



# Body water

moles, osmoles and movement

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Gravity Inertia

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**Diffusion**      **Osmosis**

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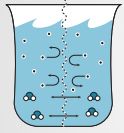
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## Osmosis



equilibrium



addition of solute



new equilibrium

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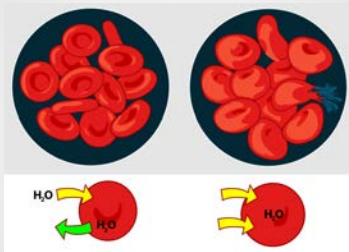
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Isotonic

Hypotonic

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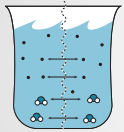
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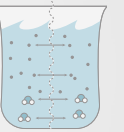
## Diffusion



equilibrium



addition of solute



new equilibrium

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## Diffusion Osmosis

movement of **solute**  
from high concentration  
to low concentration

membranes must be  
**permeable** to the  
solute

movement of **water** from  
low solute concentration  
to high concentration

membranes must be  
**impermeable** to the  
solute

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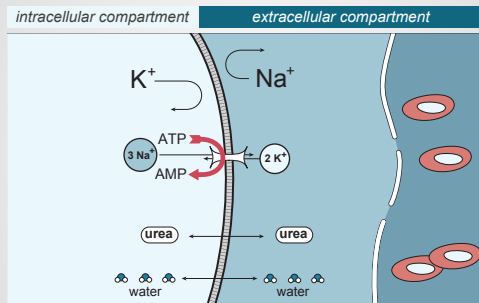
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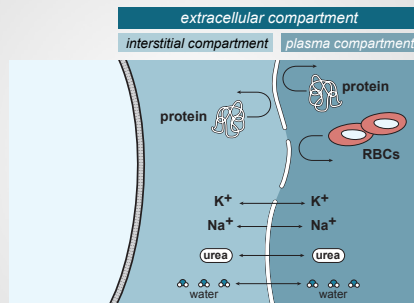
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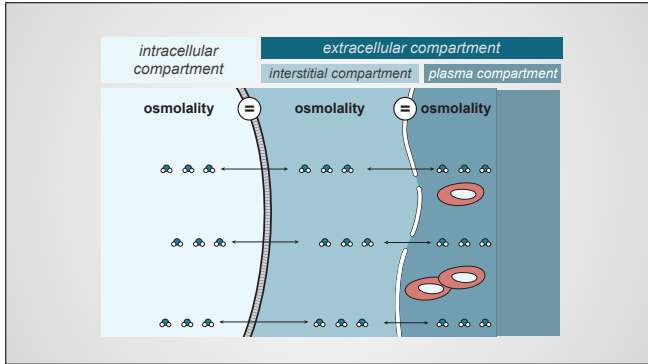
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CSF has the same osmolality as plasma

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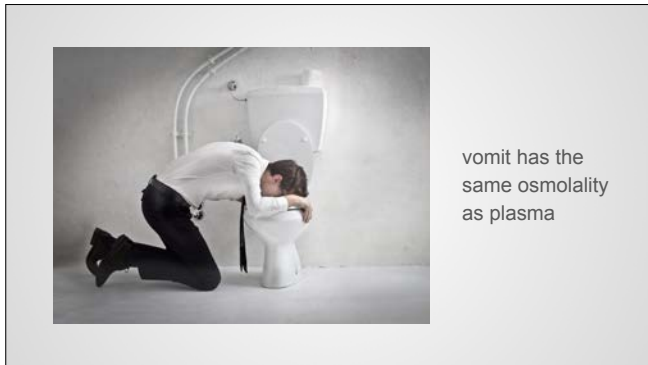
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vomit has the same osmolality as plasma

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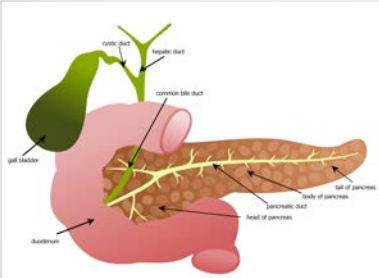
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gallbladder fluid  
is the same  
osmolality as  
plasma

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the osmolality  
in the foot is  
the same as...

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the osmolality  
in the brain

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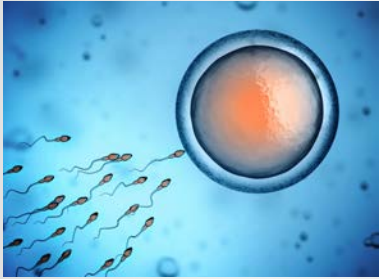
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...but not semen.  
it is hypertonic.

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The exception is  
the kidney and  
GU tract.

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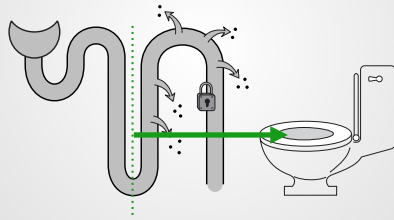
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From the tip of the loop of Henle to the toilet bowl the GU  
epithelial is impermeable to water (unless unlocked by ADH).



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There are two implications of the entire body being divided by water permeable membranes:

- ➔ the osmolality of the body is the same through out the body
- ➔ the size of the various compartments is determined by the number of osmoles in the compartment

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