THE SCIENCE BEHIND HYDRATION

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Hydration is complex, and its physiology is even more intricate. In a society focused on carbohydrates, sports nutrition often emphasizes carbohydrate delivery through drinks. That emphasis can overlook what "hydration" actually means.

hy·dra·tion (hī-drā'shən) - n.

1. Adding water to a chemical molecule without hydrolysis.
2. **Supplying body tissues with an adequate amount of fluid.**

Good hydration depends on balancing fluid and electrolytes.

BENEFITS OF HYDRATION

- ☑ Keeps tissues in the eyes, nose, and mouth moist.
- ☑ Helps regulate body temperature through sweating.
- ☑ Lubricates the joints.
- ☑ Carries nutrients, oxygen, and waste in the bloodstream and across cells.
- ☑ Water makes up 75% of muscle.

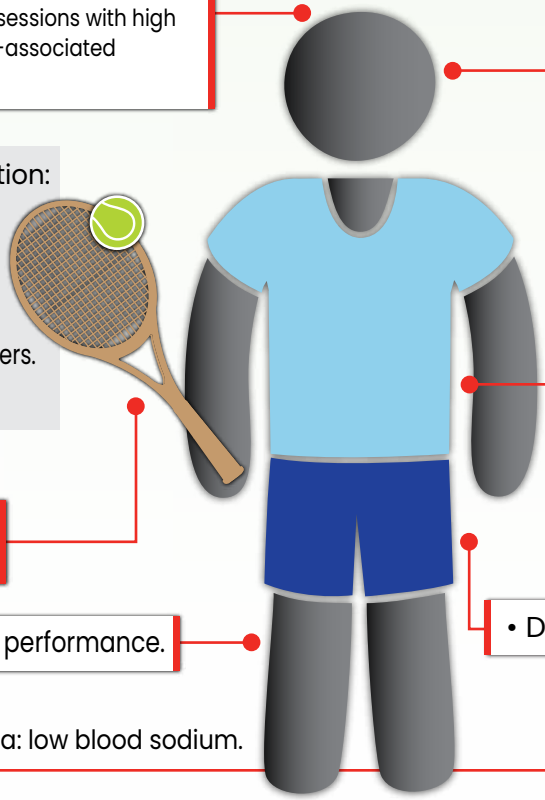
POSSIBLE SIGNS OF INADEQUATE HYDRATION:

- Post-workout headache with heavy sweating or low fluid intake before/during activity: hypohydration.
  - *A headache after long training sessions with high water intake can signal exercise-associated **hyponatraemia (EAH).**
- Feeling dizzy or light-headed.
- Tiredness.
- Irritability or mood changes.
- Thirst means drink.

Possible Causes of Low Hydration:



- Heavy sweating, hard training, or lengthy workouts.
- Strenuous training in cold weather while wearing layers.
- Heat and high humidity.



- Poor appetite and a raised metabolic rate >1 hour after exercise = dehydration.
- Feeling nauseous.
- Cramps* may also reflect neuromuscular problems or electrolyte depletion. Research has yet to identify a single, definite cause.
- Poor heat tolerance with exercise: hypohydration.
- Reduced endurance performance.
- Dark, scant urine = dehydration.

*Exercise-associated hyponatraemia: low blood sodium.

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FOLLOW THIRST OR A DRINKING SCHEDULE?

DURING EXERCISE, FOLLOW THIRST WHEN:

- The athlete is hydrated beforehand; otherwise injury, rhabdomyolysis, poor recovery, or reduced motivation may occur.
- The athlete has adapted to heat for hot training, games, races, or events.
- The athlete is trained.
  - After a long break and loss of fitness, low hydration and exercise stress can increase heat strain and reduce performance.
- The athlete is a woman in the luteal phase or using a progestin-only mini-pill. High estrogen and progesterone lower plasma volume and osmolality, increasing susceptibility to hyponatremia.
- The athlete has a history of EAH or Syndrome of Inappropriate Antidiuretic Hormone secretion (SIADH).

USE A SCHEDULE: AT MOST 800 ML/H IN TEMPERATE CONDITIONS. SMALLER ATHLETES NEED LESS; LARGER ATHLETES NEED MORE. HEAT MAY REQUIRE MORE FLUID WITH SODIUM. USE THIS APPROACH IF THE ATHLETE:

- Is a junior athlete (for example, before puberty).
- Has 2+ strenuous sessions daily, to help prevent systemic dehydration.
- Trains at altitude without being acclimated.
- Has experienced heat illness before.
- Drinks plain water.
- Is under-hydrated, traveling, low in glycogen, or in hot/humid conditions.



WAYS TO CHECK HYDRATION

Morning Check:

- Use WUT: two or more of these signs may indicate dehydration:
  - **Weight** - Keep daily body weight stable, within 1%.
  - **Urine** - Dark first-morning urine or less frequent urination.
  - **Thirst** - A dry mouth or a desire to drink.

Several Practices per Day or Less Than 24 Hours Apart:

- Check urine color; choose a salty drink and/or salted, water-rich fruit or vegetables.
- Compare pre/post-exercise weight to estimate fluid loss.
  - Include sodium rather than drinking only plain water.

BEFORE Training:

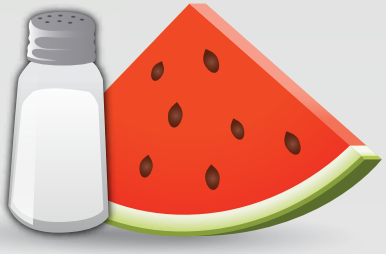
- Salted, water-rich fruit or vegetables (such as tomatoes, apples, or watermelon).
- Add a little salt to water: 1/16 tsp of table salt per 20 oz.
- Choose a dedicated hyperhydration drink or high-sodium broth/soup.

WHILE Training:

- Drink to thirst, or follow a schedule when the athlete meets those criteria. Choose a drink providing, per 8 fl oz: 7-9.5 g sugars from glucose and sucrose (a 3-6% carbohydrate solution); sodium: 150-180 mg; potassium: 60-75 mg.

AFTER Training/Rapid Rehydration:

- Aim for clear urine within 2-3 hours after training.
- A recovery drink/smoothie with protein and carbohydrates.
- An electrolyte drink low in carbohydrates.
- Soup.
- Salted, water-rich fruits/veggies (tomatoes or watermelon).



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