Obesity and Weight Loss Surgery for the Primary Care Physician

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Educational Objectives

By completing this educational activity, the participant should be better able to:

1. Identify patients who are good candidates for bariatric surgery and what premorbid conditions are exacerbated by obesity and improved with surgery.
2. Decide what preoperative evaluation and/or interventions are needed before patients are scheduled for surgery.
3. Review bariatric procedures, including what is being done and how well it works.
4. Discuss postoperative care of the bariatric patient, including issues such as vitamin malabsorption, chronic need for vitamin supplements, issues with postoperative pill size, not drinking liquids with meals, and what foods can be problematic.

Speakers Disclosure

Dr. Basa disclosed that she has no financial relationships with any ineligible organizations or commercial interests.

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Disclosure

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Objectives

- Identify Ideal candidates for Bariatric surgery
- Obesity Comorbidities and Resolution/Remission after Bariatric Surgery
- Preoperative Work up
- Bariatric Procedure Review
- Postoperative Care for the patient
  - Ways to Prevent Weight Regain

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Bariatric Surgery Candidates

Who is a good candidate?

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Bariatric Surgical Candidates

- BMI over 40
- BMI over 35 with at least one obesity related comorbidity
  - Most approved hypertension , sleep apnea, or diabetes
- Understanding of Good nutrition
- Tried healthy diets in the past
- Willing to make Lifestyle changes
- Understands Surgery is **NOT** a quick fix
- Needs a tool to help them lose weight and keep it off

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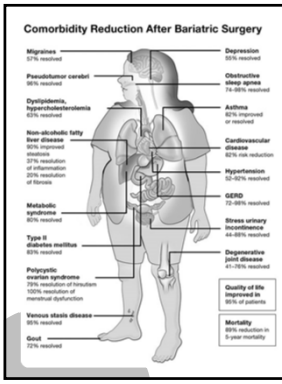

Comorbidity Resolution

2021 Data- ASMBS Fact Sheet

Condition/Disease	Remission Rate
Type 2 Diabetes	92%
Hypertension	75%
Obstructive Sleep Apnea	96%
Dyslipidemia	76%
Cardiovascular Disease	58%

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Bariatric Surgery Effectiveness

- Patients lose on average 60% of excess weight
  - as early as 6 months after surgery
- 77% of excess weight loss at 12 months after surgery

ASMBS total bariatric procedures from BOLD/ACS/MBSAQIP

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Long-term Weight Loss Surgery vs. Medical Weight Loss

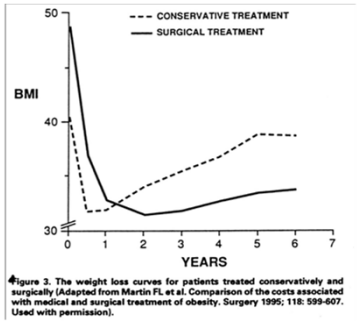

Figure 3. The weight loss curves for patients treated conservatively and surgically (Adapted from Martin FL et al. Comparison of the costs associated with medical and surgical treatment of obesity. Surgery 1995; 118: 599-607. Used with permission).

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Why is it so HARD to lose weight non-surgically and keep it off?

SET POINT

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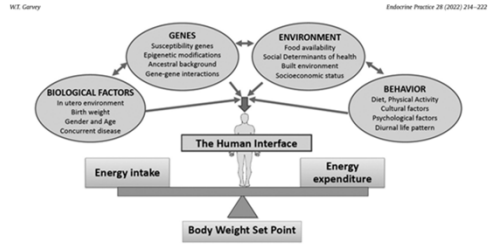
Body's Set Point



Garvey, *Endocrine Practice* 28 (2022) 214-222

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Regulation of Setpoint

Garvey, *Endocrine Practice* 28 (2022) 214-222

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Weight Loss Effect on Set Point

Metabolic Adaptation

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Metabolic Adaptation

- Reduction in **basal metabolic rate** seen in individuals who are losing or who have lost weight not explained by lost tissue
- Causes **plateau of weight loss** and difficulty in maintaining weight loss
- Metabolic Adaptation can **persist** despite weight regain

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Metabolic Adaptation After Weight Loss and Regain

- In Biggest Loser Contestants (BLC)
  - RMR at baseline was 2607 kcal/d
  - RMR 1996 kcal/d at the end of the 30-week competition
    - (approx. 600 kcal/d less)
- Despite **weight regain** 6 years later
  - RMR was 704 kcal/d below baseline
- **Metabolic Adaption** was **-275 kcal/d** at the end of the competition and **-499 kcal/d** after 6 years

Persistent metabolic adaptation 6 years after the Biggest Loser Competition, *Obesity*. 2016 August;24(8): 1612-1619

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Metabolic Adaptation after RYGB Surgery vs. Biggest Loser Competition

- Study population: Roux en Y Gastric Bypass (RYGB) patients vs. Biggest Loser Competition (BLC) contestants
- BLC lost weight faster than RYGB patients
  - **similar weight loss** at 7 months vs. 12 months respectively-
    - lost 30% of initial starting weight
- RYGB patients **lost more Fat Free Mass (FFM)** than BLC
  - 30% in RYGB patients vs. 16% in BLC participants

Metabolic adaptation following massive weight loss is related to the degree of energy imbalance and changes in circulating Leptin, Knuth et al. *Obesity*. 2014 December; 22(12): 2563-2569

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Metabolic Adaptation after RYGB Surgery vs. Biggest Loser Competition

- RMR was reduced by over 600 kcal/d in BLC and 300 kcal/d at 6 months in RYGB group
  - metabolic adaptation
- RYGB **metabolic adaptation** normalized at **12 months** post RYGB despite continued weight loss
- BLC **metabolic adaptation** did **not normalize after 6 years**
  - Patients who had best weight loss after 6 years
    - Most **metabolic adaptation**

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Hormonal Changes Between Groups

- Decrease in **Leptin** was 80% lower in the BLC group compared to RYGB group despite similar fat mass
  - Leptin produced by fat cells
    - Suppresses appetite in the hypothalamus
    - Burns fat in adipose tissue
- Triiodothyronine (T3) was significantly decreased in BLC than RYGB patients, however it did not significantly affect metabolic adaptation

Metabolic adaptation following massive weight loss is related to the degree of energy imbalance and changes in circulating Leptin, Knuth et al. *Obesity*. 2014 December; 22(12): 2563-2569

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RMR Post Bariatric Surgery

- Post bariatric surgery patients in comparison to non-operated controls at 1,2, and 5-years post RYGB
  - Higher mass of metabolic trunk organs
  - Less Skeletal Muscle
- Accounts for Higher RMR post surgery compared to non-operated controls

Resting Energy Expenditure and Organ-Tissue Body Composition 5 years after Bariatric Surgery, Heshka et al., *Obesity Surgery* 2020, 30:587-594

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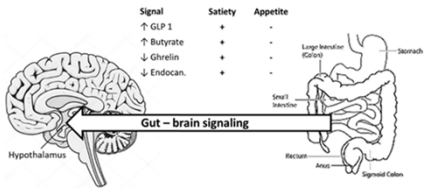
Bariatric Surgery Effects on Appetite Hormones



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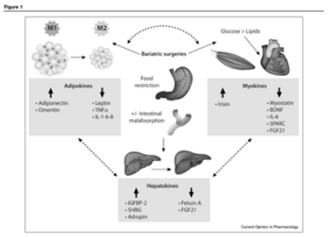
Metabolic Adaptations After Bariatric Surgery: Adipokines, Myokines, and Hepatokines

Faramia et al. *Current opinion in Pharmacology* 2020, 52:67-74



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Bariatric Surgery Effectiveness

- Decreased Ghrelin
- Increased GLP-1
- Changed Gut Microbiota
- Reduced Circulating Endocannabinoids
- Increased Butyrate Synthesis

K. Clement, Bariatric Surgery, adipose tissue and gut microbiota, *Int J. Obes. (Lond.)* 35 (Suppl3)2011:S7-S15
H.V. Lin et al. Butyrate and propionate protect against diet-induced obesity and regulate gut hormones via free fatty receptor 3-independent mechanisms, *PLoS one* 7 (4) (2012) 35240
T.C. Kirkham, S.A. Tucci, Endocannabinoids in appetite control and the treatment of obesity, *CNS Neurol. Disord. Drug Targets* 5 (3) (2006) 272-292

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Preoperative Workup

What's needed to get the bariatric surgical candidate ready

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Preoperative Requirements

- Monthly **Medically Supervised Weight Loss** Visits – RD/PCP/Surgeon
  - Length dictated by Insurance Requirements
- **Psychological** Evaluations
- **Cardiac** Clearance
  - Morbid Obesity and an additional cardiac risk factor
- Preoperative **Weight Loss**
  - Our practice requires a mandatory 5-10% prior to surgery
    - Decreases liver size
    - Starts lifestyle changes

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Bariatric Surgical Procedures

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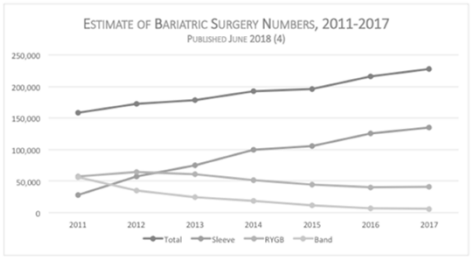

The ASMBS total bariatric procedure numbers are based on the best estimation from available data (BOLD,ACS/MBSAQIP, National Inpatient Sample Data and outpatient estimations)

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Estimate of Bariatric Surgery Numbers 2011-2019

	2011	2012	2013	2014	2015	2016	2017	2018	2019*
TOTAL	158,000	173,000	179,000	193,000	196,000	216,000	228,000	252,000	256,000
RYGB	36.7%	37.5%	34.2%	26.8%	23.1%	18.7%	17.8%	17.0%	17.8%
Band	35.4%	20.2%	14%	9.5%	5.7%	3.4%	2.7%	1.1%	0.9%
Sleeve	17.8%	33%	42.1%	51.7%	53.6%	58.1%	59.4%	61.4%	59.4%
BPD/DS	0.9%	1%	1%	0.4%	0.6%	0.6%	0.7%	0.8%	0.9%
Revisions	6%	6%	6%	11.5%	13.6%	14.0%	14.1%	15.4%	16.7%
Other	3.2%	2.3%	2.7%	0.1%	3.2%	2.6%	2.5%	2.3%	2.4%
Balloons					0.03%	2.6%	2.8%	2.0%	1.8%

ASMBS total bariatric procedures from BOLD/ACS/MBSAQIP

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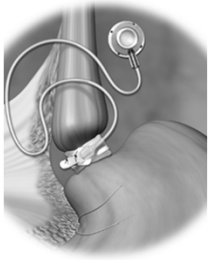
Lap Band



- 2011: Approximately 35% of weight loss surgeries
- 2019: Less than 1%

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Sleeve Gastrectomy

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Robotic Sleeve Gastrectomy

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Benefits of Sleeve Gastrectomy

- Most commonly performed bariatric procedure nationwide
- Restrictive procedure
  - Small stomach = fuller faster
- 75% of patients have significant improvement in obesity-related co-morbid conditions such as diabetes, sleep apnea, high blood pressure, and hyperlipidemia
- **60-80% excess weight loss** at 3 years post procedure
- Outpatient or Overnight stay in hospital

Cottam D, Qureshi FG, Mattar SG, et al. Laparoscopic sleeve gastrectomy as an initial weight-loss procedure for high-risk patients with morbid obesity. *Surg Endosc* 2006; 20(6):859-63.
Moon Han S, Kim WW, Oh JH. Results of laparoscopic sleeve gastrectomy (LSG) at 1 year in morbidly obese Korean patients. *Obes Surg* 2005; 15(10):1469-75.
Himpens J, Dapri G, Cadiere GB. A prospective randomized study between laparoscopic gastric banding and laparoscopic isolated sleeve gastrectomy: results after 1 and 3 years. *Obes Surg* 2006; 16(11):1450-6.
Hamoui N, Anthone GJ, Kaufman HS, Crookes PF. Sleeve gastrectomy in the high-risk patient. *Obes Surg* 2006; 16(11):1445-9

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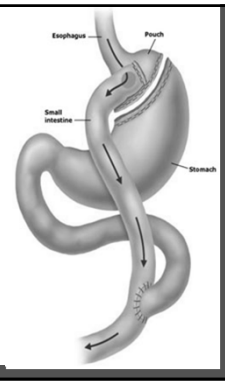
Roux-en-y Gastric Bypass



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Robotic Roux En Y Gastric Bypass

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Benefits of Gastric Bypass

- Restrictive
  - Small stomach = fuller faster
- Malabsorptive
  - Not all of the calories & nutrients are absorbed from food
- **60-80% excess** weight loss at 3 years post gastric bypass
- 60.2% diabetic remission at 7 years post-surgery[1]
- 1 to 2 night stay in hospital

1. Courcoulas, King, Belle, et Al, Seven-Year Weight Trajectories and Health Outcomes in the Longitudinal Assessment of Bariatric Surgery (LABS) Study, *JAMA*, May 2018

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Dumping Syndrome after Gastric Bypass

Intolerance of high sugar and high fat food due to anatomical changes after Gastric Bypass – **dumping syndrome is a side effect, not a complication**

Symptoms include:

- Nausea
- Vomiting
- Abdominal pain/cramps
- Diarrhea
- Flushing
- Dizziness, lightheadedness
- High heart rate

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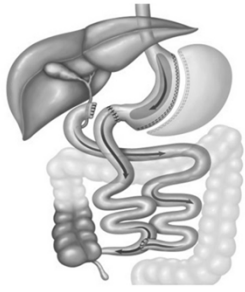

Duodenal Switch

- Less than 1% of procedures
- Malabsorptive and Restrictive
- Fat Soluble Vitamin Deficiencies
- Long limb bypass
- Short common channel compared to gastric bypass

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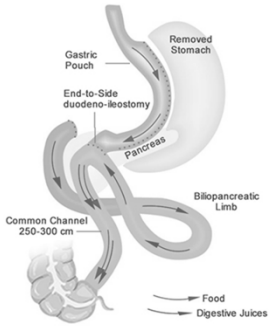

Sadi-S

Single anastomosis duodeno-ileostomy switch-Sleeve

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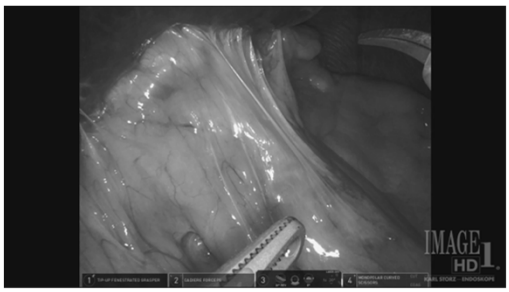
ROBOTICALLY ASSISTED BAND TO SLEEVE REVISION



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Risks and Complications of Sleeve & Bypass

- Leak from staple line
- Bleeding
- Stricture
- Marginal Ulcer
- Dehydration
- Reflux

2009-2022 Weight Loss Surgery Outcomes		
	Cedar Park Surgeons	National Database
Mortality	**0%**	0.1%
Staple line leak	**0%**	0.4%
Bleeding	**2%**	0.5%
Stricture	**0%**	0.3%
Ulcer	**0%**	0.1%
Sepsis	**0%**	0.2%
N/V/Dehydration	**0.5%**	1.2%

Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program database

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Mortality Rate

- Sleeve – 0.08%
- Gastric Bypass – 0.14%
- Gallbladder Surgery – 0.1-0.7%
- Appendectomy – 1.8%

- Bariatric surgery is **safe** and **effective**

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Life After Bariatric Surgery

- Suggested **two weeks off work** for surgical recovery time
- Slow, regimented diet progression
- **Lifelong commitment** to healthy eating with focus on protein intake and hydration
- **Long-term follow-up** with bariatric surgeon
- Adherence to **daily vitamin**/supplementation regimen

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Medication Choice after Bariatric Surgery

- For Sleeve and Gastric Bypass patients
  - NO Extended-Release medications
    - If the medication does not come in Non-extended-release form
      - Crush medication and take twice a day
  - Eliminate diuretic usage to prevent dehydration postoperatively
  - Pills smaller than 8 mm

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Postoperative Considerations

- Patients must chew 20-30 times after surgery before swallowing
- Low Carbohydrate, Protein – approximately 1gm/kg, Low/Minimal Sugar – less than 5 grams per meal
- No Straws
- No Carbonation
- Fluid Loading – drinking 30 mins before and after a meal

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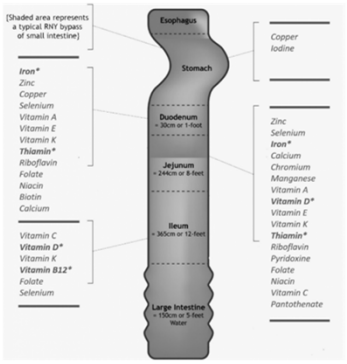
Vitamin Absorption



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Vitamin Supplementation

- Gastric Bypass and Sleeve Gastrectomy
  - Multivitamin that has greater than 100% of Vitamin K, Biotin, Zinc, Thiamine, Folic Acid, Iron, and Copper
  - Calcium Citrate with Vitamin D 1200-1500 mg/day

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Vitamin Supplementation

- Iron – Ferrous Fumarate or Ferrous Gluconate may be tolerated best
  - Men and Postmenopausal women – 18-27 mg/day
  - Premenopausal or Anemia – 50-100 mg/day
- Vitamin B12 – Sublingual 500 mcg/day, 1000 ug IM injection monthly or weekly Nascobal Nasal Spray

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Foods to Avoid

- Raw Celery
- Coconut
- Corn
- Dried Fruit
- Gum
- Hot Dog Skins

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Anti-inflammatory Use

- Sleeve Gastrectomy – OK
- Gastric Bypass – Marginal ulceration may form in the Roux limb so lifelong commitment to:
  - Stop anti-inflammatories for life
  - No smoking

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Weight Regain after Bariatric Surgery

What can be done to prevent this?

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Causes for Weight Regain after Bariatric Surgery

- **Exercise** less than 3 times a week
- **Depression/Psychological Distress/Anxiety** Postoperatively
- Lower Social **Support**
- Those who **lost <50% of EWL** had higher weight regain than those that lost >50%
- **Emotional Eating**
- **Picking and Nibling** on food

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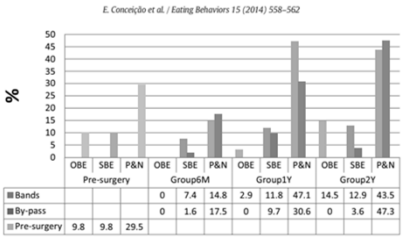
Disordered Eating Post Bariatric Surgery



E Conceicao et al. *Eating Behaviors* 15 (2014) 558-562

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Thank You!

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Audience Polling Questions

1. Bariatric Surgery has a lower Mortality Rate than a Laparoscopic Cholecystectomy.
   a) True
   b) False
2. Sleeve and Roux en Y Gastric Bypass patients can both
   a) Use Extended-Release Medications
   b) Take NSAIDs
   c) Swallow pills that are smaller than 8 mm whole
   d) Drink carbonated fluids

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Audience Polling Questions

3. In the biggest loser contestant study the finding was that these contestants
   a) Lost more Fat Free Mass than the RYGB patients
   b) Had more persistent Metabolic Adaptation than RYGB patients
   c) Lost less weight than RYGB patients
   d) Lost weight slower than RYGB patients
4. The mortality rate for bariatric surgery is 0.1%
   a) True
   b) False

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Audience Polling Questions

5. Causes for Weight Regain after Bariatric Surgery
   a) Picking and Nibling
   b) Emotional Eating
   c) Anxiety
   d) Lack of Exercise
   e) Poor Social Support
   f) All of the Above
   g) None of the Above

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Notes