

## Renal/Urinary Equations

### Week 1

### Body Fluids/Mechanisms of Urine Concentration & Dilution

Free water clearance

$$\dot{V} = C_{\text{osm}} + C_{\text{H}_2\text{O}}$$

$$C_{\text{osm}} = \frac{U_{\text{osm}} \times \dot{V}}{P_{\text{osm}}}$$

Symbol	Meaning	Units	Description
V	Urine flow rate	mL/min	The total volume of urine produced per unit time.
C <sub>H<sub>2</sub>O</sub>	Free water clearance	mL/min	The volume of plasma cleared of solute-free water (pure H <sub>2</sub> O) per unit time.
C <sub>osm</sub>	Osmolar clearance	mL/min	The volume of plasma cleared of all solutes per unit time.
U <sub>osm</sub>	Urine osmolality	mOsm/L	Total solute concentration in urine
P <sub>osm</sub>	Plasma osmolality	mOsm/L	Total solute concentration in plasma