

Limitation in Multi Casualty Incidents

**Cold-Wet-Pain
Treat the basics**

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Mass casualty incidents

A mass casualty incident is defined as an event which generates **more patients** at one time than locally **available resources can manage using routine procedures.**

It requires exceptional emergency arrangements and additional or extraordinary assistance.

It can also be defined as any event resulting in a number of victims large enough to disrupt the normal course of emergency and health care services (WHO 2001).

MCI demands a change from unlimited individual emergency and medical treatment to treatment with limited personal and material resources for a uncertain time slot.

Cabelcar accidents in the mountains caused MCI:

- 1951-1960 3 accidents => 36 fatalities => 7 casualties
- 1961-1970 4 accidents => 23 fatalities => 10 casualties
- 1971-1980 6 accidents => 80 fatalities => 27 casualties
- 1981-1990 6 accidents => 46 fatalities => 23 casualties
- 1990-2000 8 accidents => 49 fatalities => 44 casualties
- 2000 Kaprun 1 cabel care fire => 155 fatalities
- 2000 Grainau 1 cabel care accident => 29 casualties
- 20001-2010 14 accidents => 21 fatalities => 63 casualties

Plain crashes in the mountains caused MCI:

- 1946-1950 2 crashes => 54 fatalities => 12 casualties
- 1951-1960 1 crashes => 8 fatalities
- 1961-1970 1 crash => 117 fatalities
- 1971-1980 1 crash => 29 fatalities => 16 casualties
- 2000-2010 4 crashes => 98 fatalities
- 2011-2014 2 crashes => 92 fatalities

- 1970 France => 39 fatalities
- 1970 Switzerland => 30 fatalities
- 1979 France => 74 fatalities (56 children)
- 1991 Turkey => 200 fatalities
- 1998 France => 11 fatalities
- 1999 Switzerland => 12 fatalities
- 1999 Austria => 38 fatalities
- 2002 Ossetia => 150 fatalities
- 2014 Nepal => 16 fatalities

Lightning caused incident MCI in the mountains:

2003 Grand Teton National Park => 7 casualties

2010 Grand Teton National Park => 17 casualties => 1 fatality

Weather caused MCI in the mountains:

1954 Dachstein => 13 fatalities

2014 Mont Blanc => 5 fatalities

Different kinds of reasons for MCI in the mountains:

- nature hazards (avalanches),
- transport systems (cabelcar, airplanes),
- mass events (sports events, concerts).
- The number of MCI increased in the past.
- Nature hazards caused MCI will increase with climate changes(?)
- New transport systems and new mass events will further increase the number of MCI in remote areas in the future.

Therefore MRS has to be prepared for MCI in the mountains.

Who takes care and who can help first ?

- Bystander and mountain companions
- Ski resort and cable car employees
- Local residents
- Mountain guides
- Organized mountain rescue services
- Ambulance services
- Air rescue services
- Fire brigade and civil defence
- Armed forces

Problems of communication with the different services because of different communication systems and different organizational structures.

Change from

- unlimited individual emergency and medical treatment,
- towards
- treatment with limited personal and material
- resources for a uncertain time slot.

Goal:

**Gratest benefit for the greatest number of
victims**

Triage in MCI in the mountains

START:

Simple Triage and Rapid Treatment

used by first responders (ore **paramedics**)

Goal: efficiently evaluate all victims.

Assessment: 60 seconds

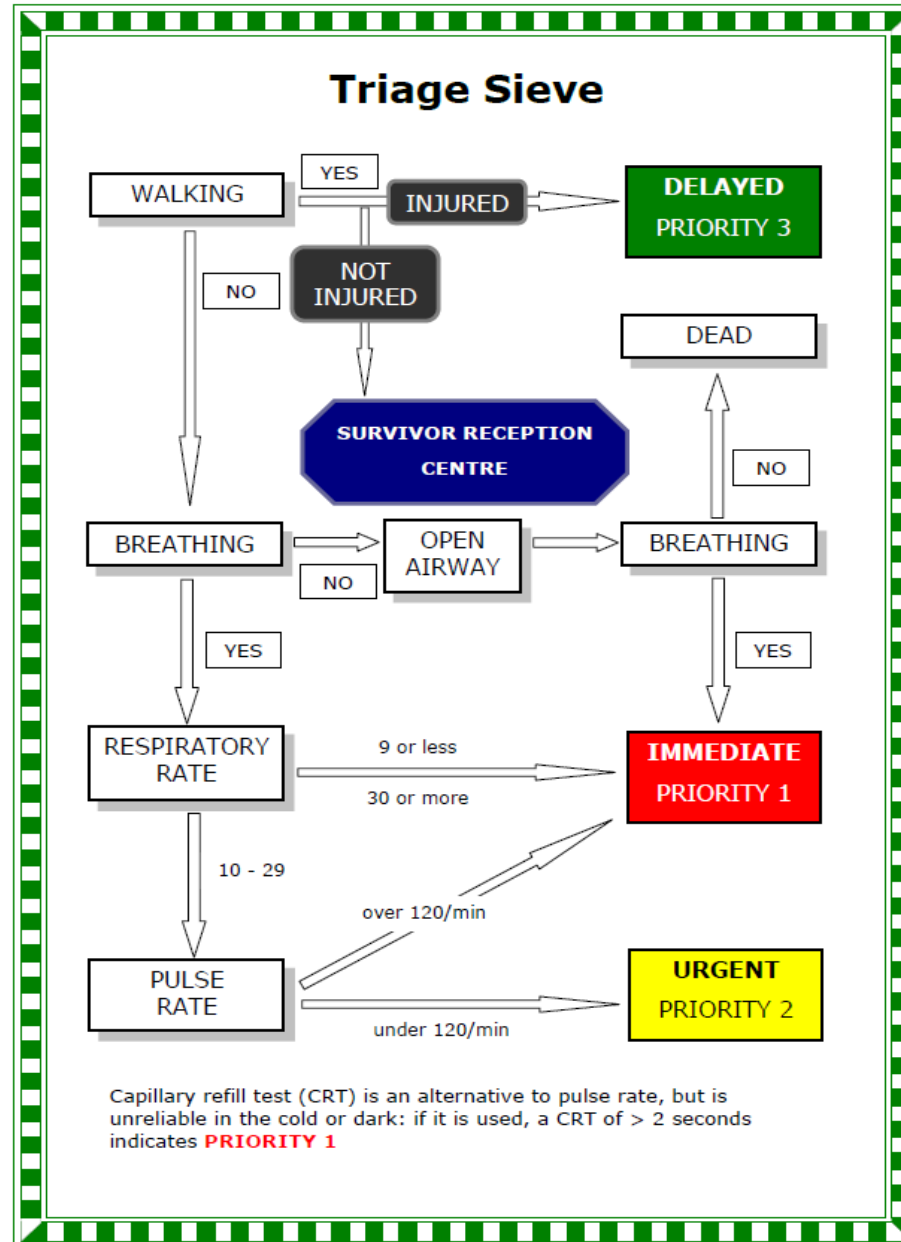
Immediate care / life-threatening

Delayed urgent care / can delay up to one hour

Minor delayed care / can delay up to three hours

Deceased victim is dead / no care required

Triage in MCI in the mountains



Treatment

- Help as many patients as possible.
- Identify and treat potential life-threatening injuries/illnesses
- Treatment according standard protocol
- secondary triage during treatment as possible by resources.
- Stabilize and prepare for transport on a priority basis to hospital(s).

Mass casualty incidents in the mountains

- far, high, cold, hot, wet, dry, late, long and many “
- Difficult to find, to reach, to walk, to help, to explain.
- difficult area, no save area.
- Prolonged activation and evacuation time
- Help as many patients as resources permit.

**Sometimes it is necessary to reduce the treatment to
the basics:**

Treat Cold, Wet and Pain !

Mass casualty incidents in the mountains

Cold-Wet-Pain

Keep warm:

- shivering = hypothermia stage 1
- increases oxygen consumption by 400 %.
- Hypothermia in traumais associated with a significantly increased mortality.

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Keep dry:

- thermal conductivity of water is 240 times greater than still air.
- Wet clothes lose about 90 % of their insulating value.
- Consider wind-chill

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Reduce pain:

- Pain increases the stress response leading to increased oxygen consumption.

Cold-Wet-Pain

- Blood loss (hemorrhagic shock)
- Hypothermia
- Pain

—————> impaired oxygen delivery to tissue

Hypothermia and pain induces stress response

—————> increased oxygen consumption.

—————> Oxygen deficit (Acidosis)

Hypothermic patients have increased bleeding (coagulopathy)

Lethal triade

Hypothermia + oxygen deficit (acidosis) + coagulopathy



Major cause of death in trauma

COLD

SHIVERING = HYPOTHERMIA STAGE 1

- Rescue blankets
- Woolen blankets
- Chemical heatpack or blankets

Reduced hypothermia \longrightarrow reduced oxygen consumption
 \longrightarrow Reduced acidosis

Consider all patients hypothermic in mountainous environment

Reduce Pain:

- recognize, assess and treat pain.
- pain relief can be provided by nonpharmacological methods
- distraction,
- splinting of injuries,
- confidence and reassurance
- If recommended use strong opioids
- Consider N₂O (Entinox), „Mucosal Atomiser Device“ (MAD).

monitoring and documentation.



Zugspitzlauf

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Conclusion

Preventing Hypothermia:

Easy

Rapid

Effective

Reducing Pain

Reduces stress

Does not require heavy equipment

Effective

Can be applied by first responder and rescuers

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