

Hypothermia and frostbite: what to do and how we can prevent and treat such conditions

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Cold weather, as we all know, can lead to very serious consequences. **Hypothermia and frostbite** are conditions that must be treated with professionalism and competence.

The Varese's Circolo Hospital is one of the **regional reference centres** for the treatment of accidental hypothermic patients.

It was established four years ago and is directed by **Dr. Luigi Festi** in collaboration with **Prof. Cesare Beghi**, Director of Cardiac Surgery Department.

Dr. Festi is a surgeon who, over the years, has become a specialist in **Mountain Medicine** and is also the creator and Director of Education of the International Master in Mountain Medicine at the University of Insubria and President of the Central Medical Commission of the Italian Alpine Club.

WHAT IS HYPOTHERMIA?

“In these days we all cover ourselves and seek shelter from the cold weather in a warm environment, explains the director of the centre. During a walk in the mountains, but also in our cities, in conditions of degradation or poverty, it may be that there are not the means **to warm up properly: in these cases, hypothermia appears**, which is the inability to counteract a generalized drop in body temperature.

Our bodies response is through the physiological **processes of adaptation, the best known of which is shivering**. When the cold is localized to a specific part of the human body, such as hands, feet, face, it is called **frostbite**.

Precisely, a state of hypothermia is reached when **the body temperature, which is normally at 37 degrees, drops below 35 degrees**. This phenomenon is obviously exacerbated by environmental conditions, insufficient protection with adequate clothing, the presence of wind, conditions of malnutrition, disease, the presence of humidity, the consumption of alcohol or drugs.

“Hypothermia is often underestimated: just think that it can occur in certain conditions, at night or in the presence of extreme weather events and **even in summer**” adds Festi. To assess the extent of hypothermia we use a table, that identifies **4 stages of hypothermia**, drawn up 20 years ago by the Swiss Doctor Bruno Durrer.

HOW TO PREVENT HYPOTHERMIA

Dr. Festi points out that the first measure to avoid the onset of hypothermia, which at grade **3 and 4 of the classification can be fatal**, is to be in good health and adequately equipped when in cold environments.

“The modern materials that characterize the clothing dedicated to the mountain, now allow a so-called **onion dressing**, composed of several layers: **a few layers are needed to breathe during physical activity**, so that sweat does not stagnate on the skin, increasing the danger of hypothermia when you stop. Instead, **several layers are needed when you stop** and during rest, since the presence of air between layers act as an insulator, helping to maintain physiological body temperature.

“It is also important to **avoid** as much as possible **exposure to wind and to water and the consumption of alcohol and drugs** that cause peripheral vasodilatation, which increases the dispersion of heat. Instead, **it is useful to move to produce heat**, massage the parts at risk, such as hands and feet, and if possible, **consume high-calorie foods** and drink hot beverages.”

However, above all, we must avoid being surprised by sudden changes in environmental conditions without adequate equipment.

“To avoid hypothermia, it is essential to think about it. Because **hypothermia is a subtle state** that creeps in slowly and often, we are unaware of it. The symptoms are in fact quite common, **from shivers, progressing to a state of unconsciousness**. On the contrary, with the worsening of the situation, hypothermia leads to a **state of euphoria and semi-unconsciousness**.”

HOW TO MANAGE HYPOTHERMIA

Here you can find a list of the procedures that can be undertaken in the earliest stages and that are within everyone's ability:

Stage 1: the patient is conscious, but feels shivers and hypothermia is probably related to the environmental conditions. It is necessary to protect him/her from further cooling by taking them as soon as possible to a shelter away from the wind and cold. It is also necessary to give them hot and hyperglycemic beverages and replace wet clothing with dry ones.

Stage 2: the patient does not shiver anymore, and his/her state of consciousness worsens: they appear sleepy, and are in an environmental condition that suggest hypothermia. It is necessary to protect the person from further cooling, **and place thermal bags on the torso. You need to move the person with extreme caution in order to avoid cardiac arrest** from the recovery position (which happens when the active or passive movement of the body causes the mixing of cold blood at the periphery of

the body, which can make warm blood reach the heart and that can cause a cardiac arrest). If the patient is conscious, give warm beverages. Call for paramedics.

In the third and fourth stages of hypothermia, which is when the internal body temperature **drops below 32 degrees, the presence of medical personnel is required.**

In this situation, the patient **may seem lifeless**. In reality, **gradual cooling tends to protect the vital organs**, and therefore, in most cases resuscitation and warming are possible.

“Numerous cases of apparent death have coined the famous phrase: **the hypothermia patient is not dead until he or she is warmed up.**

It has been documented the ability to survive with a body temperature as low as 14 degrees . In the most serious cases, even with vital signs apparently absent but with haematochemical tests still normal, it is necessary and proper to heat the patient with all available aids and in cases where the internal temperature falls below 28 °C, take the patient to a facility, where they can provide extracorporeal circulation which is even easier to use with the new minimally invasive methods with which our hospital is equipped.

The role of the heart surgeon and the perfusionist becomes essential and the therapy gets agreed with the Director of the Centre and the Heart surgeon, by prioritizing patients with serious trauma or asphyxiation, or the situations that make resuscitation and warming up unsafe.

di Translated by Eliana Poillucci (Reviewed by Prof. Robert Clarke)