



# Inflammatory Bowel Disease

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# Outline

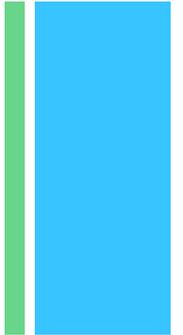
- Inflammatory Bowel Disease

- Nutrition and IBD

- Case Study

  - Initial Assessment

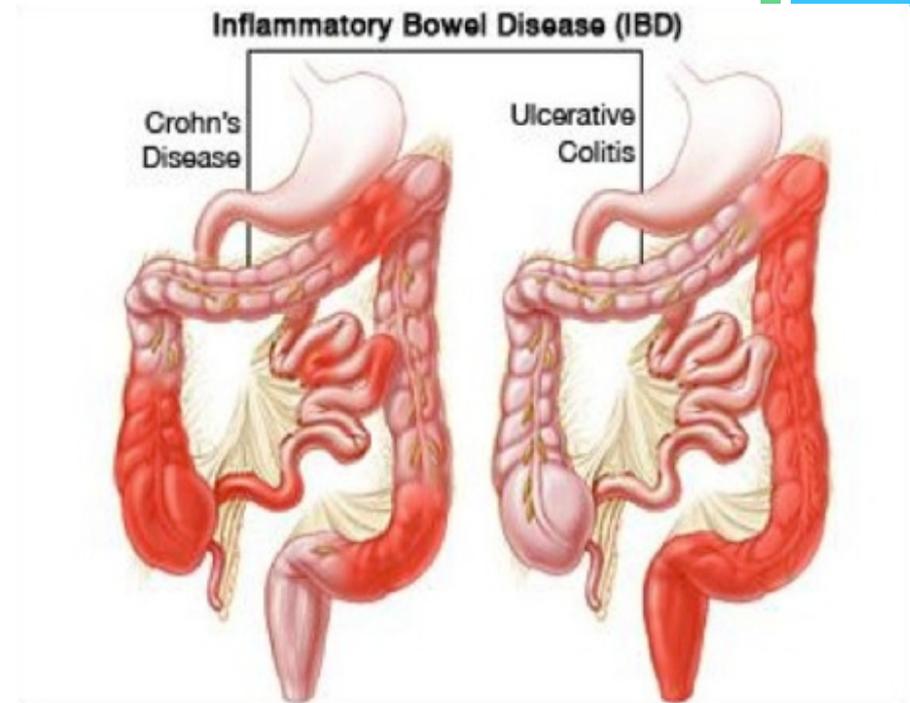
  - Nutrition Follow Up





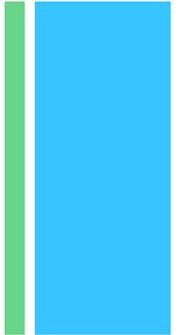
# Inflammatory Bowel Disease

- Inflammatory bowel disease (IBD) involves chronic inflammation throughout the GI tract.
  - Crohn's Disease
  - Ulcerative Colitis (UC)
  - Indeterminate Colitis
- Diagnosis:
  - EGD/Colonoscopy
  - Biopsies
  - Blood Work





# Inflammatory Bowel Disease

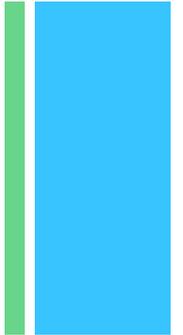


- Who:
  - IBD can affect children of any age
    - Peak incidence of IBD onset is between 15 – 25 years old
  - Affects males and females equally
- Causes:
  - Abnormal reaction of the body's immune system- once it's "turned on," it does not know how to "turn off" properly.
    - \*\*Genetics
    - Stress
    - Toxins/Antigens
    - Bacterial Overgrowth





# Inflammatory Bowel Disease

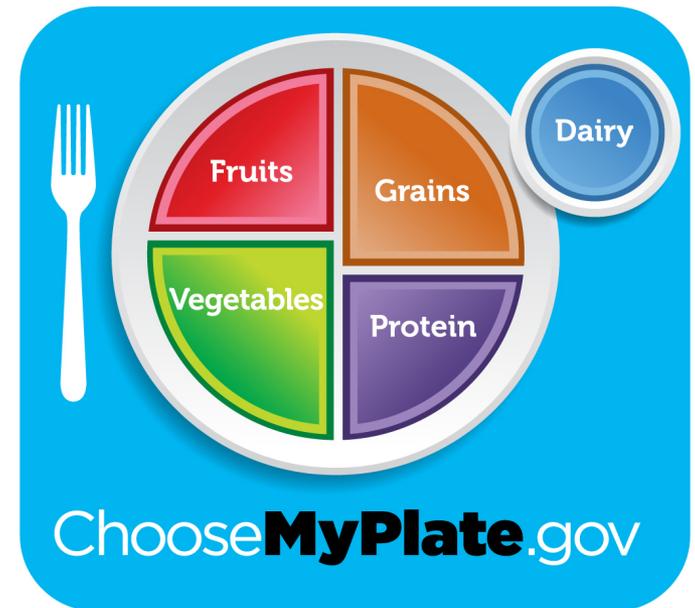


- Signs/Symptoms:
  - Abdominal pain, diarrhea, weight loss, GI bleeding.
  - Location of the inflammation
- Nutritional Implications: Malnutrition
  - Inadequate Oral Intake
  - Malabsorption
  - Increased Energy Needs
- Malnutrition → Impaired growth ☹️
- Treatment:
  - Corticosteroids
  - Ulcerative colitis can be cured by a total colectomy
  - No cure for Crohn's disease- May achieve prolonged remissions with diet, surgical intervention, and medical treatment.
    - 100% exclusive EN feeds can be used to induce remission



# Nutrition and IBD

- There is no specific meal plan for IBD
- During a Flare:
  - Low residue diet
  - Avoid “trigger foods” (sugar, artificial sweeteners, spicy foods, caffeine, lactose)
  - BRAT diet
  - Small, frequent meals
  - CAM
- During Remission:
  - Regular, balanced diet following MyPlate guidelines
  - Continue to avoid “trigger foods”

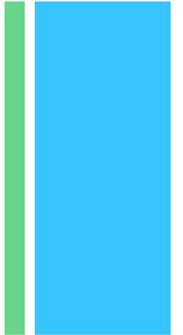




+ CASE STUDY



# Case Study Background



- KK is a 15 year old female
- PMH: No previous illnesses or hospitalizations
- Admitted 1/18/14- Presented with worsening abdominal pain, emesis x 12 days, diarrhea and fever
- Hx of constipation. Experienced lower abdominal pain, loose stools, hematochezia, and a reported 24-pound unintentional weight loss over the past two months.
- Patient with suspected IBD and development of sepsis.
  - No family hx of IBD

# + Pertinent Lab Values

Lab	Normal Range	1/22/14
Sodium	133 – 143 mmol/L	139
Potassium	3.3 – 4.7 mmol/L	3.4
Chloride	97 – 107	108 (H)
CO <sub>2</sub>	16 – 25	21
Blood Glucose	65 – 115	111 (H)
BUN	7 – 21	3 (L)
Creatinine	0.5 – 1.1	0.9
Calcium	9.3 – 10.7	7.4 (L)
Albumin	3.8 – 5.6	2.5 (L)
Ionized Calcium	1.12 – 1.37	1.25
Phosphorus	3.1 – 5.5	0.3 (L), 0.7 (L), 0.6 (L)
Magnesium	1.6 – 2.5	1.5 (L)



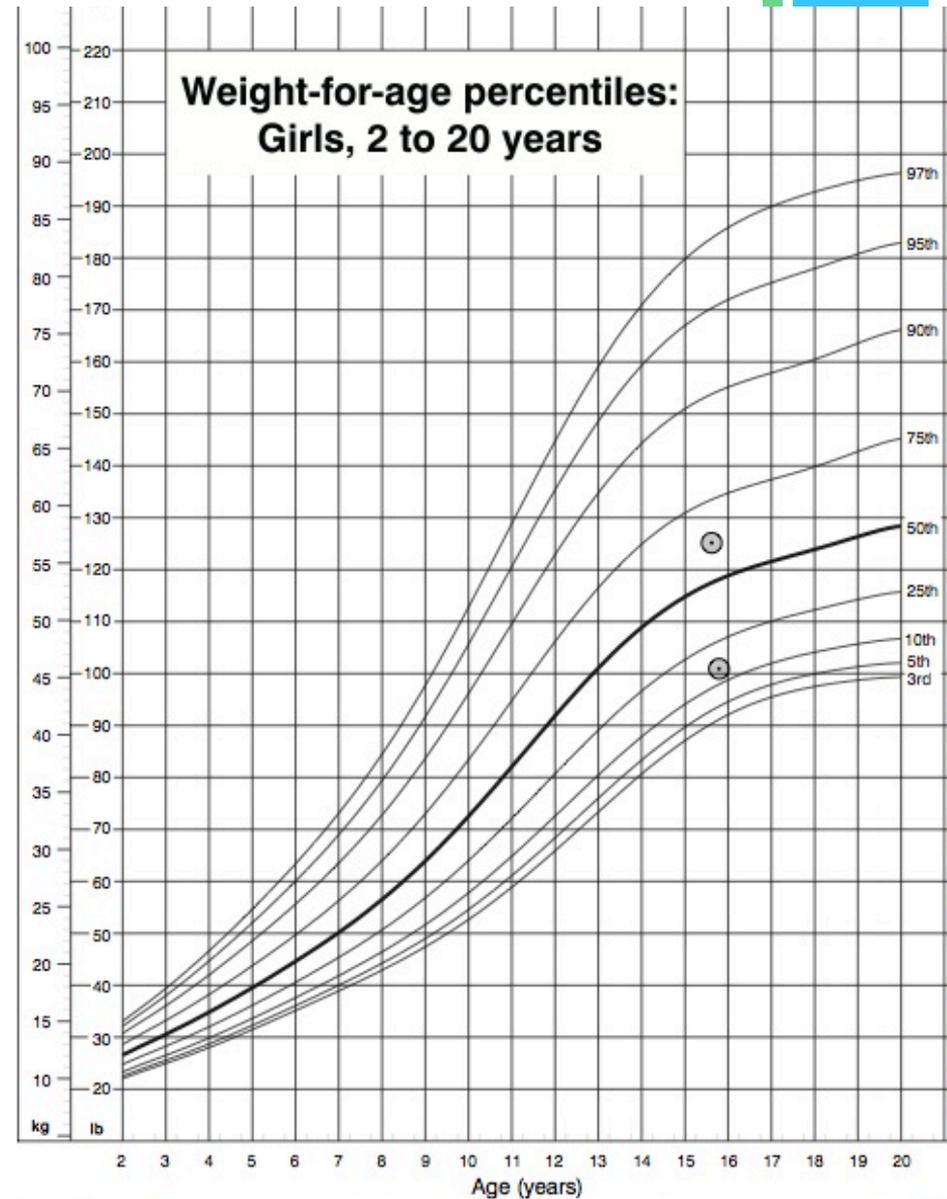
# Medications

Medication	Function	Possible Nutrition-Related Side Effects
Vancomycin	Antibiotic	Diarrhea
Magnesium Sulfate (PRN)	Repletion	Hypermagnesemia
Morphine (PRN)	Opiate (narcotic) analgesic	Nausea, Vomiting, constipation, diarrhea, loss of appetite, weight loss
Piperacillin	Antibiotic	Diarrhea, upset stomach, vomiting, unpleasant or abnormal taste, gas, constipation
Protonix	Proton pump inhibitor, anti-GERD	Nausea, vomiting, gas; may decrease absorption of iron and vitamin B12
Nalbuphine	Analgesic	Upset stomach, vomiting, dry mouth, stomach cramps, bitter taste
Zofran	Anti-nausea	Dry mouth, abdominal pain, constipation, diarrhea



# Weight-for-Age

- Reported Weight Two Months Ago:
  - 56.8 kg
  - 50<sup>th</sup> – 75<sup>th</sup> percentile
  - Weight Age: 18.5 years old
- Current Weight:
  - 45.8 kg
  - 10<sup>th</sup> – 25<sup>th</sup> percentile
  - Weight Age: 13 years old





# Stature-for-Age

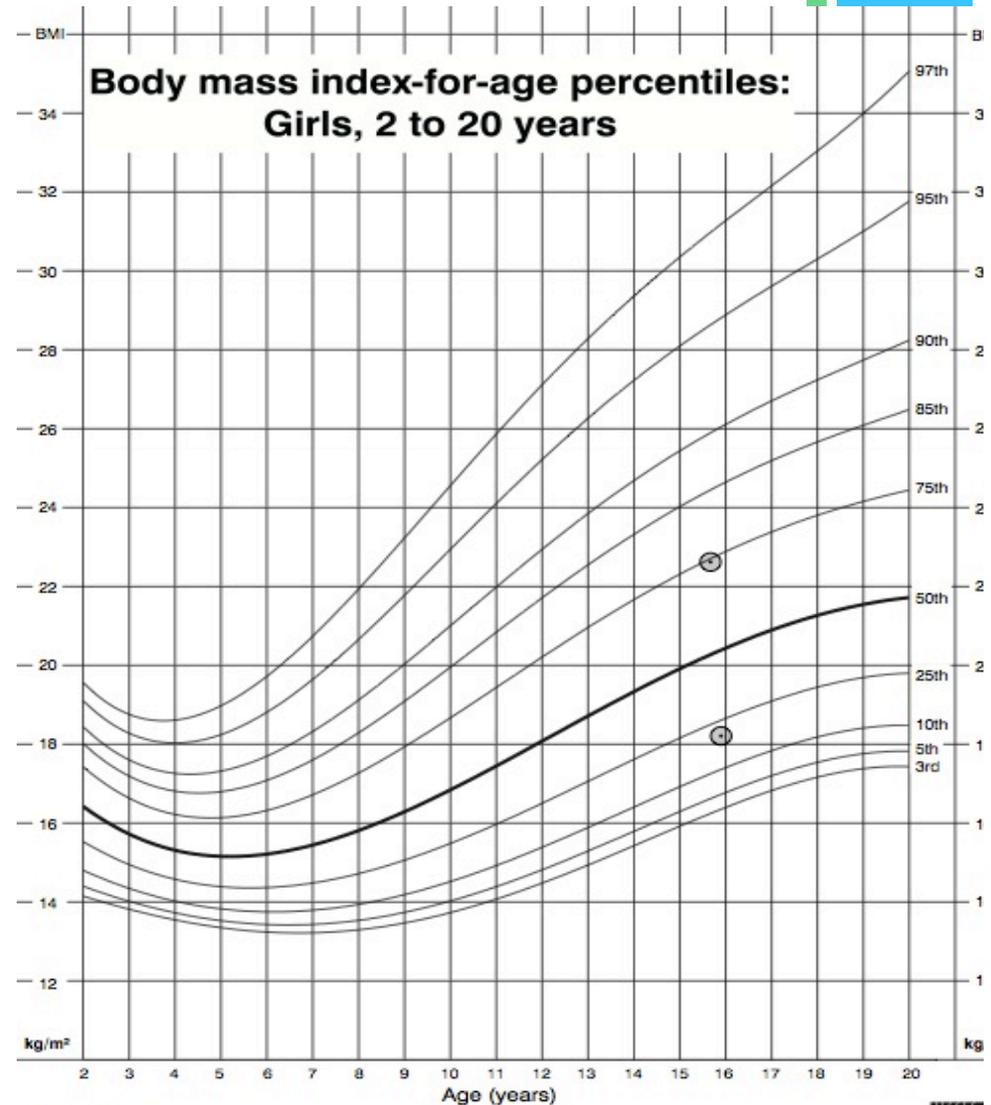
- Current Height:
  - 158.5 cm
  - 25<sup>th</sup> – 50<sup>th</sup> percentile
  - Height Age: 16.5 years old





# BMI-for-Age

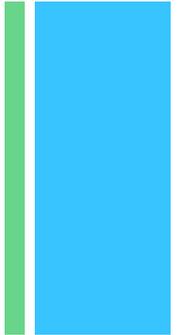
- BMI Two Months Ago:
  - 22.6 kg/m<sup>2</sup>
  - 50<sup>th</sup> – 75<sup>th</sup> percentile
- Current BMI:
  - 18.23 kg/m<sup>2</sup>
  - 10<sup>th</sup> – 25<sup>th</sup> percentile





# Diet History

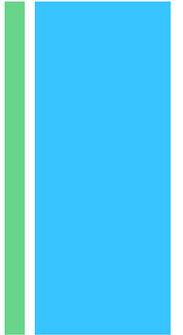
- Patient experienced emesis associated with food intake for 12 days prior to admission.
- Patient with increased fluid needs due to losses through high volume diarrhea and frequent emesis daily. KK was able to keep down some Gatorade, however, this is likely not meeting her estimated needs.
- Based on patient's report of poor intake prior to admission, unintentional weight loss, and admitting lab values, the patient's diet was inadequate for estimated macronutrient, micronutrient, and fluid requirements.





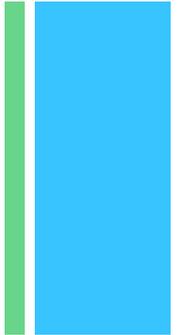
# PES Statements

- Altered GI function related to suspected IBD as evidenced by lower abd pain x 2 months, loose stools, hematochezia, and reported 24 lb unintentional wt loss.
- Inadequate oral intake related to nausea and vomiting (secondary to suspected IBD), as evidenced by reported poor intake x 12 days PTA.





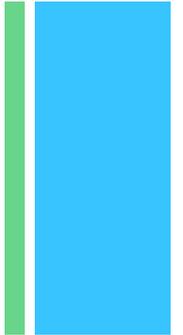
# Estimated Nutrient Needs



- **Kcals: 42 kcal/kg**
  - EER/age using IBW x 10% to account for inflammation associated with IBD
  - 34 kcal/kg while on TPN
- **Protein: 1.5 g/kg**
  - ASPEN recommendations/age for critically ill
- **Fluids: 2016 ml/day (44.02 ml/kg)**
  - Holliday-Segar Method



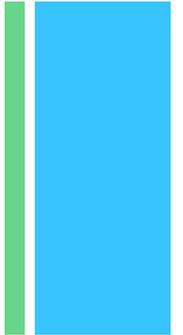
# TPN



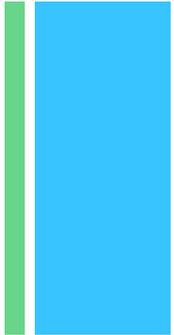
Date	TPN Order
1/22/14	Total Volume: 2020 mL/day Dextrose: 10% Protein: 2 gm/kg/day Lipid: 1 gm/kg/day (over 12 hours)



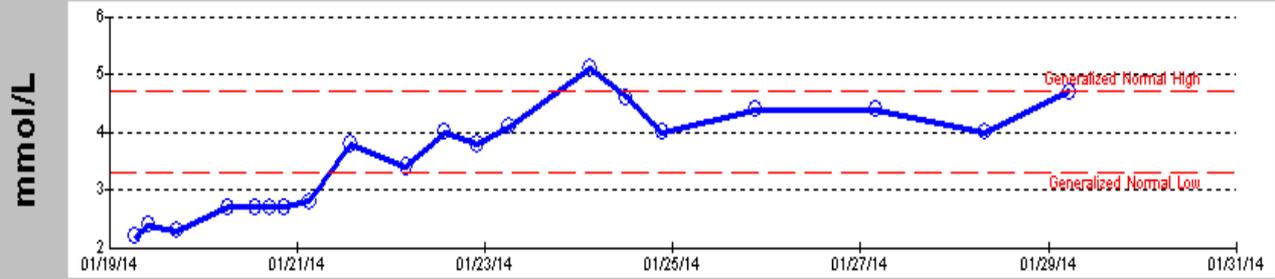
# Recommendations



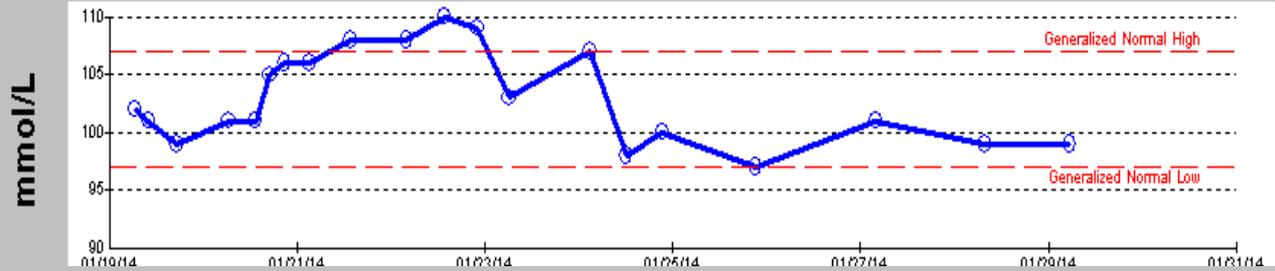
- As soon as medically appropriate, advance to low-residue diet as tolerated. RD available to provide education when needed.
- Continue TPN. Recommend 2,020 ml total fluid, D10%, 2 g/kg protein, 1 g/kg lipid to provide 33 kcal/kg.
- Will continue to adjust TPN per electrolytes. Continue to bolus as needed.
- Monitor BMP, Mg and Phos q daily until stable. Monitor CMP, TG, and Prealbumin q weekly while patient is on TPN.
- Monitor weight twice weekly. Goal weight gain is catch-up growth to the 50<sup>th</sup>-75<sup>th</sup> BMI/age percentile.



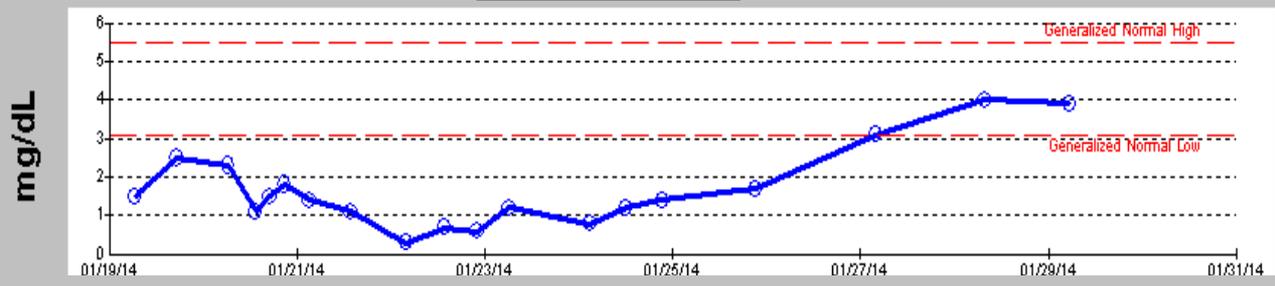
### Potassium result



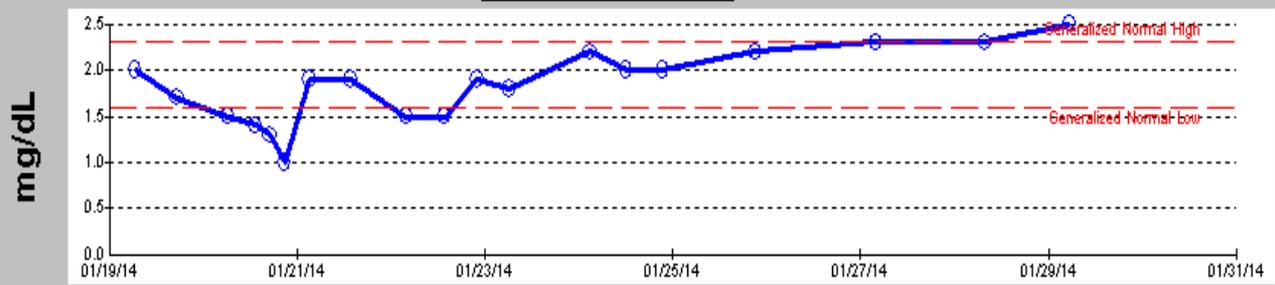
### Chloride result



### Phosphorus result



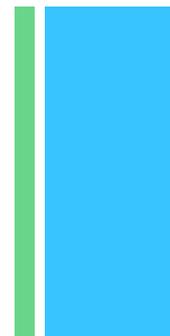
### Magnesium result





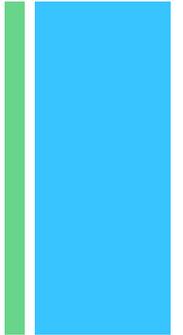
# Output

Date	Output
1/23/14	3550 ml total
1/24/14	4150 ml total 1650 ml stool
1/25/14	4150 ml total 1925 ml stool
1/26/14	6475 ml total 1975 ml stool
1/27/14	5865 ml total 3850 ml stool
1/28/14	3900 ml total 850 ml stool
1/29/14	2625 ml total 500 ml stool
1/30/14	1400 ml total 350 ml stool





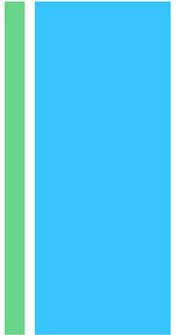
# Follow-Ups



- **1/28/14:** (6 days after initial assessment)-
  - Transferred from the PICU to the 7<sup>th</sup> floor
  - TPN x 8 days; NPO except ice chips since admission (10 days)
  - 5.5 kg weight gain since admission (likely related to hydration)
  - Currently replacing stool output >250 mL q 6 hours 1:1 with normal saline.
  - Fevers, abdominal pain, bloody stools
  - Planned EGD/colonoscopy today
  
- **1/30/14:** (2 days after follow-up)-
  - TPN x 10 days. Current TPN not meeting goal kcal needs as lipids were discontinued today due to elevated LFT labs; Cont. NPO since admission with only small sips of water and ice chips per GI recommendations.
  - Weight fluctuations likely due to fluid shifts.
  - Stool output improving with only 350 mL documented.



# References



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+ QUESTIONS??