

Anatomy and Physiology II

Learning Guide: Urinary System

Overview – The urinary system is relatively simple in terms of gross anatomy, but the physiology of the nephron compensates for this. We will commence by looking at the anatomical structures associated with the urinary system. A detailed look at nephron physiology will follow this discussion.

Review Topics – We will draw from your cytology lecture in A&P I regarding active and passive transport mechanisms, osmosis, diffusion gradients as well as other topics. Also, considering the urinary system's histological features, we will draw from the Histology module in A&P I.

Getting Started – We begin by categorizing the various regions of the nephron and associating them with unique functions. As the discussion continues, the interdependence of the parts of the nephron working together to maintain homeostasis will become clear. At the end of the lecture, the urinary system's more distal portions will be looked at: ureters, urinary bladder, urethra, and the process of micturition.

Exam – The exam is a typical exam in terms of general questions regarding the module content. However, after this, the nephron structure and function will be covered in five sequential sections. Each of the five sections on the exam will be 10 points each. These sections are:

1. Glomerulus structure and function
2. Proximal Convoluted Tubule structure and function
3. Establishment of the medullary concentration gradient with the ascending limb of the Loop of Henle and the Vasa Recta
4. Further water reabsorption and production of the “working filtrate.”
5. Regulation of the final “working filtrate.” Here, we will focus on two issues:
 - * water/salt balance
 - * blood pressure control

Laboratory – The laboratory will review gross anatomy using anatomical models in the lab and possibly preserved kidneys to be “dissected.” These topics are video recorded and can be found online. Laboratory support can be found [Here](#).

Final Point – Although the urinary system's gross anatomy is simple enough, you will undoubtedly want to know its structures and functions. However, most of your effort will be focused on nephron physiology.