A system that goes with the flow

(a) Frontal section of right kidney
Identify the following structures
Identify the following structures:

- Diaphragm
- Esophagus
- Left adrenal (suprarenal) gland
- Left renal vein
- LEFT KIDNEY
- Abdominal aorta
- Inferior vena cava
- LEFT URETER
- Rectum
- Left ovary
- Uterus
- RIGHT KIDNEY
- Right renal artery
- RIGHT URETER
- URINARY BLADDER
- URETHRA

(a) Anterior view
Identify the following structures
Identify the following structures

FLOW OF FLUID THROUGH A CORTICAL NEPHRON

Glomerular (Bowman's) capsule
→ Proximal convoluted tubule
→ Descending limb of the nephron loop
→ Ascending limb of the nephron loop
→ Distal convoluted tubule (drains into collecting duct)

(a) Cortical nephron and vascular supply
Identify the following structures
Renal Corpuscle
Identify the following structures
Identify the following structures
Identify the following structures:

- Podocytes
- Vascular pole
- Capsular space
- Urinary pole
- Distal tubules

Podocyte
What specific portion of the kidney is this section taken from?
Renal Cortex. The glomeruli are the filtering units of the nephron. The nephron is comprised of the renal corpuscle (glomerulus and capsule) and its associated tubules (proximal, intermediate and distal). A human kidney has about 1 million nephrons. Bar = 100 Microns
Name the structures indicated by the arrows
Glomeruli (red arrows). Several medullary rays (between yellow arrows) The medullary ray is composed of proximal and distal tubules going to and from the medulla, and collecting ducts. These tubules serve the adjacent glomeruli. But why would they name them "medullary rays" when they are only found in the cortex? Bar = 250 Microns
Name the structures indicated by the arrows.
Behold the human kidney. The numerous **glomeruli (red arrows)** identify the renal cortex. Several **medullary rays (between yellow arrows)** are evident as is also a interlobular artery, blue arrow. Bar = 1mm
Name the specific structures at the end of the arrows.
Three cell types make up the glomerulus: endothelial (red), mesangial (blue) and the visceral epithelial cell or podocyte (yellow). Simple squamous epithelial cells of the Bowman capsule are easily seen (green). The macula densa (black) is part of the end of the ascending limb of nephron or the beginning of the distal convoluted tubule. A collecting duct is in the upper left. Bar = 50 Microns
Name the specific structures at the end of the arrows
Name the specific structures at the end of the arrows

**Glomerulus**
The afferent arteriole is seen entering the glomerulus at the vascular pole (red arrows). The urinary pole (yellow arrow) is where the filtrate enters the tubule system (specifically, it enters the proximal convoluted tubule).

Bar = 50 Microns
Name the specific structures
The collecting duct (red arrow), shown here in a longitudinal section, is composed of simple cuboidal epithelium. Notice the prevalence of nuclei. Below are intermediate tubule segments (a.k.a., thin limbs of loop of Henle) and vasa rectae (with RBCs) (blue arrow) both have a simple squamous epithelium.
Bar = 50 Microns
Name the specific structure
Ureter
The ideal ureter is marked by a star-shaped lumen. The inner longitudinal and outer circular muscle layers are opposite of the GI tract. Bar = 1mm
Name the specific structures

Ureter

Transverse plane

Vein

Artery

Transitional epithelium

Muscularis

Adventitia

Mucosa

Transverse section of ureter
Name the specific structures:

- Ureter
- Transverse plane
- Vein
- Artery
- Mucosa
- Muscularis
- Adventitia
- Transitional epithelium
- Transverse section of ureter
Name the organ and specific type of epithelium
Urinary Bladder Wall
Transitional epithelium. The detrusor smooth muscle is in three ill-defined layers: inner longitudinal, middle circular, outer longitudinal. Difficult finding the layers. Bar = 100 Microns
Name the specific type of epithelium and the cell types shown by the arrows.
Cells of **transitional epithelium** are large and plump when the bladder is empty. When the bladder is full, they become flattened. Occasionally, a binucleate cell (black arrow) can be seen. Notice the infiltrate of **lymphocytes (blue arrows)** and an increased density of staining along the apical surface of the most superficial layer of epithelial cells. Is there a specialization of the plasma membrane at this surface exposed to the urine? Bar = 50 Microns
Name the specific structures
Name the specific structures
Name the structures
Male Urethra
This photomicrograph is derived from the penile urethra. The epithelium is seen surrounding the lumen at the top of the field. The glands of Littre' are marked with arrows and empty into the lumen (L). They are mucus-secreting glands. The asterisks (*) denote the numerous vascular channels of the corpus spongiosum which engorge with blood during penile erection. Bar = 1 mm
Name the structures
**Male Urethra**

The pseudostratified epithelium is labeled "E" and the asterisks denote the vascular channels at higher magnification. Bar = 0.5 mm
Name the structures

**Female Urethra**
Note the crescent-shaped lumen. The lining is primarily stratified squamous epithelium ("E"). The epithelium is supported by a highly vascular lamina propria ("LP") containing many veins. The smooth muscle layers underlie the lamina propria. Bar = 1 mm

**Female Urethra**
E= stratified squamous epithelium
LP= lamina propria
V= veins
Bar = 100 microns
Female Urethra
Note the crescent-shaped lumen. The lining is primarily stratified squamous epithelium ("E"). The epithelium is supported by a highly vascular lamina propria ("LP") containing many veins. The smooth muscle layers underlie the lamina propria. Bar = 1 mm

Female Urethra
E= stratified squamous epithelium
LP= lamina propria
V= veins
Bar = 100 microns