

Webinar Will Begin Momentarily

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Professional Education Series

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Optimizing Hydration: Strategies for Healthy Adults of Varied Activity Levels

TODAY'S AGENDA:

- Welcome
- Speaker Introduction
- Presentation
- Q&A
- Closing



WEBINAR HOST:

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Optimizing Hydration

Strategies for Healthy Adults of Varied Activity Levels

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Disclosures

- I have, or in the past 2 years have had an affiliation or financial interest with:
 - Orgain
 - NOW Sports
 - Honey Stinger
 - Clif Bar
 - GoGo Squeez

OBJECTIVES



- Utilize science on fluid and electrolyte balance as you make recommendations for your clients and patients based on their activity level and environment. *(CDR PI: 10.2.10)*
- Discuss the importance of carbohydrate and sodium in maintaining fluid balance to support a healthy heart and kidneys, despite trends to restrict intake. *(CDR PI: 8.2.3)*
- Provide recommendations for fluid, sodium, and carbohydrate intake before, during, and after prolonged activities that result in fluid loss. *(CDR PI: 8.3.7)*

Who benefits from

additional hydration support?



- athletes
- highly active teens and adults
- military and tactical
- those with active outdoor jobs
- warehouse + data storage workers
- teachers
- those who travel often
- those spending time at altitude
- those who change environmental temperature quickly



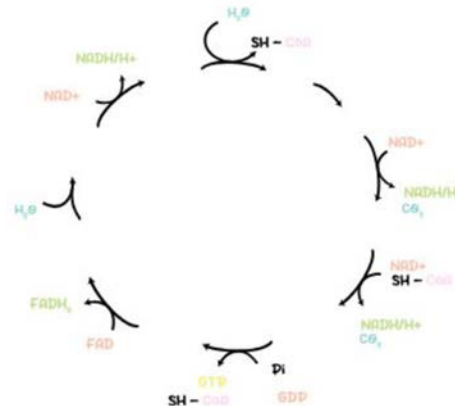
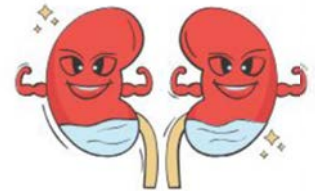
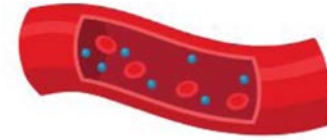
Symptoms of poor hydration

- Bloating and constipation
- Low physical and mental energy levels
- Difficulty concentrating
- Potential impact on appetite
- Decreased endurance performance
- And more...



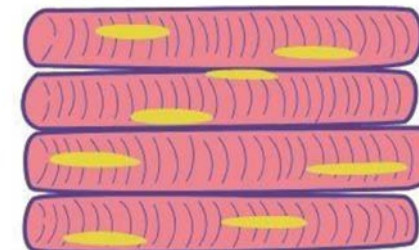
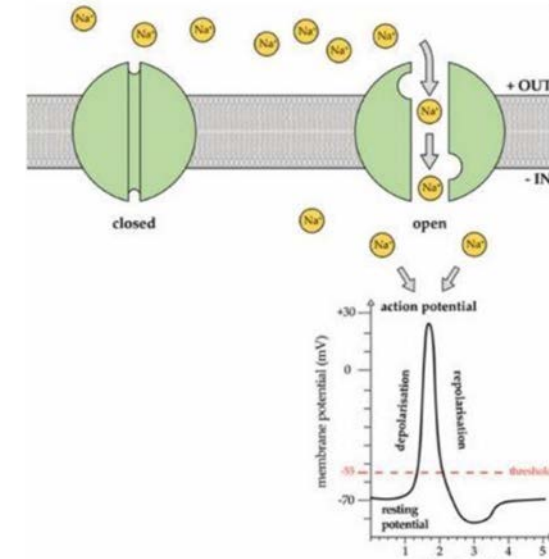
Fluid Functions

- Dissolve and transport substances
- Account for blood volume and blood pressure
- Thermoregulation
- Protection and lubrication of tissues
- Energy metabolism



Electrolyte *Functions*

- Help regulate fluid balance
- Enable nerve impulse reactions
- Signal muscle contractions



SODIUM

- Exchanges with potassium for fluid balance, pH balance, blood pressure regulation, etc
- Transmits nerve signals
- Aids in glucose and fluid absorption (SGLT1)
- Sodium sweat losses: 200 - 2000+ mg / liter



HYPONATREMIA: LOW BLOOD SODIUM

- Due to excessive intake of water or low sodium intake
- Especially common:
 - in hot environments
 - when fluids are over-consumed during exercise
 - with illness due to nausea and vomiting
- Can be fatal

POTASSIUM

- 98% of Americans do not consume enough
- Supports fluid balance, nerve impulses, healthy blood pressure
- Inadequate intakes = weakness + high BP



POTASSIUM, MAGNESIUM, CALCIUM, ZINC

- Sweat losses are not significant for most active people
- Included in many “hydration” products without adequate sodium
- Magnesium
 - plays a role in muscle recovery and *relaxation*
 - supplemental upper limit 350 mg

Intake vs.

recommendations



INTAKES AND PERCEIVED NEEDS



- **Data on fluid intake varies drastically**
 - **USDA: 32 - 40 oz**
 - **CDC: 93 - 117 oz**
- **Common recs:**
 - **8 Cups**
 - **1 gallon**
- **Sodium consumed in excess?**
 - **less common when active**
- **Potassium needs not met**
- **Magnesium needs not met**

FLUID Recommendations



- Total DRI
 - 2.7 - 3.7 L or 91 - 125 oz
- DRI for beverages
 - 2.2 - 3 L or 74 - 101 oz
- 30-35 ml / kg per day
- Replace additional fluid losses

Phillips SM, Chevalier S, Leidy HJ. Protein "requirements" beyond the RDA: implications for optimizing health. Appl Physiol Nutr Metab. 2016 May;41(5):565-72.

ALTERED FLUID (+ SODIUM) LOSSES DUE TO:

Genetics

Altitude

Respiration

Sodium intake

Equipment

Acclimatization

Apparel

Carb intake

Illness

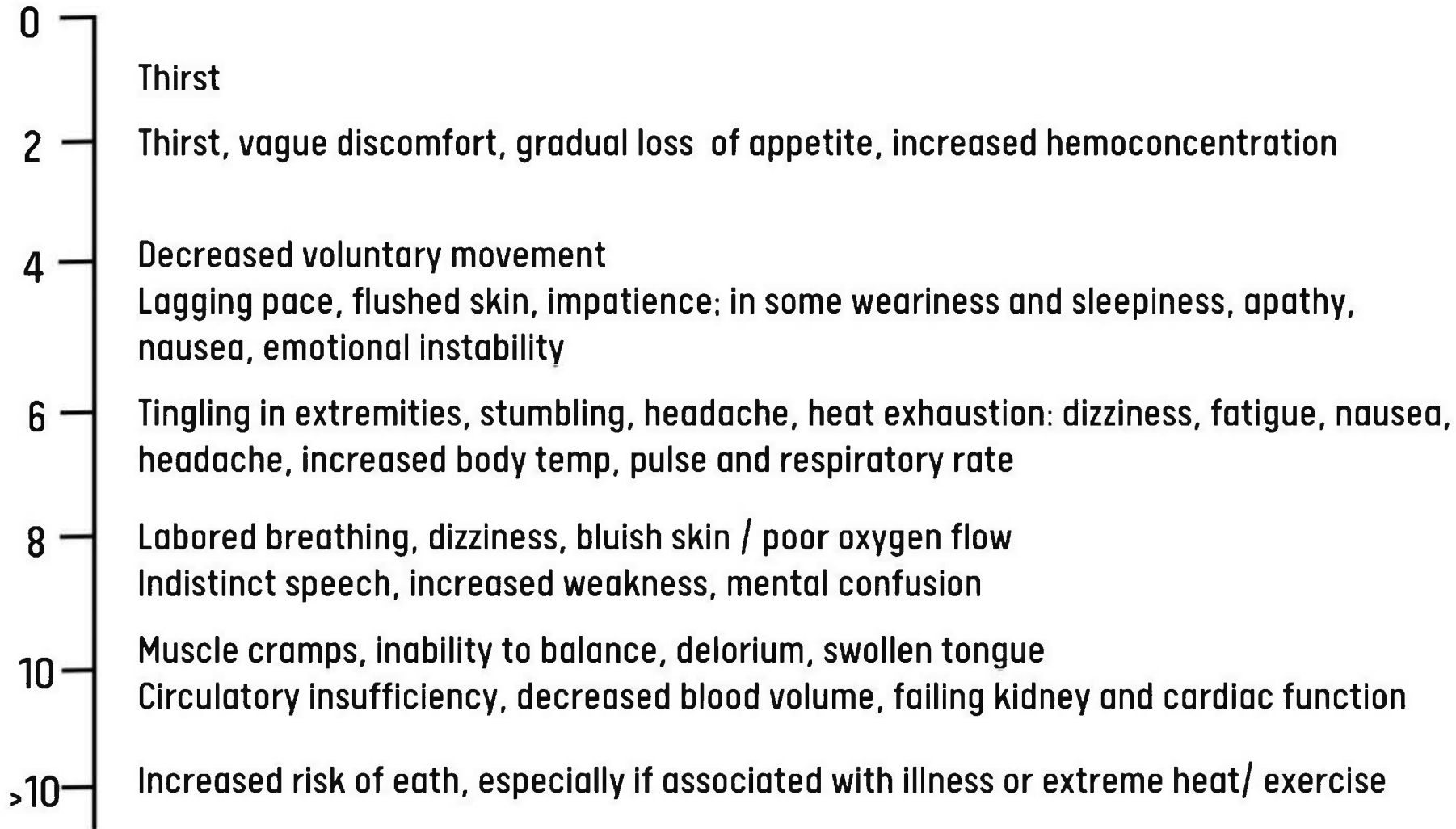
Temperature

Humidity

Diuretic
Medications

Dehydration: Health Risks

Percent fluid lost



FLUID AND SODIUM LOSSES

- In hot weather, skin can release up to 5x more fluid and electrolytes
- 2x the normal rate of fluids can be lost in respiration
- Sweat fluid rate ranges .5-2L/hour
- Sweat sodium ranges 200 - 2,000+ mg/liter



Gender Based Differences

- Greater sweating efficiency, but lower maximal sweat capacity and lower heat acclimatization
- Sweat loss = larger % of body water
- During exercise, women lose fluid less efficiently
- Potential menstrual cycle phase effects
- Needs also greater during:
 - pregnancy
 - lactation
 - perimenopause



Hydration in older adults

- Body composition changes reduce total body water
- Factors reducing fluid intake:
 - cognition
 - incontinence
- Heart and kidney may be more susceptible to effects of dehydration at lower % fluid loss



Can hydration impact mental health?

Brains of dehydrated adults have shown:

- higher workload to complete cognitive tasks
 - may impact mood and energy levels
 - may reduce cognitive performance in older adults

2% body mass lost in fluid = declines in attention, executive function and coordination

Can hydration impact mental health?

Dehydration may have negative effects on:

- self-esteem, vigor, short term memory, attention, reaction

Low water intake may increase risk for depression

Increasing water intake associated with improved emotions while decreasing intake associated with reduced positive emotions

Nutrients to

support hydration



CARBOHYDRATE AND SODIUM

stigma

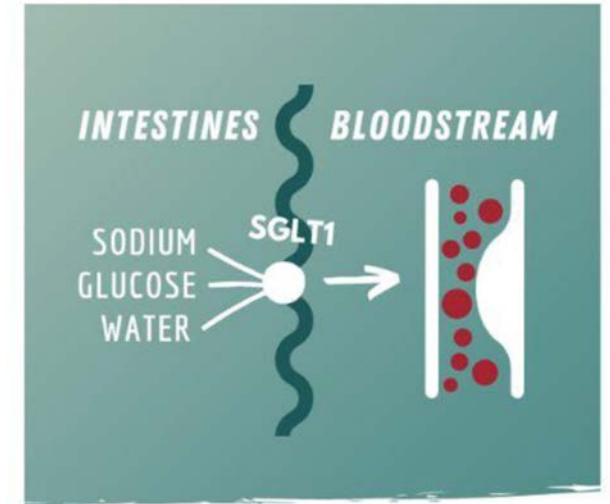


- Low carb diets remain popular
 - Carbs are the most efficient source of energy for body & CNS
 - Glycogen: maintains blood sugar, supports muscle function
- Low sodium is perceived as “healthier”
 - Everyone with HTN does not respond to lower sodium
 - More potassium, calcium, magnesium are needed

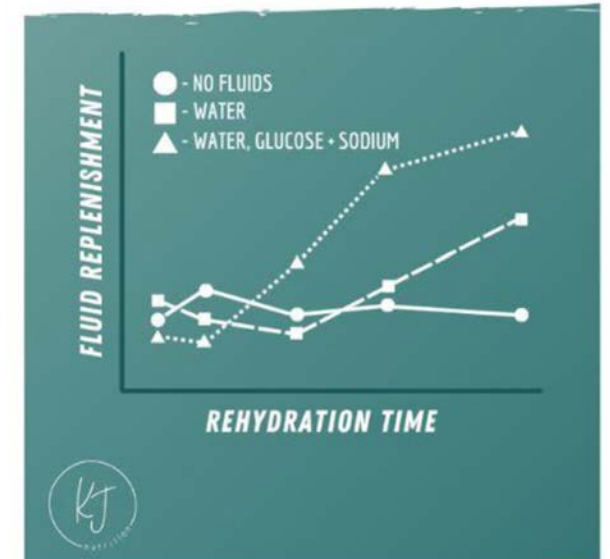
CARBOHYDRATE AND SODIUM

for fluid balance

- 1 g carb stores 2.7 ml of water
 - *weight drops fast and returns quickly*
- Sodium helps retain adequate fluid in most people
- Together, carbs and sodium support fluid absorption, retention, hydration and energy metabolism



RAPID FLUID REPLACEMENT



Practical tools

to address hydration status



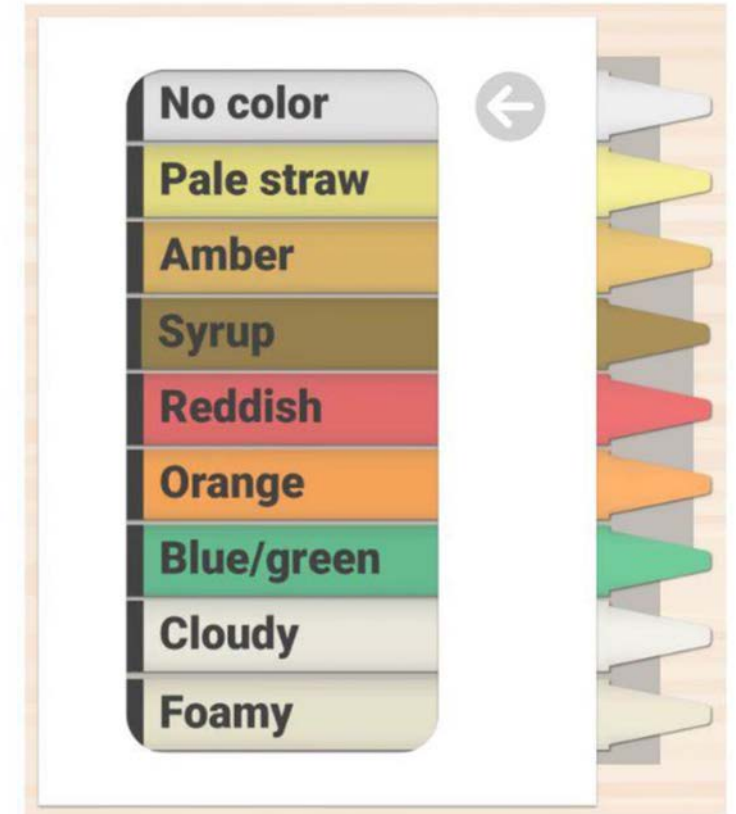
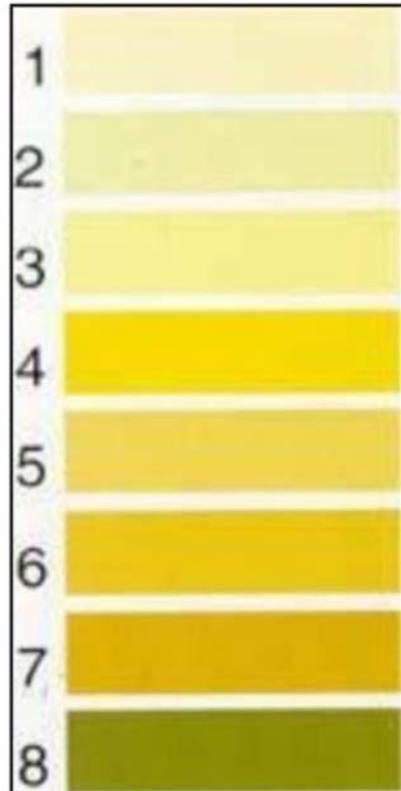
Is preventing thirst enough?

Thirst isn't reliable with heat or extended exercise

- Isn't present until 1-2% of weight lost in fluids
- Less sensitive during exercise
- Alleviated before complete rehydration
- Acclimating to environment changes takes ~2 weeks
- Low blood sodium can prevent adequate thirst responses



Urine Color



Fluid Replacement Equation

- Obtain naked weight before sweat loss activity
- Log fluid consumed during one hour of activity
- Obtain post-fluid loss naked weight



$$\begin{aligned} &(\text{weight before} - \text{weight after}) \times 16 \\ &+ \text{ounces consumed during activity} \\ &= \text{total ounces lost} \end{aligned}$$

Fluid Replacement Equation Example

$$\begin{aligned} &(162 - 160.5) \times 16 \\ &\quad + 14 \\ &= \text{total ounces lost} \end{aligned}$$

$$\begin{aligned} &24 \\ &\quad + 14 \\ &= 38 \text{ ounces lost} \end{aligned}$$

*Replace at least 38 ounces
and up to 57 ounces*



Sodium loss variability

- 200 – 2,000 mg+ per liter
- Sweat patch accuracy not yet reliable
- Precision sweat testing availability limited

Signs you're a salty sweater

- sandy texture on skin
- white discoloration in clothing
- salty taste on mouth
- eyes sting from high sweat



Practical tools

to better support hydration



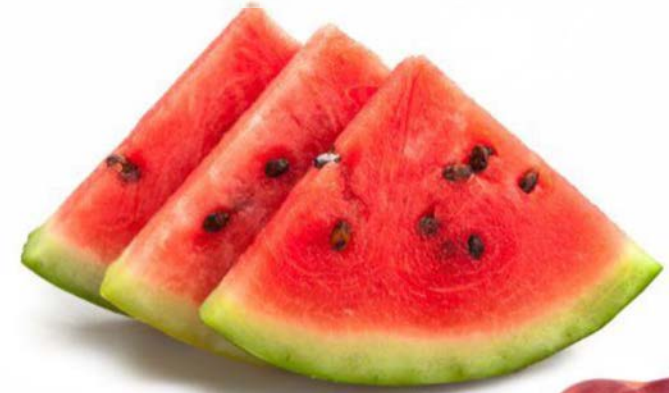
ADEQUATE FLUID INTAKE

Through foods:

- fruits + vegetables
- soups, yogurt

Through beverages:

- water, dairy + non-dairy beverages, juice
- tea, coffee, etc in moderation



ADEQUATE CARBOHYDRATE + SODIUM INTAKE

Addition vs. restriction

- Ex: More veggies, fruits, fiber rich grains, lean protein
- Ex: Swap animal fats for plant + fish fats

Reduce vs. eliminate

- Ex: Fast food X times per month
- Ex: Gradual reduction in sugar sweetened beverages



hydration plan

before, during and after sweat loss

- Start drinking an *extra* 16-24 oz, 4 hrs before activity
- Include extra salt + flavor to stimulate thirst if needed
- Drink 13-27 oz/hr during movement over an hour in heat
- Include sodium + carbs in beverages during when needed
- Replace 16-24 oz of fluid for each lb lost while training
 - Replace sodium + carbohydrate for high activity levels



hydration during activity

- Activity lasting under 45 minutes:
 - Only water is necessary
- Activity up to 75 minutes:
 - adding sodium + carbs may aid some scenarios
- Steady state activity >75 minutes or 2+ hours in heat:
 - fluid, carbohydrate and sodium are needed
 - 30-60 g carbohydrate per hour
 - 200 mg sodium per hour *minimum*



Who should use *electrolyte products?*

- Sodium ranges can vary widely
 - 0 mg - 1000 mg +
- Lower sodium products can:
 - stimulate thirst and increase fluid intake
- Moderate sodium products:
 - For moderately active adults
- Higher sodium products:
 - Appropriate for exercising/working in heat



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