

# ULTRA-DISTANCE POTENTIAL MEDICAL ISSUES



## DEHYDRATION

### *Definition*

- A depletion of the body's normal fluid volumes. This occurs when fluid losses exceed replacement rates. In an ultramarathon a certain degree of fluid loss is normal and expected (approximately 1-3% of body weight).

### *Symptoms*

- Varied and non-specific. These range from a dry mouth and reduced urine output, through to confusion, weakness and collapse. Nausea and vomiting can also occur, worsening the situation.

### *Dangers*

- If severe, body systems can begin to fail. Exhaustion can be followed by confusion and collapse. The kidneys can also be damaged in severe dehydration.

### *Prevention*

- DRINK TO THIRST. Drinking a range of fluids with volumes driven by thirst is a sensible approach. If conditions are hot make sure to carry more fluids while running between aid stations.

## EXERCISE ASSOCIATED HYPONATRAEMIA – EAH (low sodium)

### *Definition*

- Low blood sodium levels most commonly due to the combined stress of endurance events and excess water intake during exercise

### *Symptoms*

- Mild EAH can present with symptoms such as nausea or lightheadedness. More significant cases can display confusion, vomiting, seizures and in severe cases cerebral oedema (brain swelling) or pulmonary oedema (fluid in the lungs).

### *Dangers*

- Severe EAH can lead to death or permanent disability through swelling of the brain.

### ***Prevention***

- DRINK TO THIRST. Drink a range of fluids on race day, not just water. Supplement oral fluid intake with food. Avoid drinking to a pre-determined schedule, instead let volumes be governed by thirst.

## **HYPERTHERMIA**

### ***Definition***

- Hyperthermia is when the core body temperature is  $>38.3^{\circ}\text{C}$

### ***Symptoms***

- Varied depending on severity. Heavy sweating, rapid breathing, weakness and dizziness can progress to dry skin, confusion and collapse. High fluid losses often mean dehydration can coexist with hyperthermia.

### ***Dangers***

- Severe hyperthermia (known as 'Heat stroke' when body temperature exceeds  $40^{\circ}\text{C}$ ) can be life threatening with cardiovascular system instability, seizures and coma preceding death.

### ***Prevention***

- Appropriate training in warm conditions, maintaining adequate hydration and sensible equipment choices all work to prevent hyperthermia.

## **HYPOTHERMIA**

### ***Definition***

- Hypothermia is when the core body temperature is  $<35.0^{\circ}\text{C}$

### ***Symptoms***

- Initial signs include shivering, cold peripheries and skin colour change. This progresses to a loss of co-ordination, confusion, and cardiovascular instability. Confusion can make hypothermic patients combative and irrational, including taking off layers of clothes despite the cold.

### ***Dangers***

- Hypothermia can lead to death through a gradual shut down of vital body systems.

### ***Prevention***

- Appropriate equipment choice is a cornerstone of prevention and includes warm post-race clothing for use after the finish.

## **HYPOGLYCAEMIA (low blood sugar)**

### ***Definition***

- In non-diabetic athletes, blood sugar levels  $<2.8\text{mmol/L}$  OR  $<4.0\text{mmol/L}$  with symptoms are considered low. In an ultramarathon this can reflect a complete depletion of fuel that can be used to generate glucose

### ***Symptoms***

- Shakiness, fatigue and hunger can be early symptoms. Confusion, pallor, anxiety, nausea and unusual behavior are examples of more severe symptoms. Symptoms are vague, non-specific and often with a high degree of variation between individuals.

### ***Dangers***

- Low blood sugar can lead to coma and death if not treated.

### ***Prevention***

- Maintaining a consistent nutritional intake through the day is important

## **RHABDOMYOLYSIS**

### ***Definition***

- A combination of severe muscle breakdown with dangerous effects around the body from the waste products of this muscle breakdown

### ***Symptoms***

- Symptoms include dark ('coca-cola' coloured) urine, excessive muscle soreness and fatigue. Muscle pain can range from a general ache to severe. As rhabdomyolysis progresses, fatigue, nausea, lack of urine output can occur. By this point, other complications can also become symptomatic.

### ***Dangers***

- Severe rhabdomyolysis can lead to kidney damage, electrolyte disturbances and in severe cases multi-system organ failure.

### ***Prevention***

- Maintaining a consistent fluid intake during the day and monitoring urine output
- Paying attention to muscle pains, being prepared to stop if pain is severe
- Never using NSAID medications

## **OTHER MEDICAL CONDITIONS AND CONSIDERATIONS**

### **Exercise associated collapse (EAC):**

- It is common for ultramarathon runners to collapse shortly after finishing. Most cases are due to a process known as EAC which occurs because your muscles are no longer contracting and helping to pump blood back to your heart. This can result in a temporary drop in blood pressure and runners may feel very lightheaded or even collapse.
- The best way to prevent this is to continue walking for a few minutes after the finish until your body readjusts. The medical team may approach a runner who has crossed the finish line to ensure they keep moving (walk slowly for 20sec) to prevent EAC. However, any runner who collapses will be assessed in the medical tent to ensure no other cause of collapse has occurred.

### **Kidney damage:**

- Damage to the kidney can occur through a number of mechanisms. These include dehydration, rhabdomyolysis and NSAID (non-steroidal anti-inflammatory drugs) use. When these factors are combined the risk of kidney damage can increase dramatically. Therefore the best way you can reduce your risk is to adequately hydrate and AVOID ALL NSAIDs!

### **Gastrointestinal upset:**

- Symptoms such as vomiting, abdominal cramping and diarrhea are common in ultramarathon runners with a wide range of potential causes. Affected runners should all seek medical attention during or after the race. NSAIDs are widely known to cause gastrointestinal symptoms and are another reason to avoid these medications.

**Exercise induced haematuria (blood in urine):**

- Blood in the urine is a common complaint amongst ultra-distance runners. It is usually benign and a range of mechanisms are proposed including irritation of the bladder lining and breakdown of red blood cells during foot-strike. It can however be a sign of more serious bladder or kidney pathology.
- If you have red or very dark coloured urine during or after the race you should seek the assistance of the medical team for advice. They will ask questions to assess for other causes of red/dark urine. The mainstay of treatment is observation and affected runners will be advised to follow up with their GP.

**Trauma:**

- Falls, trips and tumbles are inevitable in an off-road event. Injuries can range from superficial abrasions and strains through to serious fractures and life threatening bleeding. The on course and finish-line medical teams are prepared for a range of injuries. If concerned with an injury seek medical attention.

**Blisters:**

- While seldom life threatening, a blister can ruin a race. There is also the risk of infection in the days following the race.
- Choose your race day equipment wisely and be sure to prevent blisters where possible. Treatment of severe blisters can include close follow up with regular dressing changes and in some cases antibiotics.