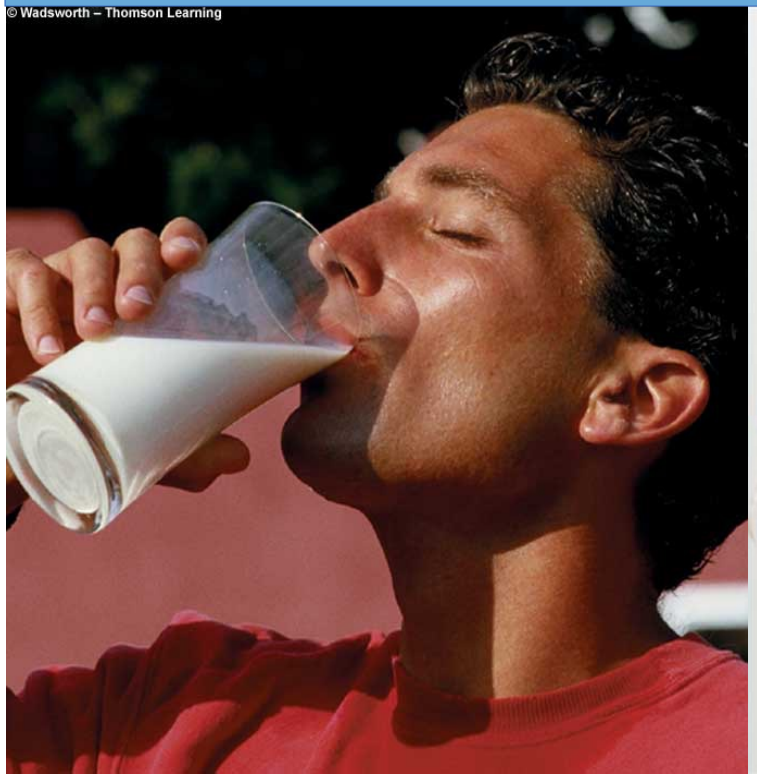
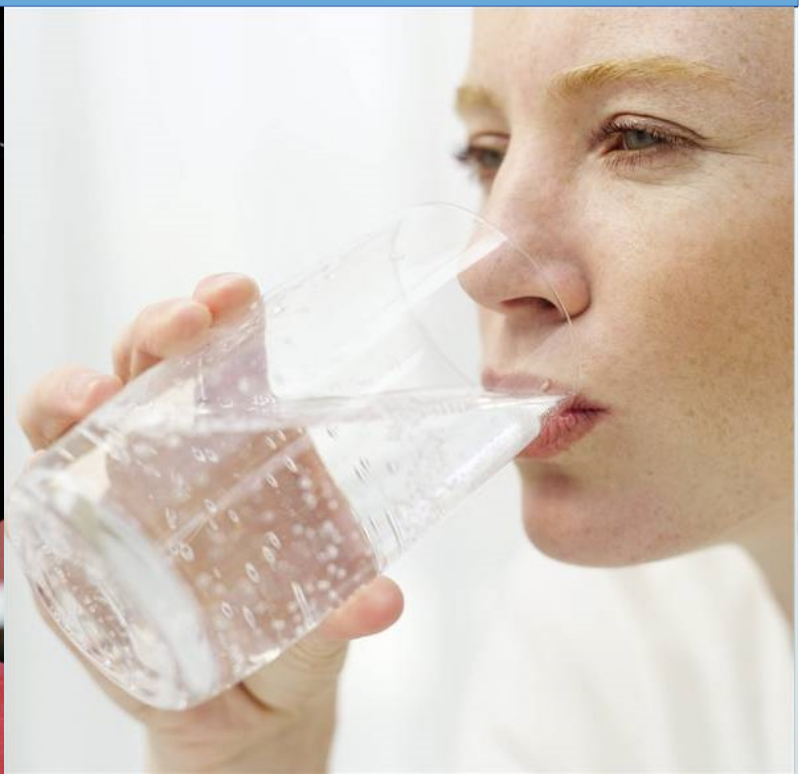
Nutrients Involved in Fluid and Electrolyte Balance





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Learning Objectives

- List the functions of water in our bodies
- Identify the risks under and over consumption of water and sodium and identify population most at risk for dehydration
- Understand when sports drinks are beneficial and the risks of excessive caffeine consumption and know the limits of safe caffeine consumption.
- Identify dietary sources of sodium, especially major sources

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Learning Objectives

- Describe the functions of electrolytes in our bodies
- Know the recommended intake (AI) and CDRR (chronic disease risk reduction intake) for sodium
- State the benefits of sufficient potassium consumption and know the recommended intake
- Identify food sources of potassium and know the daily recommended intake
- Identify the characteristics of the DASH Diet

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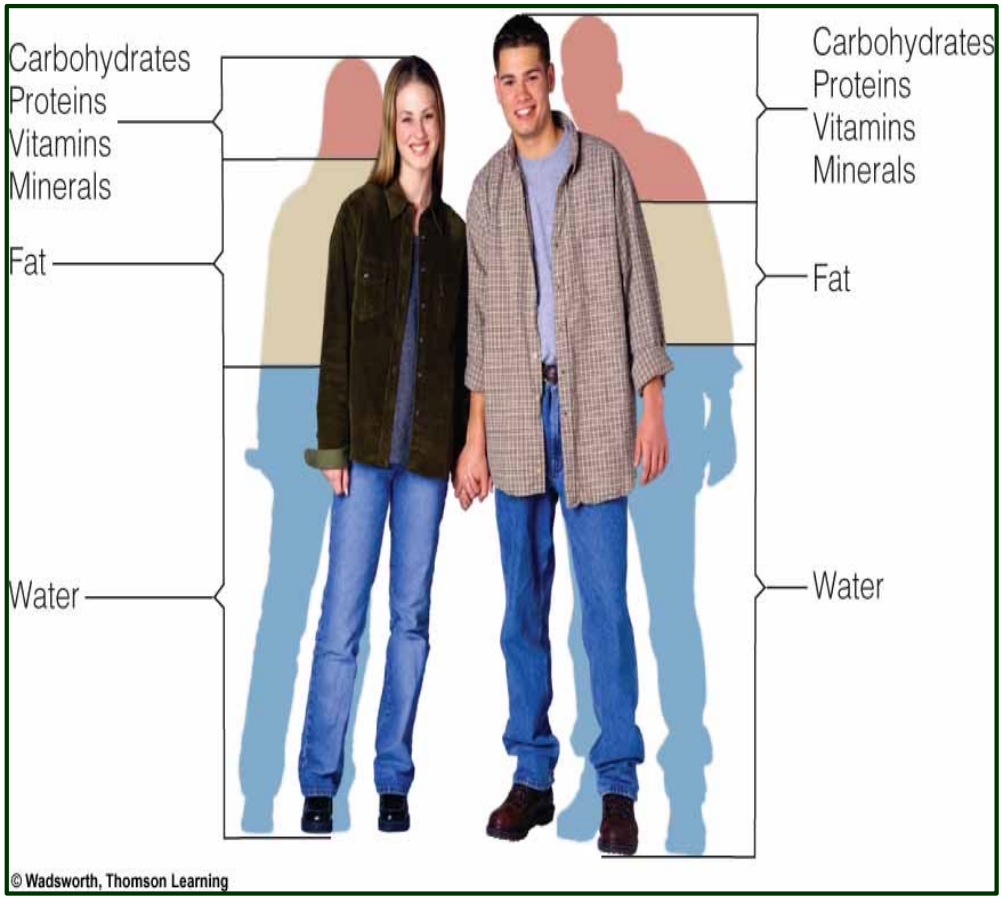
Body is approximately 60% water



- Transportation
- Blood volume
- Body temperature
- Protects and lubricates
- Body organs and tissues

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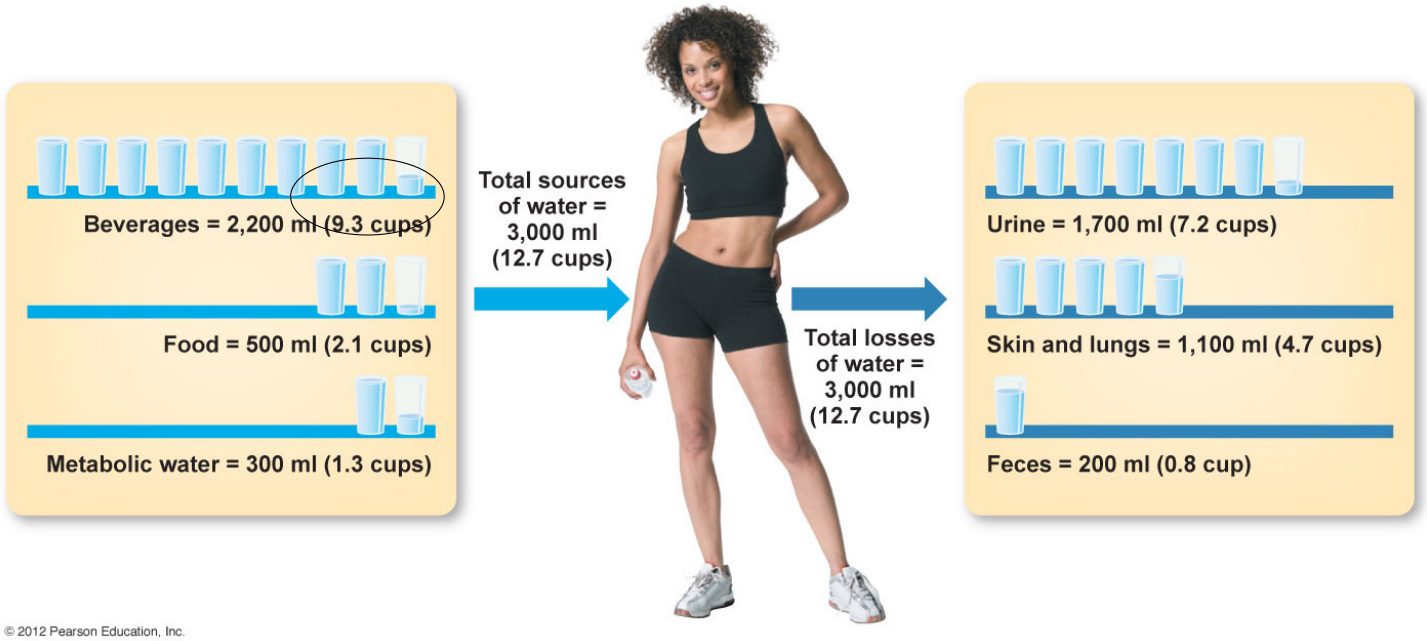
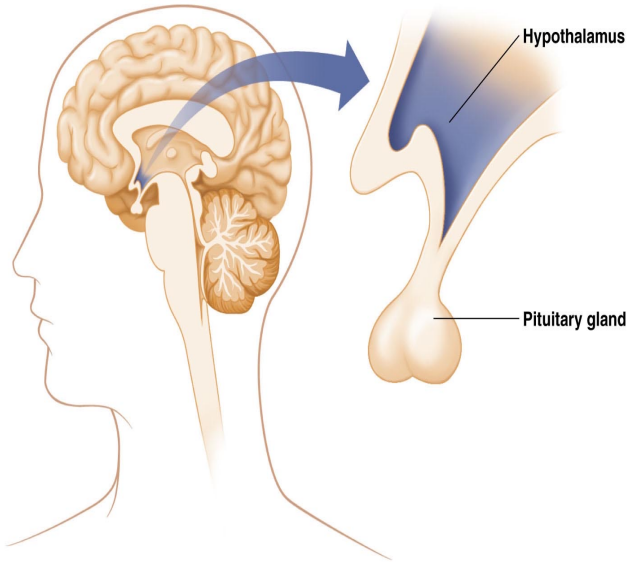
Amount and sources of water intake and output for a woman expending 2,500 kcal/day



According to common wisdom:
Average person needs to consume approximately 9 cups of fluid per day

Fluid Requirements

- Thirst Mechanism: Hypothalamus (command center of brain) → feel thirsty
  - Increased blood salt /substances concentration
  - Reduced blood volume/pressure
  - Dryness in mouth/throat



Risk of Over / Under Consumption of Water

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- Too much – rare
  - Dilution of sodium (hyponatremia)
  - Athletes who replace all fluid with water (in hot weather)
  - Dizziness, fatigue, nausea, death

- Too little
  - Dehydration
  - Vulnerable populations
    - Elderly
    - Infants
    - Sick (vomiting, diarrhea)
  - Extra care needed when
    - Exercising
    - Hot temperatures
    - Pregnancy and breastfeeding
    - Consuming alcohol

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Water vs. Electrolyte Drinks

Rule of thumb: less than an hour use water, more than an hour use Gatorade type drink

Endurance athletes

- Training 6 – 8 hours per day

Recreational athletes

- During exercise or physical work in high heat and /or high humidity
- Recently experienced diarrhea or vomiting
- Exercising in high altitudes or cold environments
- At a tournament (long duration)

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Caffeine – Does it improve athletic performance?

Drink		Caffeine Content
Coffee (drip)	10 ounces	130 – 240 mg
Tea	10 ounces	50 – 130 mg
5 hour energy	2 ounces	138 – 207 mg
Coca cola	10 ounces	45 mg
Mountain Dew	10 ounces	55 mg
Red Bull	10 ounces	100 mg
Monster	10 ounces	100 mg
Rock Star	10 ounces	100 mg

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Safe level of intake 300 – 500 mg / day caffeine

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Caffeine – Does it improve athletic performance?

Caffeine

- Cause the release of fatty acids into the blood – increase fat use for energy during exercise (so does adrenaline)
  - Related to lack of fatigue
- Diuretic effect
- Pre-competition – already have adrenaline – caffeine may put you over the edge

Safe level of intake 300 – 500 mg / day caffeine

Energy Drinks

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Drink	Kcal (8 ounces)	Carbohydrate	Active ingredients
Red Bull	109	27g	Caffeine, taurine, inositol, vitamins
Sobe Energy	113	30g	Caffeine, guarana, arginine, L-cysteine, yohimbe, vitamin C
Monster Energy Drink	100	27g	Caffeine, taurine, L-carnitine ginseng, guarana, and B6, B12

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Too Much Caffeine

- Rise in blood pressure and heart rate
- Seizures
- Miscarriages
- Mood swings
- Insomnia
- Dehydration