What's Intestinal Rehabilitation???

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Objectives

• Define intestinal failure and intestinal rehabilitation
• Discuss types of patients qualifying for IRTP
• Review common anatomical configurations in intestinal failure
• List treatment options of intestinal failure
Intestinal Rehab and Transplant Program (IRTP)

Founded in 2001 for the purpose of enhancing absorptive capacity, improving nutritional status, and reducing the need for PN through the use of:

- Diet
- Additional fiber
- Oral rehydration solutions
- Specialized nutrients
- Medications
- Enteral nutrition
- Growth factors
- Reconstructive surgery
- Intestinal or Multivisceral Transplant
Intestinal Failure

• The loss of absorptive capacity of the small bowel secondary to obstruction, dysmotility, inflammation, infection, surgical resection, congenital defect or mucosal disease.

• Presenting features may include chronic abdominal pain, chronic diarrhea, dehydration, electrolyte abnormalities, micronutrient imbalance and malnutrition.

Candidates for IRTP

• *Short Bowel Syndrome*

• Malabsorption disorders:
  – Refractory Crohn’s, Celiac, UC
  – Complications post gastrectomy or bariatric surgery
  – Scleroderma, FAP/Desmoids
  – Radiation enteritis
  – Post-op colorectal patients with High output stoma

• Long-term HPN patients with frequent line sepsis

• Chronic diarrhea, dehydration, electrolyte imbalance and weight loss
Short Bowel Syndrome

Short Bowel: Anatomical and/or functional loss of small bowel resulting in less than 200 cm of jejunum-ileum (distal to the Ligament of Trietz)

Duodenum: ~ 30cm
Jejunum: ~ 150cm
Ileum: ~ 300cm
Colon: ~150cm
Overview of the Small & Large Bowel

- SB length: 365-600 cm
- Nearly all nutrient absorption within first 150 cm SB
- Up to 80% CHO + fat absorbed in first 70 cm
- Majority of fluids consumed & secreted are re-absorbed in first 100 cm of jejunum
Areas of Nutrient and Fluid Absorption

**Duodenum**
- Amino acids
- Iron
- Carbohydrates

**Jejunum**
- Carbohydrates
- Fatty acids
- B-Vitamins
- A-D-E-K
- H₂O & Na

**Ileum**
- H₂O & Na
- B₁₂
- Bile acids

**Colon**
- H₂O & lytes
- Bile acids

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Ileocecal Resection

- Adequate calorie and fluid absorption if $\geq 60$ cm jejunum to entire colon
- Malabsorption of bile salts, vitamin $B_{12}$
- Poor jejunal adaptation
- Rapid intestinal transit
- Small bowel bacterial overgrowth

Mechanisms of Malabsorption Post Bowel Resection

• Rapid gastric emptying/Rapid intestinal transit
  – Regulated by hormones released in distal small bowel and colon
  – Food has less time in contact with enzymes for digestion and with mucosa for absorption

• Gastric acid hypersecrection
  – Occurs immediately post-resection and continues for up to 6 mos

• Loss of ileocecal valve

• Loss of colon
  – Colon can absorb up to 5 L of excess fluid daily

• Loss of bile salt pool
Fluid Secretion and Absorption

- Ingestion: 2000 mL/d water
- Saliva: 1000 mL/d
- Bile: 1000 mL/d
- Gastric secretions: 2000 mL/d
- Intestinal secretions: 1000 mL/d
- Pancreatic secretions: 2000 mL/d
- Small intestinal absorption: 7500 mL/d
- Colon absorption: 1000-3000 mL/d
- 150-200 mL/d water excreted

Ingestion + secretion = 9 L
Absorption = 8.8 L
Hyperosmolar (High Sugar) Diet
Conditions Interfering with GI Function

- Bowel resection
  - Crohn’s disease
  - Mesenteric ischemia, abdominal trauma
  - Bypass surgery (obesity, cancer)

- Infection
  - Intra-abdominal abscess
  - C diff enteritis
  - Small bowel bacterial overgrowth

- Inflammation/injury
  - Active Crohn’s disease
    - Strictures, fistulas
Complete Enterectomy

- The surgical removal of the majority of intestines due to disease or ischemia.
- Generally <50cm SB remaining to a jejunostomy or drainage tube
- Often requiring gastric decompression tube
Enterectomy: Extensive Bowel Resection

- Large fluid losses
- Nutrient malabsorption
- Poor jejunal adaptation
- Acid hypersecretion
- Rapid gastric emptying
- Rapid intestinal transit
- ≥100 cm SB to avoid PN

Management of Post-Enterectomy Patients

• Will need long-term PN and possibly additional IVF
• Reduce oral hypotonic fluid to < 1000 mL/day
• Eliminate all other fluids, let the PN do its job
• Greatly limit oral food intake (one starch PO TID)
• Separate solids from liquids
• Proton Pump Inhibitors
• Octreotide
• Ethanol Lock
• Transplantation upon PN failure
Bowel Length and PN Dependency in SBS

High risk for long-term home PN if…

- < 30 cm SB to entire colon
- < 65 cm jejunum to partial colon
- < 100 cm SB without colon
IRTP Evaluation – Assessment - Documentation

2-3 hrs for initial assessment, 1 hr for follow up

- Remaining anatomy
  - Recent GI testing
  - Surgical reports

- Diet history
  - Oral intake
  - TPN, EN, IVF

- Bowel function
  - Quantitative
  - Qualitative

- Medications
  - Current vs. past

- Weight history

- Labs/Physical Exam
  - Vitamins/Minerals/Electrolytes
  - Hydration Status

- Assessment
  - Nutrition/medical status

- Care Planning
  - Extensive diet counseling
  - Enteral/parenteral nutrition
  - Vitamin/mineral/electrolyte repletion
  - Medications to enhance absorption
  - Further GI testing
  - Restorative surgery
  - Referral for transplantation
Optimal Management of Intestinal Failure

Gastroenterologists

IRTP Dietitians

HPN Nurses

Colorectal Surgeons

Pharmacists

Social Workers

Colorectal Dietitians

Transplant Surgeons

Case Managers

Wound & Ostomy Nurses

Colorectal Nurses

PAs & NPs

HPN Dietitians