HOW TO STAY HYDRATED AT THE TOKYO PARALYMPIC GAMES?

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DEHYDRATION IMPAIRS PERFORMANCE - FACT

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

Dehydration can reduce:
- Aerobic performance
- Strength
- Power
- Concentration
- Decision making

Effects of Dehydration

![Graph showing the decline in physical performance with dehydration](chart.png)
PREPARING YOUR HYDRATION STRATEGY FOR THE HEAT AT TOKYO 2020

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

2. As you acclimatise to the Tokyo 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 Tokyo
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

Hydration Terminology

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?

Am I Hydrated? Urine Color Chart

This urine color chart is a simple tool you can use to assess if you are drinking enough fluids throughout the day to stay hydrated.

1
If your urine matches the colors numbered 1, 2, or 3 you are hydrated.

2

3

4

5

6

7

8

If your urine matches the colors numbered 4 through 8 you are dehydrated and need to drink more fluid.

Be Aware! If you are taking single vitamin supplements or a multivitamin supplement, some of the vitamins in the supplements can change the color of your urine for a few hours, making it bright yellow or discolored. If you are taking a vitamin supplement, you may need to check your hydration status using another method.

Your Nose Knows!
While some foods, like asparagus, can cause your urine to smell different, a strong smelling odor can also be a sign of dehydration.

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

Is my urine dark yellow?

Am I Thirsty?

Assess first thing in the morning (before breakfast)
**Hydration status** = % change in nude body mass

**Calculation:** \[ \frac{(\Delta \text{ body mass})}{\text{baseline body mass}} \times 100 \]

**Example:** Athlete X’s body mass decreased from 65.3 kg to 63.8, so a \( \Delta \) body mass = -2.2 kg

Hydration Status
= \[ \frac{(\Delta \text{ body mass})}{\text{baseline body mass}} \times 100 \]
= (\(-1.5\) / 65.3) \times 100
= -2.3% change in body mass

**Equipment Needed**
- Body weight scales to 0.10 kg or better
- Towel
CAN I WORK OUT MY SWEAT RATE DURING EXERCISE TO KNOW MUCH FLUID TO TAKE ON AFTERWARDS?

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

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?

Mean n=1303

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?

Rehydration required based on weight lost

<table>
<thead>
<tr>
<th>WEIGHT LOST</th>
<th>AMOUNT TO DRINK</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.2 kg</td>
<td>300 ml</td>
</tr>
<tr>
<td>0.5 kg</td>
<td>750 ml</td>
</tr>
<tr>
<td>1.0 kg</td>
<td>1.5 L</td>
</tr>
<tr>
<td>1.5 kg</td>
<td>2.25 L</td>
</tr>
<tr>
<td>2.0 kg</td>
<td>3 L</td>
</tr>
</tbody>
</table>

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 1 kg equals 1 L 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 Tokyo.

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.


THANK YOU