CADAVER DISSECTION – ABDOMEN

All of the terms indicated below in **BOLD** print should be identified during the student's oral presentation on this region.

PROCEDURE:

I. SURFACE ANATOMICAL LANDMARKS – Prior to dissection, identify the following surface anatomical landmarks of the abdomen: **infrasternal angle (costal cartilage), xiphoid process, umbilicus, pubic symphysis, iliac crest, anterior superior iliac spine.**

II. SUPERFICIAL VESSELS & NERVES – Determine the location of any major superficial veins or superficial nerves in your area of dissection to avoid damaging these structures as you dissect.
The superficial epigastric artery (a branch of the femoral artery) is located on the lower abdominal wall, within the superficial fascia, superficial to the inguinal ligament extending between the anterior superior iliac spine and the pubic tubercle.

III. REMOVAL OF SKIN – Using the following steps, remove the skin from the median line of the abdomen laterally to the midaxillary line.

A. Incision Lines - Use a marking pencil to outline the incision lines (illustrated on the handout). Use a scalpel blade to cut through the skin. Insert a smooth probe under the skin along the remaining incision lines (instructor will demonstrate). When making your remaining incision, only cut to the smooth probe to avoid damaging superficial structures deep to the skin.

Median Incision Lines – Cut the skin along the median line from the xiphoid process to the umbilicus. Cut the skin ½ inch around the umbilicus. Continue the incision below the umbilicus to the pubic symphysis.

Lateral Incision Lines

1). Cut along the border of the infrasternal angle from the xiphoid process to the midaxillary line.

2). Cut along the border of the inguinal ligament from the pubic symphysis to the midaxillary line.

B. Removal of skin – Locate the deep fascia or Epimysium (rectus sheath) of the rectus abdominis (rectus sheath) muscle. Use a smooth probe to locate the junction of the superficial fascia and the deep fascia. Using the smooth probe (and your fingers) remove the skin from the median line to the midaxillary line of the abdomen. Avoid using the scalpel blade unless absolutely necessary.

IV. MUSCLE IDENTIFICATION AND SEPARATION

A. **Rectus abdominis** – Identify the rectus sheath of the rectus abdominis muscle. Cut a small square in the rectus sheath (one inch square) to identify the fibers of the rectus abdominis muscle.

B. **External oblique** – Identify the external oblique muscle lateral to the rectus sheath.

V. OPENING THE ABDOMINAL CAVITY

Make an initial incision into the abdominal cavity at the inferior margin of the costal cavity.

- Avoid damaging the internal organs deep to the initial incision. Use a smooth probe to protect the internal organs as the remaining cuts are made.

A. Superior Incision – Begin at the median plane and cut through the anterior abdominal wall along the margins of the costal cartilages to the midaxillary line. * On the right side, observe the ligamentum teres (remnant of the umbilical vein) connecting the umbilicus to the inferior margin of the liver.
B. Lateral Incision – Continue the incision inferiorly along the midaxillary line to a point just superior to the iliac crest.
C. Inferior Incision – Continue the incision medially from the lateral incision, one inch superior to the inguinal ligament, to the inferior epigastric arteries (branches of the external iliac artery).
D. * When the opposite side of the abdomen has also been dissected, reflect the anterior wall of the abdominal cavity to identify the internal organs.

VI. MUSCLE IDENTIFICATION AND SEPARATION

Examine the lateral portion of the reflected anterior abdominal wall to identify the following muscles. Separate the three layers of muscles located on the lateral abdominal wall, superficial to deep.

A. **External oblique** – Identify the most superficial of the three muscles, the external oblique muscle. The fibers of this muscle run inferior and medial to insert into the rectus sheath.
B. **Internal oblique** – Identify the middle of the three muscles, the internal oblique muscle. The fibers of this muscle run superior and medial to insert into the rectus sheath.
C. **Transversus abdominis** - Identify the deepest of the three muscles, the transversus abdominis muscle. The fibers of this muscle run in a transverse direction from the posterior abdominal wall to the rectus sheath.

VII. VASCULATURE AND INNERVATION – ANTERIOR ABDOMINAL WALL

Superior Portion

A. **Ligamentum teres** (right side) – Identify the ligamentum teres (remnant of the umbilical vein), which was cut when the right, superior, anterior abdominal wall was opened.

Inferior Portion – Internal View

B. **Lateral umbilical fold** (contains inferior epigastric artery) – Try to identify the inferior epigastric artery (branch of the external iliac artery) on the inferior portion of the abdominal wall.
C. **Medial umbilical fold** (remnant umbilical arteries) – Try to identify the medial umbilical fold (remnant umbilical arteries), medial to the inferior epigastric artery, on the inferior portion of the abdominal wall.

VIII. COVERINGS – INTERNAL VIEW OF ANTERIOR ABDOMEN

A. Peritoneum
   1. **Parietal peritoneum** – Identify the outer peritoneal lining of the abdomen, the parietal peritoneum.
   2. Visceral peritoneum – Identify the following subdivisions of the visceral peritoneum.
      a. **Falciform ligament** – anterior attachment of the liver to the anterior abdominal wall.
      b. **Lesser omentum** – connection between the liver and the lesser curvature of the stomach.
      c. **Greater omentum** – portion of the visceral peritoneum extending from the greater curvature of the stomach to the transverse colon. Forms an "apron" over the small intestines.

IX. ORGANS

A. Digestive (Gastrointestinal) Tract
   1. **Stomach** – Identify the **lesser curvature** and **greater curvature** of the stomach. Identify the **body** and **pyloric** portions of the stomach. Try to palpate the **pyloric sphincter** in the distal portion of the stomach.
   2. **Small Intestine** – Trace the small intestine from the stomach to the connection with the large intestine. Identify the **duodenum, jejunum,** and **ileum** subdivisions. Identify the attachment of the small intestine to the posterior abdominal wall, the **mesentery.**
   3. **Large Intestine** – Trace the large intestine from its connection to the small intestine to the pelvic cavity. Identify the following portions: **cecum, vermiform appendix, ascending colon, right colic flexure, transverse colon,** and **rectum.** In addition to identify the above portions, also identify these features of the large intestine: **tenia coli, epiploic appendages.**

B. Accessory Organs of the Digestive Tract
   1. **Liver** – Identify the following portions of the liver: **right lobe** and **left lobe.**
   2. **Gallbladder** – Identify the **cystic duct** leading from the gallbladder.
   3. **Pancreas** – Identify the pancreas deep to the greater omentum.

X. POSTERIOR ABDOMINAL WALL

Carefully separate the visceral peritoneum covering the posterior abdominal wall to reveal the organs and vessels located underneath this covering.

A. Urinary System – Identify the following organs of the urinary system.
   1. **Kidney** – Identify the **hillum**.
   2. **Ureter** – Identify the ureter and follow the ureter to the point near the branching of the common iliac arteries into the internal and external iliac arteries where the ureter enters the pelvic cavity.

B. Vasculature – Identify the following vessels of the posterior abdominal wall.

1. **Abdominal aorta** – Identify the following branches of the abdominal aorta. Begin at the inferior or terminal end f the abdominal aorta and proceed in a superior direction.
    a. **Right and Left Common Iliac Arteries** – Identify these terminal braches of the abdominal aorta.
    b. **Inferior mesenteric artery** – A single branch extending towards the sigmoid colon.
    c. **Gonadal arteries** – Paired branches extending toward the pelvic cavity.
    d. **Renal arteries** – Paired branches supplying the kidneys. The renal arteries will be located deep to the renal veins.
    e. **Superior mesenteric artery** – A single branch supplying the midgut, middle portion of the digestive tract.
    f. Celiac artery – the celiac artery and its branches will be difficult to locate superior to the superior mesenteric artery.
2. **Inferior vena cava** – Identify the inferior vena cava, located to the right of the abdominal aorta. Identify the following branches of the inferior vena cava. Begin at the inferior end of the inferior vena cave and proceed in a superior direction.
    a. **Right and Left Common Iliac Veins** – These veins contribute blood from the lower limbs to the inferior vena cava.
    b. **Gonadal veins** – Paired veins extending alongside the gonadal arteries.
    c. **Renal arteries** – Paired veins extending from the kidneys to the inferior vena cava.