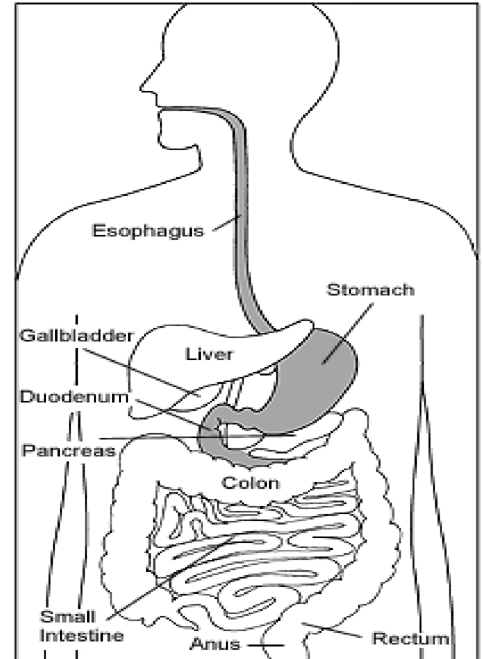
Gastroenterology and Abdominal Pain

1. Anatomy
   - The Major organs of the GI tract include:
     - Upper tract includes the mouth, esophagus, stomach and duodenum.
     - Lower tract includes remainder of the small intestine, the large intestine, rectum and anus



2. Pain Physiology
   - Abdominal pain can be classified in to 3 categories:
     - Somatic pain- is characteristically sharp and localized to the area of the problem. The patient can usually be specific to the location of the pain and may describe it as sharp and constant. Somatic pain is associated with conditions such as kidney stones or late appendicitis.
     - Visceral pain- is caused by stretching of the nerve fibers surrounding organs and is associated with conditions such as early appendicitis, bowel obstruction, and gall bladder infection (Cholecystitis)
     - Referred pain: This is pain perceived one area but originates in another area due to nerve distribution patterns. An example would be diaphragm irritation being sensed in the shoulder. Blood or pus under the diaphragm presents as an aching in the top of the shoulder. Renal colic pain (kidney stones) will radiate from the kidneys to the groin area.

   - Pain from inflammation:
     - Sudden onset or acute pain can be caused by inflammation of the hollow organs such as the appendix or gall bladder. This pain can be visceral in nature.
     - With widespread inflammation as seen in a ruptured appendix or peritonitis (inflammation of the lining of the peritoneal membrane) the pain is usually somatic. These patients will often be in severe pain and may be positioned lying down with knees to chest to prevent stretching of the inflamed abdomen.

- ***Pearl-*** *Pain that presents in the lower right quadrant and changes from visceral to somatic can be the changing stages of an inflamed appendix over time.*

- Hemorrhagic pain:
  - Sudden onset of pain can be attributed to perforation or rupture of an organ. The pain will be somatic in nature and the location will expand out as the blood spreads through the abdomen.
  - Pain from bleeding within the GI tract may initially produce vague visceral type pain that is commonly seen in inflammation or ischemia. If the bleeding is serious enough to cause abdominal distention, hypovolemic shock may also be present.
  - Pain from a dissecting aortic aneurysm is often sharp, tearing in nature and may be felt between the shoulders.

- ***Pearl-*** *when palpating a distended abdomen, specific areas that are warmer to the touch may indicate a collection of blood under the skin in that area.*

- Sample history taking:
  - **Sign and symptoms:**
    - Ask the patient to describe what they are feeling. Where is the pain located and what other symptoms are they experiencing?
    - Determine if visceral, somatic or referred pain.
    - Has the patient experienced vomiting or diarrhea?
    - What color and consistency were they?
    - What position did you find the patient?
  - Associated Symptoms:
    - A patient lying still and flat can be guarding from paritoneal pain vs. the patient who is writhing in pain and unable to find a comfortable position can have a dissecting aneurysm, obstruction or a kidney stone.
    - When they are prominent; nausea and vomiting suggest gastritis, gastroenteritis, AMI, acute pancreatitis or an obstruction.
    - Pain precedes vomiting in acute appendicitis.
    - Diarrhea is usually present with gastroenteritis.
    - The failure to pass flatus (gas) suggests obstruction.
    - GI distress in others sharing the same meal suggest food poisoning.
    - A recent ingestion of fatty foods preceding the pain suggests acute cholecyctitis (inflammation of the gall bladder).
    - An ingestion of excessive alcohol is compatible with pancreatitis.
    - **Age**: Appendicitis usually occurs between age 5 and 50. Cholecystitis is unusual in patients under 20.

Bowel obstruction is unusual in patients under 35.

- **Allergies**:
  - It is important to discover any drug allergies that may alter the treatment of pain.
- **Medications:**
  - Look for medication commonly used to treat stomach disorders such as stomach acid reducers, stool softeners, and cancer drugs.
  - Has the patient had any changed dosages, discontinued or new prescriptions lately? (some antibiotics can cause severe stomach cramps)
- **Pertinent past medical history:**
  - Has the patient ever had this pain before?
    - A history of alcohol abuse can suggest acute pancreatitis or cirrhosis.
  - Any recent surgeries or injuries?
  - Is there a possibility that you are pregnant? (a women of childbearing age should raise the highest suspicion of an ectopic pregnancy)
  - Any urologic conditions?
- **Last oral intake:**
  - Certain foods could cause abdominal pain as well as food poisoning.
  - Ask about home remedies or medications that may have been used to treat the pain and if they provided any relief.
- **Events leading to the incident:**
  - What was the patient doing when the pain started?
  - Recent trauma to the area?

- **OPQRST**
  - **Onset of pain**- sudden or slow.
  - **Provocation**- what makes it worse or better.
  - **Quality** (nature of the pain) – Sharp, dull, aching.
  - **Radiates/ Region** – where is the pain, does it go anywhere.
  - **Severity of the pain** – now and over time.
  - **Time**- how long has the patient been in pain?(any patient in severe pain more than 6 hours could be a surgical emergency)

- ***<u>Pearl</u>*** - *inquire about pertinent negatives such as*:
  - *no change in urinary or bowel habits,*
  - *no blood in stool or vomit*
  - *no history of cardiac problems (remember elderly, diabetics and women can present with abdominal pain while having an AMI)*
- **Physical exam:**
  - ABC.s

  - Skin: the patient may be in shock- look for palor, and diaphoresis or signs of dehydration.
  - Start with a visual inspection of abdomen looking for distention, discoloration.
  - Palpate all quadrants of the abdomen – starting with the unaffected areas first.
  - Remember to stop palpation if any pulsating is felt as this may cause a rupture.

- **Difference between upper and lower GI bleeding**
  - Upper GI is bleeding proximal (above) the duodenum
  - Lower GI is bleeding distal (below) to the duodenum
  - Common causes of upper GI bleeds
    - Peptic ulcer disease
    - Acute gastritis
    - Esophageal varicies
    - Esophagitis
    - Esphogeal tear from violent couching or retching.

- **Common causes of Lower GI bleeds**
  - Diverticulitis / Diverticulosis
  - Cancer: colorectal
  - Angiodysplasia (dilated and fragile blood vessels in the colon that results in intermittent loss of blood)
  - Blunt abdominal trauma
  - Hemorrhoids
  - Fissures (shallow, thin, often painful ulcers)
  - Tumors
  - Polyps (an extra piece of tissue that grows inside the body)

- **Is the bleeding lower of upper GI?**
  - Vomiting of blood is almost always upper GI
  - Bright red blood in the stool (hematochezia) may be seen in upper GI bleeding that has rapidly transited through the system.
  - Dark red blood is usually from the lower GI tract at the ileum to the right of the colon
  - Black stool or blood suggests rapid blood loss that stayed in the gut for at least 8 hours.
  - Silver or clay colored stool are caused by biliary obstruction plus GI bleeding (seen in cancer patients).

- **Life threatening reasons for acute abdominal pains causes:**
    - AMI- The acute myocardial infarction can often present as abdominal pain
    - Ruptured Aortic aneurysm- A weakened bulge in the aorta due to atherosclerosis. The rupture of an aortic may present with severe abdominal pain, back pain and shock. This patient can easily bleed to death
    - Ruptured ectopic pregnancy- Occurs when the fertilized egg implants outside of the uterus, in the fallopian tube. The rupture of the fallopian tube causes severe internal bleeding, abdominal pain, vaginal bleeding and shock.
    - Ruptured viscus- viscus is the general term for any hollow organ. The most common of these to rupture is the duodenum, usually due to a peptic ulcer. The patient will present with a sudden onset of sharp epigastric pain, a rigid abdomen and shock.

- **Common missed diagnoses in patients with abdominal pain**.
    - Ectopic pregnancy- all females of child bearing age who present with severe lower quadrant abdominal pain should be treated as an ectopic pregnancy until proven otherwise.
    - Lastly, abdominal or epigastric pain may be erroneously attributed to indigestion or gastritis when the patient is actually having an Acute myocardial infarction.
    - Appendicitis- Many times the signs of appendicitis are attributed to the "flu". To make things worse, when the appendix ruptures, the patient may feel better initially because of the release of pressure, but peritonitis will soon develop.
    - Pneumonia commonly presents with Right Upper Quadrant (RUQ) or Left Upper Quadrant (RUQ) pain.

- ***<u>Pearl</u>*- "** *Rovsings sign" during the physical exam, palpating the left lower quadrant abdomen results in pain and tenderness in the right lower quadrant of a patient with an appendicitis. The presence of this signs is related to peritoneal inflammation.*

- **GI conditions defined**:
    - **Appendicitis**- the inflammation of the appendix due to the occlusion of the lumen, in 10 % of cases, by a small piece of stool. The blood supply to the obstructed appendix is cut off as it swells to the point of rupture. The patient will present with crampy pain around the umbilicus that localizes to the right lower quadrant. These patients may have a decreased appetite, nausea, vomiting and a fever. The fact that the pain started before the nausea suggests appendicitis over gastroenteritis.

    - **Bowel Obstruction**: a blockage in the large or small intestine, commonly caused by tumors, scar tissue from previous inflammations or surgeries.

- **Bowel Ischemia**: similar to a heart attack, one of the mesenteric arteries become occluded causing bowel tissue death and extreme pain that may seem out of proportion to the patient's presentation.

- **Cholecystitis**: an acute inflammation of the gallbladder, usually due to gallstones. Distention of the gallbladder causes upper right quadrant pain that radiates to the right shoulder area.

- **Colitis** – a term indicating inflammation of the entire colon from any number of reasons. The most common causes are infections (viral), inflammatory diseases (Crohn's disease, ulcerative colitis) and STD's (gonorrheal colitis).

- **Crohn's Disease** – is a chronic condition resulting in bowel inflammation usually of the small intestines. Patients have recurrent exacerbations consisting of pain, diarrhea, and sometimes lower GI bleeding.

- **Esophageal Varices**- are the dilations of veins of the esophagus secondary to increased vein pressure. Bleeding occurs from these varices.

- **Peptic Ulcers**- a disease that involves the erosion of the lining of the stomach or duodenum. Bleeding may occur, but pain and inflammation are more common.

- **Treatment**
  - ABCs
  - Oxygen
  - Volume replacement for hypovolemia
  - Transport in a position of comfort and monitor the patient for potential vomiting.
  - Review the following protocols: Abdominal Pain, Gastrointestinal bleeding, Nausea & Vomiting and Shock(BLS & ALS)