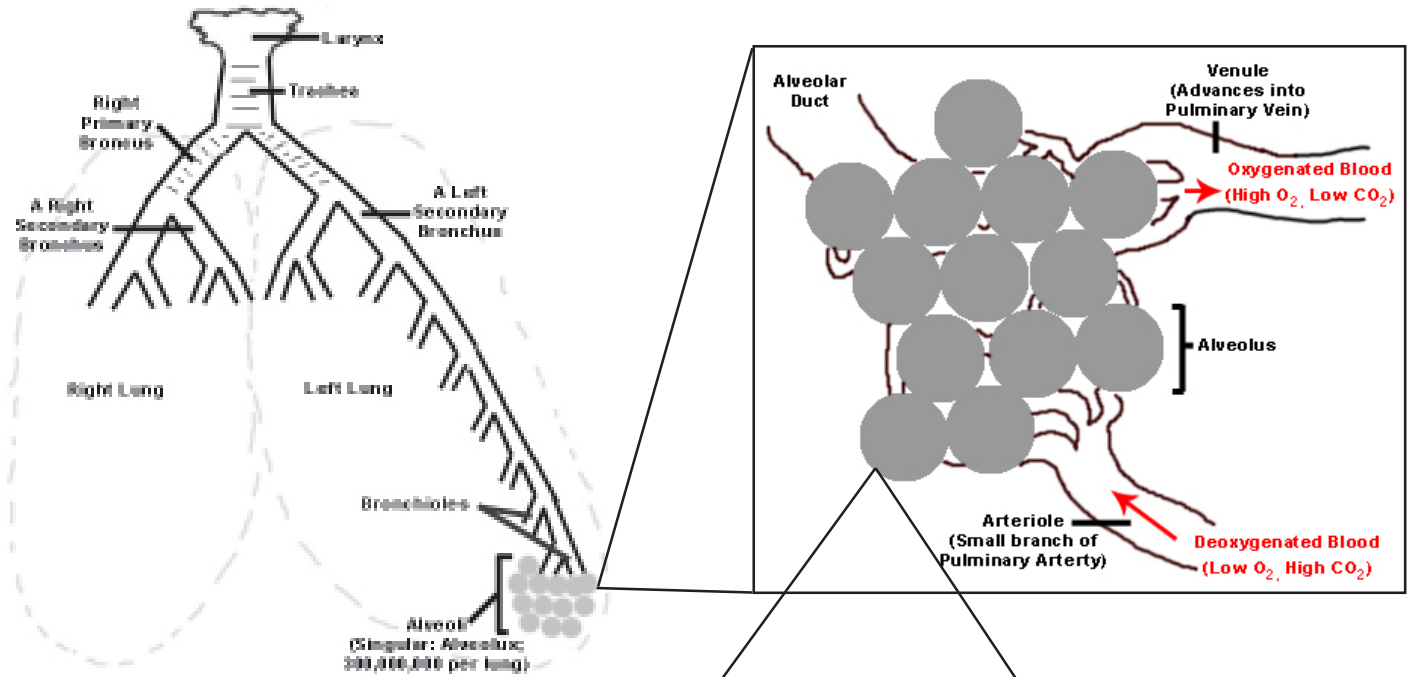


# Respiratory (Ventillation) System



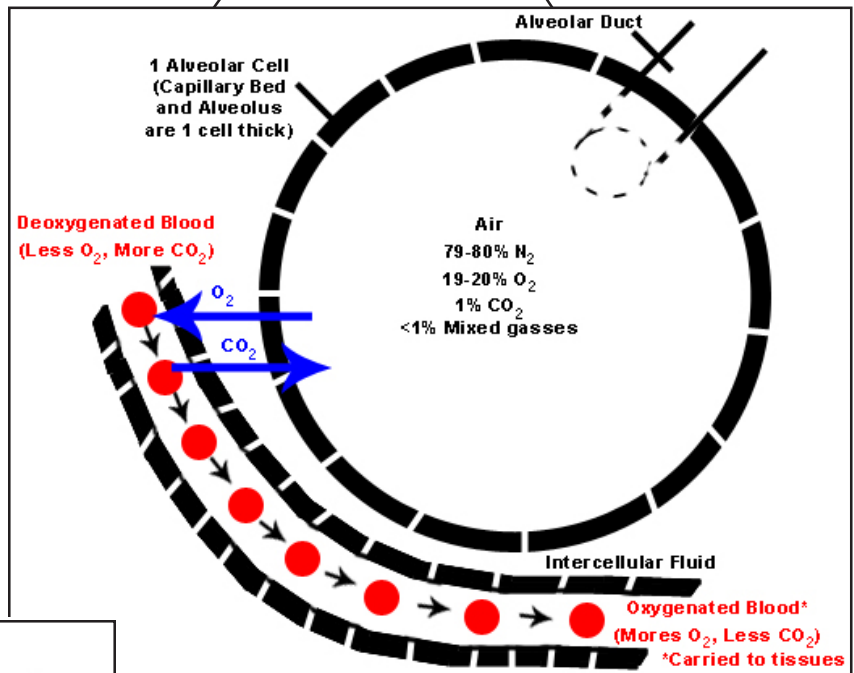
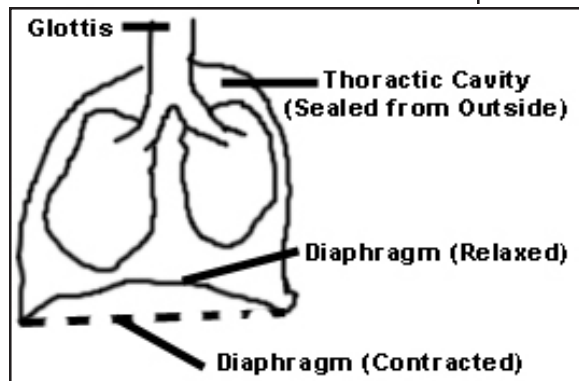
## Medical Problems caused by Smoking:

1. Particular matter and tar gather on the wall of the Alveolus (emphysema)
2. Carcinogens (cancer-causing chemicals) turn Alveolus cell cancerous

## Spirometers measure lung volumes:

- Residual Volume (air that must remain - approx. 1L)
- Tidal Volume (Air in/out on typical breath)
- Vital Volume (Max air out)
- Total Lung Capacity = Vital + Residual

## Thoracic Cavity:



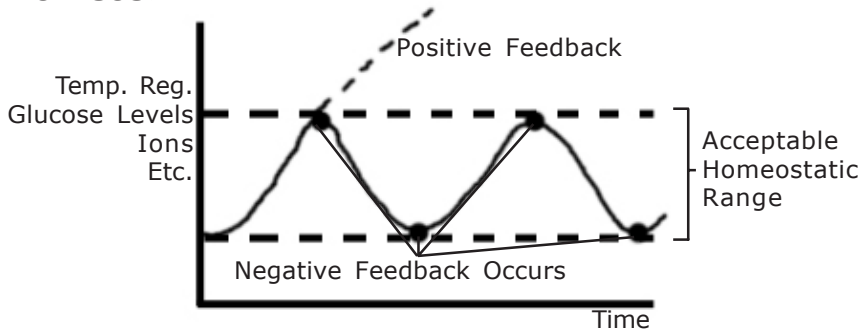
## Inspiration

1. Contract diaphragm/use intercostal muscles that raise ribcage
2. Volume of thoracic cavity increases
3. Pressure in thorax decreases
4. Volume of lungs increases
5. Pressure in lungs decreases
6. Air enters negative partial vacuum

## Expiration

1. Relax diaphragm/use intercostal muscles that lower ribcage
2. Volume of thoracic cavity decreases
3. Pressure in thorax increases
4. Volume of lungs decreases
5. Pressure in lungs increases
6. Air is pushed out of lungs

## Homeostasis



## Positive Feed-back Example:

Oxytocin - Hormone during birth  
 Begin Labor  
 Uterus Contracts  
 (*More Oxytocin*)  
 More Frequent/Harder Contractions  
 (*More Oxytocin*)

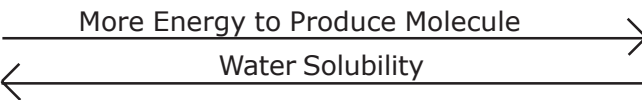
## Kidney Function

### Urine

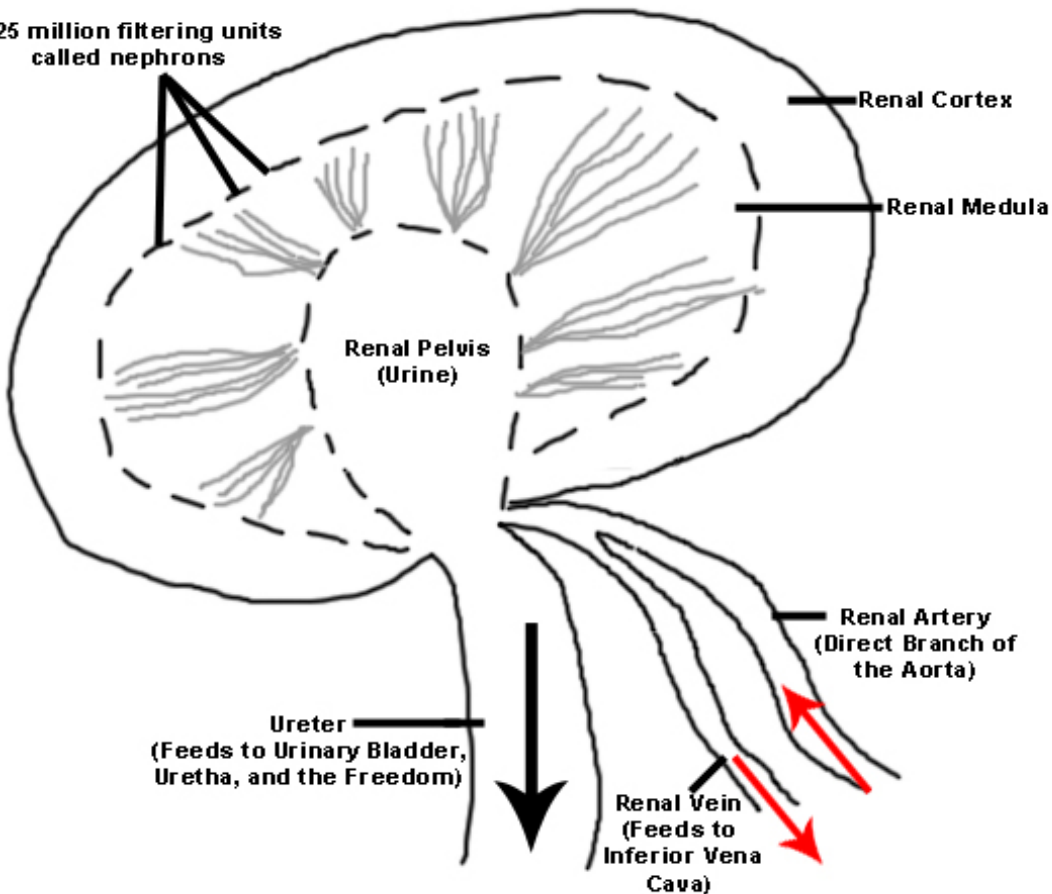
- By volume, majority is water
- Excessive Ions ( $K^+$ ,  $Cl^-$ ,  $Na^+$ )
- Nitrogenous waste urea (most) very little is ammonia and uric acid

### Nitrogenous Wastes

Ammonia	Urea	Uric Acid
$NH_3$	$H_2N-\overset{O}{\parallel}C-NH_2$	Large, complex ring structure (contains multiple nitrogen atoms)
Very Toxic	Mildly Toxic	Nontoxic

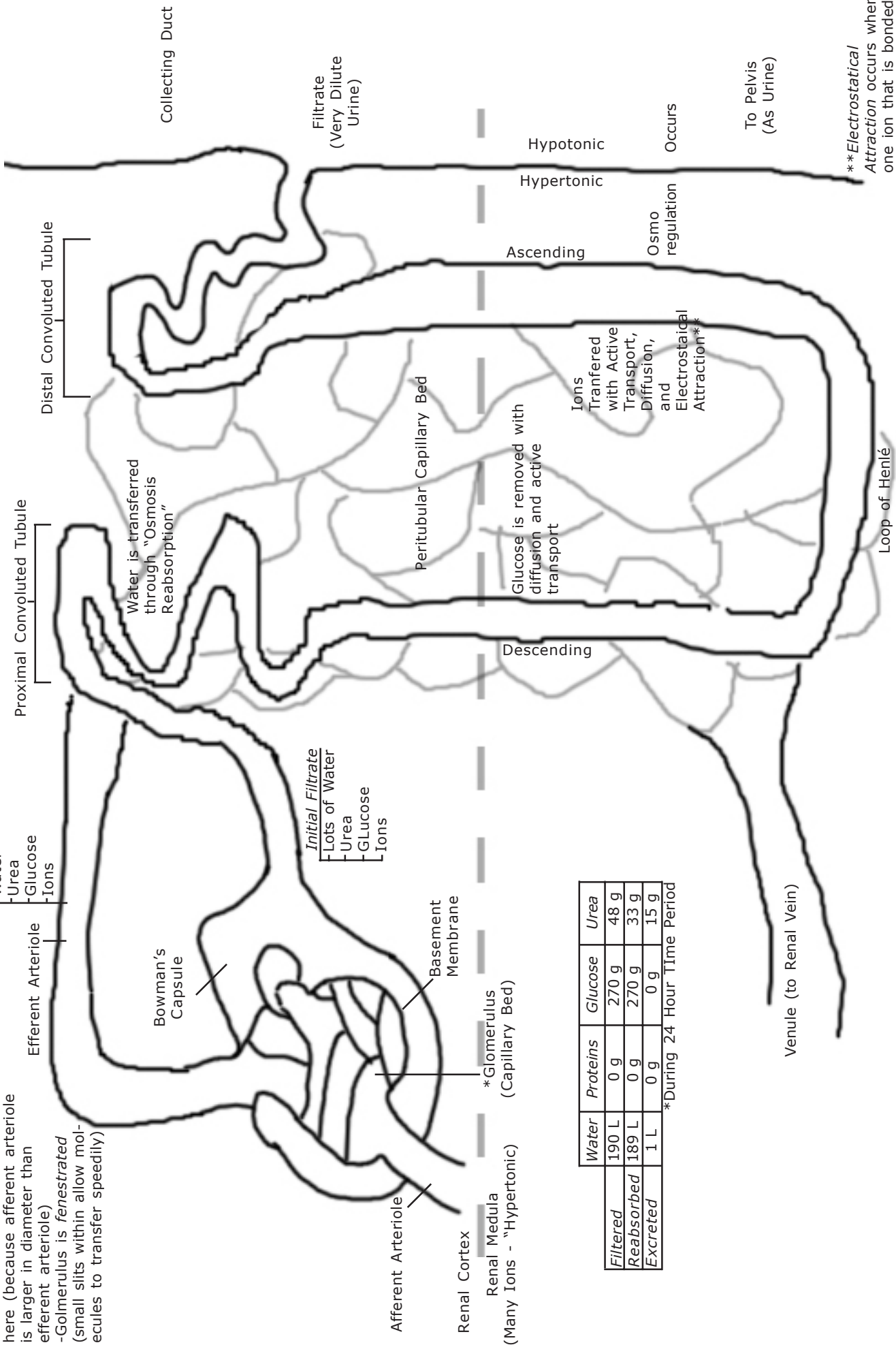


1.25 million filtering units called nephrons



**\*Ultrafiltration occurs here:**  
 -Unusually high blood pressure here (because afferent arteriole is larger in diameter than efferent arteriole)  
 -Glomerulus is fenestrated (small slits within allow molecules to transfer speedily)

- Proteins
- Water
- Urea
- Glucose
- Ions



**Initial Filtrate**  
 -Lots of Water  
 -Urea  
 -Glucose  
 -Ions

Water is transferred through "Osmosis Reabsorption"

Glucose is removed with diffusion and active transport  
 Ions Transferred with Active Transport, Diffusion, and Electrostatic Attraction\*\*

	Water	Proteins	Glucose	Urea
<b>Filtered</b>	190 L	0 g	270 g	48 g
<b>Reabsorbed</b>	189 L	0 g	270 g	33 g
<b>Excreted</b>	1 L	0 g	0 g	15 g

\*During 24 Hour Time Period

\*\*Electrostatic Attraction occurs when one ion that is bonded to another is transferred through Active Transport