



**ICAR**

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**International Commission for Alpine Rescue**

**Commission for Mountain Emergency Medicine**

**Recommendation REC M 0007 of the Commission for Mountain  
Emergency Medicine**

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**Immobilization and Use of the Vacuum Mattress in Organized Mountain  
Rescue**

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**Intended for Mountain Rescuers and Mountain Emergency Physicians**

## ***Introduction***

Immobilization of the injured patient or of parts of the body is one of the main aspects in the treatment of victims of mountain accidents. The aim of immobilization is to reduce pain to a minimum and to avoid further damage during transport. Since the beginning of organized mountain rescue, various different materials and methods have been used to immobilize injured victims in various member countries.

### ***The Vacuum mattress as a total body immobilization device***

#### **The increasing use of vacuum mattresses in the case of accidents is due to the following advantages:**

- fixation of the whole axial spine like a plaster cast
- various possibilities of positioning the patient
- reduced transmission of movements
- quick application
- leveling out of underlying surfaces
- insulation from cold
- transparent to x-rays
- hygiene
- no negative influence on circulation
- application easy to learn
- easy to transport

#### **It has the following disadvantages:**

- a relatively large packing volume
- outer cover can be damaged easily; may be made of flammable material
- transport of rescue bag necessary in mountain areas
- (relatively) high costs of acquisition
- the cervical spine and upper extremities cannot be optimally protected.
- The lower extremities cannot be placed in traction.

***The commission feels that the advantages of this piece of equipment outweigh the disadvantages, especially when compared to all the other types of devices, which all have a narrow range of applicability.***

## ***Considerations for Use***

The mattress itself is not sufficient for longitudinal immobilization of the spine. It should be used in conjunction with a stretcher/litter

For optimal immobilization, the cervical spine should be separately protected. A device such as the Kendrick Extrication Device™ (KED) can be used in conjunction with the vacuum mattress.

In case of injury of the extremities, they should be immobilized using appropriate splinting. These devices can be kept in the same kit as the vacuum mattress and will not increase the weight appreciably.

A spine board is acceptable for transport in certain circumstances if its use will be limited to a short duration – no longer than 30 minutes - to avoid compression injuries.

## **Material**

A vacuum mattress should be constructed with nonflammable material. Between the mattress and the patient a linen should be employed. Only a vacuum mattress allows sufficient fixation and positioning. Furthermore, it can be put into the transport rescue bag, on a sled, into the helicopter and on the stretcher. The pump and the tube have to be functional at low temperatures, according to the region where it is employed.

## ***Recommendation***

- For these reasons, the commission for mountain emergency medicine of IKAR/CISA makes the following recommendation regarding the immobilization of the injured patients:
- In general, injured patients in the mountains should be immobilized with a vacuum mattress and not be removed from the mattress until admitted to emergency area of the hospital. The mattress itself is not sufficient for longitudinal immobilization of the spine. It should be used in conjunction with a stretcher/litter.
- For optimal immobilization, the cervical spine should be separately protected.
- In case of injury of the extremities, they should be immobilized using appropriate splinting. These devices can be kept in the same kit as the vacuum mattress and will not increase the weight appreciably.
- Smaller splints without the vacuum mattress should be used in cases of isolated injuries
- A device such as the Kendrick Extrication Device (KED) can be used in conjunction with the vacuum mattress.
- A spine board is acceptable for transport in certain circumstances but duration should be short.