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HOW TO STAY HYDRATED AT THE PARIS PARALYMPIC GAMES?

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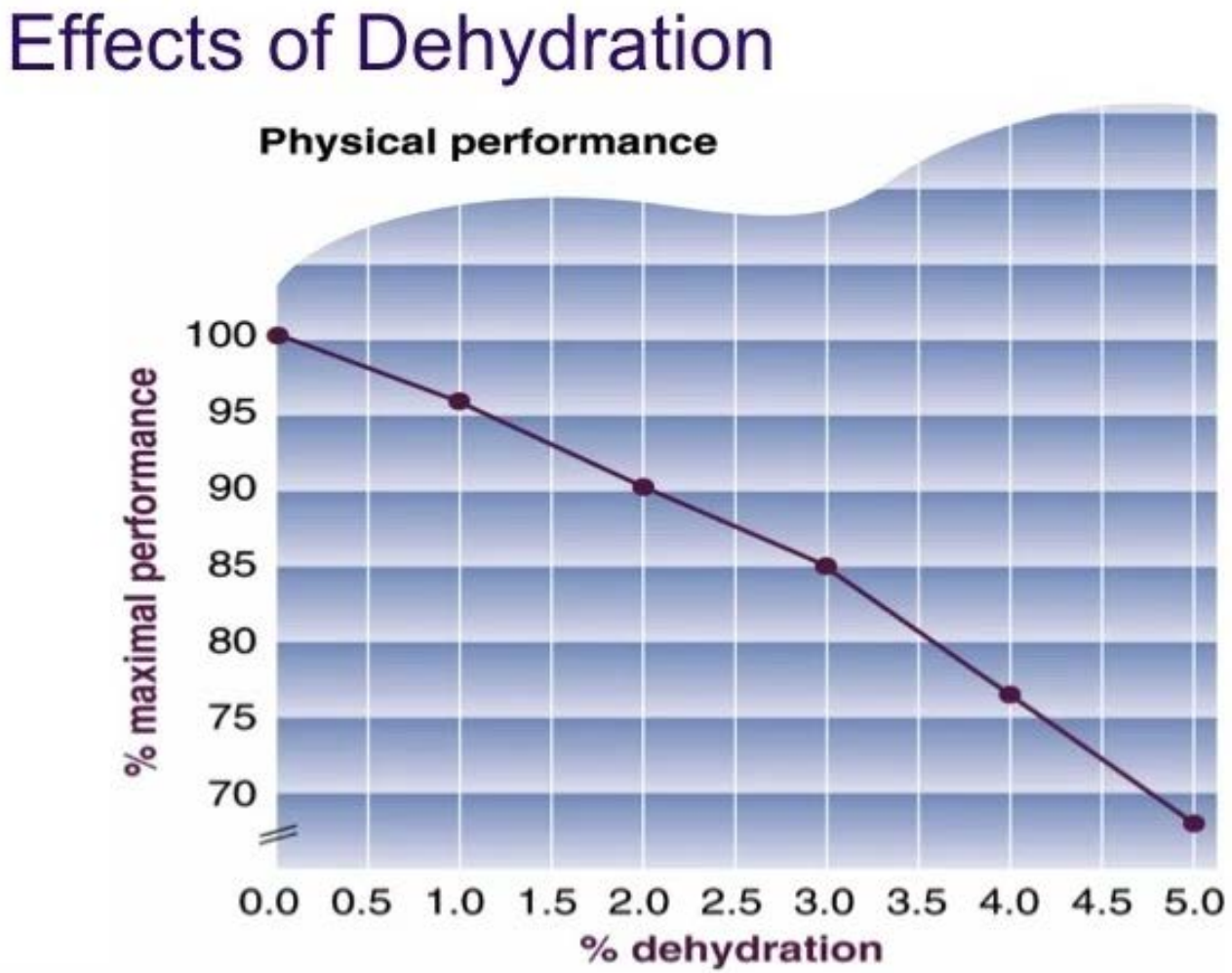
INTERNATIONAL PARALYMPIC COMMITTEE

DEHYDRATION IMPAIRS PERFORMANCE - FACT 2



Dehydration can reduce:

- **Aerobic performance**
- **Strength**
- **Power**
- **Concentration**
- **Decision making**

By the time you are thirsty, you are already dehydrated by ~ 2% of body weight

PREPARING YOUR HYDRATION STRATEGY FOR THE HEAT AT PARIS 2024

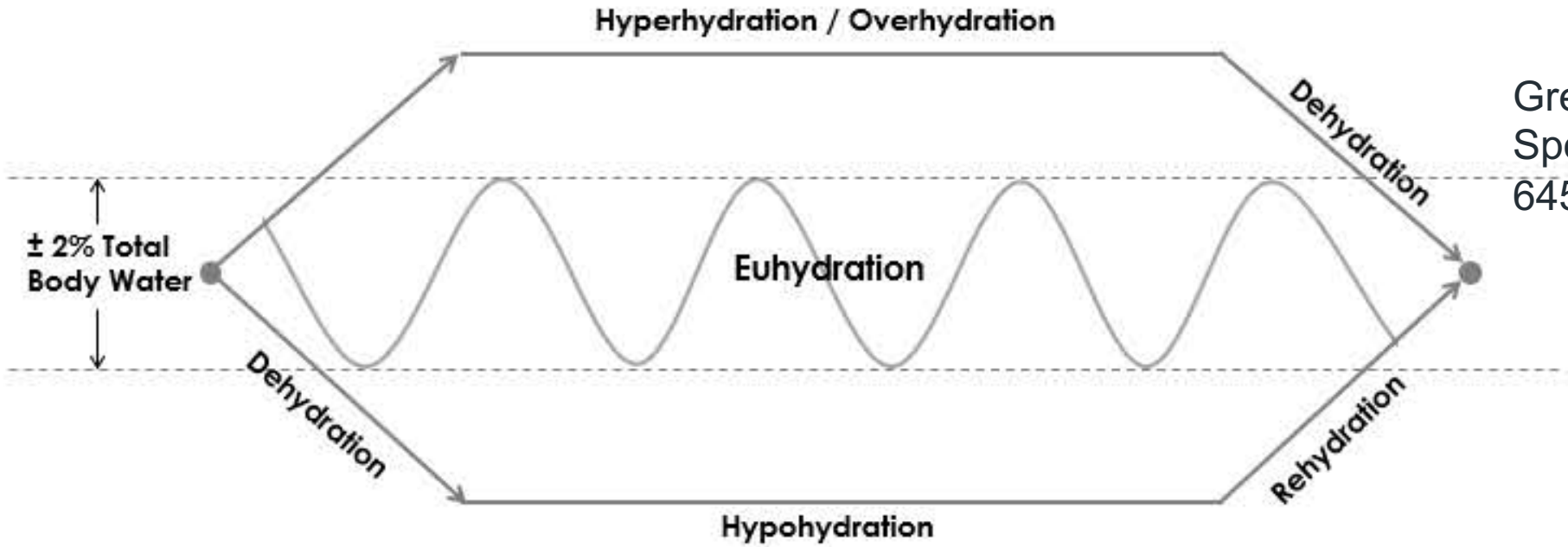
1. The Para athlete will encounter a unique challenge in Paris that will **impact their thermoregulation and hydration**

2. As you acclimatise to the Paris heat, **your sweat rate will increase** to control your temperature – but you also need to replace it – extra fluid needed

3. Simple measures exist to allow **athletes to measure their own hydration status**

4. All athletes should have a **practiced individual hydration strategy** in place prior to Paris

HYDRATION TERMINOLOGY



Greenleaf, Med Sci Sports Exercise 1992 (6), 645-656.

Euhydration – "normal" body water content within body's homeostatic range

Dehydration – the process of dynamic loss of body water – e.g., the transition from euhydration to hypohydration

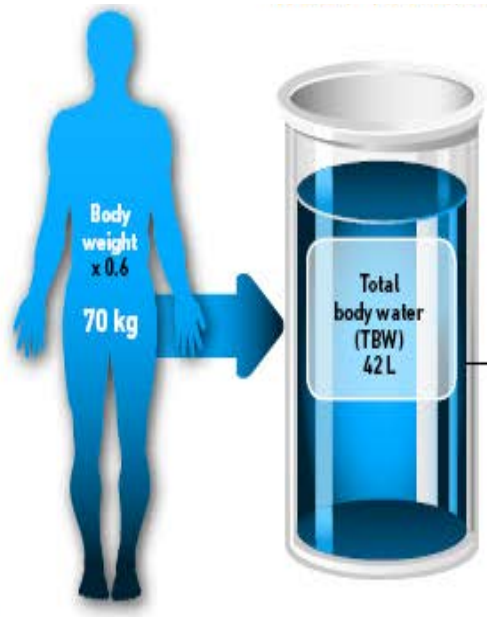
Hypohydration – state of body water deficit

Rehydration – the process of a dynamic gain of body water (via fluid intake) – e.g., the transition from hypohydration to euhydration

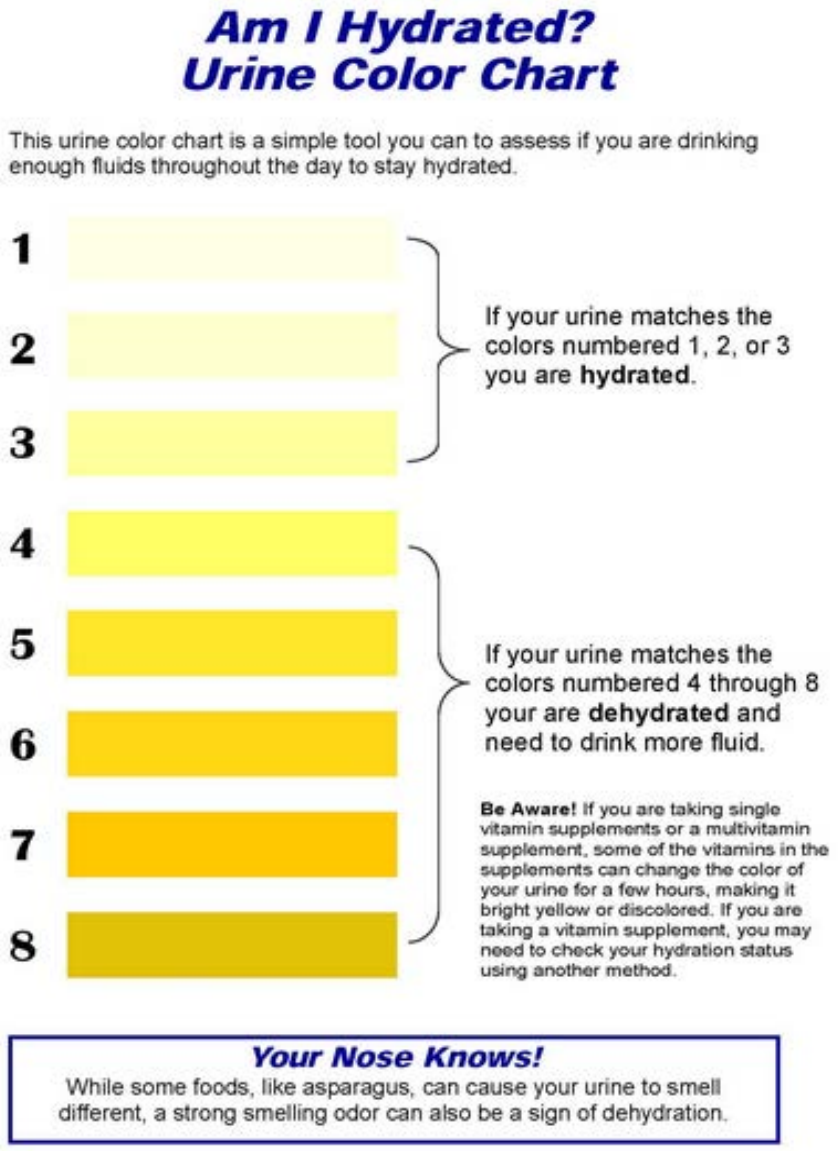
Over- or Hyperhydration – state of body water excess

WHY SHOULD I STAY HYDRATED?

1. Water makes up 50-70% of body mass
2. Drinking fluids can cool you down and help reduce a heat-related illness
3. For some Para athletes, different cooling methods may be needed due to reduced sweating and impaired thermoregulation
4. Dehydration can lead to athletes making poor decisions in competition – not just physical effects
5. Being dehydrated can impair performance in some sports



HOW CAN I CHECK IF I AM HYDRATED?



Urine Frequency or Volume

- **Athletes can monitor: urine colour/frequency/volume, thirst sensation**
- **Sport scientists might measure your urine osmolality or specific gravity**

You can also weigh yourself first thing in the morning to check if you are dehydrated based on your ‘typical’ weight

Use two or more indicators of hydration status

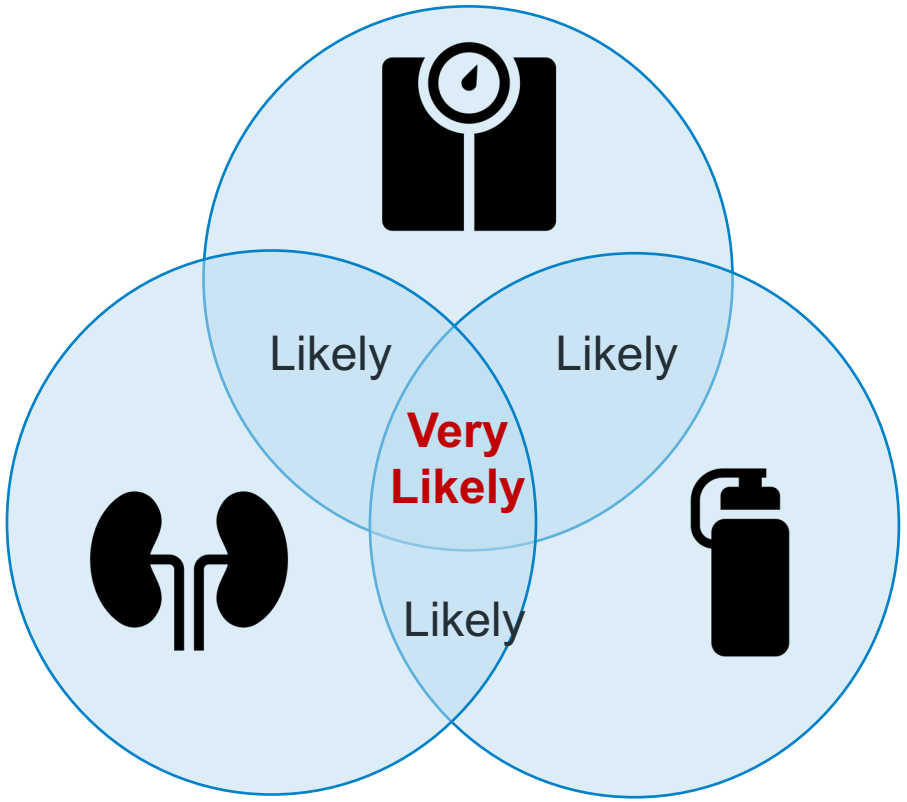
ARE YOU DEHYDRATED?

Is my body mass >1% lower than normal

Yes / No

Is my urine dark yellow?

Yes / No



Am I Thirsty?

Yes / No

Assess first thing in the morning (before breakfast)

CALCULATING YOUR OWN HYDRATION STATUS

Hydration status = % change in nude body mass
Calculation: [(Δ body mass) / baseline body mass]*100

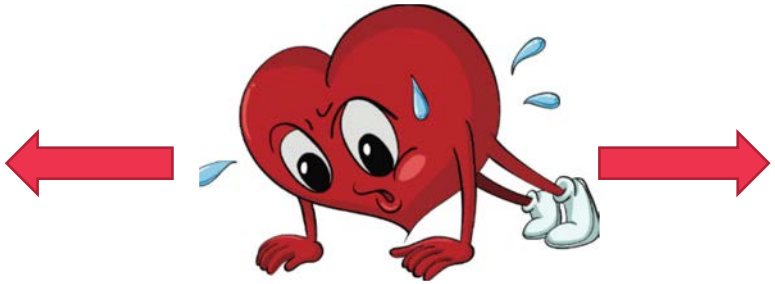
Example: Athlete X's body mass decreased from 65.3 kg to 63.8, so a Δ body mass = - 2.2 kg

Hydration Status
= [(Δ body mass) / baseline body mass]*100
= (-1.5 / 65.3) * 100
= **-2.3% change in body mass**

Equipment Needed

Body weight scales to 0.10 kg or better and towel

CAN I WORK OUT MY SWEAT RATE DURING EXERCISE TO KNOW MUCH FLUID TO TAKE ON AFTERWARDS?



Weight before exercise (minimum clothes)

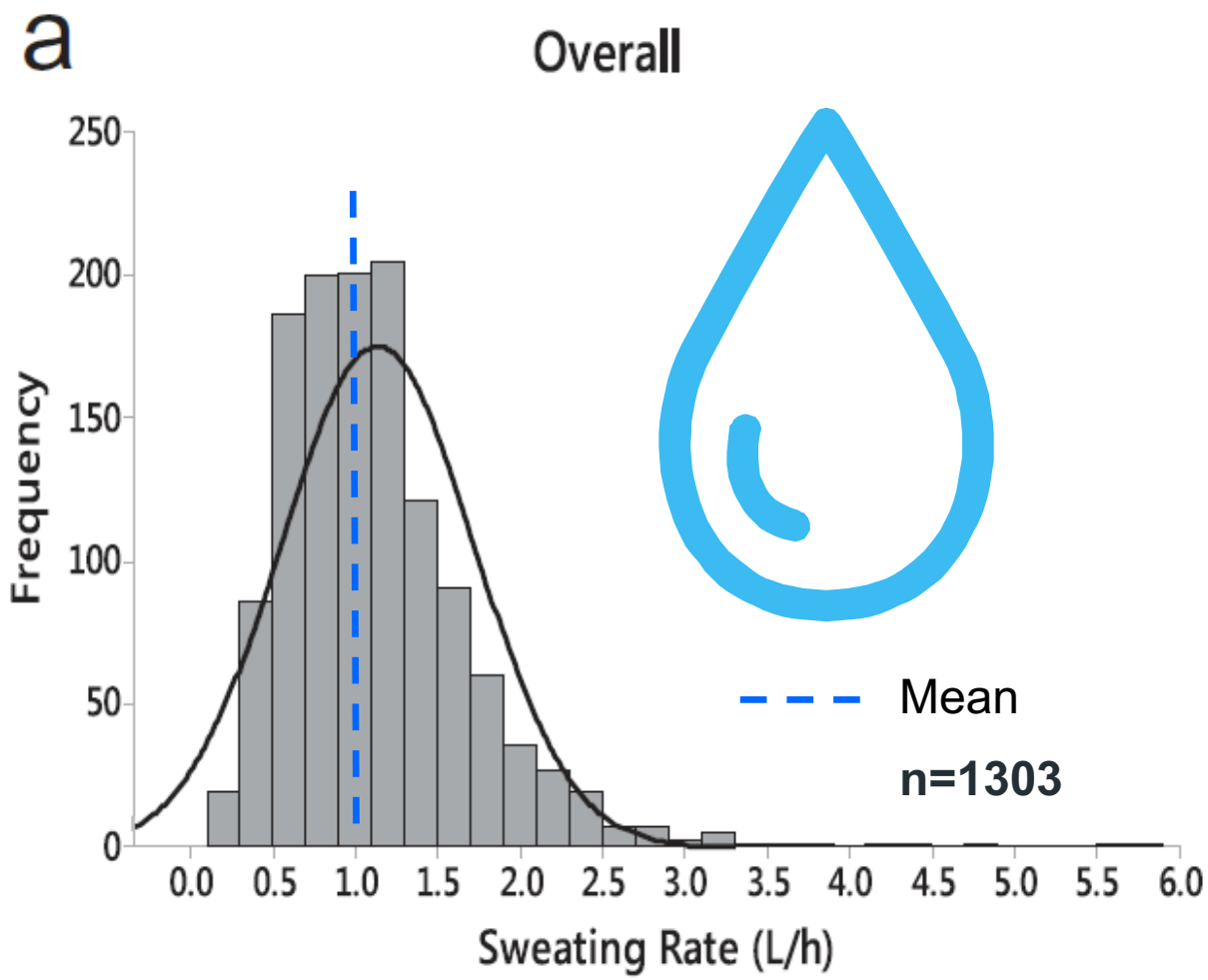
Duration of exercise (in hours)

Weight after exercise (towel dry)

Acute body mass change to estimate hydration status is appropriate for most individual and team sports < 3 h of exercise

$$\text{Sweat rate (Litres per hour)} = \frac{\text{Weight before exercise} - \text{Weight after exercise}}{\text{Duration of exercise (in hours)}}$$

WHAT IS A NORMAL SWEAT RATE?



Athlete, Environment, and Exercise Information	Mean ± SD (Range)
Age (years)	24 ± 9 (9-70)
Body Mass (kg)	84 ± 24 (23-178)
Air Temp (°C)	26 ± 5 (11-50)
Relative Humidity (%)	55 ± 17 (13-95)
Exercise Duration (h)	1.7 ± 0.7 (0.5-5.4)

Para-athletes can determine their own sweat rate when competing in the heat to help develop an individualized fluid strategy.

Some para-athletes (amputees, spinal cord injured, with multiple sclerosis) will not perceive heat as much to drink and/or sweat as much as able-bodied athletes.

HOW TO CALCULATE FLUID TO DRINK FROM WEIGHT LOSS?

Weight before – Weight after = Weight lost

Weight lost x Weight before = Amount to drink

Rehydration required based on weight lost

WEIGHT LOST	AMOUNT TO DRINK
0.2 kg	300 ml
0.5 kg	750 ml
1.0 kg	1.5 L
1.5 kg	2.25 L
2.0 kg	3 L

It is easy to work out how much you need to drink after exercise, you just need to weigh yourself before and after your activity. It is recommended that you drink 1.5 times the amount of sweat that is lost, assuming that 1kg equals 1L of water

OR

use the table to find the amount you need to drink

SHOULD I PLAN DRINKING OR DRINK TO THIRST?

Drink to Thirst

Short duration activities < 60 to 90 min
Cooler conditions
Lower intensity

Planned Drinking

Longer duration activities > 90 min
Particularly in the heat
High intensity
High sweat rates
When performance is a concern
When carbohydrate intake of 1 g/min

Some athletes with a spinal cord injury may deliberately reduce fluid intake to avoid repeated visits to the bathroom, but this increase dehydration, resulting in fatigue, reduced performance and likelihood of urinary tract infections

Kenefick (2018)

WHAT ARE MY FLUID NEEDS BEFORE AND AFTER EXERCISE?

Guiding principles for para-athletes

- Individualized hydration plan based on the athlete's expected sweat rates
- Opportunity to consume fluids during their event?
- Gastrointestinal tolerance of fluids
- Access to fluids
- Ease of access to bathroom during exercise

For para-athletes with high sweat rates, or who consistently show > 2% dehydration during exercise, drinking fluid prior to exercise and drinking regularly during the session is likely to be more effective than waiting until you are thirsty

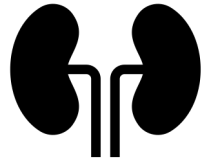
Training sessions can be useful for trialling timing, volume and type of drink the para-athlete needs

DO I NEED SODIUM (SALT) IN MY DRINK?

Sodium **stimulates thirst** – which leads to increased fluid intake

Sodium helps **maintain proper fluid and electrolyte balance** in the body

Sodium supports **how well your heart functions** during exercise through better maintenance of blood volume



Sodium stimulates your kidneys towards **better fluid retention**

Consume sodium with fluids if exercise is >2 h, in hot weather and/or if sweat electrolyte losses are known to be very high

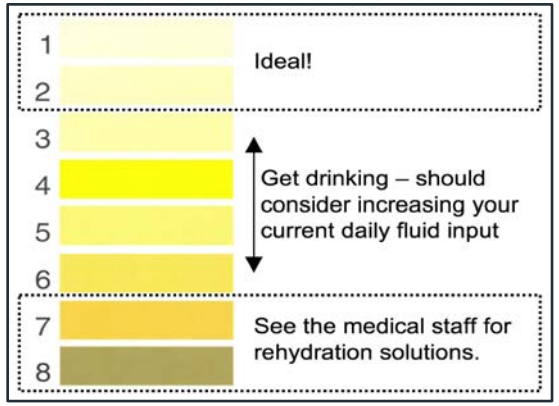
WHAT FOODS CAN HELP ME STAY HYDRATED?

Remember to always drink with your meals as the electrolytes will assist with fluid retention

Consuming a small salted snack [e.g. pretzels and/or fluids containing sodium (20–50 mmol/l or 460–1150 mg/l) or glycerol (1.2–1.4 g/kg fat-free mass (FFM) with ~ 25 ml/kg FFM fluid)] before exercise may help stimulate thirst and retention of fluids

WHAT ARE 7 GOLDEN RULES OF GOOD HYDRATION PRACTICE FOR ATHLETES?

1. Athletes should **carry fluid with them at all times** - with your own water bottle being distinguishable from other athletes
2. **Ice slurries** can reduce sweat rate and slow heat loss but can be effective in humid conditions like Paris
3. **Too much fluid too quickly** can cause gut discomfort or a need for frequent visits to the toilet. Keep a steady pace of drinking that you have practiced.
4. **Hand Cooling**, while effective at reducing heat, can reduce function and grip, or be difficult for glove wearers. Focus on cooling non-active body parts.
5. Sports drinks have energy in them and **too much carbohydrate can influence the body's ability to maintain thermal balance** in hot environments
6. Water alone is not ideal for hydrating – so **some carbohydrate and electrolytes in fluid helps** the uptake of the fluid and replenishment of energy stores
7. **Know your hydration plan** based on your sport, level of impairment and sweat rate **– then practice it** alongside cooling strategies.



RESOURCES THAT SUPPORTED THIS PRESENTATION

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THANK YOU

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