


# MEDICAL GUIDELINES FOR THE INTERNATIONAL TEAM COACH

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## INTRODUCTION

Sailing today is one of the most complex sports around – if not the most complex. High level sailors need the ability to understand and solve complicated problems: campaign, regatta, rules and technicalities of the boat. They need to develop great subtlety in the way they pick up clues from the boat and its surroundings which enable them to control it on the water. In such a complex sport with very narrow margin of advantage against competitors using or alleviating different influences to the performance, including environmental ones, becomes a vital part of success.

There is no doubt that travel is an integral part of athletes' life, and the sailing season is organized as a national or international string of events that requires weekly or biweekly travel to matches. By the nature of their sport, the sailors' racing field environment can differ much from their home one and can have a decisive influence on the final success in the competition. One day a racing field can be tropical one and the next week it can be in a very cold climate. Such a major environmental change can strongly influence not only their fitness abilities, but also their health. Modern top-level competing sailors travel frequently and must be able to deal with environmental problems and also with problems related to mode of transportation, major time zone changes, different foods, housing and different approaches and levels of medical care at the new sailing destination. Fatigue connected with travel can influence their fitness capabilities and unexpected events abroad can ruin months of dedicated training.

The purpose of these simple guidelines is to highlight knowledge on travel and sport medicine, formed in ten recommendations that could be useful in protecting a sailor's health abroad and therefore enhancing their competitive edge in racing.

Subjects include pre-competition/pre-travel preparations, adaptation to new destination, nutrition, protection from Sun and cold, re-hydration, nutrition when travelling, problem of fatigue, diarrhoea treatment and prevention, personal protection and security precautions.

## I. CONSULT WITH YOUR TEAM PHYSICIANS

Sports travel medicine is developed to assist and solve the problems of the travelling athlete, including those caused by training and competing in different environments in sailing events. Many of the travel and sport related diseases and ailments that can affect sailors are well known, have effective treatments and are largely preventable. Using preventive measures during training, competition and travel will decrease the chance of a risk to sailor's health and abilities. Sailors travel widely, usually by air, and often become lax about taking precautions regarding their health. Having travelled numerous times without major health upsets and focused on the forthcoming sailing competition, they may neglect to check that they are up to date with vaccinations or take necessary precautions against minor but potentially debilitating health conditions. Such neglect could easily cost them the medal at the big event. As the teams often travel without an accompanying doctor's support, it is the coach's duty to ensure that athletes follow simple precautionary measures and ensure that nothing stops his team on the road to success. A team doctor can plan the health protection, but it is the coach who is the closest to the athlete, has the most influence and is the one that sailor will follow all the way.



**Pre-travel planning**

The first thing to do in any prevention project is to assess the risk. In pre-travel planning your team doctor who is regularly checking and treating sailor can easily assess the risk of the individual sailor, including the potential environmental risks that may be encountered because of their itinerary, the risks of the racing field, past medical history, problem list and lifestyle. It is a big advantage if your team doctor is able to plan for continuity of care before, during and after competition. Once this initial assessment has been made, the doctor can schedule the pre-competition protection "package" needed by your team in the context of the ongoing care.

It is ideal to start the process 4 to 8 weeks before the trip but in a competition program where the season is crowded with regattas, the decision on participation is often made at short notice. Planning should start about 3 weeks before departure to countries with different environmental conditions, but even in the “last-minute visits” to your team doctor, it is possible to deliver a good pre-travel and pre-competition “package” which should consist of:

- Pre-travel advice.
- Letter regarding any current illness and get a TUE if necessary.
- Medic Alert Tag.
- Dental care or other minor ailments.
- Eye glasses if necessary: extra pair, prescription sunglasses.

Pre-travel planning in the team doctor's office should include oral and written instructions concerning the hazards in the countries to be visited, preventive measures, vaccination, and prescription of necessary medicines.

**Vaccination (Immunization)**

A cornerstone of *travel medicine* is the prevention of infectious diseases through proper vaccination, including up-to-date routine immunization, specific vaccines that will be required by any of the countries visited, and vaccines which will be needed based on expected exposure (Table 1). Either inactive or live vaccines or a combination of types can be given simultaneously, without loss of either efficiency or safety.

Your team should receive information not only about required vaccines on border crossing (COVID-19 and yellow fever are the only ones at the moment) but also about recommended vaccines for that area too. Country requirements are subject to change at any time. Your federation or team doctor should provide you with that information. Vaccinations are administered according to the health risk, which the travelling athlete is likely to incur (Table 2). Short-term travellers, for instance participating in sailing event that lasts only 4 – 5 days and staying in first class hotels in urban centres, need less protection than those staying for prolonged periods and touching ports in the developing world.

Table 1

| **Travel vaccines:** | | | |
|---|---|---|---|
| **Class** | **Vaccine** | **Booster (yr)** | **Indication** |
| | | | |
| **a. Routine** | Tetanus | 10 (or according to national regulations) | All travellers |
| | Diphtheria | 10 (or according to national regulations) | All travellers |
| | Pertussis | unvaccinated (or according to national regulations) | All travellers |
| | Poliomyelitis (oral) | once | All travellers |
| | Poliomyelitis (inj.) | once | All travellers |
| | Human papilloma virus[1] | none | All travellers |
| | MMR (measles, mumps, rubella) | none | All travellers |

| | | | |
|---|---|---|---|
| | Hepatitis B | none | All travellers |
| | Influenza[2] | annually | All travellers |
| | Rotavirus[1] | none | All travellers |
| | Tuberculosis (BCG)[3] | none | All travellers |
| | Varicella[1] | none | All travellers |
| | Pneumococcal disease | none | All travellers |
| | | | |
| **b. Required (International borders)** | Yellow fever | none (10 in some countries) | South America and Africa |
| | Meningococcal disease | 1 (3 – 5 depending on the type of the vaccine) | Hajj (S. Arabia) |
| | Poliomyelitis | once | Hajj (S. Arabia) |
| | | | |
| **c. Recommended** | Cholera | 2 | Travellers to remote high-risk areas |
| | Hepatitis A[4] | none | Travellers to risk areas |
| | Japanese encephalitis[4] | 1-2 (or none depending on the type of the vaccine) | Rural Asia, S.E. Asia, long stay in transmission areas |
| | Meningococcal disease[4] | 1 (3 – 5 depending on the type of the vaccine) | Sub-Saharan Africa, group accommodation on big sport events (sport camps, sport villages) |
| | Rabies | If VNA titre<0,5 IU/ml | |
| | Typhoid fever (inj.) | 3 | Indian subcontinent or prolonged stay /more than a month. |
| | Typhoid fever (oral) | 3 - 7 | |
| | Yellow fever[4] | none | South America, Africa |
| | Tick-borne encephalitis[1] | 3 | Eastern and Central Europe, parts of Scandinavia |
| | Dengue | none | S-E Asia, S America, Caribbean |
| | COVID-19 | 2 (1) | Globally |

1. *So far, introduced into the routine immunization programme of a limited number of countries.*
2. *Routine vaccination for certain age groups and for individuals potentially exposed to certain risk factors.*
3. *No longer routine in most industrialized countries.*
4. *These vaccines are also included in the routine immunization programme in several high-risk countries.*
5. *Recommended during COVID-19 pandemic. Compulsory for border crossing in some countries*

Table 2

| **Immunizations according to risk:** | | |
|---|---|---|
| **Childhood immunization?** | No → | Routine vaccinations (Table 1) |
| ↓ Yes | | |
| **Border crossing?** | Yes → | Yellow fever, (Meningococcal disease, Polio, COVID-19) |
| ↓ No | | |
| **Food/water risk?** | Yes → | Hepatitis A, Typhoid |
| ↓ No | | |
| **Long-term stay?** | Yes → | Hepatitis B, Rabies, TBC test |
| ↓ No | | |
| **Special risk?** | Yes → | Japanese e., Hepatitis B, Rabies, Dengue, Tick born e. |
| ↓ No | | |
| **Athlete at big events** | Yes → | Influenza, (Meningococcal disease, COVID-19) |

**Travel kit**

If your team doctor is not accompanying you, he should be able to provide you with the proper "travel kit". These kits should contain first aid materials, such as bandages, cold preparations, sunscreen, antidiarrheals, insect repellent, iodine or bleach. If necessary, extra prescription eyeglasses and any other routinely used medicines or supplies can be a part of its contents too. A signed prescription form should accompany all prescription drugs carried by the members of your team, with proper labelling on the drug container:

- Antidiarrheal (e.g. loperamide)
- Antiemetic (e.g. dimenhydrinate)
- Analgesic (e.g. nonsteroidal anti-inflammatory agents/analgesics)
- Antihistamine (e.g. hydroxyzine, terfenadine)
- Antipyrexial (e.g. paracetamol, acetylsalicylic acid/aspirin)

To avoid suspicion and misunderstanding regarding medicines that could be considered unnecessary in some countries, all the kits must have the list of original contents provided by the manufacturer or prescription and accompanying letter from your team doctor, including TUE documentation if needed.

## Antibiotics

Although many medical problems that athletes incur are of non-infectious origin (e.g. injuries or environment-associated illness) in sailing, they are often at risk for acquiring a variety of infections. Infections can not only disrupt training program and result of the race; in some instances, they can have serious health consequences if not treated. Many infectious diseases are preventable and antibiotics play an important role in the treatment and prevention of a variety of bacterial and parasitic infections. With appropriate advice they can be used safely for prophylaxis and self-treatment during travel. If abroad alone, athletes must be carefully educated regarding symptoms of disease and appropriate indications for empiric antibiotic use. The risks and benefits of antibiotic use during travel should be weighed carefully for each situation and if possible, that should be done in consultation with the team medical doctor.

In the life of every athlete there are situations when illness “cannot be afforded” and can ruin lifelong preparation. In those situations, medical team will usually opt for antibiotic prophylaxis, while if abroad for training camp, they could make different decision. Concept of the antibiotic for all reasons is especially appealing to the travelling athletes’ environment where drugs are often self-prescribed or prescribed by non-medical persons (i.e. coach). Although antibiotic resistance is growing problem, hence advice changes with time, for the sport environment the obvious choice is quinolone group of antibiotics. For travel shorter than 3 weeks, athlete should carry a 3 days course of *ciprofloxacin*.

## Malaria Prevention (Chemoprophylaxis) and Other Mosquito-borne Diseases

Malaria, viral haemorrhagic fevers, Zika virus disease, chikungunya, various rickettsial diseases and African sleeping sickness are vector borne diseases that cannot be prevented by vaccine, and for which limited protection by other means is available.

Although vaccine for dengue is available in some countries, it’s use is currently recommended under special circumstances. In most people the infection is mild and passes in about a week without causing any lasting problems but in rare cases it can be very serious and potentially life threatening. As there is no specific treatment or widely available vaccine for dengue, it's important to try to avoid being bitten by mosquitoes when visiting an area where the infection is found.

In pre-travel counselling your sailors should be given this advice, with special emphasis on the importance of compliance to chemoprophylaxis in malaria prevention if sailing in malaria risk zone for a prolonged time.
Although, due to the distance from the shore and windy conditions offshore the risk for such a vector born infection is lower, personal protective measures to prevent the mosquito bites should be taken throughout the whole day.
These include the use of appropriate repellents and wearing of light-coloured long sleeves/pants clothing. Repellents should contain either DEET (diethyltoluamide) 20% or more, or IR 3535, or Picaridin, and may be applied to exposed skin or to clothing (but not under clothing) The percentage of DEET does not increase its mosquito repelling power but rather increases its longevity of action (DEET 30%: 4 - 6 hrs protection; DEET 90%: 8 - 10 hrs. protection). Repeat application is normally needed several times a day.
Any sunscreen should be applied first.

**HIV (Human immunodeficiency virus) infection and international travel**

Advice on prevention of sexually transmitted diseases (STD's) should also be part of the pre-travel planning, at least in the form of pamphlets. All sailors should be aware of the risks of STD's, they should be taught about the dangers, constantly reminded, and should be advised to take condoms with them. Even those with a partner, need advice about STDs, condom use, hepatitis B vaccination and to come for screening after return if they have engaged in casual sex during the trip.

**Do's and Don'ts re: HIV**

| DO NOT | DO |
|---|---|
| • Engage in unsafe sex<br>• Pierce ears<br>• Accept acupuncture, tattoo or injections (reused needles)<br>• Receive transfusion<br>• Use illicit injectable drugs | • Use latex condoms<br>• Associate socially<br>• Share food, hug etc. |

*HIV Screening of International Travellers*
Some countries in Eastern Europe, the Middle East and Asia still have policies to screen international travellers. For the most part, screening requirements apply only to long-term travellers (e.g. foreign students and workers). It is important to note that some countries will not accept the results of HIV testing abroad and will insist on testing for HIV soon after arrival. The list of HIV testing requirements for entry into foreign countries changes frequently and therefore your team doctor or MNA should obtain that up-to-date information, from the embassy or consulate of the countries on the team's itinerary.

**Diseases caused by CORONA viruses (SARS, COVID19)**

Coronaviruses are enveloped RNA viruses that cause respiratory illness of varying severity, from the common cold to fatal pneumonia.

***Severe acute respiratory syndrome (SARS)*** is a viral respiratory disease caused by a SARS-associated coronavirus. It is an airborne virus and can spread through small droplets of saliva in a similar way to the cold and influenza. SARS can also be spread indirectly via surfaces that have been touched by someone who is infected with the virus. In general, SARS begins with a high fever (temperature greater than 100.4°F [>38.0°C]). Other symptoms may include headache, an overall feeling of discomfort, and body aches. Some people also have mild respiratory symptoms at the outset. About 10 percent to 20 percent of patients have diarrhoea. After 2 to 7 days, SARS patients may develop a dry cough. Most patients develop pneumonia. The case fatality among persons with illness meeting the current WHO case definition for probable and suspected cases of SARS is around 3%. Since 2004, there have not been any known cases of SARS reported anywhere in the world, but it is still considered that has the potential to pose a severe threat to public health and safety.

***Coronavirus disease (COVID-19)*** is an infectious disease caused by the SARS-CoV-2 virus, and spreads from person-to-person in small liquid particles when they cough, sneeze, speak, sing or breathe. Virus spreads mainly between people who are in close contact with

each other, typically within 1 metre (short-range). A person can be infected when aerosols or droplets containing the virus are inhaled or come directly into contact with the eyes, nose, or mouth. The virus can also spread in poorly ventilated and/or crowded indoor settings, where people tend to spend longer periods of time. This is because aerosols remain suspended in the air or travel farther than 1 metre (long-range). People may also become infected by touching surfaces that have been contaminated by the virus when touching their eyes, nose or mouth without cleaning their hands.

*COVID-19* is primarily a respiratory disease and the spectrum of infection with this virus can range from people with very mild, non-respiratory symptoms to severe acute respiratory illness, vascular complication, organ dysfunction and death. Symptoms can include fever, cough, fatigue, shortness of breath or difficulty breathing, muscle pain, loss of sense of smell and loss of appetite. Other non-specific symptoms such as sore throat, nasal congestion, runny nose, headache, diarrhoea, nausea and vomiting, have also been reported. Some people infected have reported no symptoms at all (asymptomatic cases).

Preventive measures

Standard infection protection and control precautions emphasise the vital importance of hand hygiene, physical distancing, and respiratory etiquette for every person.

In particular:

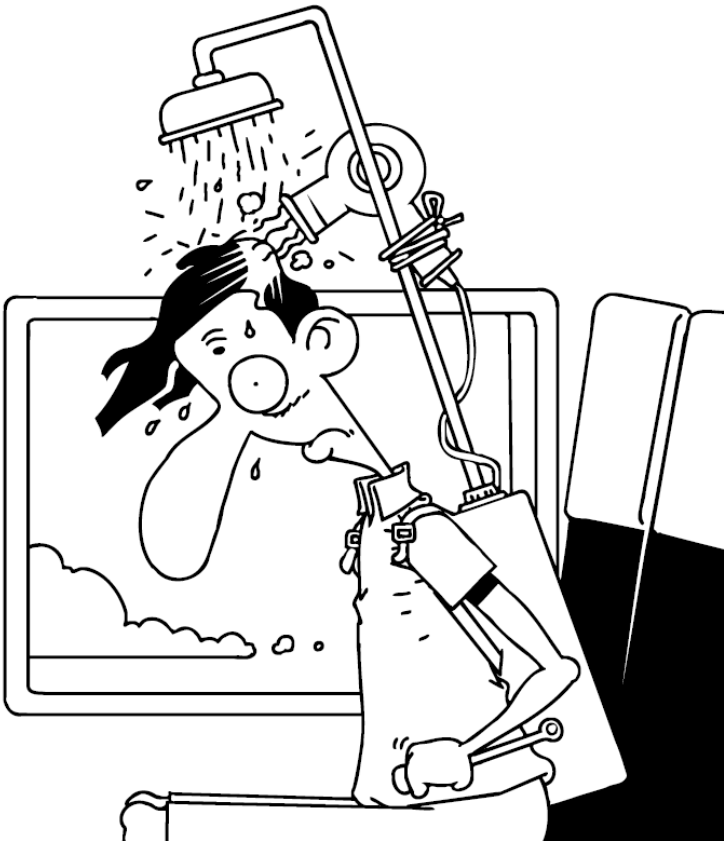
- Frequent hand washing using soap and water or alcohol-based (at least 65–70%) hand rub for 20 seconds as described in Chapter VIII.
- Avoidance of touching the face including mouth, nose and eyes.
- Cover the nose and mouth with a disposable tissue when sneezing, coughing, wiping, and blowing the nose then safely dispose of the used tissue immediately.
- If a tissue is not available, cover the nose and mouth and cough into a flexed elbow.
- Aim to keep at least one meter (3 feet) distance from other people or wear a mask when physical distancing is not possible.
- Athletes should not share clothing, bar soap or other personal items.
- All personal sailing gear (e.g. wet suites) frequently touched items (door handles in accommodation rooms, gym equipment, etc.) should be cleaned and disinfected regularly (follow the procedures described in Chapter V and VIII.
- Vaccination. There are now several vaccines that are in use.

Beside global efforts to develop, manufacture and deploy safe and effective vaccines the focus of health authorities worldwide has been containment of the virus through implementation of public health and social measures to limit and slow down widespread transmission. *World Sailing* published COVID-19 Guidance documents available at: https://www.sailing.org/medical/index.php. Race organizers are following those recommendations/requests. Follow them!

## II. ADAPT YOUR TEAM TO NEW DESTINATION

### Exposure and adaptation to heat

The sailing season can require travel and competing in very hot environments with different climatic zones. While the conditions of the wind and sea on the racing field are actually the essential part of sailing, in situations where unavoidable environmental factors such as heat is exceeding physiological accepted limits; its influence can become detrimental to sports results and even endanger a sailor's health.



Our body tends to keep its own core temperature between certain boundaries. Normally it is maintained within $0,5^0$C of $36,7^0$C. During physical exertions, muscle contractions produce a considerable amount of heath, inducing increase in core body temperature. To remain in thermal balance, the heat being gained by the body must equal that being lost, such that no heat is stored in the body. To achieve that, our body uses several efficient physiological mechanisms and in normal conditions manages to reduce the core temperature. Heat is exchanged between the body and the environment by four physical processes:

- Convection
- Conduction
- Radiation
- Evaporation

Those mechanisms have several physiological consequences, some of which although physiologically necessary, can influence final athlete's capabilities to perform at a high level. In hot ambient conditions, the gradient between skin and environmental temperature is minimal, possibly even negative, such that heath dissipation occurs mainly through sweat evaporation and an increase in skin blood flow. Increased sweating leads to decrease in blood volume and consequent decrease in cardiac blood flow. Because of those physiological changes blood-shift increases cardiac blood flow demand.

Such a change can negatively influence sailor's:

- Aerobic capacity
- Cognitive ability
- Recovery

In conditions of heath, sports performance is directly influenced by the level of the physical reserve deterioration and this deterioration is:

- Individual
- Specific to every athlete
- Not linked to the skill level

Heat stress alone will impair aerobic performance when hyperthermia occurs. In addition, dehydration during exercise in the heath exacerbates thermal and cardiovascular strain and further impairs aerobic performance. Luckily, wind is a natural cooling mechanism on board but long breaks in between or before races, while waiting for proper wind conditions on unprotected decks, can expose sailors to dangerous hyperthermia. In climates with a high humidity, the body's cooling mechanisms can become ineffective. In hot weather with light wind, perspiration is the only way to release heat from our body while exercising (because it lowers body temperature by evaporation). If air humidity rises over 70%, evaporation is impaired, and our body increases perspiration to the level of 3L/hr in the effort to keep its temperature low. 5% decrease in body water content will increase body core temperature by 1 to 3°C by the impairment of skin blood flow. Problem is that even the most effective oral fluid replacement strategies will fail to prevent dehydration above this level of sweat loss. This may lead to thermal injury: heat cramps, heat exhaustion, heat stroke, exertional rhabdomyolysis and death.

It is stated that dehydration decreases performance: a loss of fluids of 2 <% of the body weight may results in a 15% decrease of the athletic performance!

Keeping thermal balance on board and preventing dehydration is of utmost importance to sailor's health and his sport performance.

**Acclimatization**

Our body not only immediately reacts to high environmental temperature but also tries in the long term to adapt to it. By prolonged exposure to such an environment the athlete's body adapts to these conditions and despite the necessary physiological reactions to the heat, starts to function more efficiently and again reaches top level of performance. The benefits of heat acclimatization are achieved via increased sweating and skin blood flow responses, better retention of electrolytes, plasma volume expansion and hence improved

cardiovascular stability. Exercise-heath acclimatization is therefore essential for athletes preparing competitions in warm-hot environments. The problem is that today, athletes are travelling fast and there is no time for complete acclimatization. Not only does their performance suffer, but un-acclimatized sailors in hot climates are also prone to heat exhaustion, heat cramps and heat stroke (see page 41.).

This adaptation can be achieved using hot ambient conditions or by simulating hot ambient conditions using purpose-build "environmental chambers" or improvised low-tech "hot rooms".

| The best way to prepare for competition in the heat is to train in the heat! |
|---|

Acclimatization to high temperatures is achieved in a process that lasts 1-3 weeks but the systems of the body are adapting to heat exposure at varying rates with 14 days being optimal for most. Most adaptations develop within the first week of heat acclimatization. It is important to exercise during these exposures (gradually increasing exercise intensity each day until at normal pace); as resting in the heat provides only partial acclimatisation. **The process requires minimum exposure to representative environmental temperatures (40 °C and 40% relative humidity) for at least 60-90 minutes per day and takes a total of 14 days:**

- athletes can self-pace them (i.e. using sailing techniques that require more energy expenditure like pumping, hiking, etc.), or
- train under constant work rate (walking at 6km/h, running 12km/h, cycle ergometer at 185W, or
- with controlled training intensity (cycle ergometer at 65% VO heart rate (e.g. 145 bpm)
- when possible and with proper controlled environment and support, an iso-thermic protocol (e.g. controlled hyperthermia to a core temperature of at least 38,5 °C) can be implemented to optimize adaptation.

The best results are achieved by training in hot conditions, but that can be a problem for the teams from cold climate zones. They can use "environmental chambers" or passive heat techniques such as hot water immersion (at 40-42°C) or sauna bathing (at 70-90 °C) for 45-60 minutes (or intermittent for 30minutes). Fact is, that passive heat acclimatization produces overall less benefits than training in hot ambient conditions.

Bearing in mind that training quality should not be compromised, in sailing sport one solution to achieve controlled hyperthermia could be adequate clothing of sailors but that approach **should be closely monitored** by supporting staff on support boats by measuring temperature in adequate intervals to avoid heat induced illness and danger to sailor's health! Also, all measures to intervene (ice, water, towels) should be prepared in advance and carried on support boats.

Although the best method of acclimatization is two weeks of training in heat conditions of the field of play, different strategies can be developed to achieve the goal at the time of race. They can include earlier arrival at field of play and acclimatize there, or acclimatize at home and arrive ready for race, or combination of both. It is also possible to acclimatize at the beginning of the season and use maintenance sessions once a week. Combination of active and passive acclimatization methods can be used too.

It is worth knowing that heat acclimatization does not impair performance in cooler environments and may even enhance performance under certain conditions.

Besides acclimatization procedures there are some other recommendations to consider mitigating the effect of the heat on health and performance of your athletes:

- In a very hot environment reduce physical activity to sailing and swimming during daylight hours. Use indoor gyms and swimming pools to train avoiding the heat.
- Before the race, avoid working or staying too long in an overheated container, even if it's the only shade available.
- Staying in the Athlete's Lounge or restaurant may help your sailors to keep their body temperature at the right level and therefore allowing them to compete better. However, entering a cooled room coming directly from outside may cause a few problems: don't forget to put on dry and warm clothes when entering a cooled room; be careful not to let them enter these places with wet clothes or wetsuits!
- Pre-cooling (such as staying in a cool room, cool water bathing, ice cube application over the wrists, or dipping feet in cooled water) may help to keep the body temperature low. These techniques should be discussed with, and approved by your team doctor.
- Cold fluids or ice-slurry beverages can potentially enhance endurance performance when ingested before the race.
- Encourage your sailors to use "cooling vests" before and in between races. Those cooling garments are practical in reducing skin temperature without reducing muscle temperature. They function as "heat sinks" and can maintain the core body temperature, even in very unfavourable heat conditions.
- There is evidence supporting the use of cooling in between races to improve subsequent performance. Most effective way is to use towels soaked in icy water.
- While assisting the sailors in between the races coaches should provide shade on their boats to protect sailors from direct sun.
- Sailors should wear light and light-coloured clothes with UV protection. They should always wear a cap, sunglasses and sunscreen cream. Sunscreen preparations should be applied several times a day.
- Make sure they have enough fluids during exercise (600 – 800 ml/ hour, drink small amounts at least every 15 minutes) but remember: **Hydration can prevent dehydration but cannot decrease core blood temperature!**
- Extra-dietary salt and adequate rest.
- Consistent daily monitoring of fluid/electrolyte balance is required.

Simple advice about proper fluid intake can save a lot of problems, especially in very humid weather, but excess dietary water and electrolytes **do not speed up the process of heat acclimatization.** Also, don't forget that the sailing season is long and **heat acclimatization adaptation may vanish after two weeks!** Some studies are showing that only 2 days or heat re-acclimatization after that period can, bring some effects of adaptation back to level achieved on the day 5 heat acclimatization.

**Exposure and adaptation to different time zone**

Every natural process within the body shows some variation in pattern between night and day. Circadian rhythms are endogenous cycles that last about 24 hours (the "body clock"). These cycles are synchronized (entrained) by the earth's 24-hour light-dark cycle but persist in the absence of light and dark cues. Many circadian rhythms have been identified, including core body temperature and behavioural rhythms, such as the sleep-wake cycle.

Basic components of performance also have rhythmic ups and downs that follow circadian pattern. For instance, speed of reaction time and muscle strength peak consistently in the early evening and it is well known that world records are usually broken by athletes competing in the late afternoon / early evening hours. Basic components of performance have rhythmic ups and downs follow in a circadian pattern. Rapid air travel across several time zones outstrips the ability of the body to re-synchronize these rhythms forcing athlete to compete at unfavourable periods of their biorhythms when their capabilities are not at their peak. The resulting physiological de-synchronization causes symptoms such as weakness, gastrointestinal disturbance, loss of appetite, and tiredness during the day, disorientation, memory impairment and reduced mental performance that every traveller recognizes very readily as *Jet lag*.

***Jet lag*** (Circadian dysrhythmia) can significantly influence sailor's physical and especially cognitive capabilities to perform at a high level. *Jet lag* symptoms usually persist 1 day for each time zone crossed until the body realigns its circadian clock, regardless of direction travelled. Symptoms of jet lag and sleep disturbances are worse after eastward flights, when the length of the day is shortened, and the circadian system must shorten to re-establish a normal rhythm. When travel is westward, symptoms peak in the first 3 days, while for eastward travel, the symptoms persist for as long as 7 days.
Often, teams are coming on racing fields by airplane, from another part of the world and from different time zones immediately being engaged in competition. The team leader, who is responsible for organization of the team's itinerary, should know the basics of biorhythm de-synchronization problem so that he could organize the transport that best corresponds with sailors' biorhythm, allows proper rest and secures adequate time for adaptation on arrival. For a short-term travel (1 – 2 days) full adaptation to the new time zone is not always recommended, as full adaptation in short time is unlikely to be achieved. When travel across time zones is for longer than 3 days, circadian adaptation is typically recommended.

Adaptation procedures to new time zone:

a. *sleep/wake time shift*:
   Westbound: (Pre departures) go to bed later and waken later.
   Eastbound: (Pre departures) go to bed earlier and waken earlier

b. *light-exposure alteration*:*
   Eastbound: (On arrival) ≤ 6 time zones: ↑ a.m. light
   (On arrival) 7-12 time zones: ↑ p.m. light
   Westbound: (On arrival) reverse of eastbound

c. *Melatonin: 3 mg (0,5 – 5)*
   Eastbound: (Pre-departures) at 2-3 a.m. “destination time” for 3 days;
   (On arrival) at bedtime for 4 days.
   Westbound: (On arrival) at bedtime for 4 days.

d. *Caffeine: 200 – 1000 mg***
   (On arrival) morning, or chosen time before the match*

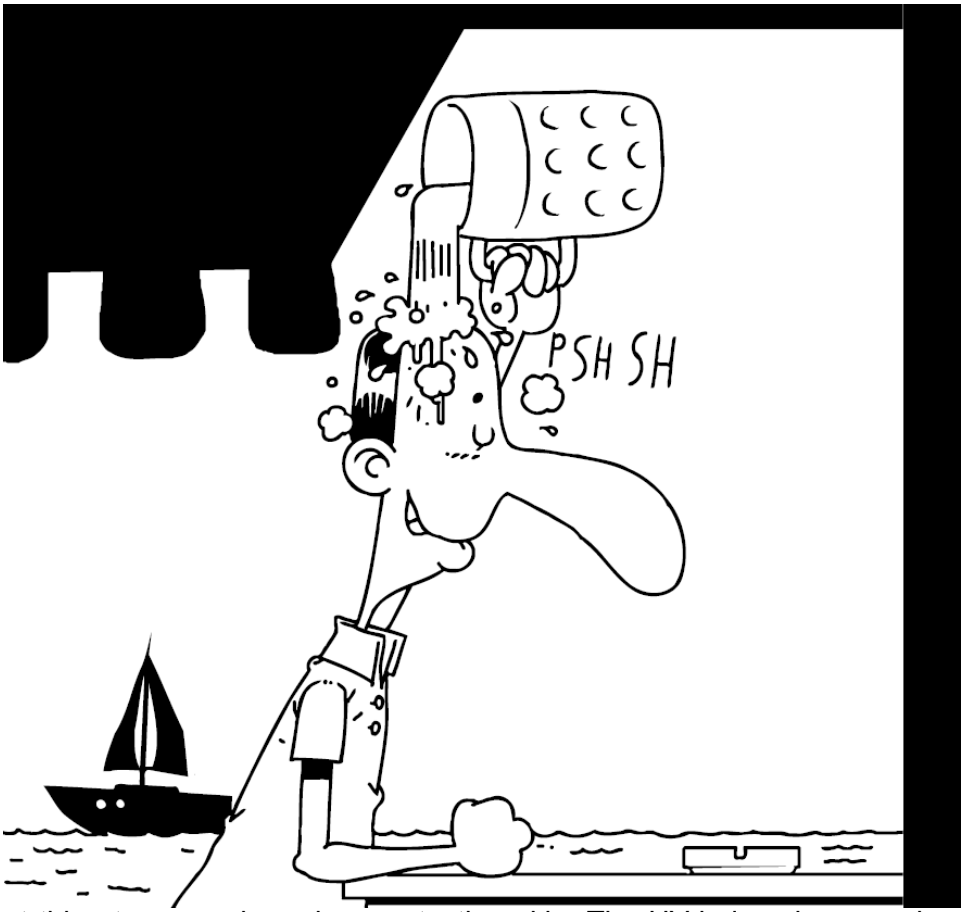
** Several methods of exposing the eyes to an artificial bright light that simulates sunlight for brief periods at planned times during the day are developed. Various modalities include a light box, a lamp, and a light visor.*
***While not banned by World Anti-Doping Agency, caffeine is a monitored substance.*

## III. PROTECT YOUR TEAM FROM SUN AND COLD

The climatic environment can have an extraordinary influence on the outcome of the sailing competition because sailing is a sport practiced in open, with only limited means of environmental protection, which is normally personal gear and equipment.

### Exposure to UV radiation from the Sun

Besides infrared rays that we feel as a heat, the sun is also radiating much more damaging ultra-violet (UV) rays that are causing serious damage to our skin which includes skin cancer. Exposure to sunlight may result in solar urticaria that can occur minutes after exposure. It can also cause damage to our eyes (acute keratitis, cataracts and macular degeneration – after long-term exposition). Exposure may suppress the immune system and increase the risk of infectious disease. Sailing has an added inconvenience: the UV radiation damage is greater on the sea than on the land. Reflection of UV from the sea surface increases the UV-index, which




is an important thing to remember when protecting skin. The UV-index shows us how strong the UV-rays are. The values of the index range from zero upwards – the higher the Index value, the greater the potential damage to the skin and eyes (and the less time it takes for harm to occur). The index values are grouped in exposure categories, with values greater than 10 being “extreme”. Before travel, always obtain the UV-index data at the sailing destination. It is as important as the weather, wind and temperature forecast!

The risk must be reduced by using the right skin protection.

To avoid some of the consequences of sailing in countries with a high UV index (higher than 5) one should:

- When training, avoid the sun between central times of the day: 11.00hrs and 16.00hrs.
- On the water, encourage the use of special UV-textile equipment; wraparound sunglasses with appropriate UV filters and caps with rim or flaps for a better head, neck and ear protection.
- Make sure that sailors are regularly covering the remaining parts of their bodies, with sunscreen preparations.
- Use the appropriate sunscreen:

**SPF 25 or greater**

- Apply appropriate quantity of sunscreen.

An adult sailor, if wearing short sleeves shirt and shorts, needs approximately 2mg of sunscreen preparation per $cm^2$ of the skin. This means that most sailors will need about 15-20ml each time. This is 1/6 of a 100 ml bottle to cover the exposed parts of the body. The reality is that the majority of people apply just ¼ up to 1/3 of the quantity needed! This means they will have a protection of just about ¼ or 1/3 of the indicated SPF on the sunscreen bottle: for example, using a SPF 25 sunscreen, they will just have a SPF approximately of 6-7, which will probably not be enough to protect their skin during the race that can last several hours, sometimes with long periods of waiting exposed to sun in between the races.

**Sun protective clothing** is standard in sailing equipment and is made from lightweight fabrics that absorb or reflect UV radiation**.** Many garments are dyed in colours, usually red or black, which also absorb or reflect UV rays. Garments should cover as much skin as possible (the back of the neck, for example) and fit loosely to allow air to circulate (overly tight fits stretch fibres, allowing some sun through). Similar to the SPF (Sun Protection Factor) rating of sunscreen, the **UPF (Ultraviolet Protection Factor)** indicates how much protection it offers from ultraviolet radiation. A fabric's Ultraviolet Protection Factor (UPF) and Ultraviolet (UV) rating indicates how many units of ultraviolet radiation it blocks. A UPF rating of 25 means that only 1/25th (4%) of UV radiation penetrates the fabric. The higher the UPF, the greater the protection. Fabrics rated below UPF 15 are not considered protective while UPFs of more than 50 add little additional protection.

However, as those fabrics are woven tightly, leaving practically no space for sun penetration, or are pre-treated with UV blocking additives they can have thermal effect. Therefore, take care when choosing them and be careful not to endanger your heat balance on the water. Especially in hot climate, thermal injury is something that you want to avoid.

### Exposure to cold

A cold climate is unavoidable in sailing. Even in temperate areas a combination of water spray, wind, wet clothes, fatigue, dehydration and interval work periods on board can dangerously lower the body temperature and influence the performance of your sailors.

All sailors must learn to deal with the cold in two different circumstances:

- A foolhardy approach to the cold while sailing on the water decreases comfort and negatively impacts performance. Although the lives of sailors are not directly in danger, this may decrease performance and certainly may have an untoward consequence to the result of the race. When skin temperatures fall below 15°C there is also a decline in the strength of handgrip and manual dexterity.
- If a sailor is in the water, one is engaged in a battle for survival!

In either case, you have no excuse for not knowing how to keep your sailors warm or how to help them in the case of capsizing in cold waters. You have to be especially careful with children as they have a large body surface-to-volume ratio, making them prone to hypothermia. In the water, if it is not possible to hold on to the capsized boat or re-enter into it, sailors should keep the **HELP (heat escape lessening posture) position**, with legs up and arms around bent knees. This will reduce the heat loss due to direct contact with cold water. **Make sure that all your sailors know that!**

In a cold environment efficiency suffers. This results from the effect of the cold on the muscles, nerves and even brain if hypothermia is present. In a cold environment our body reacts to cold by trying to keep its core warm, leaving behind the thick “shell” to fight a rear-guard action with the elements. Warm blood from the core is diverted from the surface, the temperature of the skin falls, and less heat is lost. If the increase in size of “shell” fails to keep the core temperature, the body turns to its second line of defence; an increase in heat production either by shivering or by exercise. This can increase heat production up to 10 times. For the athlete, exercise is the perfect solution, however problems can arise. If the heat loss is modest, then exercise may produce enough of a net gain in heat to keep the sailor warm, but if the heat loss is rapid, the chances are that exercise will be counterproductive. Whilst racing, sailors need their strength and endurance to win the race so using the energy to heat the body can compromise the final result of the race.

Keeping thermal balance on board the boat is of utmost importance. Overdressing can actually overheat the body, and this should be avoided! Overheating, besides putting unnecessary burden on the cardiovascular system, can result in build-up of sweat on the body and internal layers of clothing. As water conducts heat at a much higher rate than the air, in parts of the race when less strain is needed, like sailing down the wind, sailors’ bodies will cool at much higher speed and consequently produce an undesired heat loss.

Aside from using suitable clothes, there are some recommendations to consider:

- Wear a cap – the head is responsible for one-third of the body's heat loss.
- Clothing is crucial to prevent hypothermia.
- Wear multiple layers of high-tech clothing.
- Avoid sweating and wear layers such as polypropylene so as to draw the sweat away from the skin and allow evaporation.
- Test the clothing in an appropriate environment.
- Everything under 30 ºC is considered “cold water” and can cause hypothermia.
- Always be prepared to intervene and recognize the signs of hypothermia.
- Always remembers “The Rule of 50“: Chances to swim 50 yards (45 m) in the water of 50 F (11 ºC) are just 50%.
- Personal floating device on board is mandatory.

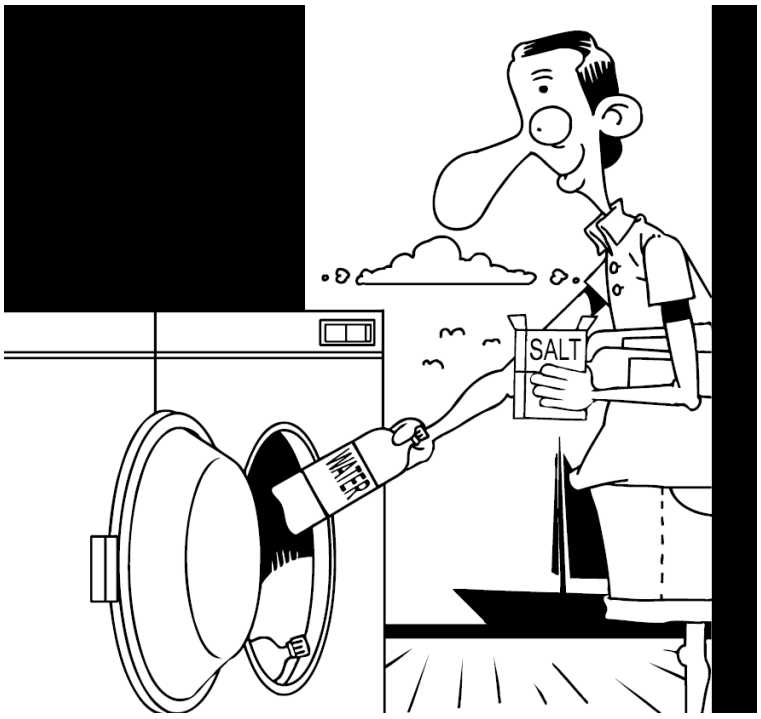
**Pre-competition warm up in cold environment**

When sailing in cold waters, pre-competition warm-up or training warm-up is particularly important. Prior to carrying out any medium or high-intensity exercise, it is very important that the muscles that will be used have received the necessary oxygenation for the work they are going to do. This means carrying out wide and progressive low-intensity movements to open up the greatest number of capillaries ensuring that the blood goes to the highest number of muscular fibres.

- Under cold conditions - start the warmup session on shore.
- Session must last between 15 and 20 minutes.
- It must include all muscles, but particularly those that are going to be used more when sailing.
- The warm-up must continue for at least a further 15 minutes on the water.
- Sailors should carry out wide and low-intensity movements and manoeuvres specifically using the muscles used for the boat they are sailing (tacking, gybing, pumping with the spinnaker, etc).
- Do not forget to keep your sailors warm in between the races.
- If possible, during breaks, hand over additional clothing for them to wear until the next race starts.
- If breaks are long – sailors should repeat the warm-up procedure of low-intensity movements from warm up sessions.

## IV. CHOOSE THE RIGHT DRINK

Careful choice / treatment of water – whether for drinking, washing, preparing food, or swimming – is one of the most important precautions a travelling athlete can take. Water is critical for exercise performance and is the nutrient most neglected by sailors. Regattas may be run for several hours at a time, over a number of days and during the summer months, typically during the hottest part of the day. There is the very real possibility that hydration may be compromised during regattas. During exercise, fluid losses are primarily due to sweating and breathing. In sailing this is emphasized with unavoidable sun and wind exposure and impermeable sailing suits. As much as 3L/hr of fluids can be lost through the process of sweating which highlights the need to replace as one loses. Uneven body cooling when sailing up and down the wind puts an additional burden on physiological mechanisms of the body's cooling which needs adequate fluid balance to function properly. If fluid losses are not replaced, performance will deteriorate, and dehydration can have devastating consequences on the sailing performance.




This basic formula can help you to estimate the amount of water needed:

| |
|---|
| Base line demand 2 L per day |
| + |
| 1 to 2 litres per hour exercise |
| + |
| 1litre for 5°C increase in ambient temperature above 21 5°C |

In the context of sailing sport, training or competing in the sun at 27°C for two hours can increase the required fluid intake to six litres!

Fluid and food intake tend to be hampered by unpredictable time intervals between the races, so support teams must secure adequate hydration on shore and during competition, taking into consideration regulations and boat space limits for the amount of fluid competitors can carry. Adequate storage space for sports drinks must be secured on support boats to give to sailors in-between races.

Use the proper procedures of hydration:

- Let your team doctor or nutritionist to do the planning.
- Organize lectures for sailors to explain the importance of hydration.
- Make hydration the habit of your athletes.
- A protocol of hydration should be established before the sailing event.
- Sports drink should be chosen before the sailing event.
- Educate on the hydration protocol before the sailing event.
- During the sailing event, hydration protocol should be laid down and followed strictly.
- Always weigh your athletes before and after the race.
- Daily estimate the body water balance by measuring urine specific weight (should be <1.015).

In the developed world, the availability of safe water is taken for granted but even there, bad sanitation is real possibility. In the developing world, water-related diseases remain a major problem. Many important infectious diseases are transmitted by contaminated water but by following some simple rules, that risk can be minimized:

### *A. Recommendations on shore when abroad:*

- First-class hotels are no guarantee of adequate water purification.
- Use bottled water only.
- Canned or bottled “carbonated” drinks and beverages made from boiled water are safe.
- Ice should be made from purified water.

### *B. Recommendations while on water:*

- Drink only originally packed sports drinks or those prepared with bottled water.
- Carry enough fluids on your boat and hand it over to sailors during breaks.
- Store the fluids in an appropriate cool box.
- Follow the established protocol of hydration.

## V. FEED YOUR TEAM WITH THE RIGHT FOOD

Whether at home or abroad; performance of your sailors can be substantially affected by the amount, composition, and timing of food intake. Good nutritional practices will help athletes to train hard and recover quickly from the strains of training, travel and competition. A diet that provides adequate energy from a wide range of commonly available foods can meet the carbohydrate, protein, fat and micronutrient requirements of training and competition. Properly structured meals should consist of 55% complex carbohydrates, 20% proteins and 25% fats.

Due to specific timing of sailing training and competitions, main meals are in the morning and after return from the sea, usually structured as:

- Breakfast 1000 Cal
- Lunch on the water 500 - 1000 Cal
- Dinner 1500 Cal

**Breakfast -** 1000 kcal
Athlete should have breakfast 2-3 hours before the race. Racing day can start early but 1,5 hours is minimum. It should be mainly carbohydrate based as our liver glycogen stores decrease over night. Sailors should make sure that they are comfortable with it and involve foods that they are accustomed to; such as toast, cereals and juices.

**Lunch** (during the race in between flights/training) - 500 - 1000 kcal
Consuming between flights is the key, so one should get used to consuming food and fluid waiting for the start. Athlete will need to intake up to 60-90g of carbohydrate per hour, during prolonged exercise (over 90 minutes) to maintain carbohydrate supply to the muscles. Knowing how long he'll be competing/training, together with his team, he can design the protocol and pack enough nutrition to see him through to the end.

**Dinner -** 1500 kcal
The capacity of muscles to absorb and store nutrients is increased 30-60 minutes post-exercise, so it is important to replace carbohydrates and provide protein and electrolytes within this time. Sometimes it will be necessary to start this procedure while the boat is towed back to the marina. Pre-planning the meals or snacks after race/training ensures that athlete can take advantage of that recovery window. A full carbohydrate-based meal should be taken within 1 hour of finishing a tough training session or race. This can be done with food like rice, pasta, breads etc) and protein options like yoghurt, chicken, fish etc). However, often after exertion athletes lose appetite so one should find what works for him/her.

Your team should adopt specific nutritional strategies before and during competition. Those protocols should be developed and designed with the help of a sports nutritionist, and you should make sure that they are followed strictly, especially during competition events.

Always use the proper procedures of sport nutritional practice:

- Let your team doctor or nutritionist to do the job.
- Organize lectures for sailors explaining the importance of proper sports nutrition.
- Involve families in the program of sailors' nutrition.
- Make proper nutrition a habit of your athlete.
- Aim to achieve carbohydrate intake that meets their fuel requirements.

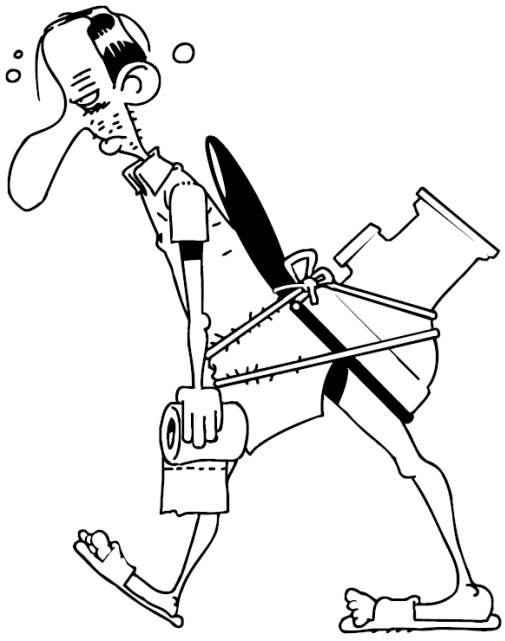
- Warn them against uncontrolled use of dietary supplements.
- Do not let sailors improvise with "natural products" that are supposed to enhance their capabilities. They don't work and can contain prohibited substances.

At sport events:

- Investigate food availability at your destination before you leave home.
- Contact the catering provider at your destination to let them know your needs.
- Take missing food supplies with you.
- A nutritional protocol should be established before the sailing event and followed strictly.
- Test the protocol before the event so that sailors can get used to the recipes.
- Take care that sailors are not tempted by the food on the offer in self service restaurants at big events. They should learn in advance what to choose according to their nutrition protocol.

**Travellers' diarrhoea**

Travellers' diarrhoea is an illness associated with contaminated food or water that occurs during or shortly after travel. Depending on the length of stay it may affect up to 50% of travellers. It may be accompanied by nausea, vomiting, abdominal cramps and fever and can seriously endanger the athlete's success in competition.



Food spoils rapidly in a hot climate, especially meat, poultry and dairy products. With high humidity and temperature, food becomes an excellent culture media for bacterial growth. Therefore, even light contamination can lead to dangerous bacterial levels within a few hours. In high-risk environments stick to food produced in good hotels, well-known restaurants, or self-catering organized at the new destination. Keep to the eating plan that is normally used at home and avoid the temptation to have an "Authentic cultural experience".

### *A. Prevention of diarrhoea: (short-term travel, up to 3 weeks):*

When abroad, your team should obey to the rule: **Cook it, peel it or leave it!** Therefore, your sailors should eat only fruit and vegetables, which they can peel and wash themselves. Eat only hot, cooked food.

**Avoid:**

- Using leftovers.
- Blown tins or "swells" with canned food.
- Un-pasteurized milk and milk products.
- Raw shellfish.
- Food from street vendors.
- Leaving hot food to stand and cool before serving.
- Cold meats in restaurants.

**Do:**

- Eat all food hot and cooked through (especially meat and seafood).
- Peel, wash or soak fruit and vegetables before eating (in sodium hypochlorite or some mild disinfectant).

Elite athletes competing in the special events, the Olympic Sailing Competition, for example, cannot afford to get ill. In potentially risky situations preventive use of antibiotics can be considered. This is also necessary for sailors with underlying medical problems. Weighing the risks of the side effects against the risk of not competing is subjective and is best accomplished in consultation amongst the sailors and the team doctor.

| **Antibiotics** | |
|---|---|
| Rifaximin | 400 mg daily |

Bismuth subsalicylate (BSS) may also be considered to prevent traveller's diarrhoea. BSS is well tolerated but due to (mild) adverse effects that include black tongue, black stools, tinnitus, and potential for constipation, it is advisable to test it before the trip abroad.

| **BSS** | |
|---|---|
| 2,1 g/day or 4,2g/day | In 4 divided doses with meals and at bedtime |

Athletes for whom preventive use of antibiotics (or BSS) might be considered:

- Poor 'track-record" travellers
- Low gastric acid
    - Antacids or H-2 blockers, proton pump inhibitors
    - Gastric surgery
    - Underlying medical problems
        - Diabetes mellitus

### *B. Management of diarrhoea:*

Estimated rates of *travellers' diarrhoea* during short-term travel (in our case – sport events) range from 20 – 50 percent per trip meaning that you could find yourself in a fight for the medals with 50% of your team having diarrhoea and being dehydrated. Your team should be reminded of specific ways to avoid *traveller's diarrhoea*.

Unfortunately, if the problem happens you cannot improvise. If your team doctor is with you, he will handle the case but if you are alone, you should obey to the rules of treatment:

1. Fluid Replacement:
    - Discontinue milk products.
    - Drink commercially prepared medical electrolyte/glucose mixture (e.g. *Gastrolyte, Hydralite*) or commercially prepared Oral rehydration salt mixed with the safe water.
    - If not available, use some sport rehydration drink or prepare rehydration solution using those two simple recipes:
        - 1/2 tsp* salt
        - 1/2 tsp* baking soda
        - 4 tbsp** sugar
        - 1 litre safe drinking water

    Or:

        - 6 level tsp* sugar (25.2 grams)
        - 0.5 tsp* salt (2.9 grams)
        - 1 litre safe drinking water

**tsp: tea spoon = 5 ml*
***tbsp: tablespoon = 15 ml*

2. Antimotility Agents:

May be used alone for mild diarrhoea (tolerable) or with an antibiotic in case of moderate (distressing – interfere with planning activities) to severe (incapacitating – completely prevents planned activities) illness. Passage of grossly bloody stools is considered severe illness!

| **Antimotility agents*** | |
|---|---|
| Loperamide | 4mg first dose, then 2mg dose after each loose stool, not to exceed 16mg in a 24-hour period |

***Note:** Do not use antimotility agents alone in case of severe illness and always try to consult with your team's doctor.*

3. Antibiotics:

For **moderate travellers' diarrhoea** loperamide can be used as monotherapy or with antibiotic (Azithromycin preferably)

For **severe travellers' diarrhoea** antibiotics should be used with Azithromycin as preferred treatment.

| Antibiotics | |
|---|---|
| Levofloxacin | 500 mg single dose, ** or 3-day course*** |
| Ciprofloxacin | 750 mg single dose, ** or 500 mg 3-day course*** |
| Ofloxacin | 400 mg single dose** or 3-day course*** |
| Azithromycin | 1000 mg single dose** or 500 mg 3-day course*** |
| Rifaximin | 200 mg 3 x daily - 3-day course |

*** **Note:** *Several scientific papers established a link between quinolone antibiotics and tendon ruptures – seek medical advice before using them.*

*** ***Note**: if symptoms are not resolved in 24h*

### *C. Procedures of epidemic control:*

If confronted with a case of diarrhoea, procedures should be initiated to prevent its spread. These procedures should be in place before your arrival at the new destination and should be designed by your medical support team. Some procedures, like regular wiping of the doorknobs with disinfectant, can be applied as preventive measure if your team doctor assesses the new destination as a risky one. You should also carry enough disinfectant that can be used if this should happen. Some of these procedures should be initiated the minute you detect a case or cases of diarrhoea among members of your team.

1. **Accommodation**:
   - isolate the sick team member in a separate room.
   - if several team members become sick, they can stay together in the same room.
   - if isolation room does not have its own toilet, designate a toilet that will be used only by the sick team member.
   - supply the room/toilet with disinfectants (e.g. soap and alcohol solution with *chlorhexidine*).
   - all clothes used by the sick team member must be put in a separate bag.
   - floor and all surfaces should be cleaned according to procedure 3. below.
   - floor and all surfaces should be disinfected according to procedure 4. below.

2. **Procedure for the regular cleaning of the rooms during s**port events.

| Area | Frequency | Cleaning agent | Method of administration* |
|---|---|---|---|
| Floors | 2 x day | Detergent containing *1,3-dihydroxymethyl-5,5-dimethyl imidazoline-2,4-dione* | Prepare solution as instructions<br>Soak the mop in the prepared solution<br>Rinse the mop in another vessel with clean water. Leave to dry |
| Other surfaces | 1 x day | | |
| Walls | 1 x week | | |
| Toilets | 2 x day | Solution with *6 g benzalkonium chloride + 3.0 g didecyldimethylammonium chloride + 8,0g glutaraldehyde* | Spread evenly on the surfaces, after 5 – 10 min rub and rinse with water<br>Repeat the procedure if needed |

**Always check the instructions by the producers of the cleaning agent regarding preparation of solution and modes of use.*

### 3. Procedure for the cleaning or the rooms in the case of the risk of infection.

| Area | Frequency | Cleaning agent | Method of administration* |
|---|---|---|---|
| Floors | 2 x in the morning<br>2 x in the evening | Detergent containing:<br>*1,3-dihydroxymethyl-5,5-dimethyl imidazoline-2,4-dione* | Prepare solution as instructions<br>Soak the mop in the prepared solution<br>Rinse the mop in another vessel with the clean water<br>Leave to dry |
| Other surfaces | 1 x day | | |
| Walls | 1 x week | | |
| Toilets | 2 x in the morning<br>2 x in the evening | e.g. solution with *6 g benzalkonium chloride + 3.0 g didecyldimethylammonium chloride + 8,0g glutaraldehyde* | Spread evenly on the surfaces, after 5 – 10 min rub and rinse with the water<br>Repeat the procedure if needed |

### 4. Procedure for the disinfection in the case of illness

| Area | Frequency | Cleaning agent | Method of administration* |
|---|---|---|---|
| Floors | 2 x day | Disinfection solution with *13.2 g benzalkonium chloride + 6.0 g didecyldimethylammonium chloride + 4.5 g formic acid* or<br>Solution with *4,5g. didecyldimethylammonium chloride + 1,8g.* isopropyl alcohol | Prepare solution as instructions<br>During disinfection soak he mop in the vessel with the solution and wipe the whole surface<br>Mops should be single used<br>Do not rinse |
| Other surfaces | 1 x day | | |
| Walls | 1 x week | | |
| Toilets | 2 x day and Immediately in the case of obvious contamination | Disinfection solution of *sodium dichloroisocyanurate* | Prepare solution as instructions<br>During disinfection soak the mop in the vessel with the solution and wipe the whole surface with single used mops |

.

### 5. Team behaviour:

- inform the team which room the sick team member has been isolated.
- restrict contact to as few persons as possible.
- enter the room only if necessary.
- before entering the room, and on exit, wash your hands and rub in alcohol-based disinfectant.

### 6. Sick team member(s) behaviour:

- wash your hands with liquid soap and water for 60sec. and dry them with paper towels.
- after washing your hands, disinfect them by rubbing in alcohol based. disinfectant. Wait for the hands to dry fully.
- carry out the above steps always after personal hygiene procedures, using the toilet, before taking food, touching anything unclean, etc.
- do not leave the room except for medical intervention.

### 7. Sick team member appliances (cutlery, shaving kit, etc):

- to be used only by sick team member.
- kept separately in isolation.
- all supplies used must be cleaned with disinfecting solution (e.g. *30% 8 g glutaraldehyde /3 g didecyldimethylammonium chloride /6 g benzalkonium chloride* solution).

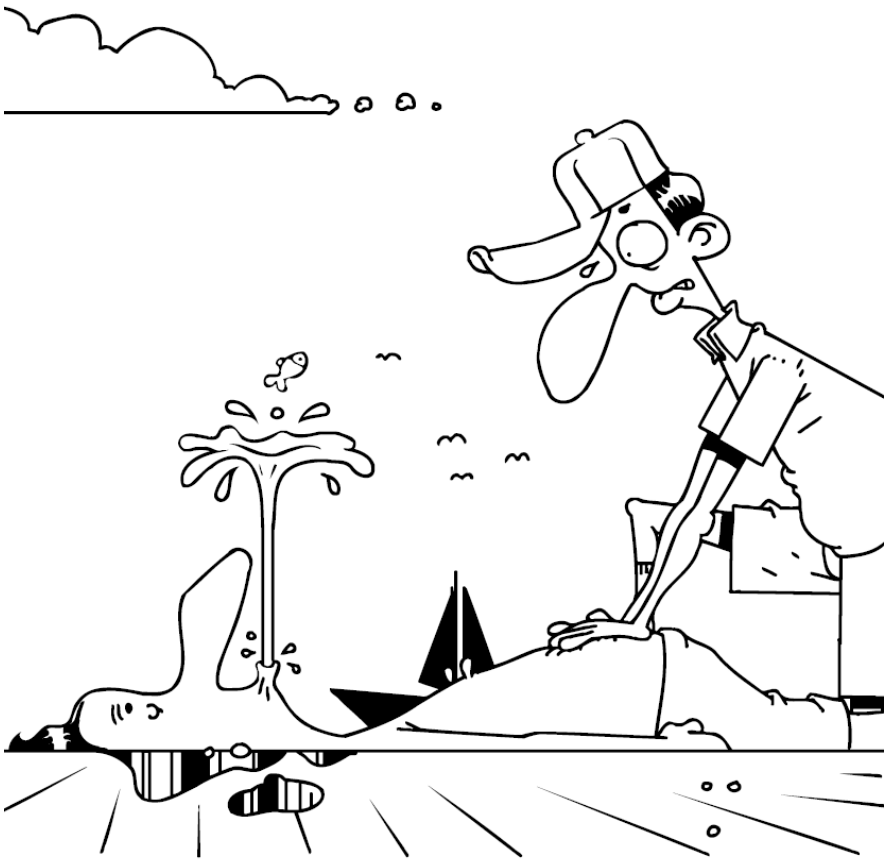
## VI. LEARN THE FIRST AID

In sailing events, organizers are obliged to ensure an adequate chain of medical help that will give prompt and effective assistance in the event of an incident, See the WS Website (http://www.sailing.org/tools/documents/MedicalGuidelines_0307-[5174].pdf). This should be provided during the event and for pre-event training or in the training camps. However, it is possible that you will not have any pre-organized medical support and you will therefore have to rely on your own abilities and the efficiency of the local medical system. Before departing your medical team should provide you with the basic information about the local medical system and at least with local emergency phone numbers. In any case, if an incident happens you will be the one who will have to provide first aid to the casualty until adequate medical help becomes available.

The aim of first aid in sports is to save and preserve life, to prevent further damage and to relieve pain. The injured should be prepared to be transported so that complete medical attention can be offered at the nearest onshore hospital or until professional aid arrives. Unfortunately, when you are out at sea it is difficult to receive medical aid immediately, so it is necessary to allow for time until it does eventually come.

First aid should be carried out within the borders of the suggestions offered in this instruction.

| Due to COVID-19 pandemics some procedures are modified to prevent possible infection* |
|---|



To avoid mistakes and hesitation in dealing with the casualty we have put forward procedures that you **should not digress from, with exception of modified procedures that should be followed during COVID-19 Pandemics:** *

Before any intervention, assess the overall situation and examine the casualty quickly and thoroughly.

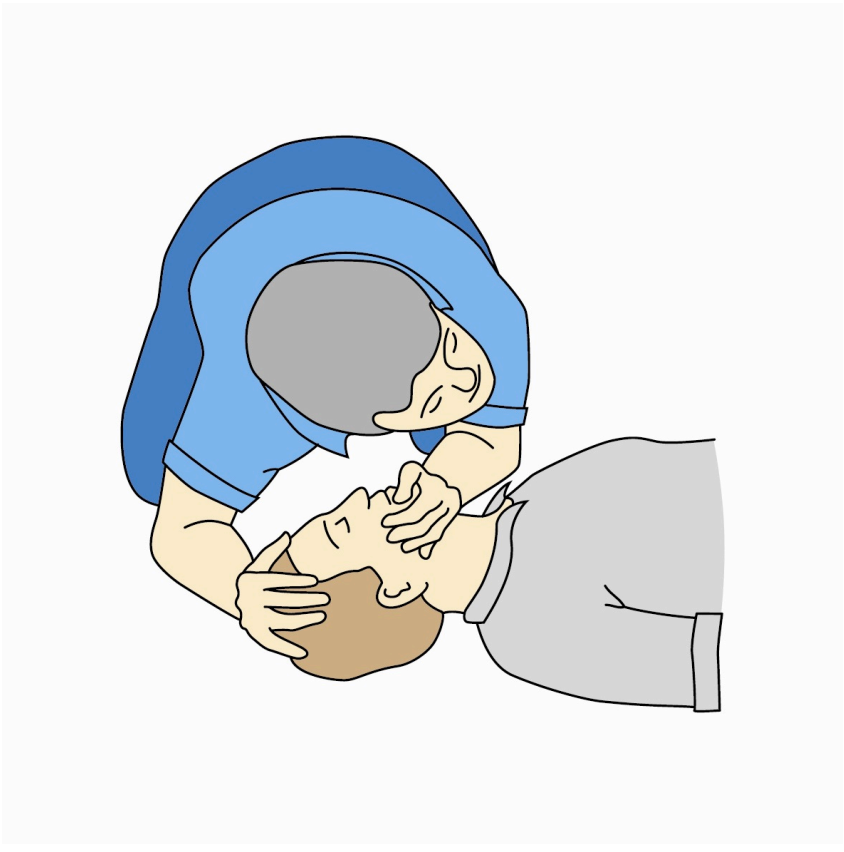
1. **Assess situation** quickly and calmly and protect yourself and the casualty from danger. If possible, ask for help from others. You should approach injuries on board / out at the sea carefully, making sure the boat is secured so that you and the casualty are safe. After you have established that you can proceed safely:

2. **Check the casualty** quickly - check if he is visibly conscious?
   - *If yes* – check for other conditions and treat as necessary.
   - *If not:*

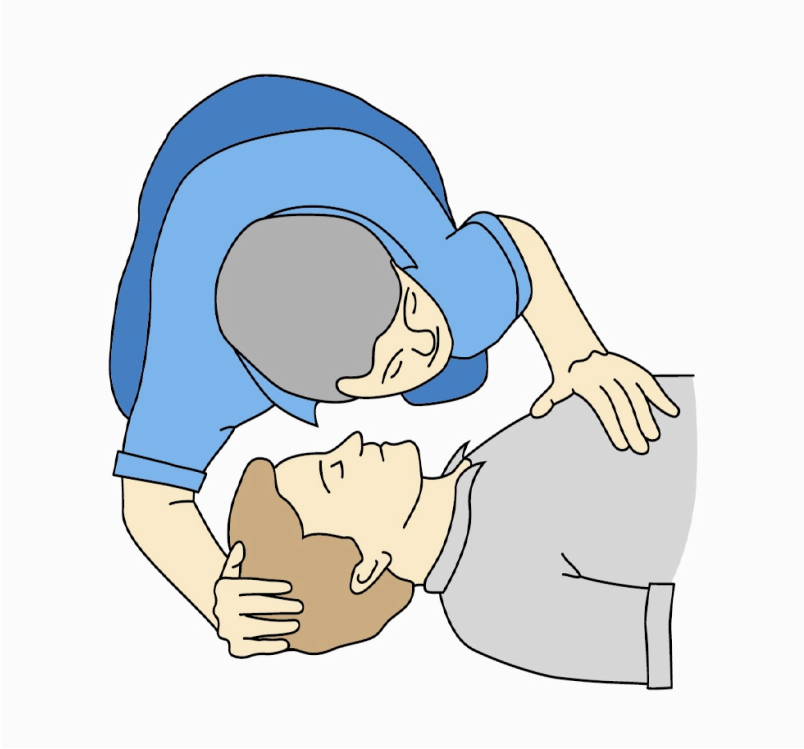
3. **Check response** - does he respond to your voice or to gentle shaking and tapping?
   - *If yes* – check for other conditions and treat as necessary.
   - *If not:* **Call** (or ask someone to call) for medical help before proceeding.

*And:*

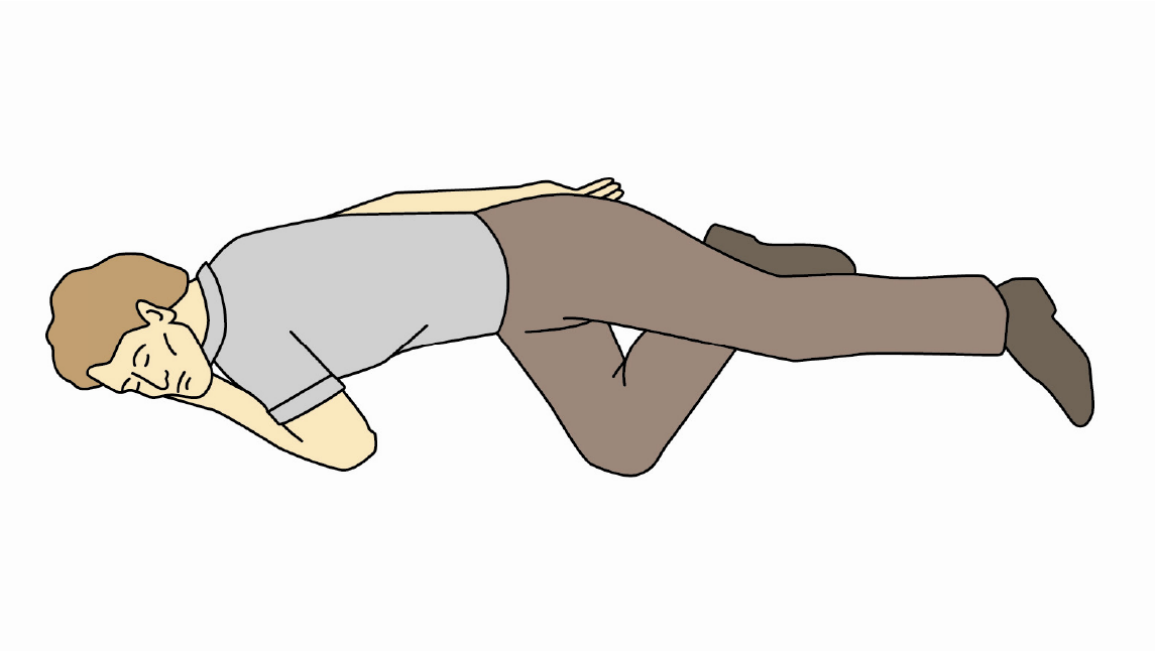
4. **Check the vital signs** - open airway and check breathing.*
   - ***A*** = *airway* (check if airways are open or obstructed – e.g. are the airways blocked by the tongue in unconscious patients or are there any objects in the mouth.
     - Lay the casualty face upwards, clean the mouth from foreign objects with your fingers.
     - Head hyperextension (tilt casualty's head, chin upwards, head backwards): this will keep casualty's airways open.



- ***B*** = *breathing* (check if unprompted breathing is present).*
  - Look, listen and feel (kneel beside the casualty, bend on him so your cheek and ear are close to his/her face, look for chest movement, breathing, warm exhaled air on your face).



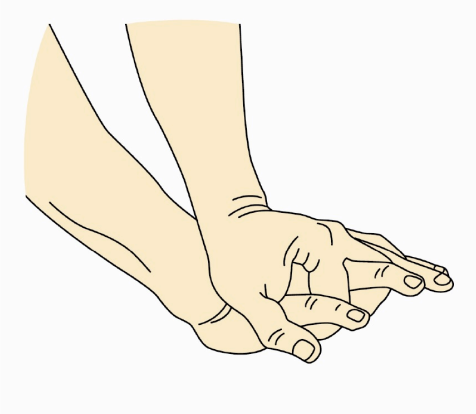
- *If breathing is present* - turn the casualty into **RECOVERY POSITION**



- *If breathing is absent:*

**5. Commence chest compressions**

- Locate the lower half of the breastbone; place the heel of one hand on it, the other on top of the first hand and interlock your fingers, making sure the fingers are not in contact with the casualty's ribs.



- Start pushing downwards, lowering breastbone lowering breastbone about 5 cm, at a rate of 100 - 120 compression/ minute.



- Complete **30 compressions**

*And:*

**6. Commence rescue breaths***

- Kneeling beside the casualty, keep his/her head tilted back, take a long and deep breath, apply your mouth over the casualty's mouth, keeping his/her nose closed with your fingers.
- Blow into casualty's lungs, watching for chest expansion (further head hyperextension may be needed if chest does not expand).



- Remove your mouth and let casualty's chest release.
- Give **2 rescue breaths** (if the casualty has drowned give 5 rescue breaths)

*And:*

**7. Continue cardiopulmonary resuscitation commonly known as CPR***

**Alternate 30 chest compressions with 2 rescue breaths until help arrives or the casualty starts breathing normally or you are too exhausted to continue.**

*Note – some medical authorities no longer recommend rescue breathing but suggest that cardiac compressions alone are sufficient to cause air exchange.*

Resuscitation (CPR) includes all procedures which are artificially administered for breathing and blood circulation of the casualty that is seen as (clinically) dead.

If heart activity and breathing stop, brain damage (due to lack of oxygen) starts in minutes and becomes irreversible after ten minutes. During the first minutes after the heart stops, the blood oxygen level remains high, so chest compressions are more important than rescue breaths in the initial phase of resuscitation. After about five minutes the oxygen level falls and rescue breathing becomes important (in view of American Heart Association guidelines).

Resuscitation techniques and manoeuvres are quite easy to perform, but they must be learnt correctly and refreshed periodically. We suggest you: attend a practical first aid course to learn to perform resuscitation on special mannequins. Once you have correctly learnt resuscitation, you only have to retrain a couple of hours every year to keep your skills fresh.

Automatic external defibrillators

Chest compressions can maintain casualty's circulation until professional help arrives but cannot reverse dangerous irregularities in heart rhythm (fibrillation). Use of Automatic external defibrillators (AED) by a layperson makes it possible to defibrillate many minutes before professional help arrives thus improving casualty's chances for survival. An AED is a portable electronic device that automatically diagnoses the potentially life threatening irregularities in heart rhythm and is able to treat them through *defibrillation* (the application of electrical therapy which stops the arrhythmia), allowing the heart to re-establish an effective rhythm.

AEDs are designed to be used by laypersons who ideally should have received AED training, so it is wise to invest in such training. AEDs are generally either held by trained personnel who will attend events (trainers) or are public access units which can be found in places such as sports fields.

**Fainting**

Fainting is a temporary loss of consciousness with quick recovery, caused by a lack of oxygen to brain.

It may be due to low blood pressure, neurological reactions to pain or emotional distress.
Skipping a meal, standing up too fast, standing for a long time in a crowd, high temperature (flu), dehydration, diarrhoea and vomiting can cause fainting.
Symptoms include nausea, giddiness, excessive sweating, dim vision, palpitations, weakness (the casualty can fall).

*Emergency treatment:*

- Lay the person down, elevate feet above head level - they should return to normal within a minute.
- If not, seek urgent medical help - it may be also due to illnesses as diabetes, arrhythmia, heart attack (CPR may be necessary – see relevant section) or shock.

If the person seems about to faint (such as in shock, heatstroke), or if they have already fainted, place them in the RECOVERY POSITION - this position keeps the airways open even if the person is unconscious, it also prevents the person from suffocating by vomiting. Always check the presence of pulse and breathing (see relevant section).

**Sequence for the treatment of adult choking**

A foreign object that is stuck in the back of the throat may obstruct the airway.

- If the casualty is breathing and shows signs of mild airway obstruction:
  - Encourage him to continue coughing but do nothing else.

- If the casualty shows signs of severe airway obstruction and is conscious give up to five back blows:
  - Stand to the side and slightly behind the casualty.
  - Support the chest with one hand and lean the casualty well forwards.
  - Give up to five sharp blows between the shoulder blades with the heel of your other hand.

- If five back blows fail to relieve the airway obstruction give up to five abdominal thrusts:
  - Stand behind the casualty and put both arms round the upper part of his abdomen.
  - Lean the casualty forwards.
  - Clench your fist and place it between the navel and the bottom end of the breastbone.
  - Grasp this hand with your other hand and pull sharply inwards and upwards.
  - Repeat up to five times.



- If the obstruction is still not relieved, continue alternating five back blows with five abdominal thrusts.

- If the casualty becomes unconscious:
  - Support the casualty carefully to the ground.
  - Call an ambulance immediately.
  - Begin CPR.

**Four dangers imminent to loss of life**

1. Breathing and heartbeat have stopped. If one of these functions fails immediately start CPR.
2. Heavy bleeding should be stopped immediately.
3. Shock should be recognised and taken into consideration.
4. Unconsciousness is dangerous because of possible suffocation either by swallowing the tongue or inhalation of vomit.

Only after considering these four dangers can you proceed to protect wounds from infection, immobilizing and laying the casualty in the correct position for transport. Do not undress the casualty any more than is necessary and this should be done very carefully. The clothes should be torn at the seams and always removed from uninjured limbs first.

**** COVID-19 Guidelines***

*European Resuscitation Council and other similar organizations developed Guidelines for Basic Life Support and First Aid procedures to be followed during COVID 19 pandemic. They suggest that chest compressions and cardiopulmonary resuscitation have the potential to generate aerosols and suggest that in the current COVID-19 pandemic lay rescuers consider* ***compression-only resuscitation*** *and public-access defibrillation (AED).*

***Cardiac arrest*** *is identified if a person is unresponsive and not breathing normally. Responsiveness is assessed by shaking the person and shouting. When assessing breathing, look for normal breathing.*

*Following procedure for CPR should be followed when victim is unresponsive and not breathing normally:*

1. *Assess breathing visually; do not open the airway or approach the victim's nose & mouth.*
2. *Call Emergency Services (state COVID-19 status if you know it).*
3. *Cover the victim's nose & mouth with a surgical mask or a cloth.*
4. *If available, also wear a mask yourself.*
5. *Give continuous chest compressions.*

*Lay rescuers should, as soon as possible, wash their hands thoroughly with soap and water or disinfect their hands with an alcohol-based hand-gel and contact the local health authorities to enquire about screening after having been in contact with a person with suspected or confirmed COVID-19*

**Injuries**

There are different kinds of injuries that can occur during sailing. They may affect the skin and the underlying tissue (abrasions, wounds, contusions, bruises), bones and joints (fractures, sprains, dislocations), or/and muscles (muscle elongations or tears).

General principles of emergency treatment apply almost to all kind of injuries and can be completed by anyone, waiting for a medical team to come:

- Check the environment and assess safety, before helping the casualty.
- Don't use any unknown procedure you are not familiar with: they can cause further harm. If in doubt, don't waste time, and call immediately for urgent medical help.
- Reassure the casualty, protect him/her from the environment (e.g. from the cold).
- Keep onlookers away.

First thing to do in case of sprains, contusions, dislocations or fractures of a limb is **R.I.C.E**.

- ***R - Rest***
- ***I - Ice*** - put an ice bag over the injury
- ***C - Compression*** - put a bandage around the injured limb to prevent swelling
- ***E - Elevation*** - elevate limb

This will reduce pain and give the casualty some relief; it's easy to do (you can use ready-to - use ice-bags, or just a plastic bag filled with ice-cubes. Ice bags are far better than cold sprays (these can harm the skin if sprayed too close to the skin, and their cooling action is short lasting).

Bruises

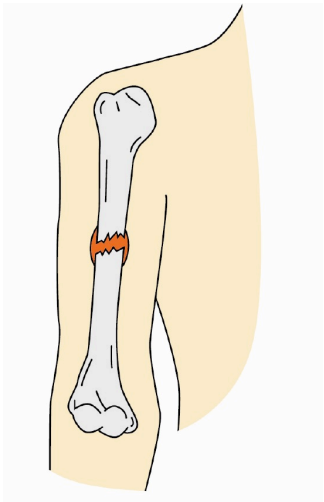
Injuries to the soft tissue may be subcutaneous (just underneath the skin), intramuscular (within the underlying muscles) or peri-osteal (related to bone).
Symptoms are pain, swelling and bluish or reddish discoloration.

*Emergency treatment*:

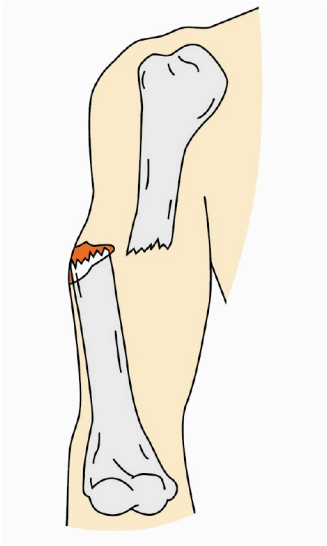
- No bandage is required if there are no wounds.
- Apply ice bag for 20-30 minutes, then reapply after another 30 minutes.
- Do not apply ice directly on skin, it can harm the skin.

Fractures

Fractures are breaks in bones or cartilage where an external force applies directly, bends or twist the bone until it breaks. They are very painful; the casualty cannot move the injured part that appears swollen and bruised. The bone shape may appear deformed when the fracture is complete and the two parts of the bone are dislocated.



*Closed fractures* - when the bone fracture is not accompanied by an external wound;



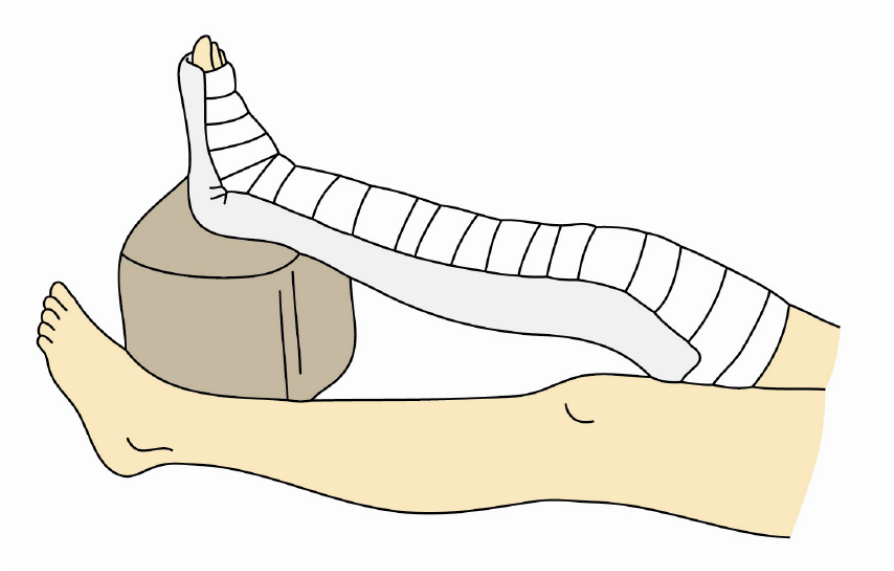
*Compound (open) fractures* - when an external wound occurs (the broken bone tears the skin); there is high risk of infection.

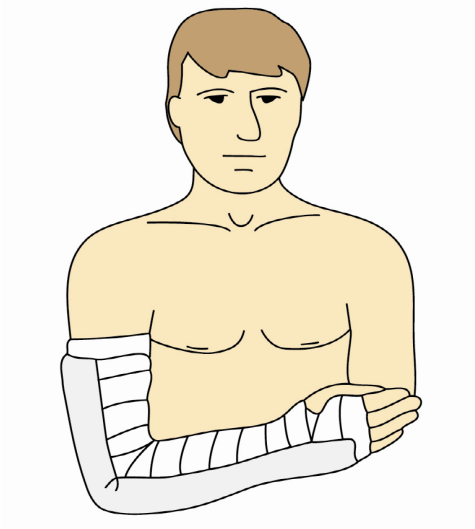
*Comminuted fractures* - when the bone is chipped or squeezed into little pieces**.**

Pain and bleeding associated with fractures can cause shock (put the casualty in recovery position, if possible, and ask for medical help). The broken bone can harm, tear or cut blood vessels and nerves (bleeding, paralysis), always check if the extremities are pale, cold or if sensation is impaired. The risk of bacterial infection is very high in open fractures, which need to be treated in emergency as wounds.

*Emergency treatment:*

- Immobilization of the limb with rolled up newspapers, improvised splint, bandages.
- Put ice bag over the fracture.
- If the casualty is in shock place in the recovery position.





**Never try to reduce (re-locate the bone parts) fractures!**
Fracture must be reduced in hospital, after X-rays, by skilled medical personnel, sometimes under general anaesthesia. A wrong attempt to reduce a fracture may be very painful, and result in blood vessels or nerve damage (this can lead to paralysis)

- Seek urgent help to carry the casualty to hospital.

Dislocations

They occur when a bone is forced out of its socket and the articular surfaces of a joint lose their contact; they can be extremely painful. The joint is locked in an abnormal position and its shape may change while movement of the joint is impossible.

*Emergency treatment:*
- Immobilization to reduce pain.
- Put ice bag over the injured joint.
- Place the injured person in a comfortable position and reassure them.
- Seek medical help and get the casualty to hospital.

**Don't try to reduce dislocation!**
As for fractures: it may cause severe nerve or vascular injuries! Only practised medical staff can do this!

Muscle injuries

They are common in sports practice. An overstretching or overexertion of the muscle causes a rupture of the muscle fibres. Pain may be felt during exercise (severe injuries) or immediately after it (mild injuries). Muscle contraction may be painful, or impossible. The limb may appear swollen or bruised.

*Emergency treatment:*
- R.I.C.E.

Cramps

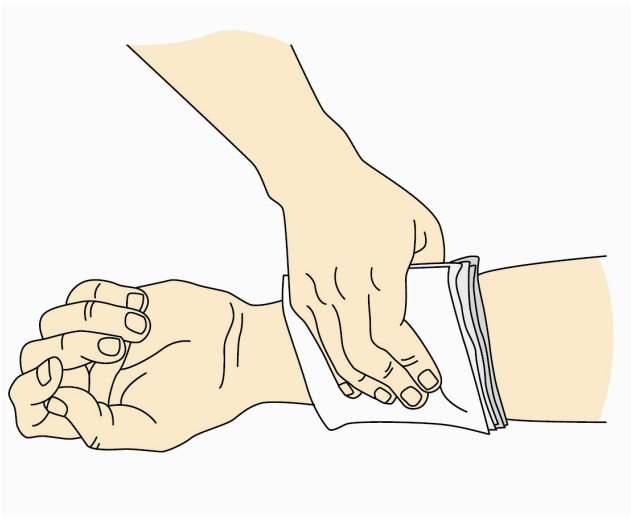
Cramps are not muscle injuries, but involuntary muscle spasms often caused by exercise in hot weather, dehydration or lack of mineral salts.

*Emergency treatment:*

- Stop exercise.
- Rest and cool down.
- Drink water and electrolyte (sports drink).
- Gentle stretching of the muscle.

Wounds

Wounds are quite common in sports practice: in sailing you can get hurt while cutting a rope with a knife or scissors, or when the boom hits your head during a tack or gybe. Wounds can be more or less deep, but they always cause bleeding. Bleeding should be stopped immediately by applying direct pressure over the wound with your fingers or your palm preferably over a sterile dressing or clean pad. Skin is a protection against bacteria, when



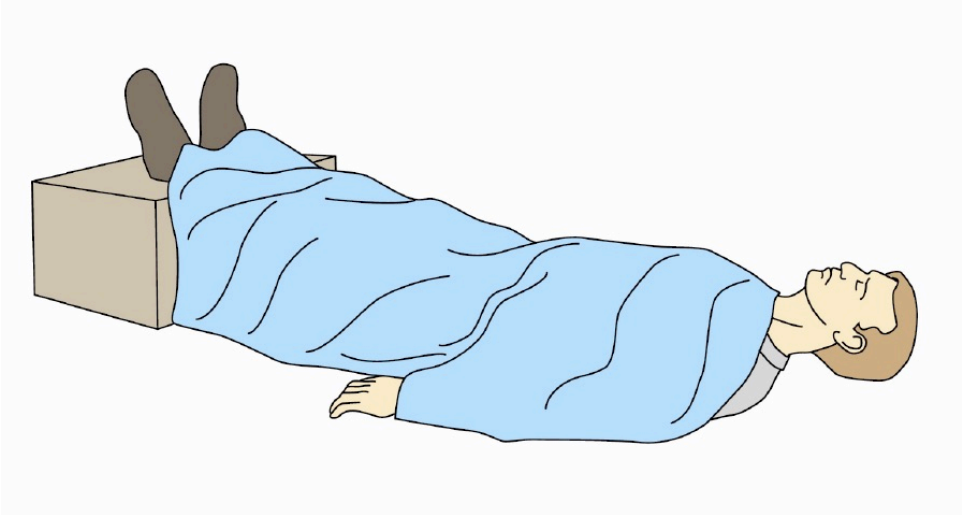
skin is cut or broken an infection may develop.

*Emergency treatment:*

- Wash with soap and water, hydrogen peroxide or surface-active agents. Do not use alcohol - it hurts, and it delays the healing of the wound.
- Remove dirt, fibreglass / carbon debris or other foreign objects from the wound. Clean the wound from the centre outward. In the case of a penetrating neck wound, do NOT remove a visible foreign body which may have torn the jugular vein.
- Apply continuous pressure with dressing pads; if bleeding doesn't stop, add further dressing pads without removing those already soaked.
- Small clean cuts can be closed with adhesive strips.
- Deep cuts need surgical treatment and antibiotic therapy (ask for medical help).
- Dirty wounds or wounds containing dead tissue must be left open. Clean as well as possible and apply dressing.

- Abrasions occur when the first layer of skin is damaged and scraped away. They are not severe, but very painful, and must be cleaned and washed to avoid bacterial infection.
- Elevate if bleeding is from a limb.

- **Treatment for shock** is necessary in case of paleness, weakness and fainting.
    - Lay the casualty down with raised legs, cover him/her with blankets or coats and call for medical help.
    - Do not leave casualty unattended and monitor the vital signs: level of response, pulse and breathing.

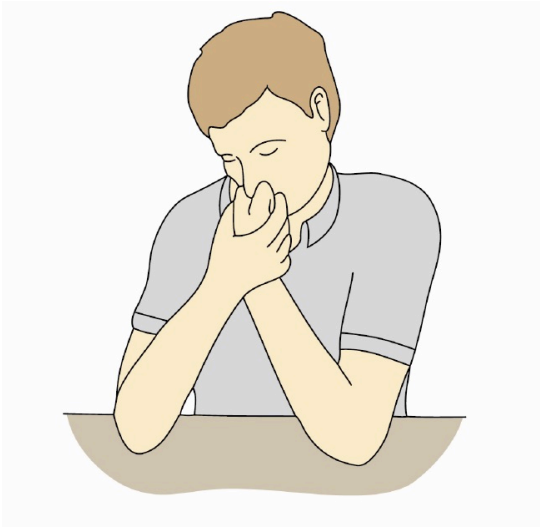


<u>Nosebleed</u>

Nosebleed can be caused by injuries of the face/nose. It's quite common in children, and usually it does not require medical treatment.

*Emergency treatment:*

- Lean the head forward.
- Pinch the soft part of the nose with two fingers for 10 minutes; this will cause the blood to clot.
- Don't blow the nose. **Don't put cotton swabs or anything else into the nose**! (This can only be done by medical personnel).
- Ask for medical help if nosebleed doesn't stop after half an hour.



Head Injury

Head injury is an ever-present risk within sports that involve high energy and speed, and also sports where there is risk of collisions between competitors.

Especially for young sailors - consider wearing helmets!

It's important to recognise both major and minor head injuries:

- Major head injuries are an immediate risk to life and may involve immediate resuscitation (see above). The added risk on water, is that a sailor with a head injury may also be suffering from near drowning.
- Minor head injuries may only cause slight symptoms that can be difficult to recognise, unless they are looked for specifically. Repeated minor head injuries can have an accumulating detrimental effect on brain function, so it's important to recognise and assess every incident of minor head injury.

The 'Concussion in Sport Group' have put together a framework that guides non-medical personnel to recognise both major and minor head injury (see below).
There is good practical guidance on how to manage the common but potentially difficult cases where minor concussion is suspected, but there are no clear symptoms. This provides a balanced and pragmatic way to deal with such cases.

The time to use this guideline is on any occasion where there is an obvious, witnessed or suspected impact to a competitor's head. This structured approach will quickly identify the presence or absence of any 'red flag' symptoms and enable a pragmatic and rapid decision to be made as to whether a competitor can continue to compete or should be assessed in more detail by a medical professional.

# CONCUSSION RECOGNITION TOOL 5 ©

**To help identify concussion in children, adolescents and adults**

Supported by

## RECOGNISE & REMOVE

Head impacts can be associated with serious and potentially fatal brain injuries. The Concussion Recognition Tool 5 (CRT5) is to be used for the identification of suspected concussion. It is not designed to diagnose concussion.

### STEP 1: RED FLAGS — CALL AN AMBULANCE OR LOCAL MEDICAL EMERGENCY SERVICES

**If there is concern after an injury including whether ANY of the folowing signs are observed or complaints are reported then the sailor should be safely and immediately removed from the boat or from the waterside. If no licensed healthcare professional is available, call an ambulance or local medical emergency services for urgent medical assessment:**

- **Neck pain or tenderness**
- **Double vision**
- **Weakness or tingling/ burning in arms or legs**
- **Severe or increasing headache**
- **Seizure or convulsion**
- **Loss of consciousness**
- **Deteriorating conscious state**
- **Vomiting**
- **Increasingly restless, agitated or combative**

**Remember:**

- In all cases, the basic principles of first aid (danger, response, airway, breathing, circulation) should be followed.
- Assessment for a spinal cord injury is critical.
- Do not attempt to move the player (other than required for airway support) unless trained to so do.
- Do not remove a helmet or any other equipment unless trained to do so safely.

**If there are no Red Flags, identification of possible concussion should proceed to the following steps:**

### STEP 2: OBSERVABLE SIGNS

**Visual clues that suggest possible concussion include:**

- Lying motioness on the ground, in the water or in the boat
- Slow to get up after a direct or indirect hit to the head
- Disorientation or confusion, or an inability to respond appropriately to questions
- Blank or vacant look
- Balance, gait difficulties, motor incoordination, stumbling, slow laboured movements
- Facial injury after head trauma

### STEP 3: SYMPTOMS

- Headache
- "Pressure in head"
- Balance problems
- Nausea or vomiting
- Drowsiness
- Dizziness
- Blurred vision
- Sensitivity to light
- Sensitivity to noise
- Fatigue or low energy
- "Don't feel right"
- More emotional
- More Irritable
- Sadness
- Nervous or anxious
- Neck Pain
- Difficulty concentrating
- Difficulty remembering
- Feeling slowed down
- Feeling like "in a fog"

### STEP 4: MEMORY ASSESSMENT

(IN SAILORS OLDER THAN 12 YEARS)

**Failure to answer any of these questions (modified appropriately for each sport) correctly may suggest a concussion:**

- "What sailing venue are we at today?"
- "Which race is about to start?"
- "Who won the previours race?"
- "Where did you sail last week?"
- "Did your boat win the last race?"

### Sailors with suspected concussion should:

- Not be left alone initially (at least for the first 1-2 hours).
- Not drink alcohol.
- Not use recreational/ prescription drugs.
- Not be sent home by themselves. They need to be with a responsible adult.
- Not drive a motor vehicle until cleared to do so by a healthcare professional.
- Not continue to sail on the water or venture in to the water.

**ANY SAILOR WITH A SUSPECTED CONCUSSION SHOULD BE IMMEDIATELY REMOVED FROM THE BOAT OR WATERSIDE AND SHOULD NOT RETURN TO ACTIVITY UNTIL ASSESSED MEDICALLY, EVEN IF THE SYMPTOMS RESOLVE**

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Echemendia RJ, *et al*. *Br J Sports Med* 2017;**51**:872. doi:10.1136/bjsports-2017-097508CRT5

**Heatstroke**

Heat stroke is caused by prolonged exposure to Sun thermal radiation.
Symptoms are: headache, confusion, hot dry skin, rapid heartbeat, lack of consciousness, irritability, and high body temperature. Athlete with elevated temperature above >**40°C** which does not resolve after 30 minutes of cooling and rehydration is to be considered a **medical emergency.**

Emergency treatment:

**The aim is to lower the casualty's body temperature as quickly as possible!!!**

- Remove the person to a shady place (recovery position if unconscious).
- Cool the person with wet towels (if possible, soaked in icy water) until body temperature falls to 38 °C (100F).
  To be started in 10mins (rescue boat) - while heading for medical care. To be lowered in 30 mins (rescue boat/ambulance/hospital).
- Monitor vital signs and if their temperature starts to rise again, repeat the cooling process.
- Seek urgent medical help (**it could be life threatening**)!

**Heat exhaustion**

Heat exhaustion occurs in very humid and hot weather, even without exposure to direct sunlight (it can even occur indoors). In these conditions' perspiration does not take heat away from the body (it doesn't evaporate, due to high amount of water in the air).
Symptoms: headache, weakness, vomiting, dizziness when standing from a sitting position, **normal or moderately** high temperature, normal mental state, weakness

Emergency treatment:

- Remove the person to a cool place (shade).
- Get them to lay down with raised legs.
- Cool the person with wet towels.
- Administer oral re-hydrating solution.

**Know the difference between heat stroke and heat exhaustion!!!**

**Drowning and near drowning**

A drowning casualty must be treated as explained in RESUSCITATION (CPR). Other manoeuvres to drain water from the lungs are actually not effective. Most likely, a drowning casualty will vomit, in this case just roll him/her on his/her side and sweep vomit from the mouth before starting rescue breathing again. All drowning casualties must be taken to hospital for medical checks and antibiotic therapy.

**Hypothermia**

Immersion in cold water or wet suit (with exposure to wind) on board may cause hypothermia (condition when the body temperature decreases to a dangerous level). It's very important to assess hypothermia symptoms quickly:

*Mild hypothermia:* shivering, weakness, slightly blurred speech and uncoordinated movements

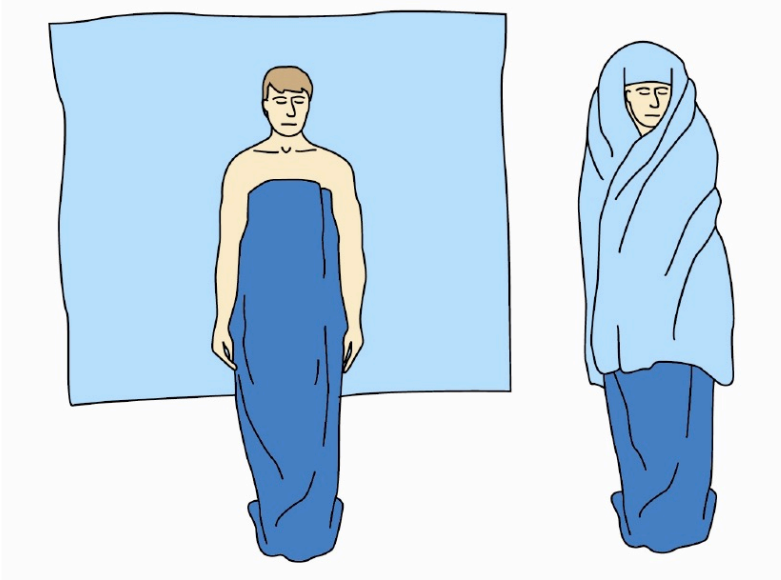
Emergency treatment:

- Remove wet garments and put on dry ones, keep the person under blankets.
- Administer warm fluids and food.

*Severe Hypothermia:* weakness, confusion, uncoordinated (unable to perform simple tasks), bizarre or unusual behaviour, lethargy, coma.

Emergency treatment:

- If possible take the casualty to a sheltered place (e.g. cabin).
- If sheltered remove wet clothes and insulate them with dry clothing or blankets.
- If on board, wrap them in blankets or thermal foil to protect them from the wind.
- If the casualty is conscious and if available, give them hot drinks.
- Do not administer fluids if the casualty is unconscious or uncoordinated!
- Seek immediate medical help (there is a risk of heart failure).
- The casualty should be transferred on a stretcher with minimal movement.



**Handle the casualty gently - do not massage or rub arms and legs, it may push cold blood to the heart, further lowering body temperature**.

After giving emergency treatment, it's always better to re-warm hypothermia cases in hospital where infusions of warm electrolyte solutions and other warming methods can be applied.

## VII. DO NOT OVER-STRAIN YOUR SAILORS

Just like all other top-level athletes, sailors competing today must undertake high demands of physical training to achieve the necessary level of physical competence to endure the strains of competition. In such a competitive environment it is easy to overlook the necessity for rest and some physiological changes during travel and training sessions that can endanger the health of your sailors.



The causes of most athletics injuries are described in literature as a result of over-strain and over-training syndrome. Inappropriate volume, intensity and recovery applied during the training process results in injuries in athletes.

### Over-training

There are many definitions of over-training. In general, over-training can be defined as an impaired performance ability despite the maintenance of an increase in training effort, which cannot be explained by any discrete pathology. It is a well-recognized syndrome in athletes in which increases, or maintenance of a training intensity are associated with decrease in performance.
Over-training develops after a series of high intensity trainings and is associated with other factors such as diet (e.g., weight loss diet), social (e.g., stress at daily life, work, school), and mental factors (e.g., relationship rejection, negative thinking).

Because over-training is a complex process, diagnosis is complicated and there is no specific biological marker or any specific test that could indicate over-training, under-performance being the only recognised symptom. This may be a consequence of miscalculation of loading intensity and necessary resting time.

Over-training syndrome has:

- *physiological manifestations* (decrease of performance, poor coordination, decreased level of $O_2$ carrying capacity, impaired heart recovery, decreased training tolerance, chronic fatigue, increased resting and delayed heart rate recovery, decreased efficiency during exercise, sustained muscle and joint pain…),
- *biochemical manifestations* (increased level of cortisol, decreased levels of testosterone, decreased muscle glycogen levels, impaired mineral absorption, increased catabolic process…),
- *immunological manifestations* (increased sensibility to all kinds of diseases, impaired immune response, increased incidence of upper respiratory diseases, increased incidence of bacterial infection, increased appearance of herpes…) and
- *mental manifestations* (depression, mood changes, irritability, decreased self-confidence, emotional instability, impaired focusing, fear…).

In order to reduce the number of injuries caused by over-training and increase the number of healthy athletes who are then able to achieve the best performance in competitions, constant education and participation of coaches is needed along with the cooperation of federations and sports doctors, nutritionists, psychologists, physiotherapists and any other professional involved in athletes´ performance.

**Travel fatigue**

The effects of airplane travel on athletic performance are relevant in a world that is increasingly reliant on flying for athletic competition. Air travel factors, like noise exposure, immobility, sleep loss, dietary changes and even breathing poor-quality air, can impact performance in ways that many may not realize. On top of everything, travel is often psychologically stressful due to delays, security and worry over potential lost luggage containing race gear. Regular routines are disrupted when one travels abroad. Athletes are particularly excited about the trip and forthcoming race at the new destination, worried about planning for the departure. Depending on the country to be visited, visas and vaccinations may be required. Professional/national teams usually have arrangements made for them but often the coach will be the only responsible and he should aim to take of the burden of travel from athletes as much as possible. Basic things such as booking the airplane ticket can make a difference; seats with more leg room should be bought, timing arrival in the evening and direct flights, if possible. These arrangements should include coping with formal procedures at departure and arrival and avoiding any mix-ups in dealing with ground staff and security controls.

*Travel fatigue* can be defined as temporary exhaustion or tiredness caused by any long journey irrespective of mode of transport. North - south travel is causing seasonal change, while east - west travel over more than 2 time zones is causing *jet lag*. Contrary to *jet lag* that can last for a week or more, if properly treated, *travel fatigue* subsides the next day but can

accumulate over the course of season. It can be persistent and impact athlete's capacity to recover and perform, causing behavioural and mood changes with loss of motivation.

Having arrived safely at the destination, the athlete may suffer not only from *jet lag* but also from *travel fatigue* due to the conditions in travel vehicle. Sitting in a seat for several hours while on the airplane can produce lethargic limbs. The long periods of inactivity during the plane journey may lead to the pooling of blood in the legs and in susceptible people cause a deep-vein thrombosis. Moving around the plane periodically during the journey, at least every 2 hours, and doing light stretching exercises is recommended. If coach is present, he should remind athletes to do it and watch over other necessary procedures.

Airplane travel harms athletic performance via the reduced oxygen pressure too. Airplane cabin oxygen pressure is generally maintained at the equivalent of 5000–6000 ft (1520–1828 m), which is equivalent to an inspired oxygen pressure (PO2) of 132–127 mm Hg. This produces a hypoxic stress and oxygen saturation levels decline significantly after 3 and 7 h of flight. Altitude exposure results in a significant decline in time trial performance in aerobic sports. It is plausible that athletes would require a period of adaptation for optimised performance after long flights (>10 h). One may need a day to fully recover their oxygen levels, so it is be recommended that athletes avoid arriving the same day of competition.

Aircrafts typically maintain a 20% humidity level, which is well-below the body's required 30%. Despite this, long haul flights do not cause significant whole-body dehydration but the dry air in the cabin does however influence mucous membranes of the eyes, mouth and nose and can lead to discomfort. Although the extra body water lost in such circumstances is small, athletes cannot afford it. This means that athletes should hydrate even more than usual. Athletes should drink about 15 to 20 ml extra fluid per hour, preferably some sport drink or water.

Nutrition is essential for performance and the circadian de-synchronization that contributes to feelings of *jet lag* also affects gastrointestinal function and digestion. Circadian disruption can cause a delay in the absorption of food from the gastrointestinal tract after eating at night. A large meal eaten late in the evening could lead to bloating and sleep disruption. Travelling athletes may also have difficulty finding access to palatable foods that are typically included in their usual diet. Thus, appropriate timing of meals may be more important than the energy content of the meal. Small meals before and during flights are better tolerated than large meals. Food served on the airplanes is generally not adequate for athletes but on majority of the airlines it is possible to choose among several meals (vegetarian, kosher, Muslim, etc) so it is possible to choose the one that is closest to what athlete needs and take missing nutrients on board as pre-prepared snacks. Intestinal gases expand with increase in altitude, which can lead to bloating and pain. This problem is exacerbated by drinking soda or carbonated beverages because the fizz creates more volume. Additionally, although chewing gum or sucking on candy may help relieve ear pressure, both habits can also contribute to bloating. Besides avoiding the food that cause bloating (e.g., legumes) water here plays a pivotal role as remaining hydrated will ensure that the digestive process continues to flow smoothly and help prevent constipation.

Unavoidable noise on board can be cause of fatigue too. Exposure to air travel noise can cause sleep disruption, increase stress, and raise blood pressure. Athletes should invest in custom made ear plugs or noise cancelling headphones to add a little more peace to their travel.

Moderate and high intensity exercise can cause a temporary decrease in immunoglobulins (IgA and IgM) in mucosal secretions. Same can happen after long-haul travel. Although these changes are disputed as direct cause of illness, this immunological change together with dry air in airplane and crowded environment, could be associated with an increased risk of respiratory illness, recently including SARS-Cov2 infection. Crowded airport halls or dormitories at big sports events, where large groups of people remain in close contact for a long time, together with a lower resistance to respiratory infection create a higher probability of transmission of respiratory diseases. A simple bout of flu at new destination can ruin months of dedicated training.

During sailing other health problems may occur which are caused by the poor health of the sailor. Never send your sailors out on the water if they are not well or recovering from flu, cold, diarrhoea or other infectious diseases. Wait a few days until they are fully recovered, then you can continue safely with the planned activities.

Some simple things may reduce health problems on board:

- Avoid overstraining your sailors with intensive training two days before the trip.
- When organizing the trip, include at least one day of rest after arrival.
- Exercise should be light or moderate in intensity for the first few days in the new time zone, because training hard, while muscle strength and other measures are impaired, will not be effective.
- Timing of the endurance training on arrival should not coincide with the circadian nadir 2-4pm and 2-4 am until full adaptation is reached.
- Avoid alcohol or caffeine which act as diuretics and can add to fluid losses.
- Sipping water with electrolytes consistently throughout the day will ensure body balance.
- If possible, make arrangements for dietary selections that are optimal for individual performance. While travelling, eat smaller meals before and during flight; and, upon arrival, time meals to match habits appropriate to the destination.
- Minimise the use of electronic devices.
- Use a neck pillow, eye mask, earplugs and/or noise cancelling headphones.
- Wear comfortable, loose fitting clothing to aid rest and relaxation and prevent overstimulation.
- Restrain from going out for training if the conditions are too heavy, or the sailors are not perfectly well and fully recovered.

**Over-strain and young sailors**

Training is supposed to make your sailors perform better, but exercise can potentially be dangerous because of injury from overdoing the training or by having an accident. Every trainer plans his training program carefully, but special care must be taken when training young sailors.

Children are not miniature adults. Their mental and musculoskeletal systems are developing from childhood into adolescence and during this period each child’s body has a different level of maturity and capacity to endure the strains put on them by training. In contemporary sailing they are exposed very early on to the highest demands of training targeted for various classes of dinghy boats, each of them with different physical demands in relation to the sailor’s height, weight, muscular strength and endurance. It is a fact that a sailor's

performance relates directly to their capacity to overcome the external forces imposed on the boat. Anthropometric parameters for creating the highest hiking moment force are well known and in some classes weight margins are very narrow, actually requesting young sailors to sail in them in order to fulfil the weight requirements of the boat. The problem is that today it is not unusual for sailors of less than 19 years old to possess the requested anthropometric parameters while nevertheless, size and weight are not always related to their bone maturation.

A 19-year-old sailor can appear as an adult athlete, although his growth has not finished. The long bones of the body do not grow from the centre outward. Instead, growth occurs at each end of the bone around the growth plate. The growth plate is the last portion of the bone to harden, which leaves it very fragile, sensitive, and vulnerable to physical compression and stretching. Any damage to those areas will affect the growth. Also, because muscles and bones develop at different speeds, child's bones may be weaker than the surrounding connective tissues (ligaments). Although all children who are still growing are at risk, girls and boys near the end of their growth period are especially vulnerable.

Trainers should always remember:

- Children have fragile growth plates at the ends of their long bones whereas adults do not.
- The chosen boat class for each child must be appropriate for the child's age and its training age.
- An early transition to a more demanding class can result in injury and de-motivation.
- Threshold growth plate stress is an individual parameter, directly influenced by the growing up stage.
- Consult with your team doctor before making a decision on transition to a more demanding class.

**Mental health**

Mental health and physical health are inseparable. Athletes competing at elite level are exposed to numerous stressors that may contribute to mental health disorders. Mental health symptoms and disorders are common in elite athletes and can impair performance and increase the risk of physical injury. Symptoms often go unrecognized, and athletes often experience barriers to seeking mental health support, largely due to stigma. Stressors include over-training, sleep disturbances, injuries, competitive failure, harassment and financial difficulties.

Early recognition is key, and trainers should always take an athlete’s concerns seriously. Mental health symptoms and disorders should be seen with the same importance as other medical illnesses. Regular mental health assessments are recommended, with immediate referral to a mental health professional when necessary. Coaches and health professionals may use the SMHAT (Sport Mental Health Assessment Tool), developed by the IOC to facilitate athletes’ mental health assessment.

Coaches should also be familiar with common warning signs:

- Mood changes
- Irritability

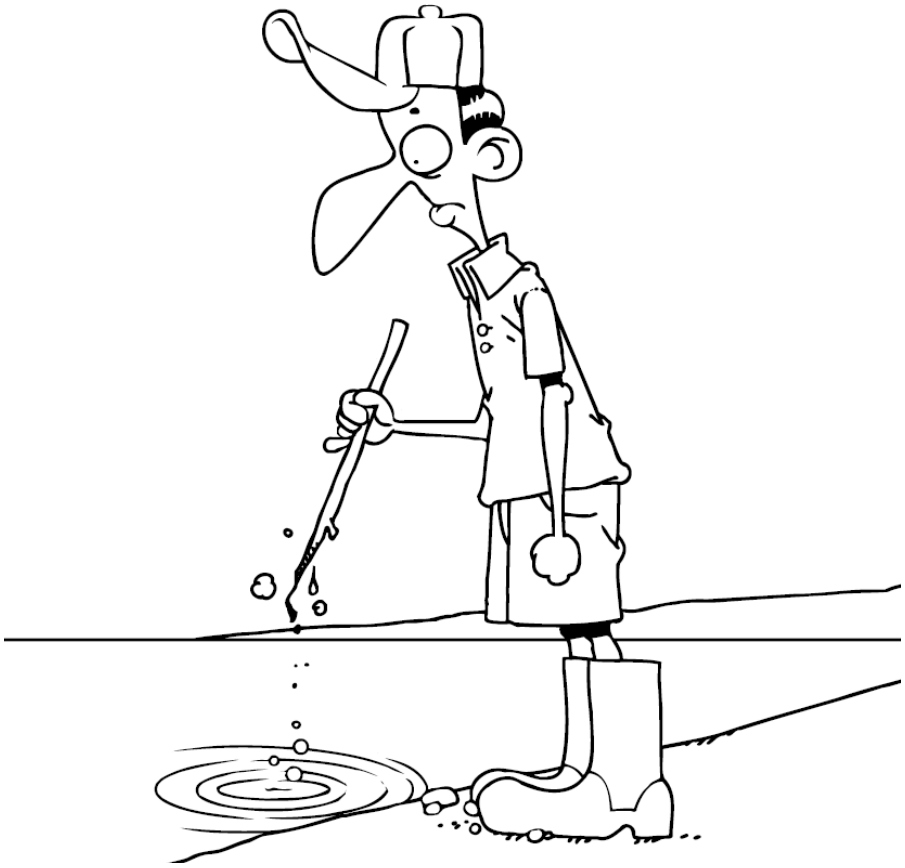
- Feeling worthless, helpless, hopeless
- Eating disturbances
- Sleeping disturbances
- Decreased energy or fatigue
- Decreased concentration, interest, motivation
- Social withdrawal
- Negative thinking

Athletes suffering from mental health disorders or symptoms may benefit from psychotherapy and pharmacological treatment. When an athlete is prescribed a pharmacological treatment always bear in mind WADA's list of prohibited substances and make sure to request a Therapeutic Use Exemption if needed.

Athletes may also benefit from various coping methods used to cope with stressors and improve mental health. Some widely used methods are meditation, visualization techniques, mindfulness techniques and systematic relaxation procedures. Furthermore, sleep hygiene, a well-balanced diet and sufficient recovery periods can have a positive effect on mental health.

## VIII. PROTECT YOUR TEAM FROM POLLUTED WATER

Unfortunately, pollution is our reality and sailing events are often held on racing fields in front of the major urban areas, not always with appropriate sewage water plants. Near major towns one should expect a high level of *coli bacteria* and potentially harmful chemicals in the water. Infection may result from ingestion or inhalation or contact with harmful micro-organisms which may be naturally present, that can be carried by people or animals using the water or present as a result of faecal contamination. The most common consequences are diarrhoea, acute febrile respiratory disease, ear infections and infection of the skin lesions. Waters in some sailing areas can also hide potentially dangerous algae and other harmful sea organisms like jellyfish.



Instruct your sailors to:

- Try not to swallow water if capsized.
- Wash their eyes and face with available clean water when on board.
- Use mouth wash and hand sanitizing gels before eating or drinking on board according to the procedure described below.
- Take a shower immediately on return according to the procedure described below.
- Not to sit in wet clothes after sailing.
- Not to wash any scratches or grazes with sea water (use clean fresh water).
- Apply antiseptic to cuts and abrasions after washing on return to land.

- Take antibiotics if inflammation develops.
- Take care to minimize contact with polluted water by wearing adequate sailing garment. Fresh water lakes or rivers may additionally harbour pathogens such as schistosomiasis (blood fluke) and amoeba - keep the mouth closed, wear eye protection, and dry off quickly to minimize the risk of pathogens entering via the skin, mouth, nose or eyes.

- Wear proper footwear – it can protect the sailor from injury (cuts, bites), insects (sand fleas, ticks), and parasites (hookworms, strongyloidiasis), which are found in the sand and soil on some beaches, especially on riverbanks and muddy terrain.
- Clean their sailing garments regularly, during and after the sailing event.
- Obtain local advice on the possible presence of dangerous aquatic animals
- Not to jump in the water after a race.
- Seek medical advice for:
    - Eye discharge (conjunctivitis)
    - Ear infection
    - Red (inflamed) skin or boils
    - Diarrhoea
    - Fever

***Procedures to reduce infection***

<u>On the water:</u>

- Rub hands and forearms with alcohol-based disinfectant for 3 minutes, including:
    - both hands, then both forearms and then both hands again for a total of 30 seconds.
    - repeat the same 30 second procedure 5 times, each time with new disinfectant
- Wait for the hands to dry fully before eating or drinking on board.
- Rinse the mouth with mouth wash (containing 0.05% chlorhexidine gluconate or *octenidine dihydrochloride phenoxyethanol or* other disinfectant) before eating or drinking.

<u>On shore after disembarking:</u>

- Use the water hose to shower immediately on return from sailing.
- Recovery procedure may require to drink and eat immediately on arrival on land after sailing. Before one actually does so – one should wash hands with liquid soap and water for 60 seconds and dry them with paper towels.
- Prior to eating and drinking, rinse the mouth with the mouth wash (containing *0.05% chlorhexidine digluconate* or *octenidine dihydrochloride phenoxyethanol or* other disinfectant). Wash and clean the boat as per your usual practice.
- Wash the sailing clothes with soap before storing. If sailing in heavily polluted water, disinfect the sailing gear by soaking it in disinfecting solution (e.g. 30% 8 g *glutaraldehyde* /3 g d*idecyldimethylammonium chloride* /6 g *benzalkonium chloride* solution) for 2 hours, then rinse through thoroughly with water before drying and storing.
- Shower thoroughly with liquid soap before changing to dry clothes.

**Washing hands properly is the most important measure to avoid the transmission of harmful germs and prevent infections**

**Duration of the entire procedure:** 40-60 seconds

0



Wet hands with water;

1



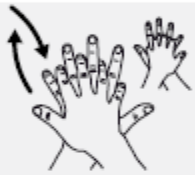
Apply enough soap to cover all hand surfaces;

2



Rub hands palm to palm;

3



Right palm over left dorsum with interlaced fingers and vice versa;

4



Palm to palm with fingers interlaced;

5



Backs of fingers to opposing palms with fingers interlocked;

6



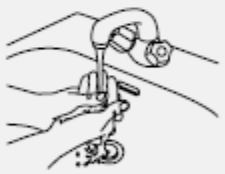
Rotational rubbing of left thumb clasped in right palm and vice versa;

7



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;

8



Rinse hands with water;

9



Dry hands thoroughly with a single use towel;

10



Use towel to turn off faucet;

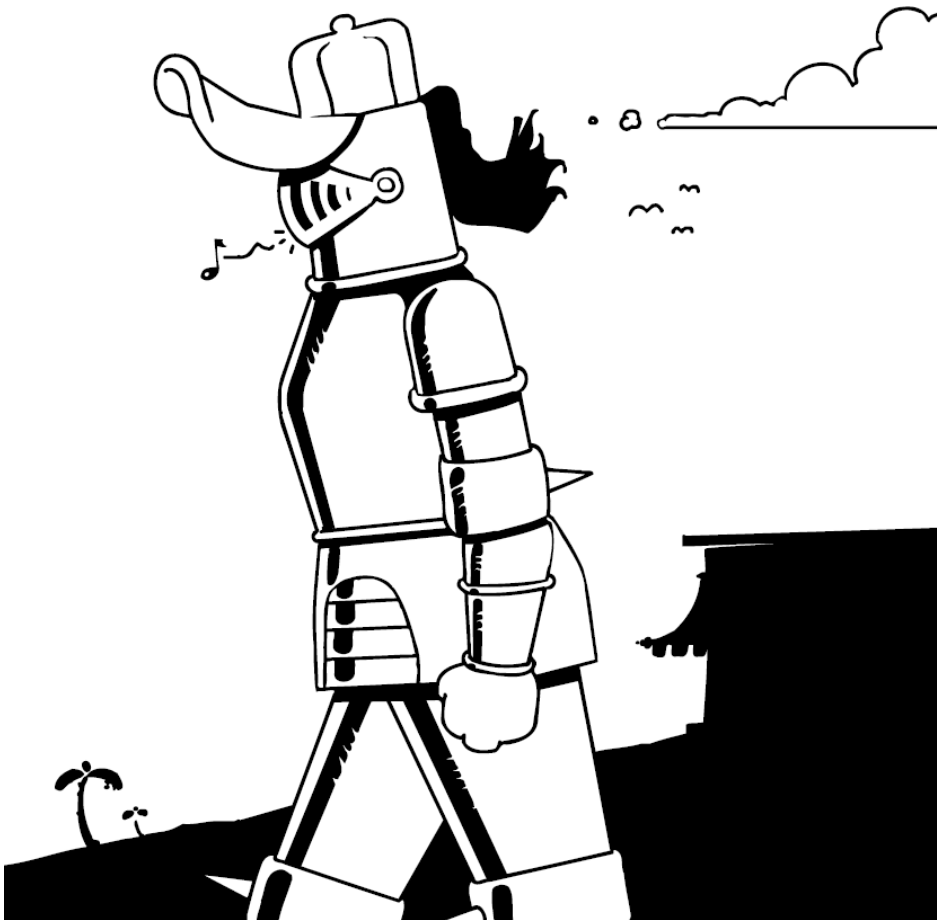
11



Your hands are now safe.

## IX. BE WARY OF ATHLETES SECURITY

Of the 500,000 homicides each year, more than 90% occur in developing countries and interpersonal violence is a significant risk in many developed countries too. Crime risks fluctuate in tune with economic situation and terrorism is a constant worry. Pre-travel advice to your team should include not only information about risks of acquiring disease in the places that will be visited but also security information. That type of advice can be obtained from government agencies, departments of foreign affairs or private agencies that are providing such a service.



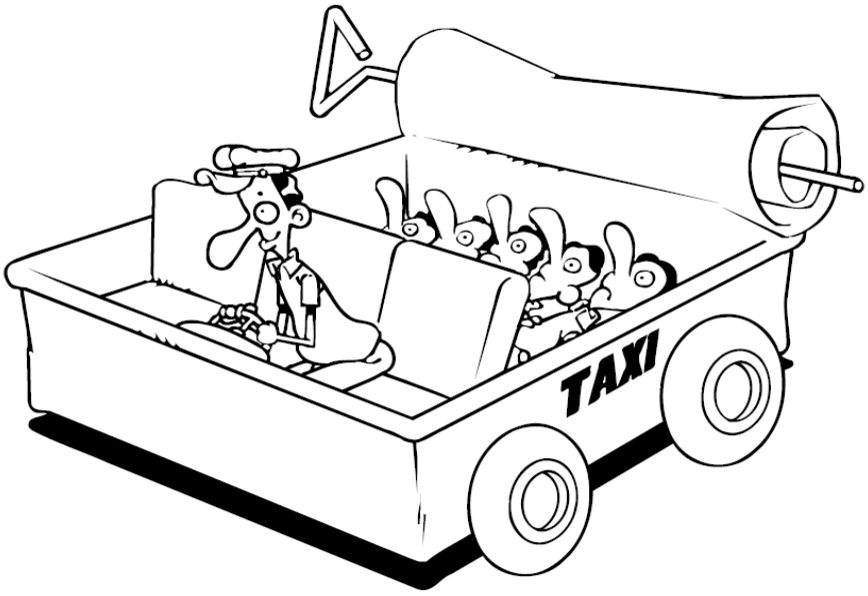
One has to:

- Dress inconspicuously (team colours in some countries can make one a target!).
- Look confident – don't look lost.
- Leave expensive jewellery and watches at home.
- Avoid night or solo travel.
- Avoid to flash money.
- Use alcohol in moderation.
- Leave the scene if feeling threatened by the mood and tone set by other people's behaviour.

- Know where the fire escape is - hotel fires are too common.
- If lift looks unsafe – probably it is.
- Remove obvious rental car markings.
- Know the local police number.
- Know where the high-risk areas are.
- Avoid using mobile phone on the street while walking – stop and put the back to the wall.
- If mugged – comply; mugging is “economic transaction”.

## X. BE WARY OF ATHLETES TRANSPORTATION

Motor vehicle accidents are the leading cause of accidental deaths of long-term travellers living in the third world. A significant portion of those deaths can be attributed to accidents involving motorcycles. The possibility for being injured in a car accident while in foreign towns is the most frequent cause of injury to all travellers abroad, including athletes. This has to be stressed.




Unfamiliarity with road signs, local customs and driving habits, and especially driving on the "wrong side of the road" are hazards to drivers and pedestrians alike. Simply learning how to say "slow down" to the taxi driver can save a life. In countries where "rules of the road" are not enforced or are non-existent, there are several common-sense recommendations which should be followed:

- Secure reliable local transport before arrival.
- Use a driver (taxi) – look for reputable company.
- Hire a large vehicle if possible.
- When renting a car, check for seatbelts, good tires and brakes.
- Always wear a seatbelt even if not compulsory by law.
- Be aware of possible car-jacking hotspots and keep the doors locked.
- Avoid riding on motorcycles.
- Avoid driving under the influence of alcohol or jet-leg.
- Avoid rural travel by road after dark.
- Avoid overcrowded, overweight, or top-heavy buses or vans.
- Carry a cell phone and know how to obtain emergency help in case of accident.

Although developed to provide medical care to the general population, the approach, the systems and the doctrine of *travel medicine*, can help your team to solve some of its health problems. This simple approach in the form of these Medical Guidelines can be effectively used in the training of sailors in the form of health manuals and easily administered as a part of pre-competition service given to the sailors in training camps.

***It is true that nobody will win the race thanks to these Medical Guidelines, but it is also true that many races were lost because of not following them.***

***WS Medical Commission***

***Disclaimer About Medical Information:***

*The information and reference materials contained here are intended solely for the general information of the reader.* ***It is not to be used for treatment purposes, but rather for discussion with the patient's own physician.*** *The information presented here is not intended to diagnose health problems or to take the place of professional medical care. The information contained herein is neither intended to dictate what constitutes reasonable, appropriate or best care for any given health issue, nor is it intended to be used as a substitute for the independent judgement of a physician for any given health issue. The major limitation of informational resources like WS Medical Guidelines for the International Team Coach is the inability to take into account the unique circumstances that define the health issues of the patient.* ***If you have persistent health problems or if you have further questions, YOU MUST consult your health care provider. Failure to consult your health care provider may result in serious permanent harm or death.*** *All readers of these Medical Guidelines for the*

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