Veterinary Bioscience: Metabolism

WEEK 5 – THE HEALTHY URINARY TRACT

LECTURER: DR CHRIS MURRAY

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INTENDED LEARNING OUTCOMES

At the end of this lecture, students should be able to:

- describe the organisation of the mammalian urinary system and its anatomical relationships with surrounding tissues and organs
- classify and distinguish the kidneys of the major domestic animal species
- describe the structure of the nephron and the arrangement of the vascular components of the kidneys, and relate these to the gross appearance of the sectioned kidney
- describe the structure of each of the components of the lower urinary system: ureters, bladder and urethra
- explain how each component of the lower urinary system contributes to urine storage and expulsion.

KEYWORDS

kidney, hilum, renal sinus, renal lobe, cortical lobule, renal pelvis, ureter, urinary bladder, urethra, cortex, medulla, renal papilla, medullary pyramids, renal crest, calyx (calyces), pelvic recess, pseudopapillae, nephron, renal corpuscle, glomerular/Bowman's capsule, podocyte, proximal convoluted tubule, proximal straight tubule, loop of the nephron/Henle, distal straight tubule, distal convoluted tubule, collecting ducts, papillary ducts, cribriform area, juxtaglomerular apparatus, renal artery, interlobar arteries, arcuate arteries, interlobular arteries, afferent arterioles, glomerulus (glomeruli), efferent arterioles, vasa recta, stellate veins, interlobular veins, arcuate veins, interlobar veins, renal vein, transitional epithelium, trigone, ureteric columns, urethral crest, vestibule, urethralis muscle, suburethral diverticulum, corpus spongiosum, os penis

LECTURE 17 – ANATOMY OF THE URINARY SYSTEM

The urinary system of domestic mammals is composed of a pair of kidneys and ureters, and a single urinary bladder and urethra. These organs are responsible for the production and discharge of urine, and thus participate in stabilising body fluid composition and volume, as well as regulation of blood pressure and acid-base balance. Components of the urinary system are also involved in erythropoiesis (production of red blood cells) and activation of Vitamin D.

The morphology of the components in the urinary system determines the functions of this system. This lecture describes the structure and anatomical relationships of the components of this system, and introduces their functions, in preparation for further lectures that explore the functions of this system in detail.

FURTHER READING

Bacha, WJ. and Bacha LM. *Color Atlas of Veterinary Histology* (2012)

Eurell and Frappier. *Dellmann's Textbook of Veterinary Histology*. 6th edition (2006)

König and Liebich. *Veterinary Anatomy of Domestic Animals*. 6th edition (2014)

Singh B. *Dyce, Sack and Wensing's Textbook of Veterinary Anatomy*. 5th edition (2017)