

Small Bowel Obstruction and Complications of Enteral Feeding

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Patient Profile

- 75y old White male
- Transferred from Long Term Acute Care (LTAC) facility
- Chief complaints: Vomiting
 - With perceived nausea and abdominal pain
 - Patient is non-communicative
- Admitted to the hospital on January 22, 2011
- Primary Diagnosis: Small Bowel Obstruction
- Secondary Diagnosis: Malfunctioning PEG/J tube

Patient Profile

Medical History

- Type II diabetes
 - Gastroparesis
- Hypertension
- Congestive heart failure
- Cerebrovascular Accident
 - Dysphagia
- Alzheimer's disease
 - severe dementia, debility, and incontinence

Patient Profile

Medical History

- Fully ambulatory one year prior to this admission
 - Skin tear to his coccyx
 - Escalated into a sacral ulcer-- for which he continues treatment
- Concomitant decrease in overall health
- Patient now bedbound
- Receives feedings through PEG tube with Jejunal extension
 - Prolonged, documented history of:
 - Obstructions to the tube, leakage,
 - migration, and high residuals
 - replaced 16 times in the past year

Patient Profile

Recent Surgical History

- Two weeks Prior to admission:
 - Colostomy

- One week Prior to admission:
 - Wound debridement with new skin graft placement

Patient Profile

Social History & Discharge Planning

- Married
- He and his wife usually live in his daughter's 10,000 square foot home.
 - Dining room converted into his suite containing medical supplies:
 - Hospital bed and air-mattress
 - Oxygen, nebulizer,
 - Enteral feeds and colostomy supplies
- Cared for by daughter and two home health nurses
 - Alternate caring for the patient during the weekdays.
- A doctor also visits the patient at home weekly.
- Plans to discharge Pt home to daughter; refusing to send back to LTAC

Disease Background

Disease Background

Bowel Obstruction

Definition:

Any condition that prevents the normal, forward flow of intestinal contents

Classifications:

--**Mechanical**-- Something is visibly interfering with passage

--**Functional**-- Bowel muscles completely paralyzed or simply inactive enough to prevent the normal passage of chyme

- Also known as Paralytic Ileus or Pseudo Obstruction

Disease Background

Bowel Obstruction

Causes of Mechanical Obstruction:

- Tumors
- Scar tissue from a previous surgery
- Hernia
- Phytobezoars
 - concretions of fruit and vegetable fibers
- Volvulus
 - a twisting of the intestine upon itself

Disease Background

Bowel Obstruction

Causes of Pseudo-Obstruction

--Myopathic --

- Muscular dystrophy
- Lupus
- Connective tissue disorders (Scleroderma)

--Neurogenic --

- Spinal cord injury
- Parkinson's disease
- Diabetes
- Drug induced dysmotility
- Immune responses
 - Paraneoplastic syndrome and certain viruses

Disease Background

Bowel Obstruction

Symptoms

Depend on the site and degree of obstruction

Proximal obstructions: abdominal pain, nausea, vomiting w/out marked distension.

Distal obstructions: Greater distension and abdominal pain with less vomiting.

Complete: constipation will occur

VS

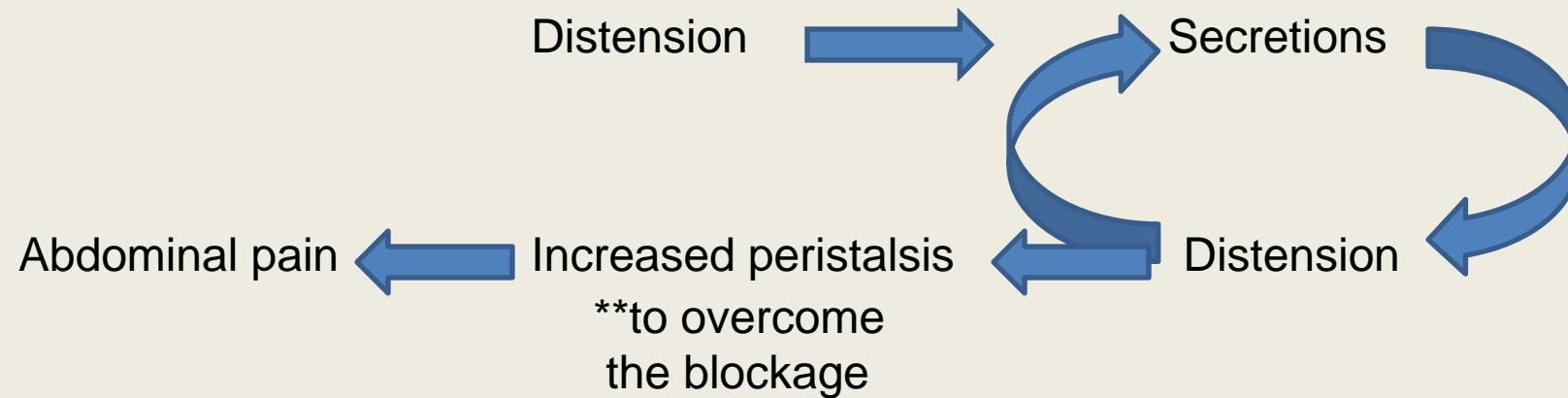
Partial: diarrhea OR constipation.

Disease Background

Bowel Obstruction

Pathophysiology

Dilation/distention: intestinal secretions, chyme, and air build up around obstruction

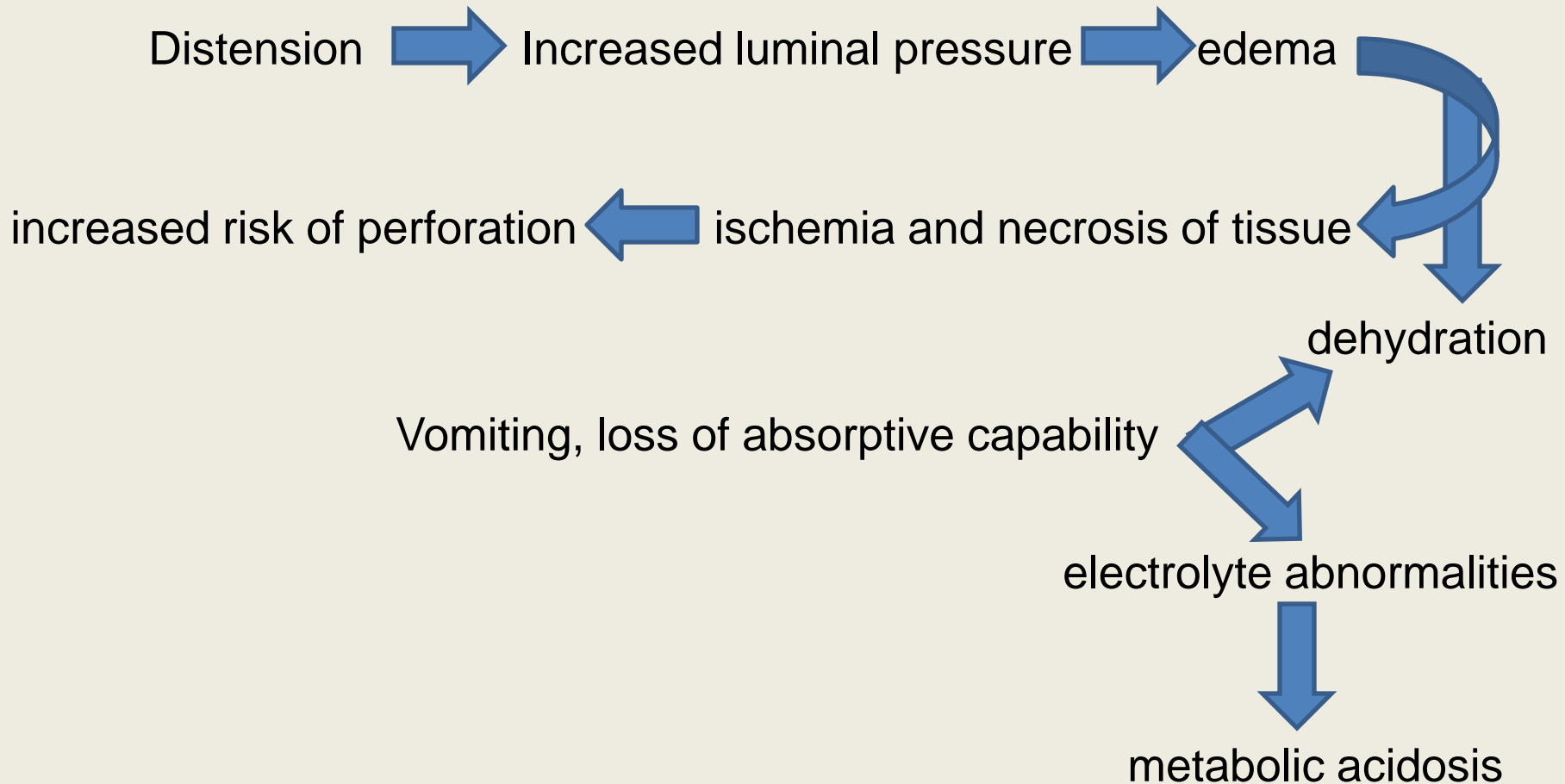


A vicious cycle causing spastic, amplified contractions

Disease Background

Bowel Obstruction

Pathophysiology



Disease Background

Bowel Obstruction

Pathophysiology:

stasis of fecal matter



overgrowth of bacteria

+

increased risk of perforation



translocation across the gut barrier

Disease Background

Bowel Obstruction

Medical Treatment

Correcting any complications caused by the obstruction

- Conservative management (1st 24-48 hours)
 - Obstruction may resolve on its own

If necessary, removing the cause of obstruction

- Immediate surgery—
 - High grade obstruction (hernial strangulation)
- If the obstruction does not resolve within 24-48 hours

Disease Background

Bowel Obstruction

Conservative Management

- replacing fluid and electrolytes
- using a catheter to gauge adequacy of fluid resuscitation
- gastric decompression
- antibiotics, especially with leukocytosis and fever

Other Medications:

Octreotide (exocrine inhibitor)

- Inhibits biliary secretions
- Decreases intestinal contractions
 - Interrupting the cycle of distension-secretion-contraction
- Stimulating an artificial bowel silence while the ileus resolves.
- To relieve colicky contraction and vomiting of intestinal secretions

Prokinetic agents --only used in pseudo obstruction—

- Reglan and Erythromycin.

Disease Background

Bowel Obstruction

Nutritional Management

- NPO: first 24-48 hours
 - stimulation can aggravate the obstruction or cause ischemia
- If obstruction does not clear on its own—
 - diet modification depends on location and degree of obstruction:
 - Full obstruction will require parenteral nutrition
 - Partial obstruction oral or enteral diet
 - Severe gastroparesis will require Jejunal feedings
 - Limited gastric involvement
 - liquid or pureed diet, in smaller more frequent meals
 - Without gastric involvement
 - low-fat, low-fiber diet with small frequent meals

Disease Background

Bowel Obstruction

Chronic VS. Acute Obstruction

Acute: malnutrition not of concern;

- typically resolves/ treated in short time frame

Chronic Intestinal Pseudo-Obstruction (**CIPO**)

- Preventing/correcting malnutrition is focus of care
- Pt's have prolonged avoidance of food in order to minimize symptoms
 - causing malnutrition
- Night-time enteral feedings may be necessary while PO intake improves
- ↑ oral intake may require therapy/counseling to overcome fears

Diet for CIPO: (same as acute cases)

- low-fat
- low-residue
- smaller, more frequent meals

Disease Background

PEG/J tube Dysfunction

Research: 191 patients followed for mean of 275 days after PEG or PEJ

- 36% of patients experienced tube dysfunction
- Replacement/removal of the tube in 80% of the patients with complications
- The average replacement: PEG = at 4 months; PEJ = at 2 months

Table 3.
Type and incidence of tube dysfunction

	PEG (N = 116)	PEJ (N = 75)	Total (N = 191)
Peritube leakage	10 (9%)	8 (11%)	18 (9%)
Plugging	10 (9%)	17 (23%)	27 (14%)
Fracture	4 (3%)	4 (5%)	8 (4%)
Migration	4 (3%)	11 (15%)	15 (8%)
Total	28 (24%) ^a	40 (53%) ^a	68 (36%)

Disease Background

Aspiration

Same Study: Within 30 days of placement...

- 5% of PEG patients aspirated
- 17% of PEJ patients aspirated
- Pre-existing conditions warranting the use of PEJ over PEG feedings
 - Gastroparesis, GERD, and recurrent aspiration,
 - Authors noted likely the cause of increased aspiration in these patients

ASPEN guidelines: PEJ vs PEG

- Reduced risk of aspiration with small-bowel feedings
- Grade C evidence in two studies

ASPEN guidelines: Methylene blue dye test

- Do *not* use blue food coloring as a surrogate marker of aspiration
- Grade E evidence
 - FDA issuing a mandate against its use for this purpose
 - Associated with mitochondrial toxicity and patient death.

Current Admission

Current Admission

Tests and Procedures

Computed Tomography (CT): Upon admission

- Did *not* identify any obstruction of the bowel
- Did show distended loops of bowel.
 - noted in the doctor's initial transcription to be questionable ileus
- Showed erosion of the sacrum at the site of pt's ulcer
 - suggested by the radiologist to be evidence of osteomyelitis.

Replacement of his PEG/J: Four days after admission

- current tube with malfunctioning seal/leaking

Abdominal X-ray: after PEG/J

- confirmed placement of the tube.
- noted mild diffuse dilatation of the small bowel at this time.

Abdominal X-ray: 2 days after the PEG/J tube was replaced

- showing no evidence of bowel obstruction.

Current Admission

Tests and Procedures



Current Admission

Tests and Procedures

Methylene blue dye Test

- Addition of blue dye to the patients formula
- gastric residuals were not blue
- formula was not the cause
 - Likely gastric/intestinal secretions causing high residuals

Abdominal X-ray (#3): Before D/C

- showed no signs of obstruction or ileus.

Current Admission

Medications

Pt was **high risk for aspiration**; of importance:

- Maintaining low residuals/ preventing gastric reflux
- placed on both Nexium and Octreotide

Nexium: Proton Pump Inhibitor

- Decreases gastric acid secretion. Decreases gastric pH
 - side-effects: ↓ absorption of Fe, B12, and Ca.
- Effect on pt:
 - residuals normalized for two days
 - on third day ↑ again, as high as 130ml

Octreotide: mimic of the natural hormone somatostatin

- Inhibitor of growth hormone (most commonly Rx for acromegaly)
- Suppresses/inhibits **wide** range of hormones including GI hormones
 - Thus decreasing secretions
- **Many** negative side effects...

Current Admission

Medications

Octreotide Continued : Side Effects

Gastrointestinal:

- Decreased motility
- Decreased absorption of fat and fat soluble vitamins
- Diarrhea/ Steatorrhea
- Abdominal pain, bloating
- Nausea and Vomiting
- Buildup of biliary sludge causing:
 - gallstones, pancreatitis, and cholecystitis.

•Endocrine :

- Inhibits glucagon and insulin
 - causing periods of both hypoglycemia/hyperglycemia
 - especially in diabetics.
- Can cause hypothyroidism

Current Admission

Medications

Other Medications of nutritional interest:

- **Insulin**
- **Multivitamin**
- **Vitamin C (500mg BID)**
- **Reglan**
 - increases gastric emptying, helping to prevent reflux
- **Digoxin**
 - Treatment for CHF
 - Interacts with electrolytes including K⁺, Ca, and Mg
 - **Diet:** High K⁺, low Na, with adequate Mg and Ca.
 - Hypokalemia and hypomagnesemia may result
 - Ca and Vitamin D supplements should be used with caution
 - ↑ drug's effects and potential for arrhythmias
 - Side effects: Anorexia, wt loss, diarrhea, N/V

Nutrition Care Process

Nutrition Care Process

Consult #1: (Day of admit)

- TF eval/ recommendations

Assessment:

Anthropometrics

- 6 feet 2 inches tall
- Admitting weight : 90.7 kg
- 105% of ideal body weight
- Borderline overweight BMI of 25.6.

Biochemical

BUN	30	10-26
Glucose	134	70-110
Albumin	2	3.2-5.5
Alk Phos	122	30-100
A1c	6.8	0.0-6.1

suggests dehydration

Microvillar enzyme, ↑ in intestinal obstruction

Nutrition Care Process

Needs Assessment

Diet Hx & Nutrition Rx

Est. Needs: 24-28kcal/kg, 1.1-1.5g/kg of protein

LTAC records:

- 2CalHN @ 55ml/hr
- Pt not tolerating TF
- PEG/J clogging
- 30kcal/kg
- 2.2g Pro/kg

Current diet order :

- 1 can Glucerna (q 4hr)
- 1 scoop Promod(q 4hr)
- Per RN, not fed since admit
- 22kcal/kg
- 1.3g Pro/kg

Recommendations:

- 1 can Glucerna 1.5, q 4hr
- 1 packet Prostat daily
- 200ml H₂O flushes QID
- 24kcal/kg
- 1.5g Pro/kg

Nutrition Care Process

Nutrition Diagnosis:

Increased nutrient needs related to wound healing
as evidenced by albumin of 2.0

Level of compromise: Severe

Goals:

1. Preserve lean body mass
2. Promote wound healing
3. Albumin to trend toward normal

Nutrition Care Process

Follow up #1 (Day of Stay 5)

Current diet order: Glucerna 1.0 @ 30ml/hr, goal of 70ml/hr

- Only running @20ml/hr
- Per RN, Daughter turning rate down D/T concern for ↑ residuals

Recommendations:

- TF goals remain as stated in past assessment
- RD explained to daughter, Pt not meeting needs if TF rate not advanced

Nutrition Diagnosis

Inadequate energy intake related to daughter decreasing rate as evidenced by enteral intake. (providing 552 kcal, 20g Protein)

Nutrition Care Process

Consult #2 (Day of stay #7)

- For continuous feeding rate recommendations

Current diet order: Glucerna 1.5 at 40ml/hr, ↑ to goal of 50ml/hr

- Only running at 20ml/hr
- Daughter again cited concern for ↑ residuals, continued to ↓ rate
- Highest residuals since admit 60ml
 - Per RN inadequate seal made it difficult to check the residuals
 - RN and daughter believed actual residuals to be higher

Recommendations:

- D/T problems tolerating TF in past/ current concerns daughter agreed to a trial of elemental formula:
 - **Δ TF to Vivonex at 50ml/hr and increase to goal of 75ml/hr**
 - 30ml of Prostat TID
 - 22kcal/kg and 1.5g/kg of protein

Nutrition Care Process

Follow-up #2: (Day of Stay #8)

- Informal note
 - D/T Vivonex ordered but out of stock

Recommendations:

- Continue to use Glucerna 1.5 for continuous feeding until Vivonex arrives
- RD advised RN not to check residuals from J-tube and to ensure that feedings remained continuous rather than bolused.

Nutrition Care Process

Follow-up #3: (Day of Stay #11)

- Informal note, Pt monitoring and changes to TF

Current diet order: Vivonex at 40ml/hr dyed with methylene blue

- Gastric residuals were not running blue
- Likely gastric or intestinal secretions
- Placed on Nexium in order to decrease gastric output.

Recommendations:

- Vivonex in stock= powdered mix, requiring daily mixing.
 - Inherently less sanitary than a sealed and ready to hang formula
- Ready-to-hang Perative, a semi-elemental formula, was now in stock.
- **Replace Vivonex with Perative and continue increasing to the goal, 75ml/hr.**
- 28kcal/kg and 1.8g/kg of protein (including Prostat TID)

Nutrition Care Process

Follow-up #4: (Day of Stay #13)

Current diet order: Perative at 50ml/hr, Prostat TID

- (plans to continue ↑ 10ml/day to goal 75)
- Tolerating well. Residuals of 10ml or less

Recommendations:

- It appeared that gastric output was causing residuals, not previous TF
- Discussed with daughter, recommended going back to Glucerna 1.5
 - Better control of Glucose
 - Less expensive formula for home health
- Daughter already arranged to have Perative through home health
 - Wanted pt to remain on Perative
- Continue increasing Perative to goal rate of 75ml/hr as tolerated**

Nutrition Diagnosis:

Inadequate energy intake related to delayed progression of TF rate as evidenced by enteral intake (~67% of Kcal needs)

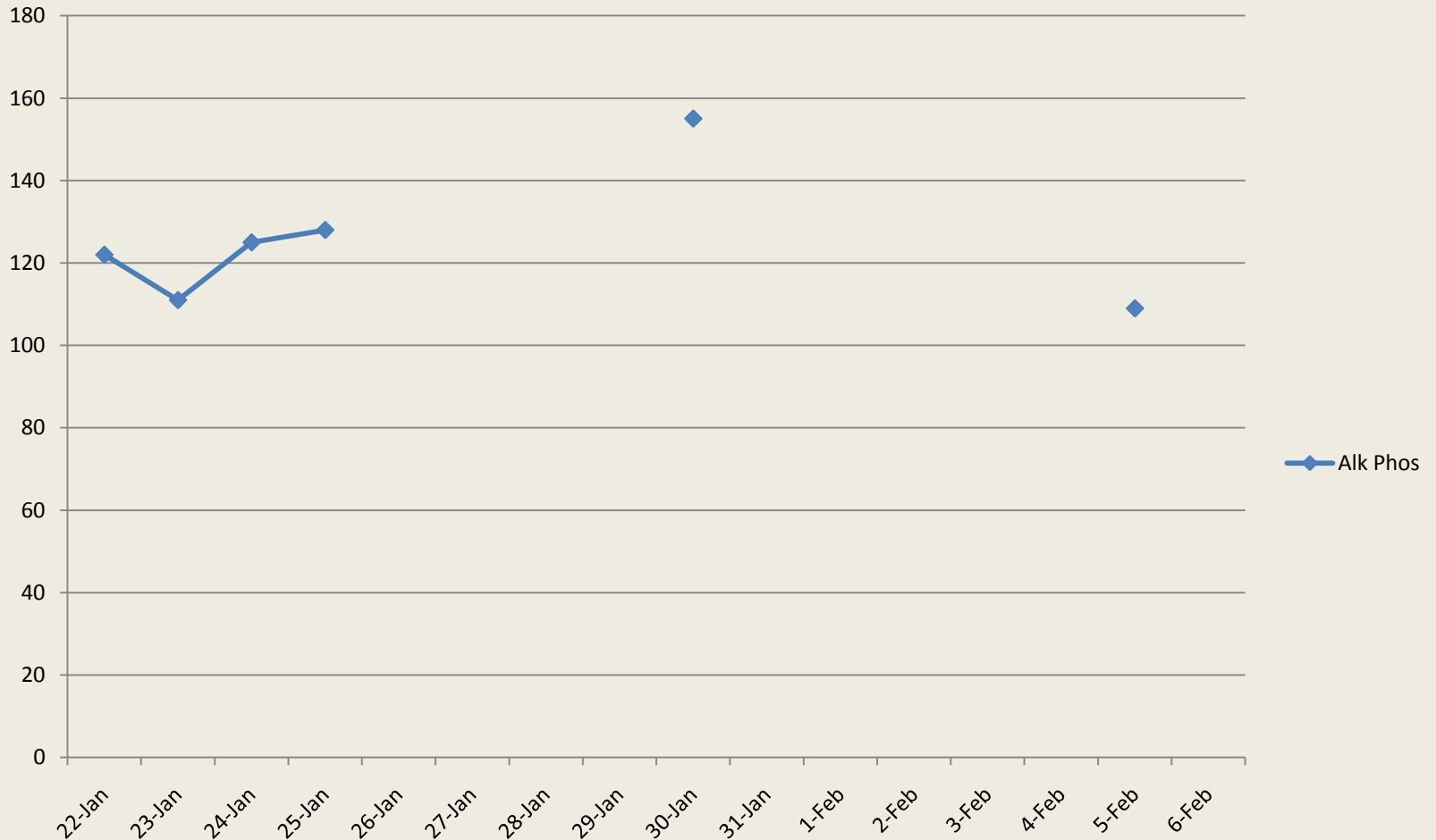
Nutrition Care Process

February 7th, 2011 (Day of Stay #17)

- Pt discharged before scheduled follow up
- Sent home on Perative at 70ml/hr
- Had been placed on Octreotide to further control bilious residuals
 - Which had increased again after last follow up (as high as 130ml)
- By D/C residuals consistently less than 10ml

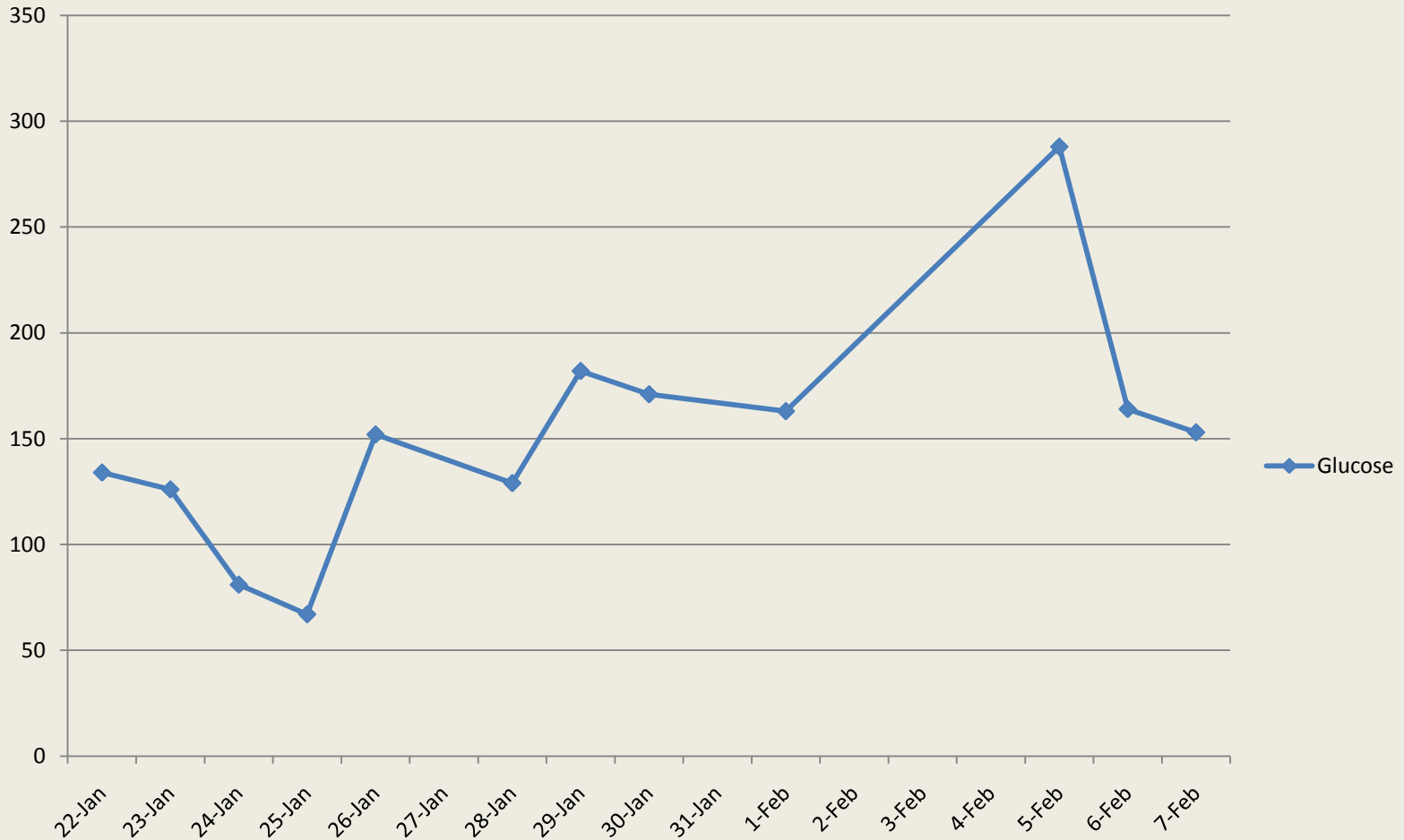
Nutrition Care Process

Alk Phos



Nutrition Care Process

Glucose



Summary / Conclusion

Summary / Conclusion

Bowel Obstruction; Many issues share the same diagnosis

- Great deal of variation
- Treatment is dependent on the Hx and location/extent of obstruction
- Dietitian's role:
 - Careful review of notes, patient Hx,
 - If possible, remain in contact with the doctor as full Dx develops.

PEG/J dysfunction and frequent replacement; not uncommon

- lifelong issues

Daughter's concern for aspiration, even with J feedings, not unfounded

- experts believe that the real risk is aspiration of throat contents and saliva, rather than aspiration of formula
- oftentimes residuals contain more gastric fluids and secretions than formula
- Checking residuals does not protect the patient from aspiration
- Medication can be just as important as standard aspiration precautions.

Summary / Conclusion

Standard precautions

- elevating the head of the bed 30-45 degrees
- continuous subglottic suctioning
- using continuous rather than bolus feeding
- using prokinetic agents,
- and feeding past the pylorus

Jejunal Residuals

- Residuals should not be checked out of the jejunal portion of the tube
- jejunal lumen is small
- the mucosa can be suctioned into the tube,
 - injuring the patient and clogging the tube

Indicators besides residuals

- abdominal pain
- distension
- stool output and consistency

Summary / Conclusion

Most interesting aspects of this case study:

Daughter's involvement in the patient's care...

- self- educated, no medical background
- providing her own care while the patient in hospital
- made it difficult for multidisciplinary team to ensure the best care for Pt.

Dietitians Role:

- Confident/ assertive RD needed to address concerns/educate family member
 - This confidence comes from knowledge and experience
 - Chose this case study to build my confidence

Quality of life issues...

- Providing aggressive care to a patient with such a limited existence
- a matter of ethics
- not the dietitian's role to make these decisions;
- RD needs to provide expert knowledge, patience and reassurance
 - given the caregiver's emotional attachment and wishes for the patient

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