Abdominal Emergencies and Endocrine Emergencies

July 2022 Mercyhealth Prehospital and Emergency Services Center

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Objectives

- Review Anatomy
- Assessment
- History and Physical
- Specific Diagnosis
- Management

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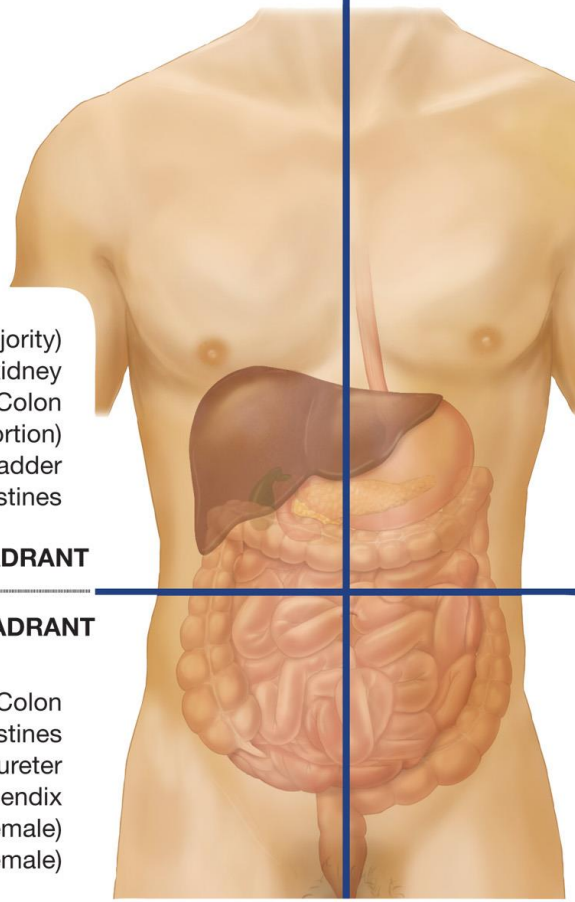
Anatomy



Liver (majority)
Right kidney
Colon
Pancreas (small portion)
Gallbladder
Small intestines

RIGHT UPPER QUADRANT

Liver (small portion)
Spleen
Left kidney
Stomach
Colon
Pancreas (majority)
Small intestines

LEFT UPPER QUADRANT

RIGHT LOWER QUADRANT

Colon
Small intestines
Right ureter
Appendix
Right ovary (female)
Right fallopian tube (female)

LEFT LOWER QUADRANT

Colon
Small intestines
Left ureter
Left ovary (female)
Left fallopian tube (female)

MIDLINE AREA

Bladder - Uterus (female) - Prostate (male)

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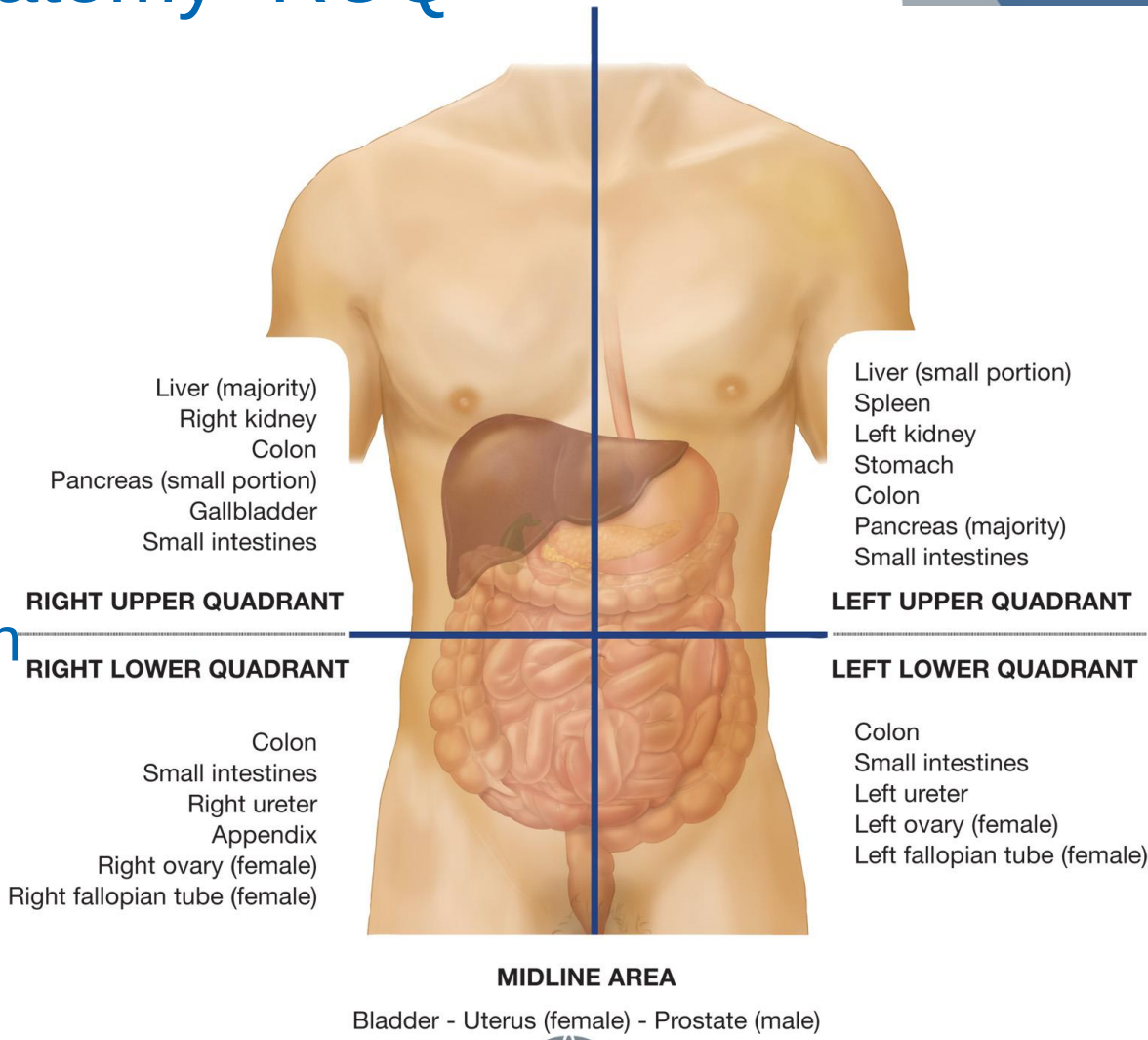
Anatomy- RUQ

- Liver
- Gall Bladder
- Right Kidney
- Small Bowel
- Ascending Colon
- Transverse Colon



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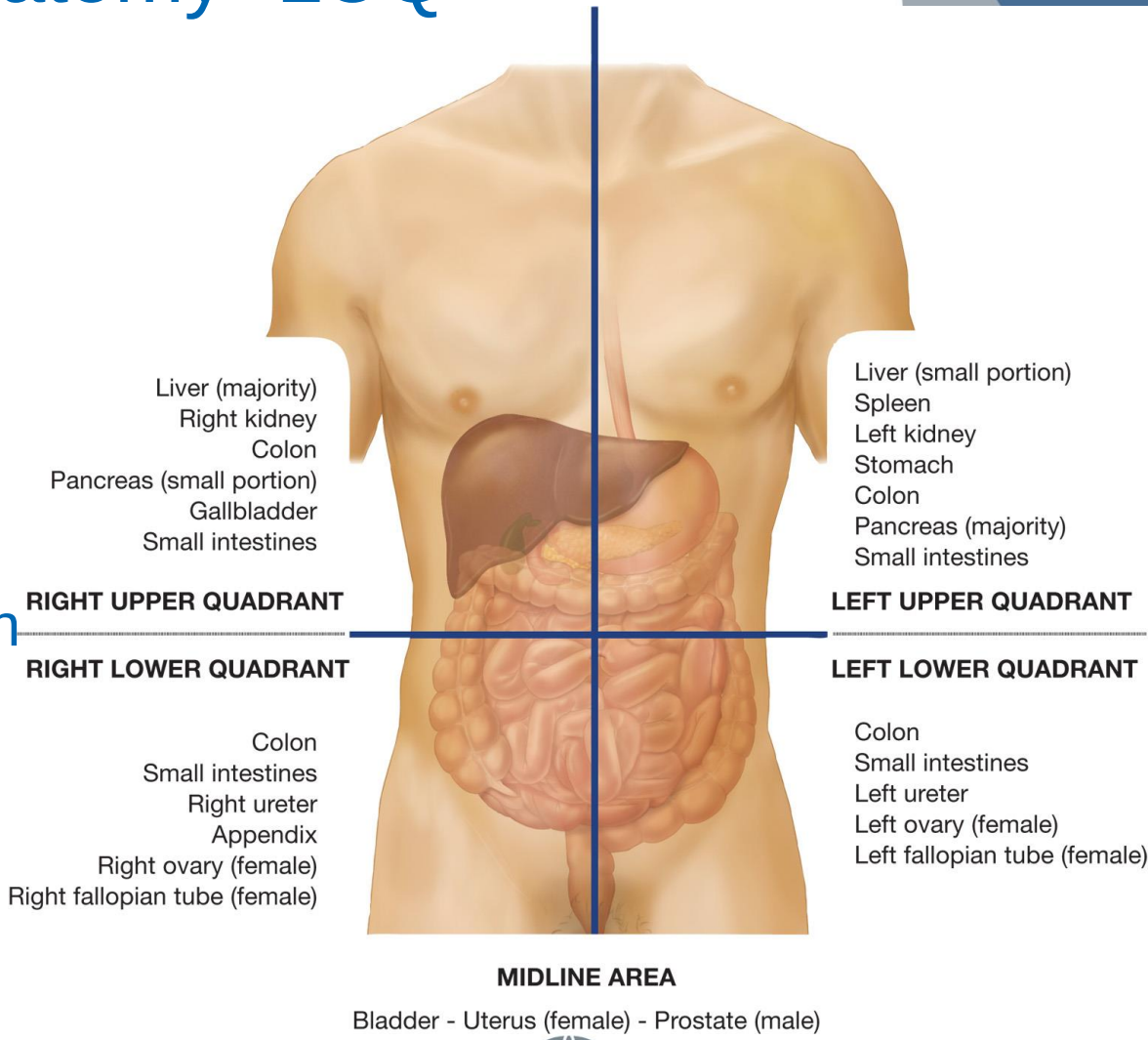
Anatomy- LUQ

- Spleen
- Stomach
- Pancreas
- Left Kidney
- Transverse Colon
- Descending Colon



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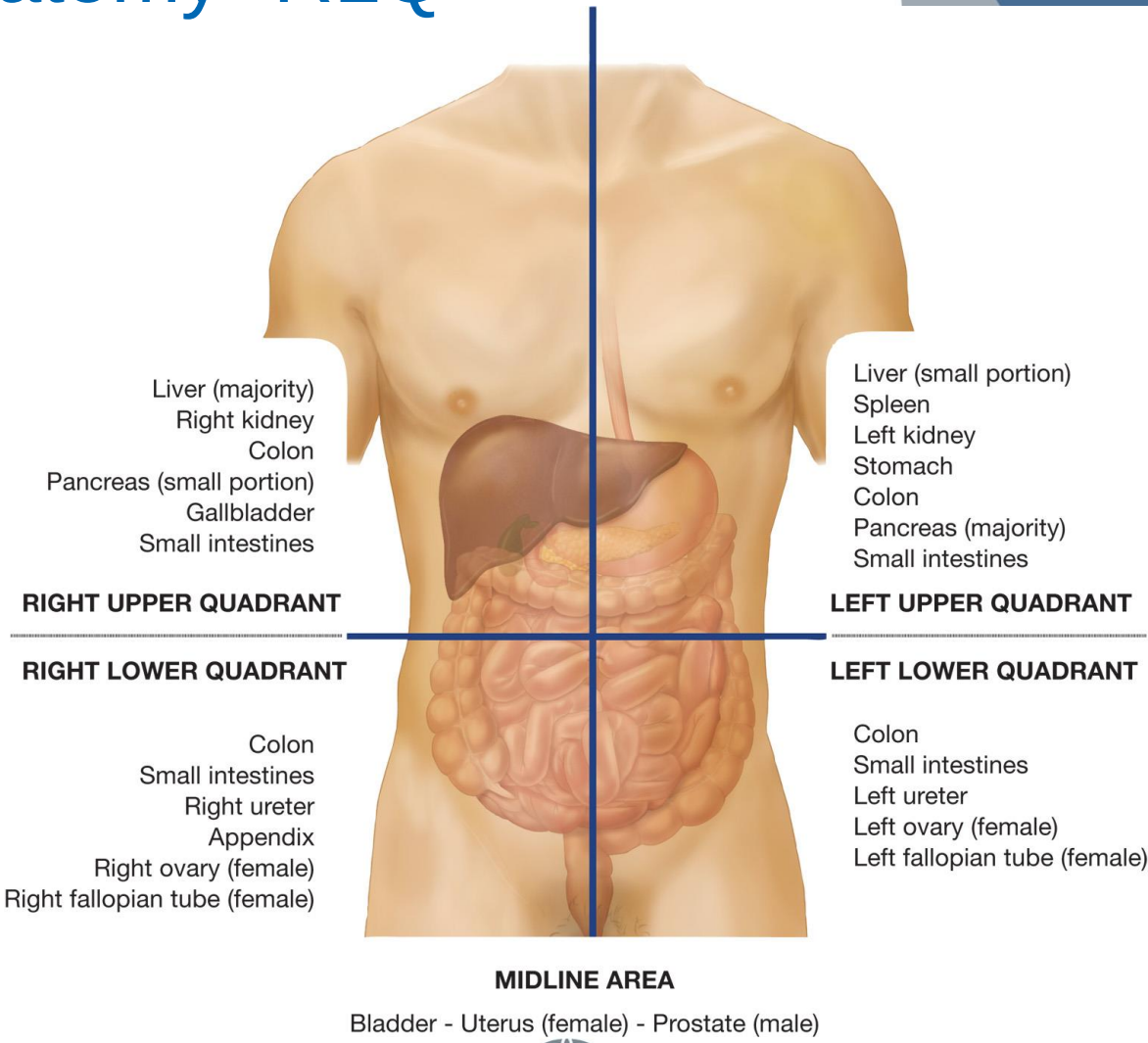
Anatomy- RLQ

- Ascending Colon
- Appendix
- Right Ovary (female)
- Right Fallopian Tube (female)
- Ureter



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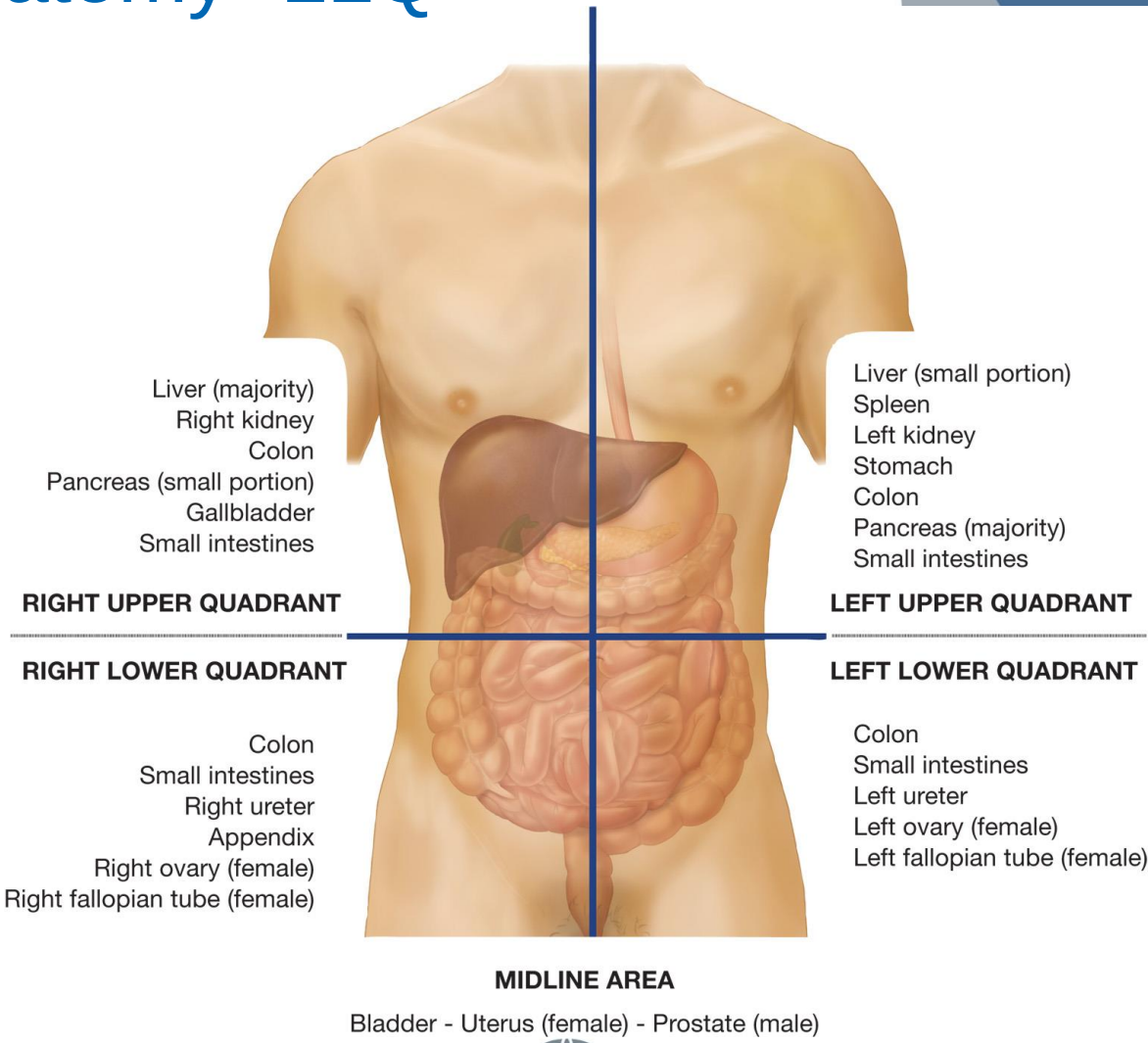
Anatomy- LLQ

- Descending Colon
- Sigmoid colon
- Left Ovary (female)
- Left Fallopian Tube (female)
- Ureter



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Anatomy-Termonology

- Periumbilical area
  - Located around (peri) the navel (umbilicus)
  - Small bowel lies in all quadrants in periumbilical area
- Suprapubic area
  - Located just above pubic bone
  - Urinary bladder, uterus lie in this area

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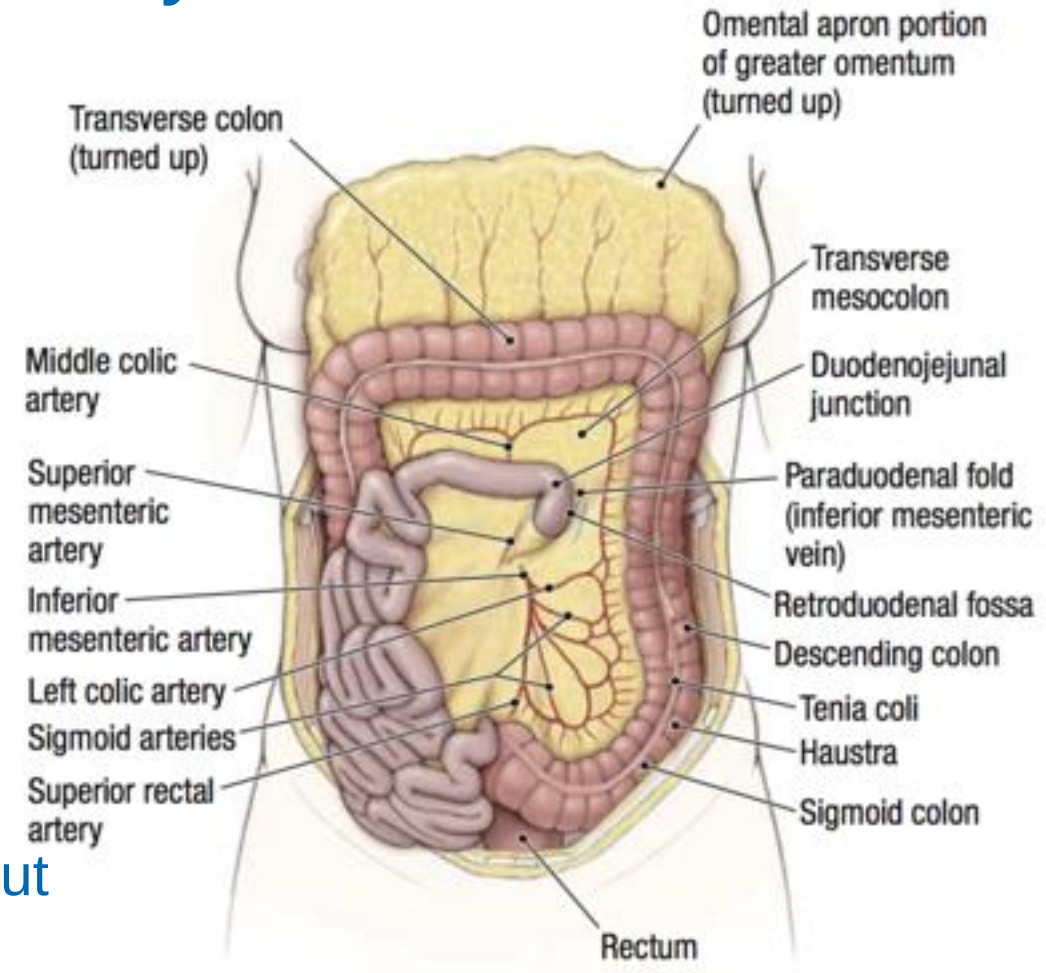
Digestive System

- Esophagus
- Stomach
- Small Intestine
  - Duodenum
  - Jejunum
  - Ileum
- Large Intestine
- Mesenteric Vessels
  - Arteries- Aorta to Gut
  - Veins- Gut to Liver



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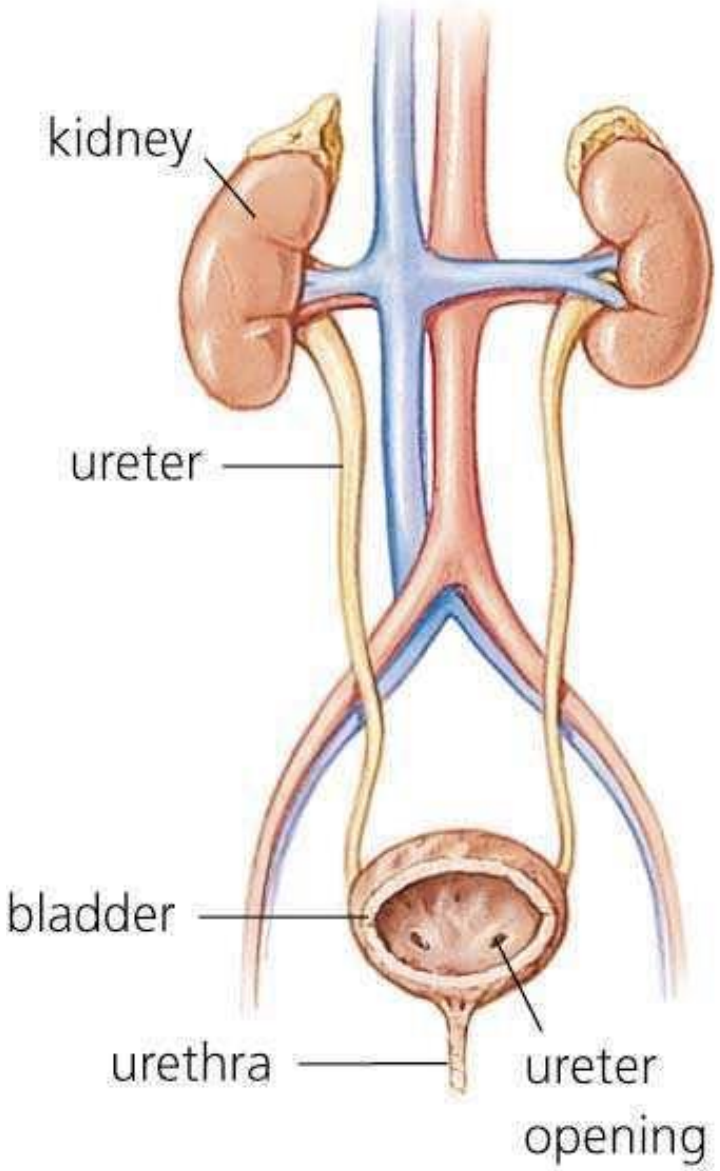
Urinary System

- Kidney (2)
- Ureter (2)
- Bladder
- Urethra



Carlyn Iverson

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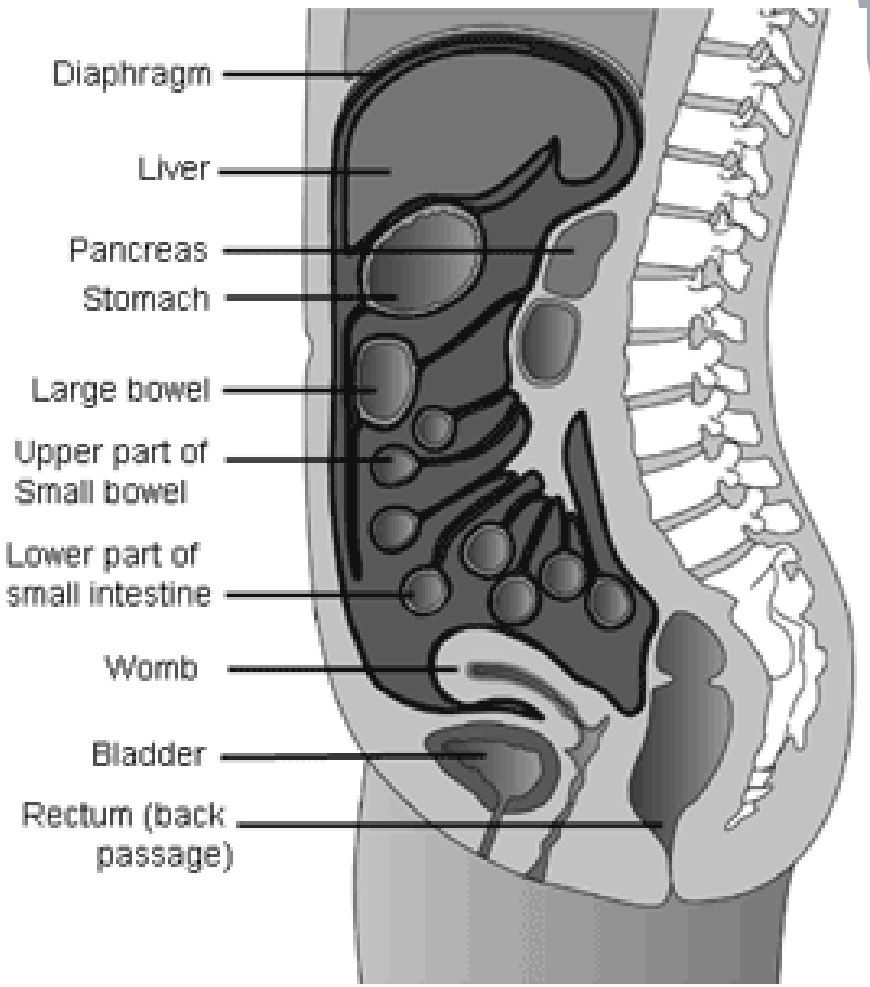
Abdominal Cavities

- Peritoneum
  - Abdominal cavity lining
- Divides Abdomen into two cavities
  - Peritoneal Cavity
  - Retroperitoneal cavity

(retro=behind)



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Abdominal Cavities

- Peritoneal Cavity
  - Spleen
  - Liver
  - Stomach
  - Gall Bladder
  - Parts of Large and Small Bowel
  - If attached to mesentery then intraperitoneal
- Retroperitoneal
  - Pancreas
  - Kidney
  - Ureter
  - Venacava
  - Aorta
  - Bladder
  - Reproductive Organs

- Note: Diseases/Injuries of Retroperitoneal Organs can present with back pain

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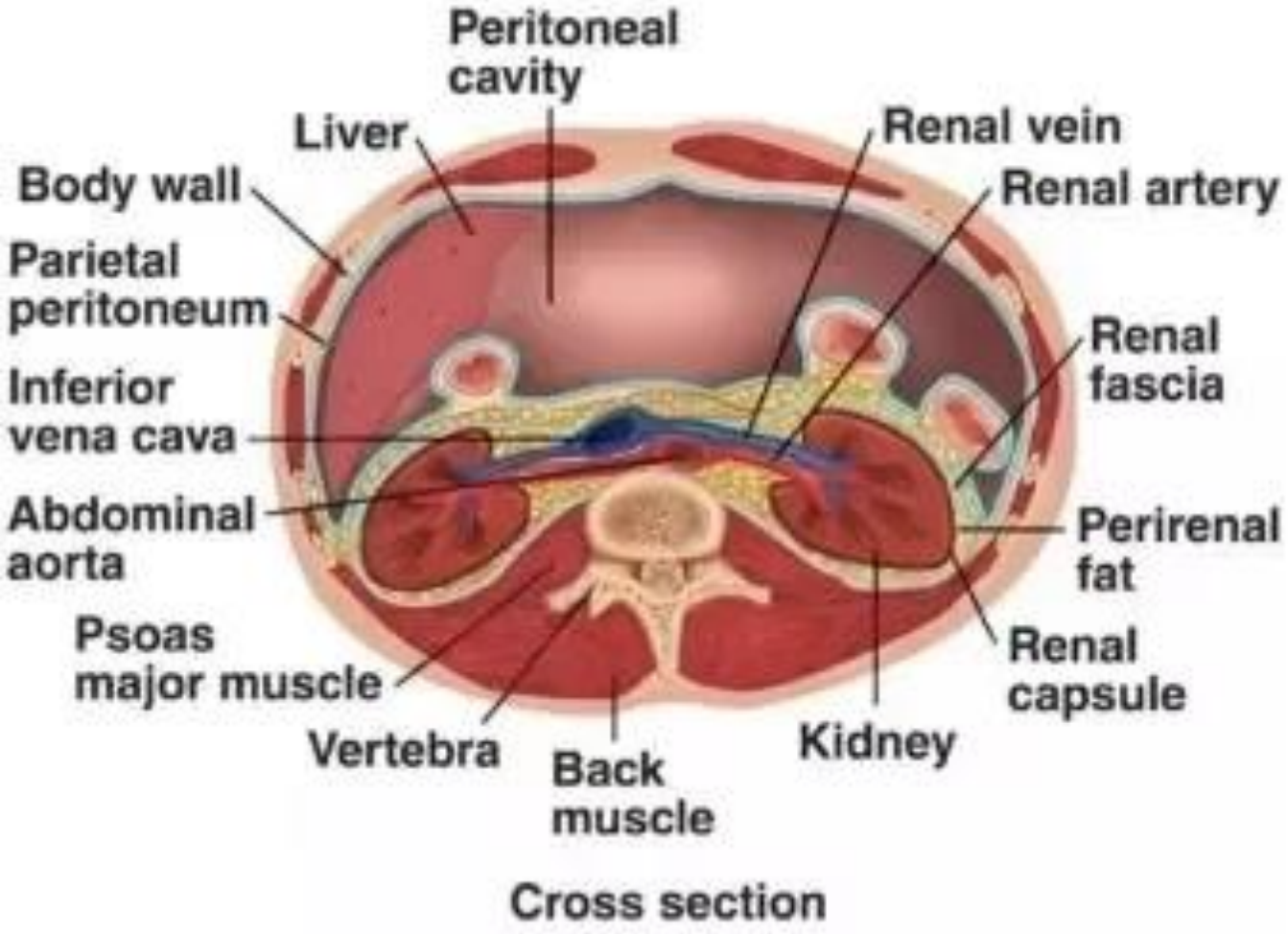
Retroperitoneal



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Abdominal Pain

- Abdominal Pain accounts for up to 10% of all ED visits.
- Most common presenting complaint to the ED
- Elderly are more likely to have an emergency condition as the cause of their abdominal pain
- “Females of childbearing age are pregnant until proven otherwise”

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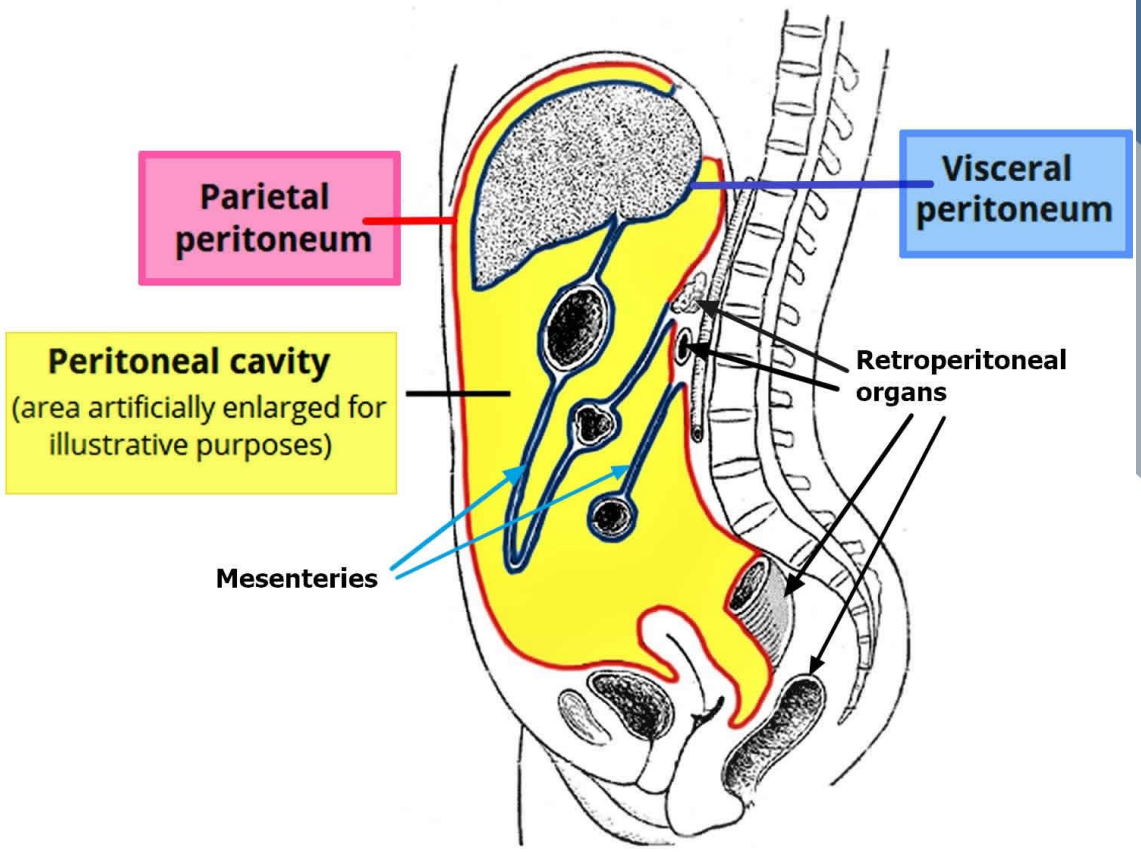
Visceral vs Somatic Pain

- Visceral- Organ Pain, early, deep-seated, dull, poorly localized
- Parietal, Somatic, localized, inflammation of parietal peritoneum, sharp



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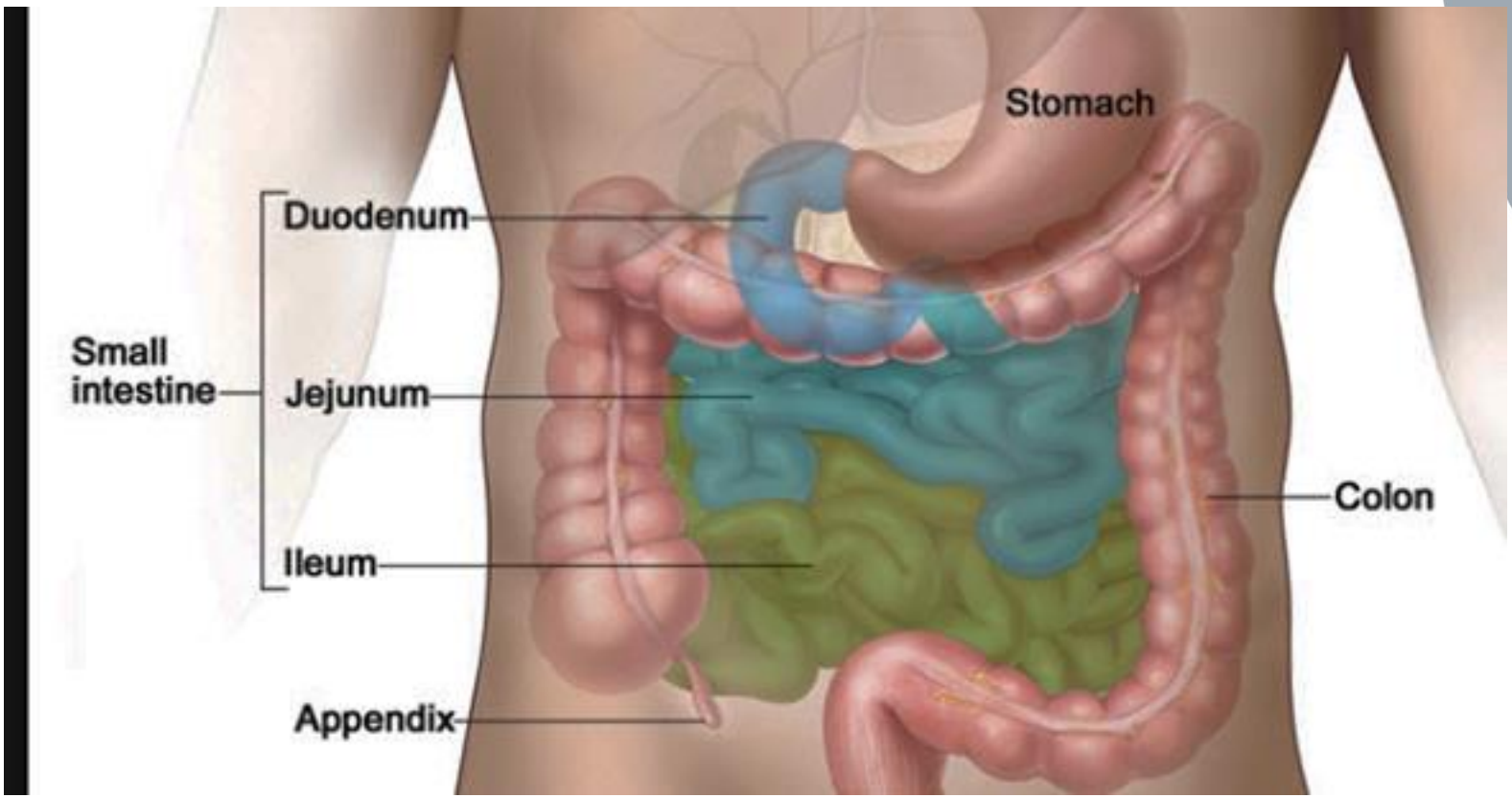
Case Study Appendicitis



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Physical Exam

- Inspection
- Auscultation
- Palpation

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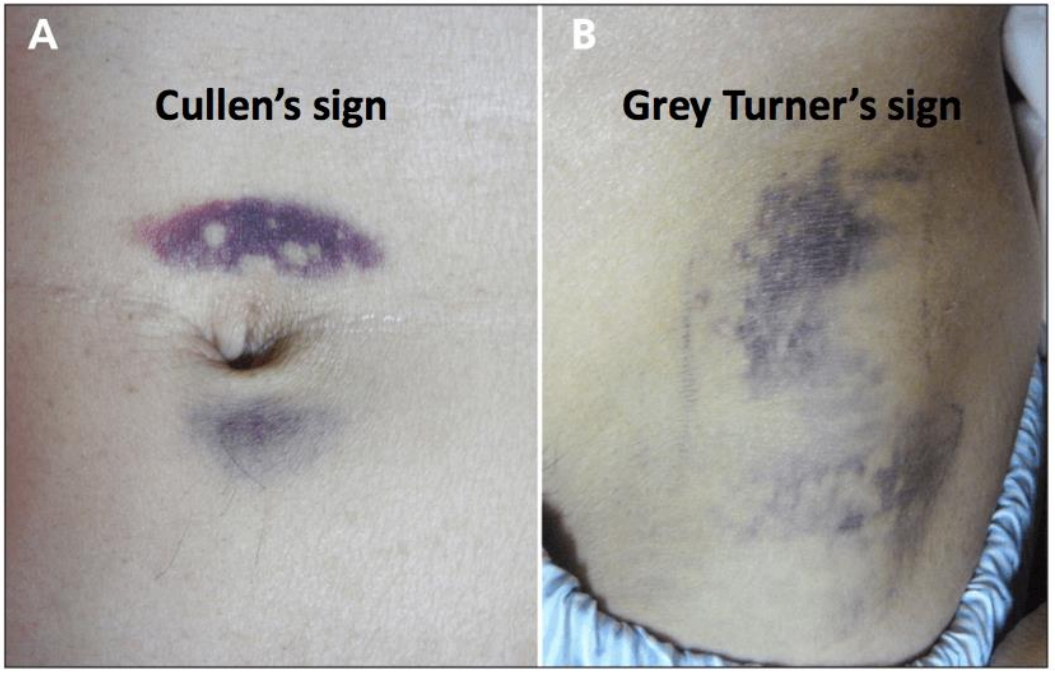
Physical Exam- Inspection

- Dilated Veins
- Ecchymosis
  - Concern for retroperitoneal hemorrhage
  - Cullen's Sign
  - Grey Turners Sign
- Hernias
- Visual Pulsations



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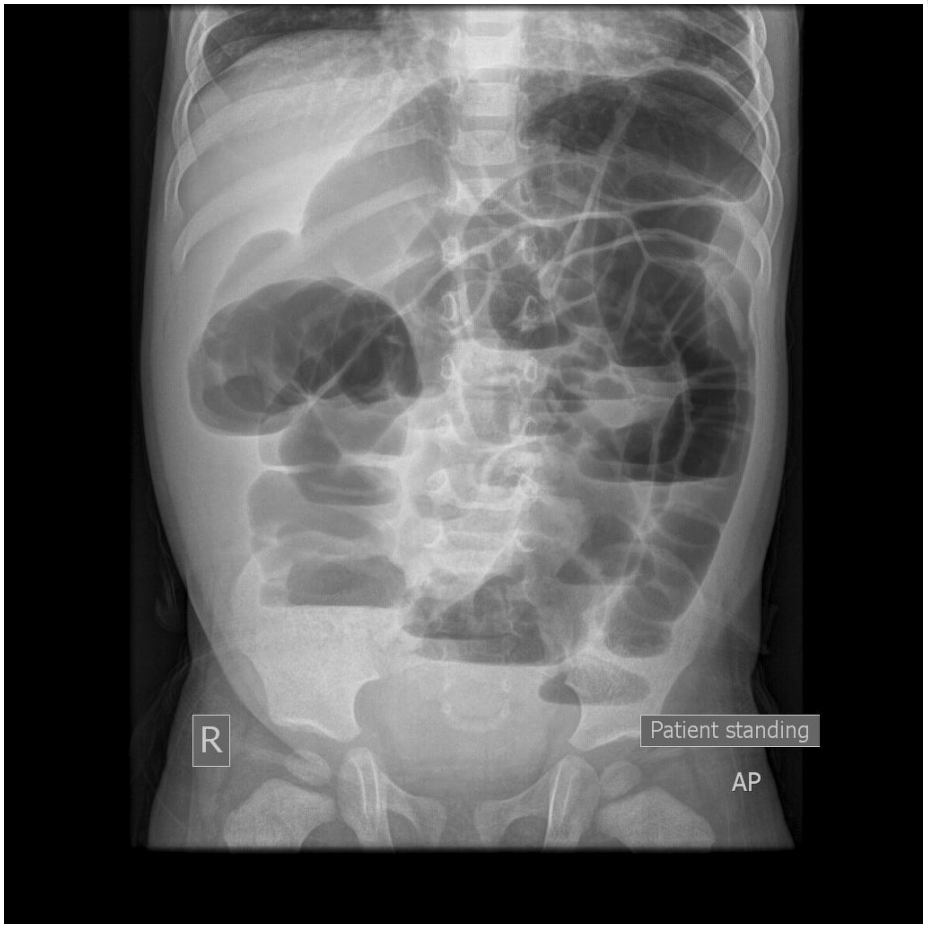
Ileus

- A temporary lack of normal muscle contractions of the intestine
- High pitched bowel sounds
- Abdominal distension
- Vomiting
- Dehydration



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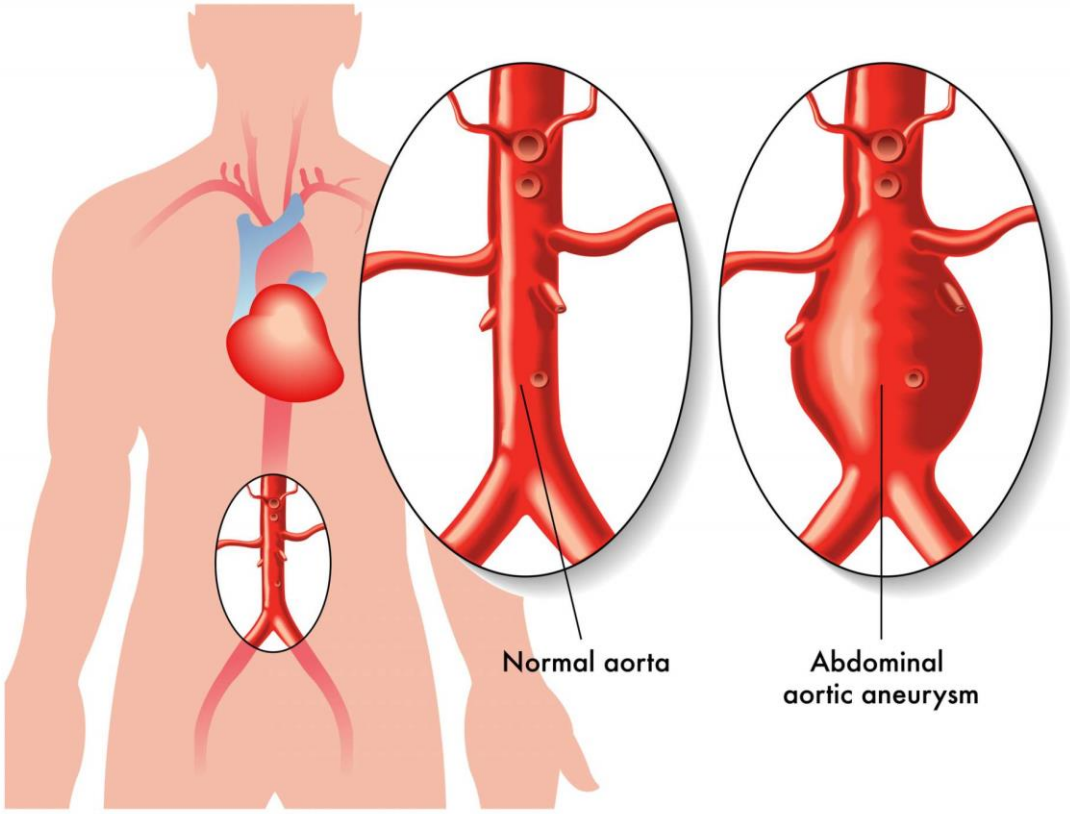
Physical Exam- Palpation

- Preformed last
- Palpate area of reported tenderness very last
- Watch for facial signs to indicate discomfort
- Assess for pulsations
  - AAA- midline
- Ascites- abnormal fluid collection
  - Liver Disease

AAA

- "Classic Presentation"
  - Abdominal/ flank/back pain
  - Hypotension
  - Hemorrhagic Shock
  - Treatment?
- Common Presentation
  - Low back pain
  - Syncope



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Physical Exam-Peritoneal Findings

- Tachycardia is most associated with the degree of peritonitis
- Rebound Tenderness-pain when you release
- Guarding
- Rigidity
- Peritoneal Findings=Surgical Emergency

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Opioids and Abdominal pain

- Fear of masking symptoms or physical exam findings is not a good reason not to treat pain.
- Opioids can slow GI motility and should be used with caution with bowel obstructions

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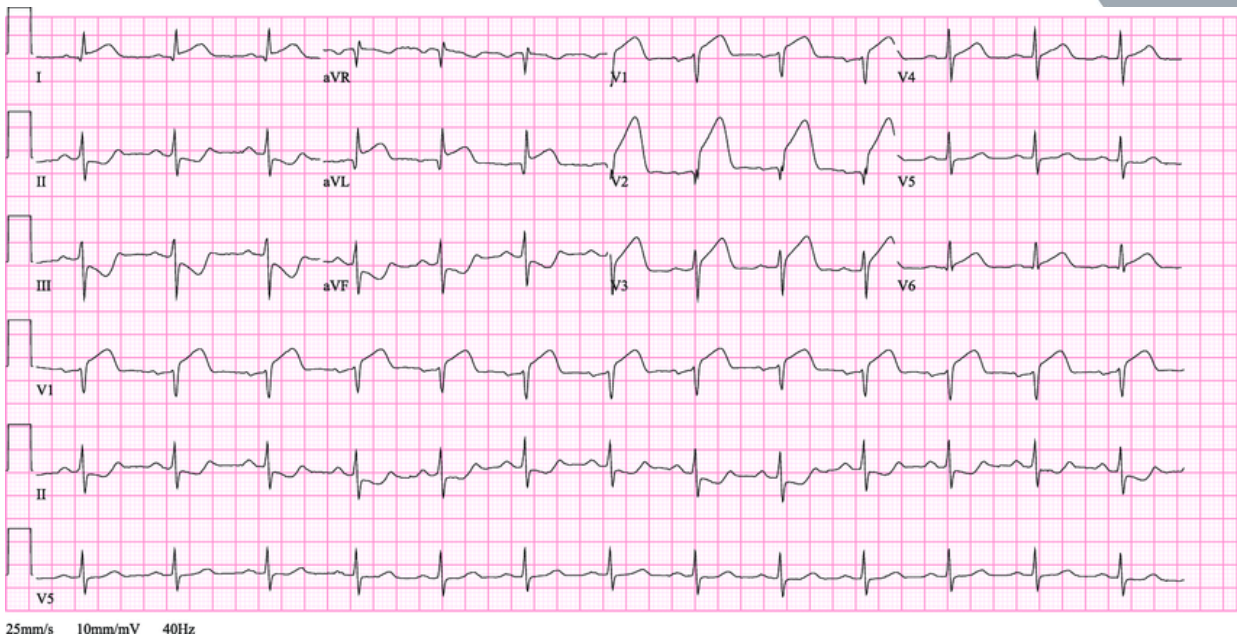
Special Populations

- Elderly- blunt manifestations of acute abdominal diseases, guarding, rebound tenderness might not be present
  - ACS Mimic
- Diabetes
- Schizophrenia



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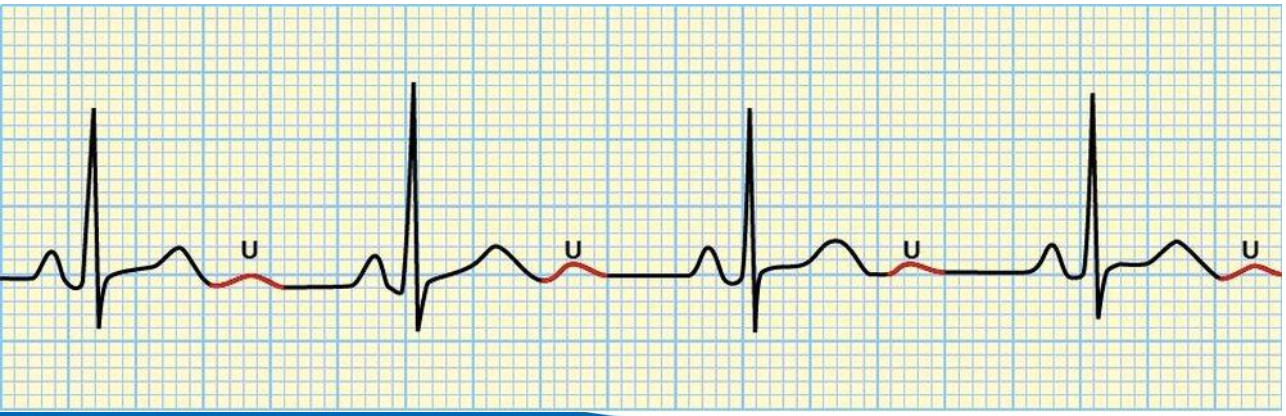
Complications of Vomiting

- Esophageal Perforation, Mallory-Weiss tear
  - Forceful Vomiting followed by Chest Pain can be emergency
- Dehydration
- Metabolic Alkalosis
- Electrolyte Derangements
  - Hypokalemia



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Why is the color of the stool/emesis important?

- Emesis
  - Bilious
  - Hematemesis
  - Coffee Ground
- Stool
  - Melena/Tarry
  - Acholic- tan liver issue
  - Hematochezia= Bright red blood

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Nausea and Vomiting-General

- Symptom, find the diagnosis
  - Don’t miss the Stroke or MI
    - Women
    - Diabetic
    - Elderly
- Assess the blood sugar
- Treatment
  - Be aware for respiratory compromise
    - Supplemental 02
      - Avoid NRB if actively vomiting
    - Suction

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Nausea and Vomiting-General

- Treatment
  - Alcohol Pad- have pt. hold 2.5 cm from nose
    - Inhale up to 60 seconds
    - Every 2 min x 2
  - Zofran ODT (Oral Disintegrating Tablet) (EMT)
    - Don’t Swallow
    - 4mg May repeat x 1
  - Zofran IM/IV (A/I EMT)
    - 4mg May repeat x 1
    - Pediatric 0.15mg/kg max dose 4 mg
  - If extrapyramidal or dystonic reactions given IM/IV diphenhydramine
  - Watch for QT prolongation

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Pediatric Dosing of IV Zofran

- 4mg 2/ml
- 4 mo/old 15 lbs = 6.8 kg = 1 mg (0.5ml)
- 2 y/o 30lbs = 13.6 kg = 2 mg (1ml)
- 4 y/o 44lbs = 20 kg = 3 mg (1.5ml)
- 6 y/o 60lbs = 27 kg = 4 mg (2ml)

- ODT Dozing?
  - Choking Considerations

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Extrapyramidal Side Effects/Dystonic Reaction

- Larry Mellick Used with permission
- “Acute Dystonic Reaction” You Tube

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Can Fam Physician. 2018 Aug; 64(8): 580.

PMCID: PMC6189884

PMID: 30108075

Inhaled isopropyl alcohol for nausea and vomiting in the emergency department

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Clinical question

Go to:

Can inhaled isopropyl alcohol be used to treat nausea and vomiting in the emergency department (ED)?

Bottom line

Go to:

Two trials with about 200 nonpregnant adults presenting to the ED found inhaled (smelling) isopropyl alcohol improved mild to moderate nausea and vomiting. For example, after 30 minutes the nausea score improved from 50 out of 100 to 20 with inhaled isopropyl alcohol versus 40 with oral ondansetron. Only 1 study reported adverse events and found none.

Pain Management-General

- Knees up, relax abdominal musculature
- Fentanyl
  - 100mcg IV/IM/IO/IN
    - Reduce by 50% in elderly, small framed or opioid naive.
    - “You can always give more but you can’t take it away”
    - Pediatric 1mcg/kg IV/IM/IO 2mcg/kg IN
  - OR
- Dilaudid 1mg IV/IO/IM (1mg Dilaudid =8mg morphine)
- Opioids can slow gut motility
  - Use caution in Ileus/Obstruction

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Upper GI Bleed

- Definition- any bleeding proximal to Jejunum
  - Esophagus-Tears/Varices
  - Gastric- Ulcerations
    - NSAIDS/H. Pylori
  - Duodenal
- History- Liver Disease, **Blood Thinners**, Alcohol
- Signs
  - Bright red or coffee ground emesis
  - Melena
  - Hemorrhagic Shock

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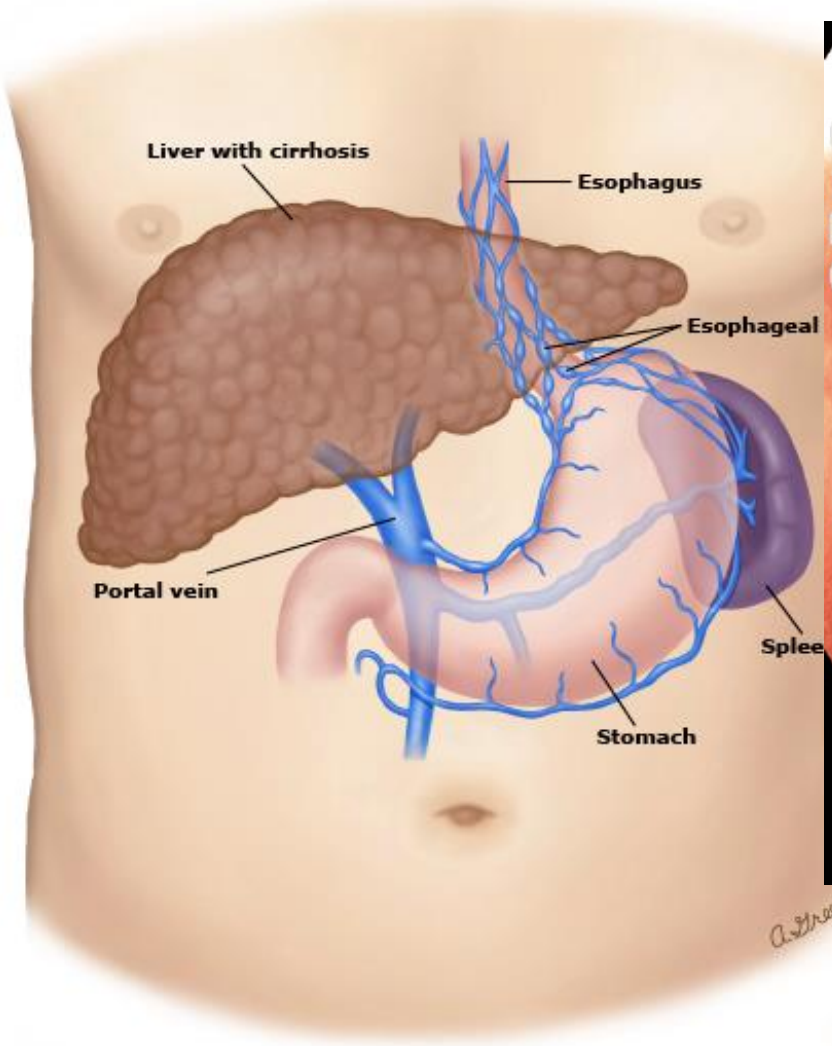
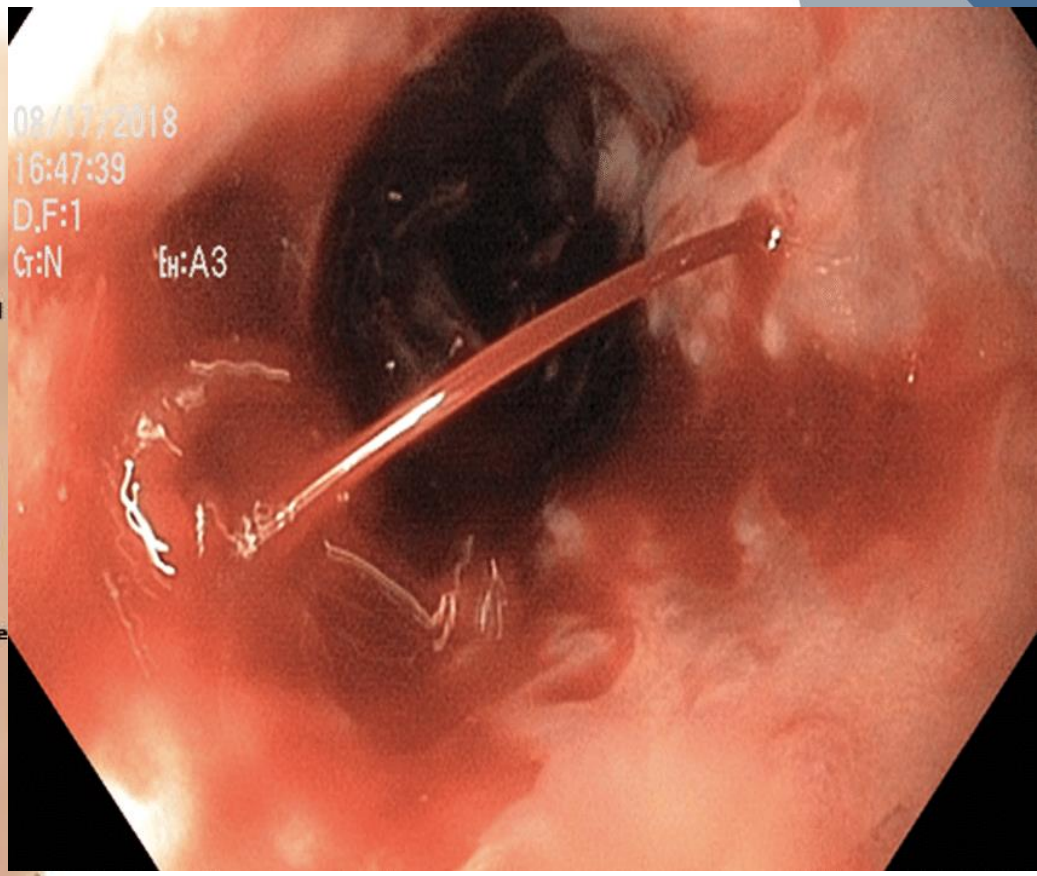
Esophageal Varicies





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Lower GI Bleeding

- Definition- bleeding past jejunum
  - Diverticular Bleeding
  - Angiodysplasia
  - Cancer
  - Inflammatory Bowel Disease
  - Hemorrhoids
- History- PMH, Painful, Blood Thinners
- Signs
  - Bright Red Blood Per Rectum
  - Hemorrhagic Shock

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GI Bleeding Treatment

- Airway Control
  - Suction
  - Avoid NRB if Vomiting
- Attempt to quantify blood loss
- Vascular Access
  - IV Fluids?
- Hang Blood Tubing!

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TXA in GI Bleeding?

- Most benefit seen if given within 3 hours of bleeding
- Timing of bleeding difficult to assess in GI bleeding
- Large recent study showed no benefit of giving TXA for GI bleeds
- Generally avoid

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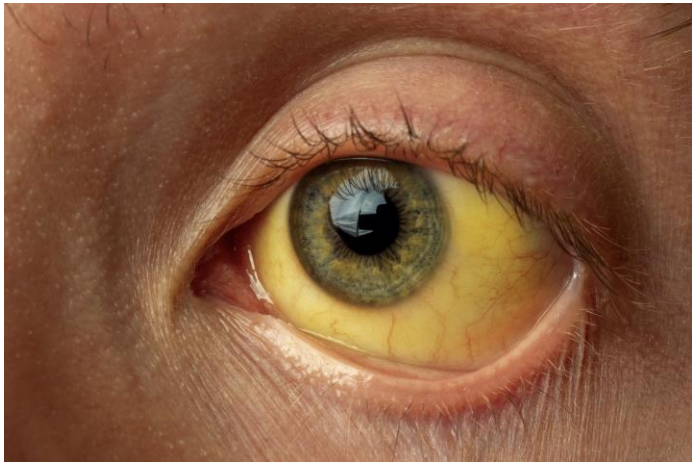
Cirrhosis

- Definition- late-stage liver disease which involved scarring of the liver and loss of function
  - Infections- Hepatitis
  - Toxins- Alcohol, Mushrooms
  - Metabolic/Immunologic/Vascular/Malignancy
- History
  - Hepatic Encephalopathy
- Signs
  - Jaundice
  - Ascites
  - Coagulopathy



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Diverticulitis

- Definition- Inflammation of intestinal out pouchings of musocal and submucosal tissue that push through the outer most layer of the intestine (diverdicula)
- History
  - LLQ abdominal pain, anorexia
- Signs
  - Fever
  - BRBPR
- EMS Treatment
  - Supportive, hemorrhagic shock rare

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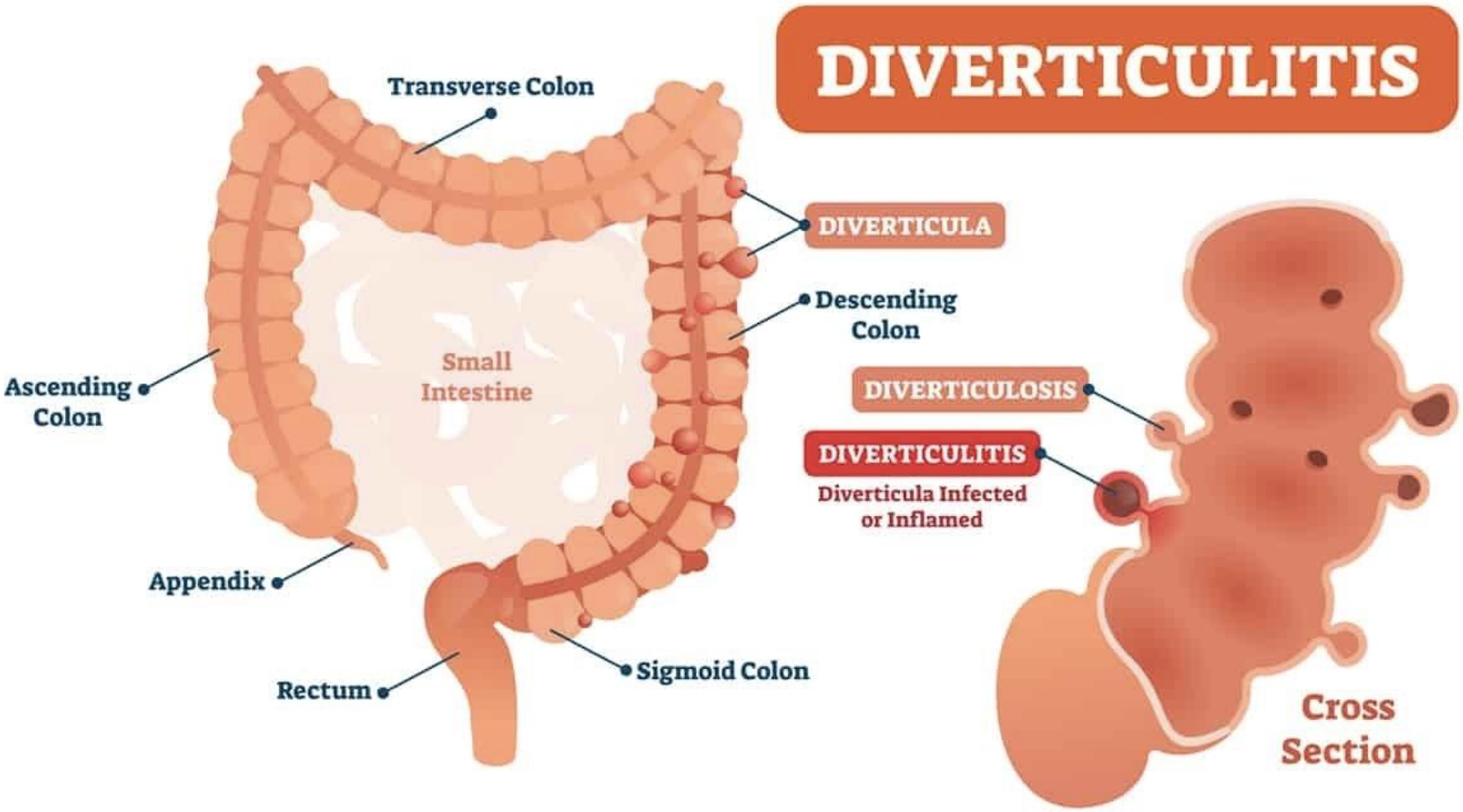
Diverticulitis



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Bowel Obstruction

- Definition- blockages of the lumen, within the small and large intestines
  - Adhesions-Prior Surgeries
  - Hernias
  - Cancer
  - Volvulus
- History- abdominal pain, vomiting, no bowel movements
- Signs
  - Dehydration
  - Feculant/Bilious Vomiting
- EMS Treatment- Supportive

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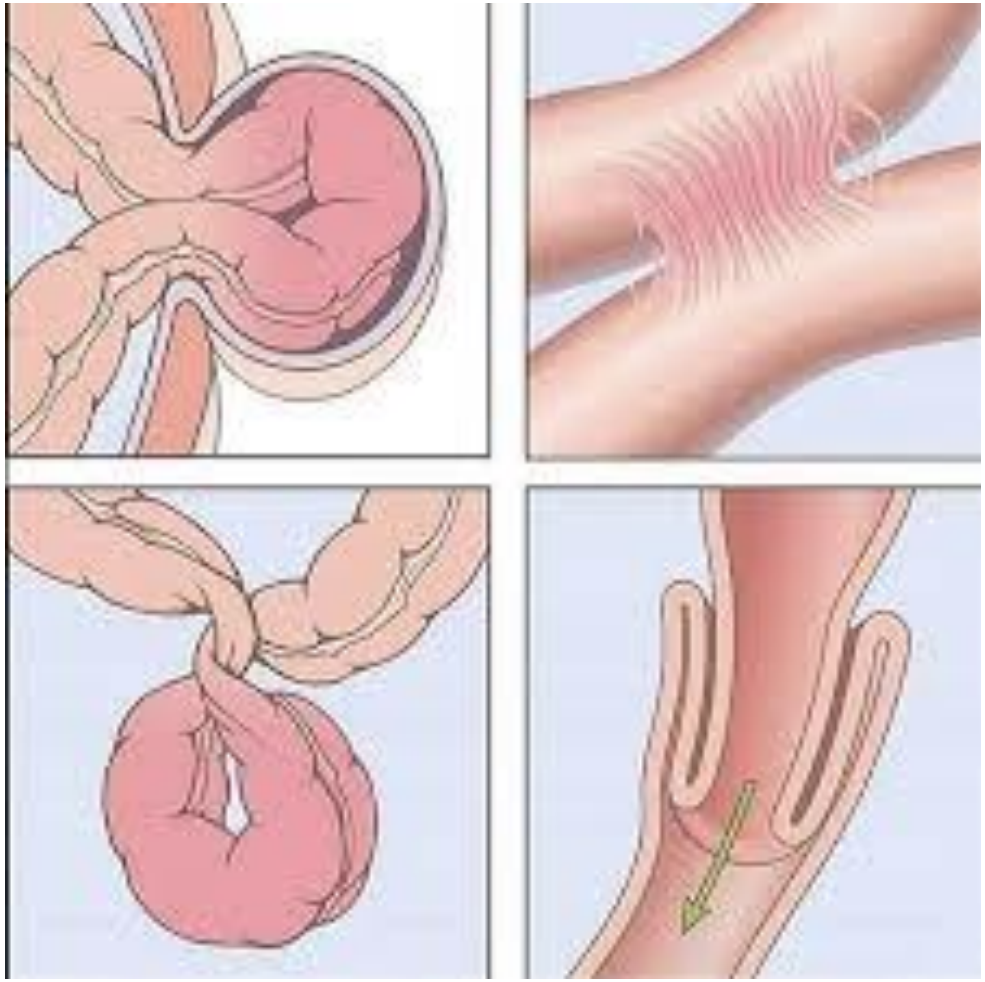
Bowel Obstruction



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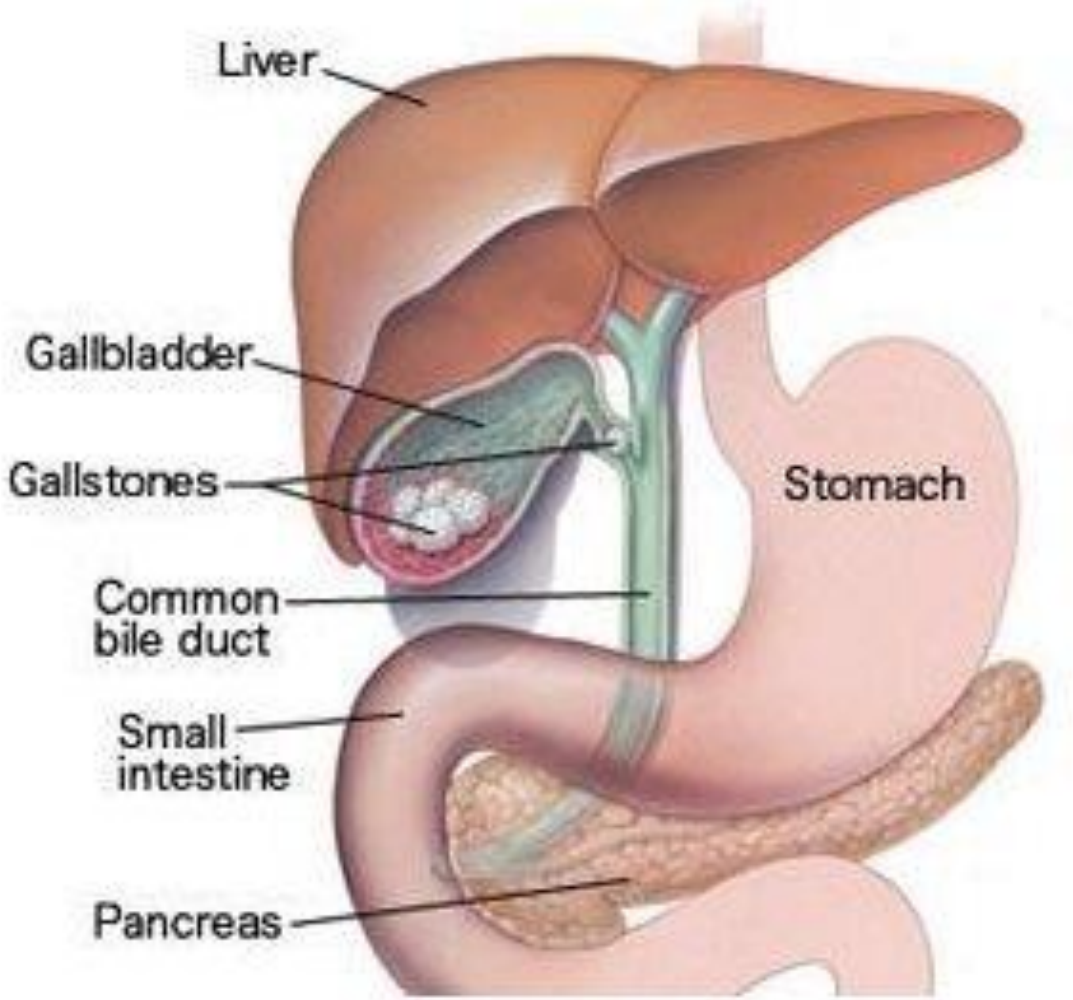
Gallbladder Disease



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Gallbladder Disease

- Cholecystitis- Inflammation of the Gallbladder
  - Gall Stones
- History: RUQ abdominal pain, worse with eating fatty foods
- Signs
  - Fever
  - Vomiting
- EMS Treatment
  - Symptomatic-IV fluids, pain control, antiemetics

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Pancreatitis

- Definition- Inflammation of Pancreas
  - Alcohol
  - Gall Stones
  - Trauma
- History
  - Pain with radiation to back (Why?)
- Signs
  - Hemorrhagic Shock
  - Dehydration
- EMS Treatment
  - Symptomatic- Pain control, antiemetics IV Fluids

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Pyelonephritis

- Bacterial Infection of Kidney
- Ascending Urinary Tract Infection
- Fever
- Flank/Back Pain
  - Why?
- Treatment
  - Recognition
  - IV Fluids for Sepsis

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Urinary Catheters

- Types
  - Urethral
  - Suprapubic
- During transport
  - Ensure it is kept lower than the bladder to prevent back flow
  - Ensure no traction
  - BLS scope of practic

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Nephrolithiasis

- Definition- Kidney Stone
- History- Sudden onset flank pain (why?)
- Signs
  - Fever
  - Hematuria
- EMS Treatment
  - Symptomatic
  - NSAIDS?

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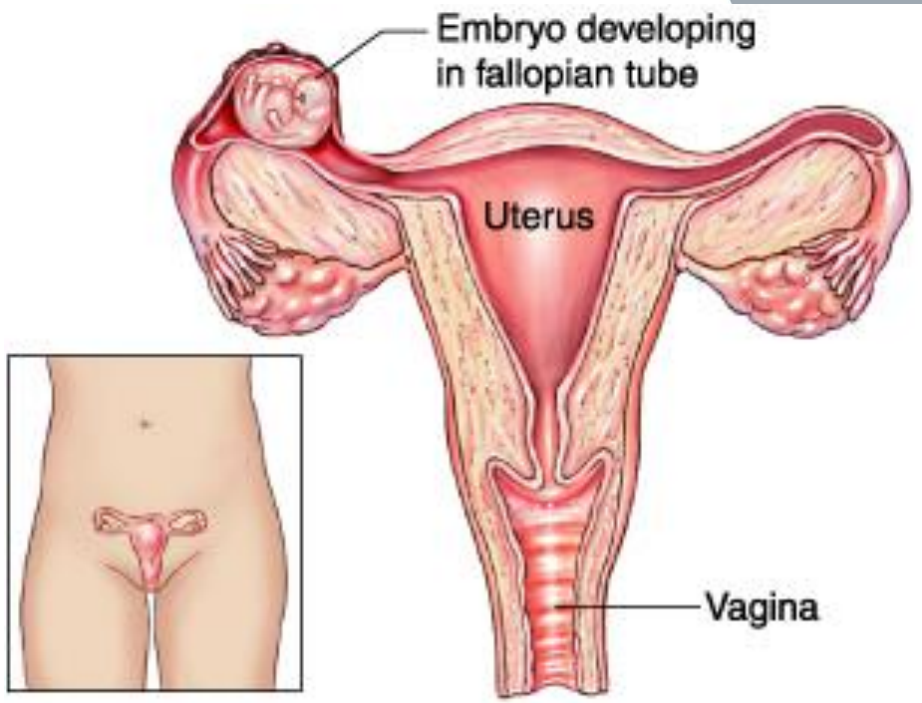
Ectopic Pregnancy

- Definition-Implementation of the fetus outside of the endometrium
  - Fallopian Tube
- History
  - Vaginal bleeding
  - Abdominal pain
  - Missed periods
  - Syncope + abdominal pain in female
- Signs
  - Hemorrhagic Shock



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Pediatric Case Studies- 6 day old

- EMS Respond for an infant with vomiting
- Friday Evening
- 6 day old
- Born at full term, normal vaginal delivery with unremarkable hospital stay. Discharged at day 2 of life
- ”bilious emesis” x2 following 2 last feeds

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Pediatric Case Studies 6 day old

- HR 160
- RR 50
- Temp 99.0
- Cap refill seconds
- Blood Sugar 72
- Abdomen soft, nondistended
- Child appears “fussy”
- Well Appearing
- Parents wish to refuse and see pediatrician on Monday
- Interventions/Actions

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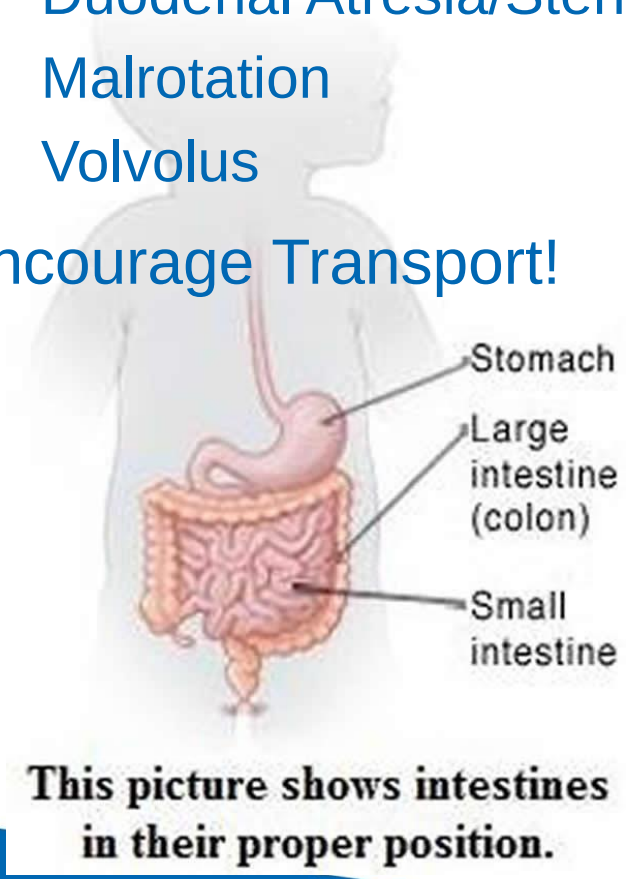
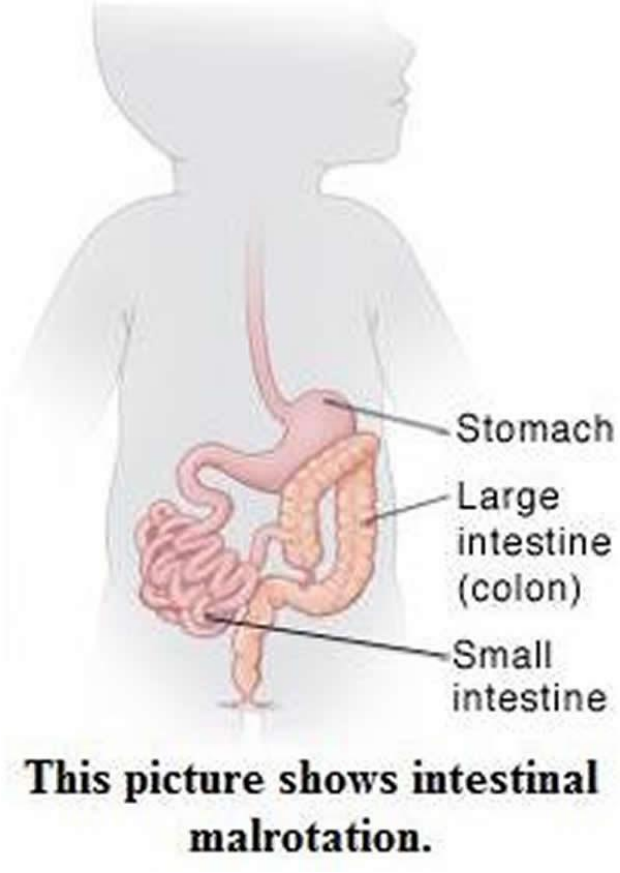
Pediatric Case Studies 6 day old

- Bilious Emesis in infants is a surgical emergency until proven otherwise!
  - Duodenal Atresia/Stenosis
  - Malrotation
  - Volvolus
- Encourage Transport!



This picture shows intestines in their proper position.



This picture shows intestinal malrotation.

Pediatric Case Studies 6 week old

- 6-week old male, mother calls for “projectile vomiting”
- Nonbloody, nonbilious emesis
- Born at full term
- “Palpable Mass in upper abdomen”
- Appears well, attempting to feed again
- Vital Signs and blood sugar normal

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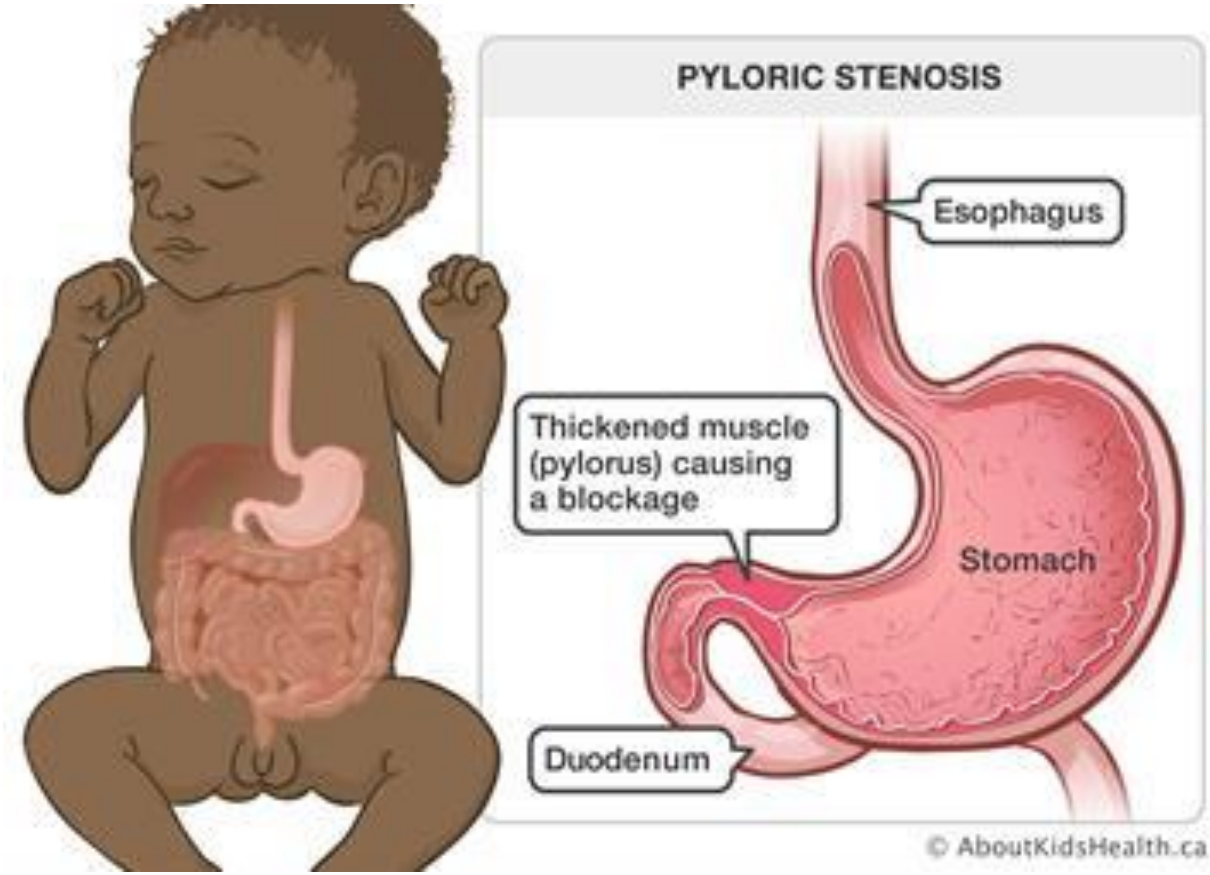
Pediatric Case Studies- 6 week old

- Pyloric Stenosis



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Pediatric Case Studies- 6 month old

- Respond to a 6 month old with lethargy
- Child appears tired, minimally responsive upon arrival with periods of intense crying
- Bloody stools noted on diaper exam
- Abdomen soft

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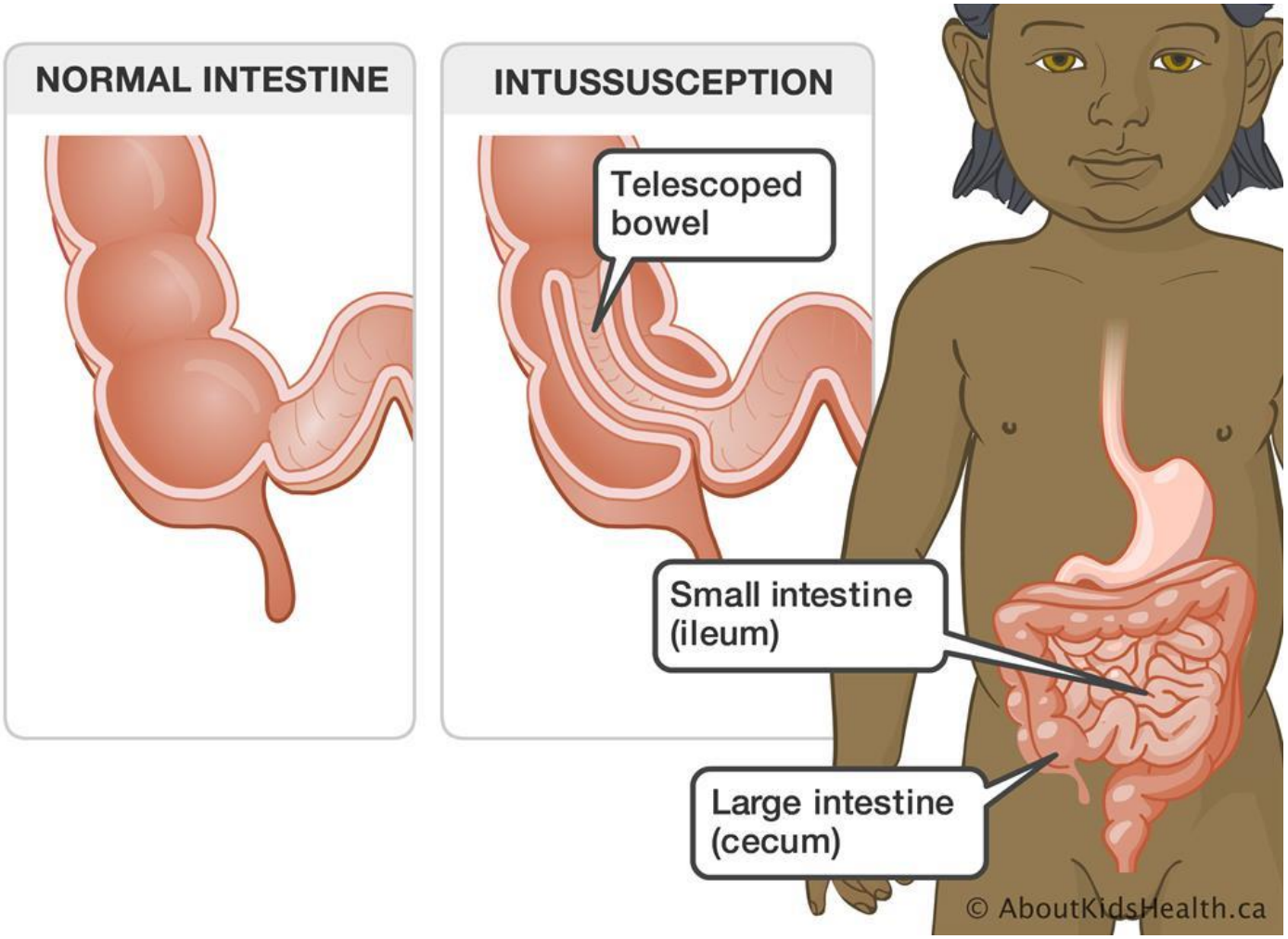
Pediatric Case Studies- 6 month old



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Abdominal Pain Mimics

- Acute Coronary Syndrome
  - Elderly
  - Diabetic
- Congestive Heart Failure
  - Abdominal Distension
- Anaphylaxis
- Testicle Torsion
- Referred Pain
- Electrolyte Abnormalities
- Be aware of syncope
- Endocrine Emergencies!

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Endocrine System

- Communication System that controls systems within the body
- Glands Secrete Hormones
  - Hormones work within feedback systems
  - Act on targets distance from their origin
  - Functions
    - Homeostasis
    - Reproduction
    - Growth and Development
    - Metabolism
    - Response to Stress

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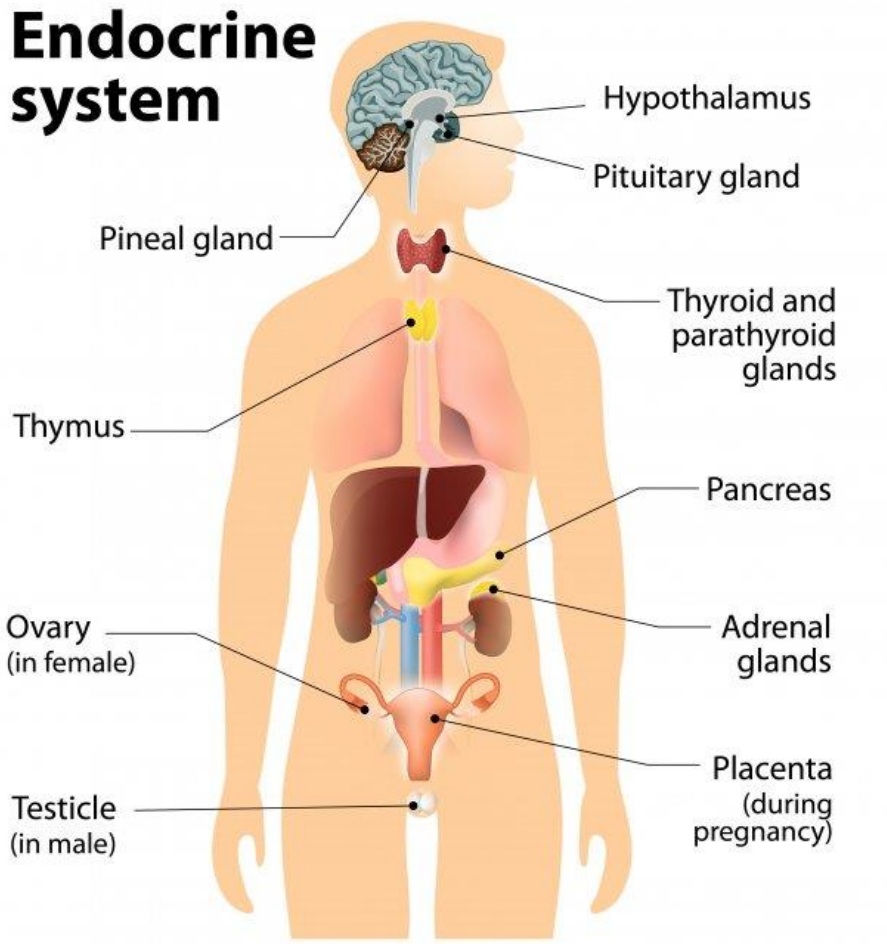
Endocrine System



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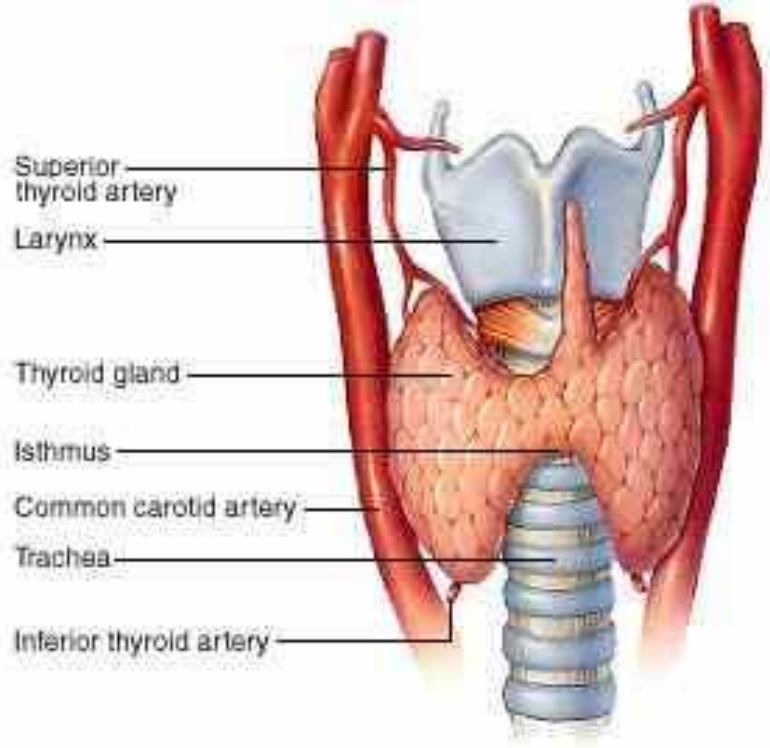
Endocrine System

- Hypothalamus
  - Master Regulator of the Endocrine System
    - Antidiuretic Hormone (ADH)= Vasopressin
- Thyroid Gland
  - Regulate Metabolism
  - Cardiovascular Function
  - Concentrates Iodine



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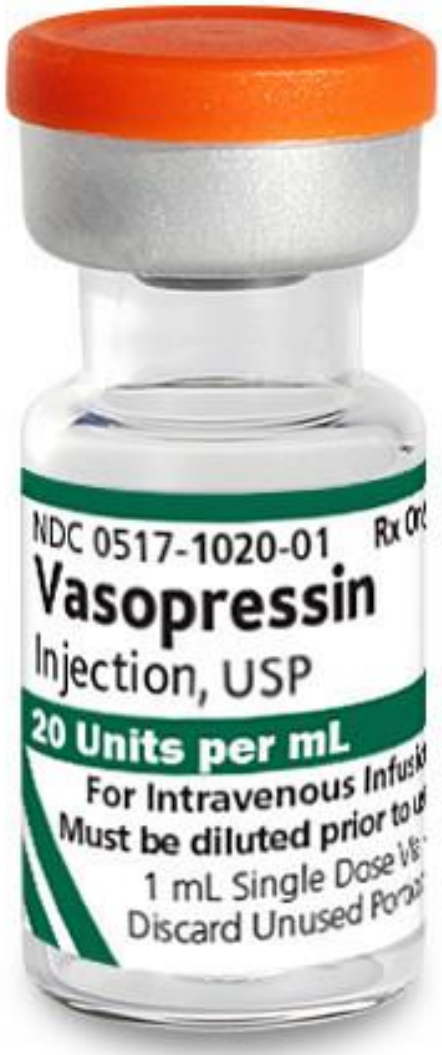
Vasopressin

- Vasoconstrictor
- Increases Water Reabsorption
- Historical Role in Cardiac Arrest Treatment
  - Epi equivalent to Vasopressin



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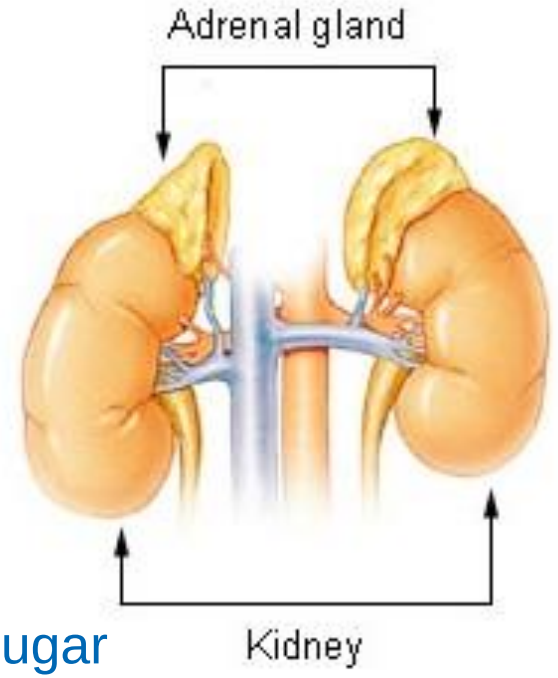
Endocrine System

- Adrenal Gland
  - Catecholamine Release
    - Epinephrine
    - Norepinephrine
  - Corticosteroids Release
    - Salt and Blood Pressure Regulation
    - Metabolism and Blood Sugar Regulation
    - Stress Response



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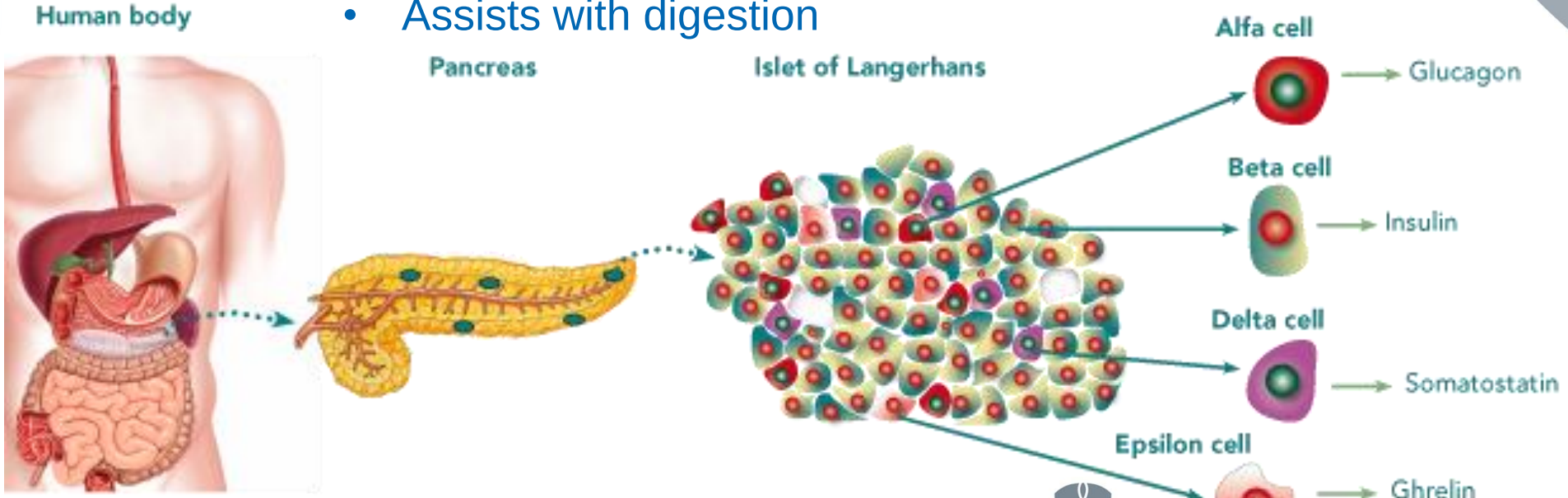
Endocrine System

- Pancreas
  - Endocrine Function (produced and stores)
    - Insulin
    - Glucagon
  - Exocrine Functions
    - Assists with digestion



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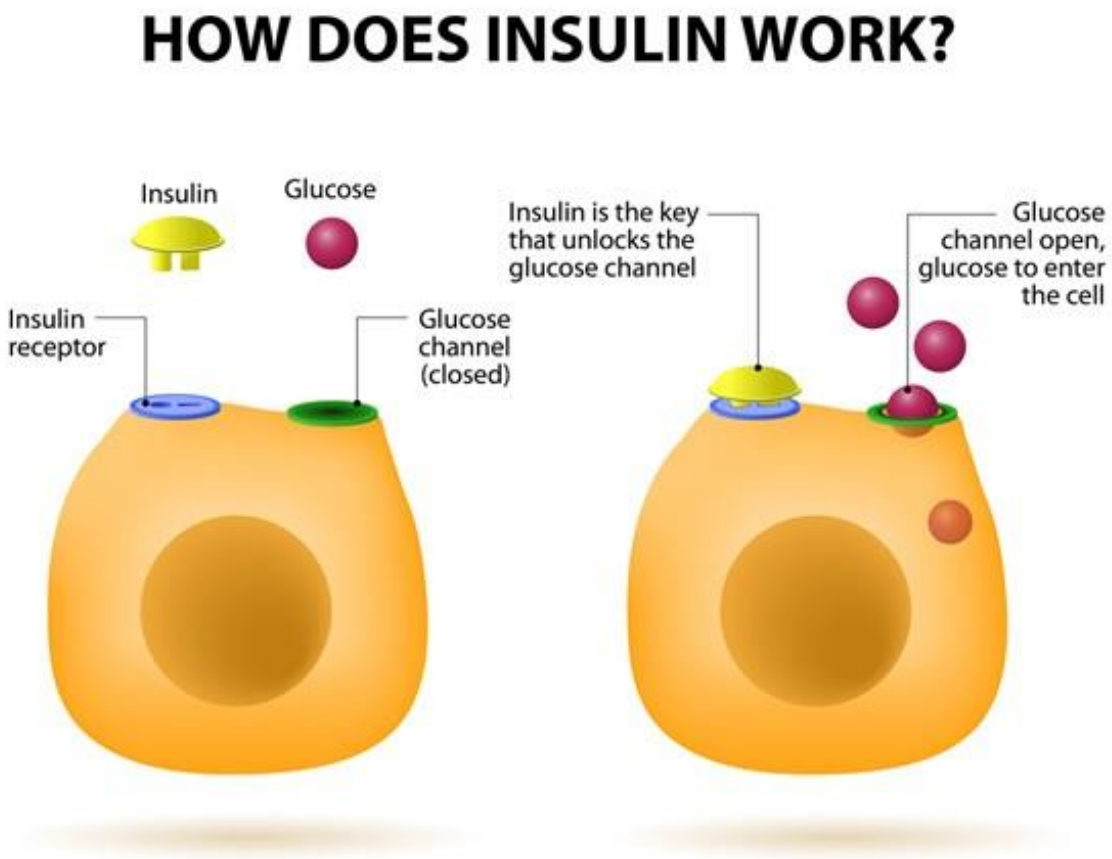
Glucose Metabolism

- Brain Requires Oxygen and Glucose
- Insulin is Necessary for Glucose to enter the cell
- Produced in liver via gluconeogenesis
  - Controlled by hormone glucagon
- Insulin
  - allows absorption of glucose by cells
  - Typically secreted by pancreas with glucose levels high

Insulin as Lock and Key



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Diabetes Mellitus

- A disease in which the body's ability to produce or respond to the hormone insulin is impaired, resulting in abnormal metabolism of carbohydrates and elevated levels of glucose in the blood and urine.
  - Type 1
    - 10% of all Diabetic cases
    - Auto immune destruction of Islet of Langerhans in Pancreas
    - Little or no insulin
  - Type 2
    - The pancreas secretes insulin, but the body is partially or completely unable to use the insulin (Insulin Resistance)

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Diabetes Mellitus Complications

- Heart Attacks
- Strokes
- Kidney Disease
- Peripheral Vascular Disease
- Neuropathy
- Amputations
- Infection Risk

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Glucose Metabolism

- Hyperglycemia >120
- Hypoglycemia <70
- Normal Blood Sugar 70-120
- What is your glucometers “High” and ”Low” Reading

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Diabetes Emergencies

- Hyperglycemia
- Diabetic Ketoacidosis
- Hyperosmolar Hyperglycemic Non-Ketotic Syndrome
- Hypoglycemia

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Hyperosmolar Hyperglycemic Non-Ketotic Syndrome

- Typically Type 2 Diabetes
- Profoundly Elevated Blood Sugar
- Elevated blood sugar leads to increased serum osmolarity
  - This results in Diuresis and Fluid Shift.
  - Increased Urination causes body wide depletion of Water and Electrolytes.
  - Extreme Dehydration/Thick Blood
    - Up to 9L Deficit in Adults

Hyperosmolar Hyperglycemic Non-Ketotic Syndrome

- Physical Signs
  - Tachycardia
  - Orthostatic Vitals
  - Poor Skin Turgor
  - Drowsiness and lethargy
  - Delirium
  - Coma
  - “Acetone/Fruity Breath”
  - Dehydration
- Prehospital treatment = IV Fluid
- Symptoms
  - Nausea/vomiting
  - Abdominal pain
  - Polydipsia/Polyuria

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Diabetic Ketoacidosis

- More Common in Type 1 Diabetes
  - Decreased Insulin or Insulin resistance leads to Elevated Blood Glucose levels
  - Cellular Glucose is Low without insulin
    - Glucometers read capillary blood sugar which is high.
  - Equivalent to intracellular starvation
- Body attempts to Compensate uses glucose stores by breaks Down Fat and Protein.
  - Results in Ketone production/Acidosis

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Diabetic Ketoacidosis

- Physical Signs
  - Altered mental status
  - Tachycardia
  - Tachypnea or hyperventilation (Kussmaul respirations)
  - Lethargy and weakness
  - Low Etc02
- Symptoms
  - Fatigue and malaise
  - Nausea/vomiting
  - **Abdominal pain**
  - Polydipsia
  - Polyuria
  - Weight loss

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Etc02 in DKA?

- DKA results in increased RR to “blow off acid”
  - Results in a lower Etc02
  - Worsened by poor perfusion
- Among patients with a blood glucose >250 mg/dL, an EtCO2 greater or less than 24.5 is both 90 percent sensitive and 90 percent specific for DKA

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EMS Treatment of DKA

- Recognize the diagnosis!
- IV Fluid!
- Treat Hyperkalemia if identified
- Indication for Sodium Bicarb in Cardiac Arrest
- Be aware for hyperkalemia and treat accordingly
- RSA Considerations

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EMS Treatment HHS vs DKA

- No Difference in Treatment for EMS
- Will Present as Altered Mental Status
- ABCs
- Supplemental Oxygen
- Dehydration
  - IV Fluids
- Vitals / Monitor
- Glucometry

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DKA RSA?

- HOP Killers
  - **H**emodynamics/Hypotension
    - SBP <90 biggest predictor of post RSA cardiac arrest
    - Patients with DKA are profoundly dehydrated
      - “Fill the tank before you give epi”
  - **P**H
    - DK**A**
    - Profoundly acidotic, usually self optimized respiratory compensation hence Kussumal breathing
    - Post intubation match preintubation Etc02 and RR
    - Any apneic time will worsen acidosis
- **Generally Avoid RSA in DKA!**

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Hypoglycemia

Chief Complaint

- Low blood sugar
- Altered/Change in Level of Consciousness
- Unresponsive
- Check blood sugars

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OPQRST

Check onset/duration

Identify possible contributing factors

Recent history of frequent episodes.

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SAMPLE

Medications:

Insulin? There are two main kinds of insulin. Long Acting and Short Acting

Long-Acting

Insulin glargine (**Basaglar, Lantus, Toujeo**) 1-1 1/2 hours No peak time. Insulin is delivered at a steady level. 20-24 hours Long-acting insulin covers insulin needs for about one full day.

Insulin detemir (**Levemir**) 1-2 hours 6-8 hours Up to 24 hours

Insulin degludec (**Tresiba**) 30-90 min. No peak time 42 hours

Short Acting Insulin

Lispro (**Humalog**) Onset 15-30 min. Peak 30-90 min

Duration 3-5 hours

Aspart (**Novolog**) Onset 10-20 min. Peak40-50 min.

Duration 3-5 hours

Glulisine (**Apidra**) Onset20-30 min. Peak30-90 min.

Duration1-2 1/2 hours

Regular (R) or **Novolin** Onset 30 min. -1 hour Peak 2-5 hours

Duration 5-8 hours.

Velosulin (for use in the insulin pump) Onset 30 min Peak 1-2hrs Duration 2-3 hours

Oral Hypoglycemic Agents

- Variety of Mechanisms of Actions
  - Limit the amount of sugar you absorb
  - Prevent kidneys from holding onto sugar
  - Stimulate the Pancreas to release insulin
  - Encourage the production of more insulin
- Some can have rebound Hypoglycemia
- Avoid Refusals! Encourage transport!

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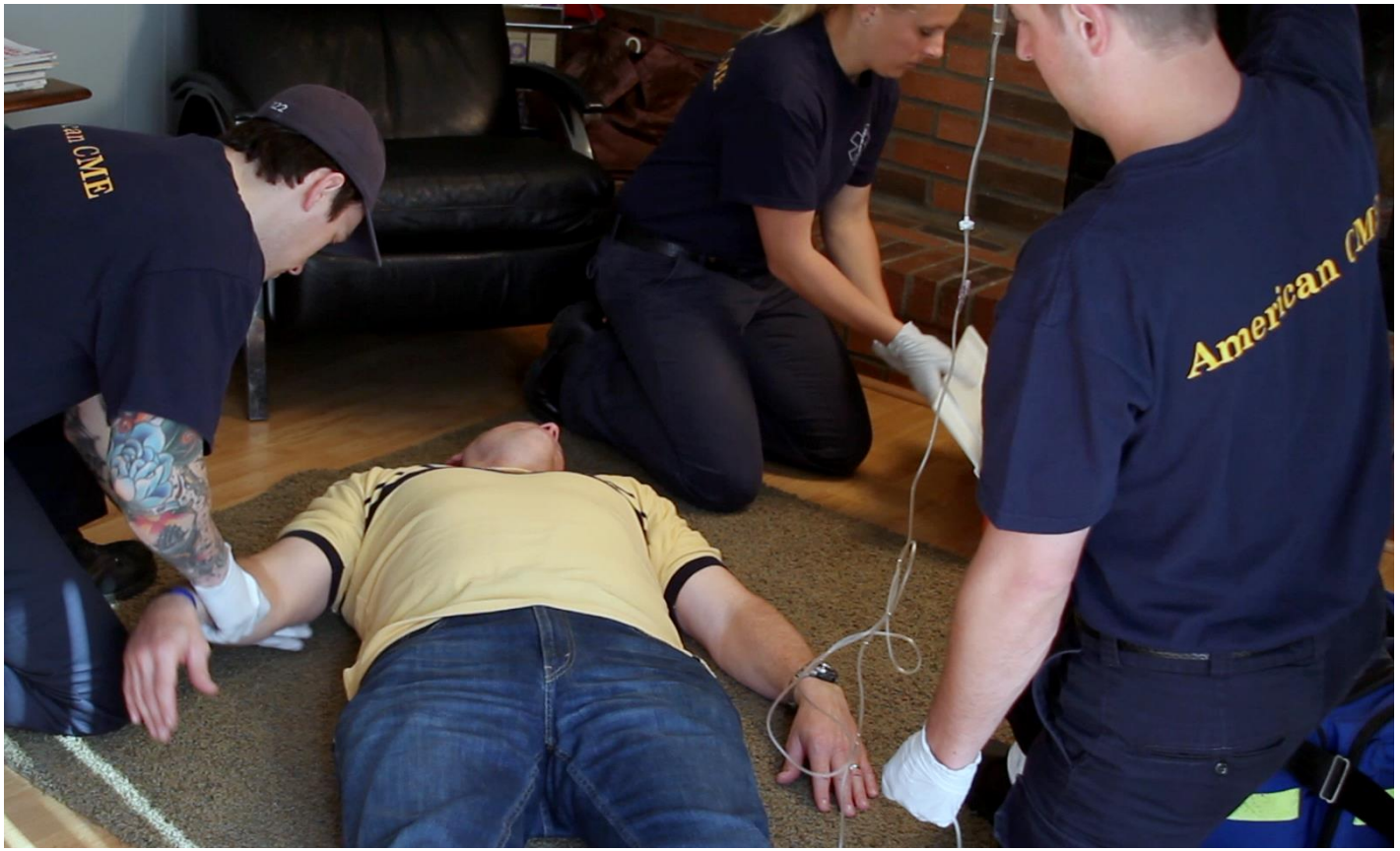
What is your average scene time?



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Treatment Times?

How long do we spend treating hypoglycemia?

What is the duration of our treatments VS the duration of the medications the patient is taking?

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Refusal VS Transport

- A large majority of diabetic patients will require continuous monitoring over an extended period of time.
- The patient needs to be aware of the risks associated with refusing care and benefits of transport- document as such
- Need to ensure consistent normal blood sugars before leaving
- Ensure complex carbohydrates and protein/fat are consumed as well as adult monitor on scene

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Things to also consider

- Adequate social support is available
- The patient has access to food or money to buy food
- The patient is not ill or in need of immediate medical attention
  - Insulin metabolized by kidney, frequently see decreased renal function as cause.
- Document proper IV removal and site inspection
- Patients on sulfonylurea oral agents refusing transport. These patients are at high risk of rebound hypoglycemia and require transport and hospital observation.

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Pediatric D10/Glucagon Dosing for Hypodlycemia

- D-10
  - 5ml/kg max of 125 ml D10
  - 10kg child (1 y/o) = 50ml D10 or 5g
  - 20kg child (4 y/o) = 100ml D10 or 10g
- Glucagon
  - Pediatric Patients <25kg give 0.5mg IM

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How to check a blood glucose
The right way

Must use a single

Use retractable

Lancet.

Pens or non-safety

Lancets are not

acceptable

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The outside of the ring finger is preferred.

It does not have as many nerve endings and will not hurt as much when the patient must grasp items later.

Insert test strip to activate glucometer

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Place a drop of blood at the END of the test strip

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Hypoglycemia Signs and Symptoms

Early adrenergic symptoms	Neuroglycopenic signs
Pallor	Confusion
Diaphoresis	Slurred speech
Shakiness	Irrational or uncontrolled behavior
Hunger	Disorientation
Anxiety	Loss of consciousness
Irritability	Seizures
Headache	Pupillary sluggishness
Dizziness	Decreased response to noxious stimuli

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How frequently should we be checking a blood glucose?

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Glucagon vs Dextrose

- Glucagon
  - Hormone vs Sugar
  - Helps release stored sugar from liver
    - Ineffective if no stores are present
  - Can cause relaxation of smooth muscles
    - Treatment of Esophageal Food Bolus
    - Side Effect=Nausea
  - Increase cGMP
    - Antidote for Beta Blocker ODs

Dextrose in Cardiac Arrest

- Hypoglycemia has been removed from list of reversible causes (Hs and Ts) from AHA. (2005)
  - What would you do with this data?
- Due to lack of perfusion distally (capillary level) finger blood glucose have poor sensitivity and specificity for detecting hypoglycemia
- Glucometer manufactures exclude “shock states” due to inaccurate reports
  - Cardiac Arrest as ultimate shock state

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D10 vs D50

- D50 causes rapid spike in blood sugar which causes insulin release leading to rebound hypoglycemia
- D50 produces a high osmotic load which can cause local skin irritation, thrombophlebitis, tissue necrosis (first do no harm)
- EMS studies show an equal time to reversal between D10 and D50 with no statistical difference in the post bolus glucose level and no difference in rebound hypoglycemia level
- Same concentration can be used in Adults/Pediatrics/Infants

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Adrenal Disease

- Addison's Disease
  - To little adrenocortical activity
  - Cortisol destruction/probably autoimmune
  - Water and electrolyte disturbances
  - Hospital Therapy with steroids
  - Signs and Sx-Sudden changes in behavior, Weakness, fatigue, decreased appetite and weight loss. Hyperpigmentation (bronze) to skin, vomiting, diarrhea, hypotension, dysthymias are common
  - EMS Tx-ABC, fluids, and 12 –lead to monitor for dysthymias

Addison's Disease

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Adrenal Disease

- Addison Crisis-metabolic failure
  - Infection
  - Trauma
  - Stop taking chronic medications
- S/Sx-Severe Vomiting/Diarrhea leading to hypotension, syncopal episodes, confusion & Psychosis, slurred speech agitation, seizures.
- Hypoglycemia Common
- Hypotension Common

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Solumedrol Review

- Methylprednisolone
  - IM/IV/IO
- Adult Dose 125mg
- Pediatric Dose 2mg/kg
  - 1 y/o 10 kg = 20mg= 0.33 ml
  - 4 y/o 20kg = 40mg = 0.66 ml
  - 8y/o 32kg= 64mg= 1ml
- Corticosteroid with Glucocorticoid > Mineralocorticoid effects
  - Anti-inflammatory> Water Balance
- Peak Onset approx. 1 hour following IV administration

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