

## Bubble wrap – a Norwegian solution to prevent hypothermia and cold-related stress

CONFERENCE POSTER NORWAY

Anders Eid and Trond Vigerust of Norsk Luftambulans, and Ullevål University Hospital's Liv Berit Stenseth and Terje Strand present their experiences of using bubble wrap as a quick and effective method to insulate patients in cold environments

### Objectives

Hypothermia is known to increase mortality in trauma patients, and for most patients cold-related stress is a negative factor. The method used to prevent this in the EMS setting needs to be easy to use and rapid to apply.

### Methods

This paper describes our simple method to prevent hypothermia and cold-related stress, which has been in use on our HEMS base since January 2006.

We started to use thermal bags and hoods made of plastic bubble wrap preformed for adults, but easily cut to fit children. This material is constructed in a way that prevents evaporation, is windproof and insulates the body. This makes it capable of preventing all types of heat loss (evaporation, conduction, convection and radiation). The efficiency of this material was also proven in a small study previously made by one of the authors.

Between 40 and 50 per cent of total heat loss in patients with normal clothing may come from the head and neck. The hood is easy to apply even when the patient is trapped on scene and is therefore the first priority in preventing heat loss. After rapid extrication, often on a backboard, the patient is wrapped in the bag straight onto the stretcher.

As the bubble wrap is transparent, monitoring of



external bleeding is possible. Access to intravenous lines is easily made by cutting a small hole in the bubble wrap.

### Results

In total, bubble wrapping have been used in approximately 100 cases. We find this method easy and rapid to use in a challenging environment where patients are easily exposed to cold. Retrospectively, we have compared scene times in 2005 and 2007 (mean 16 min in 2005, 15 min in 2007) and found no increase. When patients are awake, we also note less shivering and more comfortable patients.

### Conclusion

Bubble wrap for preventing hypothermia and cold-related stress is easy to use, rapid to apply and can be used without increasing on-scene time.



Heat signature of two persons after 30 minutes in cold air (4°C). The person to the left suffers from cold-related stress and compensates with decreased perfusion of the skin. The person to the right has been wrapped in bubble wrap during the same period and has a normal skin circulation.

Norsk Luftambulans

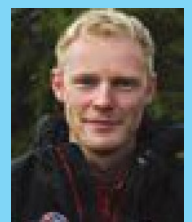
**Liv Berit Stenseth** is a consultant anaesthesiologist with ten years' HEMS experience and is a medical leader in the fixed-wing air ambulance service in southern Norway. She is involved in the NORSAR project, an immediate response unit developed to extract and treat victims from collapsed buildings in areas struck by earthquakes, and an intensive care team that transports patients under ECMO or NO.

**Terje Strand** is head of the Regional Air Ambulance Department and a consultant anaesthesiologist with more than twenty years' clinical experience in HEMS and fixed-wing air ambulance services. He is involved in the development of emergency medical systems and solutions for transportation of intensive care patients, including ECMO and NO. He has experience of research and organisation of healthcare in disaster areas.

**Trond Vigerust** is a HEMS paramedic with 18 years' clinical HEMS and EMS experience. He has experience of healthcare in disaster areas and is involved in the NORSAR project.



**Anders Eid** is a registered nurse and HEMS paramedic with clinical HEMS experience.



Both Eid and Vigerust are involved in the development of solutions for evacuating patients by rescue rope over sea, land and mountains, and have a special interest in developing techniques that prevent hypothermia in injured and sick patients.

