INSTRUCTION FOR LEADER

Complete outlined tasks in preparation for training. During training, you will read the script directly and complete an AAR. The script includes optional check on learning activities to verify Soldiers understand the lesson.

PREPARATION

1. Print and review this leader guide to ensure subject familiarity.
2. Print enough handouts for number of Soldiers in training.

OBJECTIVE

1. Soldiers will be able to identify the three main components to a balanced plate: carbohydrate, protein, and color. They will be able to choose appropriate portions to support their activity level each day.

SCRIPT TO BE READ DIRECTLY

1. **Introduction to Hydration:** Even a small amount of water loss can have a major impact on your performance. Mild dehydration (as measured by a change in body weight) of less than 1 percent can negatively affect on cognitive function. The symptoms include slowed working memory, increased anxiety and fatigue, and a higher rate of errors related to visual vigilance. A 2 percent dehydration can have a more severe impact on mental function, mood, and energy levels. Therefore, it is essential to maintain proper fluid intake to ensure optimal health. Regardless of age or performance level, everyone should stay adequately hydrated to function at their best.
2. **Factors Affecting Fluid Needs**: The amount of fluids you need to consume can vary based on your workload, heat stress, and sweat rate. Many factors can influence your sweat loss, such as age, training, acclimation status, exercise intensity and duration, air temperature, humidity, wind velocity, cloud cover, clothing, and individual sweat rates.
3. **Sources of Hydration:** Fluids are essential for hydration, with 20–25% of intake coming from food and 75–80% from beverages. Water, coffee, tea, soups, fruits, and vegetables provide fluids to support hydration. While a small amount of caffeine in tea or coffee (<200 milligrams) won't negatively impact hydration levels, consuming large quantities

of caffeine can disrupt fluid balance. To ensure peak performance, hydrate early and stay hydrated throughout the day.

4. **Calculating my Fluid Needs:** To meet your minimum fluid requirement, drink half of your body weight (lbs) in ounces of fluid daily. For example, if you weigh 200lbs, you should consume at least 100oz of fluids each day. Remember, your hydration needs will change based on your activity level, sweat rate, and the weather. For every pound lost from sweat, add 16-24oz of fluid to your daily requirement.
5. **Overview of Electrolytes:** Electrolytes control the fluid balance of the body and are important in muscle contraction, among many other essential functions. Electrolytes (such as sodium, potassium, calcium, magnesium, and chloride) come from food and fluids. During extended periods of physical activity, especially in warm weather, the loss of sodium and potassium in sweat can be high. To support recovery, you must be sure to replete these elements. Most commercially available rehydration drinks contain electrolytes. Roughly, 1–2 grams of sodium per liter of fluid (0.25 teaspoons per quart—32 ounces) can effectively replace the sodium lost during exercise or on a mission. Also, sodium is widely present in various foods and fluids, such as pretzels, pickles, or goldfish.
6. **Hydration Timeline**: To ensure that you are adequately hydrated for activity/workouts, follow these tips:
    a. **Before activity:** Drink 8-16 fluid ounces of water 1-2 hours prior to exercise.
    b. **During activity**: Drink 4-8 fluid ounces of water every 15-20 minutes of exercise (2-3 gulps).
        (1) For activities **less than one hour**, water is the best choice for hydration needs. Short, low intensity workouts do not result in significant loss of electrolytes.
        (2) Sports drinks with electrolytes are only recommended when exercise lasts **longer than 60 minutes** and then, Soldiers should only ingest 8-oz every 15 minutes.
    c. **Post activity:** For every pound lost during exercise, drink 16-24oz of fluids. Drink a sports drink or eat salty foods to replace electrolytes if needed. Chocolate milk is a perfect option to help rehydrate and refuel after a workout.
7. **Tips for staying hydrated throughout the day**:
    a. Follow your specific hydration needs.
    b. Don't rely on thirst as an indicator for fluid needs. Consume fluids throughout the day to ensure adequate hydration.
    c. Always carry a water bottle with you.
    d. Eat foods with higher water content such as melons, citrus fruits, berries, celery, cucumbers, peppers, and tomatoes.

OPTIONAL CHECK ON LEARNING

- **Group Discussion:** Discuss how hydration needs vary between garrison and how weather environments.
- **Practical Exercise:** Calculate base fluid needs. Remember this is base needs and does not account for fluid loss through exercise.
    a. ___ lbs. of body weight / 2 = _____ fluid ounces/day

AAR

1. What were the pros and cons of this training?
2. What makes it challenging to consume adequate fluid in cold weather missions?

SUPPORTING RESOURCES

1. FM 7-22 Chapter 8 Sections 37-45

THE SCIENCE OF HYDRATION

by Stacy Sims, PhD, CISSN

Hydration is a complex topic, with even more complex physiology. In this carb-centric society, the emphasis in sports nutrition has been on carbohydrate availability in fluid form, but this neglects the true meaning of "Hydration".

hy·dra·tion (hī-drā'shən) - n.

1. The addition of water to a chemical molecule without hydrolysis.
2. **The process of providing an adequate amount of liquid to bodily tissues.**

Optimal hydration requires a balance of both fluids and electrolytes.

HYDRATION BENEFITS

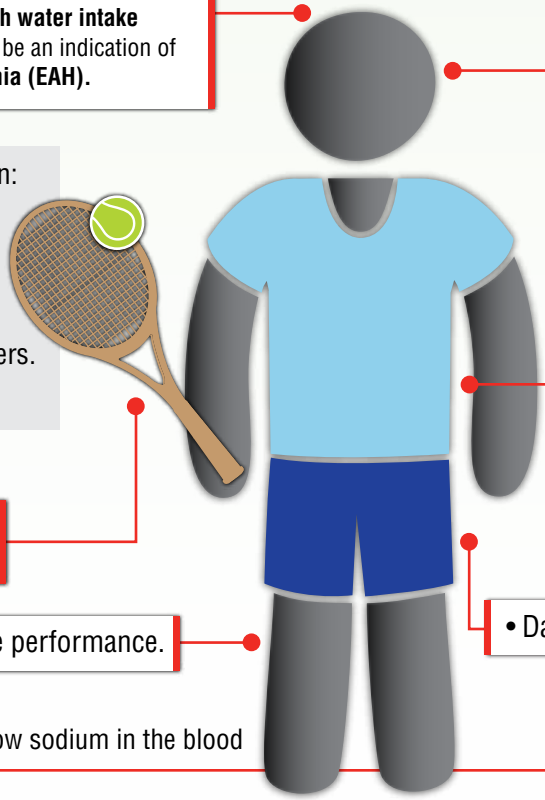
- ☑ Moistens tissues in eyes, nose, mouth.
- ☑ Assists the body in thermoregulation via sweat.
- ☑ Provides lubrication to the joints.
- ☑ Is the medium for transportation (of nutrients, oxygen, waste products) of the blood and across cells.
- ☑ Muscles are 75% water.

POSSIBLE INDICATORS OF UNDER-HYDRATION:

- Headache post-training, with high sweat rate or low fluid intake pre and during training - hypohydration.
  - *Headaches post-training with **high water intake** during long training sessions may be an indication of **exercise associated hyponatraemia (EAH).**
- Dizziness/light-headedness.
- Fatigue.
- Moodiness/irritability.
- Thirsty = drink.

Possible Causes of Under-Hydration:

- High volume of sweat, intense workouts, long workouts.
- Heavy workouts in cold weather with multiple layers.
- Hot & humid conditions.



- Poor appetite and elevated metabolism >1hour post exercise = dehydration.
- Nausea.
- Cramps – *May also be caused by neuromuscular issues and/or electrolyte depletion – research still equivocal on one specific cause.
- Heat intolerance during exercise-hypohydration.
- Decreased endurance performance.
- Dark, low volume of urine = dehydration.

*Exercise associated hyponatraemia - low sodium in the blood

THE SCIENCE OF HYDRATION

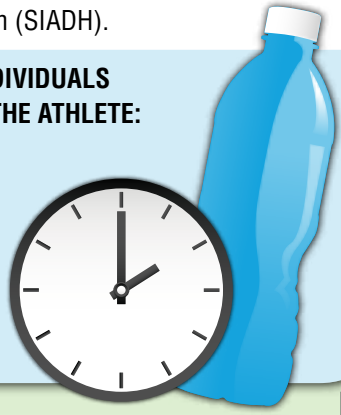
DRINK TO THIRST OR ON A SCHEDULE?

DRINK TO THIRST DURING EXERCISE IF:

- The athlete has pre-hydrated, otherwise can be susceptible to injury (e.g. rhabdomyolysis, poor recovery, decreased motivation).
- The athlete is heat acclimated (for hot training and games/racing/events).
- The athlete is trained.
  - After significant time off with lower fitness levels, hypohydration and exercise stress can exacerbate thermal strain and decrease performance metrics.
- If the athlete is a woman in the luteal phase of her menstrual cycle or on the progestin-only mini-pill (high estrogen and progesterone decrease plasma volume and lower plasma osmolality, predisposing a woman to hyponatremia).
- If the athlete has a history of EAH or has Syndrome of Inappropriate Antidiuretic Hormone secretion (SIADH).

DRINK ON A SCHEDULE (NOT TO EXCEED 800ML/H IN A TEMPERATE ENVIRONMENT- SMALLER INDIVIDUALS NEED LESS, LARGER NEED MORE; IN THE HEAT, MORE FLUID WITH SODIUM MAY BE NEEDED) IF THE ATHLETE:

- Is a junior athlete (e.g. has not gone through puberty).
- Has 2+ heavy training sessions/day (to avoid systemic dehydration).
- Is unacclimated and training at altitude.
- Has a history of heat illness.
- Is drinking plain water.
- Is hypohydrated, traveling, has low glycogen, or in a hot/humid environment.



HOW TO ASSESS HYDRATION?

In the Morning:

- Use **WUT**– Possible dehydration if 2 or more below markers are present:
  - **Weight** – Ensure maintaining stable body weight day-to-day within 1%.
  - **Urine** – Darkened first morning urine or reduced daily frequency.
  - **Thirst** – Dry mouth or the craving of fluids.

Multiple Practices in a Day or <24 Hours Between Practices:

- Pay attention to urine color and drinking something with salt and/or salted watery fruits or veggies.
- Pre/post-weight – check to assess fluid loss.
  - Ensure not just drinking plain water but added sodium.

PRE Training:

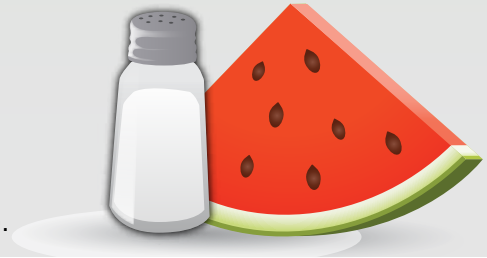
- Salted watery fruits and vegetables (e.g. salted tomatoes, apples, watermelon).
- Water with a dash of salt (1/16th tsp table salt per 20oz water).
- Use a specific hyperhydration beverage or high sodium broth/soup.

DURING Training:

- Drink appropriately (i.e. to thirst or on a schedule if the athlete meets the scheduling criteria) a beverage that contains per 8 fluid ounces: Sugars (from glucose and sucrose): 7 – 9.5 grams (3-6% carbohydrate solution); Sodium: 150-180mg; Potassium: 60-75mg.

POST Training/Acute Rehydration:

- Urine should be clear 2-3 hours post-training.
- Protein+carbohydrate-based recovery drink/smoothie.
- Low-carbohydrate electrolyte drink.
- Soups.
- Salted watery fruits/veggies (salted tomatoes, salted [water]melons).



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