Welcome to Grand Rounds - July

Bariatric surgery and medications

Presented by Julia Sanchez, PharmD

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Bariatric surgery and medications

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Grand Rounds
July 11, 2024

Disclosure Information

Julie Sanchez

- I have nothing to disclose and no conflicts of interest or funding sources

Objectives

- Recognize how obesity is associated with the occurrence of chronic medical conditions and the impairment of health-related quality of life.
- Discuss bariatric surgery and become familiar with bariatric procedures.
- Examine medications that may have absorption concerns after bariatric surgery.
- Determine potential medication changes including supplement use after bariatric surgery

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Obesity categories by BMI

- BMI of 18.9 to < 24.9: normal range
- BMI of 25 to < 29.9: overweight
- BMI of 30 to 34.9: class I obesity
- BMI 35 to 39.9: class II, serious obesity
- BMI 40 or greater: class III, severe obesity
- BMI 50 or greater: super obesity

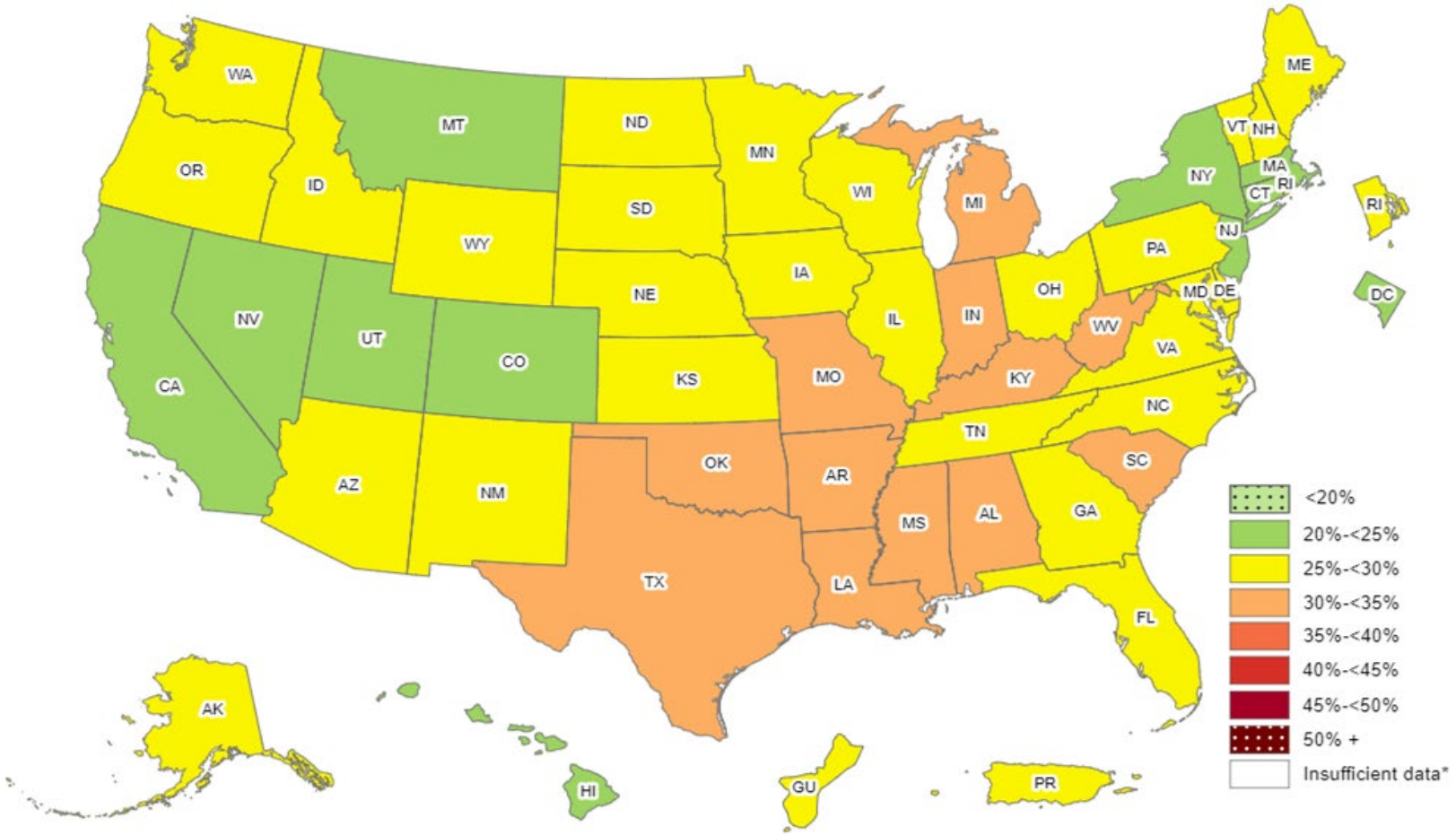
https://asmbs.org/patients/disease-of-obesity/

Obesity trends

https://www.cdc.gov/obesity/php/data-research/adult-obesity-prevalence-maps.html#cdc_data_surveillance_section_13-download-maps

Prevalence¶ of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2011

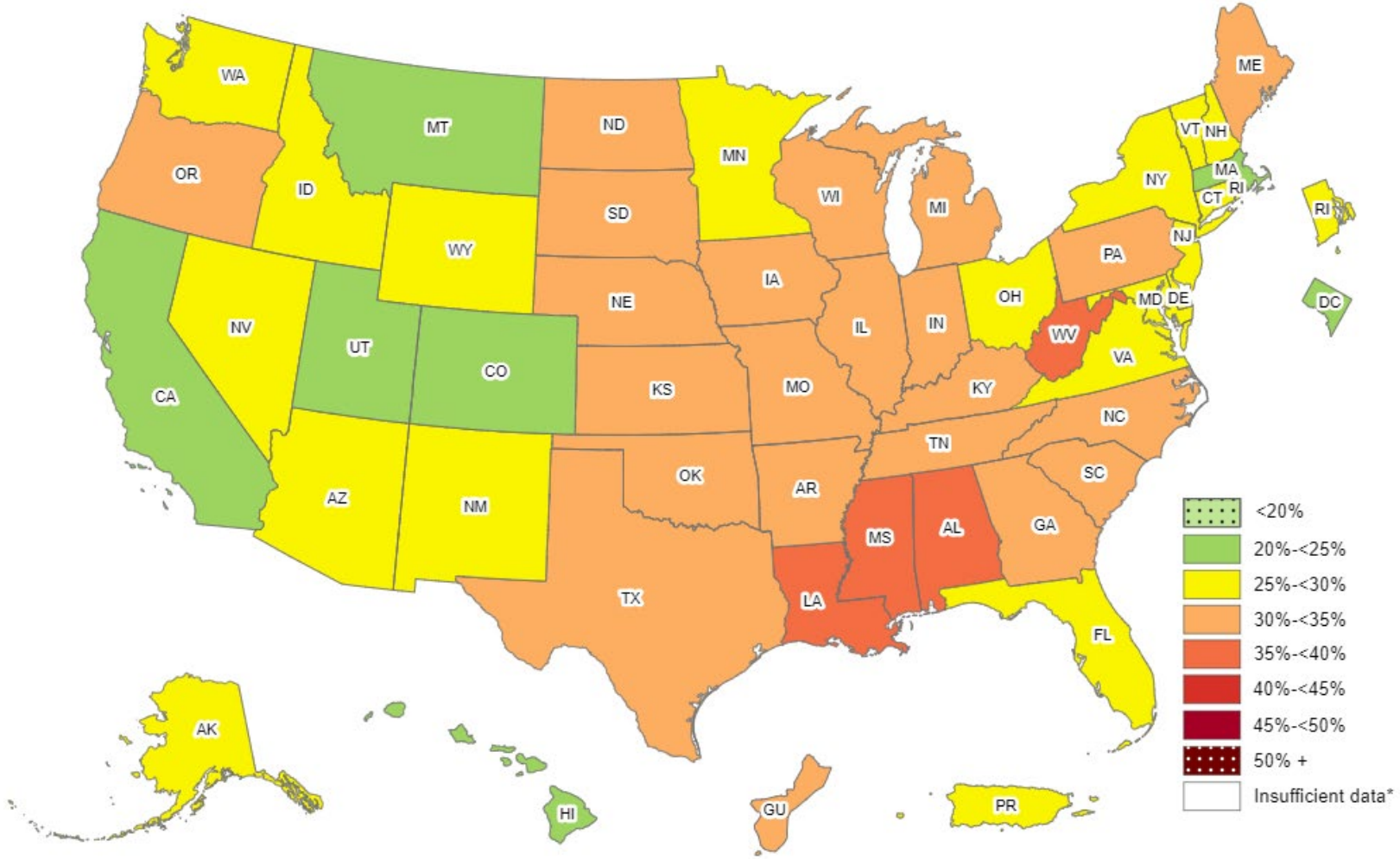
¶ Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



***Sample size <50, the relative standard error (dividing the standard error by the prevalence) ≥30%, or no data in a specific year.**

Prevalence¶ of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2015

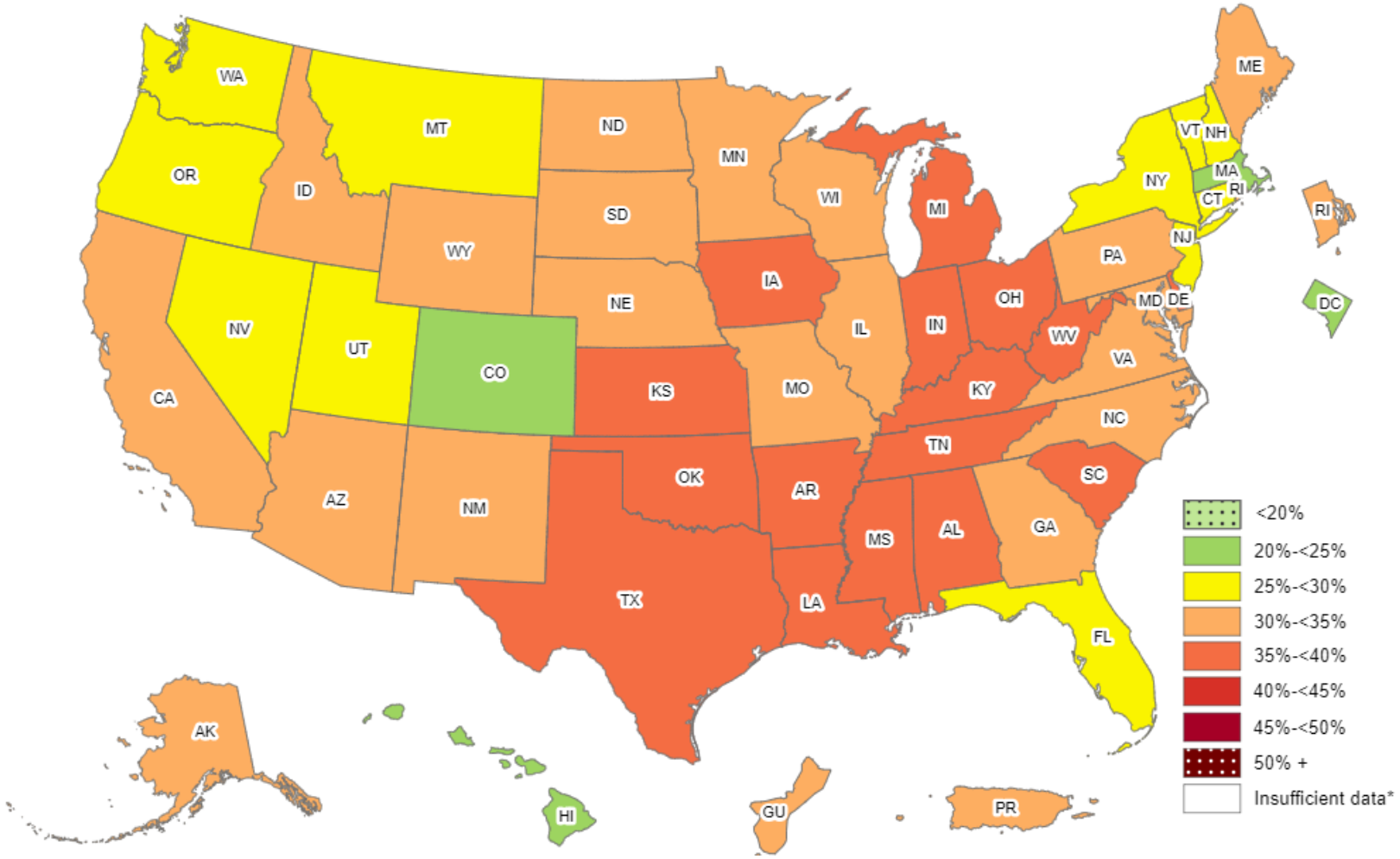
¶ Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



***Sample size <50, the relative standard error (dividing the standard error by the prevalence) ≥30%, or no data in a specific year.**

Prevalence¶ of Self-Reported Obesity Among U.S. Adults by State and Territory, BRFSS, 2020

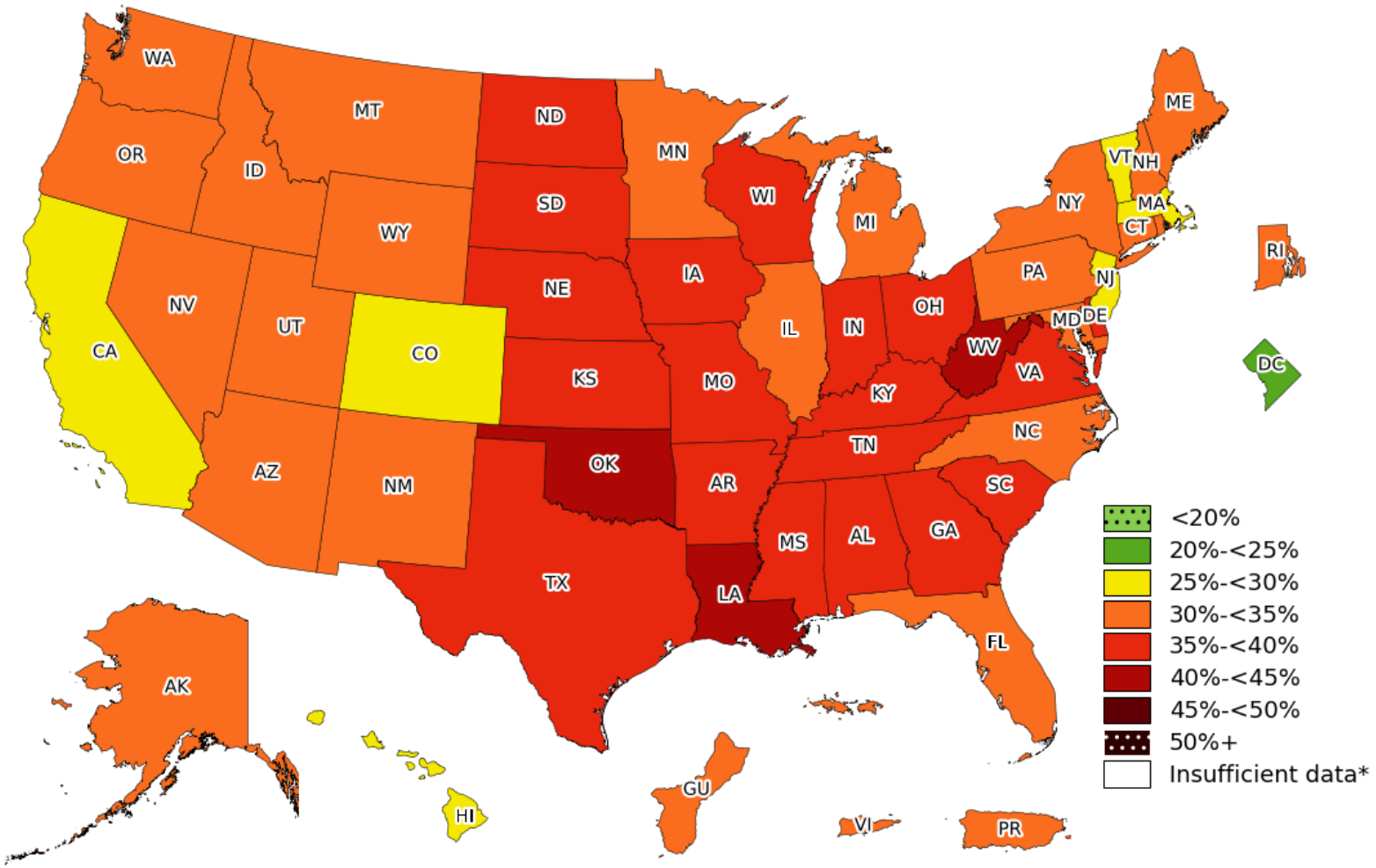
¶ Prevalence estimates reflect BRFSS methodological changes started in 2011. These estimates should not be compared to prevalence estimates before 2011.



***Sample size <50, the relative standard error (dividing the standard error by the prevalence) ≥30%, or no data in a specific year.**

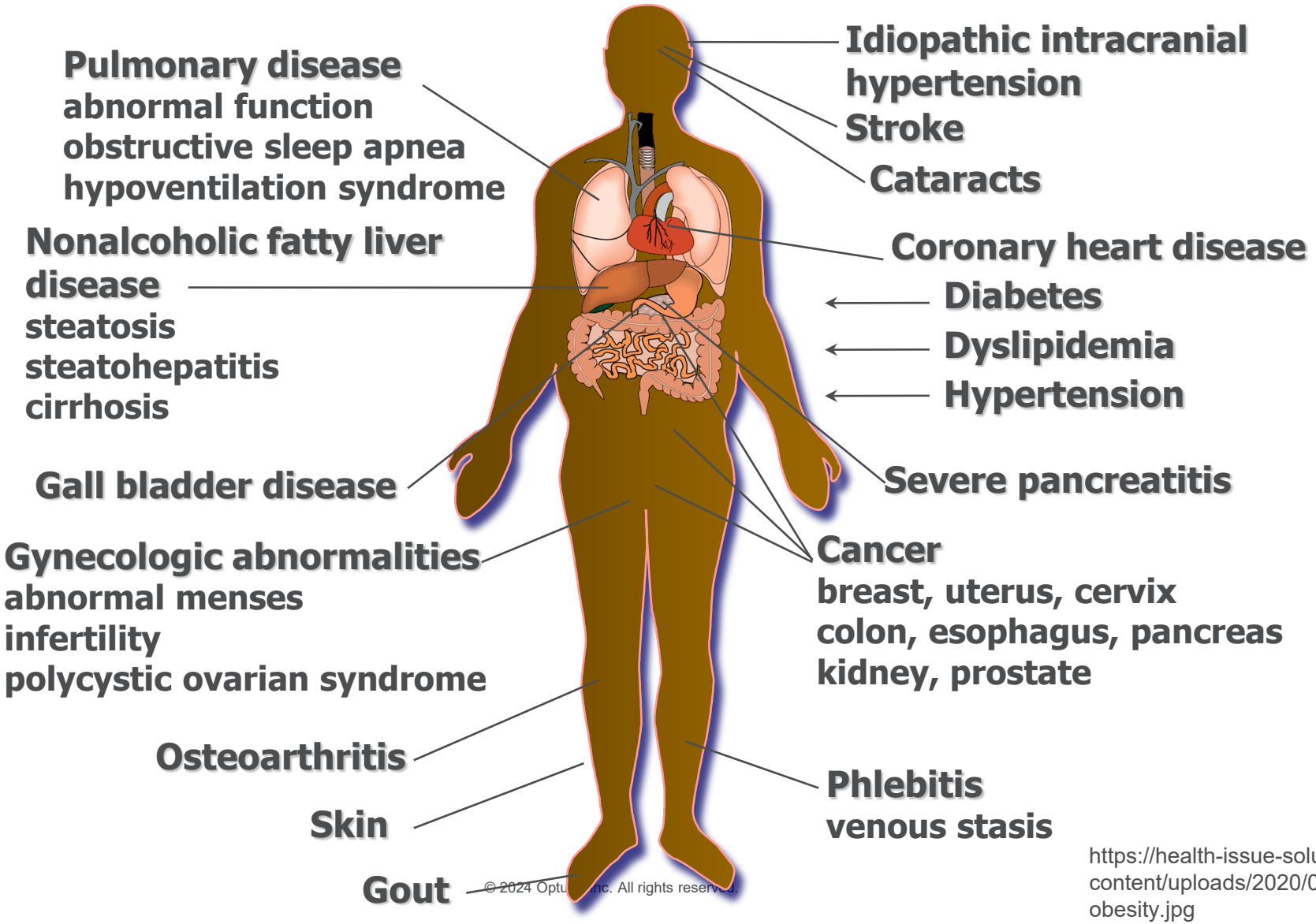
Prevalence¶ of Obesity Based on Self-Reported Weight and Height Among US Adults by State and Territory, BRFSS, 2022

¶ Pre
com



*Sample size <50, the relative standard error (dividing the standard error by the prevalence) ≥30%, or no data in a specific year.

Medical Complications of Obesity



https://health-issue-solutions.com.ng/wp-content/uploads/2020/04/implication-of-obesity.jpg

Bariatric surgery

Estimations of U.S. bariatric surgeries

	2011	2013	2015	2017	2019	2022
Total	**158,000**	**179,000**	**196,000**	228,000	256,000	279,967
Sleeve	28,124	75,359	105,448	135,401	152,413	160,609
RYGB	57,986	61,218	45,276	40,574	45,744	62,097
Band	55,932	25,060	11.182	6318	2375	2500
Revision	9480	10,740	25,656	32,238	42,881	30,894
Balloons	—	—	700	6280	4655	4358

RYGB=Roux-en-Y Gastric Bypass

Adapted from : https://asmbs.org/resources/estimate-of-bariatric-surgery-numbers

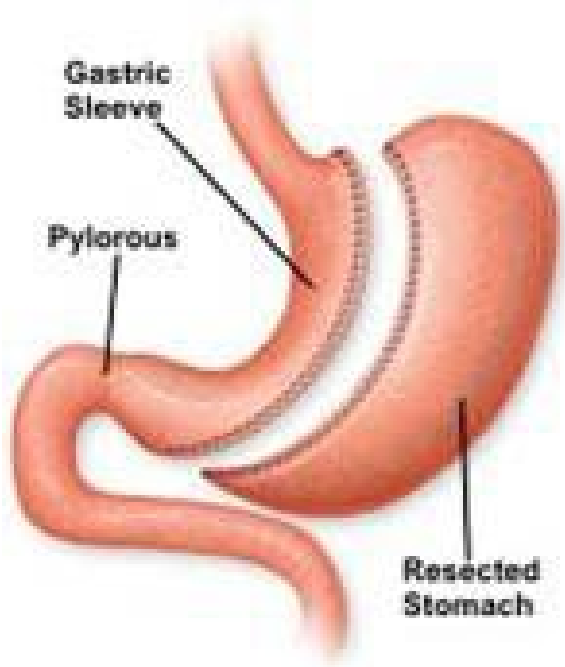
Candidates for bariatric surgery

- BMI > 35 kg/m^2 regardless of comorbidities
- Consider for BMI of 30-34.0 kg/m^2 and comorbidities
- Select children and adolescents can be considered
  - BMI 35 kg/ m^2 or 120% of the 95th percentile (class II) + major comorbidity or BMI 40 kg/m^2 or 140% of 95th percentile (class III)
- Elderly: no upper age limit
  - May have higher post op complication rates (frailty rather than age is associated with higher post op complication rates)

https://asmbs.org/wp-content/uploads/2022/10/ASMBS-IFSO-Guidelines-2022-PIIS1550728922006414.pdf

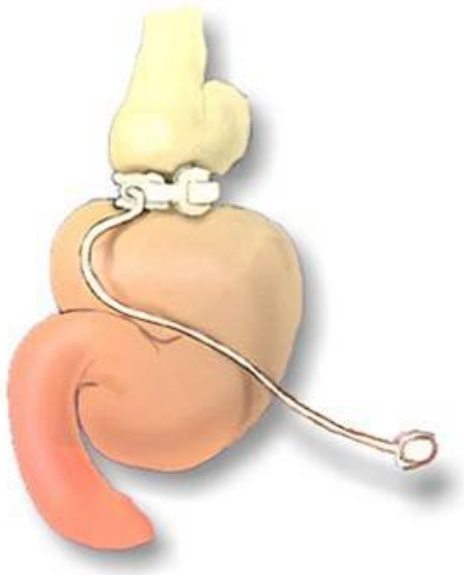
Common bariatric procedures

Restrictive



Laparoscopic Sleeve Gastrectomy

Restrictive

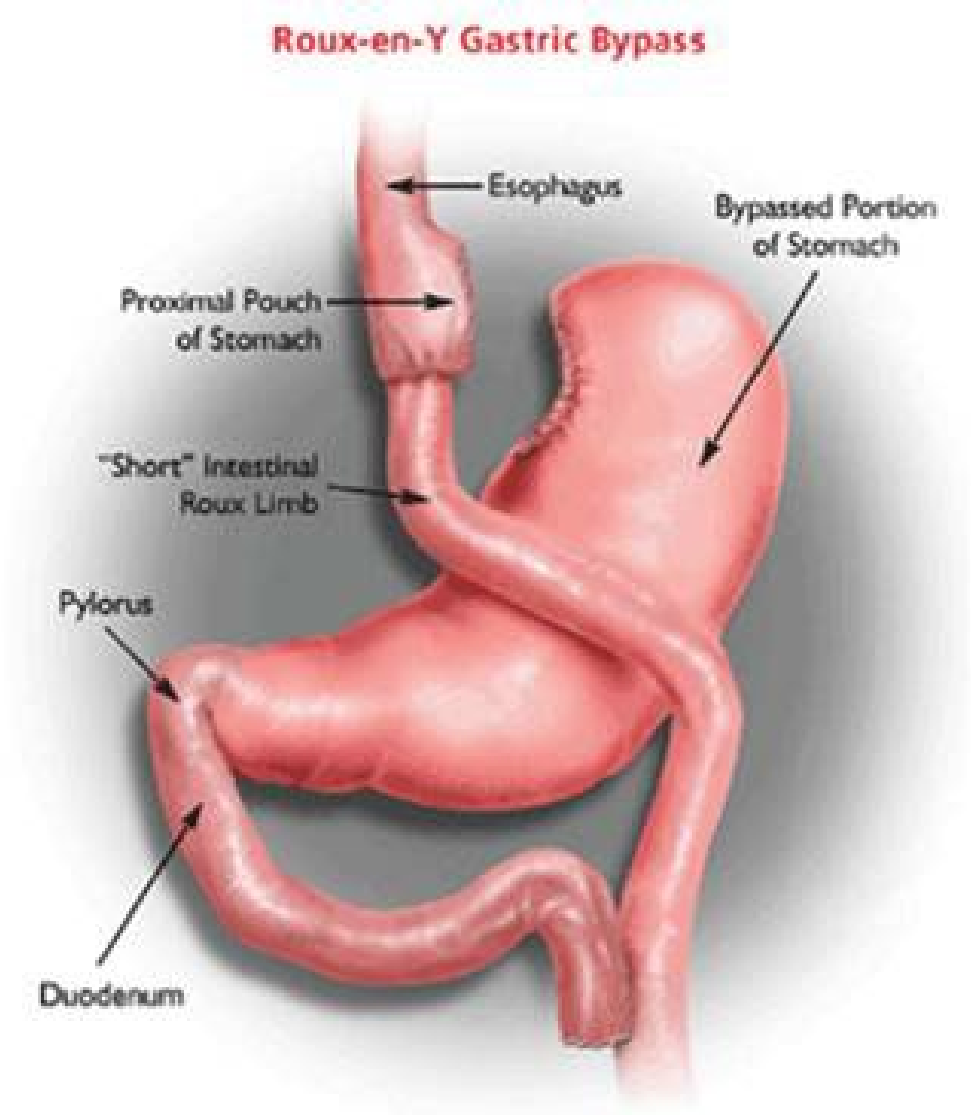


Laparoscopic Adjustable Gastric Band

Malabsorptive + Restrictive

Laparoscopic Roux-en-Y Gastric Bypass

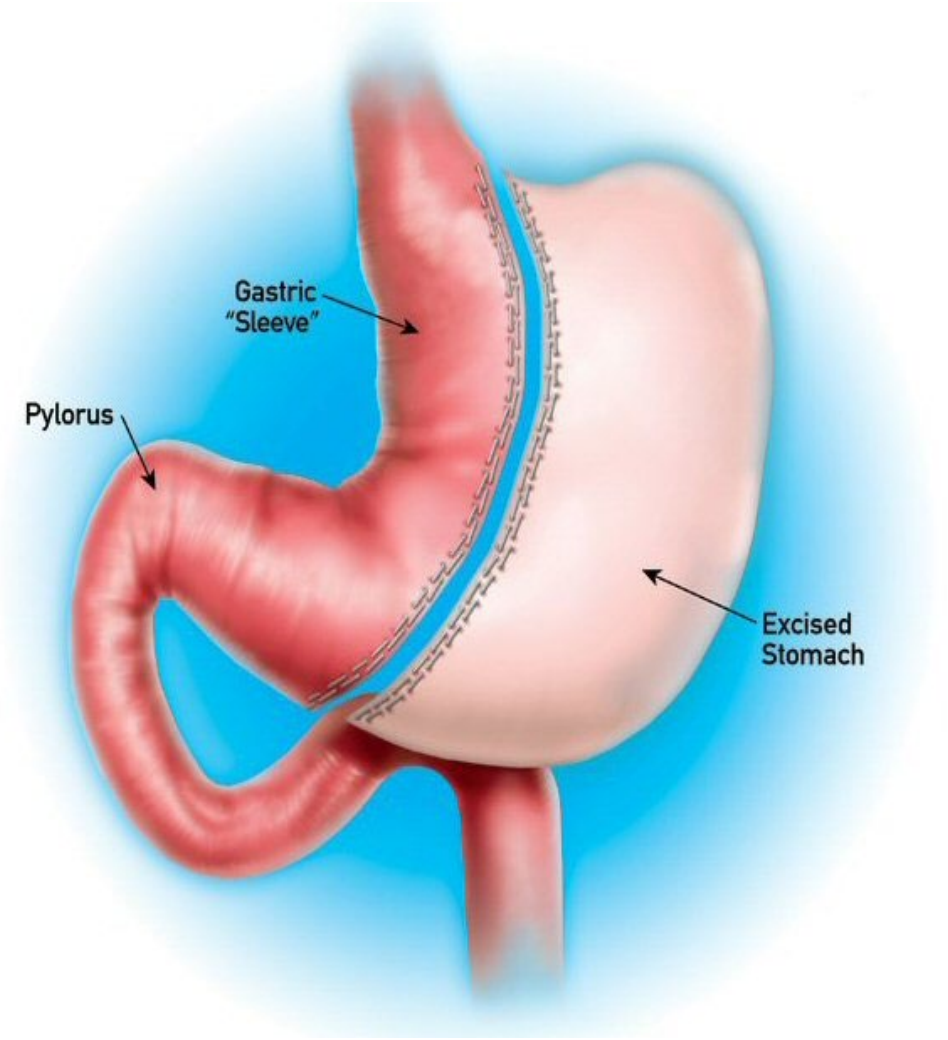
Laparoscopic Roux-en-Y Gastric Bypass



Laparoscopic Roux-en-Y Gastric Bypass (RYGB)

- Restrictive and malabsorptive
- Small 2 oz pouch created & attached directly to small intestine
- Large part of stomach and duodenum bypassed
- Increases hormones such as glucagon-like peptide 1 (GLP-1)
  - Reduces hunger, feel full faster, improves glucose control
- Weight loss is quicker than other surgeries

Laparoscopic Sleeve Gastrectomy

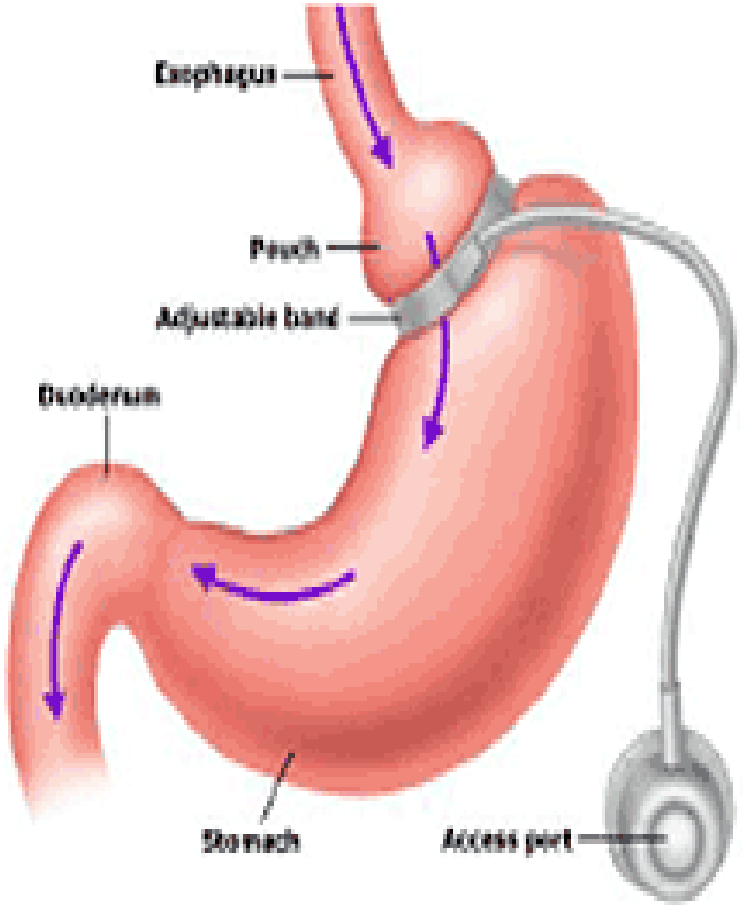


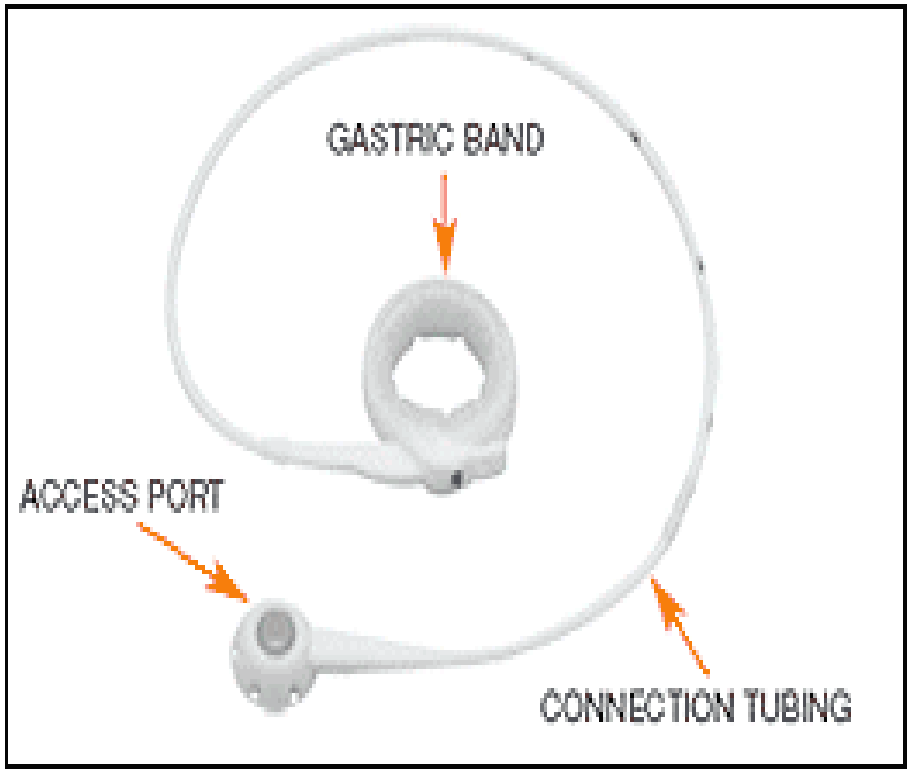
Universitybariatrics.com

Laparoscopic Sleeve Gastrectomy (LSG)

- Restrictive only procedure
- 85% of stomach is removed & then stapled & divided vertically (not reversible)
- Pyloric valve remains intact (preserves normal stomach function while decreasing volume)
- GLP-1 also affected to help with weight loss
- Removal of fundus reduces ghrelin (hunger hormone) levels

Laparoscopic Adjustable Gastric Band





https://bariatric.stopobesityforlife.com

Laparoscopic Adjustable Gastric Band (AGB)

- Restrictive only procedure
- Band placed at top of stomach so opening is smaller; all calories eaten will be absorbed
- To maintain restriction, “fills” are required via port under the skin
- Surgery does not affect GLP-1 hormone
- Weight loss slower & less than bypass
  - May take up to 5 years to reach goal weight

Comparison of procedures

SURGERY	RYGB	LSG	AGB
Reversible?	NO	NO	YES
Mechanism	Restrictive and Malabsorptive	Restrictive	Restrictive
Risk of metabolic complications	Moderate	Low	Low
Expected weight loss	3-5 lbs/week	2-3 lbs/week	1-2 lbs/week
Lab monitoring?	YES	YES	YES

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Pre-op considerations

Pre-op considerations

- Lab testing with repletion of deficiencies prior to surgery
- Examples of meds to stop prior to surgery (may vary)
  - Oral diabetes meds, insulin may be stopped or decreased (or sliding scale)
  - Aspirin, non-steroidal anti inflammatory (NSAIDs)
  - Weight loss meds such as phentermine, GLP-1 receptor agonists (GLP-1RA): semaglutide (Ozempic®); GLP-1RA + glucose dependent insulinotropic polypeptide (GIP): tirzepatide (Mounjaro®)
  - Hormones: estrogen, contraceptives (stop 1 cycle before surgery)
  - Supplements/herbals, vitamins
  - Anticoagulants and anti-platelet agents
  - Discuss with providers or specialists what meds to continue day of surgery

Clinical Resource, *Bariatric Surgery and Medication Use. Pharmacist's Letter/Pharmacy Technician's Letter/Prescriber Insights.* June 2024. [4000662]

Pre-op diets

Very low-calorie diets

- Sugar free, clear liquid diets, keto diets
- 3-14 days on average (may depend on BMI)
- ~800-1000 calories
  - Decreases liver volume, weight loss, complication rates

Adjust medication according to any pre-op/fasting diets

- Diabetes, blood pressure med doses may need 50% reduction
- Use insulin sliding scale or decreased dose
- No NSAIDs
- Continued monitoring, including labs

Smoking cessation

- Smoking increases risk of postoperative complications
  - Pneumonia, sepsis, marginal, perforated ulcers
- Quit smoking at least 4-8 weeks prior to surgery
- No e-cigarettes, patches, gum, vaping, secondhand smoke
- Cotinine urine testing
  - Major metabolite of nicotine
  - Can detect smoking within previous 72 hours

Smoking cessation products:

- Nicotine products:
  - Patches, lozenges, gum, inhalers, nasal spray
- Varenicline, bupropion, nortriptyline
- Limited evidence: clonidine, naltrexone, topiramate

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Clinical Resource, *Smoking Cessation Drug Therapy. Pharmacist's Letter/Pharmacy Technician's Letter/Prescriber Insights.* September 2023. [390905]; Guidelines for Perioperative Care in Bariatric Surgery: Enhanced Recovery After Surgery (ERAS) Society Recommendations: A 2021 Update - PMC (nih.gov)

Pre-op weight loss

- Lack of information on guidance of pre surgery weight loss with medications
  - ~ 5% weight loss with medications at a minimum
- FDA approved anti-obesity medications can be used:
  - Phentermine, orlistat (Alli®, Xenical®), phentermine/topiramate (Qsymia®), naltrexone/bupropion (Contrave®)
  - GLP-1 RA: liraglutide (Saxenda®), semaglutide (Wegovy®)
  - GLP-1RA + GIP: tirzepatide (Zepbound®)
- Can improve post-op complications (RYGB in particular) and potentially long-term weight loss outcomes post surgery

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Ann Surg. 2019 Apr 4. Patient Behaviors and Characteristics Related to Weight Regain After Roux-en-Y Gastric Bypass: A Multicenter Prospective Cohort Study. King WC et al;

Pharmacologic management of weight regain following bariatric surgery - PMC (nih.gov); Diet approach before and after bariatric surgery - PMC (nih.gov);

Post-operative considerations

Immediate post-op period

Antiemetics

- Scopolamine (Transderm Scop®), ondansetron (Zofran®), promethazine (Phenergan®)

Pain

- Acetaminophen rectal or IV, liquid opioids

GERD

- Famotidine (Pepcid®), sucralfate (Carafate®), possibly proton pump inhibitor (PPI)
- May be worse after sleeve gastrectomy and gastric band

- Patients will be following strict liquid diet, slowly advancing to solids
- Drink at least 64 ounces of liquids daily
- Cannot eat and drink at the same time
- 60-100 grams of protein a day

Life After Bariatric Surgery - American Society for Metabolic and Bariatric Surgery (asmbs.org)

Medication considerations

- Be proactive and switch medications prior to surgery that may be a concern or continue same medications with monitoring
- Switch to liquids, crushable, dissolvable tablets, capsules that can be sprinkled on food
- Meds that are > 10 mm can get stuck
- Switch to alternative routes of administration:
  - sublingual, intransal, rectal, subcutaneous, intravenous, transdermal
- Change from extended release, delayed release, controlled or sustained release to IR (immediate release) options
  - Med may not be fully absorbed, faster gastric transit time
  - Not an issue with gastric banding
  - Avoid x 8 weeks for all bariatric surgeries
- Caution with alcohol and sugar containing products
  - Alcohol containing products contain empty calories
  - May need liquid medications for first few months
    - Avoid nonabsorbable sugars due to dumping syndrome

Medication management and pharmacokinetic changes after bariatric surgery - PMC (nih.gov); Medication Routes of Administration - StatPearls - NCBI Bookshelf (nih.gov)

Condition specific considerations

Diabetes

- Medications typically held after surgery depending on hospital course
- Can continue metformin, GLP1-RA and DPP4 inhibitors: sitagliptin (Januvia®), linagliptin (Tradjenta®) if needed or need to restart
- Do not restart hypoglycemic risk meds: sulfonylureas (glipizide, glimepiride), meglitinides: repaglinide (Prandin®), nateglinide (Starlix®)
- Adjust insulin doses as needed and according to diet

  May be able to stop insulin if < 30 units/day before surgery, or reduce dose by 50-75%

HTN

- Need for medications decreases after surgery & up to 2 years. Monitor frequently.
- ***Consider stopping diuretics due to dehydration & gout risk***
- Use ACE inhibitor (lisinopril) or angiotensin receptor blockers (losartan) in diabetes

Dyslipidemia

- Monitor lipid levels as may decrease with weight loss
- If taking meds for secondary prevention of cardiovascular events, dose should be based off previous event not current lab values

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Medication management and pharmacokinetic changes after bariatric surgery - PMC (nih.gov)
Management of Type 2 Diabetes After Bariatric Surgery | Clinical Diabetes | American Diabetes Association (diabetesjournals.org); Medical Management of the Postoperative Bariatric Surgery Patient - Endotext - NCBI Bookshelf (nih.gov)

Condition specific considerations

Depression/anxiety

- Closely monitor symptoms (may increase or decrease), but generally continue even if feeling well

Anticoagulation

- Coumadin® (warfarin) may be preferred; watch dietary changes; requirements may decrease 1st 6 months
- Can consider DOACs (direct oral anticoagulants) such as apixaban (Eliquis®) or rivaroxaban (Xarelto®) with monitoring as most likely not affected by surgery

Antiplatelet

- Watch increased GI bleed risk; if for primary prevention reassess need
- Continue at lowest dose if needed for secondary prevention (aspirin) per provider discretion
- Use PPI if needed immediately after surgery

Seizures

- Ensure well controlled prior to surgery
- Consider switch to liquid, crushable tabs or caps that can open if malabsorption procedure

Asthma, psoriasis

- May require less medication

Migraines

- Frequency may decrease, especially if onset was after obesity onset

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Medication management and pharmacokinetic changes after bariatric surgery - PMC (nih.gov)

Post-operative pain

- ***Avoid NSAIDs (ibuprofen, naproxen) due to gastric injury, ulcers, perforations and leaks. Typically contraindicated for 6 months & discouraged from use life-long.***
- Switch to immediate release pain meds or alternate routes (SQ)
- Topical NSAIDs may be safer; use with caution
- Liquid acetaminophen (Tylenol®) contains sorbitol which can cause dumping syndrome, consider rectal acetaminophen
- Tramadol may be option
- May wish to avoid routine use of gabapentinoids: gabapentin (Neurontin®), pregabalin (Lyrica®) due to potential increased sedation and respiratory depression in the obese.

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Perioperative Pain Management in Bariatric Anesthesia - PMC (nih.gov); Medication management and pharmacokinetic changes after bariatric surgery - PMC (nih.gov)

Thromboprophylaxis

- Venous thromboembolism is major cause of morbidity and mortality in post bariatric surgery
- Start within 24 hours post-op if appropriate

Options

- Fondaparinux (Arixtra®) 5 mg once daily
- Low molecular weight heparin (LMWH):
  - For BMI ≥40 kg/m^2 enoxaparin (Lovenox®) 40 mg SQ q12h
  - For BMI ≥50 kg/m^2 enoxaparin (Lovenox®) 60 mg SQ q12h
- Unfractionated heparin (not preferred)
- May need to treat 2-4 weeks post discharge if higher risk

Clinical Resource, Bariatric Surgery and Medication Use. Pharmacist's Letter/Pharmacy Technician's Letter/Prescriber Insights. June 2024. [4000662]

Contraception

Contraception

- Delay pregnancy 12-18 months
- Fertility increased after surgery
- Malabsorptive surgery (RYGB):
  - Not recommended: combined oral contraceptives, progestin-only pill
  - Recommended use: IM medroxyprogesterone, implants, levonorgestrel or copper intrauterine device
- Restrictive surgery (LSG, AGB): all methods are acceptable
- Encourage multivitamin use & monitor for deficiencies if trying to conceive

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Postoperative Osteoporosis in Subjects with Morbid Obesity Undergoing Bariatric Surgery with Gastric Bypass or Sleeve Gastrectomy - PMC (nih.gov); Summary Chart of U.S. Medical Eligibility Criteria for Contraceptive Use. (cdc.gov)

Summary of changes per disease state

GERD (gastroesophageal reflux disease)

- Many have resolution of symptoms; some may get PPI x3 months to ↓ GI complications
- Avoid meds that can cause GERD (calcium channel blockers, nitrates)

Transplant

- Stabilize medications prior
- Increased tacrolimus, mycophenolate levels after sleeve gastrectomy
- Sirolimus (Rapamune®), tacrolimus (Prograf®, Envarsus®) may be decreased with RYGB. All transplant medications may need adjusting.

HIV

- Raltegravir (Isentress®) and atazanavir (Reyataz®) may have decreased absorption with sleeve gastrectomy

Medication management and pharmacokinetic changes after bariatric surgery - PMC (nih.gov; Oral drug dosing following bariatric surgery: General concepts and specific dosing advice - PMC (nih.gov)' cdc_135298_DS1.pdf

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Specific medication information

- Watch narrow therapeutic medications, monitor as indicated:
  - Digoxin (Lanoxin®), aminoglycosides, cyclosporine (Gengraf®, Neoral®, Sandimmune®), carbamazepine (Tegretol®), lithium (Lithobid®), phenytoin (Dilantin®), rifampin (Rifadin®), theophylline (Elixophyllin®, Theo-24®), warfarin (Coumadin®, Jantoven®), valproic acid (Depakote®)
- Watch meds that need food or acidic environment for absorption
  - Ketoconazole, calcium carbonate, dabigatran (Pradaxa®), lovastatin (Mevacor®), posaconazole (Noxafil®), ziprasidone (Geodon®), cefpodoxime

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Drug absorption in bariatric surgery patients: A narrative review - PMC (nih.gov;
Medication Management after Bariatric Surgery: Providing Optimal Patient Care - PMC (nih.gov)

Decreased drug absorption

- Tamoxifen: case reports of low levels
- Antibiotics:
  - Ampicillin, amoxicillin and Amoxicillin/clavulanic acid (Augmentin®), azithromycin (Zithromax®), nitrofurantoin, fluroquinolones (ciprofloxacin (Cipro®), moxifloxacin)
- Antidepressants/anxiety meds:
  - Escitalopram (Lexapro®), sertraline (Zoloft®), venlafaxine (Effexor®), duloxetine (Cymbalta®)
- Ethosuximide (Zarontin®)
- Imatinib (Gleevec®): ↓ AUC by 45% & Cmax by 35% (sleeve surgery)
- Hydrochlorothiazide (HCTZ)
- Levothyroxine
- Methylphenidate (Ritalin®, Concerta®)
- Phenytoin (Dilantin®), phenobarbital

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Drug absorption in bariatric surgery patients: A narrative review - PMC (nih.gov); The Effects of Bariatric Surgery on Pharmacokinetics of Drugs: a Review of Current Evidence - PMC (nih.gov)

Drug absorption

- Decreased absorption with older, uncommon surgeries: HCTZ, ampicillin, phenytoin, cephalexin, ethambutol, nitrofurantoin, quinidine, sulfa, erythromycin, levonorgestrel, D-norgestrel, thyroxine
- Thyroid function may improve & ↓ TSH
- Amiodarone (Pacerone®): poorly soluble, transit time decreased
- Lamotrigine (Lamictal®), olanzapine (Zyprexa®), quetiapine (Seroquel®): follow-up recommended
- Corticosteroids (prednisone) can ↑ ulcer risk (use PPI) & weight gain
- Atorvastatin (Lipitor®) (↑ and ↓ absorption) per case reports
- Cyclosporine (Gengraf®, Neoral®, Sandimmune®): ↓ & unchanged levels per case reports
- Metformin (Glumetza®, Riomet®), penicillin V, linezolid (Zyvox®), moxifloxacin may have increased levels after surgery
- Lithium (Lithobid®) influenced by fluid & sodium intake prior to & after surgery: monitor levels and symptoms of toxicity
  - Cases of low lithium levels as well as lithium toxicity after surgery

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Drug absorption in bariatric surgery patients: A narrative review - PMC (nih.gov)' Oral drug dosing following bariatric surgery: General concepts and specific dosing advice - PMC (nih.gov)' Lithium toxicity following Roux-en-Y gastric bypass: Mini review and illustrative case - PMC (nih.gov)

Complications

Dumping syndrome

- Occurs after eating too much sugar; food moves too rapidly into small intestine
  - Avoid simple/nonabsorbable sugars: mannitol, sorbitol
  - Eat more protein, healthy fats, increase fiber, lie down after eating
- Early phase: 30-60 min after eating
  - Symptoms: nausea, diarrhea, abdominal fullness, sweating, palpitations, weakness, fatigue
- Late phase (only with RYGB): 1-3 hours after eating
  - Symptoms: hypoglycemia, sweating, shaking, hunger, fainting, loss of concentration

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Medication management and pharmacokinetic changes after bariatric surgery - PMC (nih.gov); Dumping Syndrome - StatPearls - NCBI Bookshelf (nih.gov

Nutrient deficiencies

- Monitor labs pre and post surgery
- Watch drug-nutrient interactions & timing
  - Separate doses of calcium & iron from thyroid
  - Separate doses of calcium from iron or multivitamin
- Nutrients often passively absorbed in adequate amounts w/oral use
  - Supplementation depends on surgery type
- Examples of supplement regimen (usually chewable form)
  - Multivitamin (with B1, folic acid)-for all surgery types-(RYGB may use 2 multivitamin + mineral tablets)
  - Iron 18 mg elemental daily
  - Vitamin B12 500 mcg daily
  - Vitamin D 800-1000 IU daily
  - Calcium citrate 1200-2000 mg daily (No more than 500 mg in one dose)
  - Other supplements if needed (zinc, selenium, copper)

Nutritional Recommendations for Adult Bariatric Surgery Patients: Clinical Practice - PMC (nih.gov); Clinical Practice Guidelines For The Perioperative Nutrition, Metabolic, and Nonsurgical Support of Patients Undergoing Bariatric Procedures – 2019 Update: Cosponsored By American Association of Clinical Endocrinologists/American College of Endocrinology, The Obesity Society, American Society For Metabolic & Bariatric Surgery, Obesity Medicine Association, and American Society of Anesthesiologists (endocrinepractice.org)

Gallstones

- Rapid or excessive weight loss can be associated with gallstones
  - Weight loss alters the amounts of cholesterol and bile acids and can prevent gall bladder from emptying appropriately
- Watch medications that are associated with gallstones:
  - Gemfibrozil (Lopid®), octreotide (Sandostatin®), estrogen containing birth control
- Ursodeoxycholic acid (Ursodiol®) 300 mg bid x6 months can be used to prevent gallstones
  - Decreased cholesterol production & dissolves cholesterol in bile to prevent stone formation

Excess Body Weight and Gallstone Disease - PMC (nih.gov)

Postoperative osteoporosis

Osteopenia/osteoporosis

- Obese patients have low levels of vitamin D
- BMD (bone mineral density) starts to decrease after 1 year
- RYGB is biggest risk surgery for vitamin D/calcium deficiencies
  - RYGB can reduce BMD and has higher fracture risk than LSG

Treatment:

- Need adequate vitamin D in order to absorb calcium
  - Vitamin D3 at least 3000-6000 units/day up to 50,000 units 1-3 times weekly
  - Calcium citrate 1200-1500 mg/day
- Oral bisphosphonates such as alendronate (Fosamax®) can increase ulcer risk
- Use injections such as zoledronic acid (Reclast®) if oral medications not appropriate

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Clinical Practice Guidelines For The Perioperative Nutrition, Metabolic, and Nonsurgical Support of Patients Undergoing Bariatric Procedures – 2019 Update: Cosponsored By American Association of Clinical Endocrinologists/American College of Endocrinology, The Obesity Society, American Society For Metabolic & Bariatric Surgery, Obesity Medicine Association, and American Society of Anesthesiologists* - Endocrine Practice; Postoperative Osteoporosis in Subjects with Morbid Obesity Undergoing Bariatric Surgery with Gastric Bypass or Sleeve Gastrectomy - PMC (nih.gov)

Ulcers

Contributing factors

- Pouch size (larger=more acid), staple line
- Smoking
  - Mucosal cell death, decreased blood flow in GI mucosa
  - No smoking for at least 6 weeks

NSAID use

- Avoid when possible
- Use PPI if need aspirin or short-term NSAID use

Alcohol

- Some studies show not linked to higher risk

Treatment:

- PPIs +/- sucralfate (Carafate®), H2 blockers (Pepcid®), surgery
- Dose, duration and appropriate medication regimen may vary

Marginal Ulcers after Roux-en-Y Gastric Bypass: Etiology, Diagnosis, and Management - PMC (nih.gov)

Weight regain after surgery

- Some may not experience adequate post surgical weight loss
  - Adherence, diet, post-op complications
- May begin 1-2 years after surgery
- Varying degrees of weight regain; may depend on surgery type
- Weight loss plateau can occur 8-10 years after surgery
- FDA approved anti-obesity medications can be used:
  - Phentermine, orlistat (Alli®, Xenical®); phentermine/topiramate (Qsymia®), naltrexone/bupropion (Contrave®)
  - GLP-1RA: liraglutide (Saxenda®), Semaglutide (Wegovy®);
  - GLP-1RA + glucose dependent insulinotropic polypeptide (GIP): tirzepatide (Zepbound®)
- No official guidelines on pre or post-op medication use. Consider co-morbidities, side effect profile, cost, patient preference.

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Pharmacologic management of weight regain following bariatric surgery - PMC (nih.gov); https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9868802

Comparison of expected weight loss

Choice of intervention should be based on risk vs benefit and patient characteristics

- RYGB: up to 80%
- Vertical sleeve gastrectomy: up to 60%
- Adjustable gastric band: 15%
- Semaglutide (Wegovy®): 12-15%
- Tirzepatide (Mounjaro®): 20-25%

Optum

Pharmacologic management of weight regain following bariatric surgery - PMC (nih.gov); Weight and Metabolic Outcomes 12 Years after Gastric Bypass | New England Journal of Medicine (nejm.org);
What Is Best for Weight Loss? A Comparative Review of the Safety and Efficacy of Bariatric Surgery Versus Glucagon-Like Peptide-1 Analogue - PMC (nih.gov)

Expectations

- Weight loss: RYGB > sleeve > adjusted gastric band
  - RYGB up to 60% of excess weight lost at 6 months, 77% at 12 months
- Patients maintain 50% of lost weight at 5 years
- Medication expectations: stop or reduce doses
- Mortality reduction:
  - Overall mortality reduction, cancer, coronary artery disease, diabetes
  - New study suggested those w/DM ≤ 10 years who had surgery, had 62% lower risk for mortality than those using GLP-1RA
- Disease improvement or resolution:
  - Diabetes 51% remission; those with heart disease had risk cut in half at 8 years; hypertension 46.9% remission; 32% reduction in developing cancer

MBSFactSheet2024.pdf (asmbs.org)

Long term outcomes of metabolic/bariatric surgery in adults | The BMJ

Bariatric Surgery for Type 2 Diabetes Reversal: The Risks | Diabetes Care | American Diabetes Association (diabetesjournals.org) Bariatric Surgery Beats GLP-1 RAs in Reducing Mortality Risk (medscape.com)

Life-long journey

- Continue annual follow-up with physical, vital signs, lab monitoring
- Adherence to vitamin supplementation
- Avoid NSAIDs
- Caution with alcohol use
- Continued smoking cessation
- Monitor weight to intervene prior to weight plateau or regain
  - Discuss use of anti-obesity medications
- Periodic medication reviews
  - Review any new medications for weight gain potential
    - Sulfonylureas, antipsychotics, hormones/contraception, insulin