

4. VITA D- absorbs CALCIUM for healthy bones

- **The skin soaks in vita D from sun exposure**
- **15-20 min or 30 min for darker complexions to synthesize vita D**
- **Kidneys metabolize vita D into CALCITROL**

Difference between Ureter vs Urethra- Miss Thoni,p3

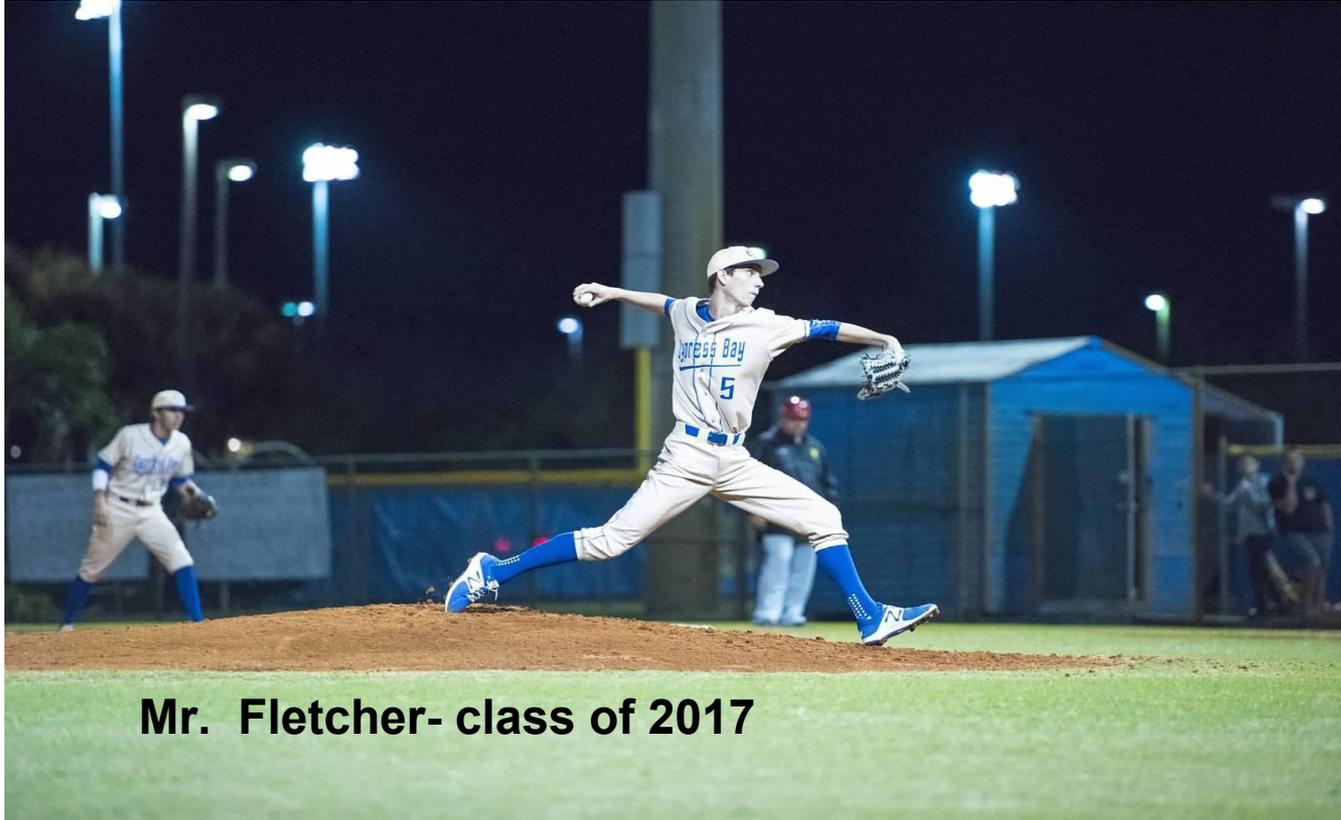
Aretha (Urethra) Franklin

Performed AT LAST, 1960



Originally performed by Etta James

Anatomy of Urinary System- pg. 961, fig. 25.1



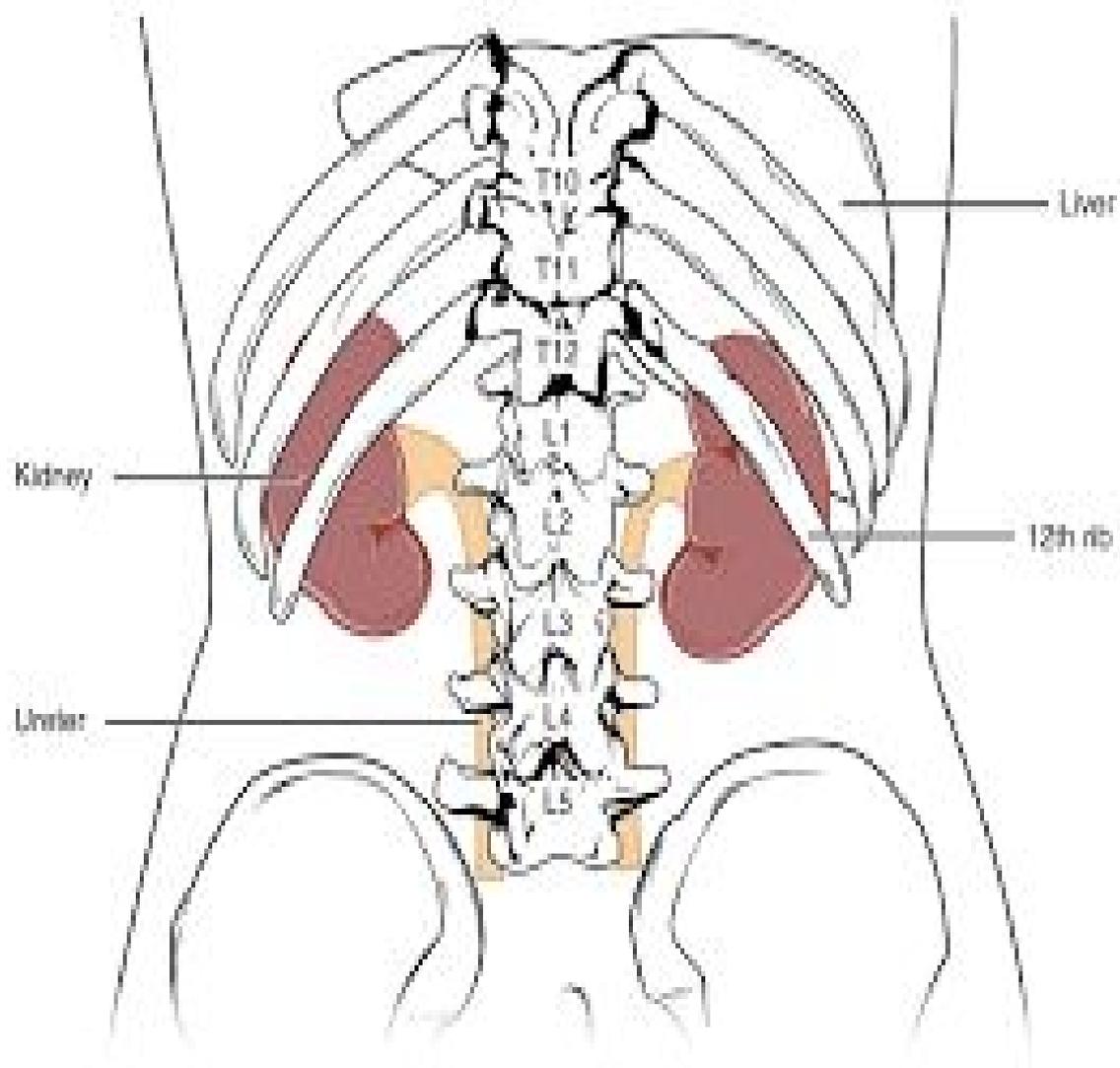
Mr. Fletcher- class of 2017

**Urethra-
ending sounds
like throw,
what pitchers
do.**

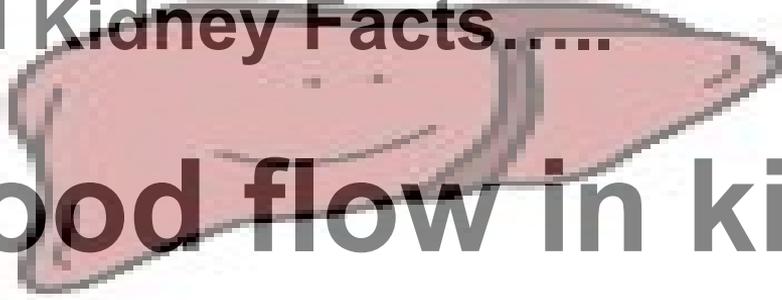
**First period:
Mr. Ruibal**

POSITION OF THE KIDNEYS

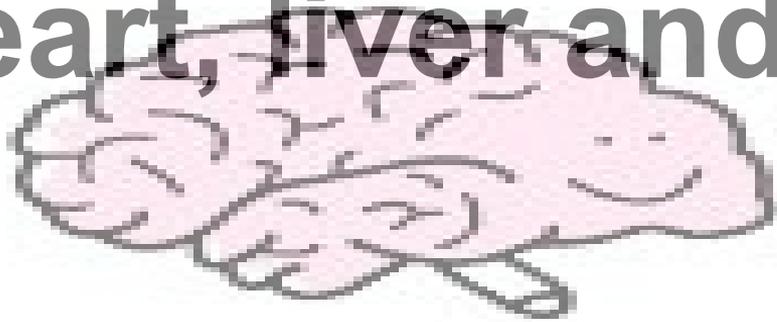
- Superior Lumbar Position
T12 - L3
- Protected by the lower rib cage
- RIGHT kidney is slightly lower than the left
- Adrenal Glands sit on top



Cool Kidney Facts.....



Blood flow in kidneys is higher than blood flow in the heart, liver and brain



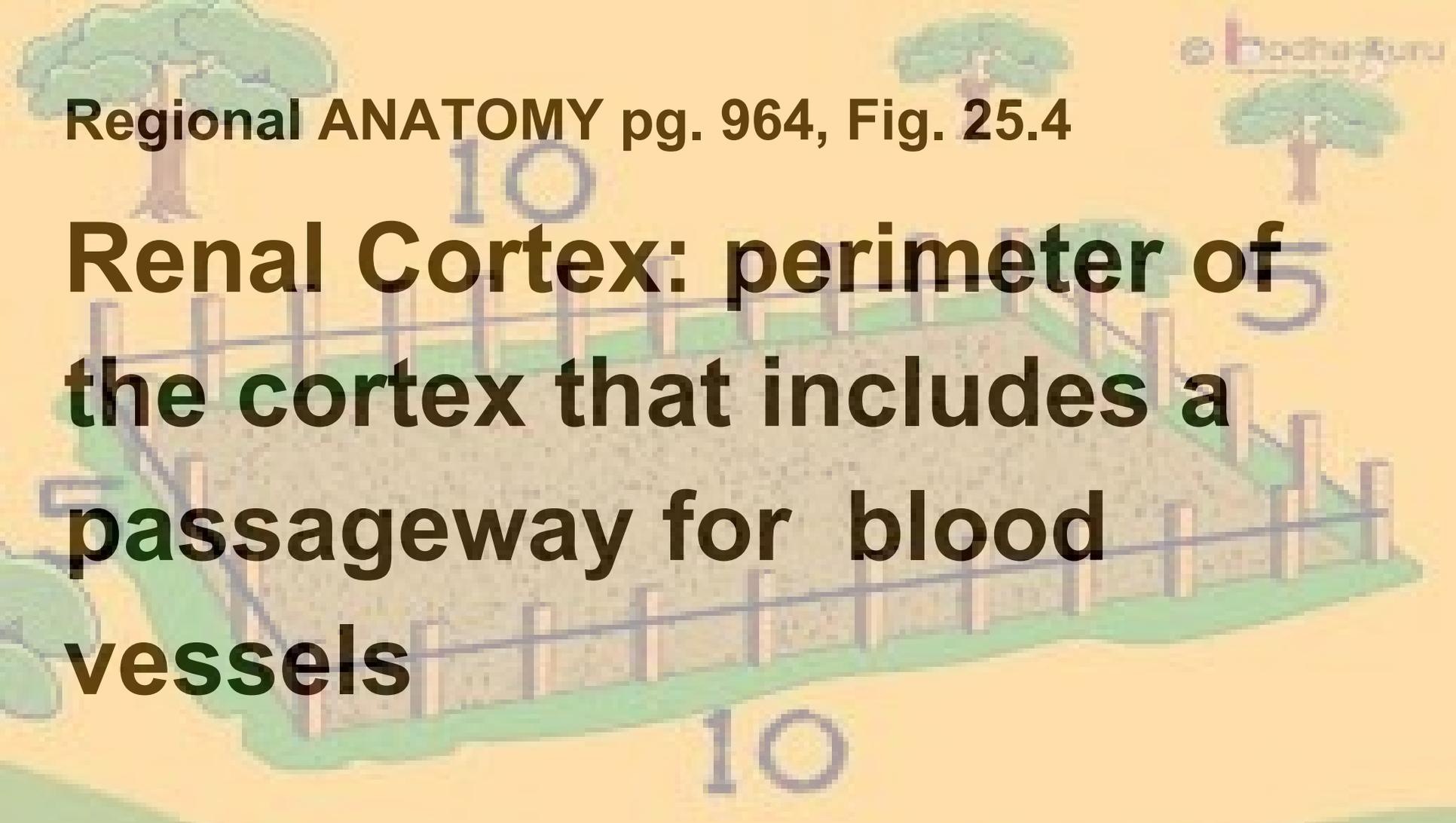
INTERNAL ANATOMY pg. 963, Fig. 25.3

Superficial- FIBROUS CAPSULE

(a supportive tissue that protects against infections to enter)

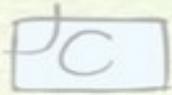
Regional ANATOMY pg. 964, Fig. 25.4

Renal Cortex: perimeter of the cortex that includes a passageway for blood vessels



Regional ANATOMY pg. 963, Fig. 25.3

Renal Medulla/Pyramids: centrally located triangular structures surrounded by major blood vessels; apex is inward



Janice Christa

Regional ANATOMY pg. 963, Fig. 25.3

Renal Pelvis: canals made up of major and minor calyces (singular= calyx) that lead out to the ureter



Blood Vessels by region of the Kidney, pg. 964, fig.

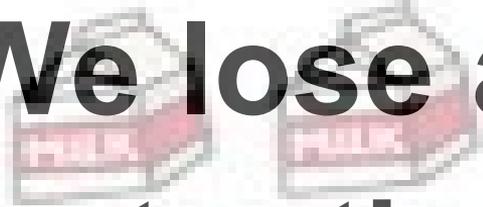
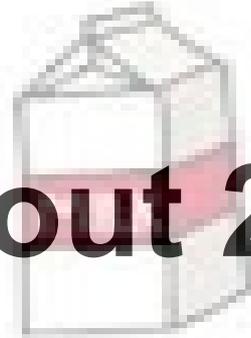
25.4

Cortical Radiate vessels are in the renal cortex & are perpendicular to the **Arcuate vessels** which run parallel to the renal pyramids

Cool Kidney Fact:

**We lose about 2 quarts of
water through urine,
reserving 198 quarts every
24 hours**

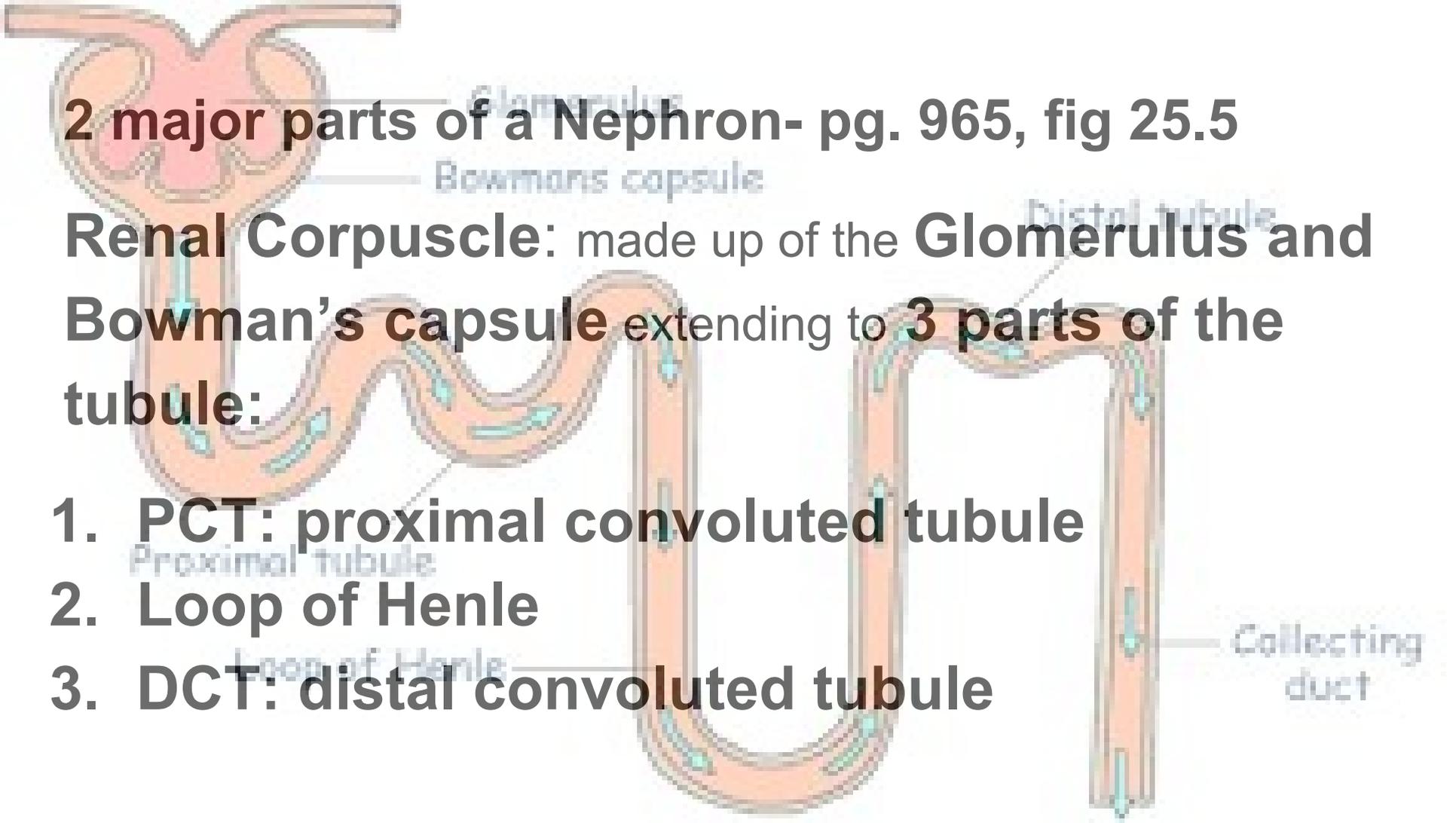
4 quarts = 1 gallon



RENAL TISSUE- pg.965, fig.25.5

- **NEPHRON: subunit that make up the kidney**
- **> million nephrons per kidney**
- **2 types of nephrons:**
 - **Cortical**
 - **Juxtamedullary**



A diagram of a nephron, the functional unit of the kidney. It shows the renal corpuscle at the top, consisting of a glomerulus (a cluster of capillaries) surrounded by Bowman's capsule. From the capsule, the tubule system begins with the proximal convoluted tubule (PCT), which is highly convoluted. This leads to the Loop of Henle, a U-shaped structure that descends and then ascends. Following the Loop of Henle is the distal convoluted tubule (DCT), which is also convoluted. Finally, the tubule empties into a collecting duct. Labels with leader lines identify the Glomerulus, Bowman's capsule, Proximal tubule, Loop of Henle, Distal tubule, and Collecting duct. Arrows indicate the direction of fluid flow through the tubule system.

2 major parts of a Nephron- pg. 965, fig 25.5

Renal Corpuscle: made up of the **Glomerulus** and **Bowman's capsule** extending to **3 parts of the tubule:**

- 1. PCT: proximal convoluted tubule**
- 2. Loop of Henle**
- 3. DCT: distal convoluted tubule**

Cortical vs. Juxtamedullary Nephrons

Nephron	Region	Fact	Length of loop of Henle
Cortical	Cortex	makes up 85% of kidney	Short
Juxtamedullary	Medulla	Produces concentrated urine	Long

URETERS, pg. 985

- **Connecting kidney to bladder**
- **Muscular tubes use peristalsis**
- **Bladder pressure prevents backflow**

URINARY BLADDER, pg. 986

- **Smooth collapsible muscular sac**
- **MALES: prostate is inferior to bladder**
- **FEMALES: bladder is anterior to vagina/uterus**
- **When empty, it converts to a pyramidal shape**

URETHRA, pg. 987

- **Thin walled muscular tube extends from bladder to exit the body**
- **Internal urethra sphincter is voluntarily controlled**
- **Females: 3-4 cm (1.5 in)**
- **Males: 20 cm (8 in)- excrete semen & urine**

A man in a suit is shown from the waist up, with his hands on his hips. He has a very large, prominent belly, which is used as a visual metaphor for the text. The background is a blurred office setting.

Cool Kidney Fact:

**children born with one
kidney grows to the
equivalent of two**

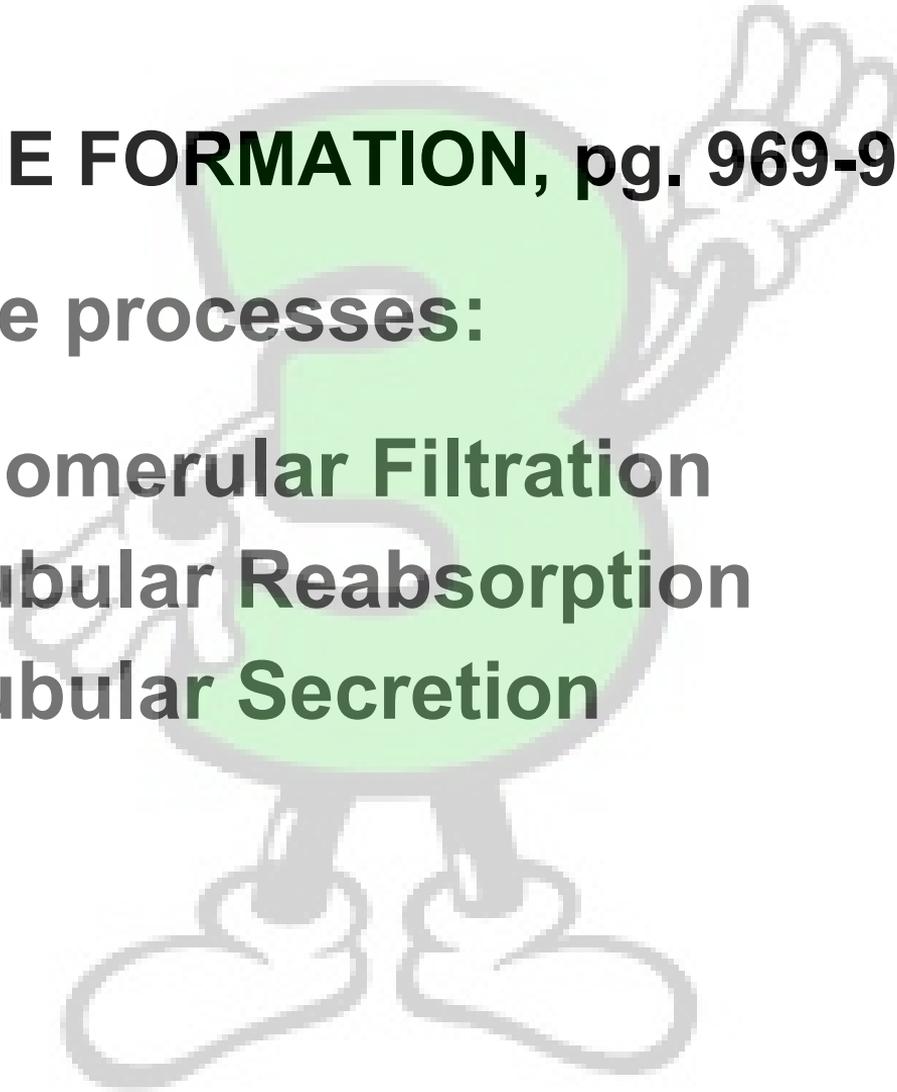
Renal Blood Flow

1. Renal artery → 2. Interlobar arteries → 3. Arcuate arteries →
4. Interlobular arteries → 5. Afferent arterioles → 6. Glomerular
capillaries → 7. Efferent arterioles → 8. Peritubular
capillaries/vasa recta → 9. Interlobular veins → 10. Arcuate veins
→ 11. Interlobar veins → 12. Renal vein

URINE FORMATION, pg. 969-978

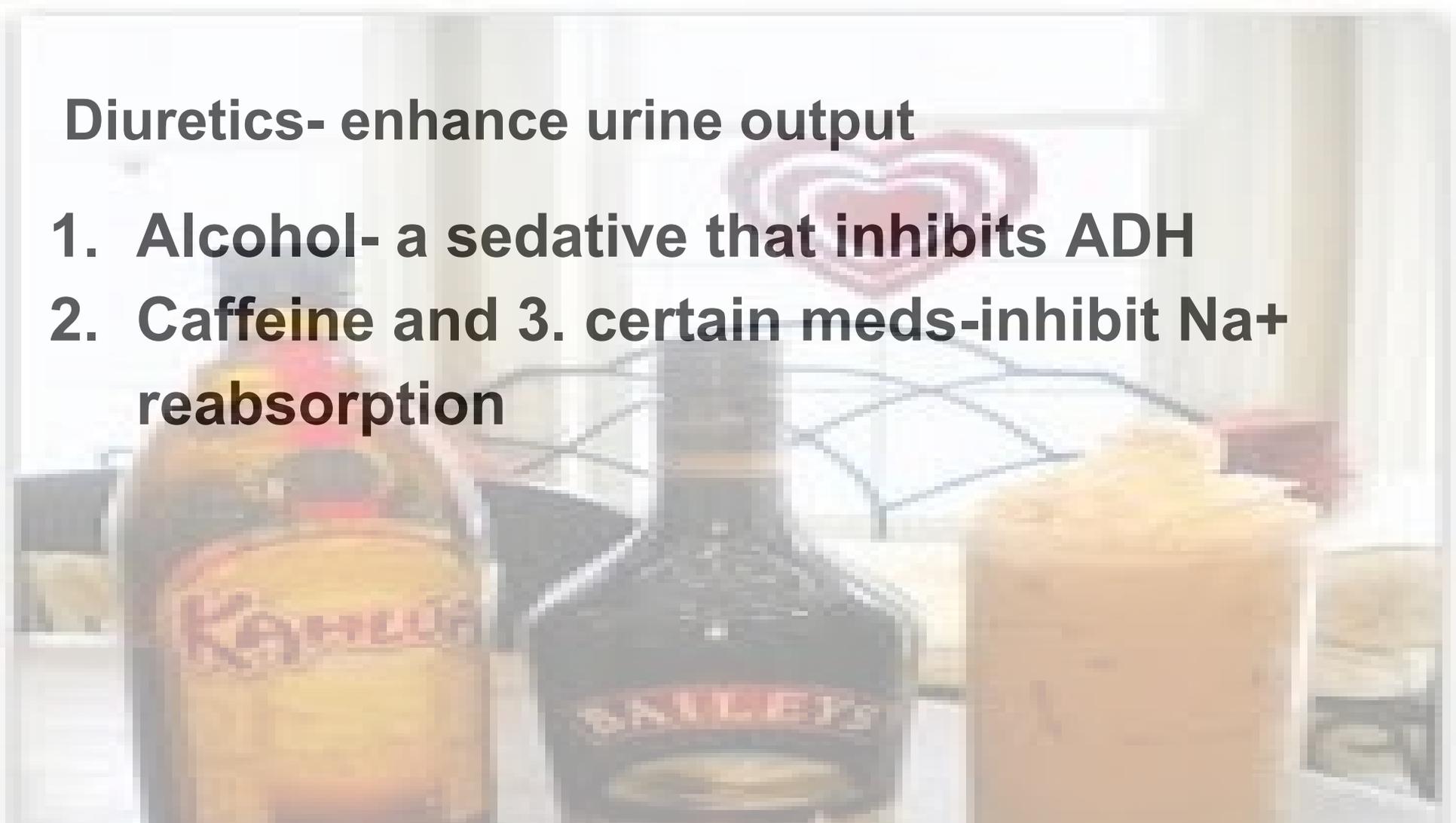
Three processes:

- 1. Glomerular Filtration**
- 2. Tubular Reabsorption**
- 3. Tubular Secretion**



Diuretics- enhance urine output

- 1. Alcohol- a sedative that inhibits ADH**
- 2. Caffeine and 3. certain meds-inhibit Na⁺ reabsorption**



Urine- Color, Odor, and pH

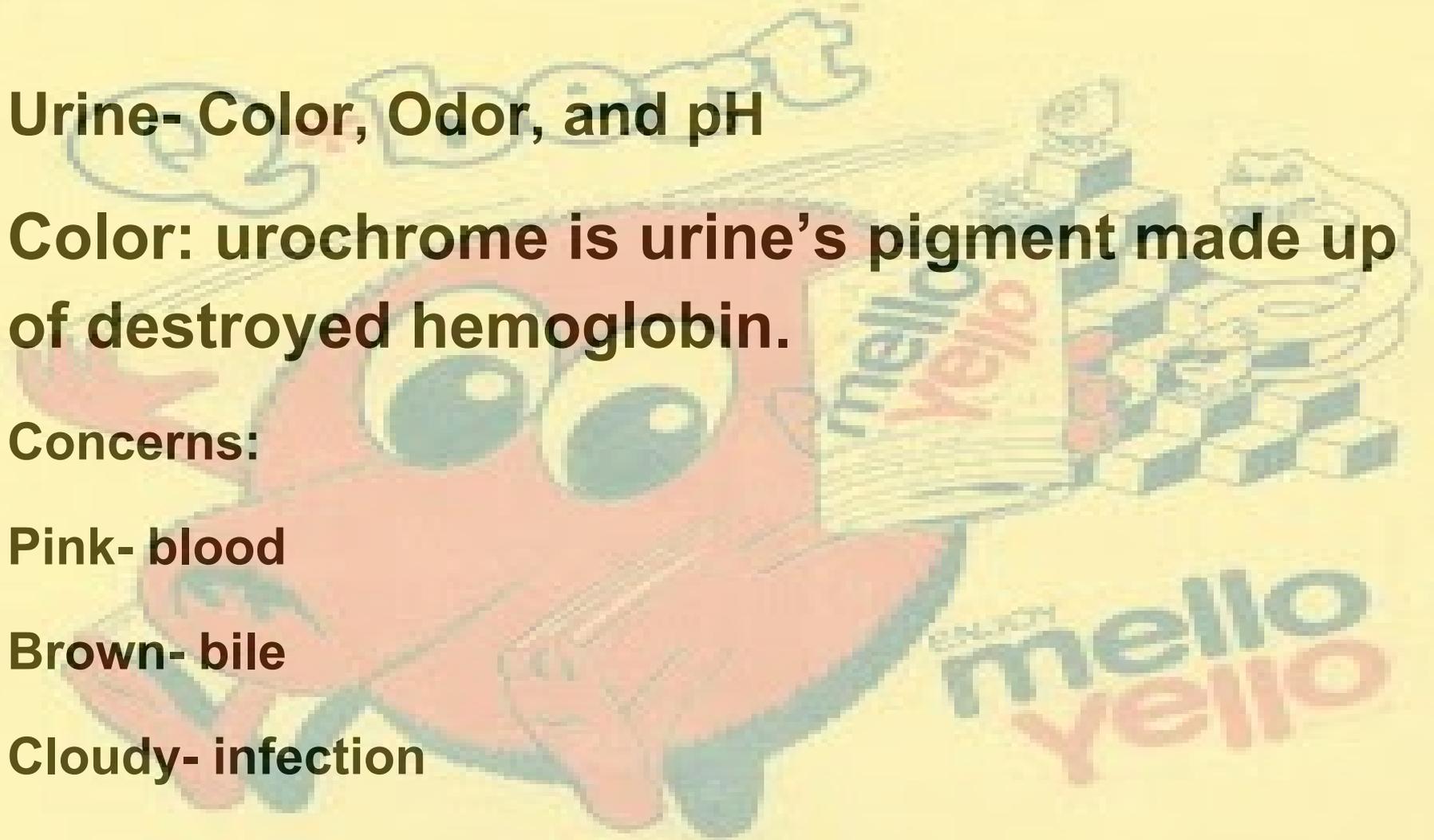
Color: urochrome is urine's pigment made up of destroyed hemoglobin.

Concerns:

Pink- blood

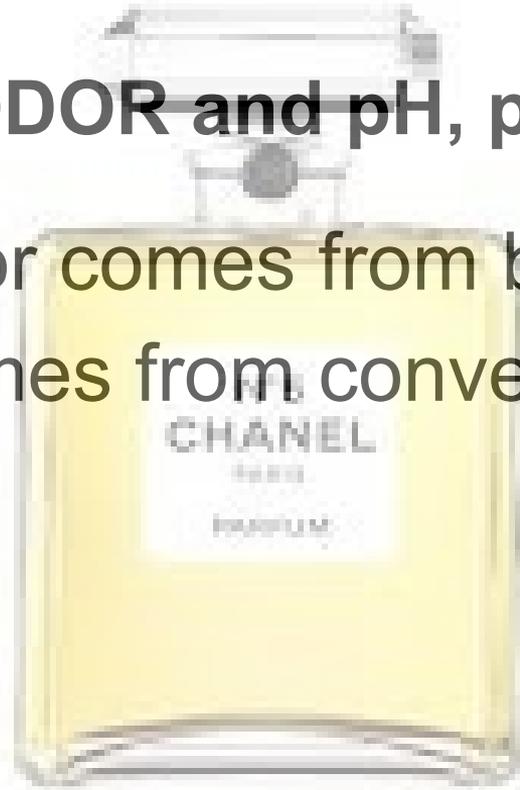
Brown- bile

Cloudy- infection



Urine- color, ODOR and pH, pg. 985

*Ammonia odor comes from bacteria metabolizes urea (urea comes from converting nitrogen)



Urine- color, odor and pH, pg. 985

pH Chart

Slightly acidic

pH: 6

Varies between 4.5-8



ACIDIC

ALKALINE



Medical Term**Causes**

Pg. 962

Hydronephrosis

Water in kidneys that leads to necrosis

Pg. 986

Renal Calculi

Kidney stones are formed from crystallized calcium, magnesium, uric acid salts. Large stones can block urine drainage
Frequent uti's, urine retention, high blood levels of calcium

Pg. 988

Incontinence

Unable to retain urine from:

1. Emotional problems
2. Pressure during pregnancy
3. laugh/cough
4. Overfilled bladder

420 KIDNEY STONES from 1 Patient in CHINA



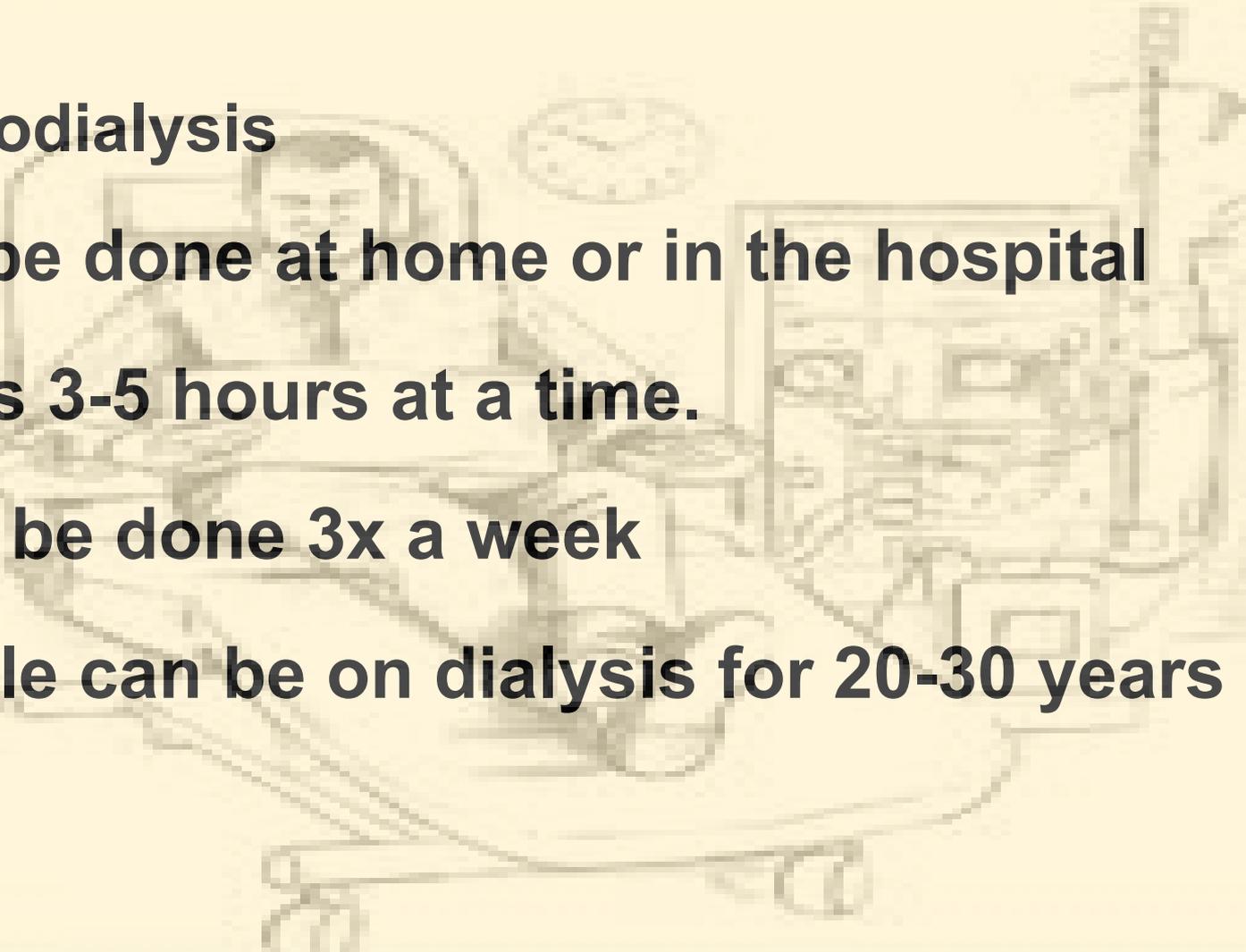
Hemodialysis

Can be done at home or in the hospital

Takes 3-5 hours at a time.

Must be done 3x a week

People can be on dialysis for 20-30 years



Hemodialysis needs an AV fistula

Vascular access

Surgically implanted of a U-shaped tube that attaches an artery to a vein



Funny FACT: What is PARAURESIS?

PEE SHYNESS- inability to urinate in public

