterns, psychosocial factors, weight-gaining medications, and familial traits. Emphasis on the complications of obesity to identify patients who will benefit the most from treatment is more useful than using body mass index (BMI; calculated as weight in kilograms divided by height in meters squared) alone for treatment decisions. The Guidelines (2013) recommend that clinicians offer patients who would benefit from weight loss (either BMI of >/=30 with or without comorbidities or >/=25 along with 1 comorbidity or risk factor) intensive, multicomponent behavioral intervention. Some clinicians do this within their primary care practices; others refer patients for these services. Weight loss is achieved by creating a negative energy balance through modification of food and physical activity behaviors. The Guidelines (2013) endorse comprehensive lifestyle treatment by intensive intervention. Treatment can be implemented either in a clinician's office or by referral to a registered dietitian or commercial weight loss program. Weight loss of 5% to 10% is the usual goal. It is not necessary for patients to attain a BMI of less than 25 to achieve a health benefit. CONCLUSIONS AND RELEVANCE: Screening and assessment of patients for obesity followed by initiation or referral of treatment should be incorporated into primary care practice

settings. If clinicians can identify appropriate patients for weight loss efforts and provide informed advice and assistance on how to achieve and sustain modest weight loss, they will be addressing the underlying driver of many comorbidities and can have a major influence on patients' health status.

Maglione MA, Maggard Gibbons M, Livhits M, Ewing B, Hu J, Ruelaz Maher A, Li Z, Perry T, Shekelle PG. Bariatric Surgery and Nonsurgical Therapy in Adults With Metabolic Conditions and a Body Mass Index of 30.0 to 34.9 kg/m². Comparative Effectiveness Review No. 82. (Prepared by the Southern California Evidence-based Practice Center under Contract No. 290-2007-10062-I.) AHRQ Publication No. 12(13)-EHC139-EF. Rockville, MD: Agency for Healthcare Research and Quality. June 2013.

OBJECTIVE: To systematically review the scientific evidence on efficacy, safety, and comparative effectiveness of various types of bariatric surgery for treating adult patients with a body mass index (BMI) of 30.0 to 34.9 kg/m2 and diabetes or impaired glucose tolerance (IGT) and to compare effectiveness of surgery versus nonsurgical interventions in this population. Systematic reviews, case series, cohort, case control studies and controlled trials, found through searching PubMed(R), Embase, CINAHL, Cochrane Central Register of Controlled Trials (CENTRAL), Cochrane Database of Abstracts of Reviews of Effects (DARE), and Clinicaltrials.gov through March, 2012. To be included, studies had to report on laparoscopic adjustable gastric banding (LAGB), Roux-en-Y gastric bypass (RYGB), biliopancreatic diversion with duodenal switch (BPD), sleeve gastrectomy (SG), or nonsurgical treatment, and had to include patients with a BMI of at least 30 kg/m2 but less than 35 kg/m2 with diabetes or IGT. The following studies were excluded: (1) those with no outcomes of efficacy, effectiveness, or safety/adverse events; (2) nonsurgical studies with less than one year followup; (3) nonsurgical studies already included in previous systematic reviews; and (4) studies with a sample size of less than three. Two reviewers, each trained in the critical analysis of scientific literature, independently reviewed and abstracted each study. We found only 24 studies reporting bariatric surgery results in this specific target population. Two were trials comparing different procedures, three were trials of surgical versus nonsurgical interventions, and the rest were observational studies. Both weight and blood glucose improved significantly for surgery patients in the trials. In the observational studies, surgery patients showed much greater weight loss at 1 year than reported in systematic reviews and randomized controlled trials (RCTs) on diet, exercise, medication, and other behavioral interventions. While both behavioral interventions and medications lowered HbA1c (glycosylated hemoglobin) levels significantly, the decreases reported in surgery patients were much greater. Improvements in blood glucose measures were reported as early as one month postsurgery. Improvements in hypertension, low-density lipoprotein (LDL) cholesterol, and triglycerides were also reported in some studies. Short-term rates of adverse events associated with bariatric surgery were relatively low. One death, a case of sepsis at 20 months in an LAGB patient, was reported. Short-term complications were minor and tended not to require major intervention. Due to the dearth of long-term studies of bariatric surgery in this particular target population, few data exist about long-term adverse effects, and we found no evidence regarding major clinical endpoints such as all-cause mortality, cardiovascular mortality and morbidity, and peripheral arterial disease. According to blood glucose outcomes, there is moderate strength evidence of efficacy for RYGB, LAGB, and SG as treatment for diabetes and IGT in patients with a BMI between 30 kg/m2 and 35 kg/m2 in the short term (up to 2 years). The strength of evidence

for BPD is rated low because there are fewer studies, and these have smaller sample sizes. Evidence on comparative effectiveness of surgical procedures is insufficient. Short-term adverse events are relatively minor; strength of evidence is low due to small sample size with low power to detect rare events. Strength of evidence is insufficient regarding adverse events in the long-term (2 years or more postsurgery). Longitudinal studies of bariatric surgery patients are needed to assess overall safety and comparative effectiveness regarding diabetes-related morbidity such as kidney failure and blindness.

Puzziferri, N., et al. (2014). "Long-term follow-up after bariatric surgery: a systematic review." JAMA 312(9): 934-942.

IMPORTANCE: Bariatric surgery is an accepted treatment for obesity. Despite extensive literature, few studies report long-term follow-up in cohorts with adequate retention rates. OBJECTIVE: To assess the quality of evidence and treatment effectiveness 2 years after bariatric procedures for weight loss, type 2 diabetes, hypertension, and hyperlipidemia in severely obese adults. EVIDENCE REVIEW: MEDLINE and Cochrane databases were searched from 1946 through May 15, 2014. Search terms included bariatric surgery, individual bariatric procedures, and obesity. Studies were included if they described outcomes for gastric bypass, gastric band, or sleeve gastrectomy performed on patients with a body mass index of 35 or greater, had more than 2 years of outcome information, and had follow-up measures for at least 80% of the initial cohort. Two investigators reviewed each study and a third resolved study inclusion disagreements. FINDINGS: Of 7371 clinical studies reviewed, 29 studies (0.4%, 7971 patients) met inclusion criteria. All gastric bypass studies (6 prospective cohorts, 5 retrospective cohorts) and sleeve gastrectomy studies (2 retrospective cohorts) had 95% confidence intervals for the reported mean, median, or both exceeding 50% excess weight loss. This amount of excess weight loss occurred in 31% of gastric band studies (9 prospective cohorts, 5 retrospective cohorts). The mean sample-size-weighted percentage of excess weight loss for gastric bypass was 65.7% (n = 3544) vs 45.0% (n = 4109) for gastric band. Nine studies measured comorbidity improvement. For type 2 diabetes (glycated hemoglobin <6.5% without medication), sample-size-weighted remission rates were 66.7% for gastric bypass (n = 428) and 28.6% for gastric band (n = 96). For hypertension (blood pressure <140/90 mm Hg without medication), remission rates were 38.2% for gastric bypass (n = 808) and 17.4% for gastric band (n = 247). For hyperlipidemia (cholesterol <200 mg/dL, high-density lipoprotein >40 mg/dL, low-density lipoprotein <160 mg/dL, and triglycerides <200 mg/dL), remission rates were 60.4% for gastric bypass (n = 477) and 22.7% for gastric band (n = 97). CONCLUSIONS AND RELEVANCE: Very few bariatric surgery studies report long-term results with sufficient patient follow-up to minimize biased results. Gastric bypass has better outcomes than gastric band procedures for long-term weight loss, type 2 diabetes control and remission, hypertension, and hyperlipidemia. Insufficient evidence exists regarding long-term outcomes for gastric sleeve resections.

Yanovski, S. Z. and J. A. Yanovski (2014). "Long-term drug treatment for obesity: a systematic and clinical review." JAMA 311(1): 74-86.

IMPORTANCE: Thirty-six percent of US adults are obese, and many cannot lose sufficient weight to improve health with lifestyle interventions alone. OBJECTIVE: To conduct a systematic review of medications currently approved in the United States for obesity treatment in adults. We also discuss off-label use of medications studied for obesity and provide considerations for obesity medication use in clinical practice. EVIDENCE REVIEW: A PubMed search from inception through September 2013 was performed to find meta-analyses, systematic reviews, and randomized, placebo-controlled trials for currently approved obesity medications lasting at least 1 year that had a primary or secondary outcome of body weight change, included at least 50 participants per group, reported at least 50% retention, and reported results on an intention-to-treat basis. Studies of medications approved for other purposes but tested for obesity treatment were also reviewed. FINDINGS: Obesity medications approved for long-term use, when prescribed with lifestyle interventions, produce additional weight loss relative to placebo ranging from approximately 3% of initial weight for orlistat and lorcaserin to 9% for top-dose (15/92 mg) phentermine plus topiramate-extended release at 1 year. The proportion of patients achieving clinically meaningful (at least 5%) weight loss ranges from 37% to 47% for lorcaserin, 35% to 73% for orlistat, and 67% to 70% for top-dose phentermine plus topiramate-extended release. All 3 medications produce greater improvements in many cardiometabolic risk factors than placebo, but no obesity medication has been shown to reduce cardiovascular morbidity or mortality. Most prescriptions are for noradrenergic medications, despite their approval only for short-term use and limited data for their long-term safety and efficacy. CONCLUSIONS AND RELEVANCE: Medications approved for long-term obesity treatment, when used as an adjunct to lifestyle intervention, lead to greater mean weight loss and an increased likelihood of achieving clinically meaningful 1-year weight loss relative to placebo. By discontinuing medication in patients who do not respond with weight loss of at least 5%, clinicians can decrease their patients' exposure to the risks and costs of drug treatment when there is little prospect of long-term benefit.