Gastrointestinal System Clinical Examination

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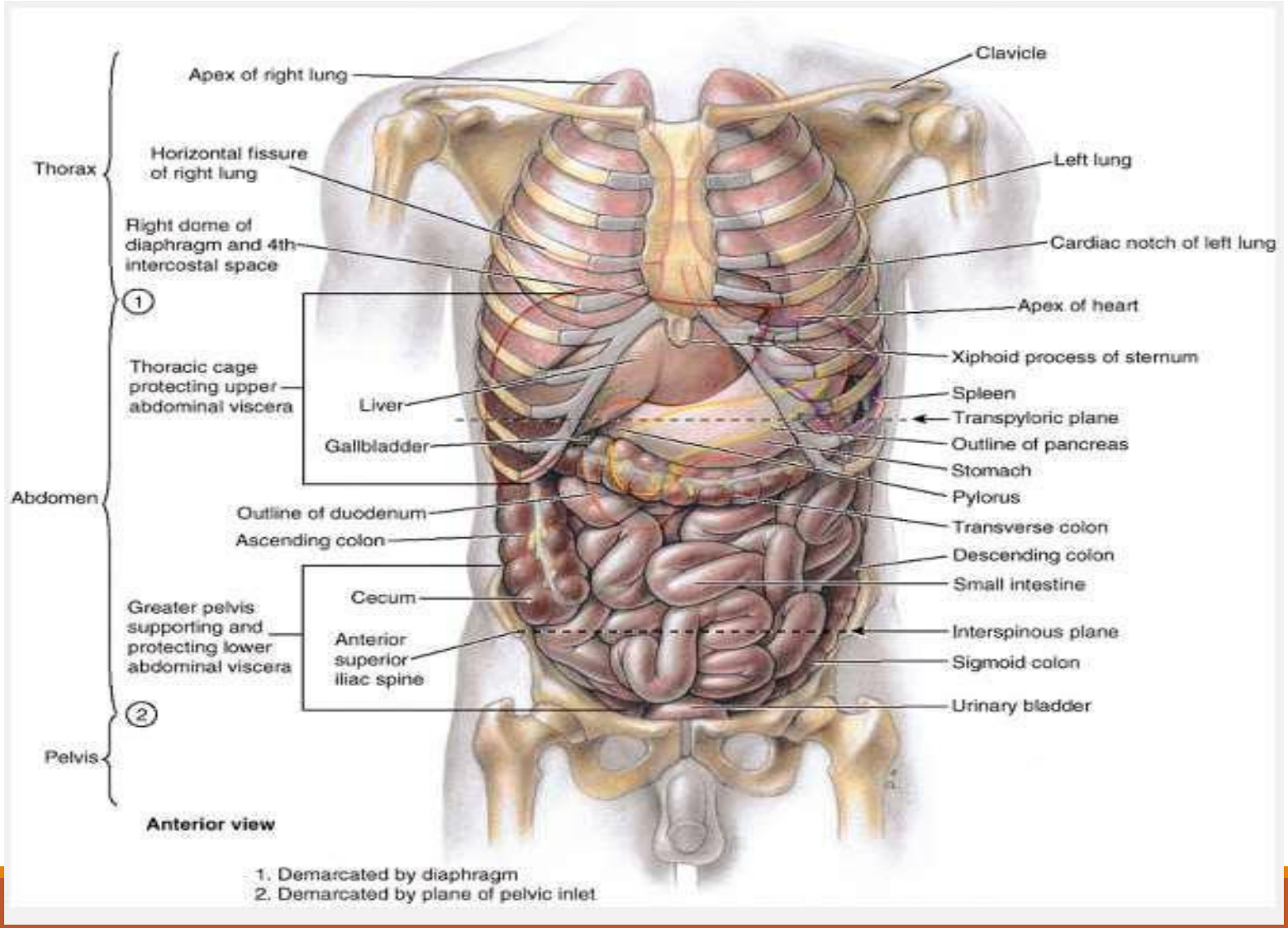
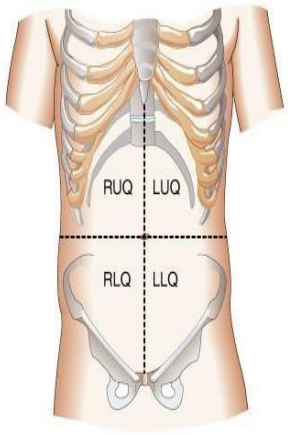
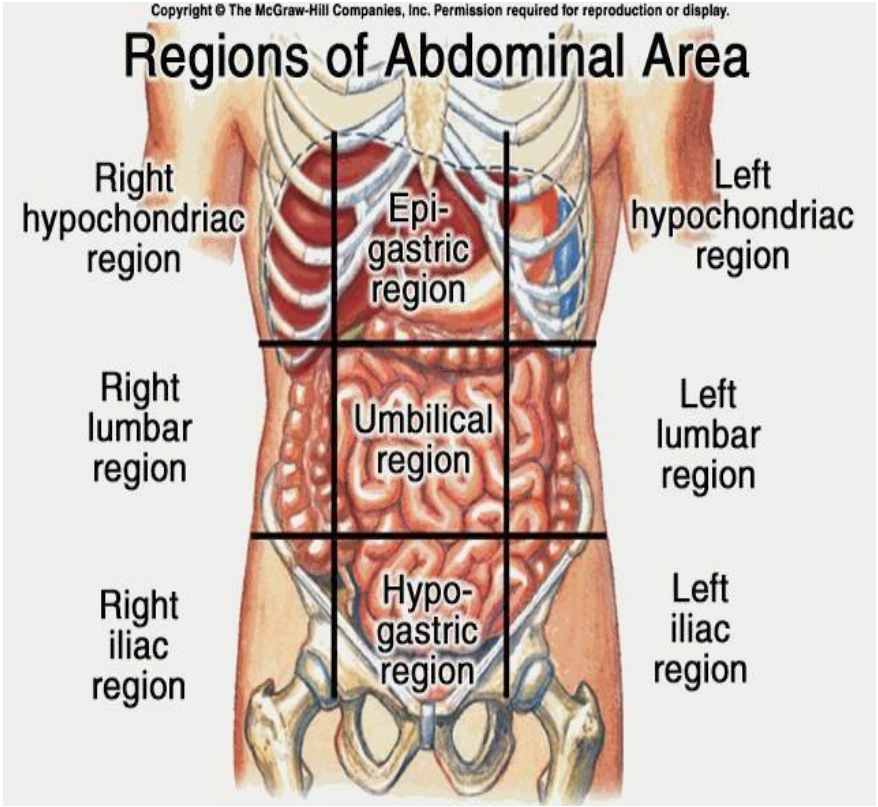
CHALLENGE


Thorax
Abdomen
Pelvis
Apex of right lung
Horizontal fissure of right lung
Right dome of diaphragm and 4th intercostal space
1
Thoracic cage protecting upper abdominal viscera
Liver
Gallbladder
Outline of duodenum
Ascending colon
Cecum
Greater pelvis supporting and protecting lower abdominal viscera
Anterior superior iliac spine
2
Anterior view
Clavicle
Left lung
Cardiac notch of left lung
Apex of heart
Xiphoid process of sternum
Spleen
Transpyloric plane
Outline of pancreas
Stomach
Pylorus
Transverse colon
Descending colon
Small intestine
Interspinous plane
Sigmoid colon
Urinary bladder
1. Demarcated by diaphragm
2. Demarcated by plane of pelvic inlet

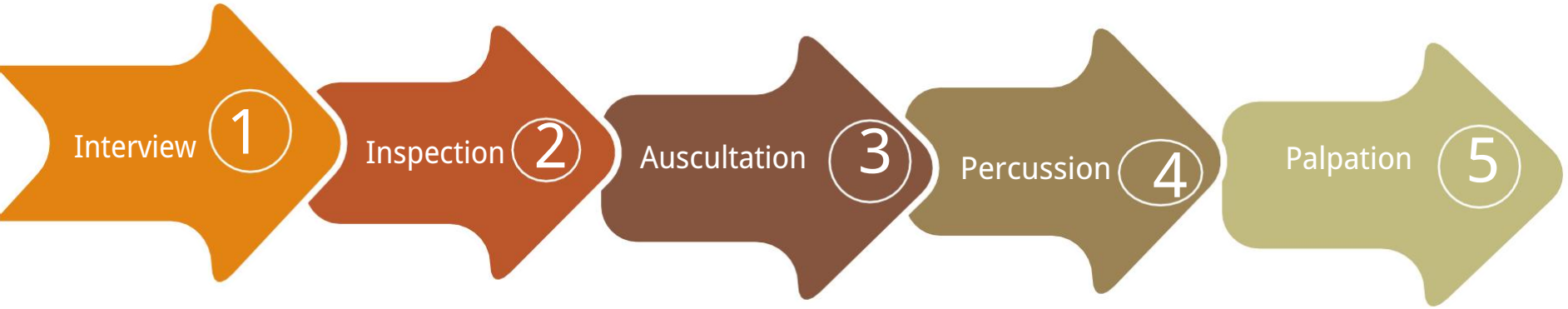
Anatomical areas



Abdomen - four quadrants



Order of GI tract examination



ORGANS & FUNCTIONS

Esophagus –

Duodenum –

Jejunum –

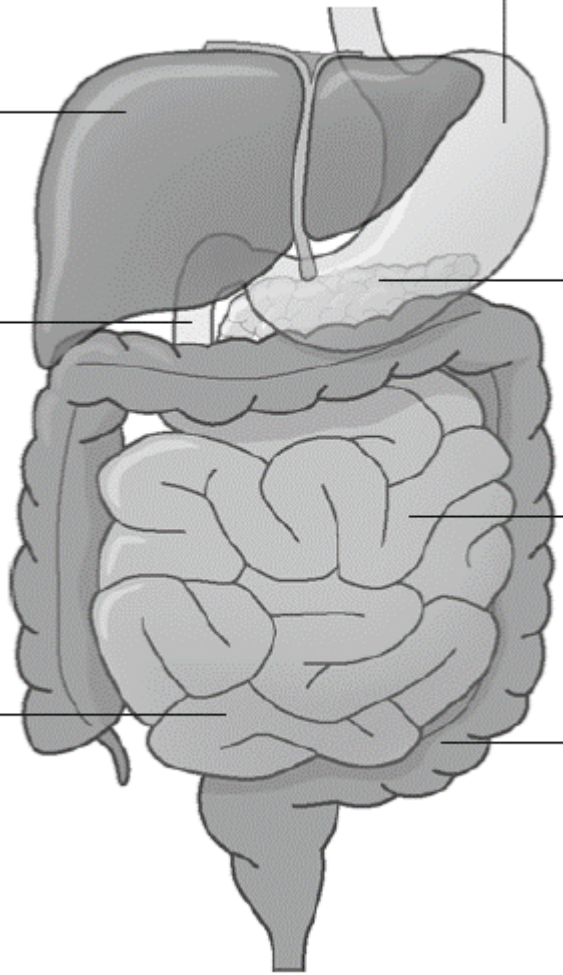
Ileum –

Liver
Bile acids
(aid lipid digestion)
Detoxification of
ingested metabolites

Duodenum
Neutralization
Protein, lipid,
carbohydrate digestion
Absorption:
- Nutrients
- Electrolytes and metal ions
- Water

Ileum
Absorption:
- Bile acids
- Vitamin B12

Role in immunity



churn and mix
Protein digestion
Acid production:
- Aids protein digestion
- Antimicrobial

Intrinsic factor
Iron reduction

Pancreas
Digestive enzymes

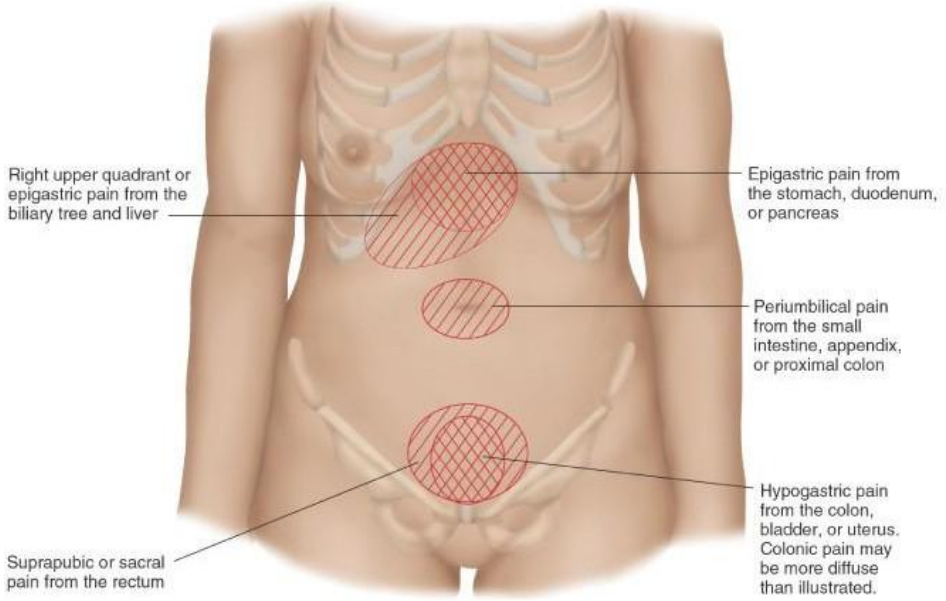
Jejunum
Digestion
Absorption:
- Electrolyte-rich fluid

Colon
Absorption:
- Water
- Electrolytes

Bacterial metabolism
Fatty acid metabolism

Abdominal pain

1. VISCERAL
2. PARIETAL
3. SUPERFICIAL
4. REFFERED



Sources of abdominal pains

Visceral pain

1.Spastic- induced by spasm of a hollow viscera, sudden, short, well localized, comes in cramps, relieved by thermoprocedures or spasmolytics (gall bladder, kidney, bowel, stomach)

2.Distensive – induced by distention by gases, feces, food, bile, has gradual onset, long standing, permanent, poorely localized (meteorism, hyposecretic syndrome)

3.Vascular (intestinal angina) – induced by ischemia, extremely severe (mesenteric thrombosis, spasm, arterial embolism)

1. **Parietal pain** – arises from impulses in the parietal peritoneum, wel localized, accentuated by pressure,
coughing, sneezing (peritonitis as a result of inflammation of an organ or perforation)

Superficial pain

2. **Superficial pain** – abdominal wall pain (skin, nerves, muscles) it is sharp, constant and superficial, aggravated by contraction of abdominal musculature

Reffered pain

3. **Reffered pain** – is radiated from the affected organ (the area of reference has the same central pathways for afferent neurons) Ex. Inferior myocardial infarction is felt in the epigastric area

Characteristics of pain

- Location
- Onset
  - Character described by adjectives—sharp/dull, Burning/ tingling, boring/stabbing, crushing/tugging.
- Radiation
- Associated symptoms
  - Timing Since onset (episodic duration and frequency of attacks, the evolution)
  - Aggravating and relieving factors (food or specific activities, postures or some medication)
- Severity subjective variation by day or night,week or month

Extracardiac causes of chest pain

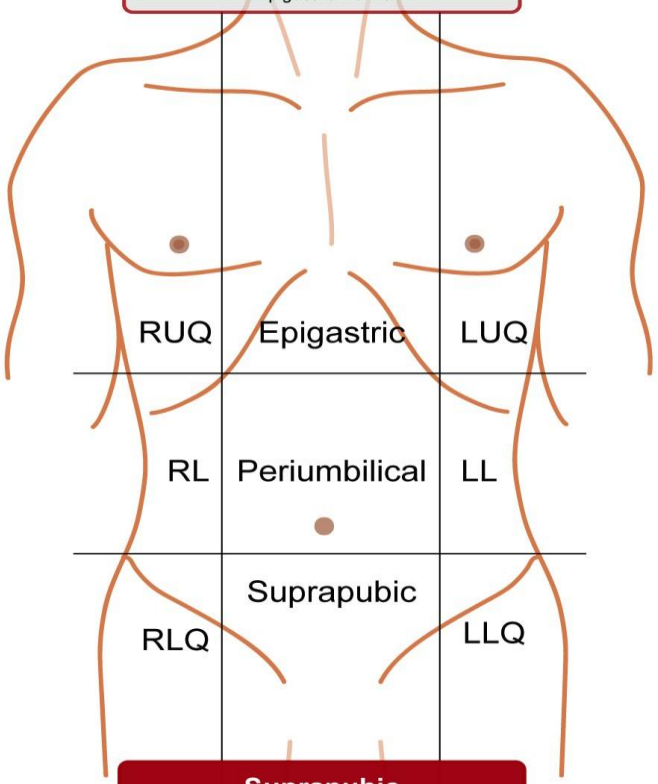
Extracardiac causes of chest pain

Common Causes of Chest Pain

• Aortic	Aortic dissection, Aortic aneurism
• Esophageal/GI	Esophagitis, Esop. Spasm , esophageal tear Pancreatitis, Biliary /GB disease , GERD, Peptic Ulcer
• Lungs & Pleura	Bronchospasm, PE, Pneumonia ,TB, Trachitis, Pleuritis, PneumThorax , Malignancy , Asthma.
• Musculo-Skeletal	Ost. Arthritis, Rib#, I. Costal Muscle injury, Costochondritis, Cerv. Disc Disease
• Neurological	Prolapsed disc, Herpez Zoster, Thoracic Outlet Syndrome
• Psychological/ others	Panic Attack/Anxiety Disorders , Cocaine abuse

Figure 3: Differential Diagnoses According to Localization of Abdominal Pain

produced by Shaza Karrar



Epigastrium

Cardiac	ACS, MI
Biliary	Colic, Cholecystitis, Cholangitis
Pancreas	Pancreatitis
Vascular	AAA, Dissection
GI	Gastritis, Early Appendicitis Epigastric Hernia

Right Upper Quadrant

Pulmonary	Lower lobe pneumonia, Emboli
Biliary	Colic, Cholecystitis, Cholangitis
Hepatic	Hepatitis, Abscess
Renal	Colic, Pyelonephritis Nephrolithiasis
GI	Duedinitis, Duodenal Ulcer Retrocaecal Appendicitis
Pancreas	Pacreatitis

Right Lumbar | Flank

Vascular	AAA, Dissection, Mesenteric Ischemia
Renal	Colic, Pyelonephritis, Nephrolithiasis
Others	Psoas Abscess

Right Lower Quadrant

GI	Appendicitis, Cecal Obstruction Ileitis, Right Diverticulitis, Consitpation Ulcerative Colitis, Crohn's Disease
GU	Epididymo-orchitis, Testicular Torsion Ureteric Colic, Nephrolithiasis, UTI
GYN	Ectopic Pregnancy, PID Tubo-ovarian Pathology, Endometriosis
Others	Hernia, Psoas Absecess Mesenteric lymphadenitis

Suprapubic

GI	Appendicitis, Diverticulitis, Consitpation Ulcerative Colitis, Crohn's Disease
GU	Urinary Retention, UTI, Cystitis
GYN	Ectopic Pregnancy, PID Tubo-ovarian Pathology, Endometriosis
Others	Hernia

Periumbilical / Central

Vascular	AAA, Dissection
GI	Early Appendicitis Intestinal obstruction Gastroenteritis

Left Upper Quadrant

Cardiac	ACS, MI, Myocarditis, Pericarditis
Pulmonary	Lower lobe pneumonia, Emboli
Pancreas	Pancreatitis
Splenic	Splenic infarction, rupture
GI	Gastritis
Renal	Colic, pyolonephritis, nephrolithiasis

Left Lumbar / Flank

Vascular	AAA, Dissection Mesenteric ischemia
Renal	Colic, pyolonephritis, nephrolithiasis
Others	Psoas abscess

Left Lower Quadrant

GI	Cecal Obstruction, Left Diverticulitis Consitpation Ulcerative Colitis, Crohn's Disease
GU	Epididymo-orchitis, Testicular Torsion Ureteric Colic, Nephrolithiasis, UTI Ectopic Pregnancy, PID
GYN	Tubo-ovarian pathology, Endometriosis
Others	Hernia, Psoas Absecess Mesenteric lymphadenitis

Character of pain

- Gastric pain could be dull, intense, “burning”;

-Localized in epigastria; irradiating to median line

-Associated with vegetative manifestations – nausea, transpiration

- Intestinal pain – has a colic character – pain periods alternating with periods of leisure; colonic pain – non-localized, in the hole abdominal cavity; rectal pain – in anal region, spreading to sacral region

- Hepatic pain – in right hypochondria

- Gallbladder pain – in epigastria, irradiate in right hypochondria, to right scapula.

- Pancreatic pain – in left hypochondria, epigastria, right hypochondria, like a “belt”.

Timing

- Constant pain – gastric carcinoma
- pain attacks – acute gastritis, biliary colic
- periodic pain – reflux esophagitis (occurs in the night time and in clinostatism)
- hunger/nocturnal pains (awakes the patient from a deep sleep) - induodenal ulcer
- Seasonal pain - in peptic ulcer (exacerbation in spring and autumn)

Relationship between pain and food intake

- **early postprandial** pain (immediately after ingestion up to 60-90 min postprandial) – reflects an oesophageal or gastric disorder

- **late postp**

hours after ingestion; " hunger pain") - in **duodenal ulcer, duodenitis, pancreatic insufficiency**

Antacids and pain relief

- Pain in **ulcer** calms down after ingestion of milk, alkaline substances, **H2-blockers**
- Pain in **gastric cancer does not** respond to antacids, but to **opioid analgesics**.

Extraabdominal causes

Extra-Abdominal Causes of the Abdominal pain

II- Abdominal wall

1- Myositis (Bornholm's disease)
2- Trauma to abdominal pain
3- Muscle strain in cough

III- Chest causes (referred along intercostal nerves)

1- Diaphragmatic pleurisy
2- Pneumonia
3- Pneumothorax

IV- CVS causes

1- Angina
2- MI
3- Pericarditis
4- CHF

V- Metabolic and endocrinal causes

1- DKA
2- Thyrotoxic crisis
3- Addisonian crisis
4- Acute porphyria
5- Severe hypercalcemia

VI- Neurological causes

1- Herpes zoster of lower intercostal nerves
2- Referred pain from spinal arthritis

VII- Other causes

1- Torsion of tests

Abdominal emergencies

- Perforation of a gastro-duodenal ulcer
- Dissection of aorta,
- Rupture of oesophagus,
- Extrauterine pregnancy,
- Renal stones

Dysphagia

Feeling of “blockage” or obstruction of food passage through pharynx or oesophagus, difficulty in swallowing

Types of dysphagia

Mechanical dysphagia ***(organic)*** **–** caused by **narrowing or intrinsec compression of** oesophageal lumen (carcinoma, post ulcerative strictures, a huge amount - bolus - of food)

Motorial Dysphagia (functional) – derangements of nervous system or musculature, it results in intermittent of dysphagia, it comes and goes (pharyngeal paralysis, achalasia, spasm).

Mechanical vs Functional dysphagia:

1. Difficulty in swallowing of a solid alimentary bolus, and only in advanced stages – including liquid food.
2. Inefficiency of spasmolitics.

1. Difficulty in swallowing of a liquid alimentary bolus, the solid one passes easier.
2. Spasmolytics are efficient.

Deranged appetite

1. **Increased appetite** – duodenal ulcer
2. **Anorexia** – diminished up to loss of appetite (gastric ulcer, cancer)
3. **Bulimia** – exaggerated feeling of hunger
4. **Aversion for meat** – gastric cancer

5. **Perverse appetite –** wish to eat non - edible substances – chalk, soil, newspapers etc.(anaemia, in pregnancy)
6. **Citofobia** – fear of eating **(gastric ulcer)**

Other functional symptoms

1. **Aphagia** – complete oesophageal obstruction
2. **Odinophagia** – painful deglutition
3. **Phagophobia** (fear of swallowing and *refuse to swallow)*– in isteria, rabies, tetanus

Vomiting (or emesis)

1. Peripheral– visceral etiology (chronic gastritis, peptic ulcer, pylorostenosis, alcohol abuse)
2. Reflective (outside the stomach)– inferior AMI, appendicitis, peritonitis
3. Central- (vomiting center) –cerebral edema, intracranial pressure, tumors, fever
4. Psychogenic (emotional distress)
5. Hematogenic (toxic) - renal failure, food poisoning, infections, drugs side effects

4. explosive forced per oral elimination of gastric content.

The Act Of Vomiting

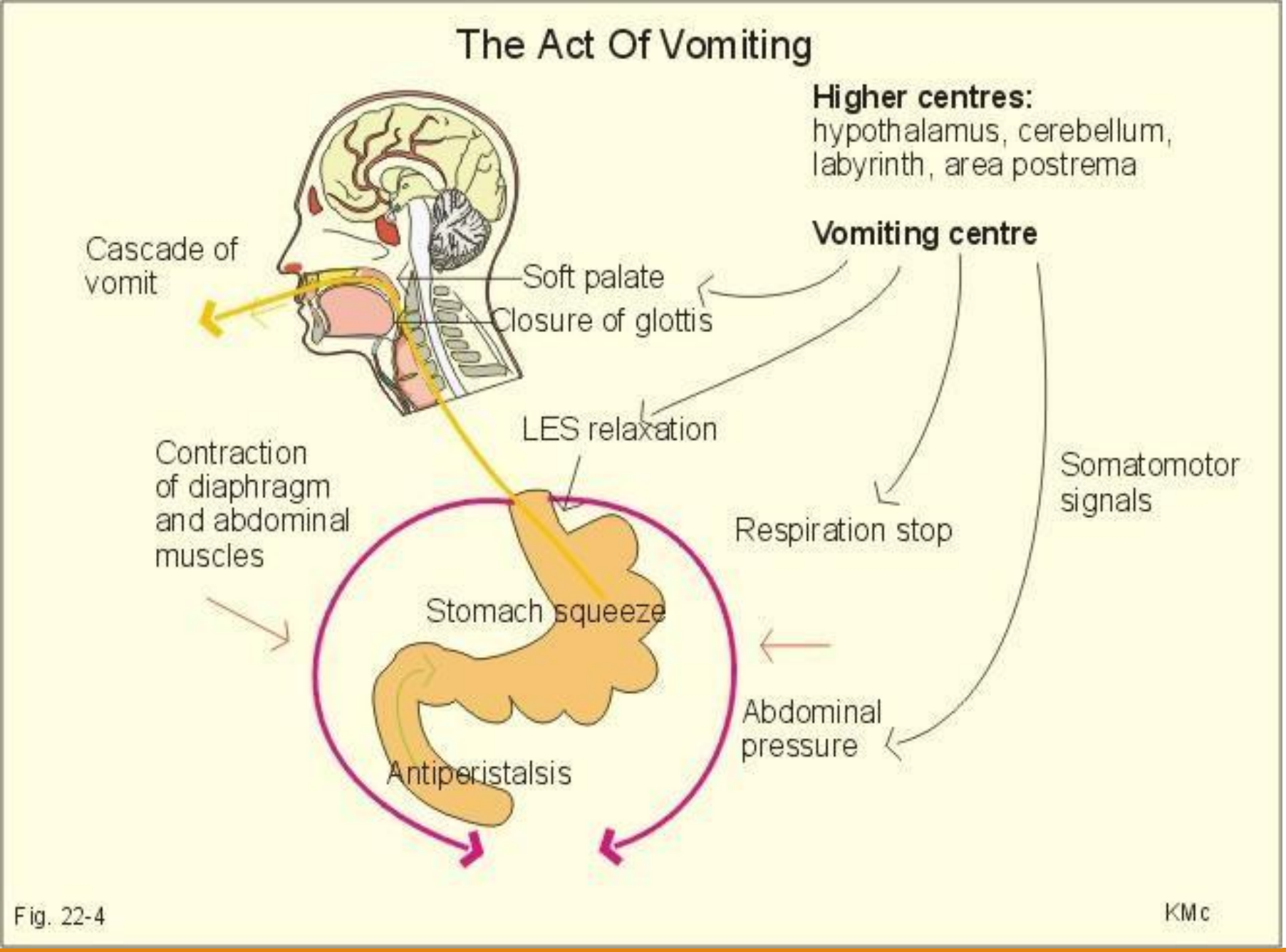
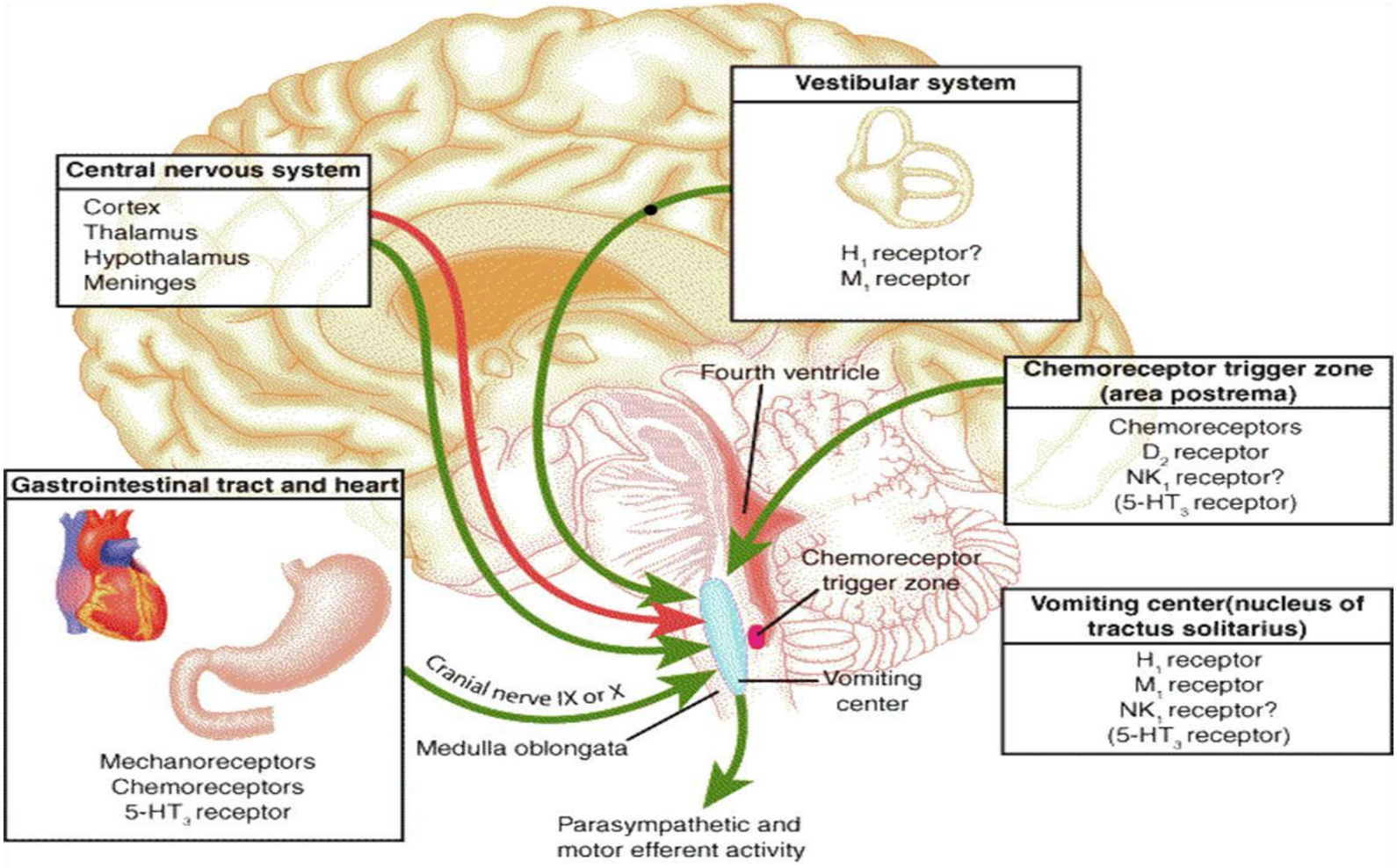


Fig. 22-4

KMc

Mechanism of vomiting



Source: Katzung BG, Masters SB, Trevor AJ: *Basic & Clinical Pharmacology, 11th Edition:* http://www.accessmedicine.com

Complications of vomiting:

- Rupture of oesophagus (Boerhaave symptom)
- Linear ruptures of mucosa in the region of cardio-oesophageal junction (Mallory-Weiss syndrome)
- Dehydration
- Loss of gastric acidity (HCl) – metabolic alkalosis with hypopotasiemia (arrhythmia)

Heartburn (pyrosis)

- Burning sensation, retrosternal or in epigastria; irradiates to the neck, sometimes to arms
- More often is associated with **gastrooesophageal reflux** due to mucosal irritation
- Relieved by antacids

Eructation

- the passage of gas from the stomach or esophagus through the mouth

Regurgitation

- is the spitting up of food from the esophagus or stomach without nausea or forceful contractions of the abdominal muscles

Rumination

-is regurgitation with no apparent physical cause (infants, emotional disorders)

Meteorism

- An increased formation of intraintestinal gas with abdominal distension and flatulence.
  Appears after:
- Ingestion of specific aliments (vegetables, some cereals)
- bacterial colonisation of small intestine (*Lambliosis*)

Diarrhoea

Increased daily amount of stools over 300g; usually associated with increased fluidity and frequency of stools.

diarrhoea is considered *chronic* after 2 weeks

Forms of diarrhoea

1) Inflammatory
2) Osmotic
3) Secretory
4) Motility disturbances

1. Inflammatory diarrhoea

- Parasite infections – hemlinth, amoeba
- Infections – salmonella, shigella, E.coli
- Ulcerative colitis, Crohn disease (autoimmune mechanisms)
- Colitis due to physical agents: toxins – Hg, Ar, irradiation
- Ischemic colitis, vasculitis

2. Osmotic diarrhoea

Ingestion of osmotically active products:

- Laxatives
- Products containing sorbitol, xilitol: chewing gum
- Medications: lactulose, almagel (Mg)

Absorption deficiencies

- Deficiency of: disahariide (lactase, sucrose), enterochinase
- Congenital malabsorption
- Exocrine pancreatic insufficiency
- Diminished absorption surface (short intestine, inflammation)

3. Secretory diarrhoea

- Infections (cholera, Staphylococcus aureus, Escherichia coli)
- Tumours
- Some laxatives
- Dihydroxilated biliary acids

4. Motility disturbances

Hypermotility

- Irritable intestine syndrome
- Carcinoid syndrome (serotonin)
- Hyperthyroidism

Hypomotility

- Diabetes mellitus
- Hypothyroidism
- Scleroderma
- Amiloidosis

Constipation

-stools are less than 3 times/week (1 time in 48 hours).

-secondary to this there is an increased absorption of water – the stool becomes more consistent.

-constipation is considered *chronic* after 6 weeks.

Causes of constipation

1. Colon tumour or foreign body, strictures of the colon, infections, ischemic colitis
2. Psychogenic
3. Functional (reduced intake of liquids, fibres; reduced exercise)

4. Rectal diseases, anal channel diseases
5. Nervous system lesions
6. Metabolic and endocrine diseases
7. Intoxications
8. Digestive system diseases
9. Drugs (analgesic, opiates, antidepressive, antipsychotic, calcium channels blockers)

Gastrointestinal haemorrhage

is an emergency, always having an organic reason

Signs of GI haemorrhage:

1. **Haematemesis** – vomiting with blood.

if haematemesis happens in short time after onset of bleeding, vomiting masses are **red.**

if haematemesis happens in 0,5 -1 hours, vomiting masses are **dark red, brown or black**, like **"coffee ground"** (blood degraded by HCl)

2. **Melena** – elimination of black stools, like pitch, "like fuel oil", caused by blood from an upper gastrointestinal haemorrhage (oesophagus, stomach or duodenum), digested by microbial flora and becoming dark

Lesions of jejunum, ileum and ascending colon can cause **melena**, when the time of gastrointestinal transit is prolonged

3. Haematochezia - passage of red blood through rectum, as a sign of bleeding from a distal source (Treitz ligament).

Severity of haemorrhage:

< 500 ml – without clinical signs

signs of hypovolemic shock (loss of more than 40% blood volume):

Lipothymia, syncope, nausea, transpiration and thirst

Pale and cold skin

Agitation

Arterial hypotension

Tachycardia

Aetiology of superior DH

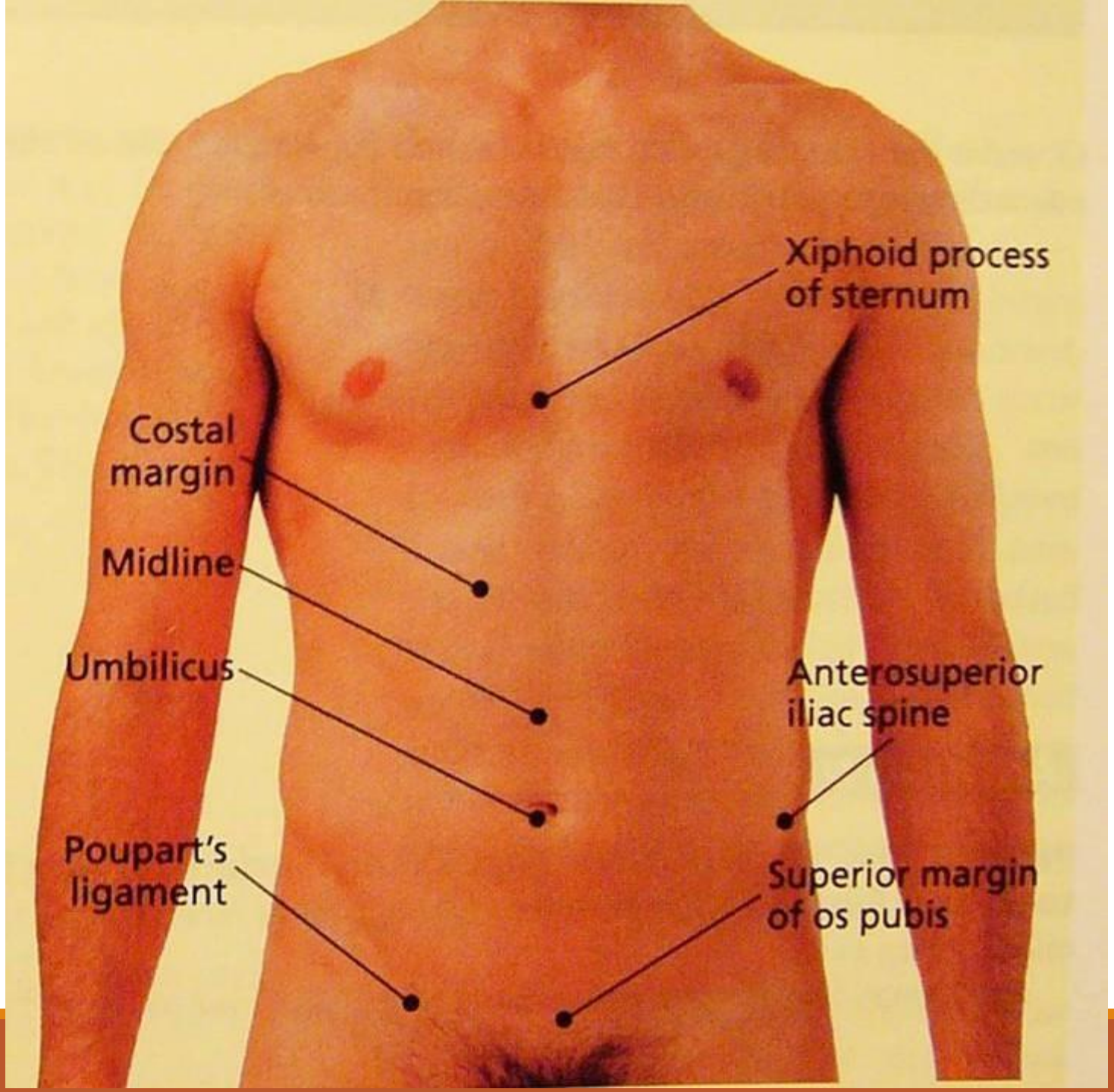
- erosive or hemorrhagic gastropathy (NAID, anticoagulants, alcohol),
- duodenal or gastric ulcer,
- s-m Mellory-Weiss,
- oesophageal varices
- malign tumours
- oesophagitis (5-8%),
- duodenitis (5-9%),
- angiodysplasia (5-7%),

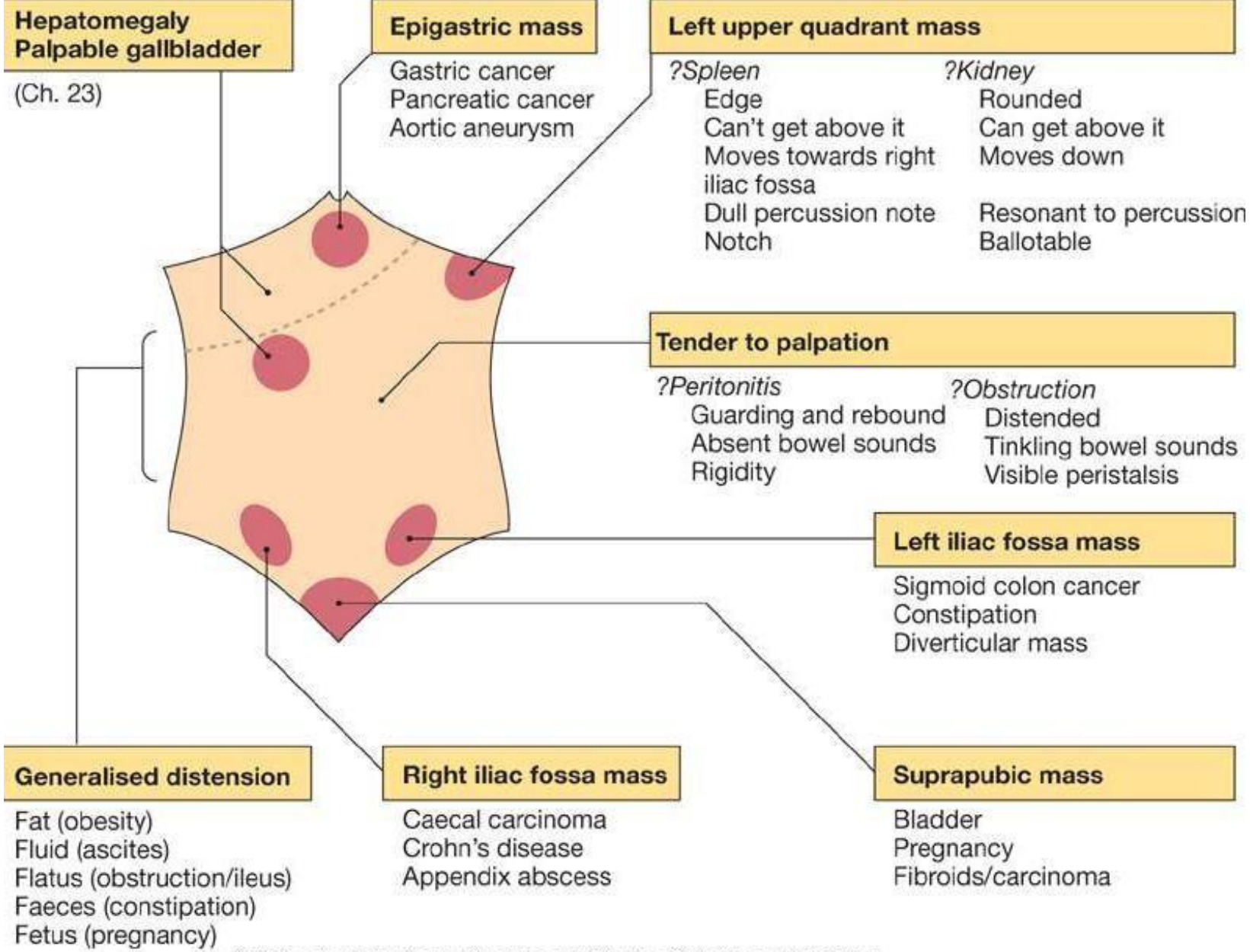
Aetiology of inferior DH

- anorectal disease
- polyps, cancer
- diverticulosis
- abnormal intestinal tract
- enterocolitis, colitis, intestinal ischemia

Inspection

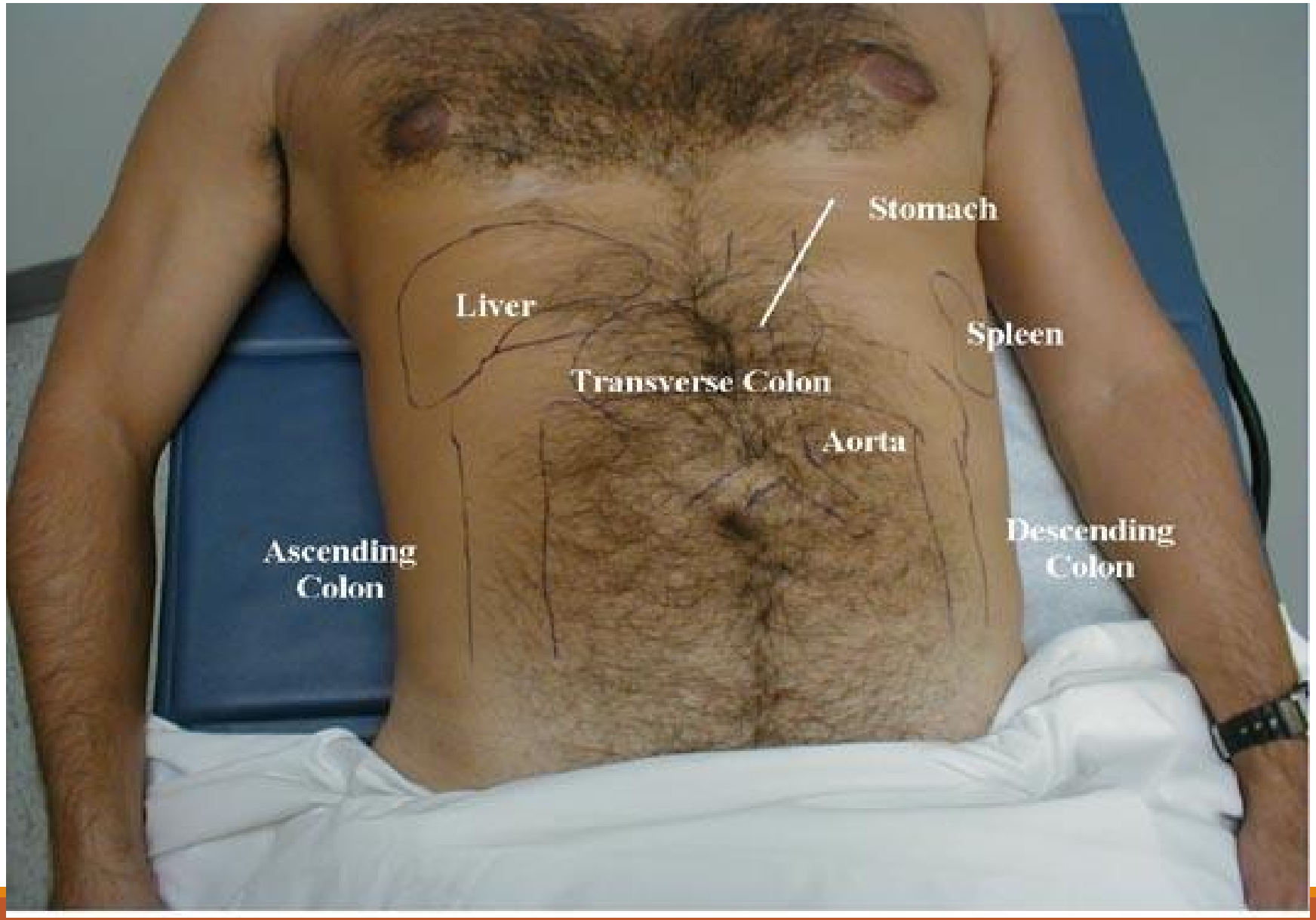
- The patient relaxed and comfortable in supine position
- Use relaxation techniques if needed Head supported with pillow
- Keep the supinated arm by patient sides, warm hands
- Insure good illumination, full exposure of the abdomen
- Be on the right side of the patient


Xiphoid process of sternum
Costal margin
Midline
Umbilicus
Anterosuperior iliac spine
Poupart's ligament
Superior margin of os pubis



Colledge et al: Davidson's Principles and Practice of Medicine, 21st Edition

Normal


Stomach
Liver
Spleen
Transverse Colon
Aorta
Ascending Colon
Descending Colon

Inspection of abdomen

Contours and peristalsis of the abdomen

Abdomen dimensions

Abdomen symmetry

Diastasis recti

Presence of local bulging (hernia, tumor)

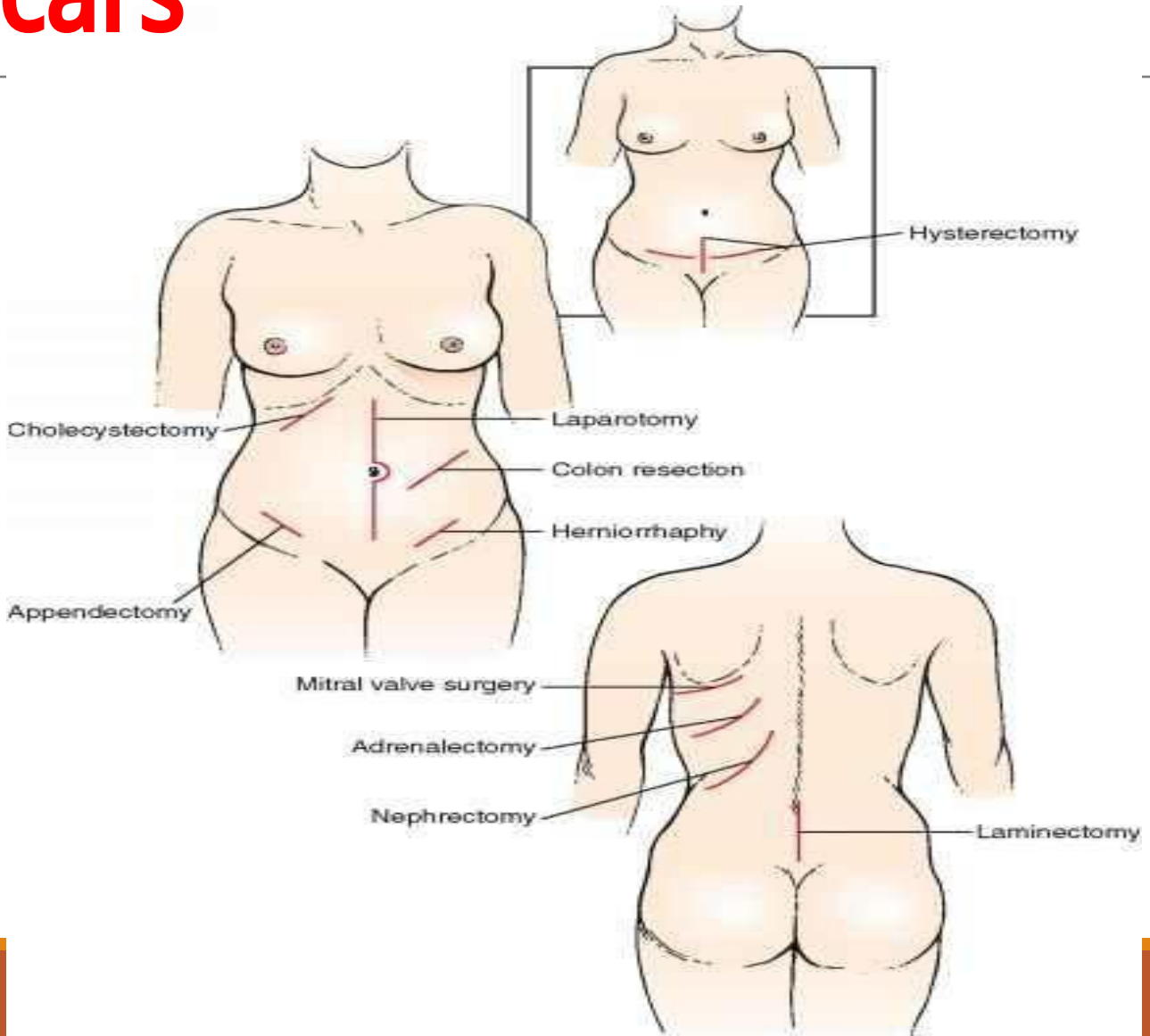
Skin and subcutaneous fat

- Umbilicus inspection (Position and protrusion)

Superficial venous circulation (caput Medusae)

Common abdominal scars

Common abdominal scars



Obesity

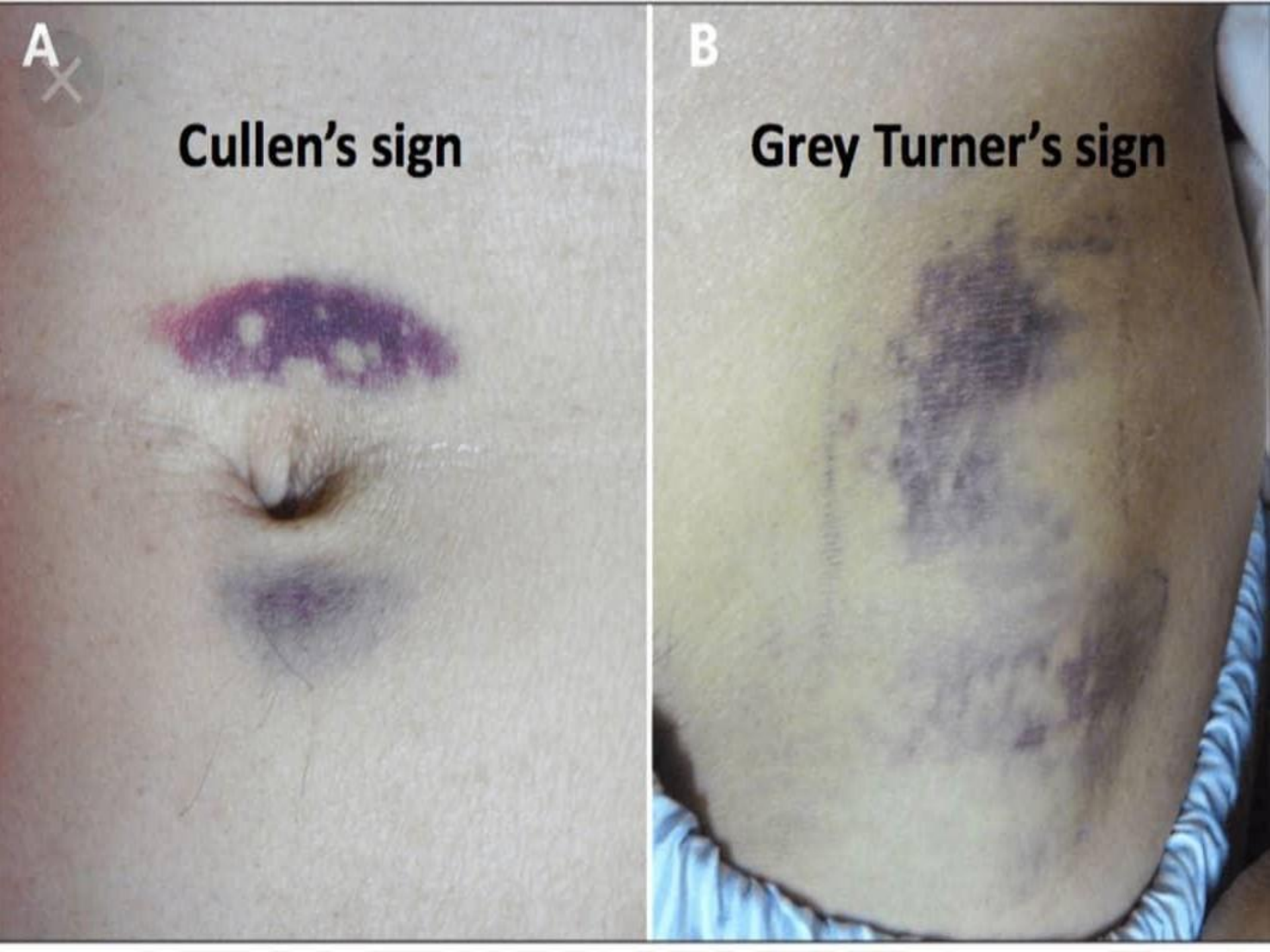
Hepatomegalia

Gallbladder, Jaundice

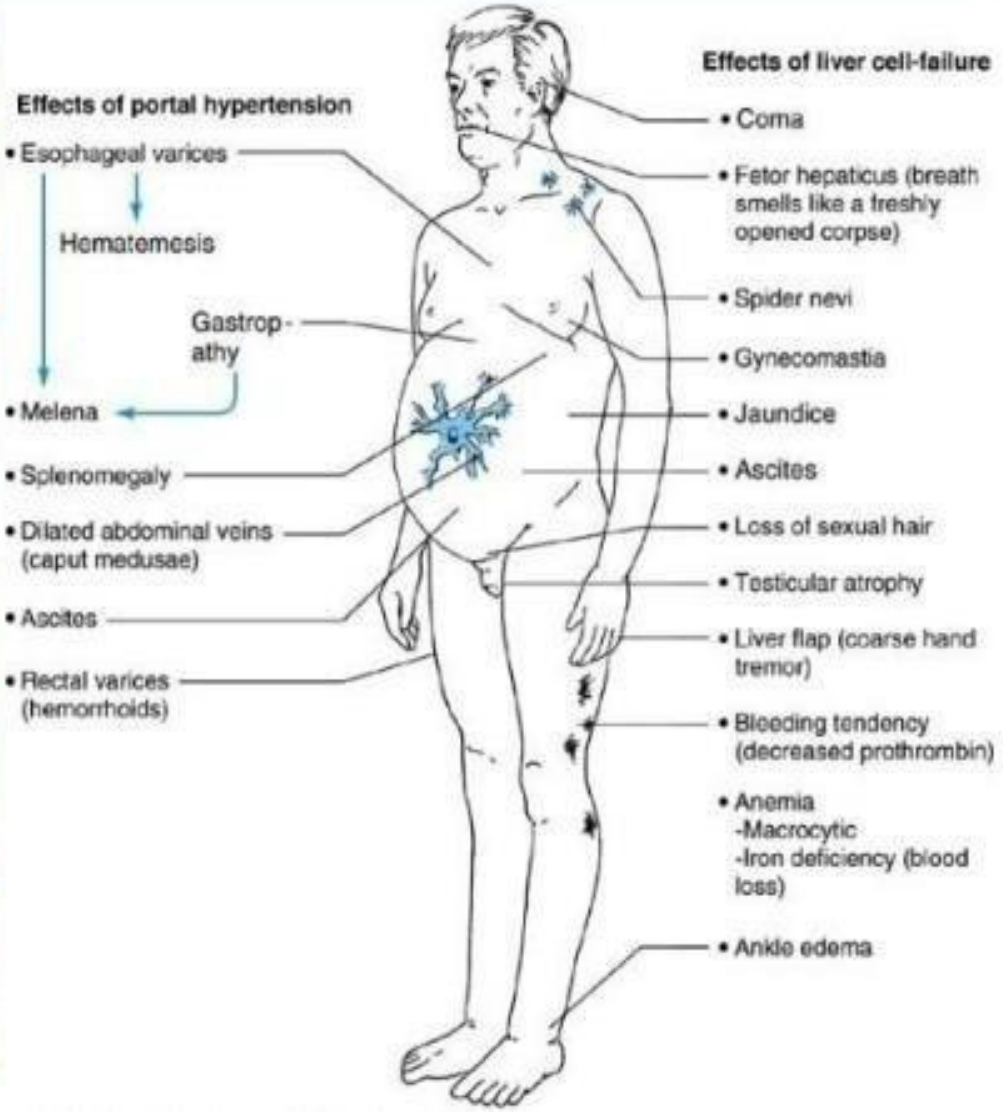
Ascites, protrusion of umbilicus

Umbilicalal hernia

Superficial venous circulation


A
Cullen's sign
B
Grey Turner's sign

Signs of CLD


Effects of portal hypertension
• Esophageal varices
Hematemesis
Gastrop-athy
• Melena
• Splenomegaly
• Dilated abdominal veins (caput medusae)
• Ascites
• Rectal varices (hemorrhoids)
Effects of liver cell-failure
• Coma
• Fetor hepaticus (breath smells like a freshly opened corpse)
• Spider nevi
• Gynecomastia
• Jaundice
• Ascites
• Loss of sexual hair
• Testicular atrophy
• Liver flap (coarse hand tremor)
• Bleeding tendency (decreased prothrombin)
• Anemia
-Macrocytic
-Iron deficiency (blood loss)
• Ankle edema

Auscultation I

Provides important information about bowel motility:

a. decreased motility suggests peritonitis

b. increased motility suggests obstruction

- *Need to listen before percussion or palpation since these maneuvers may alter the frequency of bowel sounds*

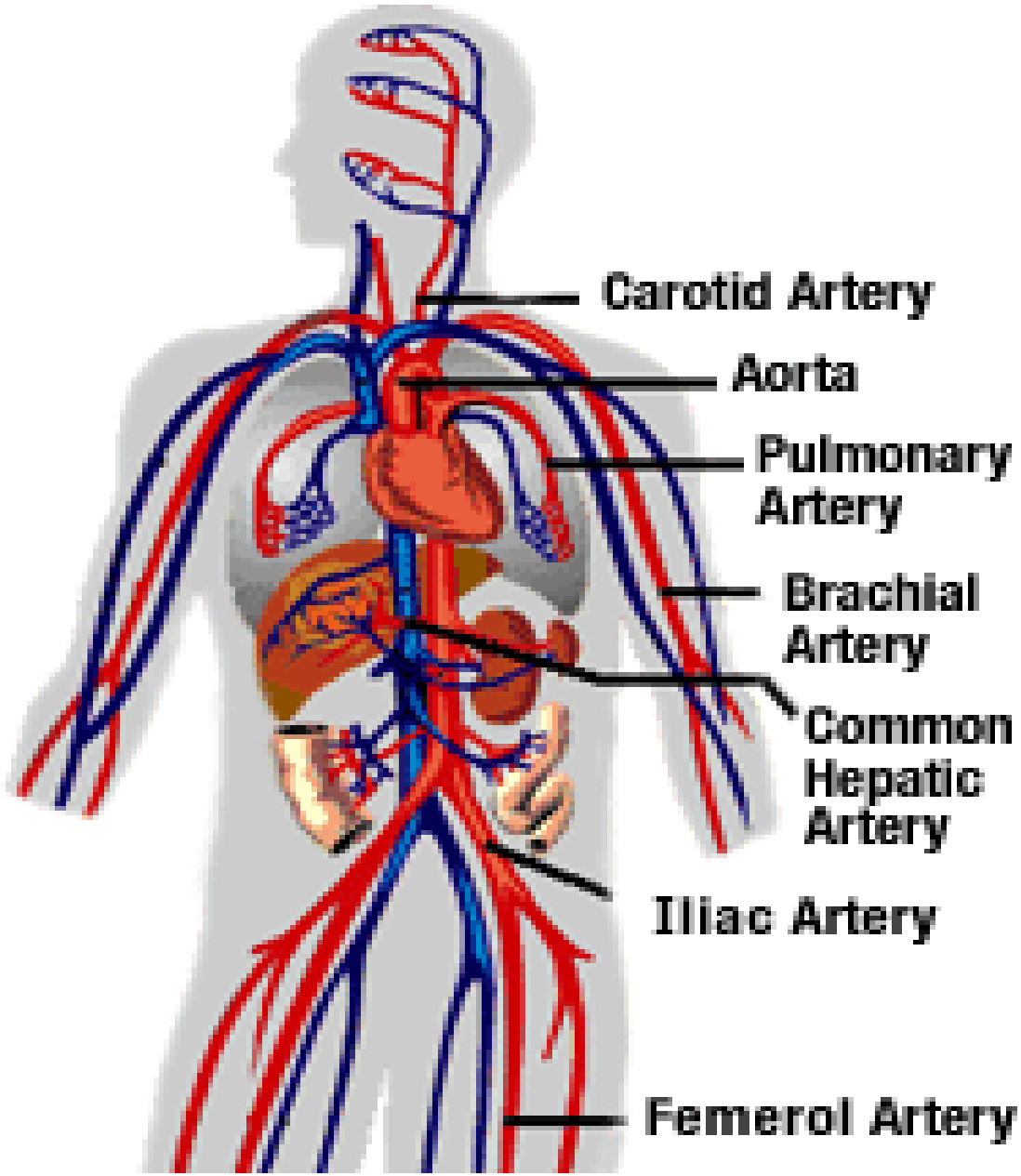
  - Can also appreciate bruits over the aorta or other arteries, suggesting narrowing of the arteries from atherosclerosis

Auscultation II

Listen with diaphragm of stethoscope
• Normal sounds occurs every 5-10 seconds & consist of clicks and gurgles

•Need to listen for 2 minutes to declare no bowel sounds; since bowel sounds are widely transmitted, need only to listen in one spot

•Occasionally hear *borborygmi* - long, prolonged gurgles of hyperperistalsis - the familiar stomach growling


Carotid Artery
Aorta
Pulmonary Artery
Brachial Artery
Common Hepatic Artery
Iliac Artery
Femerol Artery

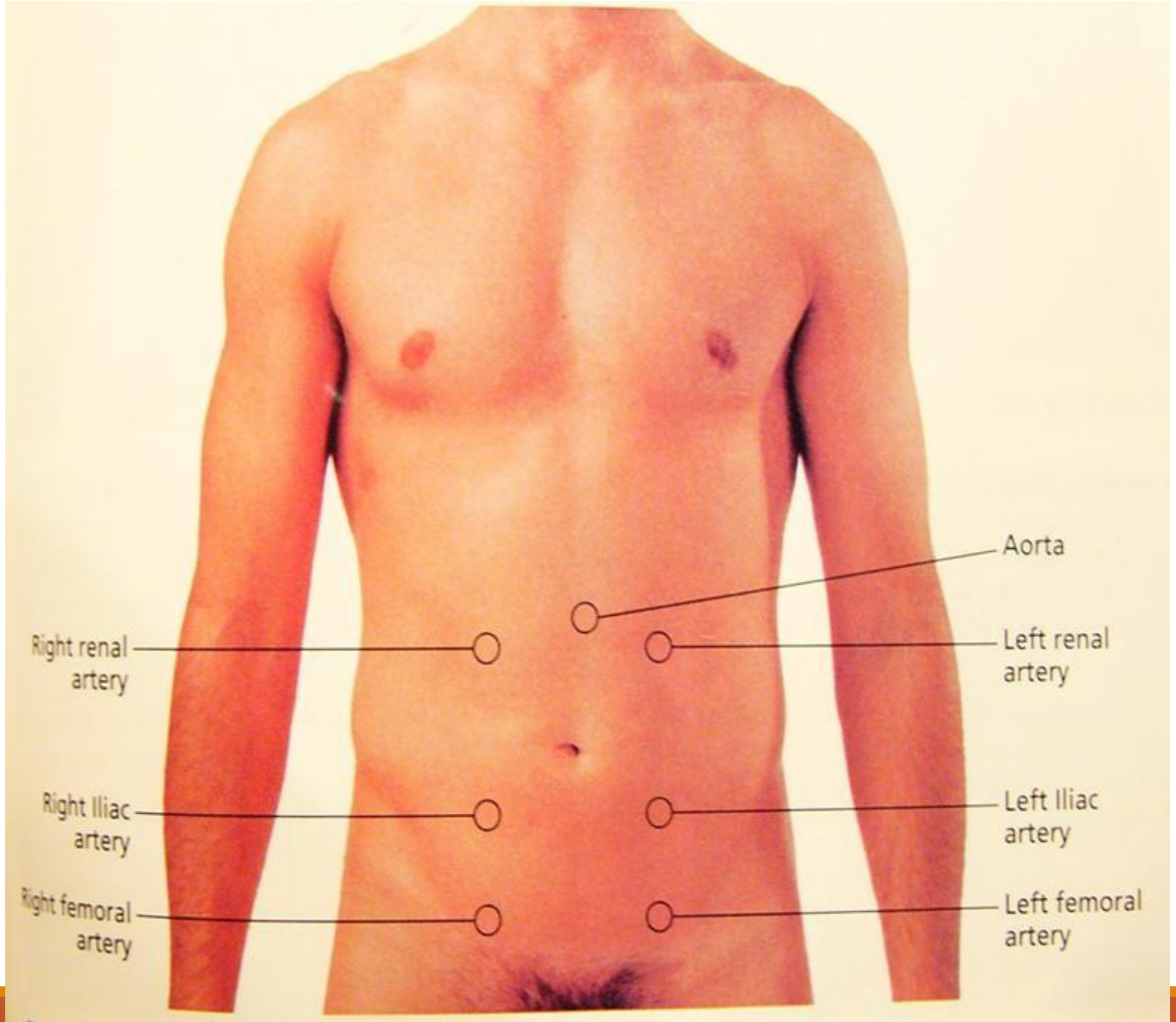


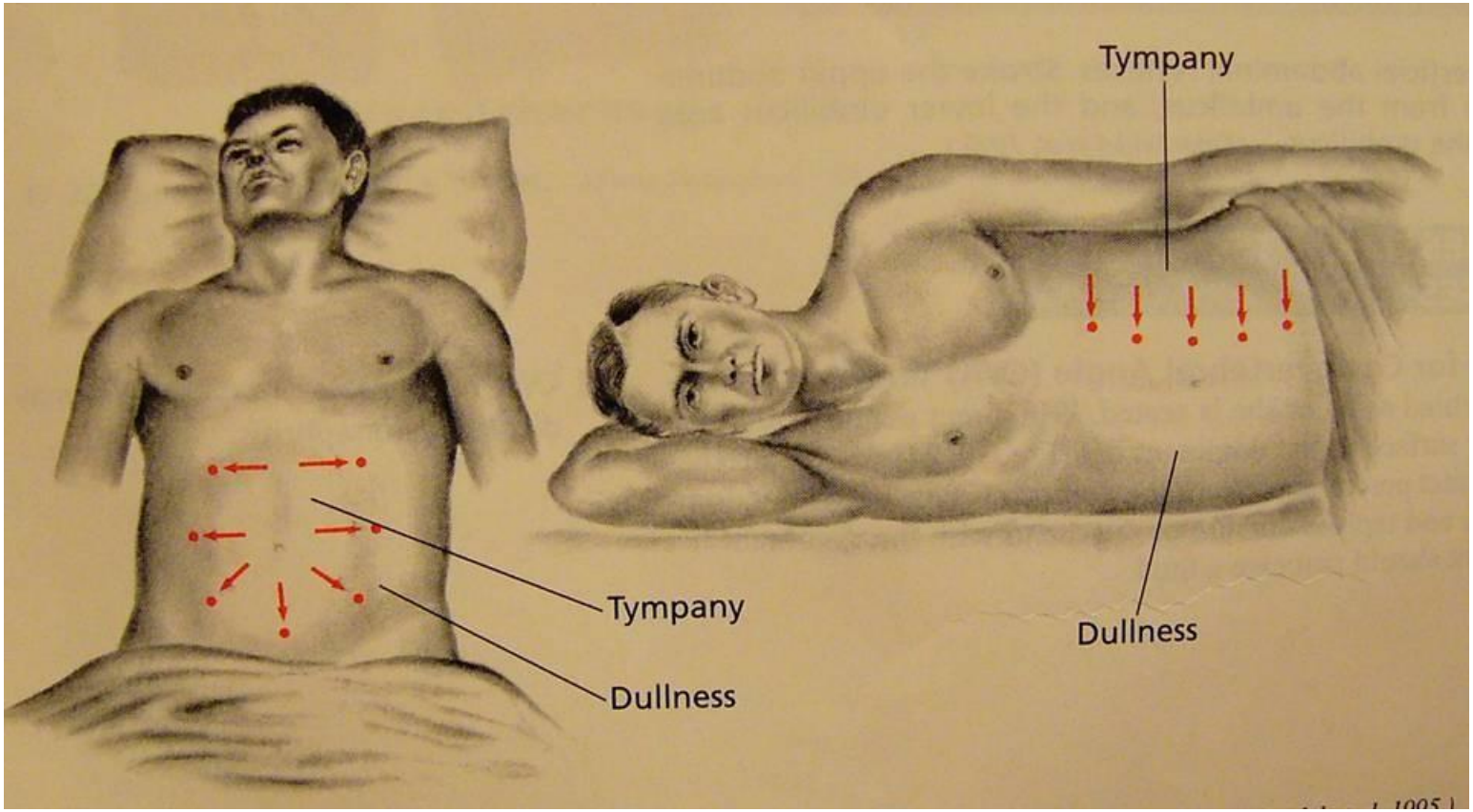
Fig. 17-8 Sites to auscultate for bruits: renal arteries, iliac arteries, aorta, and femoral arteries.

Percussion

Helps to identify the amount and distribution of gas and to identify possible masses that are solid or fluid filled

- Can be used to assess size of liver and spleen
- Percuss looking for areas of tympany and dullness
- Large dull areas may indicate an underlying mass; you will later confirm with palpation
- On the right is liver dullness; on the left, dullness of the spleen

Assessment of liquid in abdominal cavity



Assessment of liquid in abdominal cavity – fluctuation (wave) sign

Percussion

Palpation

superficial (light)

deep

Light and Deep Palpation

- Light palpation

– Helpful in identifying tenderness, superficial organs,masses, hernia of medial abdominal line, Blumberg symptom

– Palpate with a light, gentle dipping motion using the palmar surface of fingers

- Deep palpation

– Usually required to delineate abdominal masses

– Again use palmar surface of fingers

–Check for tenderness and rebound (pain induced

or increased by letting go)

Palpation: Improving the Exam

Patient should have an empty bladder

• Patient supine, arms at sides or folded across chest

- avoid arms above the head as this tightens the abdomen

•Before you begin, ask the patient to point to areas of pain and examine last

•Warm hands and stethoscope; avoid long nails; approach slowly

• Distract the patient with conversation or questions

General rules of palpation

1.The doctor is sitting on the right part of the patient, at the level of the bed

2.The painful region of the abdomen is to be palpated at the end

The order of *superficial palpation (counterclockwise):*

Left inguinal region

Left flank (Left lateral region)

Left hypochondria

Epigastria

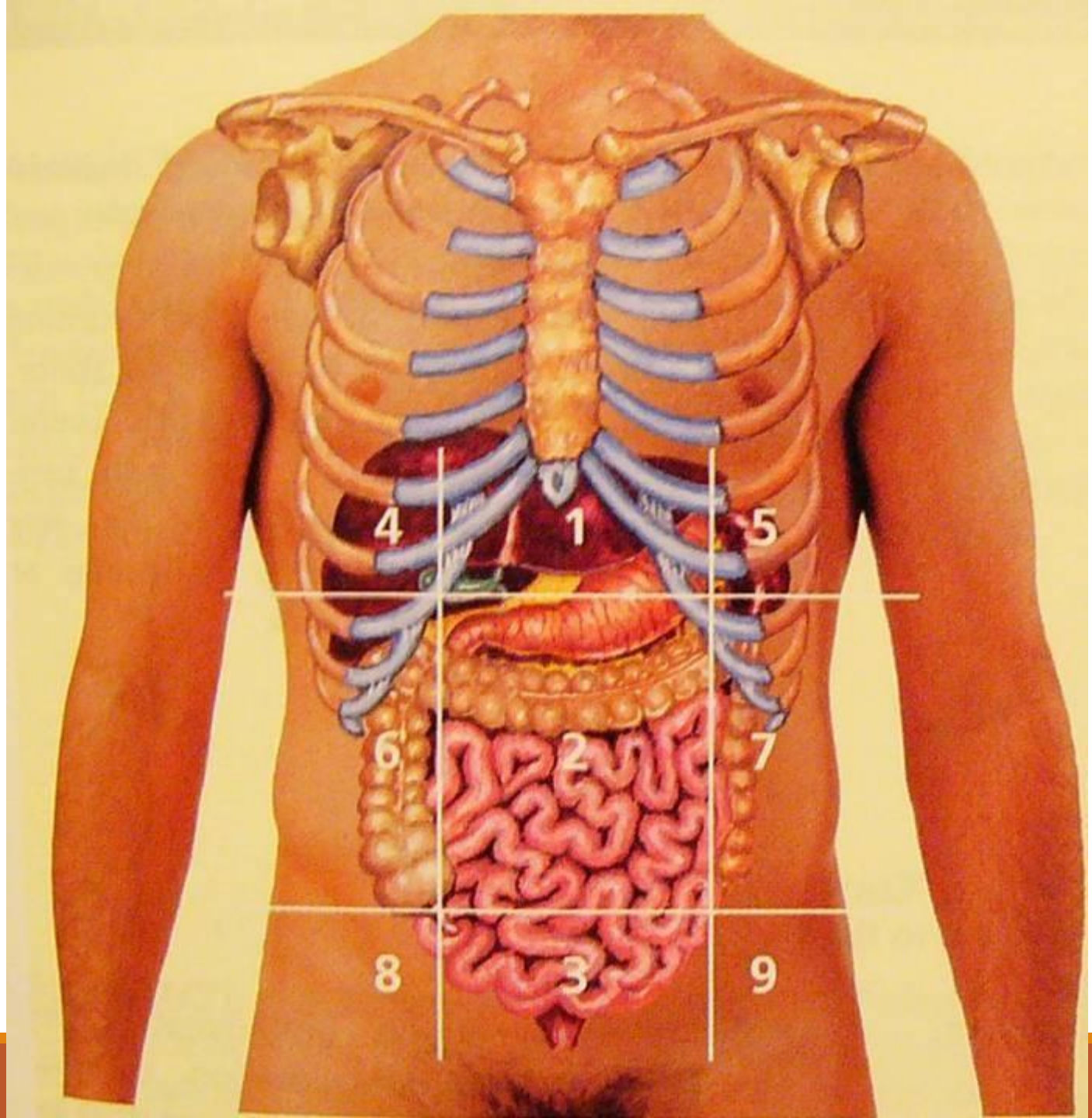
Right hypochondria

Right flank

Right inguinal region

Suprapubian region

Umbilical region


4
1
5
6
2
7
8
3
9

Blumberg symptom

sign of irritation of peritoneum (positive in peritonitis).

Appreciation:

1. **The palpatory hand pushes the abdomen in the painful region (pain is present),**
2. **Take off abruptly the hand. If pain is intensified the Blumberg sign is positive.**

Deep palpation

Aim – direct examination of different parts of gastrointestinal tract.

Appreciate:

Dimensions

Shape

Presence of irregularities

Several structures are palpable normally:

– Sigmoid colon is frequently palpable as a firm, narrow tube in the left lower quadrant

–The caecum and ascending colon form a softer, wider tube in the right lower quadrant

– Normal liver distends below the costal margin but its soft consistency is difficult to feel

–Pulsations of the abdominal aorta are frequently visible and usually palpable

–Usually NOT palpable are: stomach, spleen, gallbladder, duodenum, pancreas, kidneys

The order of *deep palpation*:

1. Sigmoid colon
2. Caecum
3. Terminal segment of ileum
4. Ascending colon
5. Descending colon
6. Transversal colon
7. Big curvature of the stomach
8. Pylorus

Method of deep palpation of the abdomen

There are 4 consecutive steps

1 moment – apply the hand parallel to the palpated margin; the other hand is on the abdomen in order to calm down the patient

2 moment – form the skin folder

The skin folder is to be formed

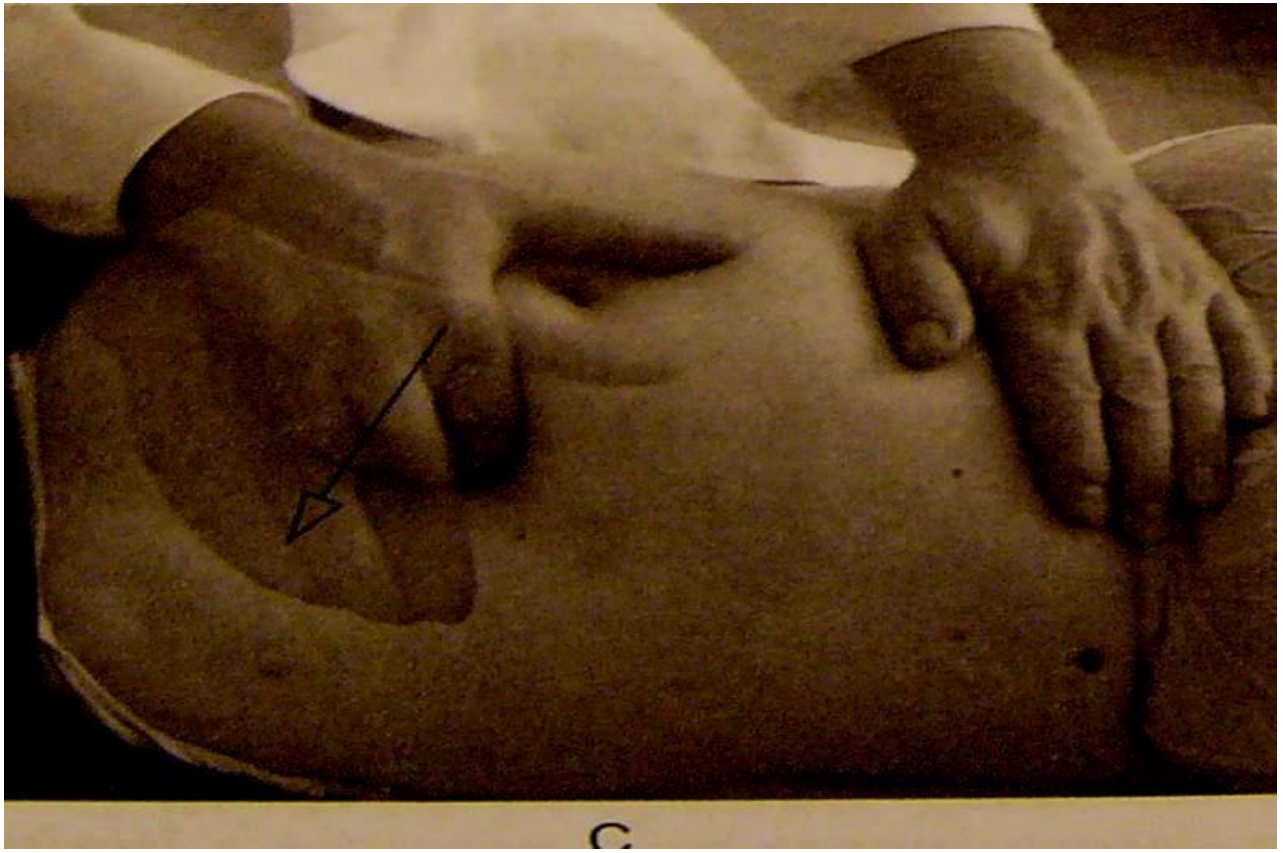
To the umbilicus

For part of the colon, situated below the umbilicus (sigmoid colon, caecum, ileocaecal angle, ascending colon, descendent colon)

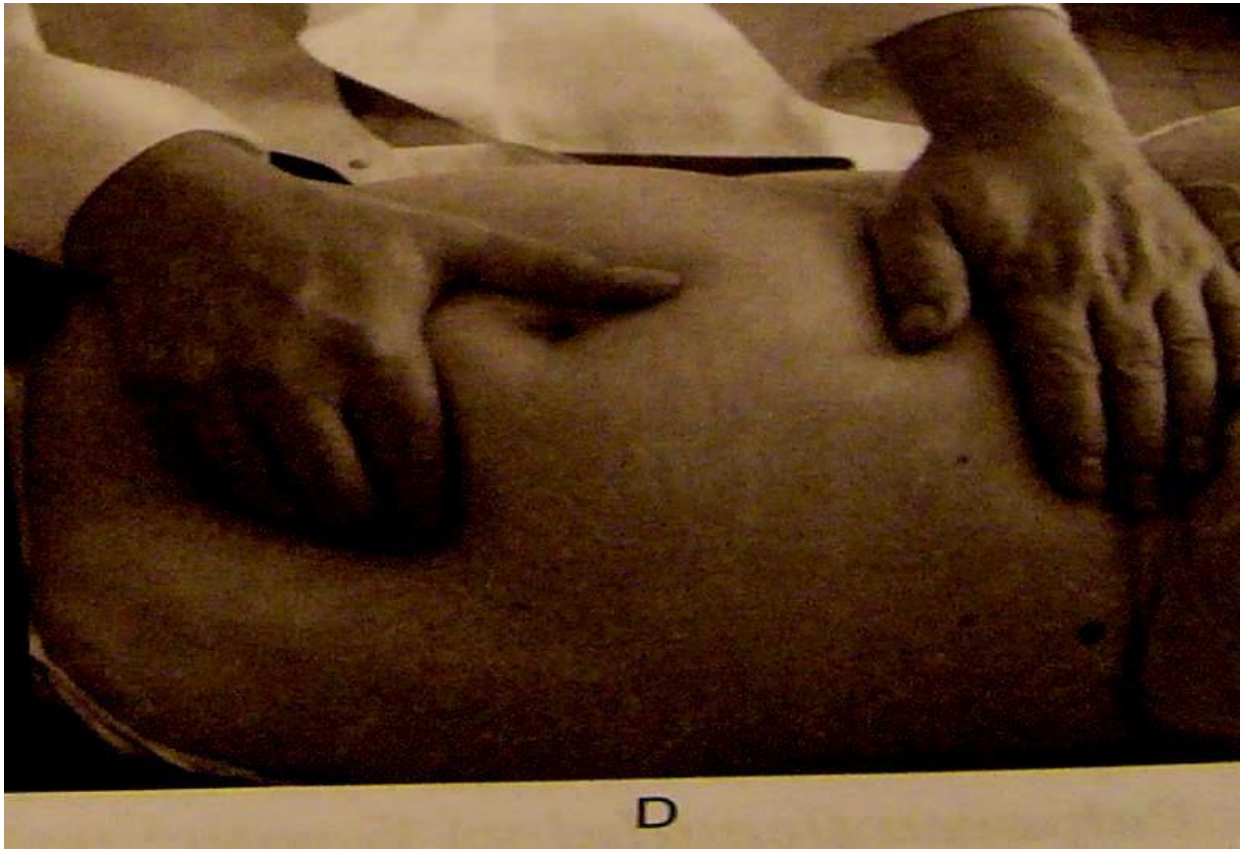
From the umbilicus

For parts, situated above the umbilicus (transversal colon, stomach)

3 moment – deepening the fingers into abdomen (in expiration)



4 moment – sliding on the surface of the respective organ



Palpation of ascending and descending colon

Palpation of ascending and descending colon

The left hand is on the posterior part of the abdomen (in lumbar region), moving the tissues to the hand which is doing palpation (right)

Palpation of the big curvature of the stomach

Paraclinical examination

BARIUM SWALLOW

UPPER GI ENDOSCOPY

ENDOSCOPIC RETROGRADE CHOLANGIOPANCREATOGRAPHY (ERCP)

PANCREAS SCAN

LIVER SCAN

LIVER BIOPSY

COLONOSCOPY

SIGMOIDOSCOPY

ABDOMINAL X-RAY

ABDOMINAL ULTRASOUND

CT SCAN OF THE ABDOMEN

LAPAROSCOPY