2025

Bariatric Surgery
Annual PCP Education

Presented by Emily Zeszutek AGACNP-BC

DENVER HEALTH
est. 1860
FOR LIFE'S JOURNEY

PURPOSE

- **Educate our primary care partners on follow-up care of the Bariatric Surgery patient.**

- **We will cover the topics of complications, lab monitoring recommendations, and the documentation of resolved co-morbidities.**

- **Long-term care of bariatric patients is managed by PCPs, however our team will follow patients <1 year from surgery and as needed after 1 year for bariatric surgery specific concerns/complications.**

WHY BARIATRIC SURGERY?

Obesity is a worldwide epidemic: Approximately 112,000 deaths/year are related to obesity in the US alone.

The combined direct and indirect costs of obesity were estimated to be $139 billion in 2009, roughly 5% of the US national health expenditure.

Bariatric surgery has been established as the most effective and durable treatment for morbid obesity.

BARIATRIC SURGERY AT DENVER HEALTH

We offer patients two surgical weight loss options- Roux en Y Gastric Bypass (RNYGB) or Vertical Sleeve Gastrectomy (VSG).

Must meet criteria as established within our program:

- BMI >40, with no co-morbidities
- BMI 35-39.9 with objective measurements documenting one or more of the following comorbid conditions: severe cardiac disease, DM2, OSA or other respiratory disease, pseudo-tumor cerebri, HTN, HLD, severe joint or disc disease that interferes with daily functioning, intertriginous soft-tissue infections, nonalcoholic steatohepatitis, stress urinary incontinence, recurrent or persistent venous stasis disease, significant impairment in Activities of Daily Living.

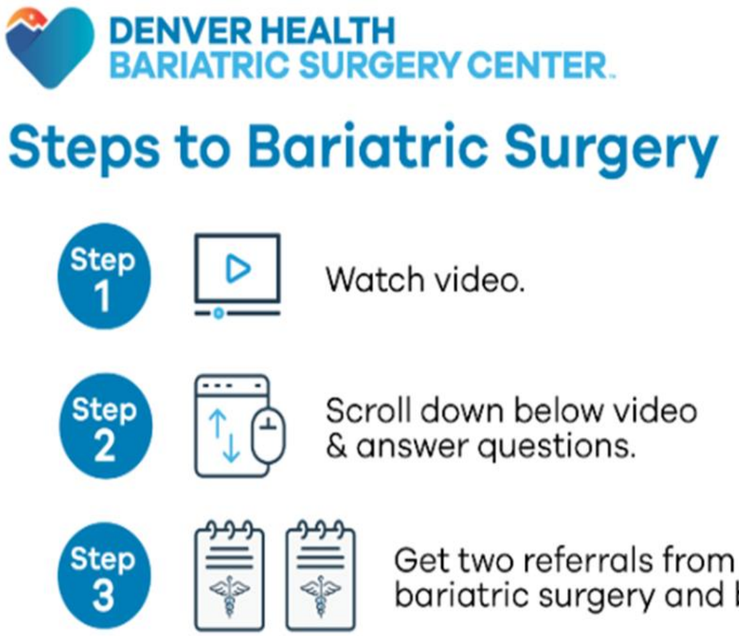
Additional requirements:

- Sobriety of one year, if history of substance abuse or problematic use of substances including ETOH.
- Stability of mental health disorders with no psychiatric hospitalizations within one year.

We are now accepting patients with:

- CKD and ESRD requiring HD
- Liver disease and compensated cirrhosis with MELD scores of 8-12

BARIATRIC SURGERY AT DENVER HEALTH



As a program, our dietitians, psychologists, and APPs follow our patients after surgery up until they have reached the milestone of one year postop.

Patients are seen at one week, one month, three-month, six month and one year postoperatively (+ PRN).

APPs routinely send PCPs sign out letters, detailing labs to be drawn annually after patient's one year visit.

Patients are educated and encouraged to follow with our team at any time, for life, as needed.

Bariatric Surgery | Weight Loss Surgery |Denver Health | Denver Health

INSURANCE WE ACCEPT

Cigna
Blue Cross Blue Shield
Anthem
United

CICP: Needs to live in Denver County, have CICP of DH, have documented history of two years of qualifying BMI.

Medicaid: Needs two years of qualifying BMIs documented in medical records.

Medicare: Needs five years of qualifying BMIs documented in medical records.

Private Pay: we assess to make sure they have bariatric coverage under their plan.

We do allow patients the option to self-pay for surgery.
Self Pay | Denver Health

PATHWAY THROUGH THE PROGRAM

Surgeon Clinic

Brief meeting with our surgeons
to determine candidacy for
surgery, review of comorbidities.

Psychological evaluation

Two psychological evaluations by
our psychologist.

Informational video

Patient to watch informational
video on Denver Health website.

Dietician visits

1:1 nutrition classes held by our
RDs; must pass a test with
required nutritional knowledge
prior to surgery.
Medicaid requires six months of
classes for approval.

PATHWAY THROUGH THE PROGRAM

Pre-Op visit with APP

Surgical evaluation, physical exam and surgery date scheduled.

Surgery

Patients generally discharge on POD1 as long as they are meeting protocol goals.

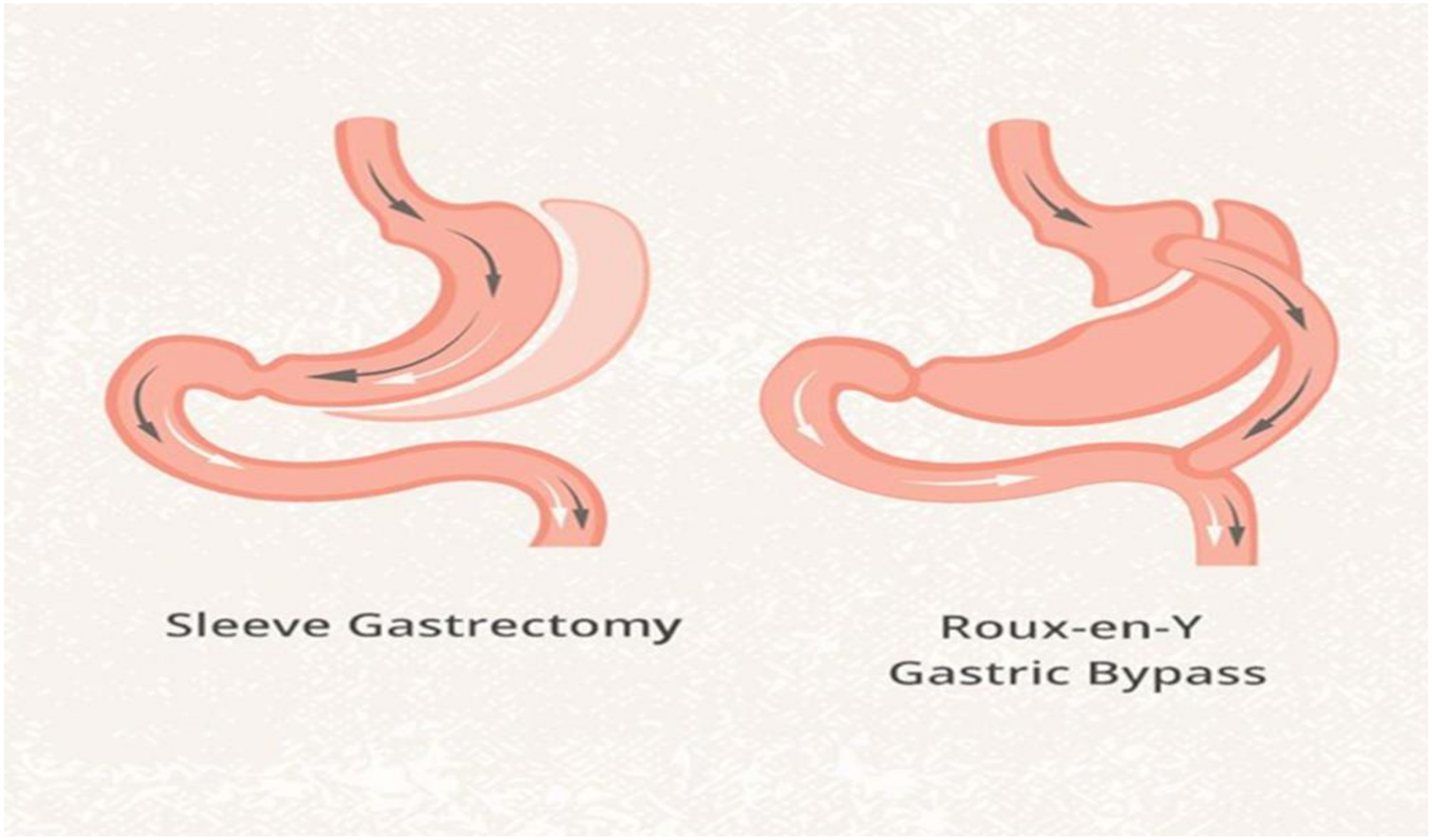
APP + RD visits

Follow up visits with our team at one week, one month, two months (RD), three months, six months and one year.

One-year postop

After one year post-op, patients schedule annual PCP visits for lab screening. PCPs may refer patients back at any time to bariatric clinic as needed.

TYPES OF SURGERY & MECHANISM OF ACTION



Removal of 70-80% of the stomach.

Mechanism of action: restrictive, decreases ghrelin.

Estimated weight loss: 45-55% of excess body weight.

Creation of 30mL gastric pouch, BP limb 25-60cm, Roux limb 100-150cm

Mechanism of action: restrictive, malabsorptive.

Estimated weight loss: 60-75% of excess body weight.

BARIATRIC ERAS POSTOP PROTOCOLS

Post-Op Day 0

- Start Sugar Free Clear Liquids in PACU (1 oz per 30 min for first 4 hours, then 1 oz per 15 min if tolerating). Pt to be made NPO if not tolerating CL diet.
- Mobilize patient to chair/walk at least once
- IVF 150mL D5 ½ NS w 20Meq KCL. IVF reduced to 75mL/hr once tolerating CL diet.

Standards of Care

- IS use teaching/enforcement, SQ Lovenox and Teaching
- No Straws
- Okay to give whole pills (begin PO meds POD 0 if tolerating diet)
- Pain control: IV Ketorolac 15 mg Q6 hr scheduled (No Ibuprofen/NSAIDs at home), Tylenol 1000mg POD Q6 scheduled, oxycodone 5mg Q4 PRN, Flexeril 5mg Q8 PRN, lidocaine patch to right abdomen POD 0 (applied on the floor), omeprazole 40mg IV daily starting POD 0.
- Abdominal binder
- On CPAP POD0

Post-Op Day #1
(majority of patients should D/C POD1)

- Bariatric sugar free clear liquid diet
- 4 oz liquid/hour (strict max od 6 oz per hour)
- Ambulate patient 4-5x per day
- D/C IV pain meds: give oral pain meds (may happen on POD)
- Wean O2, document any desats
- Discharge patient home when patient able to meet goals: tolerating clear liquids 4 oz/hr x 6 hours (total of 24 oz/720 mL), pain control, weaned O2. Discharged on clears will advance themselves to puree the next day.

Standards of Care

- IS use teaching/enforcement
- SQ Lovenox and Teaching
- No Straws
- No Ibuprofen/NSAIDs (exception: IV ketorolac while inpatient)
- Abdominal binder
- On CPAP

PROTOCOL UPDATES- MARCH 2023

Patients no longer are prescribed urosodil.

Ketorolac and celecoxib are given in preoperative holding.

We no longer require patients to crush medications- whole pills can be swallowed.

Oral NSAIDs are not recommended ever, postoperatively.

POSTOP CARE AFTER DISCHARGE

Pain: Patients are discharged with Tylenol, Lidocaine patches, Flexeril and Oxycodone.

Patients receive ABX intraoperatively and do not routinely discharge with ABX.

Patients discharge with 90 day supply of omeprazole 40mg capsules, that they open and sprinkle into food or liquids.

Patients discharge with 30 day course of Lovenox injections BID for VTE prophylaxis.

Nausea and vomiting is common as patients learn their new limits; they do not routinely discharge with antiemetics.

Hematemesis/hematochezia can occur in immediate postop period typically due to intraoperative blood loss and use of anticoagulation for VTE prophylaxis. It is usually self-limiting and rarely requires inpatient management or transfusion.

BARIATRIC SURGERY COMPLICATIONS

EARLY

Anastomotic leak, GIB, Bowel injury, DVRT, PE, wound infection, Pneumonia, MI (less 3 months)

Will be managed primarily by surgery team

LATE

Nutritional deficiencies, stricture, marginal ulcer, bowel obstruction, incisional hernia, internal hernia, dumping syndrome, cholecystitis

Occurrences after 3 months will likely be managed in partnership with PCP & surgery team.

VITAMIN DEFICIENCIES

Vitamin and mineral supplements must be taken DAILY, FOR LIFE after surgery.

Recommend bariatric formulated.

Vitamin/Mineral	Recommended Dosage
Iron	45-60 mg/day
Folic Acid	400-800 mcg/day
Vitamin B12	350-500 mcg/day
Thiamin or Vitamin B1	12 mg/day *minimum*
Copper	1 mg/day
Zinc	8-11 mg/day

Common causes of deficiencies include eating smaller amounts of food, poor absorption, not taking vitamin and mineral supplements as instructed or alcohol abuse.

Examples of Complete Bariatric Multivitamins with Iron

- Shiny Leaf Bariatric MVI with iron
- Bariatric Advantage Ultra Solo
- Bariatric Fusion MVI w/ 45 mg iron
- Procare Health MVI w/ Iron
- Celebrate Multi-Complete 45
- BariSlim Advanced Once Daily MVI w/ 45 mg iron
- BariatricPal MVI ONE w/ 45 mg iron

- You may take all vitamin and mineral supplements whole, as tolerated after surgery.
- If you have difficulty swallowing supplements whole, you should take a **chewable** form, or **crushed** in a puree or liquid (ex. sugar-free applesauce, sugar-free Jello®, or yogurt).
- **DO NOT** take gummy vitamins! They have extra calories, sugar and do not contain enough of the vitamins & minerals you need.
- **DO NOT** use vitamin patches in place of daily supplements. They are not as well absorbed.

COMPLICATION: LAB DEFICIENCIES

Bariatric surgery success is largely dependent on nutritional management in pre and postoperative phases.

Vitamin B complexes along with iron, calcium and vitamin D are commonly deficient after RNYGB.

Our team checks labs at our preop visit with APPs, then again at **three months, six months and one-year postoperative milestones.**

VITAMIN B COMPLEXES

Very important to identify early

Bariatric Beriberi- deficiency of thiamine (vitamin B1), precedes more severe deficiencies: **Wernicke's encephalopathy, Korsakoff's syndrome and Wernicke-Korsakoff syndrome**

- Highest prevalence is within the first three months following bariatric surgery
- Early postop factors leading to thiamine deficiency include nausea, food intolerance and decreased oral intake with vomiting and constipation

Serum thiamine responds to dietary supplementation but poorly reflects total body stores.

-the best single test to assess whole body thiamin is **whole blood (or RBC) thiamine**

Amnestic and gait disorders resulting from severe beriberi are seen to be **irreversible in over 50% of patients.**

If suspected get urgent CTH

- CNS damage may even lead to coma from delayed treatment

TREATMENT OF VITAMIN B COMPLEXES

Subclinical cases with high suspicion of thiamine deficiency can be treated with **100mg oral thiamine daily until symptom resolution.**
Preoperative patients with marginal thiamine level can be given **100mg oral thiamine twice daily until levels are normalized.**

For prevention postoperatively, standard bariatric MVI are sufficient.
When recurrent vomiting is experienced postoperatively, **oral thiamine 100mg twice daily for one month is needed.**

IRON

The most common nutritional deficiency- found in up to 18% of preoperative patients

Caused by dissociation of the duodenum from chyme, food intolerance of red meat, decreased gastric acid and anemia of chronic disease are contributing factors

Symptoms are non-pathognomic in nature: anemia, fatigue, irritability, pallor, brittle nails, restless leg syndrome

Screening: serum ferritin, serum iron and total iron binding capacity (TIBC).

Ferritin is elevated with active disease or inflammation, excluding common cold

Considered a **long-term complication** from obesity surgery, appearing in 20-49% of patients

Two-year postop prevalence is 17% after VSG, 30% after RNYGB

Five-year postop prevalence is 45%

TREATMENT OF IRON DEFICIENCY

Type of supplement depends on the severity and the required speed of improvement

Parenteral iron administration is recommended for rapid **responses- 1000mg, then 500mg** up to the calculated dose weekly

We do not order iron infusions- requires coordination with patient's PCP

Due to dissociation of the duodenum from bypass surgery, oral iron is likely to be relatively ineffective, and may be associated with abdominal pain, nausea and diarrhea

Postoperatively recommend **complete multivitamins with 36mg of ferrous sulfate.**

Oral contraceptives can reduce blood loss in menstruating women and may be a helpful adjunct in treatment

Serum iron and TIBC should be screened at <u>6 months</u> postoperatively, then annually.

CALCIUM

The incidence of both pre and postoperative calcium deficiency is 10%. Postoperative anatomical changes- the bypass of the duodenum, the relatively short common channel in distal RNYGB and decreased mixing of bile salts- can lead to malabsorption of calcium and vitamin D.

Acute hypocalcemia: paresthesia of the limbs and oral cavity, progressing to tetany, cardiac arrhythmia.

Long term deficiency presents with increased risk for bone fractures and osteoporosis from low bone density.

Hypoalbuminemia may simulate hypocalcemia because of the high affinity between albumin and calcium.

TREATMENT OF CALCIUM DEFICIENCIES

Calcium supplementations with calcium citrate can be up to **2000mg daily**
Calcium carbonate has shown to absorb poorly in low acid environments (RNYGB).

Oral calcium is known to hinder intestinal absorption of copper, iron and zinc

Patients are educated and should be reminded of proper PO administration of calcium- waiting 2 hours between MVI + iron and calcium intake.

VITAMIN D

Sun exposure on human skin produces vitamin D3 and supplies 90% of vitamin D.

Paramount in calcium and bone metabolism, regulating parathyroid hormone functions.

Pre and postoperative vitamin D deficiencies appear in 68-80% of patients. Reasons remain unknown but may be attributed to various factors in dietary intake, season of the year and socioeconomic status.

Deficiency of vitamin D will lead to decreased calcium absorption.

Symptoms: osteomalacia, osteoporosis, arthralgia, myalgia, fasciculation and depression

TREATMENT: VITAMIN D

Mild deficiency: **5000IU of D3 daily**
Severe deficiency: **50,000-150,000 IU of D3 daily**
-may also use 50,000IU of D2 1-3 times weekly orally

-these levels should be monitored and repeatedly checked every three months in the first year postop

Vitamin D3 is recommended as a more potent treatment than vitamin D2 when comparing frequency and amount needed for repletion.

Denver Health Bariatric Team Lab Monitoring Protocol

3 Months	6 Months
▪ HbA1c ▪ Vitamin D 25 hydroxy ▪ Ferritin ▪ Prealbumin ▪ Vitamin B12 ▪ Calcium ▪ Iron ▪ Thiamine (whole blood) ▪ Folate ▪ Copper (serum or ceruloplasmin) ▪ Zinc	▪ HbA1c ▪ Vitamin D 25 hydroxy ▪ Ferritin ▪ Prealbumin ▪ Vitamin B12 ▪ Calcium ▪ Iron ▪ Thiamine (whole blood) ▪ Folate ▪ If indicated: - Copper (serum or ceruloplasmin) - Zinc - Folate

1 Year	**Annual** PCP Monitoring
▪ CBC ▪ BMP ▪ Hepatic function panel ▪ HbA1c ▪ Vitamin D 25 hydroxy ▪ Ferritin ▪ Prealbumin ▪ Vitamin B12 ▪ Calcium ▪ Iron ▪ Thiamin (whole blood) ▪ Vitamin A ▪ If indicated: - Copper (serum or ceruloplasmin) - Zinc - Folate	▪ CBC ▪ BMP ▪ Hepatic function panel ▪ HbA1c ▪ Vitamin D 25 hydroxy ▪ Ferritin ▪ Prealbumin ▪ Vitamin B12 ▪ Calcium ▪ Iron ▪ Thiamin (whole blood) ▪ Vitamin A ▪ If indicated: - Copper (serum or ceruloplasmin) - Zinc - Folate

MAJOR POSTOPERATIVE COMPLICATIONS:

Anastomotic structure
Marginal ulcer
Bowel obstruction
Incisional hernia
Internal hernia
Dumping syndrome and nutritional deficiencies
Cholecystitis

ANASTOMOTIC STRICTURE

Incidence: 3-7% after RNY and typically develop one month after surgery.

Usually occurs at the GJ anastomosis. Considered clinically significant if endoscope cannot pass through or stoma is less than 10mm in diameter.

Risk factors: local ischemia, gastric acid hypersecretion (large pouch size), chronic ulcers (NSAIDs, smoking), subclinical anastomotic leaks, suture material, surgical technique

Presentation: epigastric pain, post-prandial regurgitation emesis of partially digested food, progressive inability to tolerate food.

Work-up: EGD

Treatment: Endoscopic balloon dilation, may requires subsequent dilations for severe strictures.

MARGINAL ULCER

Incidence: >1-16% after RNY and typically develop three months after surgery.

Usually occurs at the GJ anastomosis.

Risk factors: smoking, NSAID use, *Helicobacter pylori* infection, inappropriate surgical anatomy or foreign body reaction to suture or staples.

Presentation: Dyspepsia, dysphagia, retrosternal or epigastric pain, vomiting.

Work-up: EGD

Treatment: PPI (open & sprinkle capsule contents into liquids or onto food) and Carafate for 3 months, H pylori treatment, stop smoking and NSAID use.

Ulcers refractory to medical management may require surgical excision and revision.

BOWEL OBSTRUCTION

Incidence: 1.5-5% after bariatric surgery.

Adhesions or internal hernia.

Presentation: Pain, decreased bowel function, nausea and vomiting.

Imaging: CT scan

Treatment: SBO: Bowel rest, Internal hernia: Surgery

INCISIONAL HERNIA

Incidence: 6% after Bariatric surgery and typically is a late complication (2 years)

Presentation: Bulge, pain, bowel obstruction depending on contents.

Work-up: CT scan

Treatment: Surgery

DUMPING SYNDROME

Incidence: 75% of patients if diet is not followed.

Presentation: abdominal pain, nausea, vasomotor problems, refusal to eat and drowsiness, bloating, diarrhea; ~30-60 min after eating.

Sudden arrival of excessively concentrated nutrient solution into the small bowel→ Results in increased intestinal blood flow and reduced peripheral blood volume.

Treatment: lifestyle and diet changes (Can consider medications or surgical revision if symptoms are persistent despite diet changes)

HEPATO-BILIARY COMPLICATIONS

Incidence: 3-30% risk of gallstone formation (Similar to general population).

Presentation: epigastric and or right upper quadrant pain after meals, nausea.

Imaging: RUQ US

Treatment: Cholecystectomy

Choledocholithiasis does not change treatment and can be managed with:

Lap chole with trans-cystic common bile duct exploration

Lap chole with laparoscopic-assisted ERCP via a gastric remnant gastrotomy

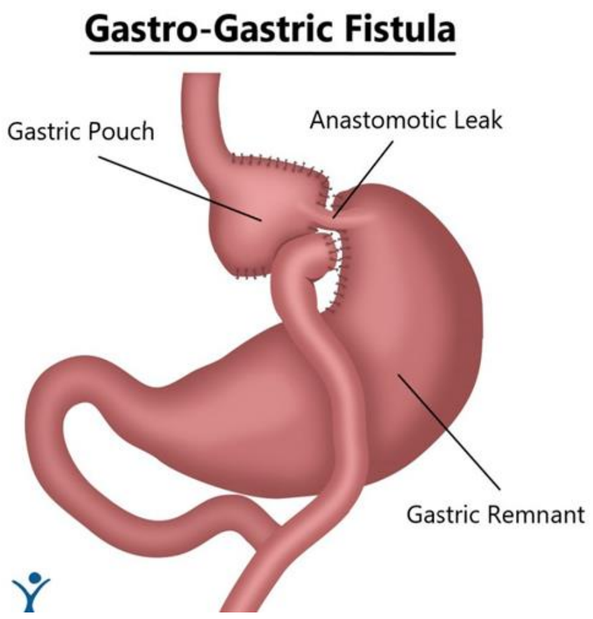
GASTRO-GASTRIC FISTULA

Incidence: 1-3%

Presentation: weight regain, recurrent marginal ulcers, strictures, GI Bleeds, new onset GERD, vague abdominal pain

Work-up: UGI, CT with PO contrast, EGD

Treatment: surgical revision



RESOLUTION OF COMORBIDITIES

Diabetes: Five-year randomized (NEJM, 2017) clinical trial showed metabolic/bariatric surgery and intensive medical therapy was more effective than intensive medical therapy alone in decreasing or resolving diabetes.

51% of individuals with a BMI 30 to 39.9 who had metabolic/bariatric surgery experienced remission.

Heart Disease: Journal of the American Heart Association study (2017) found that individuals who had surgery are at nearly half the risk of developing a severe cardiovascular event eight years after surgery compared with similar patients who did not have surgery.

High Blood Pressure: Randomized clinical trial (Journal of the American College of Cardiology, 2024) found metabolic/bariatric surgery is better at controlling hypertension than medication alone in people with obesity.

Surgical patients had an 80.7% reduction in how many medications they were using, while those who had received medication only had a 13.7% reduction. Nearly half (46.9%) of the surgical patients had complete remission and no longer required any medication.

Cancer: Clinical study (JAMA, 2022) finds metabolic/bariatric surgery significantly lowers incidence of obesity associated cancer and cancer-related mortality -- a 32% lower risk of developing cancer and a 48% lower risk of cancer-related death compared with adults who did not have the surgery.

DOCUMENTATION FOR PCPs

Annual bariatric patient documentation from PCP visits should include the following:

Current weight
Comorbidities (presence or resolution)
Labs (table below)

Ok to be seen via telemedicine/telehealth for follow-up

At least one comorbidity needs to be addressed, and weight needs to be captured.

Annual PCP Monitoring
▪ CBC ▪ BMP ▪ Hepatic function panel ▪ HbA1c ▪ Vitamin D 25 hydroxy ▪ Ferritin ▪ Prealbumin ▪ Vitamin B12 ▪ Calcium ▪ Iron ▪ Thiamin (whole blood) ▪ Vitamin A ▪ If indicated: - Copper (serum or ceruloplasmin) - Zinc - Folate

WEIGHT LOSS MEDICATIONS

Anti-obesity medications (AOMs)
are safe for patients in pre and postoperative periods,
all resulting in improved outcomes, per most recent studies.
Most commonly prescribed medications include Semaglutide, Tirzepatide, Liraglutide, Phentermine, Topiramate and Naltrexone-bupropion.

Bariatric Team does **not** prescribe or manage AOMs, defer to PCP.
GLP1s/GIP must be held one-to-two weeks prior to surgery due to aspiration risk with general anesthesia. Our team will inform patients of last dose date at preoperative visit.

It is safe to start/resume AOMs as early as one month postoperatively.
Literature shows that **early intervention** with AOMs is most effective- start at weight plateau rather than waiting for weight re-gain.

Denver Health Bariatric Team

Surgeons

Alex Morton, MD
ector of Bariatric Surgery

Fredric Pieracci, MD, PMH
Director of Surgery

Sany Thomas, MD
Director of Adolescent
Bariatric Surgery

Pediatricians

Kathy Love-Osborne,
Pediatrician MD

Carina Kugelmas,
Pediatrician MD

Advanced Practice Providers and Registered Nurse

Mollie Nardecchia, PA-C

Emily Zeszutek, AGACNP, CCRN

Erin Berry, RN

Psychologists

Alison Lieberman, PhD

Nergis Akkaya, PhD

Katherine Washington PhD
Adolescent Psychology

Dietitians

Tara Gray, RD

Tammy Vigil, RD
Lead Bariatric Dietician

Michelle Darr ,RD

Administrative and Research Support

Desiree Rivera
Administrative Support

CONTACT INFO FOR APPs

Mollie Nardecchia PA-C
Mollie.Nardecchia@dhha.org
303-602-1266

Emily Zeszutek AGACNP-BC
Emily.Zeszutek@dhha.org
303-602-6224

We are also available Monday-Friday via EPIC Secure Chat or In Basket messages for immediate questions/concerns.

DENVER HEALTH
BARIATRIC SURGERY CENTER™

Get in touch with us

777 Bannock St.
Denver, CO 80204
Phone: 303-602-6232
Email: bariatric.surgery@dhha.org
www.denverhealth.org/services/bariatric
fax: 303-602-6234