IH-101.

PREOPERATIVE VITAMIN D STATUS IN POTENTIAL BARIATRIC SURGERY PATIENTS

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Background: Vitamin D deficiency has been described in a variety of population groups. Specifically, the vitamin D status in preoperative bariatric patients is a growing concern in the field of weight reduction surgery where gastric bypass may exacerbate a preexisting deficiency or insufficiency. The purpose of this study was to determine the vitamin D status in preoperative bariatric patients and to compare results according to race, gender, BMI, and age.
Methods: Our study cohort included 234 morbidly obese adult patients who presented for bariatric surgery. Serum levels of 25-hydroxy vitamin D were tested and catergorized as insufficient (20-80 nmol/L), deficient (15-20 nmol/L) or severely deficient (<15 nmol/L). Results were compared by BMI groups (35-39.9, 40-49.9, 50-59.9, >60) age groups (<35, 36-45, 46-55, 56-65, >65) race (black, white) and gender.
Results: Results showed a statistical difference among the three vitamin D categories for BMI, and race but not between gender groups.
Conclusion: Understanding which characteristics of the morbidly obese population are associated with poor vitamin D status will aid in identifying high risk groups to allow for adequate repletion of vitamin D before weight reduction surgery. More research is needed to understand why the morbidly obese population in general suffers from vitamin D deficiency and insufficiency.

IH-102.

EFFECT OF DIFFERENT BARIATRIC OPERATIONS ON FOOD TOLERANCE AND QUALITY OF EATING

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Background: Bariatric surgery is often associated with reduced food tolerance and frequent vomiting, which may cause nutritional deficiencies and influence quality of life.
Methods: Cross sectional study was perform on 122 patients to evaluate the food tolerance and quality of eating between different bariatric operations: Roux-en-Y Gastric Bypass (RYGB), Adjustable Gastric Banding (AGB), Sleeve Gastrectomy (SG) and Duodenal Switch (DS). Each patient filled a standardized questionnaire consisting of 10 questions. The score varies between 1 and 27, with maximal score representing excellent food tolerance.
Results: 64 patients completed 3-12 month of follow up. The Excess Weight Loss (%EWL) for RYGB, AGB, SG and DS patients was 53, 39, 54 and 73 respectively ($p<0.01$). Food tolerance score was 20, 17, 20 and 22 for RYGB, LAGB, SG and BPD-DS, respectively without statistical

significant differences. 58 patients completed 1-2.5 years follow up, their food tolerance score was 22, 15, 19 and 25 for RYGB, LAGB, SG and BPD-DS, respectively ($p<0.01$). The %EWL was 64, 44, 60 and 69 respectively. Red meat was the most poorly tolerated food by RYGB patients. SG patients reported difficulties eating red meat and pasta. LAGB patients tolerated poorly red meat, bread, rice and pasta. BPD-DS patients tolerated all kind of food very well.
Conclusion: BPD-DS patients have the best quality of eating. LAGB patients cannot tolerate a wide variety of foods. Bariatric patients avoid various foods because of poor tolerance and this may affect postoperative nutritional status. This is an important consideration when choosing the operation, and for a screening tests to avoid nutritional deficiencies.

IH-103.

OBSERVATIONS ON SERUM LUTEIN LEVELS IN GASTRIC BYPASS PATIENTS
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Background: Lutein is a carotenoid found in green leafy vegetables that may be important for retinal health and as an antioxidant. Serum lutein levels in gastric bypass patients have not been reported.
Methods: We present a retrospective review of measurements of serum lutein levels in short limb gastric bypass patients operated upon in 2005 for morbid obesity. Serum lutein levels were obtained whenever allowed by managed care plans. Lutein replacement was recommended for patients who were found to be deficient.
Results: Two hundred and thirty one morbidly obese patients underwent gastric bypass in 2005. Lutein level were low in 4/19 (21 %)of pre-op patients, 37/43 (86 %) patients at 3-6 months post-op, 32/52 (61%) patients at 6-9 months, and 22/61 (36%)patients at 9-12 months.
Conclusion: We conclude that morbidly obese patients undergoing gastric bypass surgery are at risk for hypoluteinemia throughout their course. Systematic investigation is indicated to tease out the contributions of possible causes including inadequate dietary intake, the obese state itself, and possible postoperative lutein malabsorption. Lutein monitoring and replacement may be warranted in the obesity surgery patient.

IH-104.

SLEEP QUALITY AND DURATION BEFORE AND AFTER BARIATRIC SURGERY
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Background: Poor sleep quality in association with morbid obesity may result in chronic sleep loss. A shortened sleep duration, in turn, can lead to hormonal and metabolic changes that favor weight gain and/or regain. The purpose of the present study was to examine sleep quality and its effect on duration prior to and following bariatric surgery.
Methods: The study population included bariatric surgical patients (BMI>39.9) and lean

controls (BMI 19-24.9). Self-reported sleep duration and quality were assessed using a modification of the Pittsburg Sleep Quality Index.
Results: The data show that average sleep duration of the preoperative bariatric patients was significantly ($p<0.01$) less than that of the lean controls, i.e. 5.8 vs. 6.7 hrs. respectively). Associated with sleep deficits among the bariatric patients was an exceptionally high incidence and frequency of sleep disruptions including breathing difficulties, coughing, snoring, pain, night time awakenings, bad dreams and hot sensations. Weight loss following bariatric surgery resulted in significant improvement in self-reported sleep quality and mood that exceeded, or was comparable to, these measures among the lean controls. Along with improved sleep quality, sleep duration increased postoperatively to amounts comparable to the lean controls ($p=0.54$).
Conclusion: Severely obese individuals obtain less sleep and experience poorer sleep quality than do lean persons. Bariatric surgery improves sleep duration and perceived sleep quality.

IH-105.

MANAGEMENT OF PSYCHOLOGICAL CONTRAINDICATIONS FOR BARIATRIC SURGERY IN A CENTER OF EXCELLENCE

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Background: Approximately 5% of patients are not initially recommended for bariatric surgery at Cleveland Clinic Florida due to contraindications from a psychological perspective.
Methods: Prevalence rates are examined of psychological contraindications. These include major depression with suicidal ideation, unstable psychiatric presentation such as active psychosis, or less than 1 year of demonstrated stability without readmission to a psychiatric inpatient facility. Other contraindications include active drug/alcohol abuse or dependence, very limited history of making or sustaining lifestyle changes, strong history of noncompliance with medical recommendations, presence of an eating disorder, or inability to understand the procedure, risks or ramifications of behavior.
Results: The discussion outlines how Cleveland Clinic Florida manages these patients. The prevalence rates are examined for contraindications.
Conclusion: The goal at CCF is to assist the patient to modify behavior, control psychiatric symptoms, and to eventually be able to recommend the majority of these patients for surgery with an elevated level of ongoing psychiatric treatment.

IH-106.

POSTOPERATIVE DIETARY ADHERENCE AND THE POTENTIAL UTILITY OF POSTOPERATIVE DIETARY COUNSELING TO IMPROVE OUTCOMES

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Background: A significant minority of patients appear to experience suboptimal weight losses following bariatric surgery. These outcomes often are attributed to preoperative psychosocial characteristics and/or eating behaviors as well as poor adherence to the recommended postoperative diet. The present study was designed to investigate the relationship between preoperative eating behavior, postoperative dietary adherence and weight loss following bariatric surgery.
Methods: The study was an investigation of 200 gastric bypass patients studied preoperatively and 20, 40, 66 and 92 weeks postoperatively. The primary outcome measures were percent weight loss, macronutrient intake, dietary adherence, and eating behaviors.
Results: Gender, baseline cognitive restraint, and self-reported adherence to the postoperative diet at postoperative Week 20 were associated with percent weight loss at postoperative Week 92. Those high in dietary adherence lost 4.5% more weight at postoperative Week 92 compared to those low in dietary adherence.
Conclusions: Baseline cognitive restraint and adherence to the recommended postoperative diet were associated with percent weight loss. These results suggest the potential utility of pre- or postoperative dietary counseling interventions to improve postoperative outcomes.

IH-107.

NURSING CARE OF BARIATRIC REVISIONAL PATIENTS: ANALYZING ADVERSE OUTCOMES, IMPLEMENTING A CLINICAL PATHWAY

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Background: As metabolic surgery becomes more common, the need for revisional procedures is projected to rise to as much as 15% of total bariatric operations performed. These patients require nuanced nursing care as they may have serious complications. Currently, there are few nursing studies or published clinical pathways instructing nurses on how to best care for these patients.
Methods: Retrospective chart review from our tertiary bariatric program revealed an increase in the number of revisional procedures performed since 2005. Adverse outcome were reviewed using Failure Mode and Effects Analysis (FMEA) methodology in order to develop a clinical pathway to reduce complications.
Results: The review showed gastric leak and respiratory problems to be the most common revisional complications encountered at our hospital. These data guided the creation and implementation of a new clinical pathway addressing appropriate nursing assessments and

interventions for these patients. Staff nurses received classroom and bedside clinical training on using this clinical pathway to guide their bedside practice. The efficacy of this pathway continues to be regularly assessed in regards to rate of complication, sequelae and length of stay.
Conclusion: Revisional patients carry an increased risk of complications related to various pre-existing conditions. Analysis and creation of a specific clinical pathway aims to improve the quality of care of revisional patients.

IH-108.

OBJECTIVE QUANTIFICATION OF AMOUNT AND INTENSITY OF PHYSICAL ACTIVITY (PA) IN BARIATRIC SURGERY CANDIDATES AND AGE- AND SEX-MATCHED NORMAL WEIGHT (NW) CONTROLS

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Background: PA is an important component of weight loss programs and may be encouraged for patients undergoing bariatric surgery. However, it is unclear how PA patterns may differ between bariatric surgery candidates and NW individuals when PA is assessed objectively. This study used objective PA measures to: 1) assess levels of PA at different intensities in bariatric surgery candidates and 2) compare these PA levels with those of NW individuals within the context of public health PA recommendations.
Methods: PA was objectively assessed in 27 surgery candidates (83% female; M age=47.8y; BMI=45.6±6.2 kg/m2) and 18 NW (82% female; M age=47.9y; BMI=22.5±1.3 kg/m2) participants via triaxial accelerometry. Time (min/day) spent in light (2.00-2.99 METs), moderate (3.00-4.99 METs) and vigorous (≥5 METs) PA by surgery candidates and NW participants was compared.
Results: Time (min/day) spent in PA at ≥ 2 METs was comparable between surgery candidates (143.4±39.3) and NW participants (143.8±69.7)(p=0.984). Similarly, min/day spent in light and moderate PA was not different between groups. However, surgery candidates spent fewer min/day in vigorous PA (11.8±13.8 vs. 21.7±12.0, p=0.017). Additionally, 5% of surgery candidates accumulated ≥ 150 weekly minutes of moderate-or-vigorous PA in ≥10-minute bouts versus 39% of NW participants (p=0.004)
Conclusion: When compared to NW individuals, bariatric surgery candidates appear to spend comparable time performing PA at ≥2 METs. However, they spend less time in vigorous PA, which may affect energy expenditure. Moreover, they are less likely to perform PA in bouts of sufficient duration and intensity to meet PA recommendations for improving health outcomes. Additional investigation is warranted to examine the effects of PA patterns and intensity on weight and health outcomes in bariatric surgery candidates.

IH-109.

CAN HEALTHCARE PROVIDERS INCREASE PERIOPERATIVE EXERCISE BEHAVIOR IN BARIATRIC PATIENTS?

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Background: Exercise is thought to augment weight loss in bariatric surgical patients. This study is designed to determine whether verbal encouragement by healthcare professionals can increase perioperative physical activity in bariatric surgical patients.
Methods: 41 surgical candidates were prospectively randomized and all were instructed to exercise 30 minutes a day. Patients in the intervention group were contacted weekly via telephone and strongly encouraged to exercise. Providers specifically discussed ways to overcome barriers to exercise. The control group was simply asked if they were exercising. Patient activity was recorded using an accelerometer (Actical, Respironics, Inc) worn continuously for 7 days. Data was recorded preoperatively at baseline, 30 days later and at 8 weeks postoperatively.
Results: There were 25 subjects in the intervention group and 16 in the control group. 8 patients in the intervention group and 5 patients in the control group did not complete the study. At baseline the intervention group had a weekly average total energy expenditure (AEE) of 37143 (± 5759) Kcal while the control group's average was 31666 (± 9522) Kcal. At 30 days, the intervention group's AEE was 34385 (±1386) Kcal while the control group's average was 33625 (± 9895) Kcal ($p = 0.50$). Weight loss was noted in both groups prior to the operation: study group (3.10 ±4.66 lbs) and control group (6.39 ±8.03 lbs).
Conclusion: Extensive verbal encouragement alone did not increase baseline activity or energy expenditure and 32% percentage of patients did not exercise at all or refused to wear the accelerometer. Those who did exercise were able to maintain high average energy expenditure and this may lead to significant clinical weight loss in the perioperative period.

IH-110.

PREDICTORS OF WEIGHT LOSS FOLLOWING BARIATRIC SURGERY: A SYSTEMATIC REVIEW

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Background: Obesity is a major health concern that affects 32% of adults in the United States. Surgical treatment generates substantial results, but 20-30% of patients fail to achieve successful weight loss (>50% excess weight loss).

Methods: We performed a literature search of PubMed® between 1988 and February 2008. We searched for bariatric surgery and exercise, preoperative weight loss, eating disorders, nutrition, depression, social support, patient expectations, energy, follow-up, and weight loss failure.
Results: Of 464 screened articles, 140 were included. Because of heterogeneity in study design and measurement of weight loss outcomes, data pooling was not possible. The main predictors of weight loss include preoperative weight loss, postoperative eating habits, exercise, and surgeon follow-up.
Conclusion: The identification of predictive factors will allow for better patient selection and interventions targeting specific needs of patients. Structured postoperative programs (for exercise and diet maintenance) should be a mandatory part of follow-up for these operations.

Predictive Factors of Postoperative Weight Loss

Domain	# Total Articles	# Positive Effect	# No Effect	# Negative Effect	Overall Effect*
[Depression]	[10]	[0]	[7]	[3]	[Inconclusive]
[Psychiatric] Sexual abuse Therapy Personality d/o	[39] 8 2 5	[7] 1 2 1	[24] 6 0 2	[8] 1 0 2	[Inconclusive] Inconclusive Positive None
[Preop Weight Loss]	[9]	[5]	[4]	[0]	[Positive]
[Preop Eating Disorder] Binge eating Sweet eating	[30] 16 4	[5] 3 1	[17] 10 2	[8] 3 1	[Inconclusive] Inconclusive Inconclusive
[Postop Eating Disorder] Binge eating Sweet eating	[32] 9 3	[4] 0 0	[12] 3 1	[16] 6 2	[Negative] Negative Negative
[Exercise]	[11]	[9]	[2]	[0]	[Positive]
[Follow-up]	[3]	[3]	[0]	[0]	[Positive]
[Social Support]	[6]	[2]	[3]	[1]	[Inconclusive]
[Energy Intake]	[6]	[1]	[3]	[2]	[Inconclusive]

*Inconclusive: studies had conflicting results