Nursing Approach to the Abdomen

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Learning Objectives

• **Objective 1**-Learner will be able to state the quadrants of the abdomen
• **Objective 2**-Learner will be able to conduct a thorough subjective exam of the abdomen
• **Objective 3**-Leaner will be able to define two types of nutritional adjuncts
• **Objective 4**-Leaner will be aware of two main types of abdominal trauma
Surface Landmarks

• The abdomen is a large oval cavity extending from the diaphragm to the brim of the pelvis.
• Bordered in the back (posterior) by the vertebral column and the paravertebral muscles and the front (anterior) by the lower rib cage and abdominal muscles.
Location, Location, Location

• Two main systems for universal description of the abdomen and the contents.
  – Four quadrant system (most common)
  – Nine quadrant system (most descriptive)
The Four Quadrant Abdomen

- Right Upper Quadrant (RUQ)
- Left Upper Quadrant (LUQ)
- Right Lower Quadrant (RLQ)
- Left Lower Quadrant (LLQ)
Nine Quadrant Abdomen

- Right & Left Hypochondriac Region
- Right & Left Lumbar Region
- Right & Left Iliac Region
- Epigastric Region
- Umbilical Region
- Hypogastric Region
Internal Anatomy

Solid Viscera

- The *solid viscera* are those organs that maintain a characteristic shape:
  - Liver
  - Pancreas
  - Spleen
  - Adrenal Glands
  - Kidneys
  - Ovaries
  - Uterus

Hollow Viscera

- The *hollow viscera* are hollow organs in which the shape depends on the contents:
  - Stomach
  - Gallbladder
  - Small Intestine
  - Colon
  - Bladder
## Anatomic location of organ by quadrant

<table>
<thead>
<tr>
<th>Right Upper Quadrant (RUQ)</th>
<th>Left Upper Quadrant (LUQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Liver</td>
<td>• Stomach</td>
</tr>
<tr>
<td>• Gallbladder</td>
<td>• Spleen</td>
</tr>
<tr>
<td>• Duodenum</td>
<td>• Left lobe of liver</td>
</tr>
<tr>
<td>• Head of pancreas</td>
<td>• Body of the pancreas</td>
</tr>
<tr>
<td>• Right kidney and adrenal</td>
<td>• Left kidney and adrenal</td>
</tr>
<tr>
<td>• Hepatic flexure of colon</td>
<td>• Splenic flexure of colon</td>
</tr>
<tr>
<td>• Part of the ascending and transverse colon</td>
<td>• Part of the transverse and descending colon</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Right Lower Quadrant (RLQ)</th>
<th>Left Lower Quadrant (LLQ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Appendix</td>
<td>• Part of the descending colon</td>
</tr>
<tr>
<td>• Cecum</td>
<td>• Sigmoid colon</td>
</tr>
<tr>
<td>• Right ureter</td>
<td>• Left ureter</td>
</tr>
<tr>
<td>• Right ovary and tube</td>
<td>• Left ovary and tube</td>
</tr>
<tr>
<td>• Right spermatic cord</td>
<td>• Left spermatic cord</td>
</tr>
</tbody>
</table>
Subjective Data

• Appetite
• Dysphagia
• Food intolerance
• Nausea/Vomiting
• Abdominal Pain
• Bowel habits
• Past abdominal history
• Medications
• Nutritional assessment
Subjective Interview

• Appetite
  – Any change in appetite? Is this loss of appetite?
  – Any change in weight? How much weight gained or lost? Over what time period?
  – Is there a special religious/multicultural consideration?

• Dysphagia
  – Any difficulty swallowing? When did you notice this?
Subjective Interview

• **Food Intolerance**
  – Are there any foods you cannot eat? What happens if you do eat them: allergic reaction, heartburn, belching, bloating, indigestion?
  – Do you use antacids? How often?

• **Nausea/Vomiting**
  – Any nausea or vomiting? How often? What is the color? Is there an odor?
  – Is it bloody?
  – Is the nausea and vomiting associated with a colicky pain, diarrhea, fever, chills?
  – What foods did you eat in the last 24hrs? Who prepared them?
Subjective Interview

• Abdominal Pain
  – Any abdominal pain? Please point to it
  – Is the pain in one spot or does it move around?
  – How did it start? How long have you had it?
  – Constant or does it come and go?
  – How would you describe it?
  – Is the pain relieved by food, or worse after eating?
  – What makes the pain worse or better?
    • Food, position, medication, stress, activity...
Subjective Interview

• **Bowel habits**
  – How often do you have a bowel movement?
  – What is the color? Consistency?
  – Any diarrhea or constipation? How long?
  – Any recent change in bowel habits?
  – Use of laxatives? Which ones? How often?

• **Past abdominal history**
  – Any history of gastrointestinal problems: ulcer, gallbladder disease, hepatitis/jaundice, appendicitis, colitis, hernia?
  – Ever had any surgery in the abdomen?
Subjective Interview

• Medications
  – What medications are you currently taking?
  – How about alcohol—how much do you drink each day? Each week? When was your last drink?
  – How about tobacco—do you smoke, chew, dip? How much per day? How long?

• Nutritional Assessment
  – Please tell me about your diet?
Objective Assessment

Look...Listen...Feel

- **Inspection**-visual inspection
- **Auscultation**-audible inspection
- **Percussion/Palpation**-mechanical inspection
Inspection of the Abdomen

• Visual examination of the abdomen with special attention to:
  – Shape of the abdomen
  – Skin abnormalities
  – Abdominal masses
  – Movement of the abdominal wall with respiration
Visual Inspection of the Abdomen

- Inspect for symmetry of the abdomen while patient is laying down (supine).
- Inspect the contour of the abdomen
  - Flat
  - Scaphoid
  - Rounded
  - Protuberant
- Ask your patient to take a deep and hold it and look again!
  - This lowers the diaphragm and compressed the organs of the abdomen which may provide assessment of unseen bulges or masses.
Contour of the Abdomen

- Flat
- Scaphoid
- Rounded
- Protuberant
Auscultation of the Abdomen

• Audible examination of the abdomen with a stethoscope with special attention to:
  – Bowel sounds
  – Vascular Bruits
Auscultation of Bowel Sounds

- **Normal bowel sounds** are high pitched, gurgling, cascading sounds, occurring irregularly from 5 to 30 times per minute.

- **Hyperactive bowel sounds** are loud, high pitched, rushing, tinkling sounds that signal increased motility.

- **Hypoactive bowel sounds** are low pitched, rarely audible and often follow abdominal surgery or inflammation of the peritoneum.
Real life bowel sounds

• Medical and Nursing textbooks say you must listen for a complete 5 minutes in all four quadrants before completing an abdominal assessment
  – “Yea I heard a lot of stuff like a gremlin in there”
  – “Yea I heard some rumbling when I listened”
  – “I didn’t hear anything and got bored...plus I think that was my stomach anyway!”
Borborygmus...making your student loans worth it!
Postoperatively, bowel sounds resume gradually depending on the type of surgery.

The small intestine functions normally in the first few hours postoperatively.

Stomach emptying takes 24 to 48 hours to recover.

The colon requires 3 to 5 days to recover propulsive activity.
Vascular Sounds

- After listening to the abdomen, listen for the presence of any vascular sounds or bruits.
  - Aorta
  - Renal arteries
  - Iliacs
  - Femoral Arteries
Percussion of the Abdomen

- Percuss over all four quadrants moving clockwise.

- **Dullness**-occurs over a distended bladder, adipose tissue, fluid of a mass.

- **Hyperresonance**- is present with gaseous distention
Palpation of the Abdomen

• **Light Palpation**-depress the skin about 1cm making a gentle circular motion moving clockwise around the abdomen.

• **Deep Palpation**-depress the skin about 5 to 8cm moving clockwise exploring the entire abdomen.
The Critical Care Abdomen

• Now that you have an overall understanding of the abdominal assessment, what are some of the critical and traumatic alterations to the abdomen?
  – How do these alterations happen?
  – How do we fix them?
  – What are all these wires, tubes, drains?
Abdominal Pain

• Very, very, very, very, very...common.

• *Visceral* abdominal pain usually stems from internal organ injury.
  – “Dull, general, it just hurts, poorly localized”

• *Parietal* abdominal pain usually occurs from inflammation of the overlying peritoneum.
  – “right here, sharp, precise location, worse with movement”

• *Referred* abdominal pain usually occurs from a disorder from another site than where the pain is noted.
Common Sites of Referred Abdominal Pain

- Liver
- Heart
- GERD
- Biliary colic
- Cholecystitis, pancreatitis, duodenal ulcer
- Appendicitis
- Colon pain
- Renal colic
- Small intestine pain, appendicitis
- Pancreatitis, renal colic
- Ureteral colic
- Perforated duodenal ulcer
- Penetrating duodenal ulcer
- Cholecystitis
- Rectal lesions

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Common Examples of Referred Abdominal Pain

- **Liver**- Hepatitis may have mild to moderate, dull pain in RUQ or epigastrum, along with anorexia, nausea, malaise, low-grade fever.
- **Esophagus**- Gastroesophageal reflux disease (GERD) is a complex of systems of esophagitis, including burning pain in midepigastrum or behind lower sternum that radiates upward, or “heartburn.” Occurs 30 to 60min after eating; aggravated by lying down or bending over.
- **Gallbladder**- Cholecystitis is biliary colic, sudden pain in the RUQ that may radiate to right or left scapula (shoulder), and which builds over time, lasting 2 to 4 hours, after ingestion of fatty foods, alcohol, or caffeine. Associated with nausea and vomiting.
- **Pancreas**- Pancreatitis is acute. Boring midepigastric pain radiating to the back and sometimes to the left scapula or flank, severe nausea, and vomiting.
- **Duodenum**- Duodenal ulcer typically has dull, aching, gnawing pain, does not radiate, may be relieved by food, and may awaken the person from sleep.
Common Examples of Referred Abdominal Pain

- **Stomach**-Gastric ulcer pain is dull, aching, gnawing epigastric pain, usually brought on by food, radiates to back, or substernal area. Pain of perforated ulcer is burning epigastric pain of sudden onset that refers to one or both shoulders.

- **Appendix**-Appendicitis typically starts as dull, diffuse pain in the periumbilical region that later shifts to severe, sharp, persistent pain and tenderness localized by RLQ. Pain is aggravated by movement, coughing, deep breathing; associated with anorexia, then nausea and vomiting, fever.

- **Kidney**-Kidney stones prompt a sudden onset of severe, colicky flank or lower abdominal pain, nausea, and diarrhea.

- **Small Intestine**-Gastroenteritis has diffuse, generalized abdominal pain, with nausea, diarrhea.

- **Colon**-Large bowel obstruction has moderate, colicky pain of gradual onset in lower abdomen, bloating. Irritable bowel syndrome (IBS) has sharp or burning, cramping pain over a wide area; does not radiate. Brought on by meals and relieved by bowel movement.
Abdominal Trauma

• Abdominal trauma is one of the most common reasons for traumatic hospital admission.

• Abdominal trauma often involves multiple injuries leading to...
  – Hemorrhage
  – Hypovolemic shock
  – Death
Blunt Trauma

- Blunt trauma, is a traumatic force to the abdomen that does not leave an open or penetrating wound.
  - Motor Vehicle Crash (MVC)
  - Fall
Blunt Trauma

Compression

Shearing
Penetrating Trauma

- Penetrating trauma, causes an open wound.
  - Ballistic Injury
  - Stab Injury
Penetrating Trauma

Ballistic Injury

Stab Injury
FAST Exam

• A Focused Abdominal Sonography for Trauma is a standard assessment tool for evaluation of abdominal trauma.

• It is done at the bedside using a portable and noninvasive ultrasound.

• A well done FAST exam is very accurate. It allows for detection of fluid or blood in the pericardium, abdomen, or pelvis in addition to visualization of the spleen and liver.
Computed Tomography (CT Scan)

- A CT scan is helpful in determining specific injury sites, the degree of injury and bleeding, and may provide insight to retroperitoneal injuries limited by the FAST exam.
- The CT scan is limited in sensitivity for injuries to the diaphragm, pancreas and hollow organs.
To the lab...Studies for evaluating abdominal trauma

- **Urinalysis**
  - Detects blood for evaluation of urinary tract, pregnancy, and substances that may mimic an abdominal injury

- **Complete Blood Count (CBC)**
  - Helps to identify injury sites and the extent of injury

- **Arterial Blood Gas**
  - Reveals metabolic and respiratory abnormalities like acidosis and alkalosis

- **Prothrombin Time (PT), International Normalized Ratio (INR) & activated Partial Thromboplastin Time (aPTT)**
  - Screen for coagulopathy
To the lab...Studies for evaluating abdominal trauma

- **Electrolyte, Blood Urea Nitrogen, Creatinine & Lactate**
  - Provides a base line for renal problems and electrolyte replacement
- **Type and Crossmatch**
  - Defines blood characteristics for future transfusion
- **Serum Amylase and Lipase**
  - May signal injury to the pancreas or bowel
Intraabdominal Pressure (IAP)

- Intraabdominal pressure is the pressure within the abdominal cavity (IAP).
  - *Normal* - 0 mmHg
  - *Elevated* - 10-20mmHg, common after abdominal surgery
  - *Moderately Elevated* - 21-40mmHg
  - *Severely Elevated* - greater than 40mmHg
Intraabdominal Pressure
Risk for Intraabdominal Hypertension (IAH)

- Abdominal of Pelvic Trauma
  - Pelvic fractures
  - Intraperitoneal or retroperitoneal hemorrhage or hematoma
  - Visceral edema caused by ischemia and/or massive fluid resucitation
- Abdominal Surgery
  - Liver transplant
  - Postoperative bleeding
- Ascities
- Sepsis
- Pregnancy
Pathophysiologic Consequences of IAH

- Increased heart rate & respiratory rate
- Decreased cardiac output/cardiac index
- Normal or decreased Blood Pressure
- Increased intrathoracic pressure
- Decreased lung compliance
- Decreased cerebral perfusion pressure
- Decreased portal, celiac, and mesenteric blood flow
Treatment of IAH

• GI decompression
  – Prokinetics (ex. Metoclopramide)
  – Gastric and/or colonic tube
  – Enemas

• Reduce edema
  – Diuresis, dialysis and/or ultrafiltration

• Surgical Intervention (approx. >20mmHg)
  – Abdomen is opened (celiotomy)
  – The abdomen is usually left open after surgery for repair after swelling has subsided (usually within 5-7 days)
Exploratory Laparotomy (Ex-Lap)

• An exploratory laparotomy is performed with the objective of obtaining information that is not available via clinical diagnostic methods. It is usually performed in patients with acute or unexplained abdominal pain, in patients who have sustained abdominal trauma, and occasionally for staging in patients with a malignancy.
Damage Control Laparotomy

• The principles of the first 'damage control' procedure then are control of hemorrhage, prevention of contamination and protection from further injury.

• The central tenet of damage control surgery is that patients die from a triad of coagulopathy, hypothermia and metabolic acidosis.
  – Once this is reversed the definitive surgical procedure can be carried out as necessary.
Vanderbilt is one of the innovators, contributors and leaders in the traumatic abdomen.

1. Damage control
2. Restoration of physiologic reserve
3. Reconstruction

Critical Care Nutrition

• Total Parenteral Nutrition (TPN)
  – Central Venous Catheter (CVC)
  – Peripheral Inserted Central Catheter (PICC)

• Enteral Nutrition
  – Naso/Oral-gastric tube (NG or OG)
  – Weighted/Non-Weighted Feeding tube (Dobhoff)
  – Percutaneous Endoscopic Gastrostomy (PEG)
  – Percutaneous Endoscopic Gastrojejunostomy (PEG-J)
Parenteral Nutrition

Central Venous Catheter (CVC)  Peripheral Inserted Central Catheter (PICC)

Figure 46-10 Placement of triple-lumen nontunneled percutaneous central venous catheter.
Naso/Oral-Nasotric Tube
How it’s done?

• Position patient with head of bed at > 30 degrees if possible.
• Measure the distance from the tip of the nose to earlobe to xyphoid process of the sternum.
• Insert tube through nare (non-deviated side) to the back of throat (posterior nasopharynx) aiming the tube toward the back and down toward the ear.
• Swallow, swallow, swallow
• Advance tub toward your measured goal.
• Flush approx. 30cc of air to listen for wooosh.
• Confirm with x-ray film of chest/abdomen, gastri aspirates or water bubble test per institution.
Weighted/Non-Weighted Feeding Tube

Cortrak Placement

10 French; 140cm Feeding Tube
Placement of DHT

Post-Pyloric
Placement of DHT
Radiology Check!!!
Percutaneous Endoscopic Gastrostomy (PEG)

PEG Tube

Placement of PEG tube

Abdominal wall in cross-section

Feeding tube

Stomach in cross-section
Percutaneous Endoscopic Gastrostomy (PEG)

Visual Verification with Gastroscope

PEG FEEDING TUBE

PEG BUMPER
Percutaneous Endoscopic Gastrojejunostomy (PEG-J)
In one end...out the other

• There are a multitude of compounding factors in the intensive care setting that often impair normal bowel function.

• Bowel assessment is an important part of the complete assessment of the abdomen.

• If left unattended, constipation can be fatal in certain patient populations- specifically high cervical spinal injuries related to autonomic dysreflexia.
Constipation

• Constipation can be described as the decreased frequency of bowel movements with a hard dry stool.

• Little research and less literature

• Assessment of patients’ usual bowel habits by patient or surrogate is valuable.
  – ‘Normal’ bowel function is loosely defined as at least three stools a week
    • Less than 10% of the population have a daily bowel movement
Clinical Causes of Constipation

• Critical Care Medicine
  – Sedatives related to immobility
  – Opiates
  – Analgesics, anaesthetics, anticonvulsants, diuretics and calcium channel blockers

• Operative Intervention
  – Decreased peristalsis

• Immobility
  – Related to bed rest and/or orthopedic restraints

• Poor dietary intake
Trauma ICU Bowel Protocol

• **INITIALLY:**
  – Peri-Colace 1 cap PO or 15mg PT bid/tid
  – Senna (15mg sennosides): 2 tabs QD

• **IF NOT SUCCESSFUL, THEN:**
  – Milk of Magnesia 30mg QO hs
  – Dulcolax Suppositories Q Day
  – Lactulose 30cc QD to BID

• **IF STILL NOT SUCCESSFUL OVER 72H, THEN:**
  – provide ½ -1 bottle of Mag Citrate
  – USE OF MAGNESIUM CITRATE MUST BE VERIFIED THROUGH PHYSICIAN
Well they went...now what?
Assessing Stool

• Blood *on* the stool indicates from bleeding from the sigmoid colon, anus or rectum

• Blood *within* the stool indicates bleeding from the colon due to ulcerative colitis, diverticulosis, or tumors.

• *Black, tarry* stools (melena) occur with upper gastrointestinal bleeding.

• *Greyish or whitish* stools can result from biliary tract obstruction due to lack of bile in stool.

• *Greasy, frothy, yellow* stools, called steatorrhea, may appear with fat malabsorption.
## Bristol Stool Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No bowel movement</td>
</tr>
<tr>
<td>1</td>
<td>Separate hard lumps; hard to pass</td>
</tr>
<tr>
<td>2</td>
<td>Sausage-shaped but lumpy</td>
</tr>
<tr>
<td>3</td>
<td>Like a sausage but with cracks on the surface</td>
</tr>
<tr>
<td>4</td>
<td>Like a sausage or snake but smooth and soft</td>
</tr>
<tr>
<td>5</td>
<td>Soft blobs with clear-cut edges; easily passed</td>
</tr>
<tr>
<td>6</td>
<td>Fluffy pieces with ragged edges; a mushy stool</td>
</tr>
<tr>
<td>7</td>
<td>Water; no solid pieces, entirely liquid</td>
</tr>
</tbody>
</table>
Whoops…too much!

• Diarrhea is often another major problem in the intensive care unit.
  – Electrolyte imbalances
  – Dehydration
  – Malnutrition
  – Skin breakdown

• Possible causes should be continually investigated.
  – Enteral nutrition
  – Microbiological cause
Rectal Tubes

• There are many commercially manufactured bowel management systems available for use in the ICU.
  – Skin breakdown
  – Contamination with wounds and/or dressings
  – Consistent stool sampling
Questions?

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Works Consulted