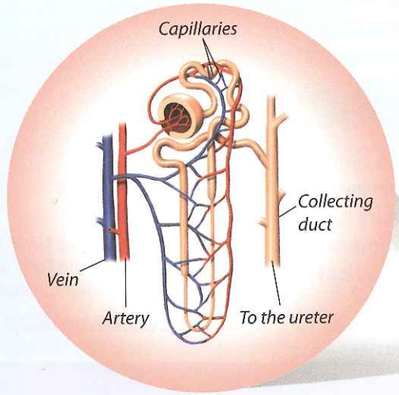
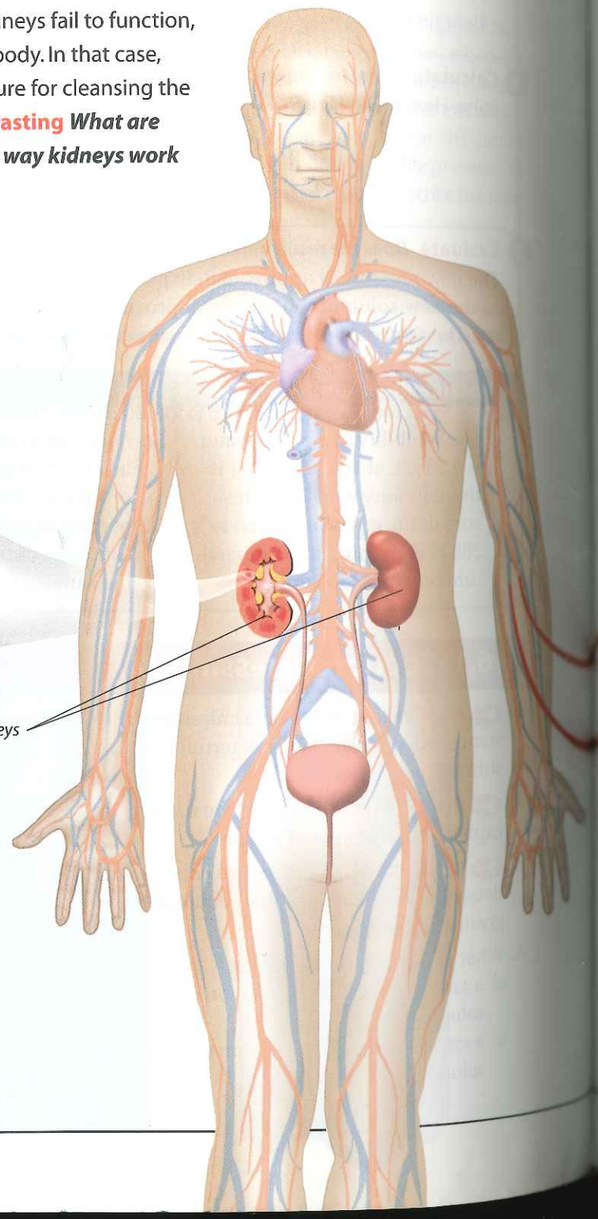
A Solution for Kidney Failure

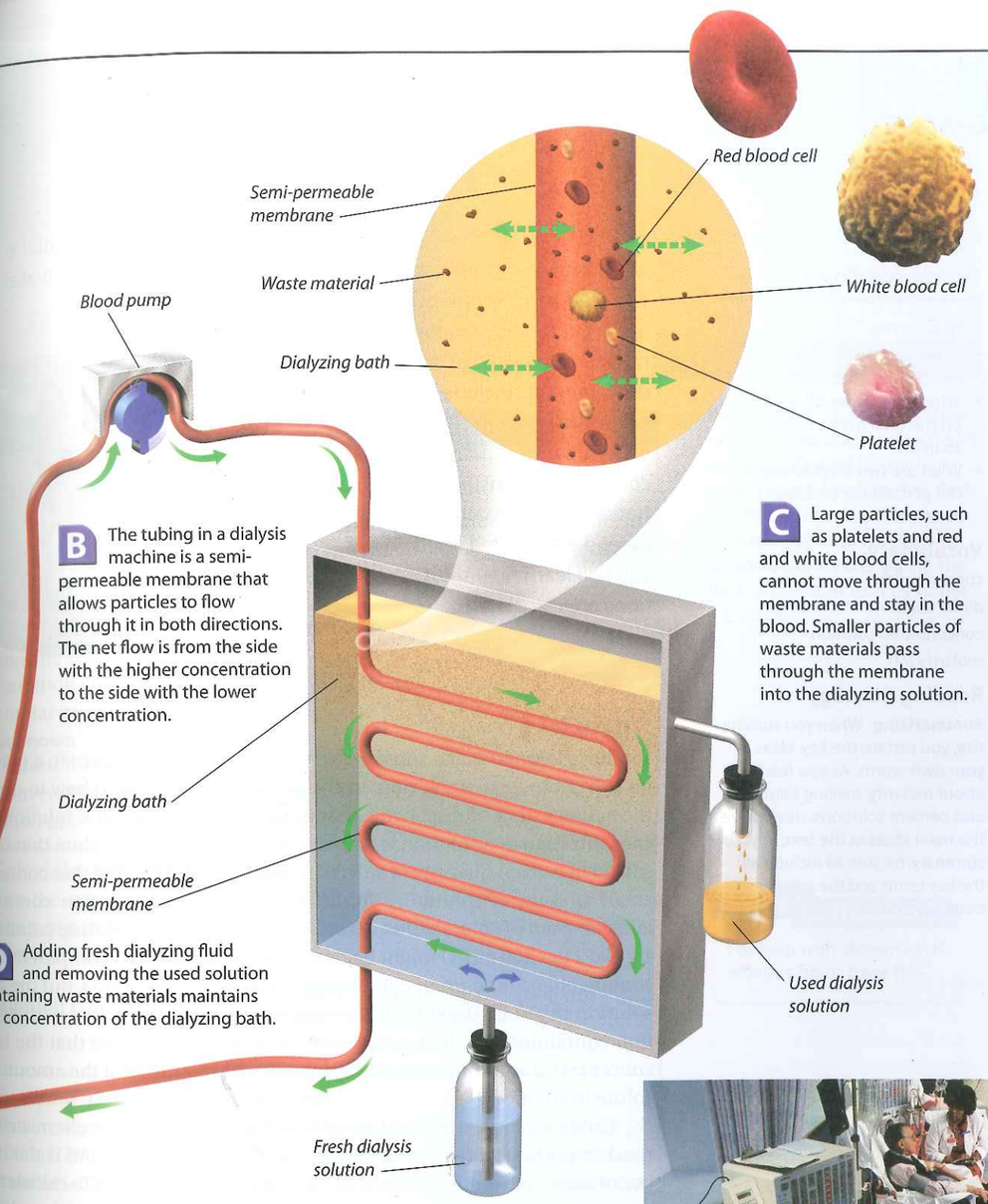
Your blood transports oxygen and other nutrients to cells throughout your body. It also picks up discarded waste materials from cells and carries them to your kidneys. Kidneys have the important job of filtering potentially toxic materials from blood and excreting them in urine. The body's entire blood supply passes through its two kidneys approximately every 45 minutes. Should the kidneys fail to function, life-threatening poisons would build up in the body. In that case, the treatment is usually hemodialysis, a procedure for cleansing the blood outside the body. **Comparing and Contrasting** ***What are some similarities and differences between the way kidneys work and hemodialysis?***



Nephrons Millions of tiny processing units called nephrons filter blood through a network of capillaries. The collecting duct carries toxic materials such as urea to the ureter for excretion.



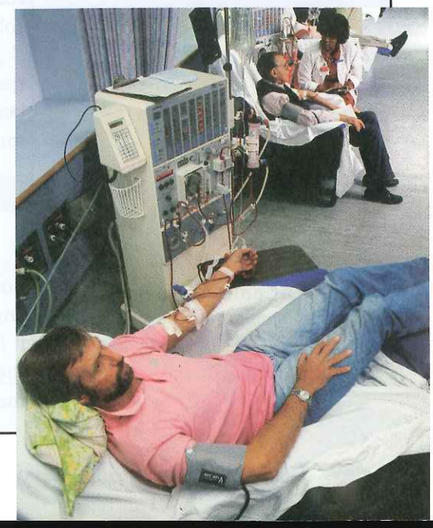
A A tube connects a patient to a dialysis machine. The machine pumps blood from a vein, circulates it through a dialyzing bath, and returns it to another vein.



B The tubing in a dialysis machine is a semi-permeable membrane that allows particles to flow through it in both directions. The net flow is from the side with the higher concentration to the side with the lower concentration.

C Large particles, such as platelets and red and white blood cells, cannot move through the membrane and stay in the blood. Smaller particles of waste materials pass through the membrane into the dialyzing solution.

D Adding fresh dialyzing fluid and removing the used solution containing waste materials maintains the concentration of the dialyzing bath.



Hemodialysis takes several hours and must happen three times a week. It helps keep people with kidney failure alive and allows them to lead normal lives.