EXAMINATION OF ABDOMEN
The abdominal cavity contains many vital organs and

Peritoneum

Omentum

Mesentery
ANATOMY – CONTD..

Lung
Spleen
Pancreas
Left kidney
Sacrum
Pelvis
Femur
Humerus
Scapula
Lungs at full inspiration
Right kidney
5th lumbar vertebra
Liver
Pylorus
Transverse colon
Small bowel
Lungs at full expiration
1st rib
Nipple
Left margin of heart
Lungs at full inspiration

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QUADRANTS OF ABDOMEN

Abdomen is divided into 9 quadrants by:

2 VERTICAL LINES:
from femoral arteries below to cross the costal margins close to the tips of the 9th costal cartilage on both sides.

2 HORIZONTAL LINES:
sub costal and inter iliac lines.
<table>
<thead>
<tr>
<th>RIGHT HYPOCHONDRIUM</th>
<th>EPAGASTRIUM</th>
<th>LEFT HYPOCHONDRIUM</th>
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<tr>
<td>Right lobe of liver</td>
<td>Pyloric end of stomach</td>
<td>Stomach</td>
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<tr>
<td>Gall bladder</td>
<td>Duodenum</td>
<td>Spleen</td>
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<tr>
<td>Right hepatic flexure</td>
<td>Pancreas</td>
<td>Tail of pancreas</td>
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<tr>
<td>Of colon</td>
<td>Portion of liver</td>
<td>Splenic flexure of colon</td>
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<td>Suprarenal</td>
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<td>Suprarenal</td>
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<td>RIGHT LUMBAR</td>
<td>UMBILICAL</td>
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<td>Ascending colon</td>
<td>Omentum</td>
<td>Descending colon, Left</td>
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<tr>
<td>Right kidney</td>
<td>Mesentery</td>
<td>kidney</td>
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<tr>
<td>Portion of duodenum &amp; Jejunum</td>
<td>Lower part of duodenum</td>
<td></td>
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<td></td>
<td>Jejunum, ileum</td>
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<tr>
<td>RIGHT ILIAC</td>
<td>HYPOGASTRIUM</td>
<td>LEFT ILIAC</td>
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<td>Caecum</td>
<td>Ileum</td>
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<td>Appendix</td>
<td>Bladder</td>
<td>Left ureter</td>
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<tr>
<td>Right ureter</td>
<td></td>
<td>Spermatic cord</td>
</tr>
<tr>
<td>Right spermatic cord / Right ovary</td>
<td></td>
<td>Ovary</td>
</tr>
</tbody>
</table>

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Regions of Abdominal Area

- Right hypochondriac region
- Left hypochondriac region
- Right umbilical region
- Left umbilical region
- Right iliac region
- Left iliac region
- Right lumbar region
- Left lumbar region
- Epi-gastric region
- Hypogastric region
COMMON SYMPTOMS

- Abdominal pain
- Abdominal distension
- Diarrhea
- Constipation
- Jaundice
- Vomiting
- Hematemesis
- Melena
- Hematochezia
- Hematuria
- Weight loss
- Pruritus
GENERAL EXAMINATION

• Look for – Pallor, Clubbing, Jaundice, Edema

  Lymphadenopathy

• Hair – Depigmentation / Alopecia

• Eyes – Pallor, signs of Vitamin A deficiency, Jaundice, K.F Ring

• Oral cavity – Glossitis, cheilitis, pallor, petechiae, dehydration
• Limbs- vitamin D deficiency

• Palms- palmar erythema, flapping tremor

• Nails- Terry nails in chronic liver disease, half and half nails in chronic renal disease

• Skin-scraper naevi, petechiae, scratch marks
UPPER GI EXAMINATION

- Lips - cheilitis, ulcers, pigmentation
- Gums - bleeding, hypertrophy
- Teeth - caries
- Buccal mucosa - ulcers, thrush, petechiae palate, fauces & tonsil.
- Pharynx - ulcers, exudate.
- Breath - halitosis, fetor hepaticus
PALMAR ERYTHEMA
EXAMINATION OF ABDOMEN - INSPECTION

• Patient lying in supine position

• Exposed – xiphisternum to upper thigh

• Good Light

• Infant and non cooperative child – mother’s lap

• Stand on right side of the patient and examine
INSPECTION – CONT..

• Shape
• Normal - Protuberant upto 5 years
• Distended-Generalised-5 Fs
  Fluid, Flatus, Faeces, Fat, Fetus
• Localized
  – Symmetrical - Small bowel obstruction (around umbilicus)
  – Asymmetrical - Gross enlargement of spleen, liver, ovary
• Scaphoid ➔
• Starvation in older children
• Diaphragmatic hernia in newborns
• Distended lower abdomen - Urinary retention
• Flank fullness - Tense ascites
INSPECTION – CONT..

• MOVEMENT
  – Free & equal on both sides
  – All quadrants move equally with respiration
  – Absent or diminished – Generalized peritonitis
  – Paradoxical movement (reverse) - diaphragmatic paralysis
  – Visible peristalsis
• CHPS
• Distal small bowel obstruction (LADDER PATTERN)
INSPECTION – CONT..

• UMBILICUS
• Normal - Slightly retracted or inverted
• Everted - Umbilical hernia
  – Expansible impulse while coughing on palpation
• Hernia sac – omentum /bowel /fluid
• Discharge - Umbilical sepsis, omphalitis
• Granuloma - fleshy red granulation tissue
• Striae –
  – Gross stretching of skin with rupture of elastic fibres
  – Recent change in size - ascites, severe dieting
  – Purple striae - Cushing’s syndrome
• Scars – linear - incisional hernia
Superficial veins –

• observe in standing posture

• Mention direction of flow

• Thin veins over the flank / over back – Occlusion of inferior vena cava

• Caput medusae ➔ rare, seen in PHTN

– Blood flows from umbilicus towards periphery
PROMINENT VEINS

(a) Place two fingers side by side
(b) Move the lower finger away thus emptying part of the vein
(c) Remove the lower finger: in this example the vein remains empty
(d) Replace the finger and remove the upper finger: blood will be seen to run down from above
INSPECTION – CONT..

• Visible pulsations ➔ abdominal aorta
  – a) nervous thin patients
  – b) aortic aneurysms-more obvious pulsations

• Pigmentation ➔
  – brown mottled pigmentation (erythema ab igne)

• Constant application of heat / hot water bottle
INSPECTION – CONT..

• GROINS

• Penis ➔ size, epispadias, hypospadias

• Scrotum ➔ hydrocele

• Testes ➔ enlargement, cryptorchidism

• Vulva - clitoral hypertrophy, vaginal discharge

• Hernial orifices

• Inguinal lymph nodes
PROMINENT SUPERFICIAL VEINS
PALPATION

• Assure patient, divert child’s attention
• It’s better to keep the infant on mother’s lap
• Child relaxed, Breast feeding– best soother
• Hands – warm
• Folding of legs not needed
PALPATION

• Superficial, deep and dipping (when there is massive ascites)
• Start in left iliac fossa
• Anticlockwise direction
• Avoid sudden poking of finger tips
• Wrist and forearm – same plane
PALPATION

FEEL THE ABDOMEN

Soft, tense, rigid, doughy (TB)

Tense and glistening – tense ascites

Floating abdomen – prune belly syndrome

Edema of abdominal wall – pinching for 5 sec.

Tenderness-Localized OR Generalized
PALPATION

FEEL FOR

- Left kidney
- Spleen
- Right kidney
- Liver
- Urinary bladder
- Aorta and para-aortic glands
- Femoral vessels
- Mass
- Groins
- External genitalia

Rapid method is to palpate liver and spleen which are enlarged commonly and then to palpate other organs.
SPLEEN

Normal  – not palpable

Tip can be palpated till 3 months of age

Palpable ➔ 2 – 3 times its usual size

Enlargement occurs in the superior & posterior direction downward towards RIF
Method of palpation:

• Conventional – supine position

Place flat of the left hand over lowermost ribcage poster-laterally and right hand beneath the costal margin. If not palpable – right lateral position

• Hooking method
SPLENOMEGALY

• Describe size, surface, consistency, tenderness and distance from the costal margin. Look for splenic notch also.

• Mild ➔ < 3cms

• Moderate ➔ 3 – 7cms (upto umbilicus in midline)

• Massive ➔ > 7cms
SPLENOMEGALY

• Firm swelling with smooth, rounded border
• Moves down on inspiration
• Splenic notch may be palpable
• Upper border cannot be felt (can’t get above it)
• Not bimanually palpable
• Band of colonic resonance anterior to an enlarged kidney
SPLENOMEGALY

Causes

• SOFT ➔ IMN, Typhoid

• FIRM ➔ Malaria, PHT, Leukemia
LIVER

• Start from the right iliac fossa and ascends upwards to right costal margin
• Place right hand below and parallel to the costal margin
• Ask the patient to breathe in deeply and at the height of inspiration press the fingers firmly inwards and upwards
LIVER

Normal: 2cms upto 5 years, thereafter 1cm sharp, regular border

- **Size:** so many cms below RCM
- **Surface:** smooth / irregular
- **Border:** rounded / sharp
- **Tenderness:** +\- 
- **Consistency:** Soft – CCF, Infective Hepatitis
  - Firm – Obstructive Jaundice
  - Hard – Cirrhosis
- **Pulsatilty:**
- **Liver span:**
LIVER

Span: Normal: from 5th ICS in right MCL to the point of dullness at lower margin

Birth 5.6 to 5.9 cm
2 months 5 cm
1 year 6 cm
2 year 6.5 cm
3 year 7 cm
4 year 7.5 cm
5 year 8 cm
6 – 12 year 9 cm
LIVER

• Pulsatile: Tricuspid Regurgitation
• Tenderness: CCF, Infective Hepatitis
• CCF: Soft, smooth, tender
  – Cirrhosis: Hard, irregular, painless
  – Advanced cirrhosis: shrunken liver
  – Rapid shrinkage: Acute hepatic necrosis
LIVER

CAUSES OF HEPATOMEGALY

- Congestion
- Cirrhosis
- Hepatitis
- Neoplasm
GROSS HEPATOSPLENOMEGALY
GALL BLADDER

• Normal: Not palpable
• Palpate just lateral to the edge of rectus abdominis near the tip of the 9th costal cartilage
• Enlargement: Uncommon in children
  – Pear shaped swelling beneath the centre of undersurface of liver
  – Cystic in consistency
  – Freely mobile from side to side
• Murphy’s sign: Child is asked to take breath while maintaining constant pressure over the gall bladder region. Gall bladder touches the fingers and the child catches his breath

• Tenderness: Cholecystitis with or without cholelithiasis
Bimanual palpation

Right kidney:

• Right hand in the right lumbar region anteriorly, left hand posteriorly in the right loin.

• Push forwards with the left hand, ask the patient to take a deep breath in and press the right hand upwards and inwards.
KIDNEYS

Left kidney

• Right hand anteriorly in left lumbar region, left hand posteriorly in the left loin

• Press left hand forwards, right hand backward, upward and inward

• Ballotment: Push the kidney back & forward between two hands

• Assess the size, surface & consistency of a palpable kidney.
KIDNEYS

• Enlarged Kidneys:
  • Unilateral
  • Compensatory hypertrophy in renal agenesis, hypoplasia, atrophy
• Hydronephrosis
• Renal tumor
• Bilateral
• Polycystic kidneys
• Amyloidosis
• Rarely two kidneys join at lower pole and may be palpable ➔ Horse-shoe Kidney
URINARY BLADDER

• Smooth, firm, regular, oval in supra-pubic region
• Lower border not made out
PERCUSSION

• To detect the boundaries of abdominal organs and masses

• Done from resonant area to dull area

• Percuss
  – lightly for superficial structures

• e.g.: for lower border of liver
  – firmly for deeply seated structures

• e.g.: for upper border of liver, Bladder
PERCUSSION

Liver-Start from the 2nd right intercostal space.

• Go vertically down

• Dull note at the 5th right intercostal space in the midclavicular line, 7th right intercostal space in the midaxillary line and 9th intercostal space in the scapular line is the normal upper border

• This dullness extends down to the lower border found at or just below the right costal margin

• Start from below upwards to detect lower border
PERCUSSION

Spleen

• Traube’s space is more sensitive for splenic enlargement
• Boundaries - 6th rib superiorly, left midaxillary line laterally and left costal margin inferiorly
• During normal breathing the space is percussed out from the medial to lateral, yielding resonant note.
Shifting dullness

• 1000-1500 ml-flank dullness is percussed, if flank dullness present look for shifting dullness

• Patient in supine position & percuss from center of the abdomen to the flank until a dull note is obtained.

• Keep the fingers in place as the patient rolls on to the other side

• Pause for at least 30 secs. Ascites is identified if the note becomes resonant & confirmed by obtaining a dull note while percussing back towards the umbilicus.
PERCUSSION

Fluid thrill

• Place a detecting hand on the person’s flank and flick the skin of the abdominal wall over the other flank using thumb and forefinger.

• If a thrill or impulse is felt, repeat the procedure with the patient’s right hand placed on the abdomen along the midline sagittal plane to dampen any possible thrill transmitted via the abdominal wall.

• Fluid thrill ➔ Massive ascites
PERCUSSION

Puddle sign

• Knee elbow position to ensure gravitation of fluid
• The chest piece of stethoscope is placed over the mid abdomen & abdominal wall is gently tapped with index finger moving from one flank towards the center
• Puddle sound audible – minimal effusion (150ml)
Renal angle percussion

• The renal angle bounded by the 12th rib superiorly and the lateral border of erector spinae

• Normally resonant due to colonic gas

• Dull in renal enlargement

• Tender in renal abscess
AUSCULTATION

• Bowel sounds – normally best heard a little to the right or left of umbilicus
• High pitched bowel sounds – Diarrhea, Empty bowel, Intestinal obstruction
• Absent bowel sounds – Paralytic ileus, late intestinal obstruction, Peritonitis
• Bowel sounds not audible in massive ascites because of mechanical obstruction
• Borborygmi: Increased frequency & intensity of bowel sounds (gurgling sounds) audible to unaided ear.
AUSCULTATION

Friction rubs:
• Liver – Hepatic tumor or infection (Perihepatitis)
• Spleen – Splenic Infarct (IMN, Malaria, SCA)
  Perisplenitis

Bruit:
• Kidney – Renal artery stenosis, Renal AV fistula,
• Venacaval thrombosis
• Liver: Malignancy (Hemangioma, Hepatoma)
• Arterial: Aortic, Mesenteric (narrowed or partially occluded)
• Venous Hum: Portal HTN
ANUS & RECTUM

- Perianal erythema ➔ Lactose Intolerance
- Polyps ➔ red & pedunculated
- Tags & Fissures
- Hemorrhoids ➔ Dark red
- Prolapse rectum ➔ Malnutrition, Trichuriasis
- Perianal fistula ➔ Crohn’s disease
ANUS & RECTUM

• Rectal examination:
  – Hirschsprung’s disease – empty rectum
  – Intussusception

• Abdominal mass extending to pelvis
  – Rectal bleeding
  – Urethral stone
OTHER SYSTEMS

• CVS:

• Cardiomegaly: Anemia

• Microcardia: Kwashiorkor
OTHER SYSTEMS

• RS:

• Pleural effusion: Cirrhosis, Nephrotic Syndrome

• Bowel sounds in Chest: Diaphragmatic Hernia
OTHER SYSTEMS

• CNS:

• Signs of Hepatic encephalopathy

• Wilson’s disease

• Reye’s syndrome
THANK YOU