TRIATHLON SASKATCHEWAN

TRIATHLON 101

HYDRATION FOR TRAINING AND RACING

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ENDURANCE JOURNEY

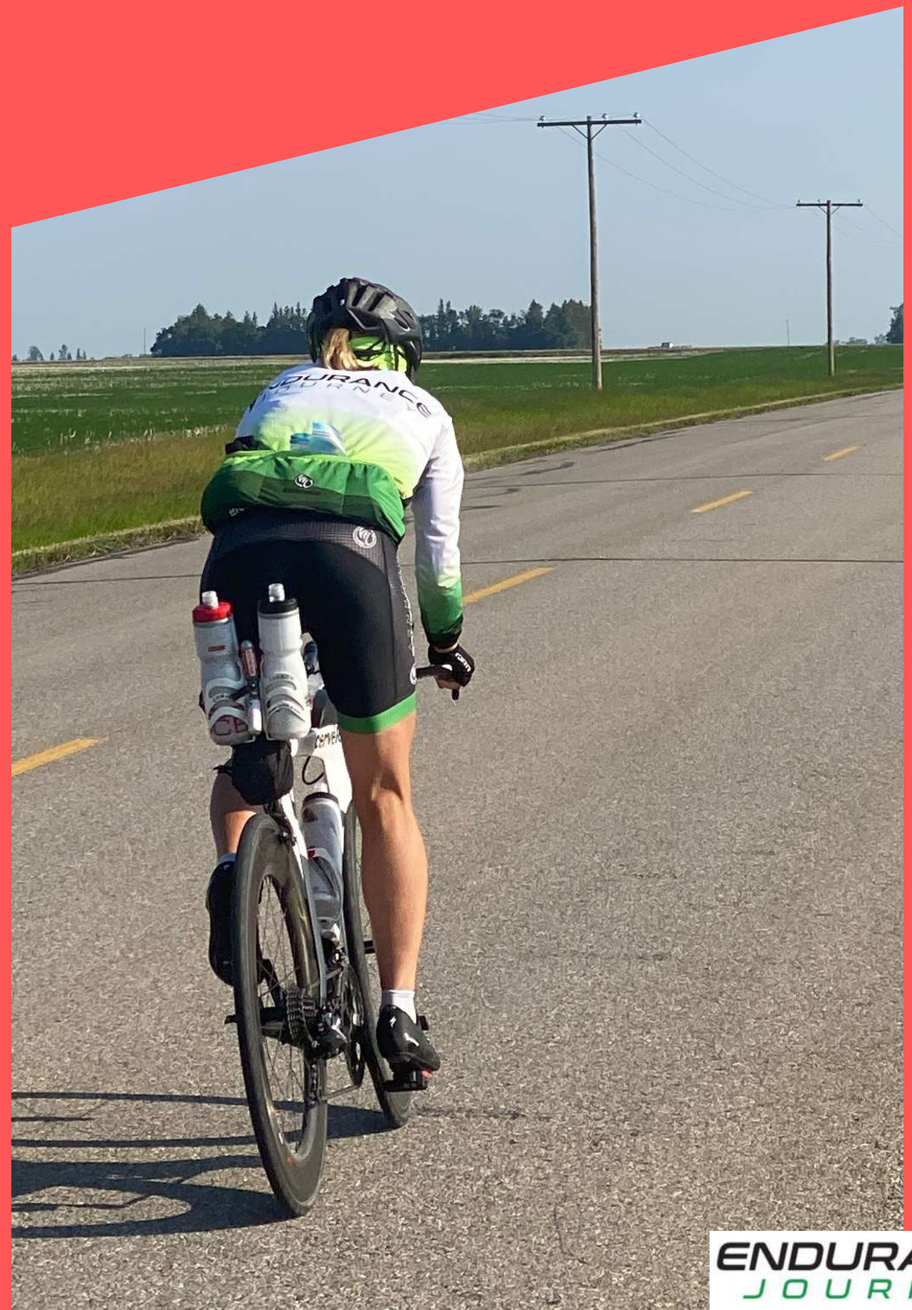
WHERE WE ARE IN THE SERIES...

- ✓ November '22- What it Takes
- ✓ December '22- Goal Setting
- ✓ January '23- How to Train (Fit It All In)
- ✓ February '23- Swim, Bike, Run (What You Need To Know)
- ✓ March '23 - Health, Fitness, And Performance - Can You Have It All?

TODAY-
Hydration For Training and Racing

April 10/23- Nutrition for Training and Racing

May /23- Event Day Preparation



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April Triathlon 101
Part#1

HYDRATION FOR TRAINING AND RACING

What we'll cover in this session (by priority)...

1

FFP Hydration

What is it and making the case for why hydration is priority #1

2

Daily Hydration Guidlines

Good Hydration Habits - Guidelines for daily water intake + caffeine considerations

3

During and Post Training/Racing Hydration

Training/racing hydration (water and electrolytes) + measuring fluid loss for recovery

4

Customize Your Hydration Strategy

How to understand your hydration needs

- Troubleshooting hydration challenges
- Gear to support your strategy

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Do you prioritize your hydration the same way as your training?

HOW CAN I HYDRATE TO OPTIMIZE THE WAY I FUNCTION, FEEL, AND PERFORM (FFP)?

FFP hydration goes beyond “sports hydration” or “performance hydration” to:

- include all types of sustained and regular movement;
- incorporate recovery, sustainability, and longevity; and
- address the complex web of health, fitness, and performance factors that can affect your hydration choices.

Good FFP hydration can help you:

- Progress and perform (i.e., get results)!
- Stay mentally sharp and energetic.
- *R*ecover.
- *H*ave a long and healthy life.
- easiest is correct imbalances - hence why its priority #1

*Source Precision Nutrition Sport Nutrition Certification

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YOU ARE A

Sport type, body composition, exercise duration and intensity are important considerations along with:

- **your unique needs;**
- **what you do or know;**
- **the context you train and live in;**
- **the skills and resources you have; and**
- **your behaviors, habits, and experiences in real life.**

LET'S GIVE YOU SOME TOOLS AND STRATEGIES TO DO THAT

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WHY DOES BEING ADEQUETLY HYDRATED MATTER?

- **Numerous research studies show even losing as little as 2% of your body fluid (via sweat, evaporation, etc.) can cause significant decline in performance as brain and body systems do not function as well.**
    - Endurance, strength, decision making, memory, creative, and flexible thinking are impacted.

*Check out this Huberman Lab Podcast for more info

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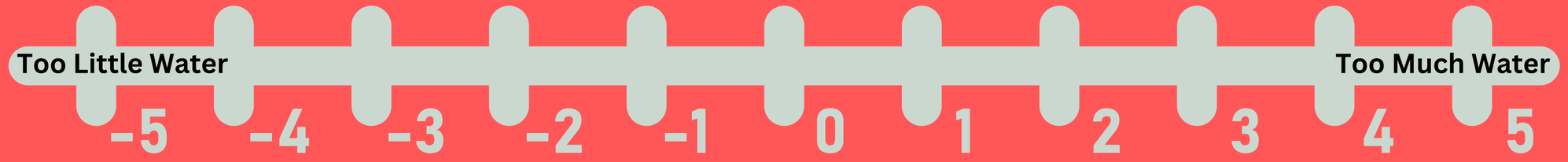
TOO LITTLE VS. TOO MUCH WATER*

SIGNS AND SYMPTOMS TO LOOK OUT FOR



Dehydration

%body fluid lost

- 1-2% - thirst, fatigue, and minor reductions in strength
- 3-4% - reduction in power output and endurance, feeling of overheating - can't cool down
- 5-6% - decreased concentration and focus, headache, increase breathing rate, chills, nausea, rapid pulse, poor circulation, decreased sweat production
- 7-10% sweating stops, dizziness, muscle spasm, poor balance, delirium, exhaustion, collapse, potential cardiac arrest.

*Source: Waterlogged Timothy Noakes

ENDURANCE JOURNEY

TOO LITTLE VS. TOO MUCH WATER*

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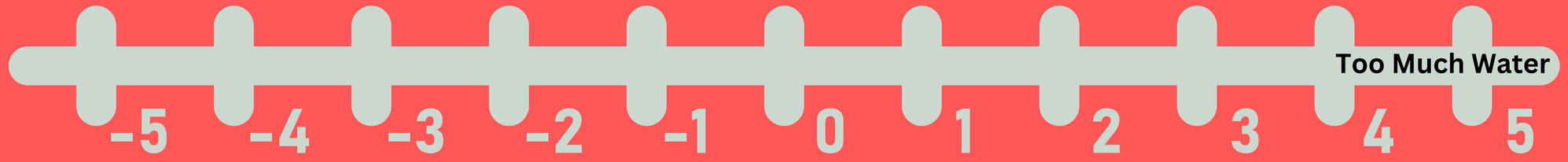

Hyponatremia

Low blood sodium from excess water intake

- *Difficulties with cordination, balance, and speech*
- Fatigue
- Nausea + Vomiting
- Dizziness + Confusion
- *Bloating and swollen hands, legs, and feet*
- *Wheezy breathing*
- Headache
- Muscle cramps
- Lethargy
- Seizures
- Loss of consciousness
- Breathing Stops

*Source: Waterlogged Timothy Noakes

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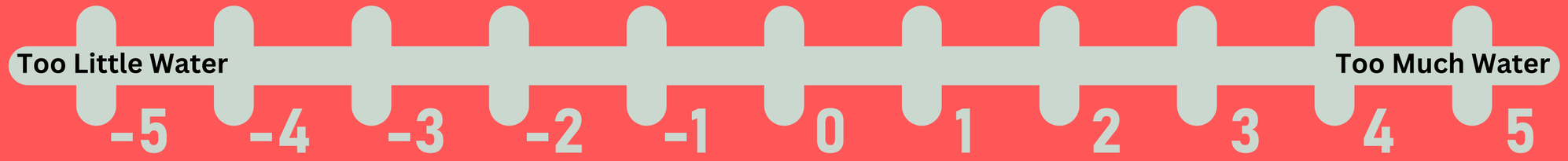

OPTIMAL

- Urination every ~2 hours
- 0.033 x bw(kg) = water intake in litres/day
- PLUS adequate exercise hydration
- Avoiding symptoms on either end of the scale

*Source: Waterlogged Timothy Noakes

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DAILY WATER LOSES*

- Breathing ~250-350ml
- Urination ~500-1000ml
- Fecal ~100-200ml
- Insensible ~450-1900ml
- Sweat in activity ~450-2000ml PER Hour

NET DAILY LOSS FOR ATHLETES:
~1750 - 5450ml

*Values Approximate - Source: UESCA Sports Nutrition Certification

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DAILY HYDRATION GUIDELINES*

Option #1

- **Bodyweight (in kg) x 0.033 = amount you consume in litres of water PER DAY.**
  - **For example, 68kg (150lb) person would consume ~2.25 liters per day.**

Option #2

- **Water - First 10 hours of the day average ~240 ml per hour**
- **Caffeinated drinks not included (diuretic)**
- **Then 120-150 ml per hour for the remainder of the day**
- **Reason - higher hydration demain earlier in the day**

STOP 90 mins to 2 hours before bed

*Check out this Huberman Lab Podcast for more info

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CAFFEINE CONSIDERATIONS

DAILY:

- **Consume 2x amount of water for every caffeine beverage consumed (i.e., drink 1 cup caffeinated coffee/tea follow it with 2 cups of water)**

- **Stop drinking caffeine 10 hours before you want to be asleep to improve sleep quality**

*Check out this Huberman Lab Podcast for more info

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What changes would you make, if any, to your current daily water intake?

TRAINING HYDRATION GUIDELINES*

- Galpin Formula During Training:
  - Consume 1 ml (water + electrolytes mixture) per pound of body weight every 15 mins of activity on average
  - Example: 150lbs person consumes ~150 ml every 15 mins

- Your hydration habits pre exercise = good hydration status leading in to your training

- In very hot conditions (e.g., >25 degrees C, humid) mostly likely need to increase these numbers (e.g., 2x)

*Check out this Huberman Lab Podcast for more info

Test and document what you need in training under different conditions

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ROLE OF ELECTROLYTES*

Electolyte	Function	Too Little	Too Much
Sodium	• Helps with fluid balance (drawing water into the cells) and muscle contractions, nerve communication	• Hyponatremia, dizziness, muscle cramps, nausea, vomiting, loss of appetite, seizures, loss of consciousness	• High blood pressure, nausea
Potassium	• Helps manage blood pressure and heart function, nerve communication	• Muscle cramps, loss interest in activity, loss of appetite, irregular heartbeat	• Disrupted heart rhythm, Cardiac arrest.
Magnesium	• Helps with muscle contraction, heart function, and even anxiety, energy production	• Muscle weakness, fatigue, loss of appetite, seizures, loss of interest, muscle tremor cramps	• Nausea, vomiting, diarrhea

TRAINING ELECTROLYTE GUIDELINES*

HYDRATION GUIDELINES
For Training/Racing

BEFORE/AFTER*

~500ml -750ml water

+

~500 to 1000 mg sodium

DURING*
(PER HOUR)

~500-1000ml water (cycling)
~250-500ml (running)

+

~300-1000mg sodium

+

~100-200mg potassium chloride/citrate

+

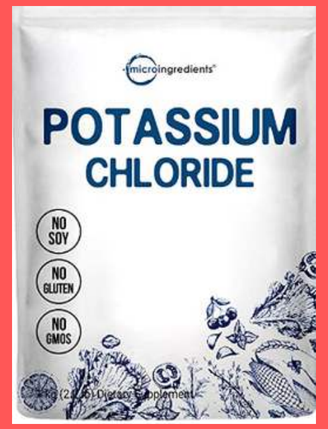
~30 to 60 mg magnesium malate

Minimum - Consume 1ml of water+electrolytes per pound of body weight every 15 mins during training/racing

***These suggested quantities can up to 2x depending on the heat/humidity, intensity, body mass, and sweat rate of the individual.**

Note intake differences for cycling vs. running

Practice in training. Adjust for your needs intensity, and conditions.



*Check out this Huberman Lab Podcast for more info

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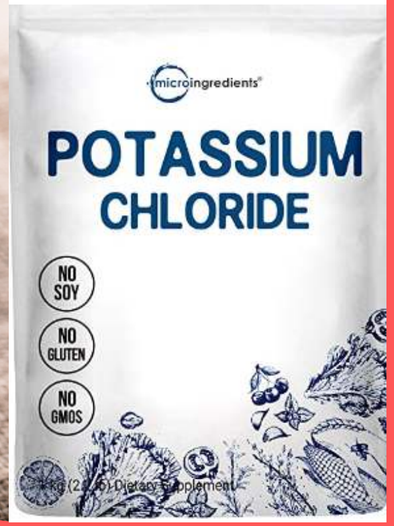
HOMEMADE HYDRATION*



Ingredients (mix into 500ml – 1L of water):,

1. 1/2 tsp Salt (1000 mg sodium)
2. 1 tsp Postasium Chloride or Citrite Powder (~200 mg potassium)
3. 1/4 tsp Magnesium Malate Powder (~60 mg magnesium)

*Source Galpin Equation

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ELECTROLYTE OPTION

CITRUS SALT

Nutrition Facts

30 servings per container
Serving size 1 stick pack (6g)

Amount Per Serving
Calories 10

	% Daily Value*
Total Fat 0g	0%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 1000mg	43%
Total Carbohydrate 2g	1%
Dietary Fiber 0g	0%
Total Sugars 0g	
Includes 0g Added Sugars	0%
Protein 0g	0%
Vitamin D 0mcg	0%
Calcium 0mg	0%
Iron 0mg	0%
Potassium 200mg	4%
Magnesium 60mg	15%

* The % Daily Value (DV) tells you how much a nutrient in a serving of food contributes to a daily diet. 2,000 calories a day is used for general nutrition advice.

1,000 mg SODIUM

200 mg POTASSIUM

60 mg MAGNESIUM

INGREDIENTS:
Salt (Sodium Chloride),
Citric Acid,
Magnesium Malate,
Potassium Chloride,
Natural Flavors,
Stevia Leaf Extract.

[Check Out Element Here]

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CAFFEINE CONSIDERATIONS

FOR TRAINING/RACING as Performance Aid:

- Aim to take 3-6mg per kg of body weight about 60-120 minutes before a training session:
  - Start with smallest amount and work up from there to find dosage will work best for you.

- Every 2 hours during the event aim to have 25-100mg
  - If its working you will feel alert with steady energy

- Begin practicing in training 3-4 months prior to event

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DETERMINING FLUID LOSS FROM SWEAT

Steps:

1. Before exercise, void all urine
2. Weigh in wearing little to no clothing (to obtain accurate reading)
3. During exercise monitor quantity of fluid consumed (intake fluid only during session). Avoid voiding (i.e., #1 or #2) if possible.
4. After exercise, towel off and step onto scale again (wear exactly what you wore during pre exercise weigh in)

Source: Ironman University

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DETERMINING FLUID LOSS FROM SWEAT

Wearables to measure fluid and electroyte losses:

- **HDrop**
  - Sensors placed on the arm body to measure fluid loss quantity and composition
- **Nix Hydration Biosensor**
  - Fluid and electrolyte losses moment-by-moment and sends notifications to your phone, watch, or bike computer to tell you exactly when, what and how much to drink.

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REHYDRATING AFTER EXERCISE

Consume

- 1L per kg of body weight lost during exercise (500-750ml per pound).
- Add 500 mg sodium to your water.
- Focus on your recovery hydration first before drinking alcohol.

Source: Ironman University

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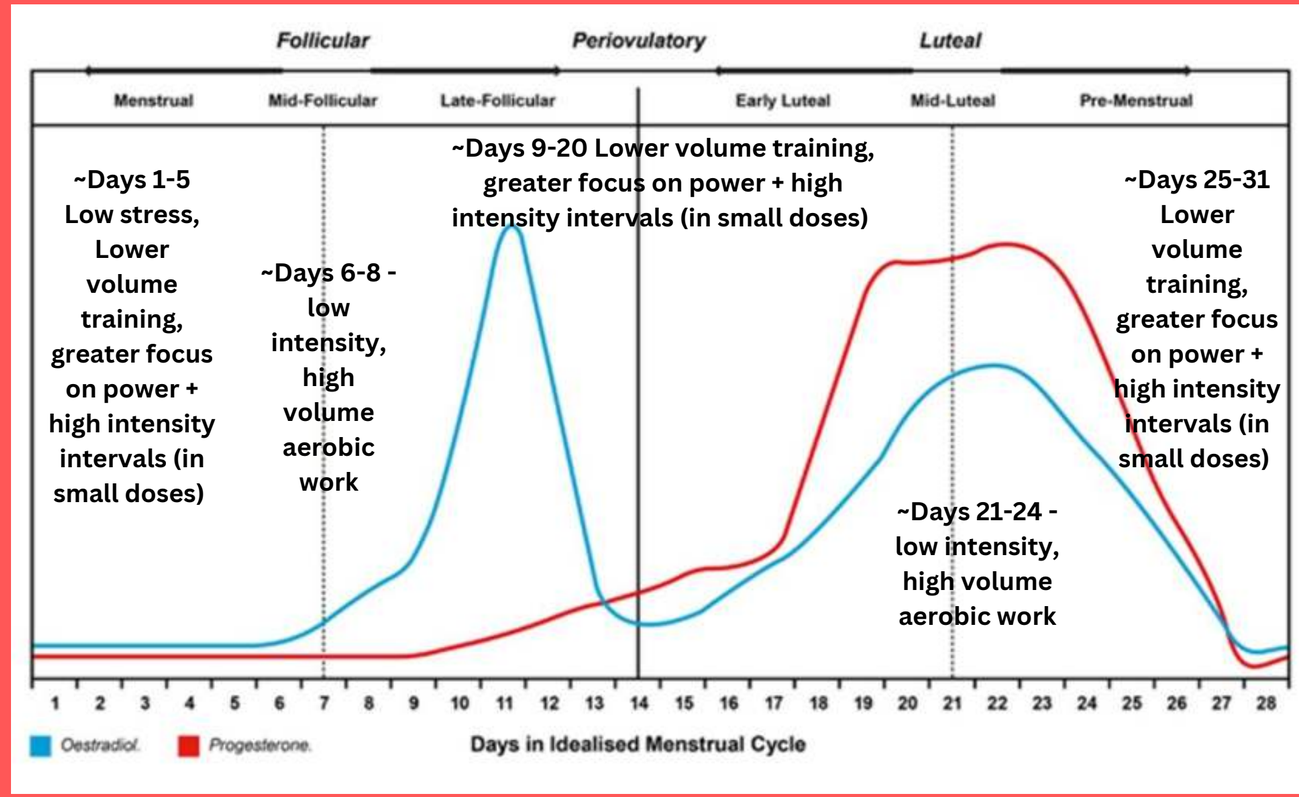
What changes would you make, if any, to your current water and electrolyte intake during training?

FEMALE HYDRATION CONSIDERATIONS

Ovulation/Luteal phase of cycle (~Days 15 - 25)

- higher progesterone inhibits sodium reabsorption which increases sodium excretion in the urine.
  - Lower total body sodium leads to reduction in blood volume which may cause
    - Elevated heart rate
    - Increased core body temperature

- Cool towel around neck prior to session
- High sodium electrolyte supplement - e.g., 1000mg Na - taken prior to training may help - helpful for menopause too - (see this article for more details).
  - For pregnancy/breastfeeding recommendations (Link Here)



KEY POINT: Best to document your response to your hydration strategy frequently during training sessions (begin 3-4 months out from key events) to understand your unique needs in various conditions and intensities.

Source: Rodriguez-Giustiniani et al. 2021 Fluid and electrolyte balance considerations for female athletes

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MANAGING HYDRATION CHALLENGES

Common Hydration Related Challenges

- Cramping
- GI distress
- Nausea
- Diarrhea
- Bloating
- Stomach Sloshing
- Weakness/Fatigue
- Overheating

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MANAGING HYDRATION CHALLENGES

What Are We Trying to Achieve With Our Hydration Strategy

- Meet fluid (and energy) demands
- Avoid dehydration or hyponatremia
- Avoid GI (i.e., gut) distress

***Rate of Fluid/Calorie Absorption is intensity dependant**

- Harder the effort the less you can absorb
- As intensity increses the easier your fluids and calories need to be to digest

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MANAGING HYDRATION CHALLENGES

Sources of Fluid Hydration and Energy (per hour)

- Water 500-1000ml

- Electrolytes (300-600mg Sodium, 100-200mg Potassium, 30-60mg Magnesium)
    - Liquid carbohydrate 30-90 grams (120-360 cals

- Glucose or Maltodextrin + fructose + blend appears to work well for absorption
        - 1:0.5 or 1:1 glucose or maltodextrin to fructose ratios
        - Superstarch (UCan)

MANAGING HYDRATION CHALLENGES

Many Hydration Related Problems are a consequence of TOO x 3:

1. **TOO MUCH INTAKE**
   - Trying to ingest too much fluid
   - Too much water without electrolytes
   - Too many calories at once and/or too often
2. **TOO MUCH INTENSITY**
   - Intensity is too high affecting absorption
3. **TOO LITTLE INTAKE**
   - Too little fluid, electrolytes, and/or calorie intake

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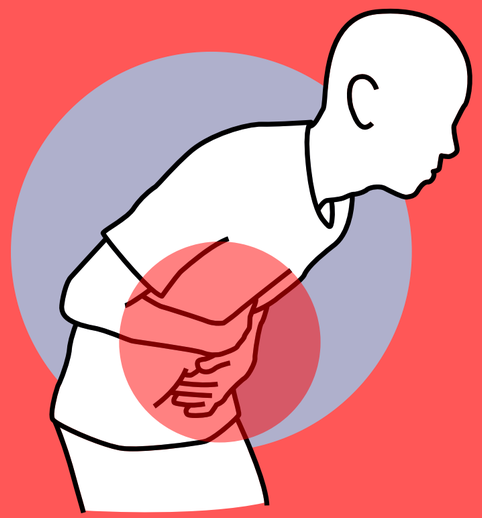
MANAGING HYDRATION CHALLENGES

If you experience:

- abdominal cramping
- stomach upset
- diarrhea
- GI distress



Possible Cause:
TOO MUCH INTAKE

POSSIBLE SOLUTION

- Decrease or stop carbohydrate intake
- Swish and spit
- Decrease intensity until it subsides
- Smaller sips and bites
  - chew solids completely before swallowing
  - take with water can help absorption (every 5-15 minutes)

MANAGING HYDRATION CHALLENGES

If You Experience:

- **Bloating**
- **Stomach Sloshing**
- **Extremity Swelling**

Possible Cause:
TOO MUCH WATER/ LOW ELECTROLYTES

POSSIBLE SOLUTION

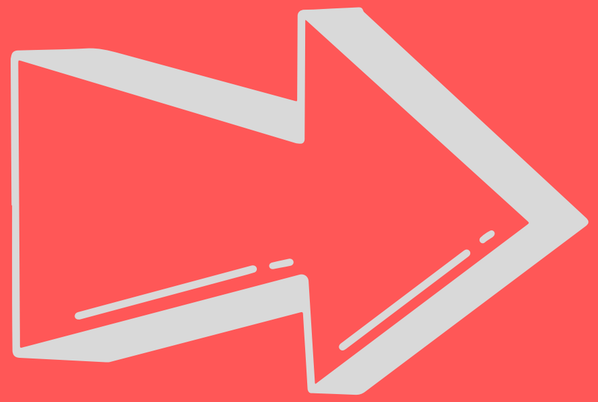
- **Check electrolyte vs water intake up until that point.**
  - **Add electrolytes to fluid intake if not meeting target (~500mg sodium)**
- **Swish and spit**
- **Decrease intensity until it subsides**
- **Small sips**

MANAGING HYDRATION CHALLENGES

If You Experience:

- Weakness
- Fatigue
- Overheating

Possible Cause:
TOO LITTLE INTAKE



POSSIBLE SOLUTION

- Heat and humidity
  - increase hydration needs (less required in cooler temperatures)
- Increase fluid, calorie, and electrolyte intake
  - e.g., 500ml water +300-600 mg sodium, 30-60 grams of carbs
  - small sip increments (every 5-10 minutes

CUSTOMIZE THROUGH DOCUMENTATION

Key Areas To Document:

- What did I consume during the session and at which time intervals?
- How much fluid (ml or litres)?
- How many calories (fluid and solid calories)?
- How much electrolytes (Sodium, Magnesium, Potassium)?
- What did you take in (which products)?
- Temperature + wind conditions during ride.
- Intensity of the session (e.g., smart watch data) and how you felt.

4.5 Hour Ride

[redacted] **SUN June 26, 2022**

Legs felt a bit tired during the warmup but settled in as the workout progressed. The zone 3 hill and out and back felt sustainable and I felt good throughout. Tried to stay consistent in my zone 3 and never felt that I wasn't able to maintain it.

[redacted] **SUN June 26, 2022**

Hydration:
3 bottles of skratch each containing 400cal.
Drank roughly every 15 to 20min or when feeling thirsty.

Nutrition:
3 pb and jelly rice cakes. Each 150cal
Ate 1 when we got to lumsden hill. 2nd one halfway through the hill workout. 3rd one on the last climb before heading home.

[redacted] **SUN June 26, 2022**

1650 total cal intake
2130ml total hydration intake

[redacted] **SUN June 26, 2022**

9c at start of ride and getting to 20c by the end

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CUSTOMIZE THROUGH DOCUMENTATION:

SAMPLE HYDRATION NUTRITION JOURNAL

Session:

- **2 hour ride 6:30-8:30am Saturday Morning**
- **4 x 15 minute Z3 tempo intervals with 10 minutes easy recovery between intervals**

Time	Fluid Description	Fluid Amount (ml)	Solid Description	Solid Cals	Sodium mg	Magnesium mg	Potassium mg	Temp (C)	Wind	Humidity	Effort Scale (1 to 10) 1=very easy, 10 max effort	Calories Expended	How did I feel?
Pre - Session	water	1000	45 min prior to ride - 1 Scoop of Whey protein powder (130 cals), Banana (100 cals), 1 packet of LMNT (10 cals)	240	1000	60	200	Indoor (20C)	N/A	N/A			Good. Well rested
Hour 1	water	850									4	650	Consistent energy and power
Hour 2	water	850	1 scoop of Skratch Hydration Mix	80	380	39	39				6	750	Legs started to feel a little heavy in the last 20 minutes of the ride.
Totals During		2700		320	1380	99	239				5	1400	Maintain power targets and consistent effort throughout. Feel good!

- Additional Information for further insight:
  - Pre and post session body weight to measure fluid loss?
  - Any cramping, GI distress, nausea, pain, dizziness, chills, etc.?
  - Female - What day in your cycle was this session completed?
  - Want to use what the race course will provide for hydration? Practice with it in training!

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HYDRATION SYSTEMS

PROS AND CONS

Type	Pro	Con	Example
Water Bottle	• Easy to store multiple on a bike frame • Can manage intake easily • Easy to clean, inexpensive	• Need practice to retrieve on bike • Can run out of fluid as bottles are small volume • Not comfortable to carry in hand • Need carrying belt or vest • Can change arm swing • Can run out of fluid as bottles are small volume	   
Hydropack	• Hands free, easy to sip anytime while running (more challenging on the bike) • Can hold higher volumes of liquid	• Can be hot and more clean up time • Bouncing, chafing • Difficult to tell how much fluid is being consumed • Bulky - effect aerodynamics on the bike	 
Handheld Flask	• Can fit into jersey pocket to hold gels • Light, fits to palm, 6, 8, 12 oz • Often options to carry other items like gel packs, gummies, etc.	• Can change arm swing • Not hands free	
Running Belts	• Extra storage • Bottle or flask option • Can carry own energy supply solid or liquid • Since many large races are banning hydration packs, these are a great option.	• Can change arm swing • Unequal weight distribution of items can impact gait • Bouncing, chafing	 

Thank you!

Let me know if you have questions or clarifications.

Need some help? Contact me here…

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