MEDICAL NUTRITION THERAPY FOR ACUTE PANCREATITIS IN PATIENT WITH COMPLEX PAST MEDICAL HISTORY

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RED FONT indicates de-identification of client and is necessary to meet current industry health informatics privacy requirements

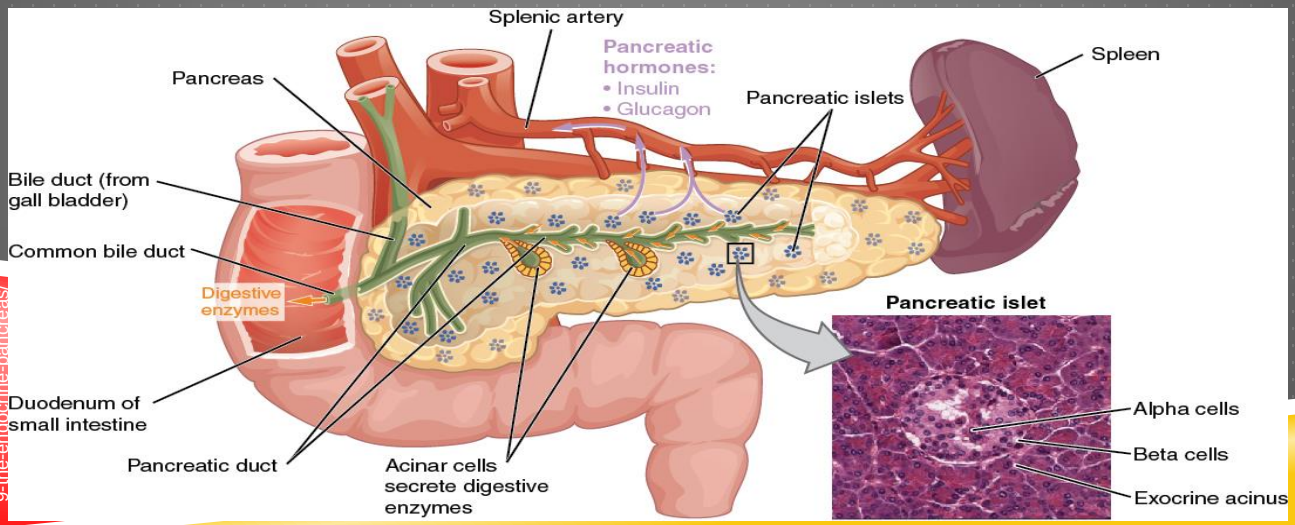
AGENDA

- Overview of Condition
- Case Patient
- Course of Treatment
- Medical Nutrition Therapy
- Discussion
- Conclusion/Implications to Practice

OVERVIEW OF CONDITION

THE PANCREAS

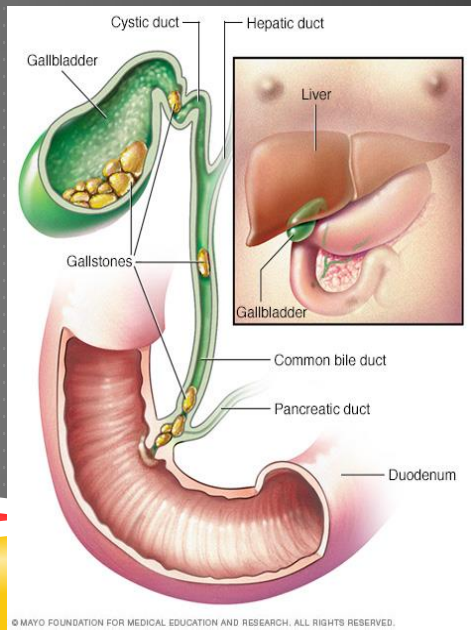
- Glandular organ in the upper left quadrant of the abdomen
- Both endocrine and exocrine functions
- Endocrine function:
  - Hormone production such as glucagon and insulin
- Exocrine function:
  - Enzyme secretion; primarily digestive enzymes such as amylase, trypsinogen, and lipase



Picture Source: https://opentextbc.ca/anatomyandphysiology/chapter/17-9-the-endocrine-pancreas/

ACUTE PANCREATITIS

- Inflammation of pancreas which can be caused by several factors
  - Most common factors: gallstones and excessive alcohol consumption
- Proposed mechanistic actions:
  - Gallstones: Cell injury occurs secondary to increasing pancreatic duct pressures causing inflammation
  - Alcohol: Ethanol causes premature activation and release of digestive enzymes while increasing permeability of ductules allowing enzymes to reach organ cells and auto-digest pancreas
- Incidence: 40 cases/year/100,000 adults and rising
- Mortality rate: 10-15%



Picture Source: http://www.mayoclinic.org/diseases-conditions/gallstones/symptoms-causes/dxc-20231395

DIAGNOSIS

- Signs and Symptoms:
  - Dull, steady abdominal pain which gradually becomes more severe
  - Nausea & vomiting, Diarrhea
  - Fever, Tachycardia
  - Abdominal tenderness and distention
- Diagnostic Lab Tests:
  - Elevated serum Lipase, Amylase, and liver-associated enzymes
- Diagnostic imaging often unnecessary but may be beneficial if diagnosis is in doubt
  - Abdominal Ultrasonography, MRCP

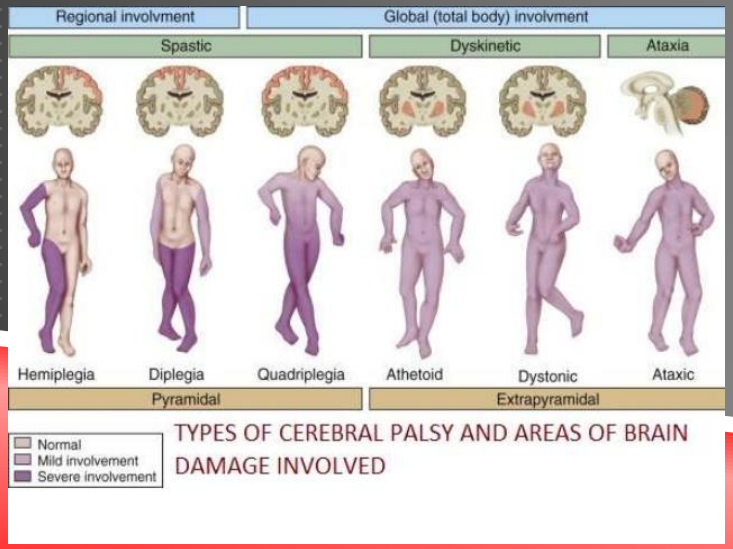
TREATMENT

- Medical treatment: relieve symptoms and allow pancreas to rest and recover
  - Initial care prevents dehydration through IV fluids controls pain, nausea, and vomiting with medication
  - Food is held until pain subsides and appetite returns
  - If gallstones are the cause they are removed surgically
    - In many cases gallbladder also removed as a future preventative measure
- Nutrition care: NPO to allow for complete pancreatic rest
  - Advance to an oral diet as tolerated when symptoms subside
  - Diet progression: clear liquid → low-fat solid diet
    - The amount of fat to be restricted in a diet is dependent upon the degree of steatorrhea and abdominal pain the patient experiences

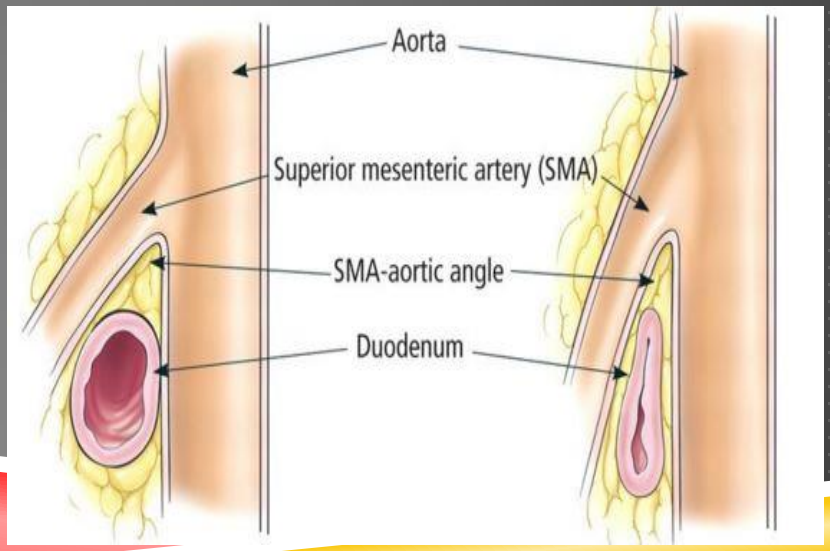
OTHER CONDITIONS OF IMPORTANCE

- **Superior Mesenteric Artery Syndrome**
  - Rare disorder in which the transverse portion of the duodenum is compressed between the aorta and the superior mesenteric artery, resulting in chronic, intermittent, or acute complete or partial duodenal obstruction

- **Cerebral Palsy**
  - Disorder of muscle control or coordination resulting from injury to the brain during its early development



Picture Source: https://image.slidesharecdn.com/cerebralpalsy-141128070508-conversion-gate01/95/cerebral-palsy-14-638.jpg?cb=1417158381



Picture Source: https://syndromespedia.com/wp-content/uploads/2015/10/superior-mesentric-artery-syndrome-image.jpg

CASE PATIENT:

XX

BACKGROUND INFORMATION

- 24 year old Caucasian Male
- Presented with SOB, uncontrolled seizures & abdominal distention
- Dx: Acute Pancreatitis
- Length of Stay: 6 days

HISTORY AND PHYSICAL

SOCIAL HISTORY

- Bed bound, total care patient
- Lives with parents
- 7 day/week daytime care through Maxim Healthcare Services
- Parents provide nighttime care
- Maryland Medicaid health insurance

HISTORY AND PHYSICAL (CONT)

Past Medical History	Past Surgical History
Anoxic brain injury	Nissen Fundoplication (Year)
Severe intellectual disability	PEG tube placement (Year)
Cerebral palsy	Permanent tracheostomy (Year)
Seizure disorder	Tonsillectomy/Adeniodectomy (Year)
SMAS	Right renal lithotripsy (Year)
Nephrolithiasis	
Recurrent UTI	
Bacteremia	

HISTORY AND PHYSICAL (CONT)

ADMITTING PHYSICAL EXAM

- Cardiovascular: Tachycardia
- Abdomen: Mildly distended, normoactive bowel sounds
- Neurologic: Nonverbal, quadriplegic
- Skin: New abdominal rash blanching to pressure around abdominal wall and chest
- Musculoskeletal: Severe contracture of all extremities

NUTRITION HISTORY

WEIGHT HISTORY

- BMI is not appropriate for assessing weight & height in CP patients
  - Hamwi method suggested instead.
- CM's ideal bodyweight is 78kg (172#)
- Patient's father reports that his UBW is 55 kg (121#)

Date	Weight	% UBW	% IBW
Month/day/year	48 kg (107#)	87%	62%
Month/day/year	57.5 kg (127#)	104%	74%
Month/day/year	53.5 kg (118#)	97%	69%
Month/day/year	37.7 kg (83#)	n/a	Wt/age:<5th%
Month/day/year	27.7 kg (61#)	n/a	Wt/age:50th%
Month/day/year	19.3 kg (43#)	n/a	Wt/age:50-90th%
Month/day/year	19.3 kg (43#)	n/a	Wt/age:50-90th%
Month/day/year	15.9 kg (35#)	n/a	Wt/age: <5th%
Month/day/year	15.9 kg (35#)	n/a	Wt/age: <5th%

NUTRITION HISTORY (CONT)

DIET HISTORY

- Dependent on EN support majority of life
- Home tube feeding regime: Peptamen 115mL/hr x 15hr w/ free water flushes at 70mL/hr x 15hr, 400 mL additional water Q24hr PRN for dehydration
  - 1725kcal (37 kcal/kg), 69gm protein (1.5gm/kg), 2916mL free water (61ml/kg), 115% RDI

Date	Diet
Month/day/year	Peptamen @ 85mL/hr x 20hrs/day w/ 30mL free water flush/hour
Month/day/year	Peptamen @ 70mL/hr x 24hrs/day
Month/day/year	**Peptamen @ 70mL/hr x 24hrs/day**
Month/day/year	Jevity Plus @ 50mL/hr x 24hrs/day
Month/day/year	Jevity Plus @ 60mL/hr x 24hrs/day
Month/day/year	Jevity 240mL @ 1200 & 1600; then 3 cans continuous feed overnight starting at 2100
Month/day/year	Jevity 240mL q 4hrs
Month/day/year	4-5 cans Jevity/day

COURSE OF TREATMENT

DAY 1/DAY 2

DAY 1

- Admitted with uncontrolled seizures and abdominal distention
- Neurology completed a limited neurologic exam, recommended continuing home anticonvulsant medications
- GI consulted
- Tube feedings held per admitting physician's request

DAY 2

- GI recommends possible MRCP, noted improved abdominal distention and possible pancreatitis improvement
- Tube feedings restarted: trickle feeds of Peptamen

DAY 3/DAY 4

DAY 3

- ID determined bacteria in blood culture contamination
- GI noted pancreatitis continuing to improve.
- Nutrition was consulted for EN support
  - Patient tolerating trickle feeds well
  - Developed a regime to advance patient slowly to goal rate of 70 mL/hr x 24hrs
- Tube feeding was advanced to 20 mL/hr x 24hr on this day.

DAY 4

- Lipase normal
- MRI/MRCP planned for today
- Tube feeding advanced to 30 mL/hr x 24hr.

DAY 5/DAY 6

DAY 5

- Physician discussed possible discharge of patient next AM r/t symptom cessation
- MRI/MRCP cancelled r/t technical difficulties associated with testing this patient
- Tube feeding advanced to 50 mL/hr x 24hr

Day 6

- Tube feeding advanced to 70 mL/hr x 24hr
- Patient discharged with intentions to continue tube feeding regime as prescribed in the hospital.

MEDICAL NUTRITION THERAPY

NUTRITION DIAGNOSIS

NI-2.1:

Inadequate oral intake r/t dysphagia secondary to Cerebral Palsy AEB EN support.

ESTIMATED NEEDS

Actual bodyweight 48kg used for calculations			
Source	Kcal requirements	Protein requirements	Fluid requirements
Facility standards	1680-1920 kcal (35-40 kcal/kg)	62-72gm Pro (1.3-1.5 gm/kg)	Per MD
EAL	n/a	n/a	n/a
American College of Clinical Pharmacy[2]	1200-1680 kcal (25-35 kcal/kg)	72-96 gm Pro (1.5-2 gm/kg)	n/a
Online Nutrition Care Manual[3]	1200-1680 kcal (25-35 kcal/kg)	72-96 gm Pro (1.5-2 gm/kg)	1200-1920 mL (25-40 ml/kg)
University of Virginia Review article on Cerebral Palsy[1]	Equations exist for pediatric patients only	"Estimated using the RDA/DRI and actual weight or appropriate weight for height"	2060mL (Holliday-Segar Equation)

NUTRITION INTERVENTION

ND-2.1.1. Enteral Nutrition – Formula/Solution

- Ordered Peptamen at 10mL/hr using family provided formula. RD will check for tolerance this afternoon and determine goal rate. MMC will replace family care of Peptamen.
- If tolerated, advance regime as follows:
  - Month/day – 20mL/hr titrate to 30ml/hr
  - Month/day – 30mL/hr titrate to 50ml/hr
  - Month/day – 50mL/hr titrate to 70ml/hr
  - PEG flush; once IV fluids weaned off, advance PEG flush to 45mL/hr, may have up to 400 mL additional water Q24hr PRN for dehydration.
  - The goal rate will provide1680 kcal (35 kcal/kg), 67gm protein (1.4gm/kg), 1425mL free water (30ml/kg) + free water flush, and 112% RDI
- Goal: Tolerate TF regime

NUTRITION MONITORING & EVALUATION

INDICATOR

- **FH-1.4.1.5 Rate/Schedule**

CRITERIA

- Patient tolerates intake of trickle feeds without diarrhea, abdominal distention, high gastric residuals, or any other signs of intolerance. If there are no signs of intolerance, progress tube feeding according to designed regime.

DISCUSSION

MEDICAL CONSIDERATIONS

- Signs and symptoms consistent with acute pancreatitis
  - Elevated lipase and amylase confirmed diagnosis
- Medical treatment involved conservative management
  - Feedings initially held, restarted at GI's discretion and given to RD for management
  - GI monitored labs and symptoms and attempted diagnostic and exploratory tests
- Overall, medical management involved little intervention and symptoms resolved on their own
- 2013 case study describes similar patient (CP, SMAS, acute pancreatitis)
  - Conservative therapy also used successfully

NUTRITION THERAPY

- Nutrition plan followed standards of care
  - NPO until symptoms subside, restart feedings, and slowly advanced to regular diet as tolerated
- Nutrition treatment complicated by past medical history
  - EN support r/t seizure disorder and cerebral palsy
  - Malabsorption r/t SMAS
  - Increased fluid needs r/t nephrolithiasis secondary to medication (Zonisamide) side effect
- Tube feeding regime at MMC based on home regime but modified to 24 hour continuous feeding
- Patient showed no signs of intolerance to regime at any point during his stay

IMPLICATIONS TO PRACTICE/CONCLUSION

- Incidence of acute pancreatitis has been increasing over recent years
  - Treatment and management of condition focused on nutrition
- Many patients present to medical team with more than one medical condition
- Learning how to provide nutrition therapy to those with multiple active medical conditions or a complex past medical history allows dietitians to more efficiently personalize nutrition care
- Bottom line: Dietitians must learn how to prioritize nutrition therapy in patients with multiple medical conditions to ensure the overall recovery of the patient

QUESTIONS?

APPENDIX A: LABORATORY DATA

Lab	Reference Range	Month/day	Month/day	Month/day	Month/day	Month/day
Glucose	0-99 mg/dL	**133 (H)**	n/a	**103 (H)**	95	96
BUN	6-20 mg/dL	**5 (L)**	n/a	**8 (L)**	10	13
Cr	0.6-1.3 mg/dL	**0.3 (L)**	n/a	**0.4 (L)**	**0.4 (L)**	0.6
GFR	>59	>59	n/a	>59	>59	>59
Na+	136-145 mmol/L	140	n/a	141	141	143
K+	3.5-5.1 mmol/L	3.7	n/a	3.8	3.7	4.6
Ca++	8.6-10.5 mg/dL	8.9	n/a	9.2	9.3	10.0
Lipase	7-58 U/L	n/a	n/a	15	48	**203 (H)**
Amylase	23-85 U/L	n/a	n/a	n/a	n/a	**110 (H)**

APPENDIX B: MEDICATIONS

Home Medications				
Medication	Dosage	Frequency	Function	Nutrition Implications
Cetirizine	5 mg	BID	Antihistamine	May cause dry mouth, stomach pain, diarrhea or vomiting
Ibuprofen	400 mg	Q6 as needed	NSAID	May cause constipation, diarrhea, gas or bloating, unexplained weight gain, and loss of appetite
Codeine	15 mL	Q4 as needed	Antitussive	May cause stomach pain, constipation, nausea, vomiting and loss of appetite
Tylenol	1000 mg	Q4 as needed	Analgesic and antipyretic	No nutrition implications
Zonisamide	200 mg	BID	Anticonvulsant	Interactions with grapefruit and grapefruit juice; may cause nausea, vomiting, weight loss, changes in taste, diarrhea, constipation, heartburn, stomach pain, and loss of appetite; increases risk for kidney stones
Phenobarbital	200 mg	BID	Barbiturate; used to control seizures	May cause nausea and vomiting
Fluticasone (Flovent)	2 inhalation	BID	Corticosteroid nasal spray	May cause nausea, vomiting or diarrhea
Polyethylene Glycol (Miralax)	17 g	Daily @ 1400	Osmotic laxative; used to treat constipation	May cause nausea, bloating, cramping, gas, or diarrhea
Ursodiol (Actigall)	300 mg	Daily @ 1400	Bile acid; used to dissolve bilestones	May cause diarrhea, constipation, upset stomach, indigestion, vomiting, and pain with urination
Lansoprazole (Prevacid Solution)	30 mg	Daily	Proton Pump Inhibitor; decreases the amount of acid made in the stomach to prevent GERD	May cause constipation, nausea, severe diarrhea, stomach pain, difficulty breathing/swallowing
Levothyroxine (Levothroid)	37.5 µg	Daily @ 1400	Thyroid Hormone used to treat hypothyroidism	Soybeans, walnuts, and dietary fiber may affect how levothyroxine works
Gabapentin (Neurontin)	900 mg	TID	Anticonvulsant	May cause nausea, vomiting, diarrhea, dry mouth, constipation, increase appetite, or weight gain

APPENDIX B: MEDICATIONS (CONT)

In-Patient Medications				
Medication	Dosage	Frequency	Function	Nutrition Implications
Ceftriaxone (Rocephin)	1000 mg	Q24	Cephalosporin Antibiotic	May cause diarrhea, bloody or watery stools, stomach cramps, stomach tenderness or pain, nausea and vomiting, off colored urine, foul smelling urine, difficulty swallowing or breathing, swelling of the throat or tongue
Chlorhexidine Gluconate (Peridex)	15 mL	BID	Oral Antimicrobial	May cause alterations in taste
Ondansetron HCl (Zofran)	4 mg	Q6	Serotonin 5-HT3 receptor antagonist; works to prevent nausea and vomiting	May cause constipation or difficulty breathing/swallowing
Lansoprazole (Prevacid Solution)	30 mg	BID	Proton Pump Inhibitor; decreases the amount of acid made in the stomach to prevent GERD	May cause constipation, nausea, severe diarrhea, stomach pain, difficulty breathing/swallowing
Polyethylene Glycol (Miralax)	1 packet	PRN	Osmotic laxative; used to treat constipation	May cause nausea, bloating, cramping, gas, or diarrhea
D5/.9 NaCL	1000 mL	Q20	IV fluid	Can cause fluid overload if not managed carefully
Linezolid (Zyvox)	300 mL	Q12	Antibiotic	Interactions with foods containing tyramine
Levothyroxine (Levothroid)	37.5 mcg	Daily	Thyroid Hormone used to treat hypothyroidism	Soybeans, walnuts, and dietary fiber may affect how levothyroxine works
Phenobarbital	194.4 mg	BID	Barbiturate; used to control seizures	May cause nausea and vomiting
Gabapentin (Neurontin)	900 mg	TID	Anticonvulsant	May cause nausea, vomiting, diarrhea, dry mouth, constipation, increase appetite, or weight gain
Metoclopramide (Reglan)	5 mg	Q6	Prokinetic agent	May cause diarrhea, nausea, frequent urination and urinary incontinence
Zonisamide (Zonegran)	200 mg	BID	Anticonvulsant	Interactions with grapefruit and grapefruit juice; may cause nausea, vomiting, weight loss, changes in taste, diarrhea, constipation, heartburn, stomach pain, and loss of appetite
Pantoprazole (Protonix)	40 mg	Q12	Proton-pump inhibitor; decreases the amount of acid made in the stomach to prevent GERD	May cause nausea, vomiting, gas, constipation, difficulty breathing or swallowing and severe diarrhea
Enoxaparin Sodium (Lovenox)	40 mg	Q24	Low molecular weight heparins; works by stopping the formation of substances that cause clots	May cause upset stomach, black/bloody stools, blood in urine and swollen ankles or feet

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