

Bariatric Surgery: Advanced Bariatric Nutrition

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Bariatric Surgery Webinar Part III

February 1, 2016



Webinar Series Objectives

Webinar #3
Advanced Bariatric Nutrition

Webinar #2
Common Post-op Complications

Webinar #1
Understanding Bariatric Surgery Process



Webinar #1:
<https://www.youtube.com/watch?v=ifVyhpklkEI&feature=youtu.be>

Webinar #2:
https://www.youtube.com/watch?v=JlXPPa_Cxhl&feature=youtu.be

Diabetians of Canada
 Les diabétiques du Canada
 Diabetes, Obesity and Cardiovascular Network

afhto

Diabetians of Canada
 Les diabétiques du Canada
 Ontario Family Health Teams Network

Objectives

- Brief review of surgical procedures
- Post-op complications
 - Weight regain
 - Reactive hypoglycemia
 - Pregnancy after bariatric surgery
 - Rare vitamin/mineral deficiencies
 - Special considerations
- Questions and discussions

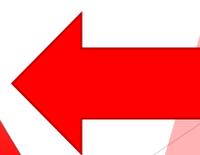
Bariatric Surgery Interventions

Disease Progression

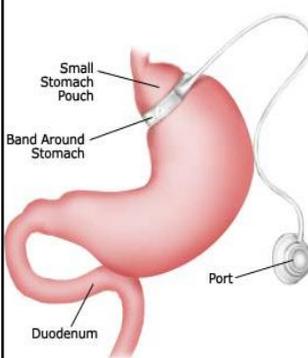
Bariatric Surgery
(RYGB, SG,
BPD-DS)

Pharmacotherapy
(Orlistat or Liraglutide 3mg)

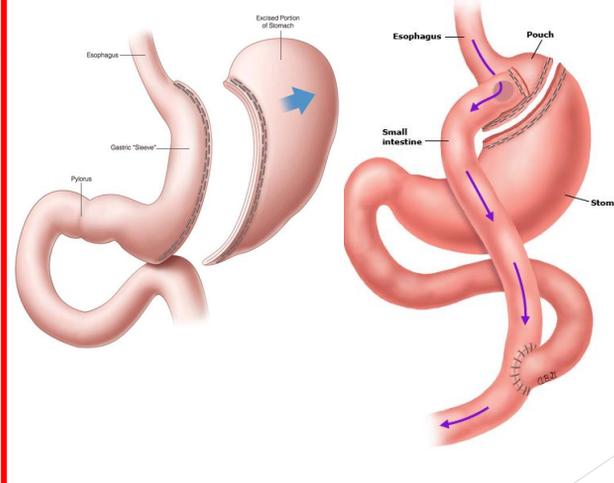
Healthy Eating Physical Activity
Stress Management
Sleep Hygiene



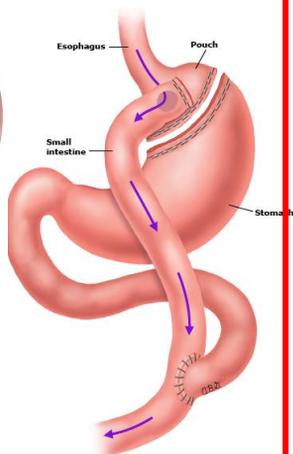
Adjustable Gastric Band (AGB)



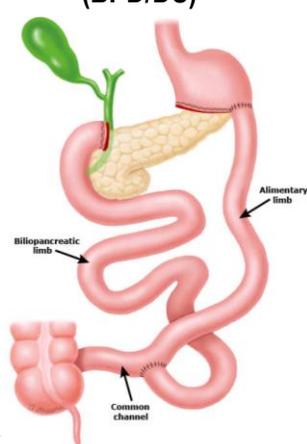
Sleeve Gastrectomy (SG)

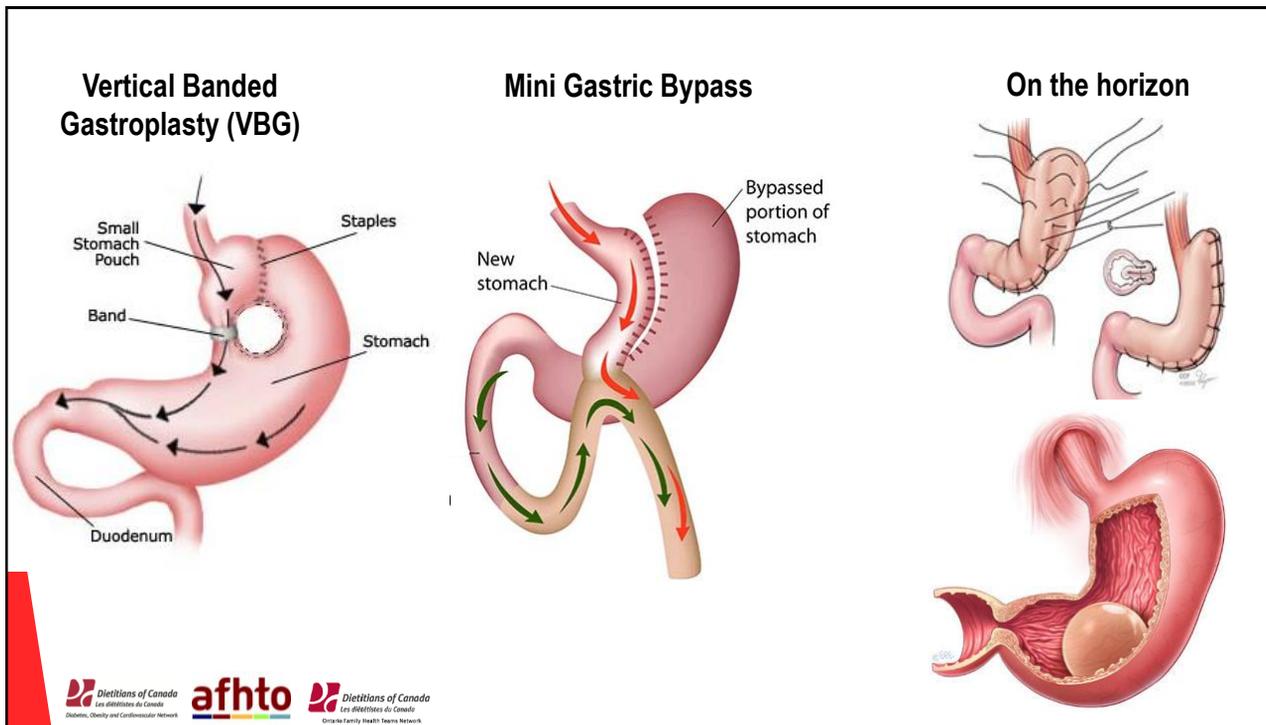


Roux-en-Y Gastric Bypass (RYGB)



Biliopancreatic Diversion w/ Duodenal Switch (BPD/DS)



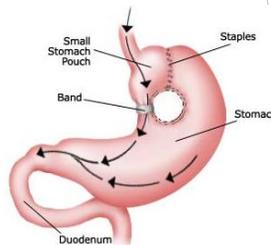


Complications – Vertical Banded Gastroplasty

- Conducted mostly in the 1980's to early 2000's.

Patients present with :

- Chronic vomiting
- Multiple food intolerances (healthier foods)
- Tolerate sugary (unhealthier foods) well
- Weight regain
- Poor quality of life
- Multiple nutrient deficiencies

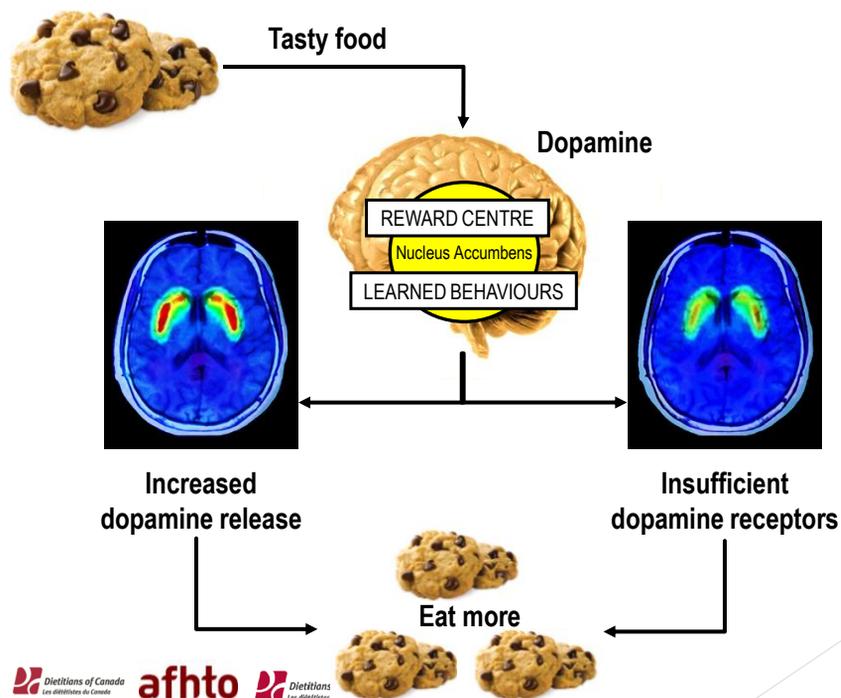
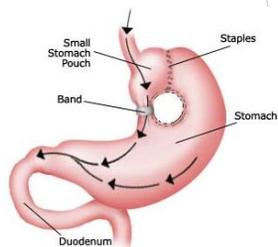


Nutrition Assessment & Counselling

VBG's need to be revised

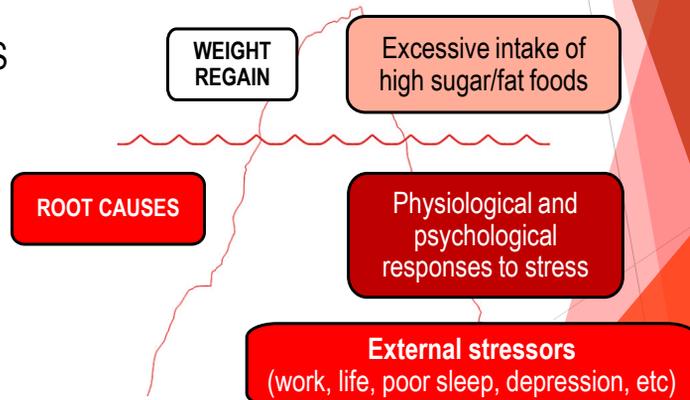
Dietitians/Health Care Providers:

- Provide empathy (avoid blame)
- Explain the physiology of the surgery:
 - Food intolerances - why "healthier" (fibre foods) don't work vs "unhealthier" (junk food) works fine
 - Food reward pathway (mesolimbic dopamine pathway) – effects on learned behaviours



Weight Regain

- Accompanied by shame, guilt, low-self efficacy and binge-type eating behaviours
- Assess ROOT CAUSES
 - Nutritional
 - Psychological
 - Physiological
 - Medical



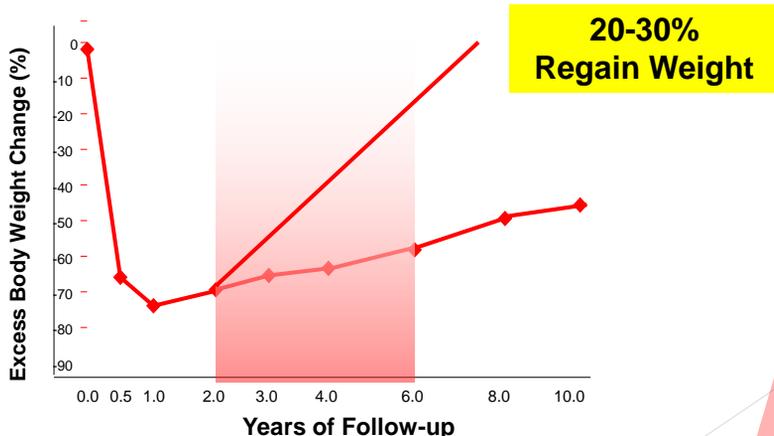
Weight Regain

- Nutrition-related
 - Lack of carbohydrates, low fibre-rich foods (aim for >120g/day)
 - Poorly distributed protein intake (aim for 20-30g/meal + 5-15g/snack)
 - Increased portion sizes
 - Inadequate dietary habits (i.e. drinking with meals, eating quickly)
 - Food and beverage choices

“Do not assume a patient is “non-compliant”. They may not have received appropriate and current evidence-based information.”

Weight Trajectories after RYGB

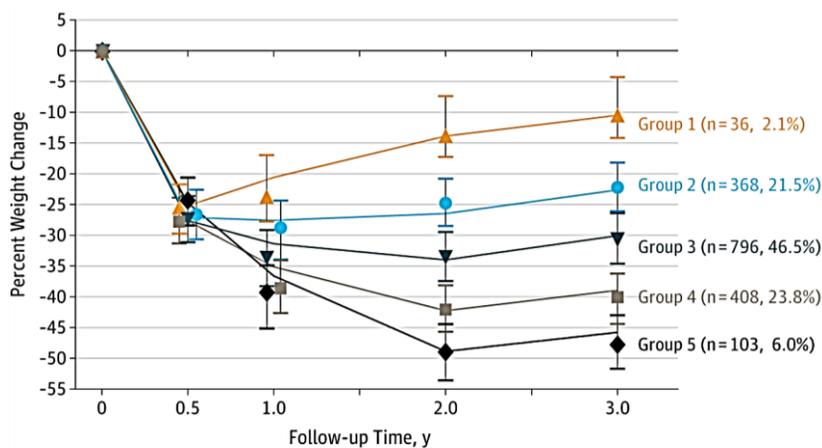
(Swedish Obesity Study)



Adapted from: Sjostrom L, et al. *N Engl J Med.* 2004;351:2683-2693.

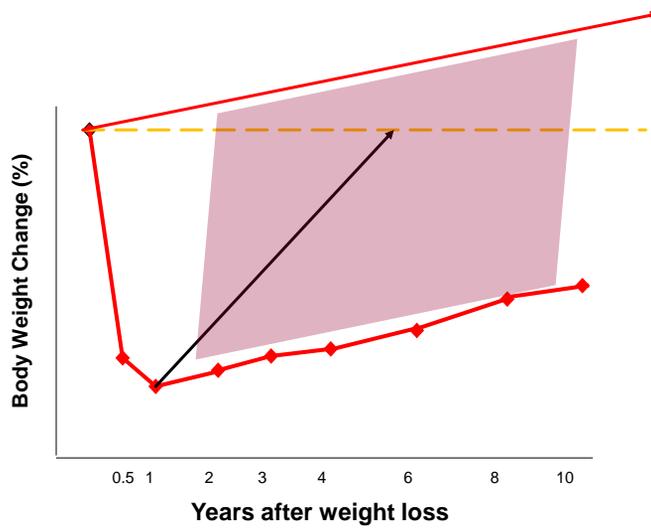
Weight Trajectories after RYGB

(Longitudinal Assessment of Bariatric Surgery (LABS) Consortium)



Courcoulas, A., et al. *JAMA.* 2013;310(22):2416-2425.

Weight Expectations – Educating Patients



Post-op complications

Tanya

- 3 years post-RYGB
- c/o: dizziness, sweating, fatigue, shakiness and few episodes of syncope
- BS: ~ 2.2 mmol/L (different times of the day/night)
- No history of diabetes, no current medications
- Dietary assessment:
 - Eating 3 meals per day – low carbohydrates
 - Protein intake adequate: averaging 70g/day
 - 2.5 L fluids per day (water, coffee, pop, juice, wine: 2-3 glasses per week)
 - Activity: Zumba, personal trainer 3x/week, averaging 12,000 steps/day



Polling Question

4) What is likely causing her low blood sugars?

- a) Dumping syndrome
- b) Inadequate fluid choices
- c) Meal timing
- d) Exercise output
- e) All the above

Reactive Hypoglycemia

- Typically presents after 1-2 yrs post-op
- Occurs 1-3 hours after meal/food ingestion
- Postprandial blood glucose <3.8 mmol/L

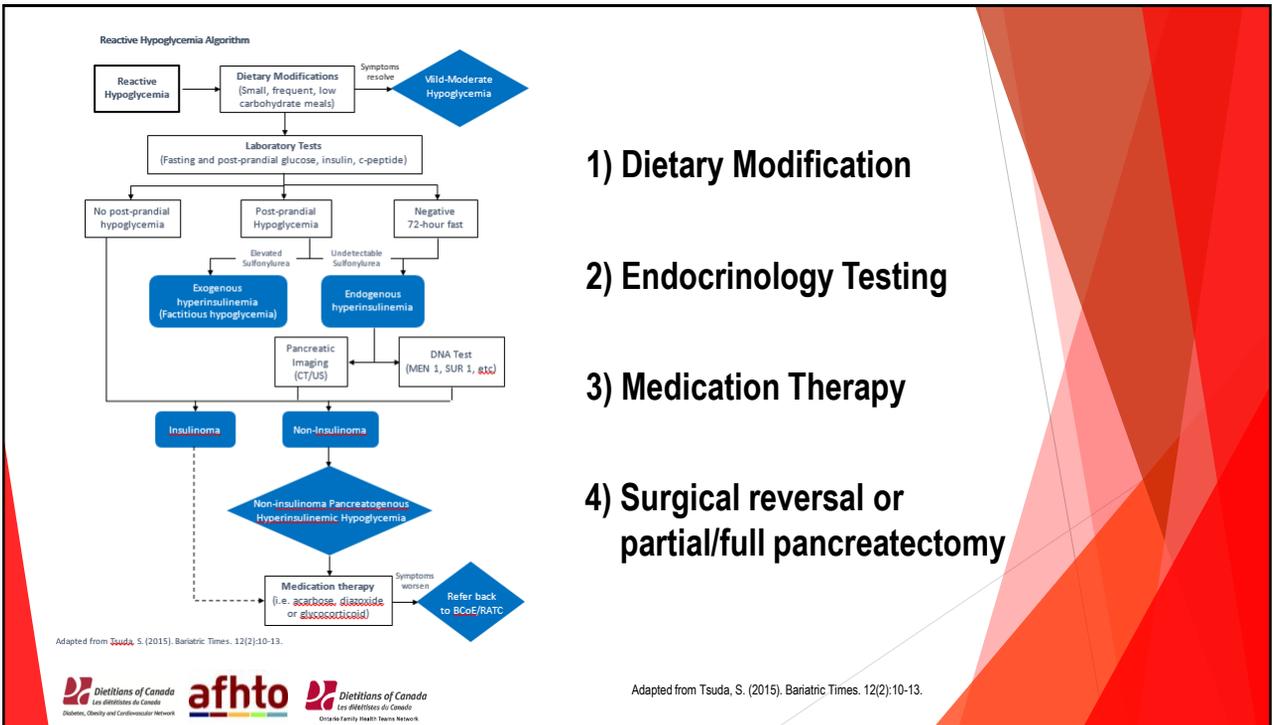
Reactive Hypoglycemia AKA:

Late dumping syndrome
Hypo-reactive glycemia
Postprandial hypoglycemia
Non-insulinoma pancreatogenous
hypoglycemia syndrome (NIPHS)

Symptoms	
Perspiration	Palpitations
Hunger	Weakness
Confusion	Tremors
Dizziness	Syncope

Reactive Hypoglycemia – Possible Etiologies

- Dumping syndrome → dietary/habits
- Beta cell hyperfunction
- Excessive secretion of GLP-1
- Increased delivery of nutrients to intestines (lack of pylorus)
- Underlying genetic hyperinsulinism syndrome



Reactive Hypoglycemia – Nutrition Assessment

- Ask for food/symptom records
 - Meal timing
 - Food/fluid intake
 - Food choices
 - Symptoms and frequency
 - Blood sugars (if possible)

Managing Reactive Hypoglycemia - Dietary

- 6-8 small, frequent meals (eat every 2-3 hours)
- Protein + fibre at all meals and snacks
 - Bran/psyllium, barley, oatmeal, beans
- Add fibre supplements with meals
- Avoid simple/refined carbohydrates
- Avoid drinking with meals and ~30 minutes after solid meals
- Avoid alcohol, caffeine, carbonation and sugar-sweetened beverages

Tanya

- Dietary assessment:
 - Eating 3 meals per day – low carbohydrates
 - Protein intake adequate: averaging 70g/day
 - 2.5 L fluids per day (water, coffee, pop, juice, wine: 2-3 glasses per week)
 - Activity: Zumba, personal trainer 3x/week, averaging 12,000 steps/day



Reactive Hypoglycemia

- If dietary changes unsuccessful → refer to endocrinologist
- Other measures:
 - C-peptide
 - Post-prandial insulin levels
 - MRI/CT of pancreas (r/o insulinoma, nesidioblastosis)
- Addition of Acarbose (Glucobay) to reduce insulin production
- Small subset of patients with severe life-threatening hypoglycemia require partial pancreatectomy



Polling Question

5) Women who become pregnant after bariatric surgery (RYGB/SG/LAGB) have fewer obesity-related complications than pregnant women with obesity?

- a) True
- b) False
- c) Not sure

Pregnancy after Bariatric Surgery

- Research is suggesting pregnancy AFTER bariatric surgery reduces obesity-related complications
 - Siblings born after mother had surgery had lower birth weights, maintained lower weight over time, less obesity-related conditions as adults (then their siblings before mother had surgery)
- Gestational hypertension
 - Pre-eclampsia
 - Gestational diabetes mellitus
 - Preterm delivery
 - Delivery complications

Pregnancy after Bariatric Surgery

- Recommended women wait 12-18 months after surgery
- Referral to high-risk pregnancy
- Referral to a dietitian (collaboration with bariatric dietitians)
 - Poor oral intake
 - Risk of vitamin/mineral deficiencies (mom)
 - Inadequate weight gain during pregnancy

Pregnancy Post-Bariatric Surgery

- Weight gain to promote fetal growth
 - Pre-pregnancy (BMI 25-29) = 15-25 lbs total
0.6 lbs/week in 2nd/3rd trimester
 - Pre-pregnancy (BMI >30) = 11-18 lbs total
0.5 lbs/week in 2nd/3rd trimester
- Energy requirements: (lack of evidence)
 - Indirect calorimeter (Met cart)
 - Individualize (increase meal frequency and caloric density)

Pregnancy Post-Bariatric Surgery - Protein

- 1.2 g/IBW
- Protein supplements if weight targets not achieved (especially in pts <12 months post-op)
- Monitor protein intake and quality
- Nutrition-related physical findings:
 - Changes in hair, skin, nails
 - Muscle mass

Pregnancy Post-Bariatric Surgery Vitamin/Minerals

**Inconsistent recommendations*

- 1 prenatal MVI + 1 adult MVI (do not exceed 5000 IU vitamin A from retinol)
- Add single-dose supplements
 - Folic acid: 5 mg/d (2 months pre-pregnancy + 1st trimester)
– decrease to 1 mg/d for 2nd/3rd trimester until post-breastfeeding
 - Calcium: 1200 mg calcium citrate
 - Vitamin D: 3000-4000 IU (treat to sustain levels 75-200 nmol/L)
 - Iron & B12 required (monitor blood work)
 - Omega-3 fatty acids: DHA supplements or 2 servings low mercury fish

Joan

Joan is 10 years post-RYGB complaining of following problems:

- Food intolerance (worsening over the past 2 years)
- Muscle weakness
- Tingling in extremities
- Unsteady gait resulting in falls (tripping over her own feet)
- Carpal tunnel syndrome
- Hair loss and frequently gets sick in the winter.
- Taking 1 multivitamin, calcium, vitamin D

Polling Question

6) What micronutrient deficiency are you MOST concerned about?

- a) Iron deficiency
- b) Vitamin B12
- c) Vitamin B1 (thiamine)
- d) Vitamin E
- e) Not sure

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Joan's Case Continues

- Starts on a multivitamin BID
- Provided with 100 mg vitamin B1 (thiamine) BID x 6 months
- Vitamin B12 IM injections monthly
- Referred to the dietitian – but doesn't attend appointment

Joan

Joan returns after 4 years (now 14 yrs post-RYGB) complaining of following problems:

- Using a walker (complains she falls regularly)
- Tingling in extremities worsening
- Incontinence

Dietitian's Nutrition-Focused Physical Findings:

- Dry, brittle and dull-coloured hair
- Pale conjunctiva (eyes)
- Joan reports she feels like something is on her hands and feet
- Coordination/balance difficulties (assessed via Romberg's test)

Polling Question

7) What is Joan likely experiencing?

- a) Psychological conditions
- b) Old age
- c) Wernicke's encephalopathy (severe thiamine deficiency)
- d) Vitamin E, copper or zinc deficiency
- e) Not sure

Musculoskeletal/lower extremity

Peripheral neuropathies → nerve damage

- Cold feet/burning fingers
- Pts reporting they feel like they wearing gloves/stockings
- Difficulty walking/fastening buttons
- Unable to balance with eyes closed
- Muscle weakness
- Inability to tolerate food/digest food



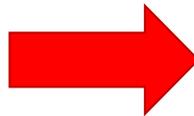
Check:

- Vitamin E
- Vitamin B1
- Vitamin B12
- Vitamin B6
- Niacin
- Copper

Musculoskeletal/lower extremity

myelopathy → pathology of the spinal cord

- Ataxic gait
- Sensory deficits
- Bowel/bladder symptoms



Check:

- Vitamin B12
- **Copper**
- Folate
- Vitamin E



Joan

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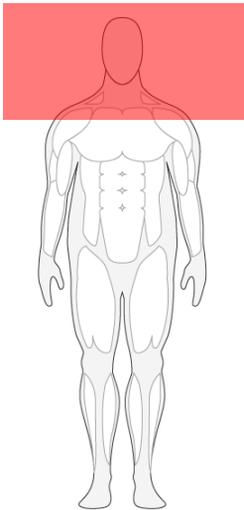
Copper Deficiency – Screening

- Screen for s/s in pts >2-5 yrs post-op
- Poor wound healing, hair loss, carpal tunnel syndrome, and muscle and joint pain
- Ask about difficulties walking, tingling/numbness in hands (stockings on hands/feet)
- Not easy to detect – blood tests do not represent body's status (low serum copper = severe deficiency → use ceruloplasmin)
- Can lead to irreversible paralysis

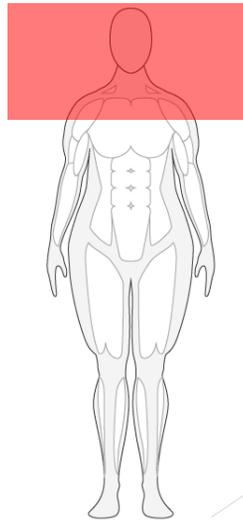
Copper Deficiency

- If treating B12/B1 deficiency with no resolutions – consider treating for copper
- Mimics iron/vitamin B12/B1 deficiency
- Ensure MV has 1mg Cu: 8-15mg zinc
- Treatment:
 - Mild-mod deficiency: 4-8 mg/d oral copper sulfate or gluconate (until s/s resolve)
 - Severe deficiency: 2-4 mg/d IV x 6 days then 4-8 mg/d orally.

Nutrition-Focused Physical Assessment



- General inspection
- Vitals
- Skin/nails
- Head/hair
- Eyes/nose/mouth
- Neck/chest
- Abdomen
- Musculoskeletal





**While everyone is looking
for horses.....**



**Look beyond the hoof beats.....
Find the zebra's**

Chronic Kidney Disease & ESRD



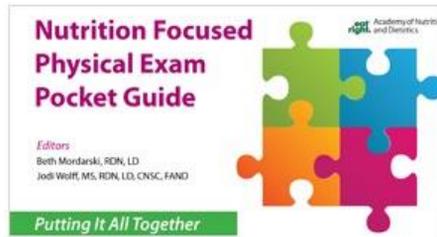
Nutrition requirements pre/post surgery for patients:

- CKD (stage 1-4)
- ESRD on Dialysis
- Renal transplantation
- Kidney stones

**Resources:
Post-op nutrition complications**



2015



2015



Resources – Post-op Nutrition Complications

- Isom, K., et al. *Nutr Clin Pract.* 2014;29:718-739.
- Aills, L et al. *SORD.* 2008;4(suppl):S73-S108.
- Mechanick, JI., et al. *SORD.* 2013; 159-191
- Cummings, S & Isom, K. 2014. *Academy of Nutrition and Dietetics Pocket Guide to Bariatric Surgery, 2nd ed*



Professional Resources

Dietitians of Canada:

DC – Learning on Demand
 DOC Network
[Bariatric surgery subgroup](#)
 PEN – Bariatric Pathway

Academy of Nutrition & Dietetics:

Weight Management Dietetic
 Practice Group www.wmdpg.org

The screenshot displays two views of the 'Learning on Demand' store. The top view is for 'obesity' and the bottom view is for 'bariatric'. Both views feature a left-hand navigation menu with categories: My Library, Learning On Demand (sub-categories: Clinical Nutrition, Management, Population Health, Professional Communications), Online Courses, and Quick-Sync Service. The main content area shows a grid of video thumbnails with titles and brief descriptions. The bottom of the page includes logos for Dietitians of Canada (Les Diététistes du Canada), afhto (Association of Family Health Teams Ontario), and the Ontario Family Health Teams Network.

Resources for Providers

www.worldobesity.org

www.asmb.org

www.obesity.org

www.cabsp.ca

www.obesitynetwork.ca

www.ontariobariatricnetwork.com



Bariatric Care:

- eConsult (Amir Afkham: amir.afkham@lhins.on.ca)
 - Bariatric Medicine: Dr. Judy Shiau, MD
 - Bariatric Surgery: Aspen Viets, NP
 - Bariatric Nutrition: Jennifer Brown, MSc., RD

Only available for PCPs



Take Home Messages



Key Messages

Bariatric surgery is only a TOOL

Familiarize yourself with nutrition complications

Use nutrition focused physical assessment

Looking beyond the horses...Find the zebras

Stay connected & collaborate



Dietitians of Canada
Les diététistes du Canada
Ontario Family Health Teams Network

Thank You Questions?



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