ERAS and Preoperative Nutrition

ERAS Collaborative: Learning Session 2
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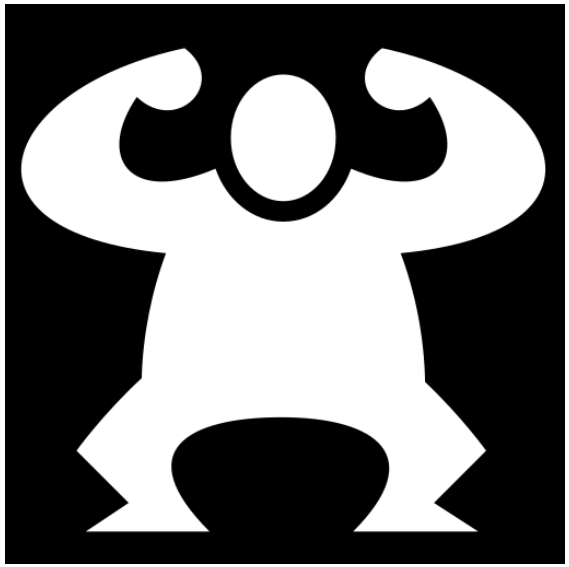
Disclosures

- No disclosures

Objectives

- Nutrition and Surgery
- Preoperative Nutrition Optimization
  - Nutrition Assessment
  - Carbohydrate Loading



Nutrition and Surgery

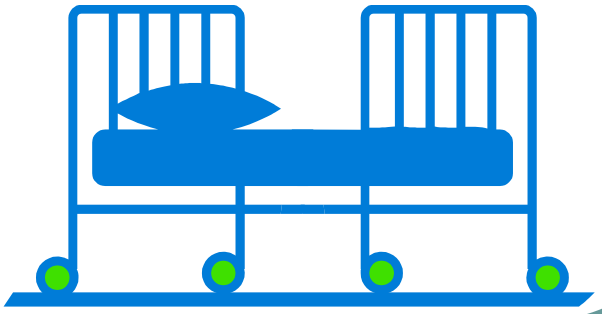
- Surgical patients at risk of nutritional depletion related to inadequate intake both pre- and post-operatively
  - Disease impact
  - Surgical stress
- Numerous studies have shown clear association between preoperative under-nutrition and increased risk of post-operative complications
  - Delayed wound healing, infectious complications, increased LOS

Disease Impact

- Inflammation/Metabolic Derangements
- Altered nutrient utilization
- GI tract dysfunction
  - Diarrhea, nausea, vomiting, abdominal pain
- Decreased intake or restricted diets prior to surgery

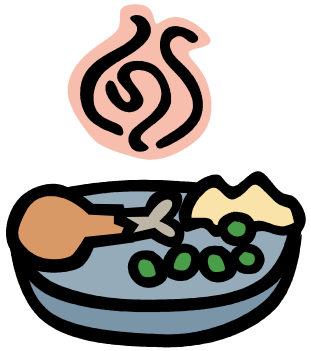
Surgical Stress

- Release of hormones that stimulate **catabolic state**
- Hypermetabolism
  - increased energy expenditure, increased protein synthesis and breakdown, negative nitrogen balance, increased insulin resistance



Nutrition Implications of ERAS

- Preoperative:
  - **Preoperative Nutrition Assessment:**
    - Optimize calorie and protein intake
    - Optimize micronutrient intake
    - Immunonutrition
  - Reduced preoperative fasting time
  - **CHO Loading**



- Postoperative:
  - Early feeding and rapid diet advancement
  - Increased calorie and protein intake post operatively
  - Gum Chewing

Nutrition Assessment

- Often not part of preoperative assessment
- Provide nutrition goal-directed therapy to optimize outcomes
- **Who to identify?**
  - Malnourished
  - Well-nourished patients at risk for surgical stress

Challenges

- Build a protocol that:
  - Is easy to use
  - Will automate RD referral or nutrition intervention
  - Uses validated screening tool
  - Can be used at an appropriate time to provide benefit
- Availability of RD for referral
  - ?Written materials
  - ?HealthLinkBC

Nutrition Screening Tools

- NRS 2002
- Other screening tools
  - SGA, Strong for Surgery
  - Suggestions?

NRS 2002

Kondrup et al. Clinical Nutrition 2003: 22: 321-336

Table 1 Initial screening

		Yes	No
1	Is BMI <20.5?		
2	Has the patient lost weight within the last 3 months?		
3	Has the patient had a reduced dietary intake in the last week?		
4	Is the patient severely ill ? (e.g. in intensive therapy)		

Yes: If the answer is 'Yes' to any question, the screening in Table 2 is performed.
No: If the answer is 'No' to all questions, the patient is re-screened at weekly intervals. If the patient e.g. is scheduled for a major operation, a preventive nutritional care plan is considered to avoid the associated risk status.

Table 2 Final screening

Impaired nutritional status		**Severity of disease (≈ increase in requirements)**	
Absent **Score 0**	Normal nutritional status	Absent **Score 0**	Normal nutritional requirements
Mild **Score 1**	Wt loss >5% in 3 mths or Food intake below 50–75% of normal requirement in preceding week	Mild **Score 1**	Hip fracture• Chronic patients, in particular with acute complications: cirrhosis•, COPD•. *Chronic hemodialysis, diabetes, oncology*
Moderate **Score 2**	Wt loss >5% in 2 mths or BMI 18.5 – 20.5 + impaired general condition or Food intake 25–60% of normal requirement in preceding week	Moderate **Score 2**	Major abdominal surgery• Stroke• *Severe pneumonia, hematologic malignancy*
Severe **Score 3**	Wt loss >5% in 1 mth (>15% in 3 mths) or BMI <18.5 + impaired general condition or Food intake 0-25% of normal requirement in preceding week in preceding week.	Severe **Score 3**	Head injury• Bone marrow transplantation• *Intensive care patients (APACHE>10).*
Score:	+	**Score:**	= **Total score**
Age	if ≥70 years: add 1 to total score above	= **age-adjusted total score**	

Score ≥3: the patient is nutritionally at-risk and a nutritional care plan is initiated
Score <3: weekly rescreening of the patient. If the patient e.g. is scheduled for a major operation, a preventive nutritional care plan is considered to avoid the associated risk status.

PHC Research

- **Assess the prevalence of preoperative nutrition risk and malnutrition in patients having colorectal surgery**
- Retrospective analysis
- Raw data collected preoperatively by Patient Navigator:
  - **Height**
  - **Weight**
  - **Changes in weight over time**
  - **Changes in intake over time**
- Post operative data analyzed using the NRS 2002

PHC Research

- **31% of study subjects deemed at nutritional risk as defined by NRS-2002**
  - 74% over the age of 70 - at nutrition risk with elective bowel surgery even without changes in weight or intake
  - 11% unintentional weight loss – study limited to colon/rectal cancer
    - Predict higher % with more diverse GI surgeries

Strong for Surgery

http://www.becertain.org/strong_for_surgery

STRONG FOR SURGERY

Nutrition Screening Checklist

Screening for Malnutrition

Is BMI less than 19?

☐ Yes ☐ No

Has the patient had unintentional weight loss of over 8 pounds in the last 3 months?

☐ Yes ☐ No

Has the patient had a poor appetite – eating less than half of meals or fewer than two meals per day?

☐ Yes ☐ No

Is the patient unable to take food orally (ex. dysphagia, vomiting)?

☐ Yes ☐ No

If YES to any of the questions:

☐ Referral to Registered Dietitian for evaluation unless currently receiving nutrition therapy

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Lab Tests for Risk Stratification

Is the patient having inpatient surgery?

☐ Yes ☐ No

If YES then:

☐ Check albumin level to assess complication risk after surgery

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Supplementation

Is the patient having complex surgery (example: GI anastomosis)?

☐ Yes ☐ No

If YES then:

☐ Give evidence-based immune modulating supplementation

Strong for Surgery

- Any YES refer to RD:
  - BMI less than 19?
  - Has patient had unintentional weight loss of >8lbs in 3 months?
  - Has the patient had poor appetite/eating less than ½ meals or fewer than 2 meals per day?
  - Is the patient unable to take food orally due to dysphagia or vomiting?

Carbohydrate Loading

- Rationale:
  - Avoid dehydration
  - Metabolically fed state
  - Allow safe general anesthesia
- 100g at HS, 50g morning of surgery (2-3 hours before) of iso-osmolar clear fluid drink
- Specialized oral supplements
  - Preload (Vitaflo UK), Clearfast (BevMD), preOp (Nutricia)
  - ? Not available in Canada

Challenges

- Optimal CHO Beverage?
  - Cost
  - Palatability
  - Availability
  - Dispensing
- Optimal type of CHO?
- Concerns with diabetic patients?
- Benefits of added protein/immunonutrition?

Alternatives to specialized oral supplements

- PHC:
  - Current practice – 500 ml + 250 ml juice
  - Coming soon – 500 ml + 250 ml maltodextrin powder/sugar (compounding pharmacy to dispense) with H20
    - Maltodextrin powder - Polycal (Nutricia)
- Others:
  - Juice, Gatorade
  - SOS 25 (Vitaflo Canada) – dried glucose syrup
  - Glycosade (Vitaflo Canada) – high amylopectin maize starch
  - Suggestions?

CHO Loading with Diabetes

- Concerns with:
  - Delayed gastric emptying
    - ?same with liquids vs. solids
  - Impaired glycemic control
- Limited research
- **ERAS Recommendation**: “In diabetic patients carbohydrate treatment can be given along with the diabetic medication”
  - Evidence level: Very Low
  - Recommendation grade: Weak
- PHC: same protocol for diabetics with juice

Carbohydrate Loading Bottom Line…

- We **SHOULD** be carbohydrate loading surgical patients

Thank You!

**"You'll have to eat that donut outdoors.
Nobody wants to inhale secondhand carbs!"**

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