

Level of dehydration	Physical or physiological characteristics
2% body water loss	Thirst, lack of appetite, decreased urine output, increased cardio and respiratory function, decreased sweating.
5% body water loss	Sleepy, headache, nausea, dimmed vision, increased body temperature, decreased urination, fatigue, muscle cramps, tingling in limbs
10% body water loss	Muscle spasms, shriveling and wrinkling of skin, lack of urination—painful, confusion, seizures, racing pulse, hypo and/or hyperthermia.
12% body water loss	

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12% body water loss	Clinical shock; unconscious; depressed function of all organ systems.

The Body's Response to Stress, Dehydration, and Starvation

What is the 60–40–20 rule for body water?

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Water constitutes 60% of body mass.

Intracellular water = 40% body mass

Extracellular water = 20% body mass.

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Water moves osmotically in response to solute concentrations on either side of permeable membranes.

Intracellular water content is defended most vigorously.

Assuming that Darlene did NOT have access to water during her entrapment, from what sources would her body begin to lose water? What are the specific avenues of water loss?

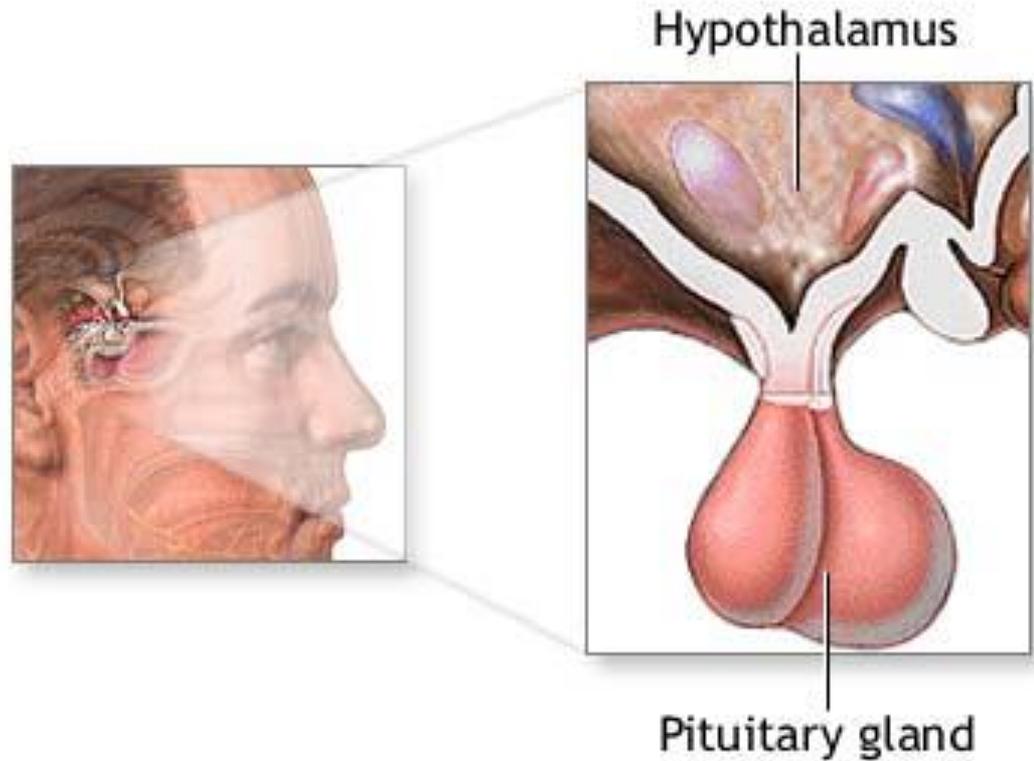
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- **kidney** (urine)
- **skin** (sweat)
- **gut** (secretions and excretion)
- **respiratory tract** (evaporation from mucosal surfaces and loss of water in exhalation).

Calculation of Darlene's Water Loss

Condition	Rate of water loss	Darlene's survival time in days
7c. Average water loss for young adult females, 12% body water loss	2.7 L/day	1.47 days
7c. Average water loss during summer for European women (55 kg), 12% body water loss	3.3 L/day	1.2 days
7e. Absolute minimal water loss rate possible in humans, 12% total body water loss	1.2–1.4 L/day	About 3 days (2.8–3.3)
7f. Absolute minimal water loss rate possible in humans, and 20% total body water loss	1.2 L/day	About 5.5 days

Hormonal Responses

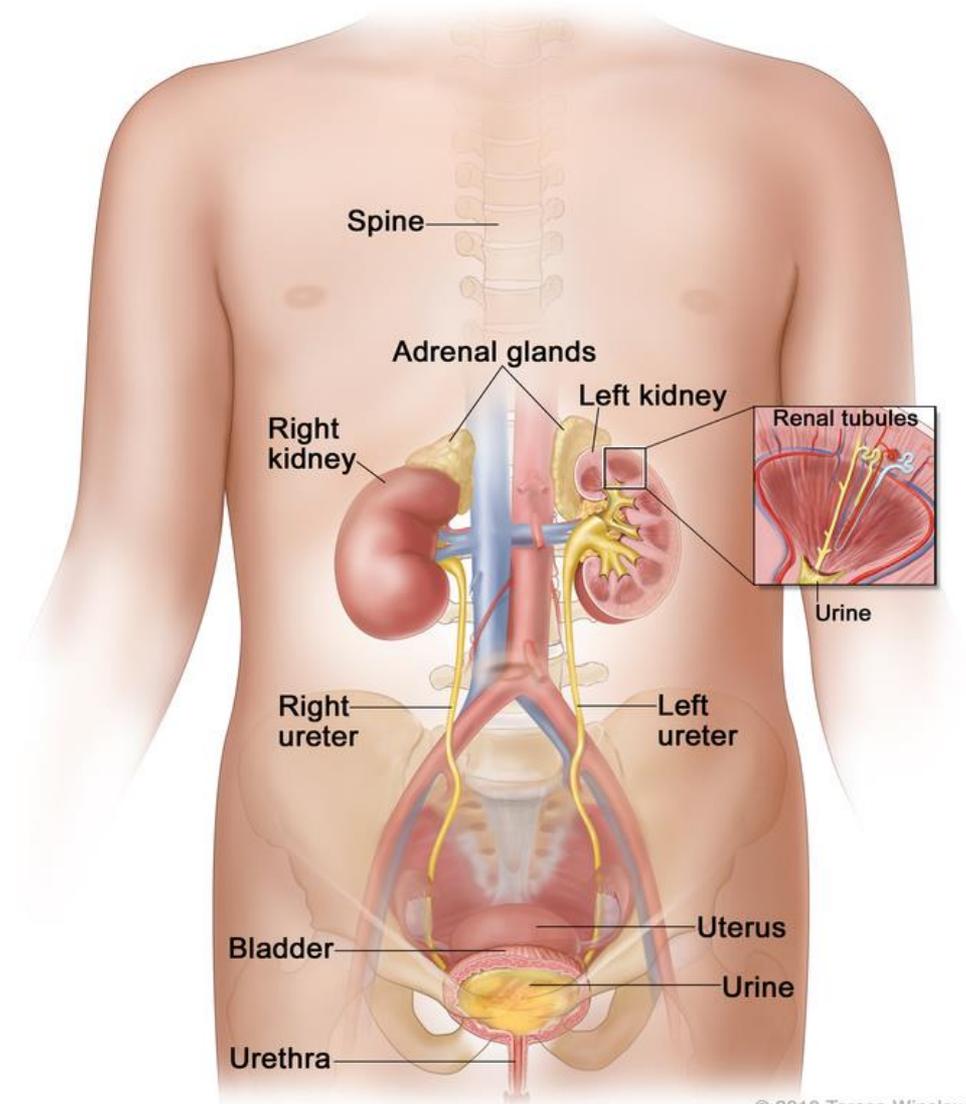


Hormonal Responses

Antidiuretic hormone (ADH)

- Decreases urine production
- This in turn increases water retention

Hormonal Responses



Hormonal Responses

Epinephrine & Norepinephrine

- Increase heart rate
- Increase breathing rate
- Increase cardiac muscle contractions
- Increase blood pressure
- Increase blood glucose levels

- Accelerate the breakdown of glucose in skeletal muscles
- Accelerate the breakdown of stored fats in adipose tissue.

Hormonal Responses

Aldosterone

- Helps kidneys conserve sodium ions
- This in turn stimulates water retention

Cortisol

- Increases body's utilization of fatty acids (energy)
- Stimulates increase in breakdown of glucose (by facilitating epinephrine's effect)
- Helps to prevent inflammation