



DEHYDRATED?

By Flying Officer Gareth Iremonger, Aerospace Physiologist Officer



Dehydration can be defined simply as a loss of water and salts from the body. Maintaining adequate hydration and electrolyte balance is essential. Our bodies depend on water for just about everything: temperature regulation, the elimination of waste, digestion and the transport of nutrients. Yet we are constantly in a state of loss through perspiration, respiration and excretion, which our body tries to control through a range of physiological processes. These processes are temporary and without restoration of fluids through drinking, the changes induced can combine to increase cardiovascular and thermoregulatory strain by delaying the onset of sweating, reduced skin blood flow, stroke volume of the heart and cerebral blood flow.

But what does this mean? Well, quite simply it means that dehydration can affect your performance. The effects of dehydration on physical performance are well known but possibly not as important to us as they are to athletes. Flying duties involve limited amounts of physical activity, yet the cognitive workload of flying over several hours can be immense, especially when flying in difficult and technical conditions. The potential for dehydration, heat/cold stress (or their combination) to reduce cognitive performance and contribute to an incident or accident is high. So, given the importance of cognitive functioning when flying, it is important to remember that even a small possibility of pilot error can have disastrous consequences. The coroner noted that dehydration was a significant factor in the fatal accident of Trevor Atkins at Matamata in 2008.

So, here we are telling you that you need to stay hydrated, and you are probably thinking to yourself that you have heard this all before and have never had a problem. Think about a time you last made an error in flight. Were you aware of your body's physiological state? Were you feeling at your peak? Ok, so maybe you weren't as hydrated as you thought. What can you do about it?

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To start with you need to drink adequate amounts of water.

How much water should you drink every day? There is no easy answer, as everyone has different requirements. How much water you need depends on many factors, including your health status, how active you are and the environment in which you live. It has been recommended that we should drink six to eight glasses of water a day; indeed, this is a good guide, although there is no research-based evidence to support this. A better recommendation is to use the colour of your urine as a guide to how much water you should be drinking. Your urine should be a very light-coloured yellow. If it is a deep yellow then it is likely you are not drinking enough water.

Dehydration can be insidious. You need to be aware of the risk and take preventive measures by drinking small amounts consistently. Even at quite moderate levels of dehydration, voluntary unimpeded rehydration to achieve normal levels may take a long time (>1 hour) so constant drinking of small amounts is best practice to stay ahead of the game. Do not rely on thirst to be the signal that you need water. By that time, you are already on your way to dehydration. Although sometimes difficult in gliders, finding a good system to keep hydrated in flight is highly recommended. Avoid the "tactical dehydration" option of not drinking prior to flight. Although this might mean that you don't have to deal with an in-flight pit stop, extreme dehydration in-flight can be fatal and therefore not a wise choice. Plan to carry sufficient water for the flight and have it well within reach. It is recommended that additional water be carried in case of landing out, as you never know how long you might be out there.

Caffeine is great way to stay alert however excessive use should be avoided, especially prior to flight. Caffeinated and alcoholic beverages can actually make dehydration worse, increasing urine output. Water is the best alternative to high-sugar, high-calorie energy drinks and is an excellent way to maintain a healthier lifestyle. Use sports drinks diligently and only use when required; again, water should suffice unless you are in fact already dehydrated.

Recognise environments with increased risk of dehydration. Think about additional factors that may also cause dehydration, including lengthy runway 'standbys' in hot environments, ground duties between flights, and poor airfield conditions (no air-conditioned briefing room; no standing protection of the aircraft against solar radiation). Minimise your exposure to the heat of the day, rest and hydrate. The risk of dehydration and concomitant heat strain should always be considered whenever operating under conditions requiring various combinations of high work rates, heavy or insulative protective clothing, and hazardous environmental conditions. Manage appropriately what clothing is required for the expected cold at high altitude versus the heat strain and potential dehydration operating at low altitudes and on the ground.

Lastly, monitor your health state. Vomiting, diarrhoea, fever and many illnesses such as influenza or the common cold accelerate fluid loss. Make sure when you do go flying you are medically fit to fly. Knocking off early and calling it quits because your body is not quite at its peak is not a sign of weakness, it's a sign of a professional making smart decisions. I challenge you to think hard about that next time you are out there. That thought that you normally ignore, listen to it next time, be a professional and make a smart decision.

Till next time, safe soaring.

The Royal New Zealand Air Force (RNZAF) Aviation Medicine Unit (AMU) is one of New Zealand's premier aviation medicine training organisations. The mission of the RNZAF AMU is to provide specialist medical and scientific support and training to the RNZAF in the field of Aviation Medicine; and to provide the most effective medical support through training to all aspects of Air Operations.

Located at RNZAF Base Auckland, AMU provides the following specialist aviation medicine support:

Aviation Medicine Training for Aircrew. AMU runs aviation medicine courses for aircrew on all aircraft types. Practical training includes hypoxia awareness training in a hypobaric chamber; spatial disorientation; and Night Vision Goggles (NVGs) and night ops familiarisation.

Training for Specialist Personnel. AMU provides training in Aero Medical Evacuation (AME) to doctors, medics and flight nurses.

Support to Commands. AMU provides in-depth expertise in Aviation Medicine for advice in the field of aircrew personal equipment and life support systems.

Clinical Support for Aircrew. Clinical investigations of aircrew are carried out as tasked by the Director of Air Force Medicine and include studies into human performance.

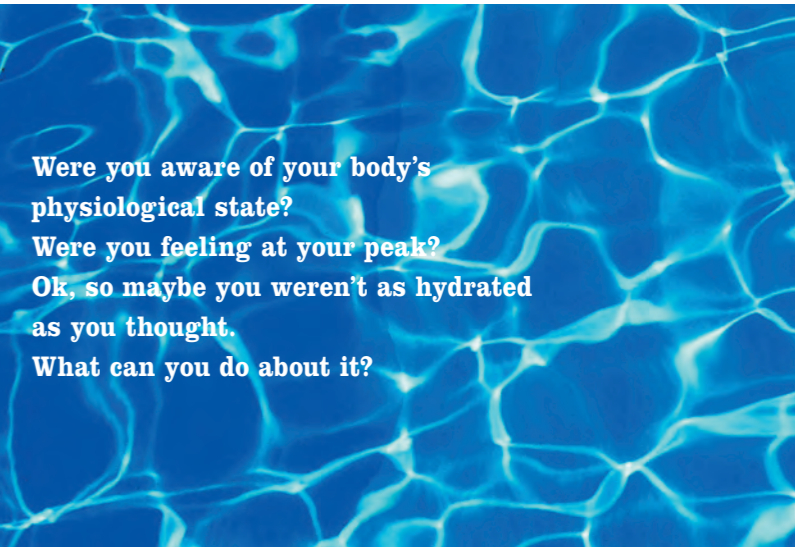
Aviation Pathology. AMU provides support to medical aspects of military fatal aviation accidents.

RNZAF Medical Boards. The RNZAF Medical Board is responsible for approving and effecting both temporary and permanent changes to all RNZAF patient's medical employment standards.

For more information on the Aviation Medicine Unit, hypoxia awareness training or general inquires on other training, please contact the Aviation Medicine Unit on (09) 417 8932 or email AKAMUTRAINING@nzdf.mil.nz

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Were you aware of your body's physiological state?
Were you feeling at your peak?
Ok, so maybe you weren't as hydrated as you thought.
What can you do about it?