Notes on pre-game meal, importance of measuring heart rate, importance of measuring blood pressure, second wind, and mountain sickness

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Pre-game meal

Pre-game meal help to supply our body with a significant amount of energy an athlete will need for an event. However, it will not supply all the energy needed. Instead, we should eat the right types of food for several days prior to any event in order to charge the muscles with plenty of glycogen, the energy source the muscles use during most sporting activities. The pre-game meal helps to stabilize blood sugar levels, hydrate the body, prevent gastrointestinal upset and avoid hunger during the event.

Timing the Meal: It is important to allow enough time for digestion prior to the event. The meal should be eaten at least three hours prior to the athletic event. Although the timing is important, it is also important to eat the right combination of types of foods to ensure that the stomach is empty and there is no excess gas or gastrointestinal upset.

Components of Pre-game meal:

Complex Carbohydrates: Starches and other complex carbohydrates are an important piece of a pre-game meal plan because they breakdown and are digested at a rate that provides energy faster than proteins or fats.

Water: Although not a true food, any pre-game meal plan must include adequate hydration with plain water. During an event athletes should replace fluid with chilled liquid during frequent intervals. Chilled fluids are absorbed more readily and help to reduce core temperatures.

Importance of measuring heart rate

Resting Heart Rate is a measure of how fast the heart beats per minute (bpm) while standing, sitting, or lying down — but not sleeping — and best measured first thing in the morning. The average adult will have a RHR between 60-100 beats per minute, while athletes are likely to rest somewhere between 40-60 bpm. (And the lower, the better, as RHR indicates the health of the heart leading to overall longevity, lower risk of heart attack, higher energy levels, metabolic efficiency, and athletic endurance.)

An optimal exercise prescription is a balance between the frequency, intensity, duration, and mode of exercise. Heart rate is a useful indicator of the intensity of effort and body's physiological adaptation. Heart rate monitoring is an important component especially in cardiovascular fitness assessment and training programmes.

In order to gain the most from a workout it is essential to try to maintain the target heart rate. The target heart rate is the number of heart beats per minute we should achieve while exercising. Each person's target heart rate helps to determine their fitness level and by keeping their target heart rate in check, a person is able to avoid under or over training, both of which severely effects the quality of the work out.

Resting Heart Rate is a strong indicator of overall health and fitness

For decades, athletes and trainers have obsessively tracked Resting Heart Rate (RHR) as an indicator of athletic performance, but a low RHR is an important vital sign which indicates overall good health.

Importance of measuring blood pressure

Blood pressure is important because higher is the blood pressure, the higher will be the risk of health problems in the future.

If blood pressure is high, it is putting extra strain on arteries and on heart. Over time, this strain can cause the arteries to become thicker and less flexible, or to become weaker. If the arteries become thicker and less flexible, they will become more narrow, making them more likely to become clogged up. If an artery becomes completely clogged up, this can lead to a heart attack, kidney disease or dementia. More rarely, if an artery has become weakened, the extra strain may eventually lead to the artery bursting.

Second wind

Second wind is a phenomenon in distance running, such as marathons or road running (as well as other sports), whereby an athlete who is too out of breath and tired to continue suddenly finds the strength to press on at top performance with less exertion.

Some scientists believe the second wind to be a result of the body finding the proper balance of oxygen to counteract the buildup of lactic acid in the muscles. Others claim second winds are due to endorphin production.

Heavy breathing during exercise is also to provide cooling for the body. After some time the veins and capillaries dilate and cooling takes place more through the skin, so less heavy breathing is needed. The increase in the temperature of the skin can be felt at the same time as the "second wind" takes place.

Metabolic switching

When non-aerobic glycogen metabolism is insufficient to meet energy demands, physiologic mechanisms utilize alternative sources of energy such as fatty acids and proteins via aerobic

respiration. Second-wind phenomena in metabolic disorders are attributed to this metabolic switch and the same or a similar phenomenon may occur in healthy individuals.

Mountain sickness

Mountain sickness is a pathological effect of high altitude on humans, caused by acute exposure to low partial pressure of oxygen at high altitude.

Although minor symptoms such as breathlessness may occur at altitudes of 1,500 metres (5,000 ft), mountain sickness commonly occurs above 2,400 metres (8,000 ft). It presents as a collection of nonspecific symptoms, acquired at high altitude or in low air pressure, resembling a case of "flu, carbon monoxide poisoning, or a hangover".

Acute mountain sickness can progress to high altitude pulmonary edema (HAPE) or high altitude cerebral edema (HACE), both of which are potentially fatal, and can only be cured by immediate descent to lower altitude or oxygen administration.

Signs and symptoms

People have different susceptibilities to altitude sickness; for some otherwise healthy people, acute altitude sickness can begin to appear at around 2,000 metres (6,600 ft) above sea level. This is the most frequent type of altitude sickness encountered. Symptoms often manifest themselves six to ten hours after ascent and generally subside in one to two days, but they occasionally develop into the more serious conditions. Symptoms include headache, fatigue, stomach illness, dizziness, and sleep disturbance. Exertion aggravates the symptoms.

Primary symptoms

Headache is the primary symptom used to diagnose altitude sickness. A headache occurring at an altitude above 2,400 metres (7,900 ft) – a pressure of 76 kilopascals (0.75 atm) – combined with any one or more of the following symptoms, may indicate altitude sickness:

Gastrointestinal disorder:	Loss of appetite, nausea, or vomiting, excessive flatulation[8]
Nervous system disorder:	Fatigue or weakness, headache with or without dizziness or lightheadedness, insomnia
Locomotory system disorder:	Peripheral edema (swelling of hands, feet, and face)
Respiratory system disorder:	Nose bleeding, shortness of breath upon exertion
Cardiovascular system disorder:	Persistent rapid pulse
Others:	Pins and needles, general malaise

Severe symptoms
Symptoms that may indicate life-threatening altitude sickness include:

- Pulmonary edema (fluid in the lungs)

Symptoms similar to bronchitis, Persistent dry cough, Feve, Shortness of breath even when resting

- Cerebral edema (swelling of the brain)

Headache that does not respond to analgesics, Unsteady gait, Gradual loss of consciousness, Increased nausea and vomiting, Retinal hemorrhage

- The most serious symptoms of altitude sickness arise from edema. At very high altitude, humans can get either high altitude pulmonary edema (HAPE), or high altitude cerebral edema (HACE).

Prevention
Ascending slowly is the best way to avoid altitude sickness. Avoiding strenuous activity such as skiing, hiking, etc. in the first 24 hours at high altitude reduces the symptoms of mountain sickness. Alcohol and sleeping pills are respiratory depressants, and thus slow down the acclimatization process and should be avoided.

Treatment

The only reliable treatment and, in many cases the only option available, is to descend. Attempts to treat or stabilize the patient *in situ* (at altitude) are dangerous unless highly controlled and with good medical facilities. However, the following treatments have been used when the patient's location and circumstances permit:

- Oxygen may be used for mild to moderate AMS below 3,700 metres (12,000 ft) and is commonly provided by physicians at mountain resorts. Symptoms abate in 12 to 36 hours without the need to descend.
- For more serious cases of AMS, or where rapid descent is impractical, a Gamow bag, a portable plastic hyperbaric chamber inflated with a foot pump, can be used to reduce the effective altitude by as much as 1,500 m (5,000 ft). A Gamow bag is generally used only as an aid to evacuate severe AMS patients, not to treat them at altitude.
- Acetazolamide 250 mg twice daily dosing assists in AMS treatment by quickening altitude acclimatization.[29] A study by the Denali Medical Research Project concluded: "In established cases of acute mountain sickness, treatment with acetazolamide relieves symptoms, improves arterial oxygenation, and prevents further impairment of pulmonary gas exchange."[30]
- The folk remedy for altitude sickness in Ecuador, Peru and Bolivia is a tea made from the coca plant. See mate de coca.
- Steroids can be used to treat the symptoms of pulmonary or cerebral edema, but do not treat the underlying AMS.
- Two studies in 2012 showed that Ibuprofen 600 milligrams three times daily was effective at decreasing the severity