

ANATOMY & PHYSIOLOGY 12

Kidney Dissection

Name: _____

Partners: _____

This must be submitted by the end of the block. Each lab participant must submit their OWN paper.

PURPOSE:

- To demonstrate safe and correct dissection technique.
- To understand the structure of the brain including the medulla oblongata, cerebrum, thalamus, cerebellum, hypothalamus, pituitary gland, corpus callosum, and meninges and relate it to their functions.
- To compare the structure (including grey/white matter) of the cerebrum and cerebellum.

Introduction:

The human urinary system consists of two kidneys, two ureters, one urinary bladder, and one urethra. This system has many basic functions, all of which occur in the kidneys. One function is to remove nitrogenous wastes (such as creatinine, urea, and uric acid) from the body. Another is to maintain the ion, pH, and water levels in the blood. One product of these processes is urine, a pale yellow fluid containing water and particles such as urea, sodium, potassium, creatinine, and uric acid. Urine moves from the kidneys to the urinary bladder via the ureters, which are essentially tube shaped extensions of the renal pelvis. Urine is stored in the urinary bladder until it leaves the body via the urethra.

Materials (per group):

- Dissection tray, scissors, probes, scalpel
- Dissecting Microscope
- Plastic Gloves and apron
- Pig Kidney
- Coloured pins

Basic Kidney Anatomy

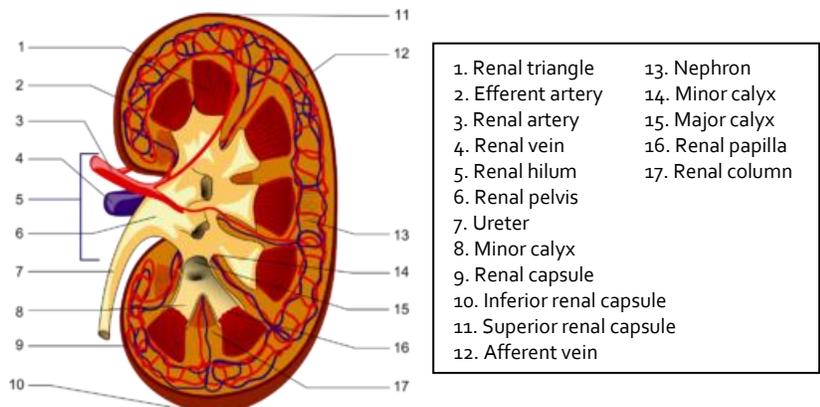
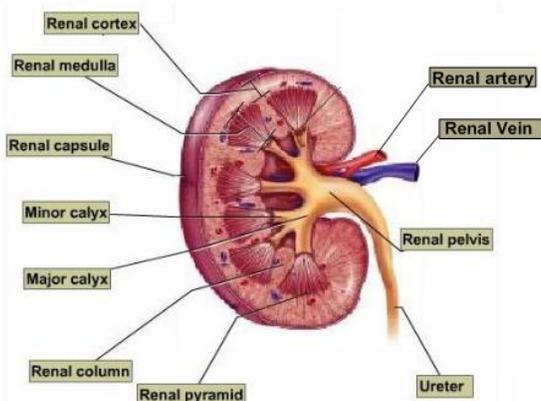
There are four primary components to a kidney:

Renal Capsule: A smooth semitransparent membrane that adheres tightly to the outer surface of the kidney.

Renal Cortex: The region of the kidney just below the capsule. In a fresh kidney the colour of the cortex will be reddish brown.

Renal Medulla: The region deeper into the kidney, beneath the cortex layer. In a fresh kidney it is redder in colour than the cortex. It is segregated into triangular and columnar regions. The triangular regions are the renal pyramids, which should be striated (or striped) in appearance due to the collecting ducts running through them. The columnar regions between the pyramids are the renal columns. These renal columns are where the interlobar arteries are located.

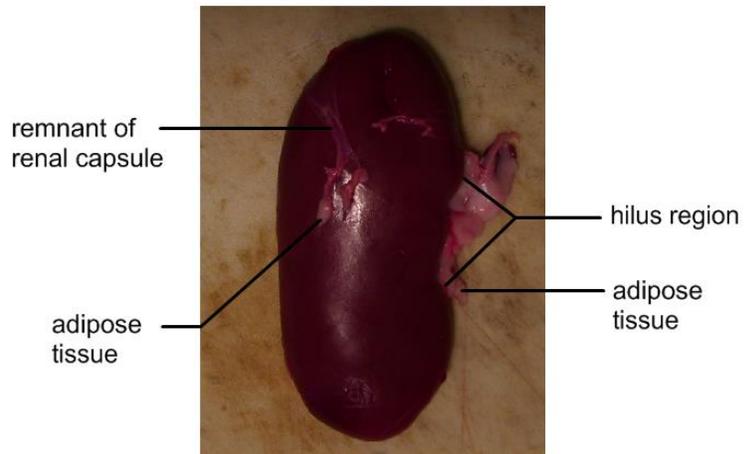
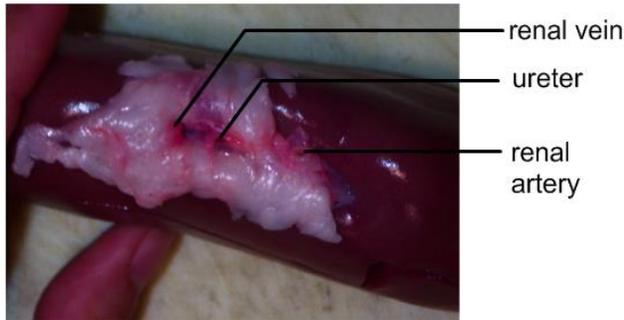
Renal Pelvis: A cavity within the kidney that is continuous with the ureter, which exits from the hilum. The pelvis has portions that extend towards the apices of the renal pyramids. The primary (large) extensions are the major calyces and the smaller extensions are the minor calyces.



Procedure:

Observation: External Anatomy

1. You'll need a fresh pig kidney for the dissection. Set the kidney down so the flatter side rests on the dissection pan. Observe the whitish adipose (fat) tissue clinging to the renal capsule. These are remnants of the adipose capsule. Use your scissors to remove excess adipose tissue around the hilus region, and the probe to help you identify the ureter and any blood vessels located in the hilus region. Complete two biological drawings of two views of the exterior of the kidney.



Drawing of first view of the kidney

Drawing of second view of the kidney

Observation: Internal Anatomy

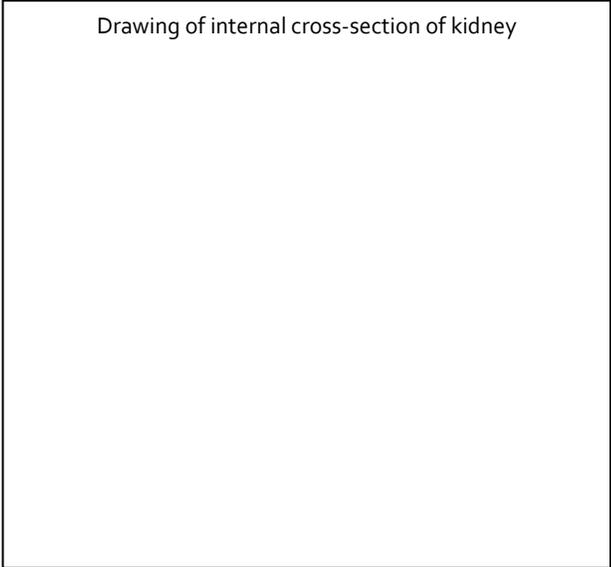
2. Cut the kidney in half longitudinally using the knife or with short repeated strokes of the scalpel.
3. Examine the interior structure of the kidney. Identify & label the following structures with the coloured pins. It may be useful to trace the vessels from the hilus region with a blunt probe to help with identification. Call your teacher over when complete.



<u>Structure</u>	<u>Colour</u>
Cortex	<i>blue</i>
Medulla	<i>black</i>
Renal Pyramids	<i>yellow</i>
Renal Columns	<i>white</i>
Major Calyx	<i>red</i>
Minor Calyces	<i>green</i>
Ureter	<i>clear</i>
Renal Vessels	<i>#1</i>

4. Complete a biological drawing of the interior of one half of the kidney. Include labels where appropriate.
5. Dispose of the kidney in the waste bag provided. Wash all dissecting equipment and return. Wash your hands thoroughly with warm soap and water.

Drawing of internal cross-section of kidney



Discussion Questions

Answer the following questions in FULL SENTENCES

1. What is the smooth semitransparent membrane that adheres tightly to the outer surface of the kidney? What is its function?
2. What are the four main functions of the urinary system?
3. Discuss the differences between the walls of the renal artery and the other vessels located at the hilum region.
4. What gives the renal pyramids their striped appearance?
5. What are the major and minor calyces?
6. State any conclusions, questions, insights or ideas that you gained from this dissection:

Performance Based Assessment

NAME: _____

	Beginning	Developing	Accomplished	Exemplary
Labeling	Many structures are incorrectly labelled or not labelled at all	The majority (more than 1/2) of structures accurately labelled	Almost all structures accurately labelled	All structures accurately labelled
<i>Cortex, medulla, renal pyramids, renal columns, major calyx, minor calyces, ureter, renal vessels</i>				
Diagrams	Kidney structures are not labeled in most drawings Diagram is not neat nor realistic and is not drawn in pencil.	Kidney structures are incorrectly labeled in most drawings Diagram is may not be neat or realistic and is not drawn in pencil.	Kidney structures are correctly labeled in at most drawings Diagram is neat and somewhat realistic, but may not be not drawn in pencil	Kidney structures correctly labeled in all drawings Diagram is neat and realistic and drawn in pencil
Observation & Discussion Questions	Does not demonstrate a basic understanding of concept. Substantial errors throughout.	Basic understanding of concepts. Errors and inconsistency reveal some missing understanding of the concepts.	Solid understanding of concepts. Most answers are correct with only a few errors	Complete and in depth understanding of concepts.