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ATHLETICS.

# Competition Medical Guidelines for World Athletics Series Events

A Practical Guide  
October 2020 – Second Edition



## World Athletics Health and Science Department

### **Authors:**

Paolo Emilio Adami  
Stéphane Bermon  
Frédéric Garrandes  
Gaia Guadagnini

### **Reviewers:**

Pedro Branco  
Fumihiko Yamasawa

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## Foreword



The health and safety of our athletes is paramount. At World Athletics we want everyone who participates in our sport to enjoy the competition and feel a sense of achievement, but this is only possible in a safe environment.

For this reason, I am pleased to introduce the second edition of the Competition Medical Guidelines for World Athletics Series Events, which offers expert guidance to athletics event organisers on how to prepare and implement an appropriate medical plan for World Athletics Series events.

Much has changed in our world since the first edition was issued in January 2013. This updated guide contains the latest scientific advice on topics including infection control and heat stress and has been compiled by medical practitioners who have extensive experience working with athletics competition, both inside and outside the stadium.

It is an essential reference for the medical specialists working with our Local Organising Committees and I commend it to you.

Sebastian Coe,

A handwritten signature in black ink that reads "Sebastian Coe". The signature is written in a cursive, flowing style. Below the signature is a long, horizontal, slightly curved line that serves as a decorative underline.

President, World Athletics

## Preface

This document aims at supporting Local Organising Committee (LOC) Medical Teams of World Athletics In-Stadium and Out-of-Stadium events, in the preparation of the medical services for the event. This guideline alongside the other documents provided by the Health and Science department, should guide the LOC through every phase of the preparation. The work should be done in close connection and constant communication with the Medical Delegate and the Health and Science department. The LOC is in any case financially responsible for all provisions detailed hereunder.



# Chapter 1

## General principle for medical organisation

### 1. Medical Team

The Medical Team is only one of the many components of athletics event organisation which is necessary to conduct a successful competition. The missions of the Medical Team are:

- to provide primary and emergency care to athletes, staff, officials, judges, volunteers, World Athletics family members and spectators at all competitions, training, and other event sites;
- to provide other medical support services needed to ensure the safety and health of the above described categories;
- to arrange for referrals, where necessary, to a higher level of health care.

The composition and scope of the Medical Team may vary with the size of the competition; number of people involved (athletes, officials, judges, volunteers, media, etc.), and responsibilities assigned to other departments of the Local Organising Committee (LOC).

The members of the Medical Team must integrate all aspects of their operation into the functions of the other departments, if their mission is to be carried out successfully.

### 2. The Medical Director

The LOC should appoint a certified physician as the Medical Director. The Medical Director should lead the Medical Team and is ultimately responsible for all health care services provided at all official sites, venues, and accommodation areas. The Medical Director oversees the overall coordination of medical organisation and represents the Medical Team of the Organising Committee. He/she should preferably be a member of the local medical community, to ease cooperation with community resources. The Medical Director reports to, and co-operates with, World Athletics – mainly World Athletics Medical Delegate – and the LOC President/CEO.

The Medical Director's responsibilities include a number of significant tasks and duties. Due to the burden of work, it is strongly recommended to appoint assistants to the Medical Director. Among them a Deputy Medical Director and venue managers who can help the Medical Director in the following duties:

- a) Ensure recruitment and supervision of the various medical personnel that should have basic knowledge of the nature of Athletics as a sport, and should have sports medicine skills;

- b) Design a comprehensive health care system, making sure that adequate facilities, supplies and equipment are available for medical care at all official sites, venues and accommodation areas;
- c) Recruitment and co-ordination of community medical resources, including emergency transport services, emergency room(s) and hospital admissions;
- d) Ensure the correct accreditation and formal licensing of medical staff and of teams' official medical personnel;
- e) Assist the LOC in obtaining liability insurance for medical staff (doctors, nurses, physiotherapists, volunteers etc.) and negotiate, if any, an insurance contract to cover care and consultative services for all accredited personnel;
- f) Support the LOC in developing a medical budget, according to the necessary and planned medical services;
- g) Develop medical information for the Team Manual including detailed facts of medical care provided by the Organising Committee to visiting teams, VIP's, World Athletics Family and media. The medical information should also be available on the Organising Committee website;
- h) Maintain administrative liaison with World Athletics Medical Delegate. At major championships, the Medical Director should work with World Athletics Medical Delegate to ensure that all World Athletics Rules and Regulations are complied with. If necessary, appoint a Medical Team member to serve as a liaison to World Athletics Medical Delegate;
- i) Promote and/or invite teams to check the external validity of insurance policies of their participants (for possible mutual recognition of health assistance between different states), and/ or to cover their travel and accommodation periods by temporary insurance contracts;
- j) Develop policies and procedures for all departments of the medical organisation, for final approval by the World Athletics Medical Delegate and if needed the LOC CEO;
- k) Inform National Teams' medical staff of all government regulations required for the importation of medication and medical supplies, and provide necessary forms to meet these requirements;
- l) Work with venue coordinators and department heads to develop supply and equipment needs. Determine whether these materials must be obtained by purchase, by loan or donation from local medical sources;
- m) Deal with the Food Services Department and the Support Services Chair to assure that meals and beverages are available for food safety control personnel.
- n) Ensure that meal services are adapted to the early and late work schedules of staff members.
- o) Guarantee that inadvertent food contamination with prohibited substances (e.g. clenbuterol or nandrolone in meat; morphine poppy-seeds, stimulants in soft drinks, etc.) is avoided;



- p) Work with local health authorities to implement control and prevention of contagious diseases. Pay specific attention to epidemic outbreaks of infectious diseases (COVID-19, A type influenza, dengue fever, norovirus etc.). Medical Director should also ensure water and air sanitation as well as control of vectors. Implement monitoring programmes of environmental conditions, local pollution, radiation, or any environmental disturbance that can create concern and alarm for the visiting teams;
- q) Work with the local meteorological agency to ensure the WBGT measurement in competition field, warm-up tracks and training venues;
- r) Work with the Housing Office to provide for the housing needs of Medical team members, especially Medical staff who are scheduled for on-call emergency care during night-shifts;
- s) Ensure that convenient medical records are kept for all medical encounters from all relevant medical centres in various sites (medical encounter form is available in "Appendix A");
- t) Make the necessary arrangements to compile daily and final statistical data from medical records. It is suggested that a Daily Medical Report be prepared for review by the Medical Director and other officials on a 'need to know' basis;
- u) Work with World Athletics Medical Delegate to enable the implementation of data collection for athletes' injuries and illnesses epidemiology study; and
- v) During the actual period of the event, appoint a Medical Team member with adequate language skills to serve as a liaison with visiting teams' medical staff.
- w) Take necessary measures to collect biological waste from teams.

### 3. The scope of the health care services

Provide health care and sports medicine services to athletes, team officials, VIPs, media, spectators, local workers and volunteers, through the organisation of local personnel and facilities, and by working with accredited national teams' medical personnel.

The scope may vary with the size of the competition and the responsibilities assigned to other departments in the organisation. The goal is to provide health care and sports medicine services through an organisation of local personnel and facilities. The extent of services depends on the location, duration and type of competition, as well as the type and number of patients expected, and the nature of the injuries or illnesses which are predictable. Patient groups may include not only athletes, but also health care staff, team officials, LOC workers/volunteers, judges/referees, World Athletics Family and VIP's, media, and spectators. The services shall be available at all training sites and competition venues, including all accommodation areas.

Health Care Services include, but are not limited to the following:

- a) Adequate facilities available for medical services to cover all accredited people and all competition, training and accommodation sites;
- b) Provision of primary and emergency care to all above mentioned categories at the various venues and areas of the event, at no charge to all eligible individuals;
- c) Provision of other medical support services needed to ensure the safety and health of the aforementioned, and of the spectators;
- d) Maintenance of a data-recording system for all medical and physiotherapy encounters (acute incidents, injuries, illnesses assistances and treatments provided);
- e) Supervision of pharmacy services, medication and medical equipment supplies;
- f) Establishment of liaison for specialty services and consultations: such as imaging studies (i.e. X-ray, ultra-sound, computerized tomography (CT), magnetic resonance imaging (MRI), etc.); laboratory services; dental; ENT; ophthalmology; gynaecology; and orthopaedic care etc. (X-ray, Musculo-Skeletal –MSK-ultra-sound and orthopaedic services may be on-site at major events);
- g) Coordinating service with the hospital network and emergency services; including the development of a liaison system with admitting hospitals to ensure timely reports of hospital admissions, daily progress reports and hospital discharges;
- h) Supervision of environmental and meteorological parameters at all official sites, venues and accommodation areas;
- i) Public health and safety surveillance;
- j) Administration of official emergency treatments (including any kind of injection or intravenous infusions) for athletes at World Athletics competitions only by LOC medical personnel in LOC medical care sites by licensed professionals;
- k) Organise training sessions for the various medical care teams; including those in charge of road race events. Topics should include: information on Athletics and its rules; basic sports medicine skills; evacuation; transfers and refer medical criteria on competing, on training and accommodation areas; medical guidelines for common conditions in athletes, etc.
- l) Supervision of qualitative and quantitative aspects of meals served to participants, and general food sanitation in cooperation with the LOC; sealed water and drinks are preferred – both for health and legal/doping problems – in competition venues and call rooms/medical room/anti-doping rooms; drinkable tap water might be provided at accommodation sites to encourage sustainable behaviours; maximum attention should be paid to the choice, storage, conservation and presentation of foods; consider a wide choice of different meals, taking into account different needs linked to possible medical necessities (food allergy, coeliac disease, etc) and/or

different cultural, ethnic or religious uses (e.g. vegetarians, religious restrictions for meat, etc.); the timing of meals should be as flexible as possible, and should take into account not only the competition schedule, but also possible particular needs (e.g. religious fasting.); ensure adequate and diversified collection of meal waste (e.g. humid, plastic, paper etc);

- m) Contribution towards the prevention or early detection of possible food-linked problems and/or of general epidemic diseases, if any;
- n) Provision of adequate support (fluid drinks, ice, hot drinks, blankets, conditioned or warmed areas, etc.) in case of particular heat or cold environmental conditions, in accordance with the LOC;
- o) Provision of information – by means of the team manual: website, or other tools – on particular vaccinations requested by the World Health Organisation (WHO) and/or national or international travel laws, if any;
- p) An orientation session or medical meeting for visiting teams' medical staff, outlining available medical services;
- q) Liaison with Security Services to facilitate access to medical areas for accredited team medical personnel, when necessary, for athlete care; and
- r) Producing a plan against full-scale disasters and accidents in cooperation with relevant LOC departments.
- s) Develop a contingency plan to isolate and treat infected athletes and officials, for contagious diseases.

#### 4. Pharmacy and prescription guidelines

The pharmacy should be supervised by a licensed pharmacist. Following a consultation, an athlete or the team physicians should be provided with adequate medication for a duration of two (2) days, to initiate optimal medical care, plus prescription so that the athlete or the treating doctor can have the remaining part of drugs delivered at a local pharmacy. The size and complexity of the supplies stored and managed will vary considerably and will be determined by the size and number of teams, and the duration of the competition.

- a) Medication should be dispensed only by a pharmacist or by a staff member of the local Medical Team;
- b) Only prescriptions from LOC physicians will be evaluated and honoured;
- c) Team physicians can only prescribe medication for members of their own delegation;

- d) Prescriptions should be written on a form provided by the organiser; and
- e) World Anti-Doping Agency (WADA) prohibited medication should be kept separately and be clearly marked. The responsibility for using these substances, due to emergent situations, will lie with the prescribing physician and patient. Prohibited substances, according to WADA, should be avoided, unless there is no therapeutic alternative. However, athlete health should be the first priority and prescriptions of prohibited substances should not be excluded if these are needed to treat any particular medical condition. The pharmacist should inform the patient that the medication is in the WADA prohibited list, and the patient must acknowledge this fact by counter-signing the prescription, prior to dispensing.

## 5. Public Health and Safety

The LOC Medical Team shall supervise environmental health, sanitation of food and safety at all venues, including housing facilities, training and competition sites. The Medical Team should be informed about any possible reports of communicable and food-borne illnesses, and should cooperate with local public health authorities, especially in cases of infectious airborne diseases (e.g. COVID-19, SARS, MERS), diseases manifested by a rash and fever (e.g. measles, rubella, varicella, dengue fever, etc.), gastro-intestinal illnesses (e.g. norovirus infections); hepatitis; influenza-like illnesses; and sexually-transmitted diseases.

A Public Health Officer should be appointed. The Public Health Officer should be responsible for:

- the preparation of a comprehensive public health plan (mitigation and contingency) in cooperation with local public health authorities.
- Maintain constant contact and ensure interaction with local public health authorities;
- Develop a specific plan for the isolation and treatment or hospital admission of individuals with contagious diseases;
- Develop a communication, education and information plan, in cooperation with other LOC Functional Areas, aimed at preventing all sorts of communicable diseases among athletes, staff, workforce, volunteers and spectators.

### 5.1. Contagious diseases

Mass gathering events represent a public health challenge because of the gathering of large numbers of athletes, spectators and working staff, for a prolonged period of time. Furthermore, such events often result in mixing of populations that travel to the competition destination from different parts of the world, thus are exposed to a different infectious risk (higher or lower) than the hosting local community. It is of utmost importance that the risk of a potential disease outbreak is always

considered while preparing the medical plan, that specific mitigation plans are activated to reduce the risk and that contingency plans are ready to be implemented in case of an infectious outbreak.

Based on the principle that a certain level of risk will always be present and that a “zero risk” situation does not exist, we developed the concept of the pendulum of risk (see Figure 1) and hypothesized the existence of three infectious diseases outbreak phases: active pandemic, post-peak/contained outbreak, and seasonal outbreak. These phases represent a simplified version of the WHO Pandemic Phase Description and WHO Pandemic Severity Score which adopts three indicators: transmissibility of a virus, seriousness of disease and impact. Whether in a seasonal outbreak or contained outbreak phase, the infectivity and transmissibility risk of any infectious disease will have to be considered and assessed before the organisation of all mass gathering and mass participation sporting events.

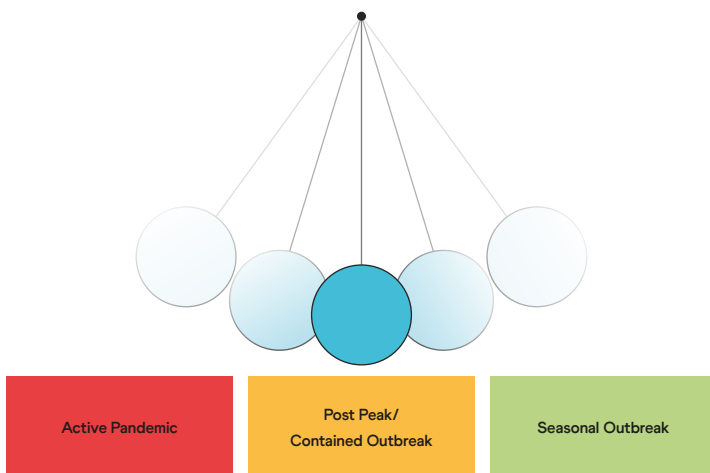


Figure 1 – The pendulum of risk

The partnership with local and regional health and safety agencies is strongly encouraged, as these are absolutely necessary to properly assess the infectious risk, put the mitigation strategies in place effectively and plan for efficient contingency plans. The collaboration and communication between event planners and local health authorities should aim at bringing together the specific expertise of the sports bodies with that of the local public health system within a defined framework for risk assessment and risk management.

Based on the event characteristics, different risk assessment tools might be used to identify the infectious risk and, consequently, define mitigation strategies and contingency plans. National and/or local rules and regulations must be followed at all times. For In-Stadium and Out-of-Stadium events, event organisers can refer to the World Athletics Health and Science department website <https://worldathletics.org/about-iaaf/health-science/risk-assessment>

For out-of-stadium events, competition organisers are encouraged to use the online Infectious Diseases Outbreak Management Tool that can be accessed through the following link <https://idom.worldathletics.org/>

This web-based system provides event planners with the ability to assess the feasibility of staging a mass participation event and should help by:

- assessing the risk level of the event in both quantitative and qualitative manner,
- determining the public health and sport event's mitigation preparedness,
- proposing the steps to take to further mitigate and reduce the risk.

### 5.2. Food Safety and Food manipulation Control

In close cooperation with the relevant LOC department, supervise the meal quality for participants and general food sanitation; prevent from, or enhance early detection of, possible food poisoning, if any; and make every best effort to guard against inadvertent food contamination.

### 5.3. Drinking water, air conditioning and swimming pool sanitation

Sealed water and drinks are preferred, both for health and legal/doping problems, and should be available at all competition venues. However at accommodation sites, for sustainability purpose, athlete should be encouraged to use their own container, filled with tap water, when the latter is drinkable. The LOC will supply the stadium, warm-up, training and accommodation facilities with bottled water that is manufactured only by an authorised bottled water supplier. Tap water sanitation at accommodation should be assured. Appropriate control of air conditioning and swimming pools to prevent legionella outbreaks should be implemented.

### 5.4. Vector control

Adequate programmes of sanitation in competing, training, accommodation and spectators' areas should be implemented as well as appropriate control of animals mosquitos, rodents, etc. Fumigation of the above-mentioned areas should be done an adequate number of times and, with appropriate timing.

### 5.5. Biological waste disposal

Clearly-marked "biohazard waste" disposal containers shall be provided at all medical sites, including visiting teams' medical treatment areas. Collection and disposal of containers will be carried out according to treatment of contaminated medical waste, and national health and prevention rules.

## 6. Environmental conditions monitoring

### 6.1. Weather conditions

The risk of heat illness increases above 21°C (70°F) and 50% relative humidity. The wet bulb globe temperature (WBGT) which measures the combined thermal stress from the wet bulb (WBT), dry bulb (DBT), and black globe (BGT) thermometers has been widely used to assess environmental heat stress. The WBGT is calculated as  $0.7WBGT + 0.2BGT + 0.1 DBT$ , measured outdoors (see Table 1). Other thermal stress indexes have been developed through the years and provide with further information, like the Physiological Equivalent Temperature (PET), modified PET (mPET) and Universal Thermal Climate Index (UTCI). PET, for example, is a universal index that allows to characterise the thermal bioclimate and the evaluation of thermal conditions in a physiologically significant manner. PET can be calculated with the radiation and bioclimate model RayMan, available at <https://www.urbanclimate.net/rayman/>.

These more recent indexes allow for the quantification of thermal stress also in cold condition, unlike the WBGT (see Table 2). A corresponding coloured flag system can be used to visually signal the thermal injury risk of current weather conditions to competitors and spectators.

| Heat Index (WBGT) |                   | Comment        |
|-------------------|-------------------|----------------|
| Temperature in °C | Temperature in °F |                |
| Above 30°C        | Above 86°F        | Danger         |
| 28°C to 30°C      | 82,4°F to 86°F    | Severe Warning |
| 25°C to 28°C      | 77°F to 82,4°F    | Warning        |
| 21°C to 25°C      | 69,8°F to 77°F    | Caution        |
| Below 21°C        | Below 69,8°F      | Almost Safe    |

Table 1 – WBGT Heat Index and color coding system

| PET  | Thermal Perception | Grade of Physiological Stress |
|------|--------------------|-------------------------------|
| 4°C  | Very Cold          | Extremem Cold Stress          |
| 8°C  | Cold               | Strong Cold Stress            |
| 13°C | Cool               | Moderate Cold Stress          |
| 18°C | Slightly Cool      | Slight Cold Stress            |
| 23°C | Comfortable        | No Thermal Stress             |
| 29°C | Slightly Warm      | Slight Heat Stress            |
| 35°C | Warm               | Moderate Heat Stress          |
| 41°C | Hot                | Strong Heat Stress            |
|      | Very Hot           | Extreme Heat Stress           |

*Table 2 – Ranges of the physiological equivalent temperature (PET) for different grades of thermal perception by human beings and physiological stress on human beings; internal heat production: 80 W (W is the mechanical work done by the body), heat transfer resistance of the clothing: 0.9 clo (Clothing insulation was calculated from clothing weight, covered body surface area, and the number of clothing layers worn). (According to Matzarakis and Mayer 1996. Another kind of environmental stress: Thermal stress. WHO collaborating centre for Air Quality Management and Air Pollution Control).*

Thermal stress information must be provided to teams, staff and volunteers according to the above-mentioned indexes. Based on these weather conditions, on the type of event (strong endurance component) and the mitigation strategies available, the World Athletics Medical Delegate can suggest, in coordination with the World Athletics Technical Delegate, a postponement or a cancellation of one, or several, Athletics events.

The LOC shall work with local meteorology services to provide statistical information on prior weather patterns and thus assisting in developing the competition schedule. Many athletes drop out of endurance events due to heat casualty. LOC Medical Team should consider the risk of heat strokes and heat injuries and plan proportionate strategies to prevent and promptly treat these medical conditions.

The LOC Medical Team should implement a thorough monitoring system of weather conditions. During the competition, daily and hourly weather forecast information should be available on the competition's Official Website. For the period of the competition, and on race days, the LOC shall arrange to take frequent readings of temperature, humidity, WBGT and PET at different competition sites in order to assess possible heat stress for athletes, officials, volunteers and spectators. Readings will be performed at various times and the measurements displayed in banners of sufficient size to facilitate information available to athletes, officials, and health staff:

- Warm-up Area: one banner indicating the health-care staff measured every 60 minutes on-site;
- Road races: one banner at the start line, one at the finish line and another one showing the WBGT/PET measured every 20 minutes on-site; and



- Race walking: one banner in front of the Team-Refreshments Station showing the WBGT/PET assessed every 20 minutes on site.

The Medical Team will work with the Supply Department, Venue Management, and Competition Management to ensure that, during competitions held both in hot or cold weather conditions, adequate shelters (tents, canopies, awnings, umbrellas, raincoats etc.) are provided for athletes and officials in events, where prolonged exposure is likely to occur. Adequate water and glucose/ electrolyte solutions shall be provided at each site. In general, particularly considering endurance events, better performance and less adverse results are obtained when the environmental conditions are going to improve, rather than worsen, during the event. As an example, in hot environmental conditions, start times would be better set for late afternoon or evening, rather than early morning (increased thermal stress in sunny morning). The Medical Team should work together with the Competition Department to monitor weather conditions and a specific contingency plan should be implemented to consider the scenario of extreme meteorological situations that could force a delay or even cancel the competition.

## 6.2. Air Quality Monitoring

Considering the impact of air quality on athletes' health and performances, the LOC should implement monitoring programmes of local pollution and pollen ratings before and during the competition. LOC should provide teams, staff and volunteers with daily average of main pollutants (NO<sub>2</sub>, O<sub>3</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, CO) starting 2 weeks prior to the competition and for the entire duration of the competition. A yearly analysis of the pollutants will be required by World Athletics Health and Science Department to monitor the air quality trend in the competition location. Pollution and pollen forecasts shall be available and published in the Team Manual. For indoor events average indoor and outdoor pollutants levels should be provided too.

For road races, pre-race air quality measurements of main pollutants (NO<sub>2</sub>, O<sub>3</sub>, PM<sub>2.5</sub>, PM<sub>10</sub>, CO) and pollens, should be provided for the two weeks prior to the race. Average values of pollutants should be available at the start and finish lines during the race. Forecasts and average values of pollens are particularly relevant for all running events, including road races, cross country, trail running and mountain running events.

# Chapter 2

## Medical management for In-Stadium athletics events

### 1. Scope of the services

The scope of services includes critical care; first-aid, treatment for environmental illnesses, as well as the general medical problems associated with In-Stadium athletics events

Spectator care should also be provided, under the responsibility of the LOC, in World Athletics In-Stadium Events.

### 2. Workload

Information concerning the number and type of injuries and illnesses seen during major athletics competitions are available in the scientific literature. The Medical Director is urged to maintain complete records which should be included in the final report to the LOC and to World Athletics Health and Science Department.

Previous experience suggests the following numbers:

- General medicine/sports care: 40-60 visits/1,000 athletes/day.
- Physiotherapy: 40-50 visits/1,000 athletes/day; and
- Massage therapy: 40-50 visits/1,000 athletes/day

During the competition period, 5-10% of the total number of athletes and staff will consult for diagnosis and/or treatment of injuries or illnesses.

Staffing for ancillary facilities and spectator care will depend upon the number of venues required for training, housing of teams, officials, VIPs and media.

### 3. Staffing

Staffing at events is recommended to be as outlined in "Appendix B". These recommendations provide approximate staffing guidelines for the minimal number of on-duty personnel needed to cover all official sites and venues during In–Stadium World Athletics championships:

- Physicians, one per 100 athletes;
- Nurses, one per 50 athletes;
- Physiotherapists/Massage Therapists, one per 60 athletes

Staffing for ancillary facilities care will also depend on the number of official sites, venues and accommodation areas.

Depending on the level of competition, a pharmacy will be organised, and should be supervised by a licensed pharmacist.

The provision with adequate medical equipment is of paramount importance. Detailed suggestions of equipment can be seen in the appendix section. Above all, the setting up of Automated External Defibrillators (AEDs) at the competition track, warm-up, training sites and accommodation is crucial to implement adequate secondary prevention of sudden cardiac death/arrest. AEDs should be available in all areas accessible to spectators, athletes, officials, workforce, staff and volunteers.

Distinctive identification markers including caps, arm bands, vests, T-shirts and/or bibs labelled with individual training level (e.g. physician, physiotherapist, nurse, Emergency Medical Technicians – EMT, etc.) allow for easy recognition of the medical team by competitors.

All staff members (physicians, nurses, members of medical staff etc.) must be officially accredited.

#### 4. Venue Medical Manager

An experienced sports medicine professional should be appointed to supervise the medical function at venue (training, warm-up or competition sites). These professionals play a key role in the implementation of a high-quality medical care

Duties include:

- a) Supervising venue healthcare services;
- b) Working with the Medical Director to determine daily staffing needs;
- c) Assigning daily duties to all medical personnel;
- d) Ensuring adequate supplies and equipment for the medical stations;
- e) Coordinating requests for consultations with physicians;
- f) Coordinating the requests for ancillary support services, transportation, specialty referral and transfer to Accident and Emergency (A&E) department or Emergency Department (ED) at Hospitals etc. according to the Medical Director, or whoever he/she nominates;

- g) Ensuring maintenance of complete medical records;
- h) Supervising the use of diagnostic or therapeutic medical instruments, if any; and
- i) Ensuring continuous availability of sealed drinks for athletes (water) and of ice.

## 5. Organisation of Venue Medical Stations

Medical services must be available at all official sites related to the competition, and available to all accredited persons, including teams' medical staff. Full details on staff, facilities, location and equipment at each site can be found in the appendix section.

### 5.1. Polyclinic/Central Treatment Area

This is the primary care centre for medical evaluation and treatment. If athletes are dispersed over several locations, a central location must be selected. The clinic should include treatment areas, examining rooms, offices, dispensaries, and waiting area with all necessary equipment. Physical and/or massage services should be offered to athletes from countries without medical staff.

Ambulance service should be located on-site or, alternatively, be easily available by phone/radio.

### 5.2. Competition Stadium

Medical staff must be available at least 1.5 hours before the start of the competition and remain until all spectators leave the stadium after the competition is over. The medical areas provided must include, as a minimum, a pre-competition treatment area (near the call room); a triage/emergency area (with an ambulance stationed nearby); and the main treatment area.

At major championships, 4 field of play emergency medical teams should be stationed at the perimeter of the track. All should be connected by radio to the Medical Director or the Venue Medical Manager, who should watch the competition from a prominent place in the Stadium, so that he/she has an overall view of the whole competition, enabling him/her to notice immediately any medical incident on the field of play that would require prompt medical assistance. Upon notification from either the Medical Director or the medical teams themselves, under strict co-ordination with marshals and judges/referees, the first-aid teams should assist speedily, at the earliest time, all injured/sick athletes on the track, and transfer them immediately to the main treatment area in the Stadium. AED should be available at the competition track, as well as a variety of appropriate medical emergency equipment.

Ensuring the immediate care of an injured or ill athlete on the field of play is of utmost importance. The chain-of-command to allow first-aid teams to intervene should be quick and efficient. First-aid teams and medical staff, as well as marshals and judges/referees, should be trained to activate

immediate assistance to injured/ill athletes without unnecessary delay. Neither the injured athlete, nor the first-aid teams, should interfere with the competition, or disturb other competing athletes. Evacuation from the field of play and subsequent transfers to the Main Treatment Area in the Stadium should always be done at the earliest time.

Team Doctors should be permanently informed whether their athletes required medical assistance in the field, or in the main treatment area. The Medical Director should make the necessary arrangements to ensure that a member of the Medical Team, in constant communication with the main Polyclinic/ Central Treatment Area, will liaise with Team Doctors and provide them with any medical information on their athletes.

### 5.3. Training Venues

Medical care must be available whenever these sites are in use and be staffed, at a minimum, by a physician and physiotherapists. An emergency physician and an ambulance service should be available by phone/radio.

### 5.4. Warm-up Area

This is the most important site for medical teams from member federations. It should be open at least 2 hours before the start of the competition and remain open until 1 hour after the last competition is over.

A wide area should be made available to all team doctors and team physical therapists to provide care to their own athletes. This area should be in the shade and/or air conditioned/warmed and be equipped with power supply and lightning for night hours.

Cold water immersion therapy for recovery should be provided (see "Appendix A"). Medical care must also be available, including first-aid and ambulance services. Physical and/or massage services should be offered to athletes from countries without medical staff. It is usually recommended to mark areas of 5 x 5 metres for national teams. Team tents should be air-conditioned in hot and humid environment.

### 5.5. Spectators Area

The provision of emergency care and first-aid for spectators is a responsibility of the medical organisation, according to the national health and security rules on public events. Community resources, such as the Red Cross or Local Emergency Services may be recruited to assist.

AEDs have to be available to implement adequate secondary prevention of sudden cardiac arrest.

An ambulance service, proportional to the number and/or sectors of spectators, should be available to evacuate, if any, patients to a critical care facility. First-aid teams should be available at easily accessible, well-identified, areas for the treatment of minor medical problems.

### 5.6. Athletes' Accommodation and World Athletics/LOC Official Hotels

In hotels accommodating Teams, a medical care or facilitated contact must be established and staffed by physicians and physiotherapists/athletic trainers during the day and evening hours (according to the schedule of the competition). Physicians should establish medical care hours and be available on-call for emergencies at all other times. It is preferable that each Team with a medical staff is placed in separate room for medical care as part of the Team's housing allocation.

For all other World Athletics and LOC official hotels, as a minimum, first-aid should be available on-site, with access to on-call at all times.

### 5.7. Patient's transfer organisation

Advanced Cardiac Life Support (ACLS) emergency ambulance coverage should be available at the polyclinic/central treatment area. Medical support vehicles or ambulances should be reserved for transportation of injured or sick athletes. A minimum of one ambulance should be located at training and warm up venues (depending on the number of competitors and distance to the main medical centre/polyclinic). All should be in communication with the main medical centre/polyclinic and Medical Director.

### 5.8. Communication resources for staff

Medical staff operating at the different venues should be given communication means to directly contact the Venue Medical Manager or the Medical Director (telephone landline for indoor and/or mobile or radio).

# Chapter 3

## Medical management for Out-of-Stadium events and elite race competitions (including Race Walk, Marathon, Half Marathon and Cross Country)

### 1. Scope of the services

The scope of services include critical care, first-aid, treatment for environmental illnesses, as well as the general medical problems associated with endurance events. The Race Medical Director (RMD) is asked to maintain records of all medical encounters, which should be included in the final report to the LOC and to World Athletics Health and Science Department.

Depending on the level of competition, a pharmacy will be organised, and supervised by a licensed pharmacist.

Spectator care should also be provided in World Athletics Out-of-Stadium Events.

### 2. Medical consideration for safe race course planning

The medical set up for an Out-of-Stadium endurance event should consider multiple factors, including:

- competition length
- competition course characteristics (uphill/downhill segments)
- race-course design (possibility of running several loops over the same course)
- environmental conditions (ambient temperature, humidity, WBGT, altitude, wind speed and direction, hours of sunrise and sunset, air pollution levels)
- expected participants' number
- medical facilities and available medical staff

When planning a race is fundamental that race organisers include, from a very early stage, the LOC RMD and the World Athletics Medical Delegate in the discussion and decision-making process of the final course set up. The provision of adequate medical care is central to the planning of any Out-of-Stadium event.

### 3. Workload

There is usually a smaller number of participants in World Athletics elite road races, compared to mass participation races, and competitors are expected to be well-trained for World Athletics road events. However, many athletes face medical problems during road races, depending on the environmental conditions and racecourse characteristics. While most of the infrastructure and services provided to elite athletes competing in endurance events are similar to that of mass events, the proportions but also the medical needs are different between the two types. Many mass-races athletes face medical problems during road races, and up to 10% of participants retire due to heat exhaustion in races of 10 kilometres or longer on average (depending on weather conditions).

Optimum medical support for elite and mass-road race events should be:

- a) Minimisation of the potential hazards of road racing by scheduling events at the safest possible period of the year, time of the day, and by modifying the event's schedules in extreme conditions;
- b) Organisation of medical personnel, communications systems, equipment and supplies to swiftly handle medical emergencies;
- c) Appropriate triage and management of injuries and illnesses that affect competitors;
- d) Education of runners by means of printed material in race packs and prerace announcements, to allow informed and rational decisions with respect to participation in an event given the environment, distance, and individual factors which affect risk on a specific race day;
- e) To ensure continuous and adequate supply of sealed drinks (e.g. water, etc.) along the race;
- f) To ensure adequate protection tools, according to hot or cold weather conditions;
- g) To ensure adequate number of AEDs, throughout the race course;
- h) To ensure cold water immersion treatment is available throughout the course and at the finish line.

### 4. Staffing

Each race should appoint a Race Medical Director (RMD), knowledgeable in runners' health problems. Other healthcare personnel include:

- a) Physicians with experience and expertise in sports medicine and emergency medical care;
- b) Registered Nurses (RN) with critical care and/or emergency room experience;
- c) Paramedics and emergency medical technicians (EMT);
- d) Sports physiotherapists and physical therapists (PT);



- e) Certified athletic trainers (ATC); and
- f) First responders.

All personnel should be familiar with medical problems associated with runners and be Basic Life Support with Device (BLS/D) certified. The RMD should check that the certification is renewed every 1 year. Non-medical support staff should act as recorders, transporters, and supply technicians.

The number of medical personnel should be proportional to the number of participants and also take into consideration the expected weather conditions. The following numbers are recommended:

- Physicians, 2-3 per 1,000 runners;
- Nurses, 4-6 per 1,000 runners;
- Other professional staff (EMTs, paramedics and athletic trainers), 4-6 per 1,000 runners; and
- Non-medical staff (stretcher bearers, spotters, walkers, clothing fetchers, drivers and administrative recorders), 4-6 per 1,000 runners.

Distinctive identification markers including caps, arm bands, vests, T shirts and/or bibs labelled with individual training level (physician, physiotherapist, nurse, EMT, etc.) allow for easy recognition of the medical team by competitors.

All staff members (physicians, nurses, members of medical staff etc.) must be officially accredited.

Staffing for ancillary facilities care will depend on the number of official sites, venues and accommodation areas.

## 5. Site coordinator

An experienced sports medicine professional should be appointed to supervise the medical function at each medical station. These health-care staff professionals, play a key-role in delivering high-quality medical care

Duties include:

- a) Supervising venue healthcare services;
- b) Working with the RMD to determine staffing needs;
- c) Assigning duties to all medical personnel;
- d) Ensuring adequate supplies and equipment for the station;
- e) Coordinating requests for consultations with physicians;
- f) Coordinating the requests for ancillary support services, transportation, specialty referral and transfer to A&E/Hospital etc. according to the RMD, or whoever he/she nominates;

- g) Ensuring maintenance of complete medical records;
- h) Supervising the use of diagnostic or therapeutic medical instruments, if any, and ensuring continuous availability of sealed drinks (water) and of ice for athletes.
- i) Ensuring adequate numbers of personal protective equipment (PPE) for medical staff;
- j) Ensuring isolation procedures for individuals infected with contagious transmissible diseases.

## 6. Spectators and traffic control

There must be adequate crowd, and traffic-control, to allow for the unimpeded flow of runners' traffic. The LOC should communicate with the local Police and Law Enforcements prior to the events.

Cordoning off starting pens, finish line area, and designated medical areas should help yield an efficient flow of runners. At the finish line, good security will allow an efficient flow of runners through the chutes.

## 7. Health and Weather Announcements

Pre-race announcements should be made describing the current and anticipated weather conditions. The race medical team (including those at aid stations) and medical volunteers should activate relevant actions according to the weather changes and provide the proper types of fluid (hot and cold fluids and hydration supplies).

Colour coded WBGT/PET index flags for heat stress should be displayed prominently at the start area and announced in the pre-race weather announcement. Colour coded flags can be placed at selected aid stations along the course to alert runners of changing conditions.

## 8. Medical Care Sites

Medical services must be available at all official sites related to the competition, and available to all accredited persons, including mass race participants and teams' medical staff. Full details on staff, facilities, location and equipment at each site can be found in the appendix section.

The medical areas should include:

- a pre-competition treatment area (near the call room);
- medical first-aid teams along the course (Minor medical first-aid teams along the course every three kilometres or in strategic positions and Major aid stations along the course every five kilometres or located in strategic positions), that would allow medical first-aid teams to keep constant eyesight over the participants;

- a triage/emergency area at the finish line;
- the main treatment area at the finish line (with ambulances stationed near-by).

Advanced life support emergency ambulance coverage should be available along the whole course, up to the finish line. Automated External Defibrillators (AEDs) should be available along the course and the finish line, to be able to reach the emergency scene as soon as possible. The first-aid teams should evacuate all injured or sick athletes from the course at the earliest time, and transfer all of them to the main treatment area at the finish line. Medical assistance in cross country events, should follow the same principles and be proportional to the number of participants, the characteristic of the course and comply with specific rules and regulations (see Appendices F and G).

The provision with adequate medical equipment is of paramount importance. Detailed suggestions of equipment can be seen in "Appendix B". Above all, the setting up of AEDs at the competition venues and accommodation is crucial to implement adequate secondary prevention of sudden cardiac arrest.

Field care for major and minor medical, dermatologic, and orthopaedic problems should be provided. The evaluation and treatment of environmental and exercise related medical problems like dehydration, hyperthermia, hypothermia, and exercise associated collapse, and problems associated with road racing, including allergic responses such as anaphylactic shock, hives, asthma exacerbation, and diabetic insulin reactions are of notable importance.

Toilets or portable commodes should be provided for runners. Ensure the availability of the availability of adequate facilities for female participants. The providers of such services should have charts to estimate the number of commodes necessary for an event, based on duration, number of expected participants, and gender distribution.

### 8.1. Pre-competition/Start line

A medical point should be organised in close vicinity of the start line. This will minimise transport of runners that need assistance in other medical stations or to the finish line. The size of the medical point depends on the number of participants, type, distance of race and weather conditions. The medical point should be staffed with enough human resources and include physicians, nurses, paramedics, and/or EMTs (PT, ATC, or massage therapist optional). The medical point should have medical staff and supplies to treat the most common medical problems. The medical point should have appropriate ventilation with fans or heaters based on weather conditions. Easy access to emergency transport and unobstructed access points from the start line and to emergency routes are fundamental.

## 8.2. Medical first-aid teams

Physicians, nurses, paramedics, and/or EMTs (PT, ATC or massage therapist optional) should take care of injured runners. Aid stations shall be located every three to five kilometres or at pre-defined medical points along the course. In case of marathons with multiple loops, walk races, cross country, aid stations should be located in strategic positions allowing to keep participants always within the medical team eyesight. AEDs and first-aid kits must be available. Aid stations can be located next to drinking stations, in order to use the latter as point of reference for runners. Equipment and supplies for obtaining vital signs, performing BLS and Advanced Cardiovascular Life Support (ACLS) should be available at major on-course medical stations.

### 8.2.1. Types

Major aid stations should be equipped and staffed with the capacity to deliver the same care provided at the finish line medical station. Minor aid stations are usually located in conjunction with water stations to provide comfort care and minor first-aid with the intent of transporting any serious medical casualties to a facility equipped to deliver definitive care.

### 8.2.2. Location

Major aid stations are usually placed at high risk areas on the course which have high casualty rates or difficult access for evacuation or every five kilometres. Minor aid stations should be located at a minimum every three kilometres. In case of cross country, aid stations should be in strategic positions that would allow medical first-aid teams to keep constant eyesight over the participants.

### 8.2.3. Medical Personnel

Aid station staff should include: physician, nurses, paramedics, EMTs or BLS trained first-aid volunteers, communications person; and a recorder.

### 8.2.4 Supplies

Aid stations should have: sealed drinks, ice and small plastic bags, towels, petroleum jelly, blankets for races under 21°C (70°F), athletic therapist kit and supplies for minor musculoskeletal injuries, chairs, cots, and covered shelter (van or tent).

## 8.3. Roving medical vehicles and critical care teams along the course

### 8.3.1. Roving vehicles

Roving medical vehicles and mobile medical aid, though they are impeded by runners, offer the best solution for rapid response to a collapsed athlete on the race course. These should be staffed with physicians, nurses, paramedics or EMTs and equipped with adequate supplies for obtaining vital signs and deliver ACLS. Defibrillator or AED experience is fundamental. The use

of fully-equipped ambulances on the course is advantageous and increases the medical response capabilities.

The race aid vehicles should be supported by local emergency vehicles through the communications network. Medical vehicles should have access lanes to the course. Course configuration and access may dictate a greater number of vehicles or the use of “first response teams” on bicycles, motorcycles, or motorised carts equipped with minimal supplies and AED.

### 8.3.2. First response teams

AED-equipped motorcycles or bicycles should have rapid access to collapsed athletes with potential cardiac arrest must be available on the course. Operators must be trained in the use of AED, and the team must be integrated with the local emergency medical system. Several teams must be assigned along the course to follow the runners. First response teams should be prepared to evaluate and treat cardiac arrest, exertional heat stroke, hyponatremia, diabetic insulin shock, status asthma, and exercise-or allergic anaphylaxis.

## 8.4. Finish line area

It has been widely demonstrated that the number of medical encounters in the final quarter of the race is significantly higher in respect to other segments. Therefore, in the last two kilometres of the course, medical staff and supplies should be increased. Usually at this stage of the race, runners are tired but still try to increase their pace as they approach the finish line, thus the number of collapses increases. The last 500 meters should have several medical staff deployed along the course to act as spotters for runners in distress. This is particularly important for mass road races. Equipment and supplies for obtaining vital signs, performing BLS and ACLS should be available at the finish line.

The layout of the medical area should allow for efficient movement and easy access from the finish line. The medical area can be divided by function, between medical and skin, bone, and joint sections. It is most efficient if type of casualties are grouped in the same section of the tent. Emergency vehicle access should be arranged to allow unimpeded entrance and exit to the medical area.

### 8.4.1. Finish line Medical Facilities (including internal organisation and layout)

The main medical point should be organised in close vicinity to the finish line and, in any case, not more than 100 meters away. This will minimise transport of runners who collapse just before or after the finish line. It must be large enough, considering the continuous arrival of exhausted athletes at the same time (mainly in case of severe hot conditions). The medical point should have medical staff and supplies to treat the most common race-related problems. The main medical point should be surrounded by enough space to allow participants to keep walking after the end of the race as sudden stop has been demonstrated to be one of the leading causes of collapses. Medical staff and volunteers should be able to keep participants within eyesight after they have crossed the finish line.

The size of the medical point depends on the number of participants, type and distance of race and weather conditions. Usually a medical point should be able to cope with a 1, 2 up to 3% of participants. The medical point should have appropriate ventilation with fans or heaters based on weather conditions. Easy access to emergency transport and unobstructed access points from the finish line and to emergency routes are fundamental.

A secondary medical point, of smaller size, should be located further along the finish area as many runners cross the finish line and walk away of the finish area before collapsing or suffering a problem. This is particularly important for mass races.

Facilities should be accessible to accommodate athletes on stretchers, wheelchair athletes and other types of disability.

The area should be cordoned off and secured from spectators and media. Rigid barriers such as temporary fences are recommended. Credentials should be required to enter the medical area. Runners should be permitted to enter only if they are injured or sick.

A separated heat-deck must be organised and equipped with enough bathtubs, water and ice to treat runners experiencing a heat-related illness. Enough rectal thermometers with single-use probes should be available. Ice should be stored in refrigerated thermic containers or trucks. A specifically trained team of 4-5 (1 physician, 1 nurse and 3-4 EMTs/ATCs/physiotherapists) members should be assigned to each athlete needing cold water immersion.

Finish line medical centre supplies should include: a large tent or adequate shelter from weather, with heaters if cool weather is expected; or fans and ice immersion tubs if hot weather is expected; toilet facilities; lighting, electricity source or generator; defibrillator, cardiac resuscitation drug kit; intubation kit; oxygen tank and administration sets; personal protective equipment for staff and patients; hand-washing stand; cots; chairs; blankets; towels; water in large containers; ice in plastic bags or ice chest; tables for medical supplies and equipment; stethoscopes; blood pressure cuffs; rectal thermometers with long thermistor probes (including standard clinical thermometers); hyperthermia thermometers to 44°C (110°F) and hypothermia thermometers to at least 21°C (70°F); elastic bandages; inflatable arm and leg splints; intravenous fluids and administration equipment (supervision by a physician required); dressings; blister prevention tape; and adhesive dressings for minor musculoskeletal injuries.

#### 8.4.2. Finish line staff

The finish line is usually where most medical encounters occur. Especially for mass road races this is the location where most medical staff and volunteers should be.

The finish line team should include:

- a. A Triage Officer who is, preferably, a primary care or emergency room physician with special interest in sports medicine, to direct the flow of casualties to the proper area for care; and

- b. Other physician staffing can include orthopaedic surgeon; family practice; emergency room; internal medicine; and intensive care physicians. Nurses; physicians' assistants; EMTs; paramedics; and athletic trainers make up the remainder of the medical team.
- c. Sweep team/field medical personnel divided into medical care teams that can spot runners as soon as they show signs of distress, transporting them to the closest medical point or manage medical illnesses or injuries on site.

Dedicated medical areas may be organised for participants based on injury or illness. The triage team should direct runners to the proper care centre. Non-medical staff should also be available for recording medical data, retrieving dry clothing, distributing census information to concerned parties (such as the RMD) and for general assistance.

### 8.5. Drinking stations and other facilities

Water and other suitable refreshments must be available at the start and finish area of all races. For all events up to 10 kilometres, drinking/sponging must be provided at regular intervals and according to the competition rules, if weather conditions warrant such provision. For all events of 10 kilometres or longer, refreshment stations must be provided at regular intervals and according to the competition rules. In addition, drinking/sponging stations, must be placed approximately mid-way between the refreshment stations, or more frequently, if weather conditions warrant such provision.

The amount of fluid to be provided depends on the number of participants, the race distance and characteristics, and the environmental conditions. A minimum of 180-300 ml (6 to 10 oz.) of water and appropriately-mixed glucose-electrolyte replacement drink solutions, per runner, in sealed bottles totalling 1.5 times number of entrants for each fluid type, should be provided at all water stations. Double this total if the course is out-and-back. Unnecessary drinking stations should be avoided as these may encourage over-drinking. Over-drinking should be discouraged as it can lead to Exercise Associated hyponatremia (EAH). Salty snacks might also be provided at the finish line drinking stations.

#### 8.5.1. Signs

Provide adequate signs notifying competitors of the fluid type and the location of medical personnel. Colour-coded flags describing current environmental heat stress should be located at each station, or at a central aid station, if marked changes in conditions are expected during the race.

#### 8.5.2. Toilet Facilities

Portable toilets should be located at aid stations along the course based on the number of entrants and recommendations of the portable toilet vendor.

## 8.6. Patient's transport

ACLS emergency ambulance coverage should be available at the finish line and along the course. Medical support vehicles or ambulances should be reserved for transportation of sick or injured runners who are unable to finish the race. A minimum of one ambulance should be at the finish line Medical Station, and others (depending on the number of competitors and on the length or characteristics of race) should be located in different sites along the course or moving behind the competitors. All should be in communication with the finish line and course Aid Stations.

## 8.7. Athlete's transport

Transportation for drop-outs without medical problems should be arranged separately, so that those who cannot complete the event due to fatigue or minor injury/illness do not suffer further problems due to exposure, after their race participation has stopped. Vehicles for runners who drop out of the event should be equipped with cell phones, fluids, and blankets.

## 8.8. Spectators Areas

The provision of emergency care and first-aid for spectators might be responsibility of the medical organisation, according to the national health and security rules on public events. Community resources, such as the Red Cross or Local Emergency Services may be recruited to assist.

AEDs must be available to implement adequate secondary prevention of sudden cardiac arrest.

An ambulance service, proportional to the number and/or areas of spectators, should be available to evacuate, if any, patients to a critical care facility. First-aid teams should be available at easily accessible, well-identified areas for the treatment of minor medical problems.

## 8.9. Athletes' Accommodation and World Athletics/LOC Official Hotels

Medical care must be provided at all official sites and be staffed by physicians and physiotherapists/athletic trainers during the day and evening hours (according to the schedule of the competition). Physicians should establish medical care hours and be available on-call for emergencies at all other times. It is desirable that each Team with a medical staff is placed in separate room for medical care as part of the Team's housing allocation.

For all other World Athletics and LOC official hotels, as a minimum, first-aid should be available on-site, with access to on-call at all times.

## 9. Medical evaluation of impaired runners

Medical evaluation of impaired runners should be allowed at the discretion of the medical staff but should not result in automatic runner disqualification. According to the competition rules, the Medical



Delegate is the only official who can decide whether a runner must be removed from the competition or not. The Medical Delegate can transfer the authority and responsibility of the decision to any medical official, that has the capacity to examine a runner who appears ill, and to remove that runner from the competition if, in the medical official's opinion, it is in the runner's best interest for health and safety. The medical staff should evaluate runners who appear compromised and are proceeding toward the finish staggering or weaving; or are disoriented in time and space; or are not maintaining good running posture; or are not appearing clinically fit. Runners and medical staff should be informed in the registration materials and pre-race announcements of the evaluation criteria, and that aggressive or emotional behaviour is an early sign of hot-and-cold-injury which will be interpreted as such by the medical staff. Stopping the runner and checking mental status, blood pressure, pulse and respirations will allow for decision making on medical disqualification, and transport to Finish Line medical station or local hospital emergency facility. If medically warranted after evaluation, the runner may return to the race.

## 10. Public authority notification

Coordination with local hospitals, emergency medical vehicles, fire fighters, and police is crucial. They must be notified of the race date, start and completion times, course route and intersection closures, and anticipated casualties. The set up of a centralized command center, ensuring that all representatives from health, safety and security departments, are informed and act together, is fundamental.

## 11. Communication

To speed delivery of medical care, it is essential to use radio communication among medical personnel in spotter vehicles located at the start; aid stations; stationary points on the course, and finish line, or in roving medical vehicles; dropped out runner vans; sweeper buses; and on bikes. Mobile phones can be used as back up.

The telephone-accessible emergency notification system should be used by race volunteers, when available. Every volunteer who has his/her own cell phone can become a medical spotter. A phone directory for the race printed on a small card distributed to all volunteers will speed communications. Information can be directly conveyed to the medical communications director who can dispatch the nearest medical or pickup van to the scene. A finish line telephone or direct communication to emergency aid vehicles can act as a backup source of communication for medical assistance. A radio back up system should be available and ready to be activated in case the mobile phone system goes down.

## 12. Medical encounter system

A medical encounter system should be available to gather all clinical data, for epidemiological and legal purposes. These data are extremely helpful to improve the medical care provided, establish injury and illness rates, and adjust staff and supplies accordingly. In order to make valid comparisons among endurance race events world-wide, it is strongly recommended that all medical encounters are recorded in the proper medical encounter form (see "Appendix A").

# Chapter 4

## Most frequent medical conditions in endurance events

Medical personnel should be familiar with the wide variety of medical conditions which may be associated with endurance events. Education in these areas should be addressed as part of a medical team orientation.

### Allergic Reactions

Exercise-induced/related asthma, hives, and anaphylactic shock are sometimes experienced, and, if not controlled medically, might preclude racing. The medical team must be prepared to handle these problems on an emergency basis, and transport to established medical facilities, if necessary.

### Cardiovascular Collapse

Sudden death of cardiac origin occurs more frequently in runners with known heart disease and those with clearly defined risk factors. However, it should be stressed that sudden cardiac death occurs in runners even without any documented heart diseases. The risk of death from cardiac events at all ages during marathon competition is in the range of 1 per 50,000 –100,000 finishers. Heat strain markedly increases cardiac workload and, ultimately, increases the risk of cardiovascular collapse, especially when combined with dehydration. Runners should be warned of the risks on the entry form, and with pre-race announcements. They should also be advised to seek medical clearance from their personal physician, and to avoid “sprinting” to the finish line, especially if they are in higher-risk categories. Pre-race medical questionnaires have been proved to be effective in identifying high-risk runners and to reduce the number of acute cardiovascular events. Integrating a self-assessment cardiovascular questionnaire in the online registration procedure would raise awareness among participants and reduce the number of cardiac and fatal events during the race, thus it is highly recommended.

### Dehydration

This is the most common problem encountered in participants under hot-and humid conditions. Appropriate fluid intake before, during, and after the race is essential. Medical personnel should remind race staff and athletes of the risks of over-drinking, which can be fatal as it might lead to Exercise Associated Hyponatremia. Runners should replace sweat losses but should not assume that

fluid replacement beyond the losses is beneficial. Maintaining intravascular volume is the critical factor for thermoregulation. Rapid rehydration after the race will speed recovery and decrease incidence of post-race collapse.

### Exercise Associated Collapse (EAC)

One of the most common medical problems is likely to be with athletes who collapse at, or after the finish. EAC is most accurately viewed as a symptom, with many possible aetiologies or diagnoses (including post-exercise postural hypotension). EAC is simply defined as a situation involving an athlete requiring assistance during or after endurance activity, not of orthopaedic or dermatologic origin (including: post-exercise postural hypotension; exertional heat induced and associated injury; exercise exhaustion; exertional leg cramps; and hypothermia). Post exercise postural hypotension is best prevented by keeping the subject moving, possibly walking, until it progressively gets back to a rest condition.

### Exertional Hyponatremia

Athletes who ingest more fluid than the amount lost through sweating, or who lose excessive salt in sweat, can dilute serum sodium to dangerous levels, and develop cerebral and pulmonary oedema. Athletes should be encouraged to replace sweat losses, but never to drink “as much as possible”. Exertional hyponatremia should be suspected in marathons when a collapsed or ill runner has a finish time greater than 4 hours and is known to have been drinking constantly. Treatment of hyponatremia might require hospitalisation.

### Skin wounds

Blisters and blood blisters should not be opened. If the lesion is on a pressure area, or is very tense, it may have to be drained. Make several openings in the blister roof, but do not remove the skin. Cover with an antibiotic compound and a sterile bandage or blister pad. If the athlete wants to continue running, a low friction tape will help decrease the shear stresses on the blister area. Subungual fluids may be drained dorsally through the nail plate by using a heated needle or drilling through the nail with an 18-22g hollow bore needle.

# Chapter 5

## MCM algorithms

Adapted from “Managing the Collapsed Runner: Marine Corps Marathon, Medical Triage and Algorithms 2019” by Champ, the Marine Corps Marathon and the International Institute for Race Medicine.

**Francis G. O’Connor, MD, MPH**

Medical Director, Consortium for Health and Military Performance (CHAMP)  
Uniformed Services University of the Health Sciences

**W. Bruce Adams, MD**

Former Medical Director, Marine Corps Marathon

**C. Marc Madsen, DO**

Medical Director, Marine Corps Marathon  
Bradley Branch Health Clinic, Naval Health Clinic Quantico

**Anthony I. Beutler, MD**

Associate Medical Director and Fellowship Director, Sports Medicine  
Intermountain Healthcare, Provo, Utah

**Fred H. Brennan, Jr., DO**

Chief Medical Officer, Finish Line Tent B, Boston Marathon  
Assistant Sports Medicine Program Director, Baycare – University of South Florida

**Jesse DeLuca, DO**

Chief Medical Officer, Army Ten-Miler  
Experimental Therapeutics, Walter Reed Army Institute of Research

**Korin Hudson, MD**

Team Physician, Georgetown University  
Georgetown University School of Medicine & MedStar Sports Medicine

**Robert A. Huggins, PhD, LAT**

President of Research and Athlete Performance and Safety  
Korey Stringer Institute, University of Connecticut

**Chad Hulsopple, MD**

NCC Sports Medicine Fellowship Director  
Uniformed Services University of the Health Sciences

**John Jardine, MD**

Medical Director, Falmouth Road Race  
Chief Medical Officer, Korey Stringer Institute, University of Connecticut

**Scott Pyne, MD**

Former Medical Director, Marine Corps Marathon  
Team Physician, US Naval Academy

**Matthew D. Sedgley MD**

Director of Emergency Action Planning, MedStar Health, North  
Director of Running and Walking Medicine, MedStar Health

**Chris Troyanos, ATC**

Medical Coordinator, Boston Marathon

**Shelly Weinstein, PT, MS, SCS, ATC**

Medical Operations Coordinator, Marine Corps Marathon

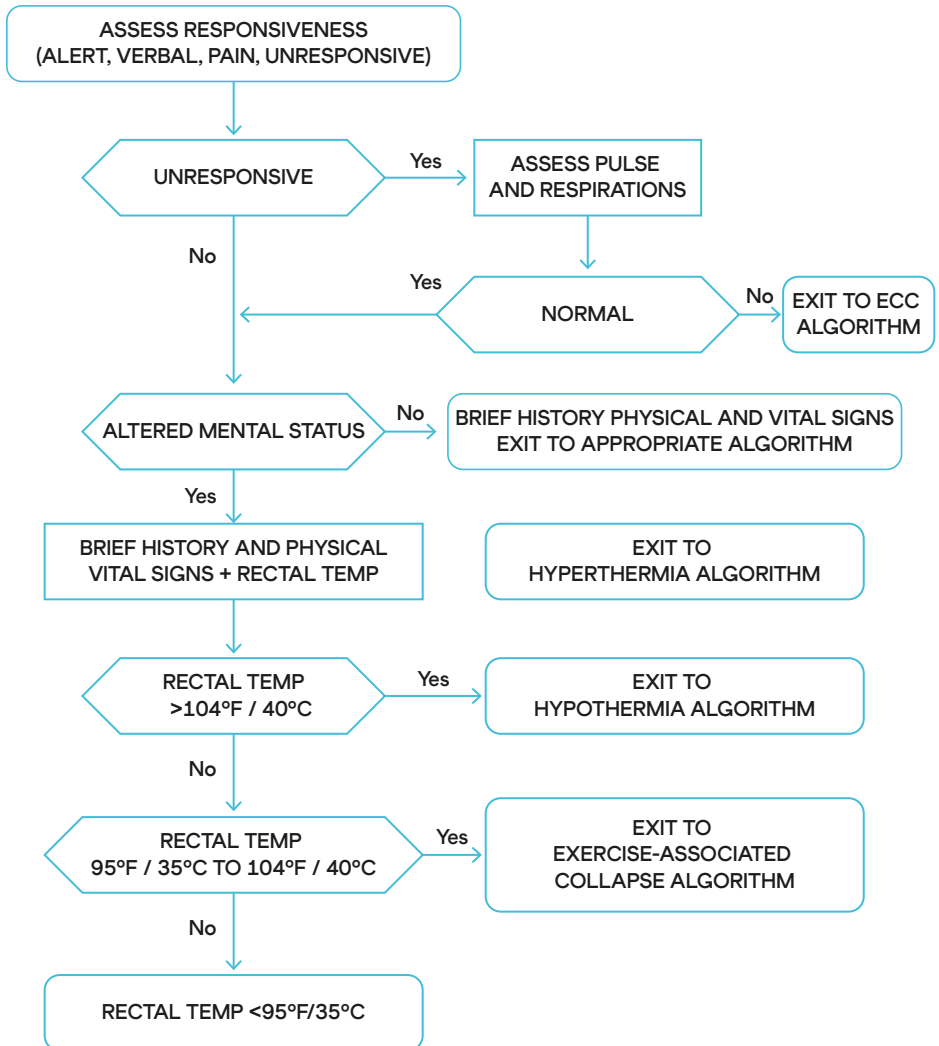
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- XIII. Tent Discharge Considerations

## Glossary of algorithms

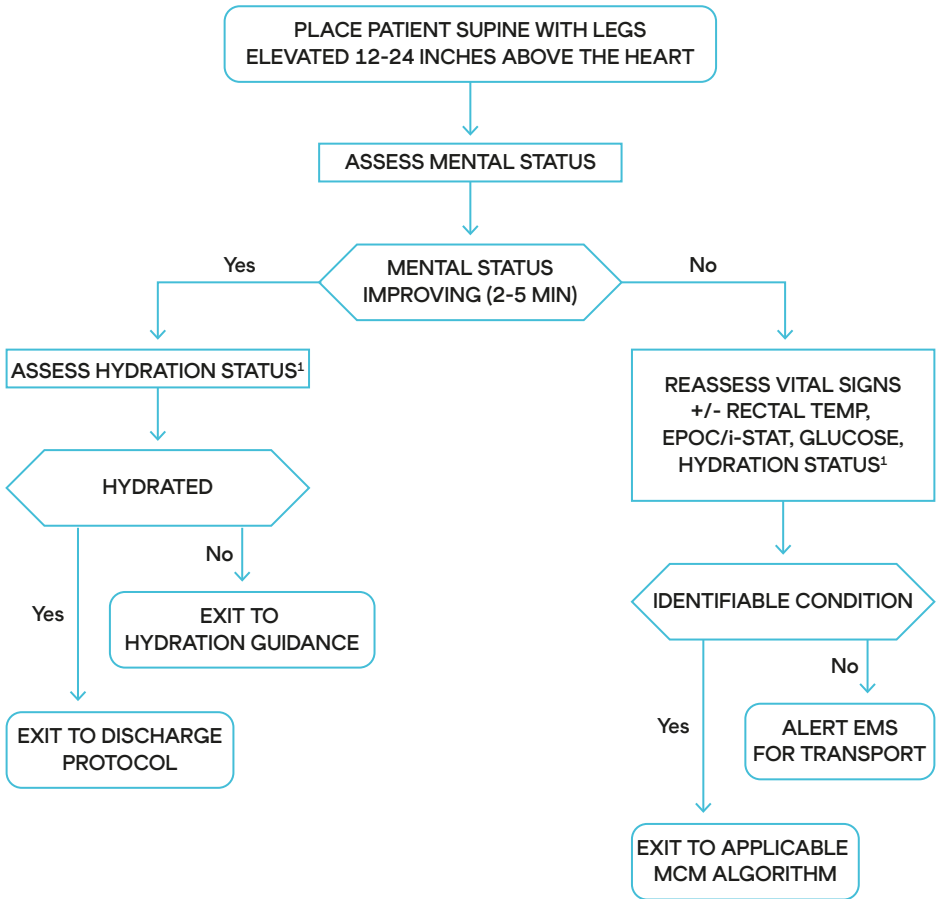
- AED:** Automated external defibrillator
- AMP:** Ampule
- BP:** Blood pressure
- CNS:** Central nervous system
- CPR:** Cardiopulmonary resuscitation
- CV:** Cardiovascular
- D50W:** 50 grams of dextrose in 100 ml of water.
- ECC:** Emergency cardiac care
- ECG:** Electrocardiogram
- ED:** Emergency department
- EHS:** Exertional heat stroke
- EMS:** Emergency medical services
- FS:** Fingertick
- H&P:** History and physical examination
- IV:** Intravenous
- IVF:** Intravenous fluid
- MCM:** Marine Corps Marathon
- MS:** Mental status
- NS:** Normal saline
- PO:** Per os

# I. Master algorithms – Collapsed athlete triage





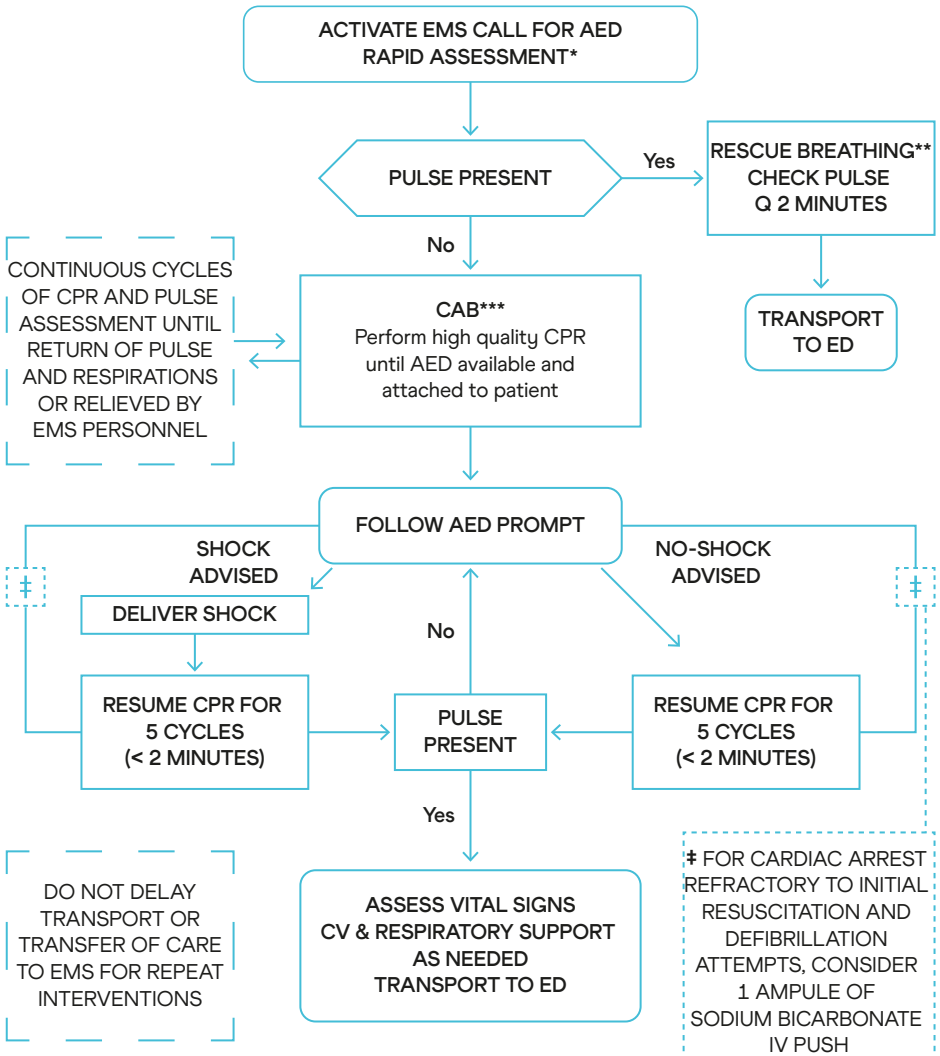
## II. Exercise-associated collapse



### 1. ASSESS HYDRATION STATUS

- a. MILD TO MODERATE DEHYDRATION: signs and symptoms include thirst, fatigue, malaise, headache, vomiting, reduced sweating, cold/clammy skin, decreased skin turgor, and sunken orbits.
- b. SEVERE DEHYDRATION: signs and symptoms include orthostatic hypotension, relative tachycardia, and capillary refill of > 2 seconds, in addition to those described with mild to moderate dehydration.

## II. Emergency cardiac care (ECC)



\* open airway, assess breathing and pulse (no more than 10 seconds)

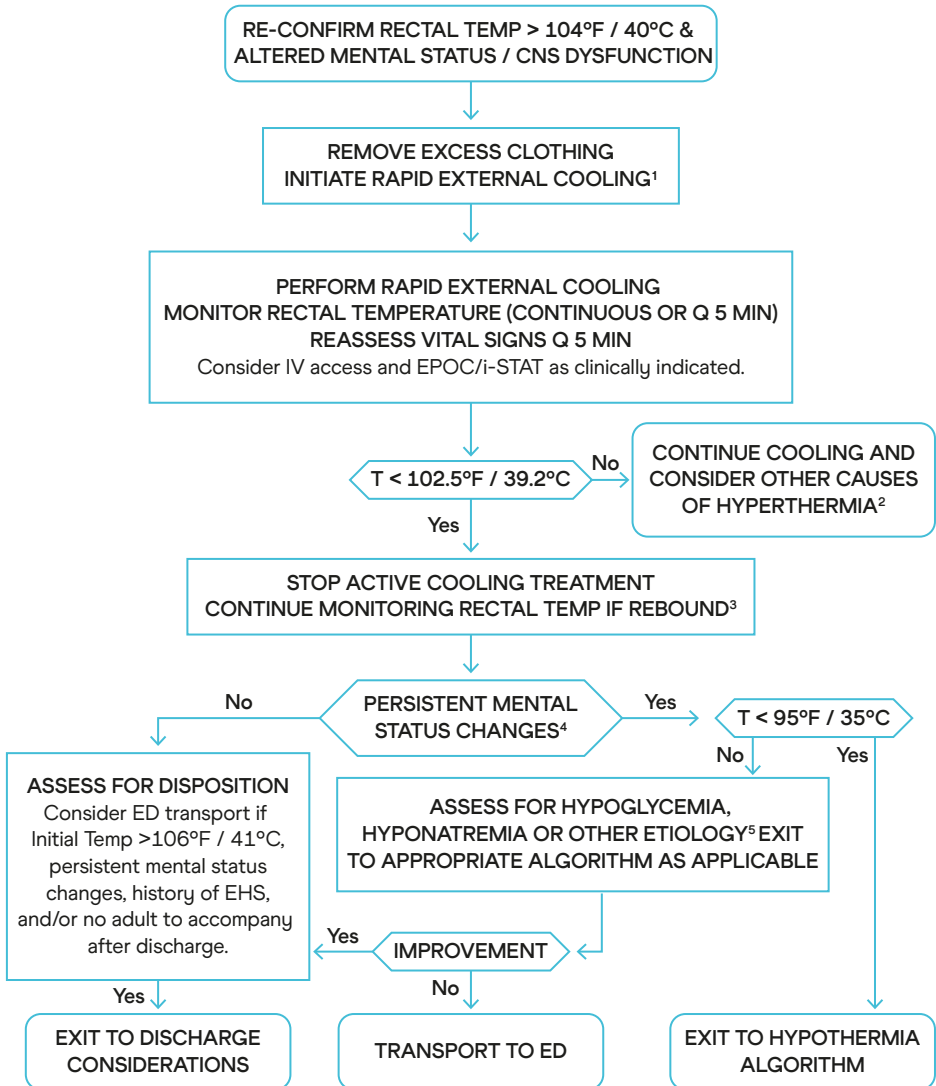
\*\* adult rescue breathing rate: 1 breath every 5-6 seconds

\*\*\* ABC priority changed to CAB (circulation, airway, breathing) – start compressions ASAP

† adult CPR: 30 compressions per 2 ventilations / compression rate = 100/minute (compression depth = 2" with full chest recoil)

\* patients who collapse in midst of strenuous exertion often have a concomitant profound lactic acidosis

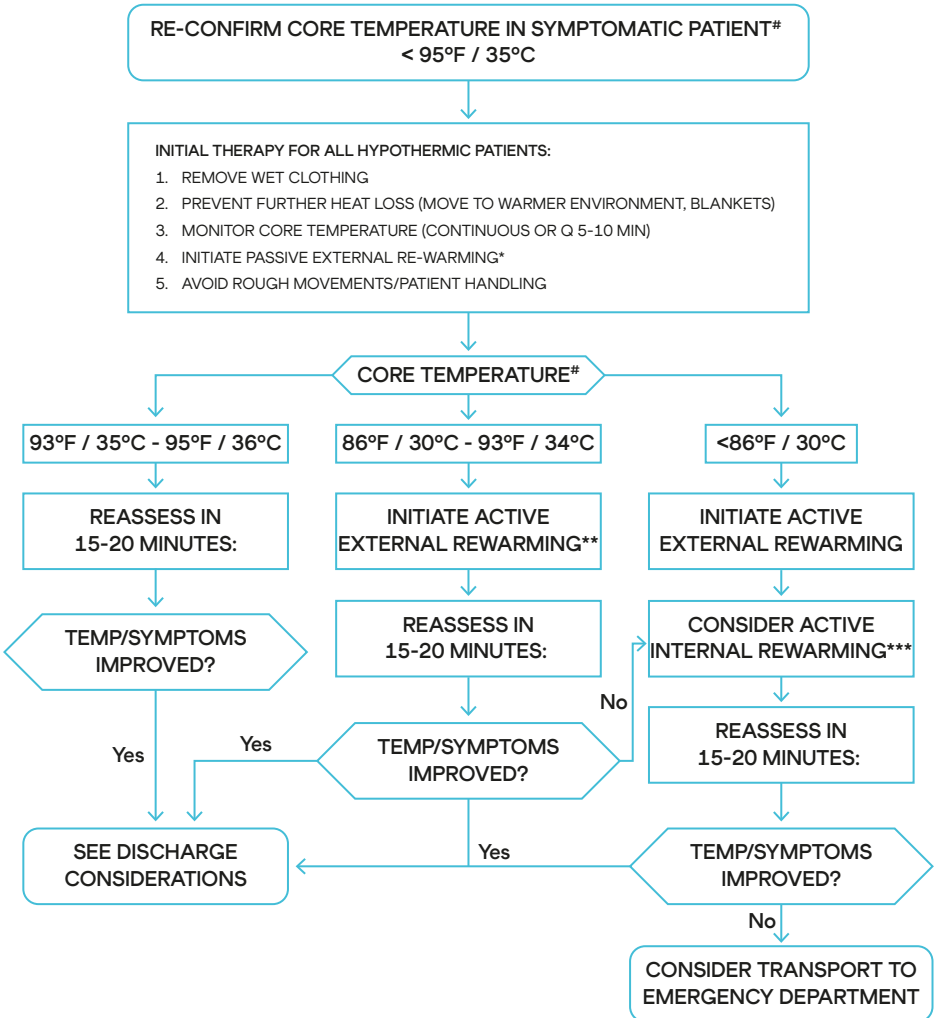
## IV. Hyperthermia



ALL TEMPERATURES ARE RECTAL; COOL FIRST, TRANSPORT SECOND!

1. Preferred/proven cooling options: 1) ice water bath immersion 2) ice water dousing with whole body ice massage and packing (fans if available). May add cooled IV fluids if sodium is normal.
2. Consider malignant hyperthermia, underlying infection, and neuroleptic malignant syndrome.
3. Return to active cooling as clinically indicated; monitor until clinically stable.
4. Be aware, not all exertional heatstroke patients have complete mental status recovery with temperature drop; Mental status recovery is variable and can be delayed.
5. IMMEDIATE Na, Gluc, K +/- Cr, BUN, Cl & Hct (e.g. EPOC/i-STAT); treat hypoglycemia and hyponatremia per protocols.

## V. Hypothermia



### # RECTAL TEMPERATURE

\* Passive external rewarming: apply cotton, wool and/or mylar blankets.

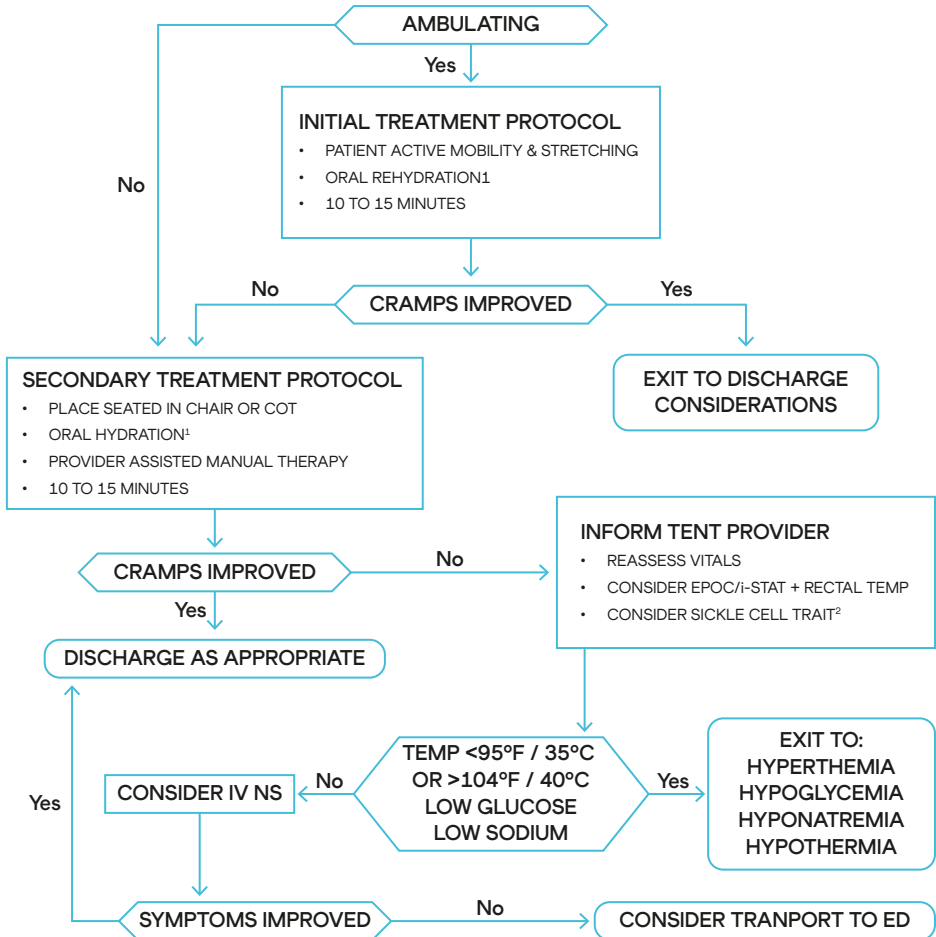
\*\* Active external rewarming: warmed blankets, heating pads, forced warm air.

\*\*\* Active internal rewarming: warmed oral fluids (if normal mental status & tolerating PO). Consider warmed iv fluids ( $40^{\circ}\text{C}$  to  $42^{\circ}\text{C}$ ) and/or warmed humidified  $\text{O}_2$ .

### GENERAL TREATMENT GUIDANCE

- Rewarm the trunk before the extremities to minimize risk of core temperature afterdrop
- If altered mental status: consider EPOC sodium & glucose; move to appropriate algorithm
- If patient becomes pulseless or APNEIC: activate EMS, call for AED, go to ECC algorithm

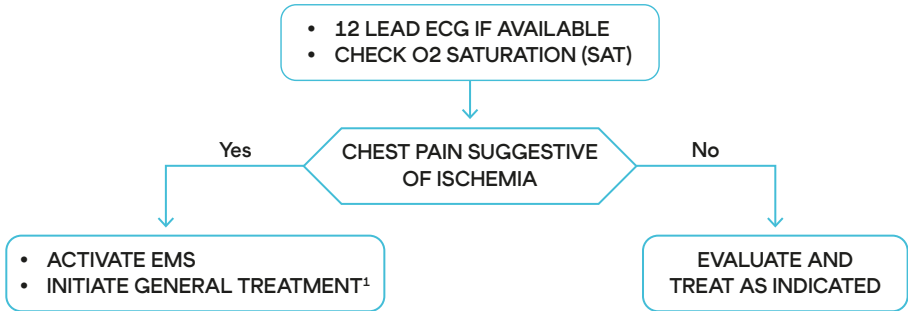
## VI. Exercise-associated muscle cramps



1. Oral hydration with clear fluids (water, sports drink, broth) per patient preference.

2. Consider exercise collapse associated with sickle cell trait and/or compartment syndrome if: African American, persistent cramping without visible cramp/fasciculations, muscle rigidity, and/or sustained severe pain.

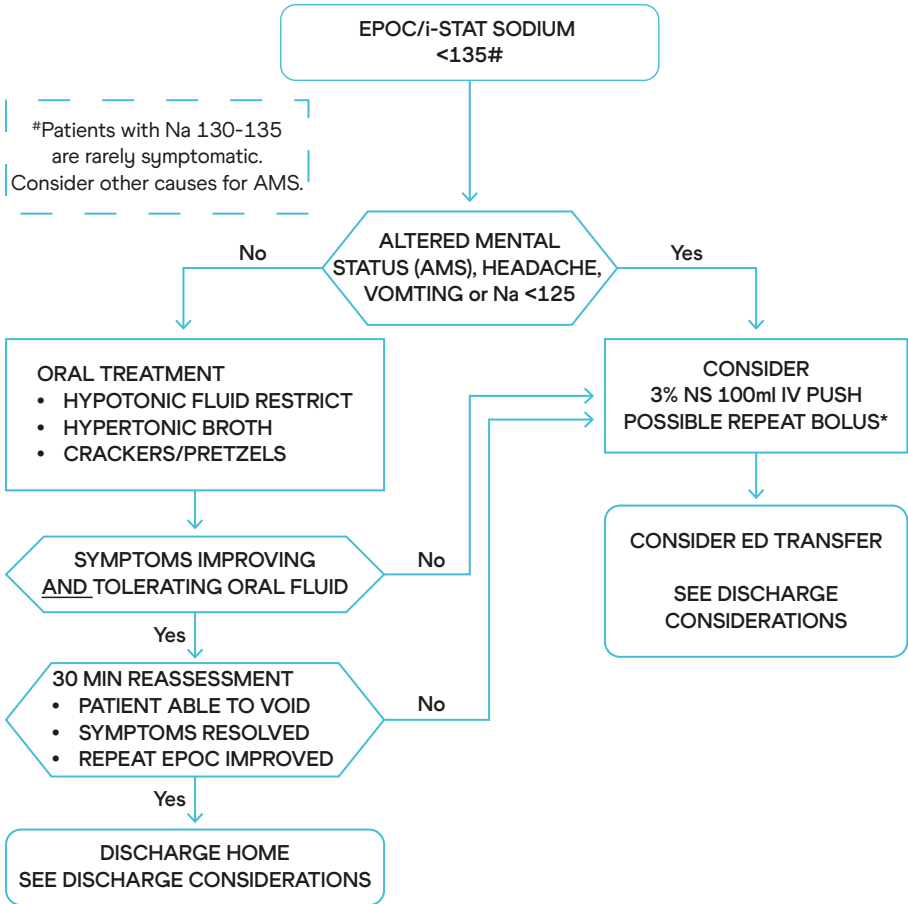
## VII. Chest pain



### 1. IMMEDIATE GENERAL TREATMENT GUIDANCE

- OXYGEN: BY MASK OR CANNULA IF O<sub>2</sub> SAT <93
- ASPIRIN: 325 MG TABLET SHOULD BE ADMINISTERED:  
CHEWED (unless contraindicated)
- NITROGLYCERIN:
  - ADMINISTER (unless contraindicated)
    - ONE SUBLINGUAL TABLET (0.03 TO 0.04 MG)
  - OR
  - ONE SUBLINGUAL SPRAY
  - MAY REPEAT TWICE AT 5 MINUTE INTERVALS
  - SYSTOLIC BP SHOULD BE GREATER THAN 90-100 MM HG

# VIII. Hyponatremia



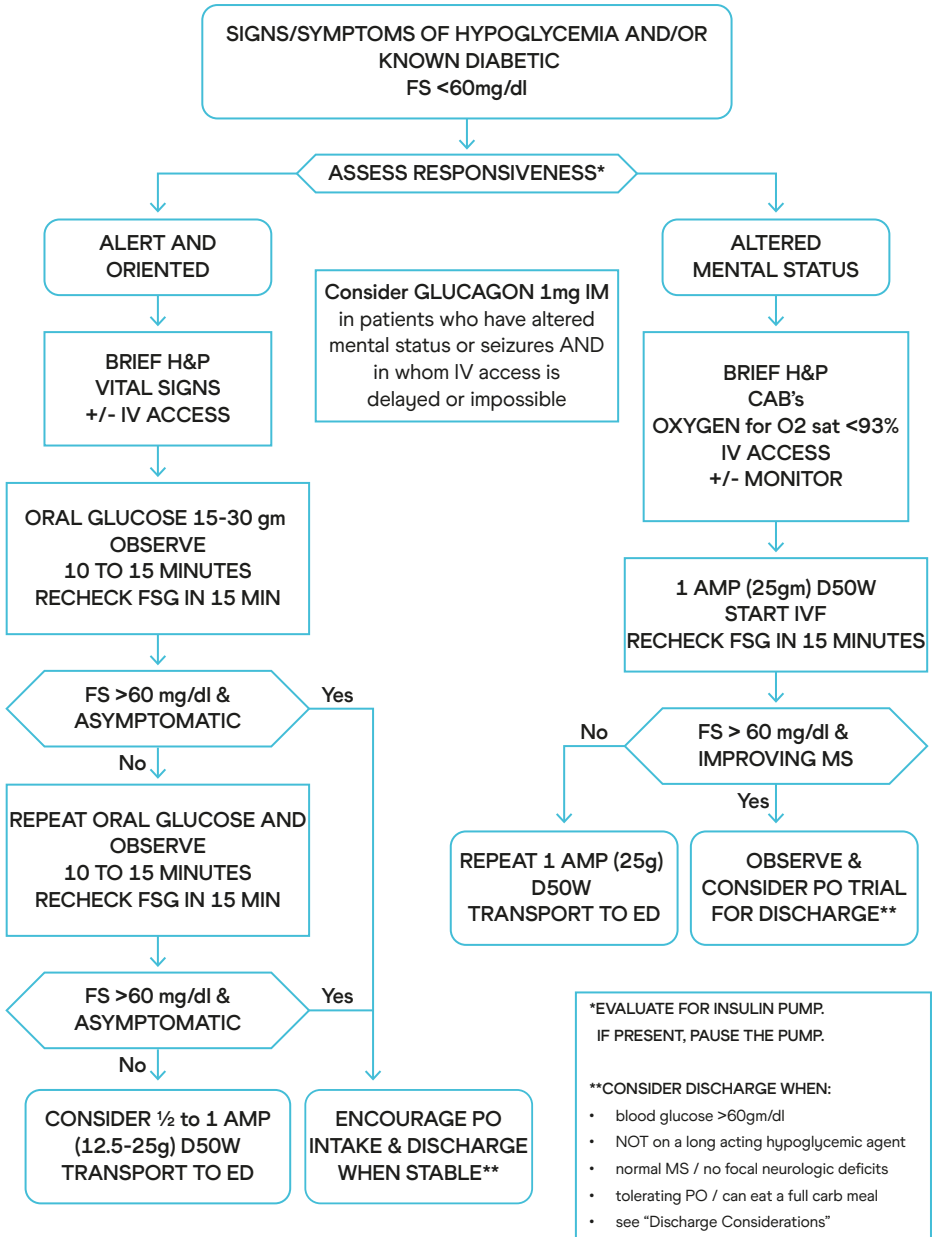
\*100ml 3% NS will raise serum Na 1-2 mEq/liter

CONSIDER REPEAT BOLUS FOR:

- Delay in transport
- Worsening mental status/symptoms
- Serum Na < 124

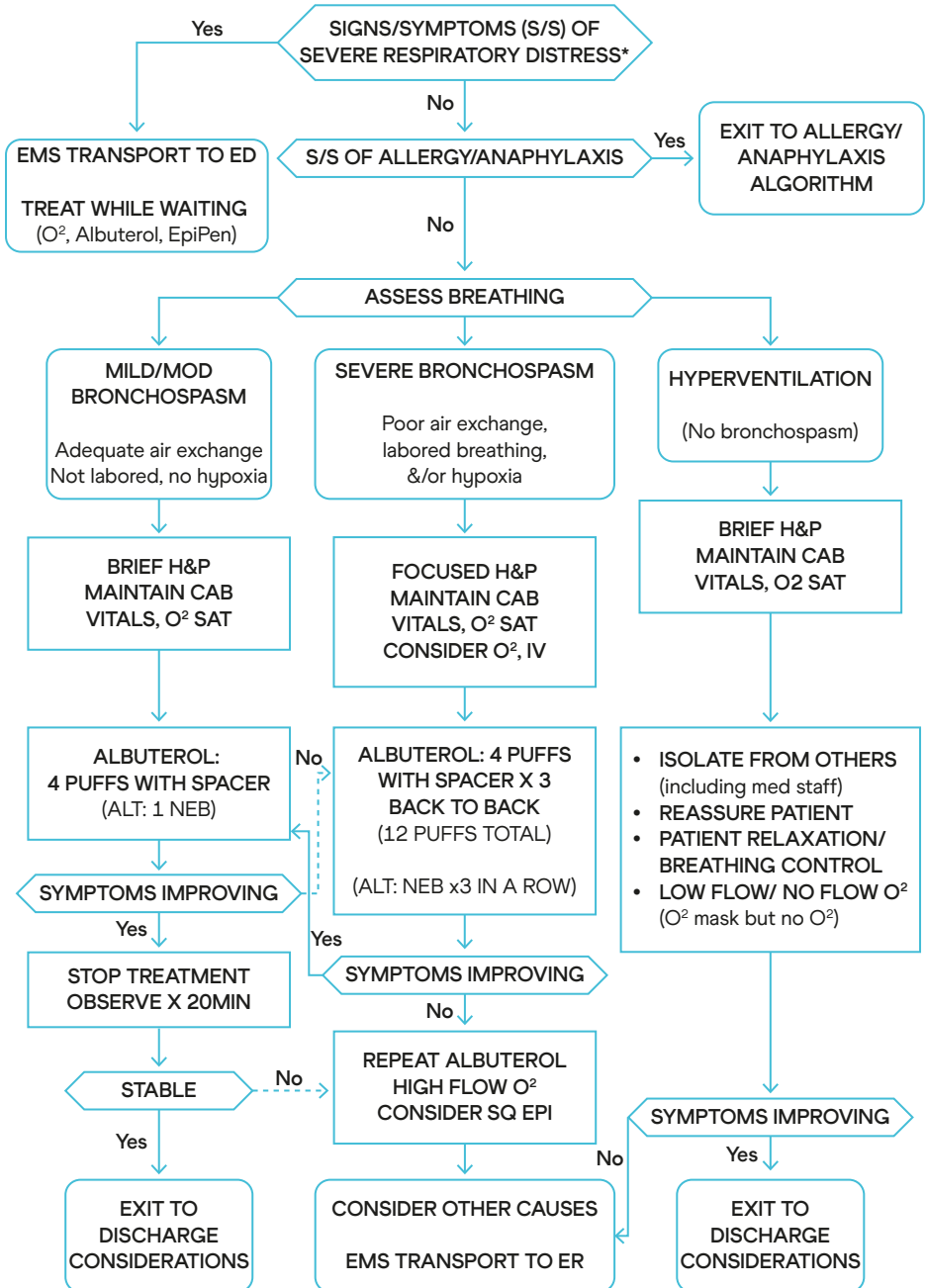
**NOTE:** There have been no cases of CNS myelinolysis reported from 3% NaCl treatment of race-associated hyponatremia.

# IX. Hypoglycemia





# X. Respiratory



# MCM respiratory algorithm notes

## \* SEVERE RESPIRATORY DISTRESS = TRIPOD POSITION, 2-WORD SENTENCES, STRIDOR, CYANOSIS

1. Bronchospasm can limit air flow; wheezing may be louder \*after\* albuterol.
2. Albuterol may cause tachycardia and drop serum potassium.
3. Aid stations have limited inhalers. DO NOT give the inhaler away.
4. If no spacer is available, improvise: cut a small hole in a cup, toilet paper roll, etc.

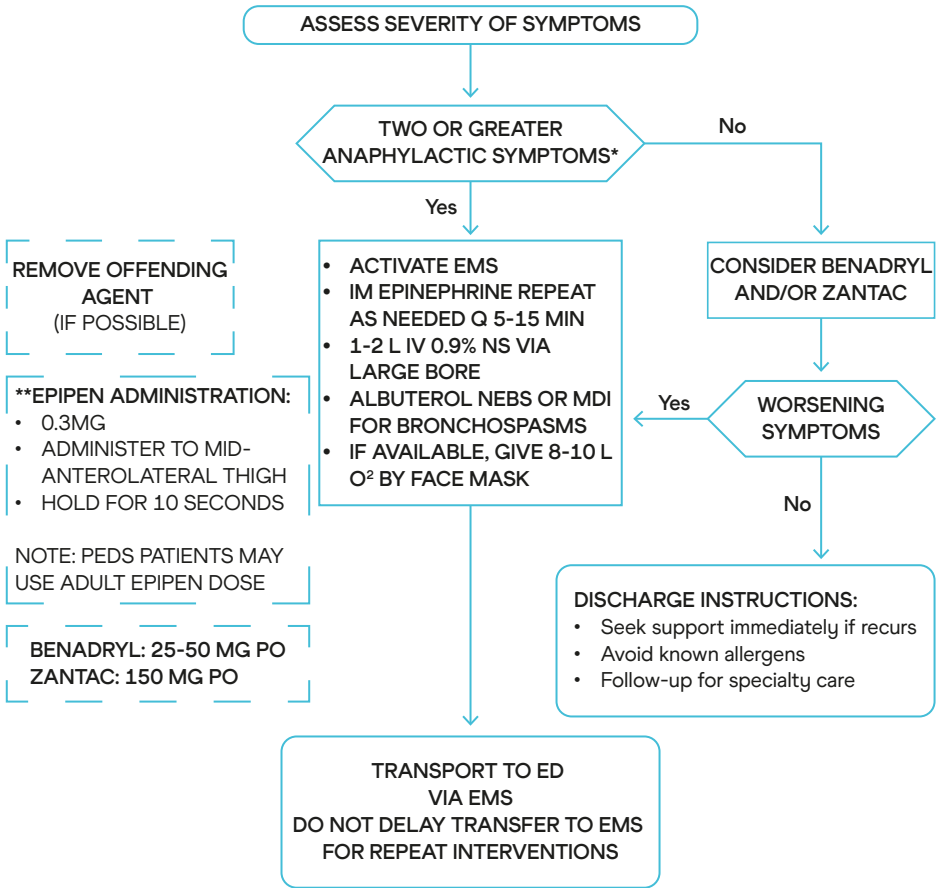
## EXERCISE-INDUCED HYPERVENTILATION

1. Common cause of shortness of breath in athletes, particularly at the finish.
2. Contributing factors: new to this event, sprinting to the end, faster pace than normal.
3. Some individuals get anxious from the acidosis hyperventilation.

### Characteristics:

- Symptoms include chest tightness, lightheadedness, perioral/hand/feet paresthesia, carpo-pedal spasms, nausea, and possible vomiting.
- Normal SaO<sub>2</sub>
- Clear to auscultation with good air movement throughout all lung fields.
- Patient may have referred vocal cord sounds (louder on auscultation of larynx).
  - Instruct the patient to stop making noise.

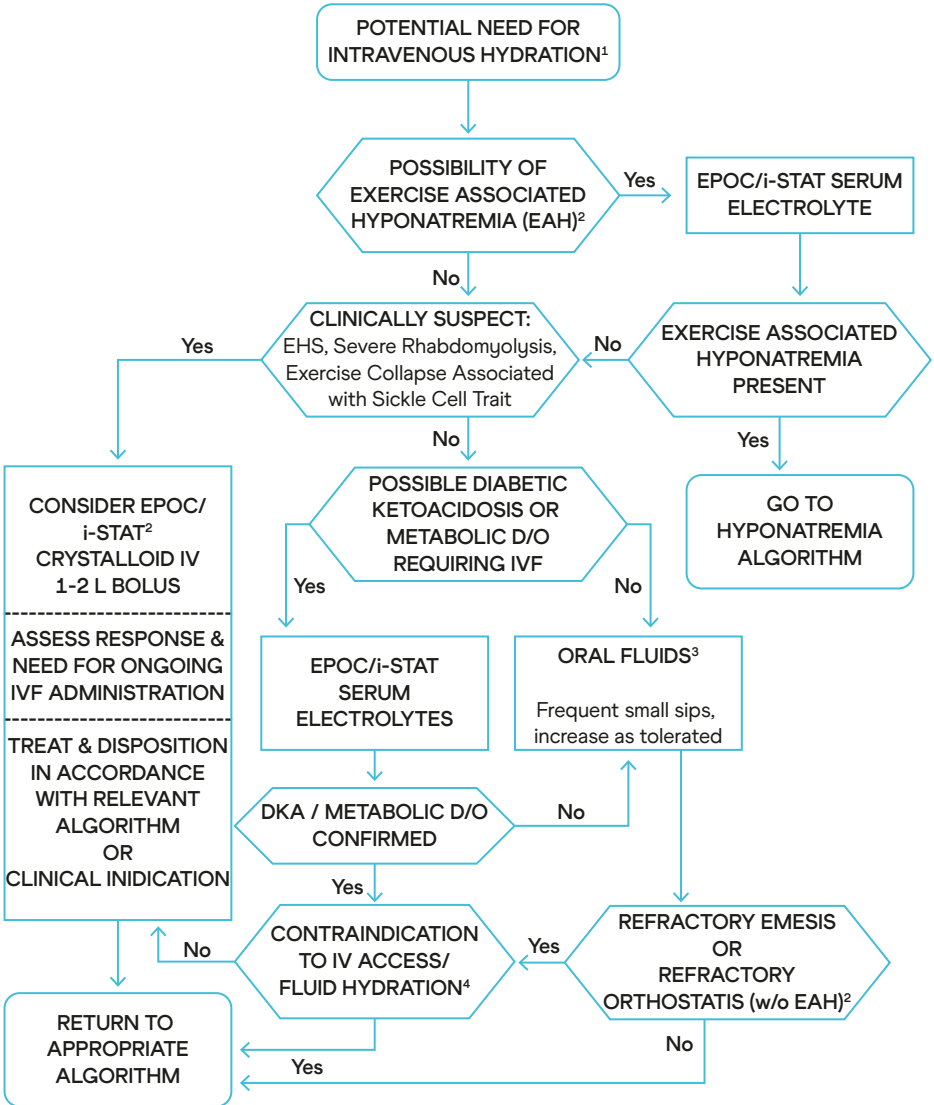
# XI. Allergy/anaphylaxis



\* ANAPHYLAXIS HIGHLY LIKELY WITH RAPID ONSET (MINUTES TO HOURS)  
IF TWO OR MORE OF THE FOLLOWING AFTER EXPOSURE TO ALLERGEN(S):

- RESPIRATORY COMPROMISE (e.g. wheezing, cough, stridor, shortness of breath, choking, throat closure)
- HYPOTENSION OR END ORGAN DYSFUNCTION (e.g. syncope, hypotonia, dizziness, collapse)
- SKIN OR MUCOSAL SYMPTOMS (e.g. hives, itching, flushing, swelling of the lips-tongue-uvula, periorbital edema)
- GASTROINTESTINAL SYMPTOMS (e.g. vomiting, crampy abdominal pain, diarrhea)

## XII. Hydration guidance



1 Dehydration, orthostasis, EAC, muscle cramping, EHS, DKA, AKI, rhabdomyolysis.

2 If potential EAH, check sodium level before fluid administration.

3 Electrolyte drinks are preferred, but high sugar content may affect tolerance; consider concurrent salt replacement / salty foods if heavy sweating, salt lines in clothing, or salt crusting on skin.

4 Cellulitis at site; obvious signs of overt fluid overload (e.g. pulmonary edema) warrant precaution.

## XIII. Discharge considerations

### General Discharge

1. Provide a copy of the medical encounter form to the patient
2. Ensure patient's information is complete in the medical database
3. Recommend follow-up with appropriate provider
4. Patients should be discharged with dry clothing if at all possible

### EMS Transfers

1. Provide a copy of the medical encounter form to the patient/EMS team
2. Notify the Medical Information Tent of the transport
3. Notify Medical Director/Coordinator of the transport

### Pediatric

1. Notify emergency contact as soon as patient enters Aid Station
2. Release patient to an adult/guardian only
3. Provide a copy of the medical encounter form to the adult/guardian

### Signing Out Against Medical Advice (AMA)

1. Ensure they sign the encounter form with AMA circled
2. Provide a copy of the medical encounter form to the patient
3. Notify Medical Director/Coordinator of the AMA
4. Flag the encounter in the medical database

### Exertional Heat Stroke

1. Ensure temperature remains within 95.5-102.0oF (35.3-38.9 oC) prior to discharge
2. Notify Medical Director/Coordinator of injury and max temperature
3. Ensure temperatures/labs/data is entered in the medical tracker
4. Flag the encounter in the medical database
5. Inform patient of contact from race organisation 24-48 hours after event

### Exertional Hyponatremia

1. Ensure EPOC/ISTAT/ lab values are entered into the medical tracker
2. Recommend follow-up with appropriate provider

### Exercise-Associated Muscle Cramps

1. Provide precautions regarding muscle soreness and worsening symptoms
2. Recommend gentle stretching, oral hydration and salty foods for 24 hours

# Appendices

- A. Medical encounter forms
- B. Recommended staff and equipment for WAS events
- C. Recommended medication and medical supplies for WAS events

# Appendix A

## Medical encounter forms

# Illness-Related Race Medical Encounter Data (R-MED) Form

## Endurance Sport Events –

### 1. Race Details: <Pre-populate before the event>

Race name: \_\_\_\_\_ Date: \_\_\_\_\_ Official start time: \_\_\_\_\_ Official finish time: \_\_\_\_\_

### 2. Location Of The Medical Facility:

Course Q1    Course Q2    Course Q3    Course Q4    At finish    Sweeper bus    Hospital    Other

### 3. Athlete Demographic Details: Race Number:

Male    Female    Race finisher:    Yes    No    Arrival time at medical facility (hh/mm): \_\_\_\_\_

### 4. Athlete Illness-Related Medical History:

#### 4a. Pre-Race History:

Did the athlete suffer from any pre-race acute illness/symptoms (gastro/acute illness or infective illness)?    Yes    No

Details of pre-race illness or injury (Type):    URT symptoms with no systemic symptoms    URT symptoms with systemic symptoms

LRT symptoms    Nausea/vomiting and diarrhoea    Nausea only    Nausea and vomiting    Diarrhoea    Other infective illness

Other pre-race illness \_\_\_\_\_

Onset of pre-race illness:    Race day    1 day before    2-7 days before    8-14 days before    > 15days before

Analgesics/NSAIDs use 0-24 hours before the race?    Yes    No

Analgesics/NSAIDs use during the race?    Yes    No

Prescription medication use (list please):    Yes    No

Reason for medication use: \_\_\_\_\_

#### 4b. Presenting Complaint:

Collapse (pre-finish)    Collapse (post-finish)    Confused    Muscle cramps (localized)    Chest pain    Palpitations

Fatigue/exhaustion    Muscle cramps (systemic)    Abdominal cramps/pain    Diarrhoea    Nausea/vomiting    Seizure

Headache    Hot (suspected hyperthermia)    Cold (suspected hypothermia)    Difficulty breathing    Wheeze    Coughing

Skin (chafing/blisters)    Skin (cut/laceration)    Skin (other)    Musculoskeletal (head/neck)    Musculoskeletal (chest/trunk)

Musculoskeletal (upper limb)    Musculoskeletal (spine/back)    Musculoskeletal (hip/pelvis)    Musculoskeletal (lower limb)

Deep Chest/Abdominal trauma    Other: \_\_\_\_\_

Additional clinical notes: \_\_\_\_\_

### 5. Clinical Examination:

5.1. Mental status (APVU):    Alert    Responds to voice    Responds to pain    Unresponsive

5.2. Glasgow Coma Scale:    /15    Eye:    /4    Verbal:    /5    Motor:    /6

5.3. Hydration:    Normal (clinically)    Dry mouth (mucosa)    Oedema (swollen periphery)    Poor skin turgor

Fluid intake during race (ml): \_\_\_\_\_    Pre-race weight (kg): \_\_\_\_\_    Post-race weight (kg): \_\_\_\_\_    % Weight change: \_\_\_\_\_ %

#### 5.4. Vital signs

| Time of measurement | Pulse | BP Systolic/diastolic | Core Temp | % Sats | Glucose | Other |
|---------------------|-------|-----------------------|-----------|--------|---------|-------|
| Admission           |       |                       |           |        |         |       |
|                     |       |                       |           |        |         |       |
|                     |       |                       |           |        |         |       |
|                     |       |                       |           |        |         |       |

5.5. Other clinical findings: \_\_\_\_\_



**6. Orders/Investigations:**

Admit to ICU/resuscitation (medical tent or hospital)    Admit medical tent for treatment    Elevate legs    Fluids (Oral)  
 Fluids (IV)    Cooling    Warming    Wound care    Other:  
 Lab tests (glucose)    Lab tests (sodium)    Lab tests (potassium)    Lab tests (urea/creat)    Lab tests (blood gas)  
 Lab tests (Hct/Hb)    Lab tests (ECG)    Lab tests (Ultrasound)    Lab tests (Other):

**7. Laboratory/Investigation Results (Attach):**

Lab tests (glucose)    Lab tests (sodium)    Lab tests (potassium)    Lab tests (urea/creat)    Lab tests (blood gas)  
 Lab tests (Hct/Hb)    Lab tests (ECG)    Lab tests (Ultrasound)    Lab tests (Other)

**8. Treatment:**

**8.1. Fluids**

Oral Fluid (volume ml):                      Type:    Water    Sports drink    Hypertonic saline    Other:  
 IV Fluid (volume ml):                      Type:                      Rate:                      ml over                      min    Start time:                      End time:

**8.2. Medication**

Type:                      Dosage:                      Route (po/IM/IV):                      Time (given):  
 Type:                      Dosage:                      Route (po/IM/IV):                      Time (given):

**8.3. Other treatment:**

**9. Pre-Discharge Assessment:**

Conscious/orientated    Yes    No    N/A                      Ambulatory    Yes    No    N/A  
 Asymptomatic    Yes    No    N/A                      Passed urine:    Yes    No    N/A

**10. Final Diagnosis Of Illness-Related Medical Encounter:**

Main organ system:    Multiple organs    Cardiovascular system    Respiratory/ENT system    Central nervous system  
 Rheumatological system    Gastrointestinal system    Genitourinary system    Haematology/Nutrition    Endocrine/Metabolic  
 Dermatological system    Ophthalmological system    Dental illness    Psychological/Psychiatric    Tumour/malignancy  
 Drug use/Overdose    Other medical illness

**Final diagnosis/illness type (Enter code from Table):**

**11. Illness-Related Medical Encounter Severity:**

Minor encounter                      Moderate encounter                      Serious/life threatening encounter  
 Sudden cardiac arrest (SCA)                      Sudden cardiac death (SCD)                      Non-cardiac sudden death

**12. Discharge Information:**

Discharged    Hospital transfer    Follow-up care needed    Refusal of care  
 Follow up call by race medical team needed    Yes    No    Other special instruction:

**13. Transport Information:**

Authorized by: Dr                      Hospital name:  
 Transported by:                      Receiving doctor:  
 Receiving doctor's contact details:  
 Family/Next of Kin notified:    Yes    No    Who was notified?

**14. Additional Clinical Notes:**

**15: Doctor/Clinician Details:**

Doctor/Clinician name:                      Signature:  
 Date:                      Time:

# Illness-Related Race Medical Encounter Data (R-MED) Form

## Endurance Sport Events –

### 1. Race Details: <Pre-populate before the event>

Race name: \_\_\_\_\_ Date: \_\_\_\_\_ Official start time: \_\_\_\_\_ Official finish time: \_\_\_\_\_

### 2. Location Of The Medical Facility:

Course Q1    Course Q2    Course Q3    Course Q4    At finish    Sweeper bus    Hospital    Other

### 3. Athlete Demographic Details: Race Number:

Male    Female    Race finisher:    Yes    No    Arrival time at medical facility (hh/mm): \_\_\_\_\_

### 4. Athlete Medical History:

#### 4a. Injury History:

Onset of Injury:    Acute    Chronic (pre-existing)    Acute exacerbation of chronic injury

Mechanism of Injury:    Traumatic – contact with another athlete    Traumatic – contact with moving object

                                  Traumatic – contact with immobile object    Traumatic non-contact    Overuse injury    Other

Factors Contributing to the mechanism of injury:    Violation of rules    Weather conditions    Equipment failure

                                  Course/field of play conditions    Fatigue    Psychological    Other:

#### 4b. Presenting Complaint:

Pain    Loss of function    Swelling    Confusion    Unresponsive (coma)    Head/neck injury    Chest injury    Trunk injury

Upper limb injury    Spine/back injury    Hip/pelvis injury    Lower limb injury    Abdominal injury

Injury multiple anatomical areas:

Other injury:

Additional clinical notes:

### 5. Clinical Examination:

5.1. Mental status (APVU):    Alert    Responds to voice    Responds to pain    Unresponsive

5.2. Glasgow Coma Scale:    /15    Eye:    /4    Verbal:    /5    Motor:    /6

5.3. Hydration:    Normal (clinically)    Dry mouth (mucosa)    Oedema (swollen periphery)    Poor skin turgor

Fluid intake during race (ml):    Pre-race weight (kg):    Post-race weight (kg):    % Weight change:    %

#### 5.4. Vital signs

| Time of measurement | Pulse | BP Systolic/diastolic) | Core Temp | % Sats | Glucose | Other |
|---------------------|-------|------------------------|-----------|--------|---------|-------|
| Admission           |       |                        |           |        |         |       |
|                     |       |                        |           |        |         |       |
|                     |       |                        |           |        |         |       |
|                     |       |                        |           |        |         |       |
|                     |       |                        |           |        |         |       |
|                     |       |                        |           |        |         |       |

#### 5.5. Other clinical findings:

### 6. Orders/Recommended Investigations:

Admit to ICU/resuscitation (medical tent or hospital)    Admit medical tent for treatment    Splint/brace    Warming

Wound care    Other:

Lab tests (Ultrasound)    Lab tests (Radiology – X Rays)    Lab tests (MRI scan)    Lab tests (CT scan)



# Appendix B

## Recommended staff and equipment for WAS events

### Recommended numbers of medical and paramedical personnel for In-Stadium athletics events

|                          | Medical Doctor       |                          |                        |                  | Pharmacist | Nurse | EMT | Physiotherapist | Room Manager | Receptionist | Translator |
|--------------------------|----------------------|--------------------------|------------------------|------------------|------------|-------|-----|-----------------|--------------|--------------|------------|
|                          | General Practitioner | Emergency Physician      | Traumatology Physician | Sports Physician |            |       |     |                 |              |              |            |
| <b>Main Stadium</b>      |                      |                          |                        |                  |            |       |     |                 |              |              |            |
| Athlete's Medical Center | 1                    | 1                        | 1                      | 1                | 1          | 2     | 2   | 1               | 1            | 1            | several    |
| Finish Line              |                      |                          |                        | 1                |            |       | 2   |                 |              |              |            |
| Track Perimeter          |                      | 4 (any of 3 specialties) |                        |                  |            | 4     | 4   |                 |              |              |            |
| Post Event Control Room  |                      |                          |                        |                  |            |       | 2   |                 |              |              |            |
| VIP Area                 |                      |                          |                        |                  |            | 1     | 1   |                 |              |              |            |
| Media Area               |                      |                          |                        |                  |            |       | 1   |                 |              |              |            |
| <b>Warm Up Area</b>      |                      |                          |                        |                  |            |       |     |                 |              |              |            |
| Medical Center           |                      |                          |                        | 1                |            | 1     | 2   |                 | 1            |              |            |
| LOC Physio Room          |                      |                          |                        |                  |            |       |     | 10              |              | 1            |            |

|                                | Medical Doctor       |                     |                        |                  | Pharmacist | Nurse | EMT | Physiotherapist | Room Manager | Receptionist | Translator |
|--------------------------------|----------------------|---------------------|------------------------|------------------|------------|-------|-----|-----------------|--------------|--------------|------------|
|                                | General Practitioner | Emergency Physician | Traumatology Physician | Sports Physician |            |       |     |                 |              |              |            |
| <b>Training Venue</b>          |                      |                     |                        |                  |            |       |     |                 |              |              |            |
| First Aid Station              |                      |                     |                        | 1                |            |       | 1   | 1               |              |              |            |
| <b>Athletes' Accommodation</b> |                      |                     |                        |                  |            |       |     |                 |              |              |            |
| Medical Center                 | 1                    |                     |                        | 1                |            | 2     |     |                 |              | 1            | several    |
| LOC Physio Room                |                      |                     |                        |                  |            |       |     | 5               |              | 1            |            |
| <b>VIP Hotel</b>               |                      |                     |                        |                  |            |       |     |                 |              |              |            |
| First Aid Station              | 1                    |                     |                        |                  |            | 1     |     |                 |              |              |            |

# Recommended numbers of medical and paramedical personnel for Out-of-Stadium athletics events

## Road Races and Race Walking Events

|  | Medical Doctor       |                     |                        |                  | Pharmacist | Nurse | EMT | Physiotherapist | Room Manager | Receptionist | Translator |
|--|----------------------|---------------------|------------------------|------------------|------------|-------|-----|-----------------|--------------|--------------|------------|
|  | General Practitioner | Emergency Physician | Traumatology Physician | Sports Physician |            |       |     |                 |              |              |            |
| <b>Start and Finish</b>                |                      |                     |                        |                  |            |       |     |                 |              |              |            |
| Main Medical Center                    |                      | 1                   | 1                      | 2                |            | 5     | 4   | 1               | 1            | 2            | several    |
| Finish Line                            |                      | 1                   |                        |                  |            |       | 8   |                 |              |              |            |
| Post event recovery room               |                      |                     |                        |                  |            |       | 2   |                 |              |              |            |
| <b>On the course</b>                   |                      |                     |                        |                  |            |       |     |                 |              |              |            |
| First aid station (staff per/station)* |                      |                     |                        | 1                |            | 1     | 2   |                 |              |              |            |
| Roving vehicles *                      |                      |                     |                        |                  |            |       | 2   |                 |              |              |            |

Note: numbers and suggested coverage locations can vary based on weather conditions and course route (point to point or a loop course).

\*Please refer to paragraphs 8 and following of the chapter on out Stadium events

## Recommended medical equipment and supply for In-Stadium athletics events

|                                |   | AED | Ambulance | Cold water Immersion | Crutches | Diag Echo | ECG monitor | Ice maker | IV Drip kits* | Oxygen | Oxygen saturation monitor | Stretcher | WBGT | Wheelchair |  |
|--------------------------------|---|-----|-----------|----------------------|----------|-----------|-------------|-----------|---------------|--------|---------------------------|-----------|------|------------|--|
| <b>Main Stadium</b>            |   |     |           |                      |          |           |             |           |               |        |                           |           |      |            |  |
| Athletes' Medical Center       | Close to the finish line, ample space, 6 beds | 2   | 1         | tbd                  | 4 pairs  | 1         | 1           | 1         | 5*            | 2      | 1                         | 2         |      | 2          |  |
| Finish Line                    |   |     |           |                      |          |           |             |           |               |        |                           | 4         |      | 2          |  |
| Track Perimeter                |   | 1   |           |                      |          |           |             |           |               |        |                           | 2         | 1    | 2          |  |
| Post Event Control Room        |   |     |           |                      |          |           |             |           |               |        |                           | 1         |      |            |  |
| VIP Area                       |   | 1   |           |                      |          |           |             |           | 1             | 1      | 1                         | 1         |      | 1          |  |
| Media Area                     |   | 1   |           |                      |          |           |             |           | 1             | 1      | 1                         | 1         |      | 1          |  |
| <b>Warm Up Area</b>            |   |     |           |                      |          |           |             |           |               |        |                           |           |      |            |  |
| Medical Center                 | 2 beds  | 1   | 1         |                      | 2 pairs  |           | 1           | 1         | 2             | 1      |                           | 1         |      | 1          |  |
| LOC Physio Room                | 10 boxes                                      |     |           |                      |          |           |             | 1         |               |        |                           |           |      |            |  |
| Team Physio Room               | 30 boxes                                      |     |           | 2-4                  |          |           |             | 2         |               |        |                           |           |      |            |  |
| <b>Training Venue</b>          |   |     |           |                      |          |           |             |           |               |        |                           |           |      |            |  |
| First aid station              | 1 bed   | 1   | 1         |                      |          |           |             | 1         |               |        |                           | 1         | 1    |            |  |
| Team Physio Room               | 3 boxes                                       |     |           |                      |          |           |             | 1         |               |        |                           |           |      |            |  |
| <b>Athletes' Accommodation</b> |   |     |           |                      |          |           |             |           |               |        |                           |           |      |            |  |
| Medical Center                 | 3 beds  | 1   |           |                      | 4 pairs  |           |             |           | 2             | 1      | 1                         |           |      |            |  |
| LOC Physio Room                | 10 boxes                                      |     |           |                      |          |           |             | 1         |               |        |                           |           |      |            |  |
| Team Physio Room               | 10 boxes                                      |     |           |                      |          |           |             | 1         |               |        |                           |           |      |            |  |
| <b>VIP Hotel</b>               |   |     |           |                      |          |           |             |           |               |        |                           |           |      |            |  |
| First aid station              | 1 bed   | 1   |           |                      |          |           | 1           |           | 1             | 1      | 1                         |           |      | 1          |  |

\* These figures of Drip IV are a suggested minimum. Increase if in severe weather conditions (hot).

# Recommended medical equipment and supply for Out-of-Stadium athletics events

## Road Races and Race Walking Events

|                          |   | AED | Ambulance | Cold water Immersion | Crutches   | Diag Echo | ECG monitor | Ice maker | IV Drip kits* | Oxygen | Oxygen saturation monitor | Stretcher | WBGT | Wheelchair |  |
|--------------------------|---|-----|-----------|----------------------|------------|-----------|-------------|-----------|---------------|--------|---------------------------|-----------|------|------------|--|
| <b>Start and Finish</b>  |   |     |           |                      |            |           |             |           |               |        |                           |           |      |            |  |
| Main Medical Center      | Ample space. Should be able to accommodate and treat between 1 and 5% of the number of athletes competing | 1   | 2         | 3                    | 2<br>pairs |           | 1           | 1         | 10            | 3      | 1                         | 2         | 1    | 2          |  |
| Finish Line              |   |     |           |                      |            |           |             |           |               |        |                           | 4         |      | 2          |  |
| Post event recovery room |   |     |           |                      |            |           |             |           |               |        |                           | 2         |      |            |  |
| <b>On the course</b>     |   |     |           |                      |            |           |             |           |               |        |                           |           |      |            |  |
| First aid stations       | Fixed tent or mobile  | 1   | 1         |                      |            |           |             |           | 1             | 1      |                           | 1         |      |            |  |

\* These figures of Drip IV are a suggested minimum. Increase if in severe weather conditions (hot).



# Recommended numbers of medical and paramedical personnel in World Athletics Cross Country Championships

|  | Medical Doctor       |                          |                        |                  | Pharmacist | Nurse | EMT | Physiotherapist | Room Manager | Receptionist | Translator |
|--|----------------------|--------------------------|------------------------|------------------|------------|-------|-----|-----------------|--------------|--------------|------------|
|  | General Practitioner | Emergency Physician      | Traumatology Physician | Sports Physician |            |       |     |                 |              |              |            |
| <b>Start and Finish</b>                |                      |                          |                        |                  |            |       |     |                 |              |              |            |
| Main Medical Center                    |                      | 2 (any of 3 specialties) |                        |                  |            | 4     | 4   | 1               | 1            | 2            | several    |
| Finish Line                            |                      | 1                        |                        |                  |            |       | 8   |                 |              |              |            |
| Post event recovery room               |                      |                          |                        |                  |            |       | 2   | 2               |              |              |            |
| <b>On the course</b>                   |                      |                          |                        |                  |            |       |     |                 |              |              |            |
| First aid station (staff per/station)* |                      |                          |                        | 1                |            | 1     | 1   |                 |              |              |            |
| Roving vehicles *                      |                      |                          |                        |                  |            |       | 2   |                 |              |              |            |
| <b>Athletes' Accommodation</b>         |                      |                          |                        |                  |            |       |     |                 |              |              |            |
| Medical Center                         | 1                    |                          | 1                      | 1                | 1          | 2     |     |                 | 1            | 2            | several    |
| LOC Physio Room                        |                      |                          |                        |                  |            |       |     | 8               |              | 1            |            |
| <b>VIP Hotel</b>                       |                      |                          |                        |                  |            |       |     |                 |              |              |            |
| First Aid Station                      | 1<br>(on call)       |                          |                        |                  |            | 1     |     |                 |              |              |            |

Note: numbers and suggested coverage locations can vary based on weather conditions and course route (point to point or a loop course). \*Please refer to paragraphs 8 and following of the chapter on out Stadium events

# Recommended medical equipment and supply for World Athletics Cross Country Championships

|                                |  | AED | Ambulance | Cold water Immersion | Crutches | Diag Echo | ECG monitor | Ice maker | IV Drip kits* | Oxygen | Oxygen saturation monitor | Stretcher | WBGT | Wheelchair |
|--------------------------------|--|-----|-----------|----------------------|----------|-----------|-------------|-----------|---------------|--------|---------------------------|-----------|------|------------|
| <b>Start and Finish</b>        |  |     |           |                      |          |           |             |           |               |        |                           |           |      |            |
| Main Medical Center            | Ample space. Should be able to accommodate and treat between 1 and 5 % of the number of athletes competing | 1   | 2         | 3                    | 2 pairs  |           | 1           | 1         | 10            | 3      | 1                         | 2         |      | 2          |
| Finish Line                    |  | 1   |           |                      |          |           |             |           |               |        |                           | 6         | 1    | 4          |
| Post event recovery room       |  |     |           |                      |          |           |             |           |               |        |                           | 2         |      | 2          |
| <b>On the course</b>           |  |     |           |                      |          |           |             |           |               |        |                           |           |      |            |
| First aid stations             |  | 1   |           |                      |          |           |             |           |               | 1      | 1                         | 1         |      |            |
| <b>Athletes' Accommodation</b> |  |     |           |                      |          |           |             |           |               |        |                           |           |      |            |
| Medical Center                 | 2 beds   | 1   |           |                      | 2 pairs  | 1         | 1           | 1         | 6             | 1      | 1                         |           |      |            |
| LOC Physio Room                | 5 boxes  |     |           |                      |          |           |             |           |               |        |                           |           |      |            |
| Team Physio Room               | 10 boxes   |     |           |                      |          |           |             |           |               |        |                           |           |      |            |
| <b>VIP Hotel</b>               |  |     |           |                      |          |           |             |           |               |        |                           |           |      |            |
| First Aid Station              |  | 1   |           |                      |          |           | 1           |           |               | 1      | 1                         |           |      | 1          |

# Appendix C

## Recommended medication and medical supplies for WAS events

### 1. Anti-infective agents

Anti-bacterials-oral and systemic Anti-fungal-oral, vaginal and topical Anti-viral-oral and topical

### 2. Anti-histamines (local, nasal, ophthalmic and systemic)

Cetirizine Loratadine

### 3. Central Nervous System Agents

Analgesics, Anti-pyretic (Acetaminophen, Salicylates, Morphine and/or similar for emergencies)

Anxiolytics, Sedative, Hypnotics (Diazepam, flurazepam, lorazepam, midazolam etc.)

Anticonvulsants

Naloxone

Myorelaxants

### 4. Non-steroidal anti-inflammatories (NSAID's) local and systemic

Ibuprofen Declofenac Piroxicam Ketorolac

### 5. Electrolyte and Fluid Balance

Calcium gluconate Sodium Chloride 0.9% in Water Sodium Bicarbonate injection

Glucose (dextrose) water solution 5-10-20-33%

## 6. Eye, Ear, Nose and Throat Preparations

Anti-bacterial Ophthalmic solution and/or ointment Optic solution

Anti-inflammatory Ophthalmic solution and/or ointment; Nasal aerosol

Vasoconstrictor Oxymetazoline or naphazoline (local solutions or nasal spray)

Expectorant/Anti-tussive Dextromethorphan, Levodropropizine, etc. Acetylcysteine, carbocysteine, etc.

## 7. Gastro-intestinal

Antacids Anti-diarrheic Antispastics Antiemetics Stool softeners Histamine (H2) antagonist and/or proton pump inhibitors (PPI)

## 8. Hormones and Synthetic Substitutes

Glucocorticosteroids (see 10.c) oral, local and systemic Beclomethasone, Budesonide, Fluticasone Methylprednisolone Betametason, Dexamethasone Hydrocortisone, Fludrocortisone

Oral contraceptives

## 9. Local Anesthetics

Lidocaine, xylocaine, carbocaine, mepivacaine, procaine, etc.

## 10. Skin and mucous membranes

### 11. Cardiovascular system (emergency)

Nitrates (oral and/or systemic)

Diuretics (furosemide)

Heparin, enoxaparin etc.

Beta-blockers (atenolol)

# Medical supplies and equipment

## Tape

- 4cm
- 2.5 cm
- 2.5 cm elastic tape 5 cm elastic tape
- 7.5 cm elastic tape Under wrap

## Suture Supplies

- Suture sets w/tape envelopes Disposable suture sets 3-0, 4-0, 5-0, 6-0 polypropylene sutures 4-0, 5-0, 6-0 vicryl, chromic gut Suture removal sets Sterile gloves Sterile towels Eye drapes Sterile saline Instrument germicide Instrument trays Alcohol preps Iodine preps 60mm & 30mm Steri-strips Xylocaine 1% with epinephrine

## Pharmaceutical Supplies

- Assorted prescription and non-prescription medications needed by physicians.

## Record Keeping

- Pharmaceutical record forms Medical Encounter form Treatment forms Referral forms Insurance forms Prescription pads Anti-doping Prohibited Substances and Methods List "Safe" Substances List Drug information booklets Prescription/non-prescription clipboards Pens/pencils/markers/highlighters Tape – packing/mending Stapler File folders Post-it notes Note pads Legal pads

## Chemicals

- Skin lubes Analgesic lotion Athletic liniment Massage lotion/oil Tape adherent Powder Ammonia Inhalants Isopropyl Alcohol Tape Remover

## Syringes/Needles/others

- TB syringes w/needles 3 ml syringes w/needles
- 5 ml syringes w/o needles 20 ml syringes w/o needles Needles, assorted gauges Tourniquets Needles 18G, 20G and 23G

## Diagnostic Instruments

- Electrocardiograph Oximeter Oto/ophthalmoscopes, Stethoscopes, Sphygmomanometers Reflex hammers, Neurological pinwheels Tuning forks Nasal specula, ear syringes, ear currettes Vaginal specula Electronic thermometers, w/probe covers rectal thermometers; or Tympanic membrane; Thermometers lab supplies

## Treatment Modalities

- Cardiac and respiratory monitor Cardiac defibrillator and resuscitation equipment Whirlpool (Laryngoscopes, endotracheal tubes, various adult sizes) For physio areas:
- Ultrasound

- Laser therapy
- Electrical stimulation
- TENS units
- Electrophoresis units w/electrodes
- Pressure unit w/sleeves

### **Miscellaneous**

- Felt padding Rolls 125 mm vinyl foam
- Rolls 30 mm adhesive foam
- 7.5 cm x 7.5 cm adaptic dressings Large dermicel pads XL band-aids ointment tins Iodine solution Moleskin Topper sponges Cotton swabs Cotton balls Plastic bags Prep razors KY jelly Eye-aid eye wash aspirin Pill envelopes Assorted foam 60 mm adhesive foam Steripads
- 7.5 cm x 20 cm adaptic dressings
- 2.5 cm band-aids bacitracin ointment Iodine scrub Hydrogen peroxide packages 2nd skin Basins emesis Basins portable Tongue blades Back plasters #15 sunscreen Scalpel, #11 & #15
- Exam gloves Flexible collodion Paper towels 150 ml paper cups 300 ml paper cups Electrolyte drink
- Non-Expendable Items
- w/cases air splints Spine boards/scoop stretchers 15-litre coolers 30-litre coolers 1-litre squeeze bottles Universal knee mobilisers Air-cast standard ankle brace, right Air-cast standard ankle brace, left
- Air-cast training ankle brace, right Air-cast training ankle brace, left Heel cups, padded/non-padded Felt podiatry supplies Tape cutters
- 7.5 cm elastic wraps 10 cm elastic wraps 15 cm elastic wraps Crutches (various sizes) Cervical collars (s, m, l, xl) Clavicle and Gilchrist straps (s, m, l, xl) Triangular bandages Thigh elastics (s, m, l, xl) Double length 10 cm elastic wraps Double length 15 cm elastic wraps





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6-8, Quai Antoine 1er, BP 359  
MC 98007 Monaco Cedex