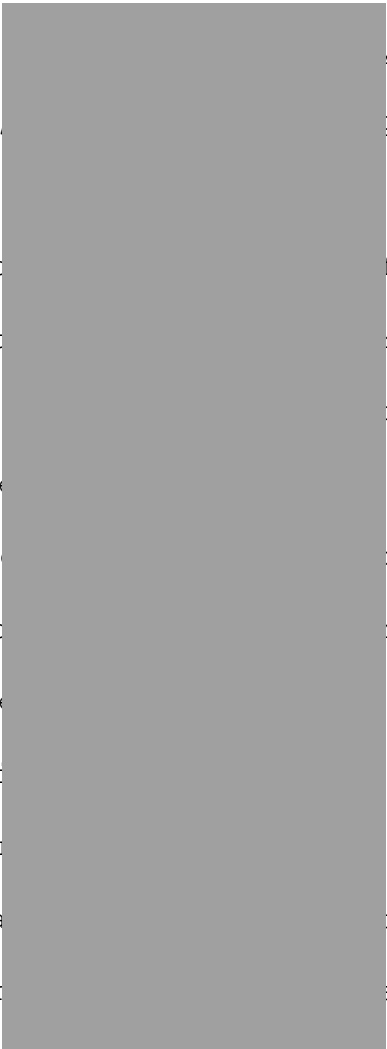
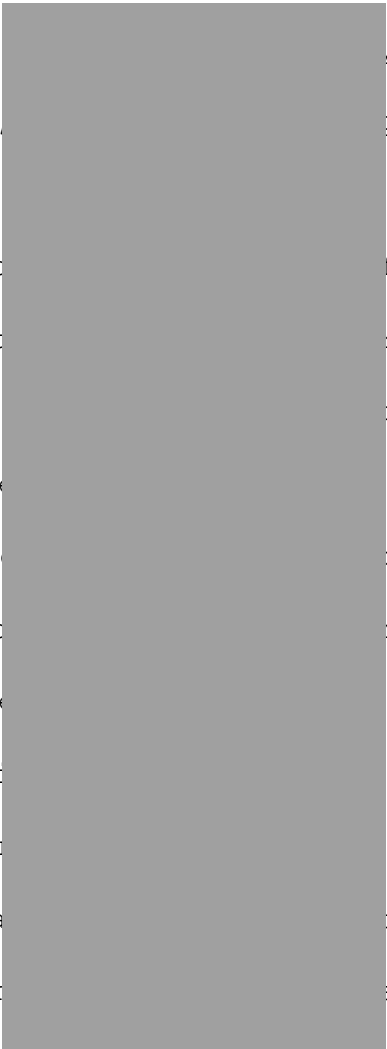
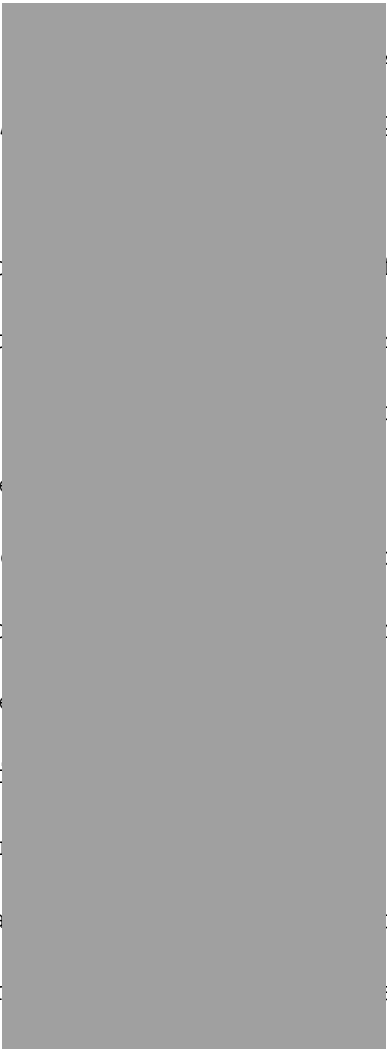
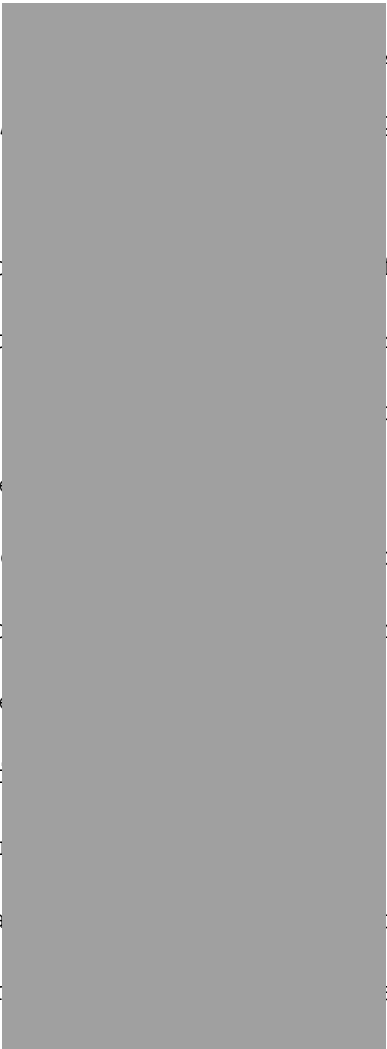


CHAPTER SUMMARY

- Excretion is the process of an organism to dispose wastes that are toxic to an organism.  of the systems in an animal, digestive, respiratory, gumentary and urinary systems.
- Excretory system refers to a group of functions in the disposal of metabolic waste.  refers to the urinary system because this  exclusively for excretion of nitrogenous waste.
- Invertebrates has vacuoles to accumulate and transport waste materials by exocytosis to the cell surface.  excrete waste through diffusion across the cell membrane.
- Other invertebrates have specialized structures such as flame cells, nepridiaphore, protonephridia, etc.
- The kidney is the major organ of excretion for vertebrates where blood is filtered to remove wastes and other substances in excess.

- The kidney has three basic parts namely and a pair of longitudinal ducts.
- The glomeruli is made up of tufts of fenestrated capillaries where blood flows containing water, ions and small molecules.
- Nephrostome is the ciliated funnel of the nephron. The longitudinal duct is the terminal part of the nephron that collects the nitrogenous wastes that are filtered out of the blood or into a urinary bladder for excretion.
- There are different types of kidneys namely mesonephros and metanephros.
- Nephron is the functional and structural unit of vertebrate kidneys. There is approximately 1 million nephrons for each kidney.
- Nephrons has two parts, glomerulus and renal tubule.
- Glomerulus are capillaries that supplies blood to the Bowman's capsule. Glomerulus and Bowman's capsule collectively called renal corpuscle.
- The renal tubule is made up of the proximal convoluted tubule (PCT), loop of Henle, distal convoluted tubule (DCT) where reabsorption of substances like water, glucose, sodium and potassium happens.

- Excretion starts at the straight [REDACTED] t in the renal pyramid to the minor and major c [REDACTED] llected in the renal pelvis.
- Ureter transports urine from [REDACTED] the urinary bladder.
- Urinary bladder is a muscular [REDACTED] serves as the temporary storage of urine.
- Urethra is the final passageway o [REDACTED] outside.
- Micturition is initiated when a s [REDACTED] s initiated by stretch receptor attached to t [REDACTED] muscle of the bladder.

STEM CONNECT

Dialysis: Mechanical Kidneys at Work



The kidney is an important organ in the human body, not only for urine production but also for cardiac functions by maintaining the volume and composition of the blood. A sick

kidney will have a devastating effect on the body that could result to death.

Death is [REDACTED] happen to patients with kidney failure during [REDACTED] century. This scene of death was the reason a [REDACTED] cian decided to find a way to filter the blood [REDACTED] of a working kidney. Dr. Willem Kolff started [REDACTED] to remove toxins from the blood. On the course [REDACTED] he read a study made by John Abel of John Hopk [REDACTED] hemodialysis in animals which inspired him to [REDACTED] the invention of the "artificial kidneys".

Unfortunately [REDACTED] of his dialyzer faced a big challenge when [REDACTED] erupted and the Nazi took over Netherlands. Dr. [REDACTED] and sent to work at another hospital in [REDACTED] the country. But despite his relocation, Dr. [REDACTED] resourceful and used available materials during [REDACTED] such as washing machine, sausage skin, and orange [REDACTED] and invented the first dialyzer. This was done [REDACTED] of the Nazi.

In 1943, he used his dialyzer to 16 patients with no success. But in 1945, a 67-year-old patient was revived after one hour of dialysis and lived further for 7 more years.

Dr. Kolff's invention was considered as the first drum dialyzer. Though acceptance of this invention and its role as

kidney replacement is slow, eventually the technology was accepted and used widely in all parts of the globe. Thus, Dr. Willem Kolff is known as the "Father of Dialysis."

How Does Dialysis Work?

There are two different kinds of dialysis and peritoneal dialysis.

Hemodialysis is the more common. It uses the artificial kidney called hemodialyzer. A doctor will create an access to a relatively large artery in the body where a stent could be attached for every time the patient must go into dialysis. One end of the dialyzer allows blood to flow out of the body and the other end allows filtration of waste and the other access point allows the filtered blood to the body. This must be done 5 hours depending on the size of the patient weight and depends on the status of the blood.

The other type is the peritoneal dialysis. It involves implanting a catheter into the peritoneum. During dialysis a fluid called dialysate is allowed to flow into the abdomen to draw and drain waste out of the abdomen. The dialysate will be deposited into a drainage bag for disposal.

This invention has made a tremendous difference in patient care. The machine might have saved billions of lives all over

the globe. But though an option is given to patients with malfunctioning or non-functioning kidneys, it is always better to have healthy and functioning blood filtration system. Dialysis is not for forever.