



**SPORTS
EXCELLENCE**



Running in Hot Weather Brief Practical Guidelines



Giannis Psarelis - Triathlon Lab
Athens BSc, BSc, MSc, MBA

Triathlon Lab
Scientific Partner - Sports Excellence



Under the scientific supervision

HELLENIC REPUBLIC
**National and Kapodistrian
University of Athens**

1st Dept. of Orthopaedic Surgery, School of Medicine
University General Hospital "ATTIKON"

Exclusive Donor



ΙΔΡΥΜΑ ΣΤΑΥΡΟΣ ΝΙΑΡΧΟΣ
STAVROS NIARCHOS FOUNDATION

Race Day Weather Forecast(21:00)

Temperature : 31 Celsius Degrees

Humidity: 44 %

Wind : 2Bft from South- West direction



From : www.meteo.gr

The organizers will inform the participants about weather conditions continually prior to the race

CONTENTS

What steps can be taken to minimize the risk of heat illness?

Race Day – Brief Tips

Sports Medical Australia- Some Golden Rules for Training and Competition

Medical Aid Stations

Water Aid Stations

Heat Related Disorders

Factors that increase the risk of heat illness include amongst others

Adjusting training and competition intensity to conditions

Timing of sessions

Heat waves

Summary of the main recommendations for hydration

References



**SPORTS
EXCELLENCE**

What steps can be taken to minimise the risk of heat illness?



Acquiring adequate fitness and acclimatization



Adjusting training and competition intensity to conditions



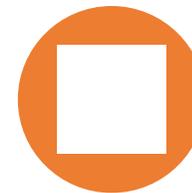
Timing of sessions



Clothing



Modifying warm-up



Hydration

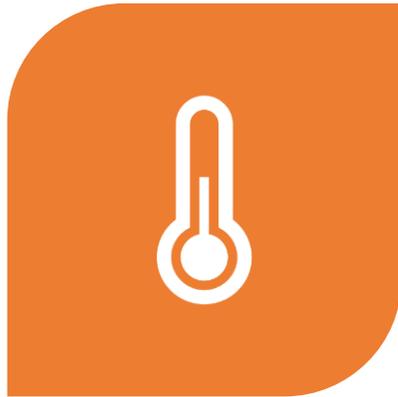
Clothing



Choose proper clothing for warm conditions that will allow easy evaporation of sweat from the skin.

Choose light coloured clothing (avoid dark colours) , light weight and loose fitting, and with high UV protection.

Modifying warm-up



IN HOT CONDITIONS, THE
DURATION AND INTENSITY OF A
WARM-UP SHOULD



BE REDUCED TO MINIMISE THE
INCREASE IN BODY HEAT AND



TEMPERATURE BEFORE
COMPETITION

Drinking (Hydration)



Substantial amounts of water are lost through sweating when exercising vigorously in the heat. During strenuous exercise sports



people often replace only half their sweat losses, but they tolerate moderate levels of dehydration well.



To minimise dehydration, drink about two cups of water in the 2 hours before exercising. During exercise lasting 60 minutes or longer, 2-3 cups (500-750 ml) of cool water or sports drink per hour are sufficient for most sports.



Dehydration is rarely the sole cause of sports heat illness, but maintaining an adequate water intake assists temperature control.



Carbohydrate and electrolytes in sports drinks help to maintain performance in endurance events.



Water intake exceeding sweat loss in events lasting several hours can lead to the harmful condition of hyponatraemia (low blood sodium)

When should I consider not to participate ?

- Low Degree of Physical Fitness (e.g. Running 2-3 per week the last 6 weeks)
- Dehydration
- Lack of Heat Acclimatization
- A previous History of Heat Stroke
- Certain Medications including diuretics & antidepressants
- Illness/ Virus Infection the last 7-10 days especially those involving fever, respiratory infections, diarrhea e.tc.
- Haven't done Cardio exams the last 4-6 months
- Covid-19 the last Weeks: Consult your doctor



Race Day – Brief Tips

- Adequate fluid consumption before- during and after the race. Consistent Hydration (6ml/ body weight the last 2-3 hours)
- Light Lunch
- Stay away from the sun
- Reduce Warm up length
- Re-adjust the running pace. Consult your Coach.
- Participate with the Goal to do an easy run. It's not a race. You are advised to choose a comfortable running speed
- Choose Clothing with easy evaporation of sweat from the skin. It should be light coloured, light weight and loose fitting



Sports Medical Australia- Some Golden Rules for Training and Competition

Achieve	Exercise	Do not undertake	Drink	Stop	Stop
Achieve a high level of physical fitness before exercising strenuously in competition, or in warm weather.	Exercise at moderate intensity in hot or humid conditions.	Do not undertake hard exercise, or exercise in hot or humid weather if you feel unwell or are recovering from recent illness.	Drink water before and during exercise.	Stop exercise if you feel unwell when exercising hard, or if exercising in hot or humid weather.	Stop other sports participants if they appear unwell, confused or show loss of skill and coordination.

Medical Aid Stations

Medical Teams will be positioned at the following

- Start of the Race (Panathenaic Stadium)
- 3th km
- 4,6th km (Syntagma Square)
- 6th km
- 7th km
- 8th km (Mobile Unit)
- 9th km
- Finish Area - SNFCC

Mobile Medic Teams

- 3 Para medics motorcycles
- 4 Ambulances around the course & at the finish area
- 2 Mobile medic teams following the last runner (both races 6km and 10 km)

Water Aid Stations

Start Area

3,5th km

6,1th km

8th km

9th km

Finish
Area

Heat Related Disorders

Heat Cramps

Heat Exhaustion

Heatstroke

Heat Cramps

- Heat cramps are considered as the least serious of the three heat disorders,
- They are characterized by severe and painful cramping of large skeletal muscles that are most usually heavily used during exercise.

Heat Exhaustion

- Heat Exhaustion usually is accompanied by such symptoms as extreme fatigue, dizziness, nausea, vomiting, fainting, and a weak, rapid pulse.
- People who are unfit or not acclimated to the heat are more exposed than others to heat exhaustion.

Heatstroke

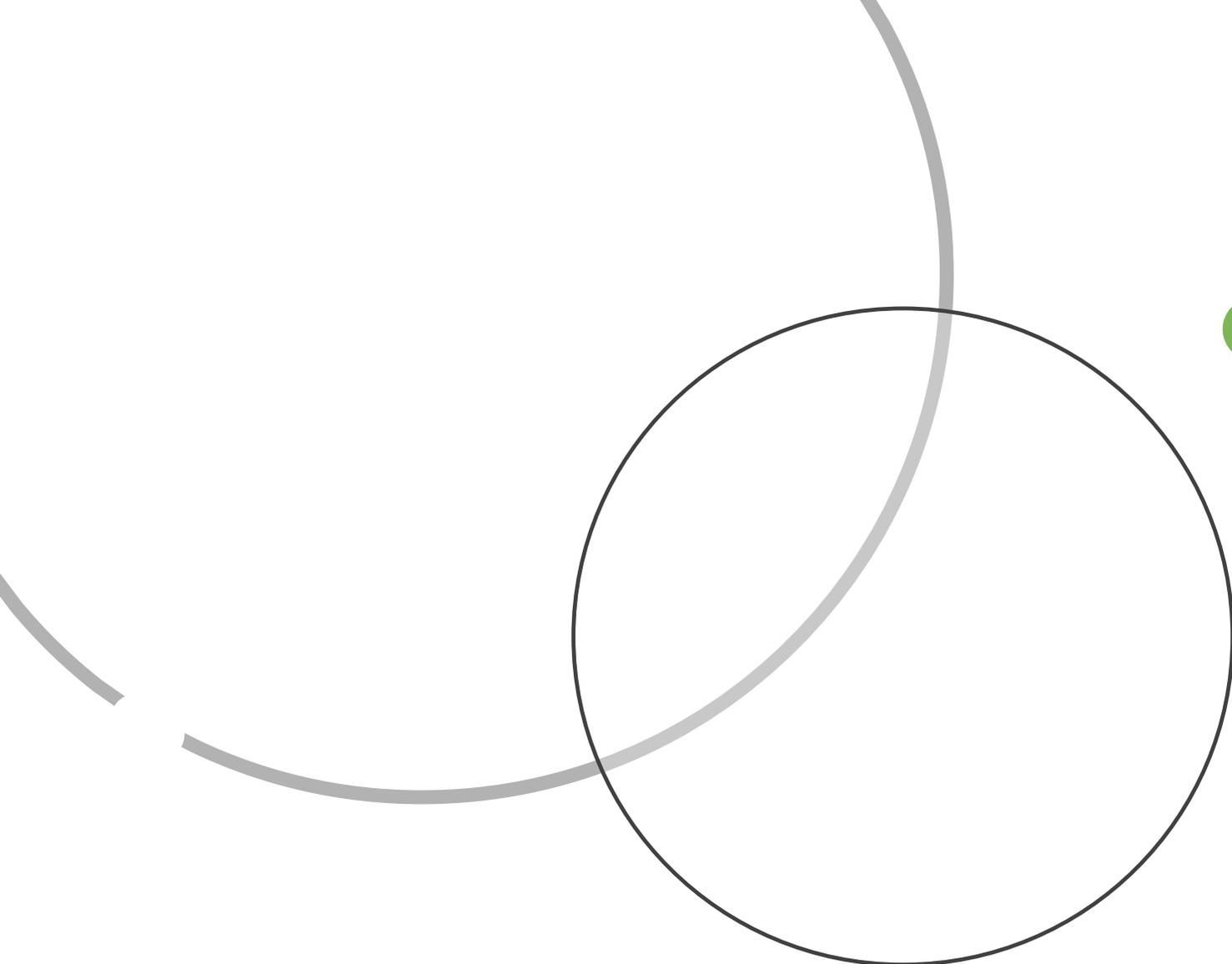
- Heatstroke is considered a life threatening that is caused by failure of the body's thermoregulatory mechanisms heat disorder and demands immediate medical attention
- Internal body temperature : exceeding 40 Celsius Degrees.
- Symptoms : Confusion, Disorientation, or unconsciousness.
- Runners who show signs of altered mental function, loss of consciousness or collapse during exercise are likely suffering heat stroke.
- Runners showing signs of confusion, loss of skill, loss of coordination or irrational behaviour should be stopped and removed from the field immediately.

Factors that increase the risk of heat illness include amongst others:

- Lack of fitness (due to insufficient training that includes some at competition intensity and duration).
- High % exercise intensity e.g. exercising/ running close to personal capacity.
- Previous history of heat illness and/ or heat intolerance.
- High Thermal loads = High air temperature- high humidity – high radiation
- Low air movement/no wind
- Long Periods of exposure to hot conditions.

Factors that increase the risk of heat illness include

- Heavy clothing
- Lack of acclimatization
- Dehydration (inadequate water intake before exercise and during sessions)
- Illness and medical conditions



Acquiring
adequate
fitness and
acclimatisation

A grayscale photograph of a person's legs and feet as they lift a barbell. The person is wearing dark athletic pants and shoes. A large, solid green circle is overlaid on the right side of the image, partially obscuring the person's leg and the barbell. The background is dark and out of focus.

Adjusting training and competition intensity to conditions

Exercise intensity in training
should be appropriate to current
fitness and weather;

Timing of sessions

Training sessions and competition involving moderate to high intensity exercise should be scheduled early in the morning or late in the evening. In order to avoid the hottest part of the day.



Heat waves

Extra caution needs to be taken :

I. During unseasonal heat waves or unusually hot or humid weather

II. If an athlete travels from a cool region to a hot or humid climate

In circumstances as above athletes lack acclimatisation and are at increased risk of heat illness.

Other considerations

Age and medical conditions

Illness/ Virus Infection the last 7-10 days especially those involving fever, respiratory infections, diarrhea e.tc. : Don't compete in a race or do a strenuous exercise if

People over 65, who are taking medication or who are pregnant usually face difficulties exercising in the heat and they have to decrease the exercise intensity



Summary of the main recommendations for hydration

Prior to a training session and competition in the heat, athletes should drink 6 mL of fluid per kg of body mass every 2–3 h in order to start exercise properly hydrated.

During intense prolonged exercise in the heat, body water mass losses should be minimized (without increasing body weight) to reduce physiological strain and help preserve optimal performance

Summary of the main recommendations for hydration

Extra Sodium supplementation should be considered.

Daily morning of body mass and urine specific gravity can provide useful insights into the hydration state of the athlete.

Consider consuming fluids and electrolytes to offset 100– 150% of body mass losses.

Recovery procedure should include sodium, carbohydrates, and protein



Summary of the main recommendations for cooling

Cooling methods include external and internal methods

Precooling may benefit sporting activities

Summary of the main recommendations for cooling

Use fans and ice-cooling vests

The above are considered to provide effective cooling.

References



- American College of Sports Medicine position stand. Heat and cold illnesses during distance running (1996)
- American College of Sports Medicine position stand: Exertional heat illness during training and competition (2007)
- Burke Luise. The complete guide to food for sports performance. 1995, Second Edition. Allen and Unwin
- Brearley M.B. & Saunders P.U. Heat από το βιβλίο Physiological Tests του Australian Institute of Sports, 2013 Human Kinetics, 2nd edition
- Colgan Michael. Optimum Sports Nutrition. 1993. Advanced research press. New York.
- Daniel J. Daniels The Running Formula. 2014. Third Edition. Human Kinetics
- Goulet ED. Effect of exercise-induced dehydration on time trial exercise performance: a meta-analysis. 2011. British Journal of Sports Medicine; 45: 1149-1156.
- Goulet ED. Dehydration and endurance performance in competitive athletes. 2012. Nutrition reviews Volume 70 (suppl, 2): S132-S136
- Guyton & Hall, Human Physiology and Mechanisms of Disease, 1997, 6th edition. Μετάφραση στα Ελληνικά. Εκδόσεις Γ. Παρισιάνος
- Hoffman K., Ruel P., Thompson MW, Brotherhood JB, Richards D (1999) An investigation of hyperthermia and endotoxemia in fun runners. In : Proceedings of the fifth IOC World Congress on Sport Sciences, Sports Medicine Australia, page 26 (through Thompson) Try to find the article
- Kenney WL, Wilmore JK, Costill DL (2020) "Physiology of Sport & Exercise" (Seven Edition) Human Kinetics, Champaign Illinois
- Noakes, Timothy (2011). Is Drinking to Thirst Optimum?
- Annals of Nutrition & Metabolism : 10.1159/000322697 <http://nutsci.org/2011/03/03/athletes-obey-your-thirst/>
- Racinais S, Alonso JM, Coutts AJ, Flouris D, Girard O, Gonzalez-Alonso J, Hausswirth C, Jay O, Lee JKW, Mitchell N, Naussis GP, Nybo L, Pluim BP, Roelands B, Sawka MN, Wingo JE, Periard JD. Consensus recommendations on training and competing in the heat. 2015 Scandinavian Journal of medicine and science in sports. 25 (suppl:1) 6-19
- Ryan Monique, Complete Guide Sports Nutrition. 1999 Velo Press. Boulder Colorado. USA
- Sports Medicine Australia
- Thompson Martin W. Cardiovascular Drift and critical Core Temperature : Factors Limiting Endurance Performance in the Heat? 2006. Journal of Exercise Science Fitness Volume 4 No1.
- Wyndram CH, Strydom NB (1969) The dangers of inadequate water intake during marathon running SA Med J p893 (through Noakes and Thompson)

Scientific Partner - Sports Excellence



Under the scientific supervision



HELLENIC REPUBLIC
**National and Kapodistrian
University of Athens**

1st Dept. of Orthopaedic Surgery, School of Medicine
University General Hospital "ATTIKON"

Exclusive Donor



ΙΔΡΥΜΑ ΣΤΑΥΡΟΣ ΝΙΑΡΧΟΣ
STAVROS NIARCHOS FOUNDATION