Preoperative Optimization and Surgical Site Infection Reduction

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Objectives

• Introduce Enhanced Recovery (ERAS)
• Discuss Preoperative Optimization
• Surgical Site Infection Risk Reduction Strategies

Preoperative Optimization

• Meet Tim
• 55 yo male with new colon cancer
• Poor appetite
• Smoker
• COPD on albuterol prn
• BMI 40
• History of 10 lb unintentional weight loss over past month
Enhanced Recovery Pathways

ERAS
- Pre-Op
- Intra-Op
- Post-Op

Pre-Op
- Medical optimization
- Exercise
- Nutrition
  - Minimize fasting
  - Carbohydrate Loading
ERAS

Pre-Op

Intra-Op

Local, Regional Anesthesia

Normothermia

Fluid Management

Laparoscopy

Post-Op

Pain Management

PONV

Early Feeding

Early Mobilization

Immunonutrition

Minimize drains, catheters
Diagnostic Characteristics of Malnutrition

Identification of two or more of these six criteria is recommended for diagnosis:

- Insufficient energy intake
- Weight loss
- Loss of muscle mass
- Loss of subcutaneous fat
- Localized or generalized fluid accumulation
- Diminished functional status (handgrip strength)


**Loss of Muscle Mass and Function Can Now Diagnose Malnutrition, Independent of Body Weight**
### Insufficient energy intake

<table>
<thead>
<tr>
<th>Type of malnutrition</th>
<th>Acute illness or injury-related</th>
<th>Chronic disease-related</th>
<th>Social or environmental cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>&lt;75% of est. energy requirement for &gt;7 days</td>
<td>&lt;75% of est. energy requirement for ≥1 month</td>
<td>&lt;75% of est. energy requirement for ≥3 months</td>
</tr>
<tr>
<td>Severe</td>
<td>≤50% of est. energy requirement for ≥5 days</td>
<td>≤75% of est. energy requirement for ≥1 month</td>
<td>≤50% of est. energy requirement for ≥1 month</td>
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</tbody>
</table>

White et al, JPEN 2012

### Weight loss

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</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>% Time</td>
<td>% Time</td>
<td>% Time</td>
</tr>
<tr>
<td>1–2</td>
<td>1 week 1 month 3 months</td>
<td>5 7.5 10 20</td>
<td>1 month 3 months 6 months 1 year</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td>5 7.5 10 20</td>
</tr>
<tr>
<td>7.5</td>
<td></td>
<td></td>
<td>3 months 6 months 1 year</td>
</tr>
<tr>
<td>&gt;2</td>
<td>% Time</td>
<td>% Time</td>
<td>% Time</td>
</tr>
<tr>
<td>&gt;5</td>
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<td>&gt;7.5</td>
<td></td>
<td></td>
<td>&gt;5 &gt;7.5 &gt;10 &gt;20</td>
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White et al, JPEN 2012
Effect of Malnutrition on Surgical Complications

N = 100 patients


Increased risk of post-surgical complications

Pre-existing malnutrition increases risk for post-surgical complications by 2- to 5-times.

Surgery is a sport – train!

Goal: Increase / maintain muscle mass to improve surgical outcomes


Evidence for Preoperative Pulmonary Exercise

Source: Dronkers et al. Clin Rehabil 2008 vol. 22 no. 2 134-142
Quit Smoking to Reduce SSI

- The odds ratio for SSI in smokers is 1.51 (95%CI, 1.20-1.90; P < .001)
- The odds ratio for SSI if smoking on the day of surgery is 1.96 (95%CI, 1.23-3.13; P < .001)

**Real World Application of Immunonutrition Preoperative Oral Supplements: The Strong for Surgery Project**

- Elective Colorectal Procedures w/ anastomosis
- Composite Adverse Event Rate (Reintervention, Infection, Anastomotic Leak and/or Death)
  - No preoperative supplements 9.4%
  - Preoperative immunonutrition 7.1%
  - Did not reach statistical significance
- Length of Stay improved with immunonutrition


**The Power of Oral Nutritional Supplements**

High protein oral vs. placebo.

Primary Endpoint was readmission

Study Population:
- Congestive heart failure (CHF)
- Acute myocardial infarction (AMI)
- Pneumonia (PNA)
- Chronic obstructive pulmonary disease (COPD)

SSI Reduction – Gametime!

- Skin care is crucial to SSI reduction
Postoperative Skin Care

- Epithelialization occurs in 48 hours
- Dressings changed before 48 hours require sterile technique
- Most wounds ok for gentle soap/water shower (not bath/soak) after 48 hours

Wound Healing and Abdominal Core Health

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Topics Today

- General concepts of wound healing
- Practical guide to wound infection
- Abdominal Core Health

GENERAL CONCEPTS OF WOUND HEALING
Phases of Wound Healing

Characteristics of the Phases

- Inflammation  ->  Exudate
- Proliferation  ->  Granulation
- Maturation  ->  Contraction
Clinical Implications

- 1 week postop -> protect incision from excessive stretching/moisture
- 2-3 weeks postop -> increase activity
  - ***use pain as your guide

PRACTICAL GUIDE TO WOUND INFECTION
Surgical Site Infection


Surgical Site Occurrences

- Include all SSIs
- Expand to include other wound events
  - Wound cellulitis
  - Non-healing incision
  - Fascial disruption
  - Skin/soft tissue ischemia
  - Skin/soft tissue necrosis
  - Serous/purulent drainage
  - Stitch abscess
  - Seroma/hematoma
  - EC fistula
When Do SSOs Occur? Not Just 30 Days!


How Do You Recognize a Wound Infection?

- Erythema, heat, swelling, pain…and drainage
- Sometimes can be difficult to differentiate normal postop inflammatory phase of wound healing vs an infection
- Best approach is to follow incision over time
How Do You Treat a Wound Infection?

- Oral antibiotics for wound cellulitis (consider patient risk factors)
- If anything more severe->needs wound opening and local wound care
  - Local wound care – BID packing with iodoform gauze, BID damp to dry with Kerlix, negative pressure dressing
- If signs/symptoms of sepsis->need aggressive treatment
  - Aggressive treatment: admission, IV antibiotics, operative debridement, prosthetic removal
- If any doubt or concern->talk you your proceduralist
  - Communication is key for effective postoperative care; ***PARTNERSHIP
ABDOMINAL CORE HEALTH
Abdominal Core Health

**Spectrum of Disease**

- Hernia
- Chronic Pain
- Back
- Diastasis
- Intrinsic Pathology
- Pelvic Floor

**Patient Experience**

- Symptom Based Decisions
- Quality of Life Optimization
- Tailored Management
- Rehabilitation
- CQI

- Symptom Based Decisions
- Preoperative Optimization
- Tailored Operation
- Rehabilitation
- CQI
Center for Abdominal Core Health

Abdominal Core Health
Spectrum of Disease

Hernia  Chronic Pain  Back
Diastasis  Intrinsic Pathology  Pelvic Floor
Common Themes To All Hernias

- Management based on symptoms
  - Exceptions: femoral hernias in women, Spigelian hernias
- Diagnosis made by physical exam
  - Adjuncts can help (CT/US->ventral and femoral; US->inguinal)
- Continuum from normal->hernia can make diagnosis challenging
Incarceration and Strangulation

- Incarceration (opposite: ‘Reduceable’)
  - Chronic
  - Acute
- Strangulation
  - Incarceration with ischemic or functional compromise
  - Acute

Ventral Hernia

Henry Gray (1918) Anatomy of the Human Body
Bartleby.com: Gray's Anatomy, Plate 392
Author: Henry Vandyke Carter
Ventral Hernia

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<tr>
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<th>Acquired</th>
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<tbody>
<tr>
<td>• Midline</td>
<td>• Incisional</td>
</tr>
<tr>
<td>• Umbilical</td>
<td>• Subxyphoid</td>
</tr>
<tr>
<td>• Epigastric</td>
<td>• Suprapubic</td>
</tr>
<tr>
<td>• Hypogastric (rare)</td>
<td>• Traumatic</td>
</tr>
<tr>
<td>• Lateral</td>
<td></td>
</tr>
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<td>• Spigelian</td>
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Choices for Repair

- Open vs Minimally Invasive (robotic or laparoscopic)
- Location of mesh
- Type of mesh
Goals of Repair

• Improve quality of life and overall well being
• Minimize risk of recurrence (chronic disease?)

Inguinal Hernia and Myopectineal Orifice
### Types of Hernia in This Region

- Inguinal hernia
- Femoral hernia
- Obturator hernia

### Choices for Repair

- Open vs Minimally Invasive (robotic or laparoscopic)
- Open – mesh based or tissue based
- Special situations
  - Open infra-inguinal approach to femoral hernia
  - Laparoscopic approach to obturator hernia
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