

ADVANCED LEADERSHIP PROGRAM

Elevated Leadership Tools for Advanced Leaders

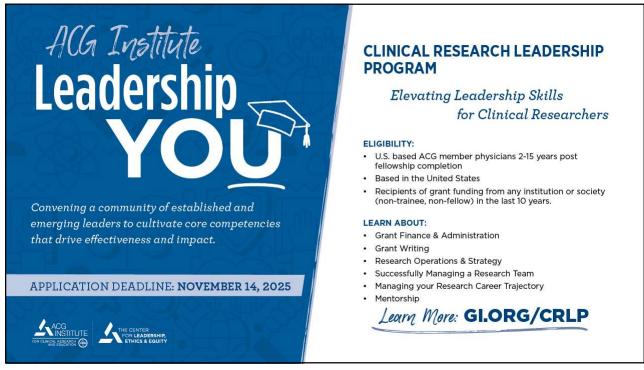
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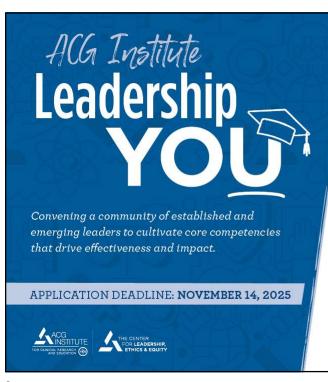
- U.S. based ACG member physicians 10-20 years post fellowship completion
- Based in the United States

LEARN ABOUT:

- · Impactful Networking
- · Financial Literacy for the Physician Leader
- · Actionable Emotional Intelligence
- · Conflict Resolution
- · Navigating Career Transitions
- · Running a Meeting Like a Boss

Learn More: GLORG/ALP





EARLY CAREER LEADERSHIP PROGRAM

Elevating Great Doctors into Great Leaders

ELIGIBILITY:

- U.S. based ACG member physicians 1 5 years post fellowship completion
- · Based in the United States

LEARN ABOUT:

- Effective Leadership
- · Impactful Networking
- · Emotional Intelligence
- Group Dynamics
- Team Building

Learn More: GI.ORG/ECLP

3







ACG/ASGE Epidemiologic Research Award in Gastrointestinal Endoscopy

- \$50k/1- or 2-year award
- To fund research using the GIQuIC registry

•Request a Letter of Support from GIQuIC by November 3

•Email: research@giquic.org







7













ACG Virtual Grand Rounds

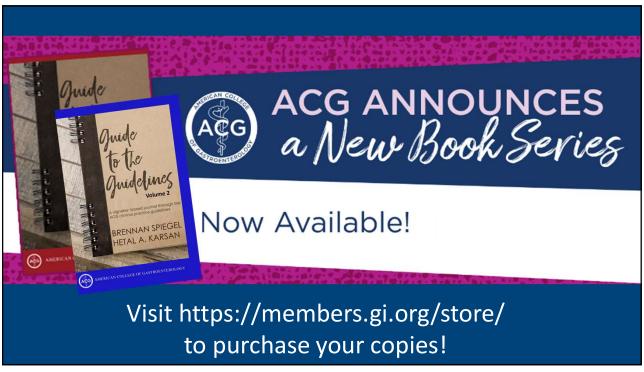
Join us for upcoming Virtual Grand Rounds!

Week 41 – Thursday, October 9, 2025

ACG Clinical Guideline: Management of Crohn's Disease in Adults
Faculty: Gary R. Lichtenstein, MD, FACG
Moderator: Edward V. Loftus, Jr., MD, FACG
At Noon and 8pm Eastern

Week 42 – Thursday October 16, 2025
The Role of Social Determinants of Health in Gastroenterology Care
Faculty: Costas H. Kefalas, MD, MMM, MS-PopH, FACG
Moderator: Sonali Paul, MD, FACG
At Noon and 8pm Eastern

Visit gi.org/ACGVGR to Register









Advanced therapies for short bowel syndrome

Shirley C. Paski, MD, MSc Staff Gastroenterologist, Cleveland Clinic



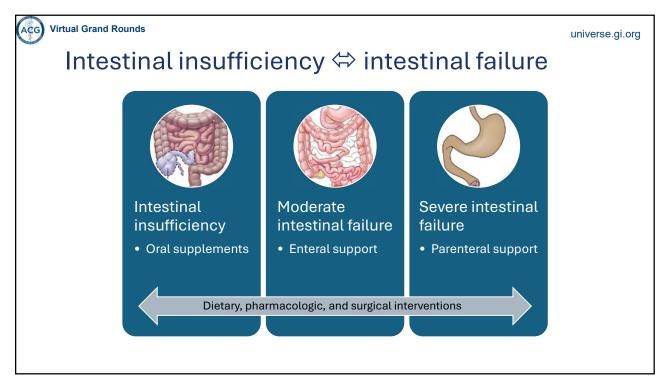
ACG Virtual Grand Rounds

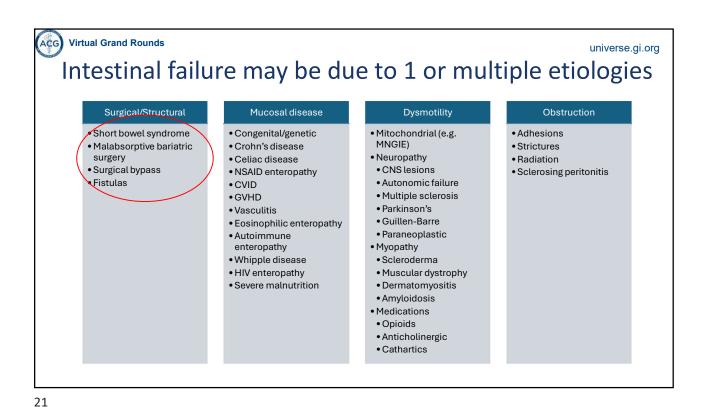
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56 yo. F with structuring, penetrating enterocolonic Crohn's disease

- s/p extended R hemicolectomy and multiple small bowel resections, most recently 9-2024
- Current anatomy: upper GI with 55cm proximal small bowel anastomosed to distal transverse colon thru rectum/anus. No ICV.
- On TPN since 8-2024, currently 1.8L daily containing 1350 kcal/d
- Crohns disease in endoscopic remission on risankizumab

19





ACG **Virtual Grand Rounds** universe.gi.org Estimate fluid needs based on remnant bowel Type II Type I Type III Enterostomy Jejuno-colic Jejuno-ileocolic · Fluid loss: high • Fluid loss: moderate-· Fluid loss: mild high Poor jejunal Potential for ileal • Poor jejunal adaptation adaptation adaptation Rapid transit and Fat malabsorption hypersecretion Rapid transit and calcium oxylate stones SIBO Goulet O et al. Current Concepts of Intestinal Failure 2016 pp1-22. Chakrabarty I & Burns D. Clinical Mgmt Intestinal Failure 2012 pp13-30



SBS diet and lifestyle

- Separate fluids from solids.
- Eat every 2-3 hours.
- Avoid concentrated sweets. Limit sugars to 10g per serving.
- · Chew well.
- Sip (not slurp) fluids between meals, ideally isotonic fluids and ORS

Oral/enteral nutrition requirements are higher in malabsorption

23

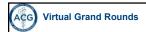


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SBS basic medical management

- Electrolyte replacement
- Anti-diarrheals (loperamide, diphenoxylate → codeine, DTO)
- PPI, H2B
- Soluble fiber (psyllium)
- Anti-secretory (clonidine, somatostatin analogue)
- PERT, bile acid sequestrants (limited roles)
- SIBO treatment

Manage primary GI disease



Nutrition support indicated when nutrition needs cannot be met orally

Enteral support

- Gastric/post-pyloric
- Jejunal

Parenteral support

- IV hydration
- Parenteral nutrition

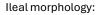
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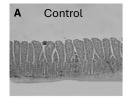


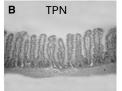
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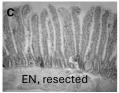
Trophic factors facilitate parenteral support weaning

- Growth hormone
- · GLP-2 agonists
 - Secreted from L-cells in ileum & proximal colon
 - · Stimulated by intraluminal carbs & fat
 - · "Ileal break"
 - · Slows gastric emptying & intestinal transit
 - · Reduces gastric secretion
 - Stimulates growth of small & large intestine
 - · Increases mucosal blood flow
 - · Increases epithelial proliferation
 - · Inhibits apoptosis











Martin GR et al., AJP 2004;286:G964





- Teduglutide is a recombinant GLP-2 analogue
 - Alanine → Glycine
 - ∘ Resistant to dipeptidyl peptidase-4 (DPP-4) degradation; t½ 7mins → 2hrs
 - Same trophic, motility, and absorptive effects

Jeppesen PB et al. Gut 2005;54:1224.

27

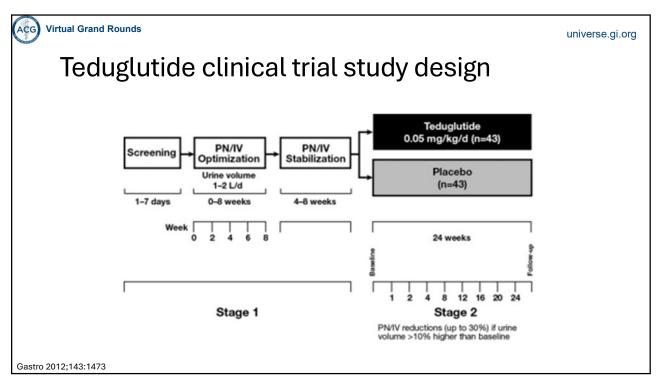


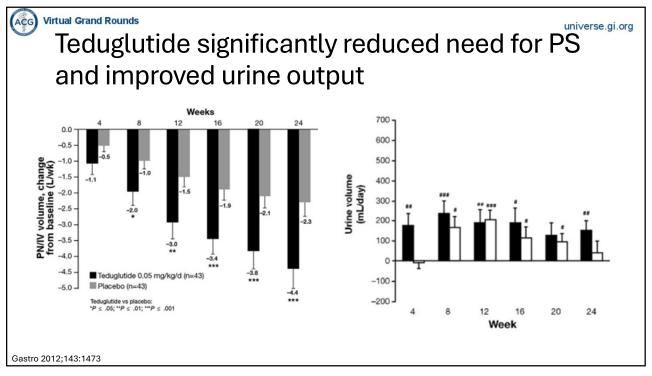
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Features of patients who weaned off TPN

- 11/173 patients treated by teduglutide were weaned off TPN
 - 63% were able to wean off ≥1-day TPN
- Healthy remaining bowel
 - 5 with mucosal disease (Crohn's, radiation enteritis)
 - 6 with infarction/injury
- PN volume <7L/week at baseline (9/11)
- Preservation of colon (8/11)

O'Keefe et al., Clin Nutr 2012

31

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		Control	Teduglutide	Р	
	Outcome, pts (n)	3081	269		
	Still on PN	49.5%	63.2%		
Real world	Weaned off PN	18.2%	30.5%	<0.001	
teduglutide	Deceased	21.8%	4.8%		
	Lost to follow up	10.5%	1.5%		
experience:	PS volume (ml), pts (n)	2987	252		
higher %	Weekly, median (IQR)	12, 292 (10,500)	9000 (9000)	<0.001	
	Daily, median (IQR)	1756 (1500)	1285 (1265)	<0.001	
wean off TPN and lower %	Days of PS/wk, pts (n)	2992	254		
	Median (IQR)	7 (2)	5 (3)	<0.001	
	Type of oral feeding, pts (n)	1277	88		
death	NPO	5.6%	0		
	Only water	0.5%	0	<0.001	
	Clearliquids	1.7%	0		
	Small amount of food/drink	23.3%	6.8%		
	Unrestricted food/drink	68.7%	93.2%		
Clin Nutr 2025;47:54-67					

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Some can maintain PN volume reduction after discontinuing teduglutide

- Follow-up after teduglutide discontinuation:
 - 15 had rapid weight loss, treated with increased PN
 - 15 patients maintained stable BMI & PN volume
 - 3 had discontinued TPN during study and remained off
 - 7 had further PN volume reductions
- · Predictive features:
 - Longer small bowel & colon
 - Lower PN volume reduction on drug
 - Lower BMI

Compher et al., JPEN 2011;35:603.

33

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Teduglutide improved QOL vs controls at 24 wks.

	TED			Placebo			D b/w		
	Median baseline	Median week 24	Change	Р	Median baseline	Median week 24	Change	Р	P b/w groups
GI symptoms	4.9	3.9	-1.2	0.007	4.1	3.3	0	0.83	0.116
Sleep	5.1	3.3	-0.9	0.003	4.2	3.3	0	0.527	0.0811
Leisure activity	5.0	3.3	-0.9	0.024	4.6	4.3	0	0.972	0.123
Everyday activity	4.8	33.8	-0.9	0.007	5.0	4.3	-0.3	0.157	0.499
Energy	5.0	4.7	-0.9	0.051	4.8	4.5	0.1	0.476	0.455
MSK symptoms	4.4	3.6	-0.6	0.002	3.8	3.6	-0.1	0.445	0.240
Social life	5.4	4.0	-0.5	0.018	5.2	3.9	-0.1	0.469	0.301
Physical health	5.2	4.1	-0.4	0.021	4.4	3.9	-0.4	0.325	0.354

Clin Nutr 2013;32:713



Warnings and Precautions (REMS)

Neoplastic growth

- Pre-treatment colonoscopy and polypectomy
- Repeat colonoscopy at 1 year
- Screening/surveillance prn, minimum q5 years
- Contraindicated in colon cancer, GI malignancy

Intestinal obstruction

· Hold teduglutide

Biliary & pancreatic

• Baseline bilirubin, alk phos, lipase, amylase; then q6 mo.

Volume overload

 Regular volume assessment, TPN volume adjustment

Increased absorption of concomitant oral medication

Benzodiazapines, psycotropic toxicity reported

Product Monograph

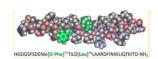
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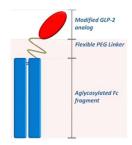


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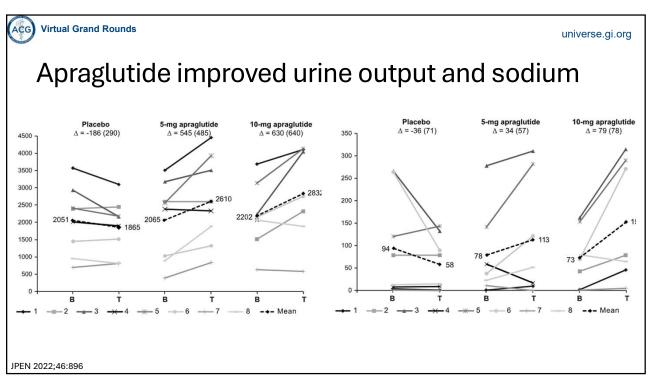
Upcoming GLP-2 agonists & combination GLP-1/GLP-2 agonist

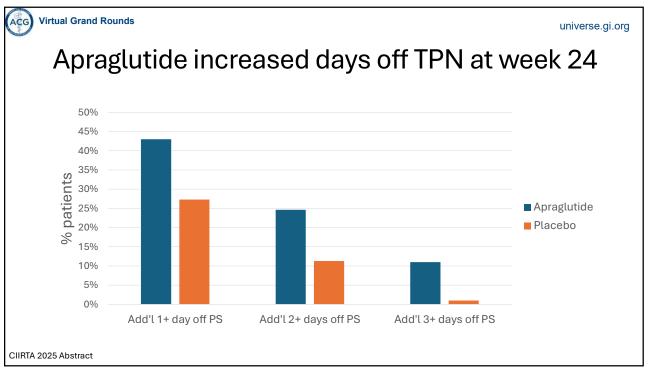
- Apraglutide
 - o GLP-2 modified positions 2, 10, 11, and 16
 - GLP-2 agonist + selective GLP-1 and GCG agonist
 - Weekly injection
- · Glepaglutide
- HM15912
 - Modified GLP-2 analog conjugated with human IgG Fc fragment via flexible linker
 - Monthly injection
- HM15912/efpeglenatide
 - GLP-2 analog/GLP-1 receptor agonist

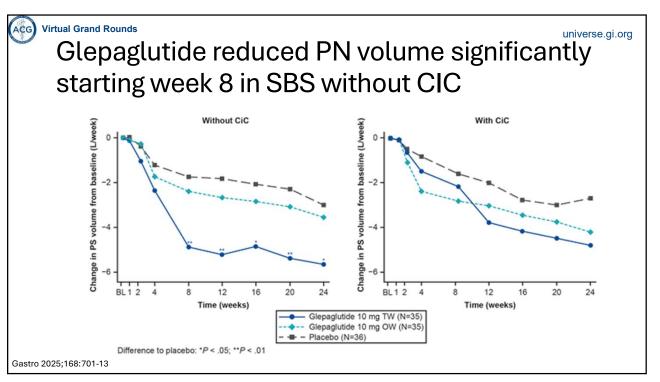


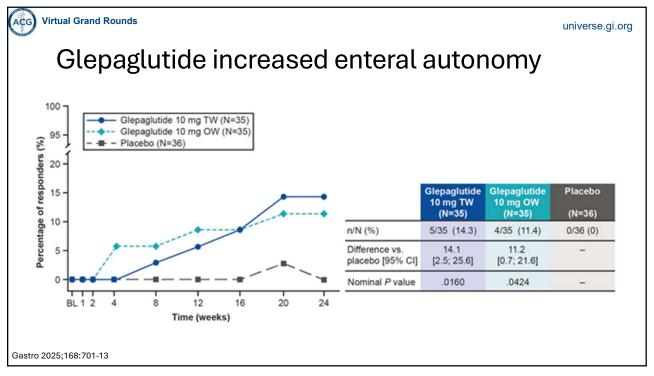


Wisniewski et al J Med Chem 2016;59:3129. Choi et al ESPEN 2022







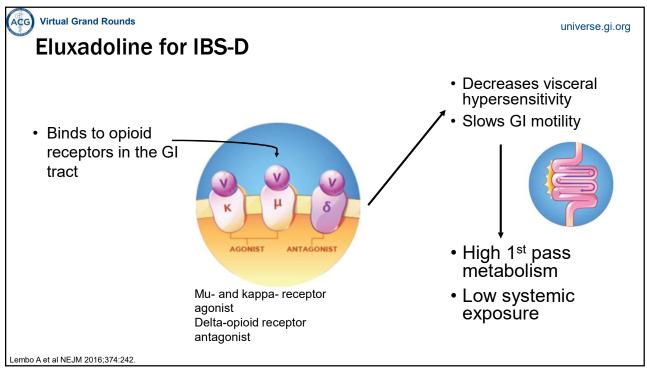


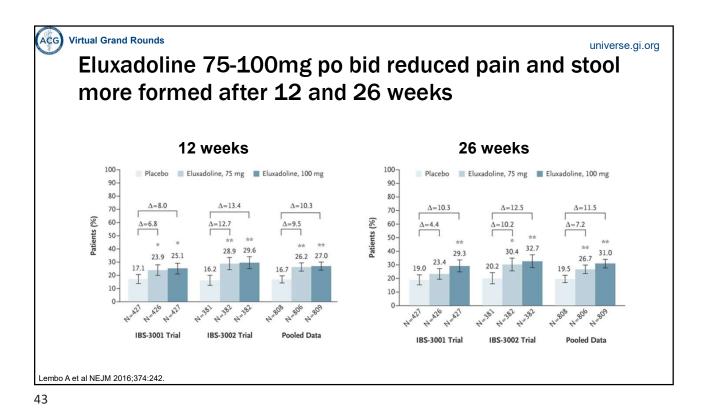


Additional medications (off label)

Medication	Mechanism of action	Current Indication	Usual Dosing
Eluxadoline	Mixed opioid effects on GI tract	IBS-D	100mg po bid with food
Exenatide Liraglutide	GLP-1 agonist	Type 2 diabetes, metabolic syndrome	5mcg subQ bid (Byetta) 2mg subQ every 7 days (Bydureon) 0.6-1.8mg subQ daily (Liraglutide)
Crofelomer	Blocks Cl- secretion via CFTR & CaCC	Non-infectious HIV diarrhea	125mg po bid

41





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Eluxadoline cautions & contraindications

Adverse effects

- Nausea, constipation, abdominal pain in 5.8-8.6%
- Pancreatitis in 0.3%

Contraindications

- Without a gallbladder
- Known/suspected biliary obstruction, SOD dysfunction, Hx pancreatitis, structural disease of the pancreas
- · Alcoholism or 3+ drinks/d
- · Severe hepatic impairment
- Hx chronic/severe constipation, mechanical bowel obstruction

Lembo A et al NEJM 2016;374:242. Product monograph



GLP-1 agonists

- GLP-1 is produced by L-cells in the ileum that regulate proximal gut transit (ileal break)
- · Enhance intestinal growth via crypt fission
- Enhances insulin secretion, inhibits glucagon secretion
- Extensive ileal resection → GLP-1 levels may be deficient
- · Retained gastric contents associated with anesthesia complications
- · Currently indicated for type 2 diabetes, metabolic syndrome, and weight loss

Drucker JCI 2024;134:e175634. Hashah et al Clin Gastro Hep 2023

45



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Exenatide 5mcg subQ bid improved bowel function in SBS

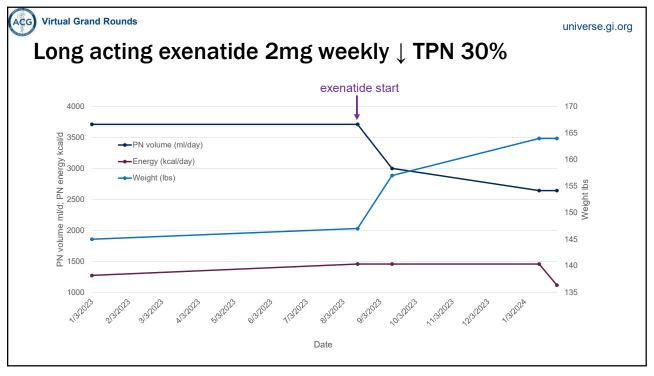
Before exenatide	Immediately after exenatide
Bowel movement within 10 mins of eating	Bowel movement 3-6 hours after eating
TPN in 3 patients	No TPN
Malnutrition without TPN in 3 patient	No malnutrition despite not having TPN
Urine frequency 1-2 times per day	Urine frequency 4-6 times per day plus increased volume
Repetitive gastric contractions in 3 patients	Reduced gastric contractions

Kunkel et al. Neurogastroenterol Motility 2011;23:739

ACG Virtual Grand Rounds universe.gi.org Liraglutide 0.6-1.8mg sc daily reduced jejunostomy output and improved absorption in 8 weeks Measure Baseline (mean) 8 wks liraglutide (mean) P Wet weight PN 3721 ml/d 3671 ml/d 0.79 Wet weight diet 2743 g/d 2733 g/d 0.83 Wet weight ostomy output 3249 g/d 2775 g/d 0.049 Wet weight absorption -42 g/d -506 g/d 0.05 **Diuresis** 1543 g/d 2308 g/d 0.02 Ostomy output sodium 309 mmol/d 272 mmol/d 0.04 Urinary sodium 132 mmol/d 197 mmol/d 0.03 Energy ostomy absorption 3243 kJ/d 4146 kJ/d 0.02 Carbohydrate absorption 53 ± 23% 62 ± 21% 0.002 Lipid absorption 20 ± 24% 30 ± 24% 0.09 Protein absorption 24 ± 25% 31 ± 28% 0.15

Hvistendahl et al JPEN 2018;42:112.

47





GLP-1

Adverse effects

- Nausea, vomiting, GI dysmotility
- Hypoglycemia
- Pancreatitis
- Acute gallbladder disease
- · Drug-induced ITP
- Injection site and hypersensitivity reactions

Contraindications

- Personal or family Hx of thyroid Ccell tumors (including medullary thyroid cancer), patients with MEN 2
- Hx of drug induced ITP from GLP-1 products
- Hx of hypersensitivity reaction to GLP-1 or product components

Product monograph.

49



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Crofelemer

- · Inhibits:
 - 1) Cyclic adenosine monophosphate (cAMP)-stimulated cystic fibrosis transmembrane conductance regulator (CFTR) chloride ion (CI) channel, and
 - 2) Calcium-activated Cl channels (CaCC) at the luminal membrane of enterocytes
- CFTR Cl⁻ channel and CaCC regulate Cl⁻ and fluid secretion by intestinal epithelial cells
- Crofelemer blocks Cl_ secretion and associated diarrhea water losses and normalizes flow of Cl_ and water in Gl_ tract
- Currently indication: non-infectious diarrhea in patients with HIV on HAART



Crofelemer improved electrolyte and fluid balance in patient with SBS without colon

- 55yo F s/p multiple ileocolonic resections → type II SBS
- Diarrhea and malnutrition refractory to antidiarrheals, opioids, antibiotics, eluxadoline
- Crofelemer 125mg bid → tid → crushed
- Over 6-18 months, developed formed stool 2-3/d, weight gain

Powers W J Clin Gastroenterol Treat 8:086.

51



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Crofelemer is safe to use

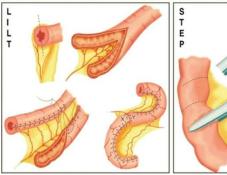
 Only contraindication is infectious diarrhea because it hasn't been tested in this population





Surgical management of short bowel syndrome

- Restore luminal continuity/motility
 - Fistula repair
 - Stricturoplasty
 - Re-connection of existing bowel
- Lengthening procedures
 - STEP Serial transverse enteroplasty
 - LILT Longitudinal intestinal lengthening and tapering





Goulet O et al. Current Concepts of Intestinal Failure 2016 pp1-2

53



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Imaging, motility and stool studies to help guide therapy

- · Gastric emptying time
- · Small bowel transit time
- Dilated bowel
- · Partial bowel obstruction
- · Colon transit studies
- · Endoscopy, enteroscopy, capsule endoscopy, colonoscopy
- Evaluation of primary GI disease activity
- · Stool studies



Positioning of therapies for intestinal malabsorption

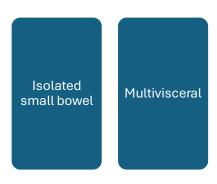
- Start with diet and lifestyle
 - No amount of medication can overcome gross excess consumption of free water/hyperosmotic beverages and a terrible diet
 - Physical activity to build/maintain lean body mass & strength
- Early resection, start PPI empirically
- Add anti-diarrheals ac meals and hs
- Assess appropriateness for anti-secretagogues and/or hormonal therapy
- Concurrent treatment of SIBO, PEI, micronutrient deficiencies, and surgical rehabilitation +/- intestinal transplant

55



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Intestinal transplant



Intestinal transplant indications:

- Intestinal failure associated liver disease
- Loss of central venous access of 2+ central veins
- 2+ catheter related sepsis
- 1+ line related fungemia, septic shock, or ARDS
- Recurrent severe dehydration despite IV fluid in addition to TPN
- Underlying disease with high morbidity (e.g. ultrashort bowel syndrome, microvillous inclusion disease)



Take Home Points

- 1. Intestinal malabsorption symptoms vary significantly based on GI anatomy, structure, motility, and GI disease.
- 2. Treat symptoms, nutritional deficits, and underlying disease
- 3. Start nutrition support if oral intake fails to meet nutrition requirements
- 4. Consider advanced therapies for patients needing parenteral support
- 5. Refer to a specialized center for nutrition & medical optimization, surgical management, and/or transplant evaluation

57



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Thank you!

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