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Athletes exposed to cold, wet environmental conditions for a long period of time are susceptible to hypothermia. This brief article is written in an "ask the expert" format per request of the journal editor. This article outlines the signs of hypothermia, recommended first aid, predisposing factors, and preventative measures that can be taken.

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Q: What should athletes know about low body temperature (hypothermia)?

A: Although the majority of accidental hypothermia cases occur during winter activities, it is an important consideration during the fall and spring months as well, for athletes exposed to cold, wet environmental conditions for long periods of time (triathletes, swimmers, rowers, divers, hikers, endurance cyclists, marathon runners). As you know, human core body temperature (T) exhibits controlled fluctuations around 98.6°F during daily activities. Victims of mild hypothermia (T of 90-94°F) exhibit these signs: low skin blood flow (ashen skin color), altered mental state (dazed appearance, slurred speech, confusion), and altered muscular coordination (stumbling, inability to fasten a zipper). Severe hypothermia (T below 90°F) involves progressive loss of consciousness, stiffening of muscles, a large decrease in heart rate, and respiration slowing to 3-4 breaths per minute. If T falls below 80°F, the victim will be cold to the touch and will lapse into a state of shock, with heart rate dropping to 5-10 beats per minute. This is a life-threatening situation.

The following steps may be taken to prevent hypothermia in athletes: (1) select clothing which allows sweat to evaporate, keeping the skin dry, yet protects the skin from wind chill and

rain or snow; (2) plan the duration of outdoor exposure by considering wind speed, air temperature and precipitation; (3) instruct athletes in the use of a wind chill chart; and (4) avoid water immersion because the body cools more than 30 times faster in water than in air. Factors which predispose an athlete to hypothermia include: dehydration, exhaustion, alcohol/drug abuse, and illness (e.g. diabetes, insufficient thyroid gland function).

The period following exercise is crucial in the development of hypothermia, because internal metabolic heat production stops but the body continues to lose heat rapidly. If you encounter an athlete who is hypothermic, the following steps may be taken: (1) shelter him/her from the wind and remove wet clothing; (2) rewarm the body slowly by covering the victim with blankets and adding external heat (e.g. hot water bottle at approximately 120°F; not vehicle exhaust); (3) handle him/her gently because a cold heart is very susceptible to abnormal rhythms (e.g. ventricular fibrillation); and (4) have the victim evaluated by a physician. Do not: (1) begin CPR unless you are certain that no pulse exists (because of the sensitivity of a cold heart to vigorous manipulation); (2) allow him/her to move, walk, or run, because cold blood in the arms and legs will move to the core and will decrease T further; (3) give alcohol to drink because alcohol increases skin blood flow (dilates vessels) and heat

loss. Administering warm fluids by mouth is controversial due to the possibility of stimulating abnormal heart rhythms.

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