MEDICAL STANDARDS FOR MOUNTAIN RESCUE OPERATIONS USING HELICOPTERS

Official Consensus Recommendations of the International Commission for Mountain Emergency Medicine (ICAR MEDCOM)

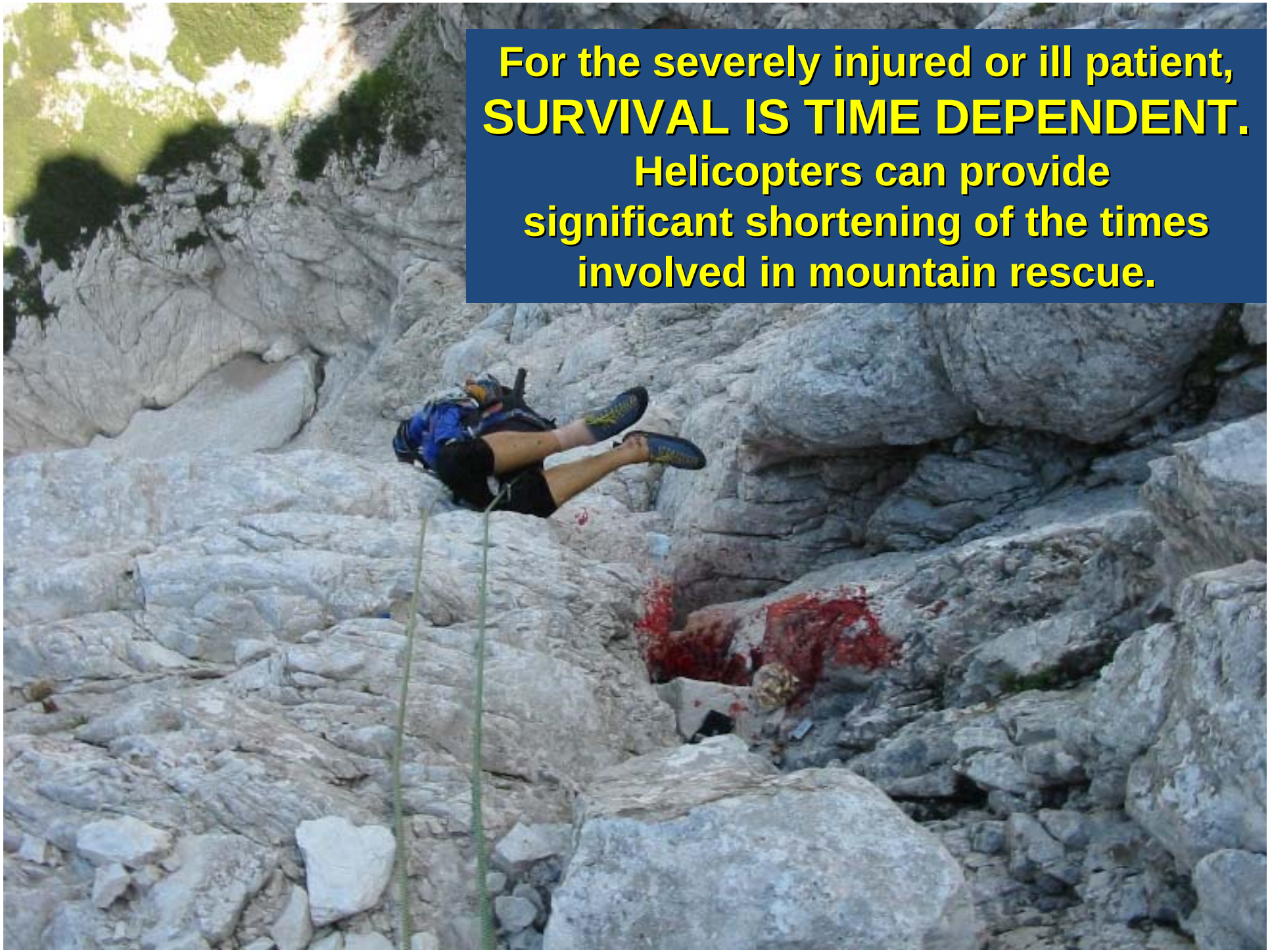
Iztok Tomazin, John Ellerton, Oliver Reisten

ICAR Slovakia 2010

THE PURPOSE OF OUR WORK

To establish medical recommendations for safe and effective Helicopter Emergency Medical System (HEMS) in mountain rescue.

ICAR Slovakia 2010


For the severely injured or ill patient,
SURVIVAL IS TIME DEPENDENT.
Helicopters can provide
significant shortening of the times
involved in mountain rescue.

The north face of Rjavina in Julian Alps: hanging climber with fractured pelvis

SCOOP AND RUN

“STAY AND TREAT”


ALPINA
MAMMUT
“STAY AND TREAT”


“STAY AND TREAT”

THE FUNDAMENTAL PRINCIPLES OF (H)EMS IN MOUNTAINS

- **Safety is most important!**
- **Speed and quality** of HEMS are critical factors in patient's ultimate outcome
- **Cooperation** amongst all involved services
- **Helicopter characteristics** for safe and effective work
- Appropriate, light and portable **medical and rescue equipment**
- Appropriate continuous **training and education** of all involved personnel are of utmost importance.
- **"Golden hour"** (time from the accident to the hospital)

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ORGANIZATION:

- Helicopter with a mountain rescue competent crew should be **dedicated** to HEMS within a region
- Ideally, every medical emergency within the region should be reached in **less than 20 minutes**
- Role of **Medical Director** (quality management, clinical governance, education etc.)
- UIAA-ICAR-ISMM **Mountain Emergency Medicine diploma**
- Safety Officer responsible for a **Safety Management System**
- **Facilities** for rest, pre-mission planning and training
- Appropriate rescue and medical **equipment etc.**

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INTEGRATION AND COOPERATION

- HEMS operating in the mountains should be integrated within the EMS and other emergency systems of the particular area
- Strategies for cooperation across international boundaries are essential.

FINANCE should not compromise safety nor basic principles:

- service is for everyone according to medical and rescue need
- regardless of nationality, insurance or other influences

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DISPATCHING

- Dispatch centers should be contacted by a widely publicized **internationally recognized calling number** (112, 911…)
- **Integrated centers** for all emergency medical and rescue calls are recommended
- Dispatcher should be **aware of specific mountain rescue problems**
- Decision to dispatch HEMS should be between the dispatch center and HEMS team, and **should exclude unnecessary bureaucratic steps**
- The **final decision** to perform the mission remains with the HEMS team
- The **nearest qualified HEMS** team to the site of the mountain accident, regardless of administrative boundaries, should be dispatched

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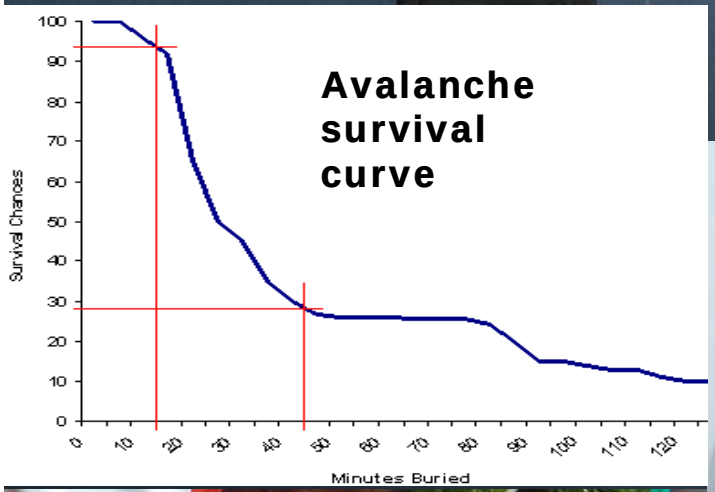
TIME

Survival is time dependant!



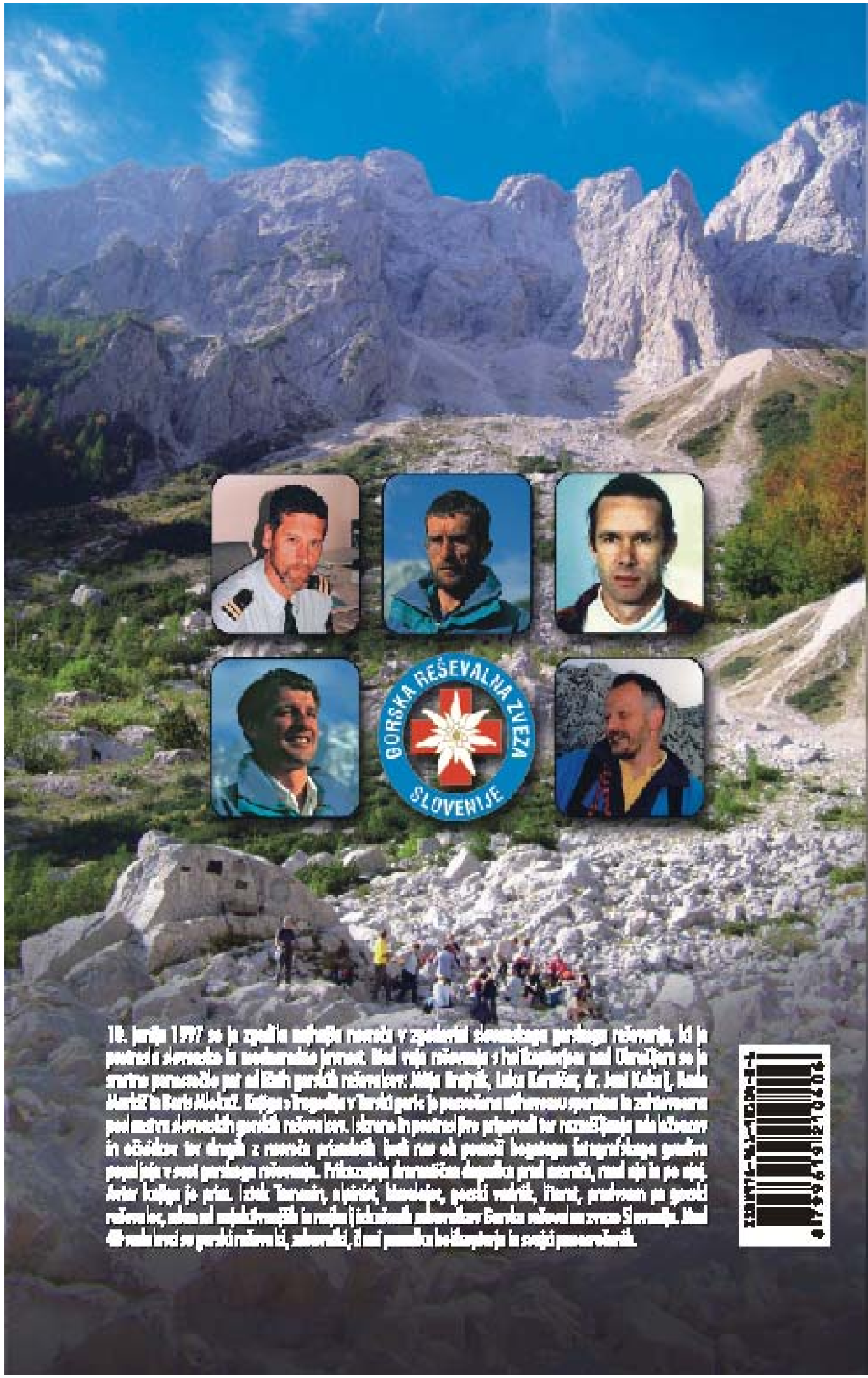
Avalanche survival curve

TIME IS LIFE

TIME – medical perspective

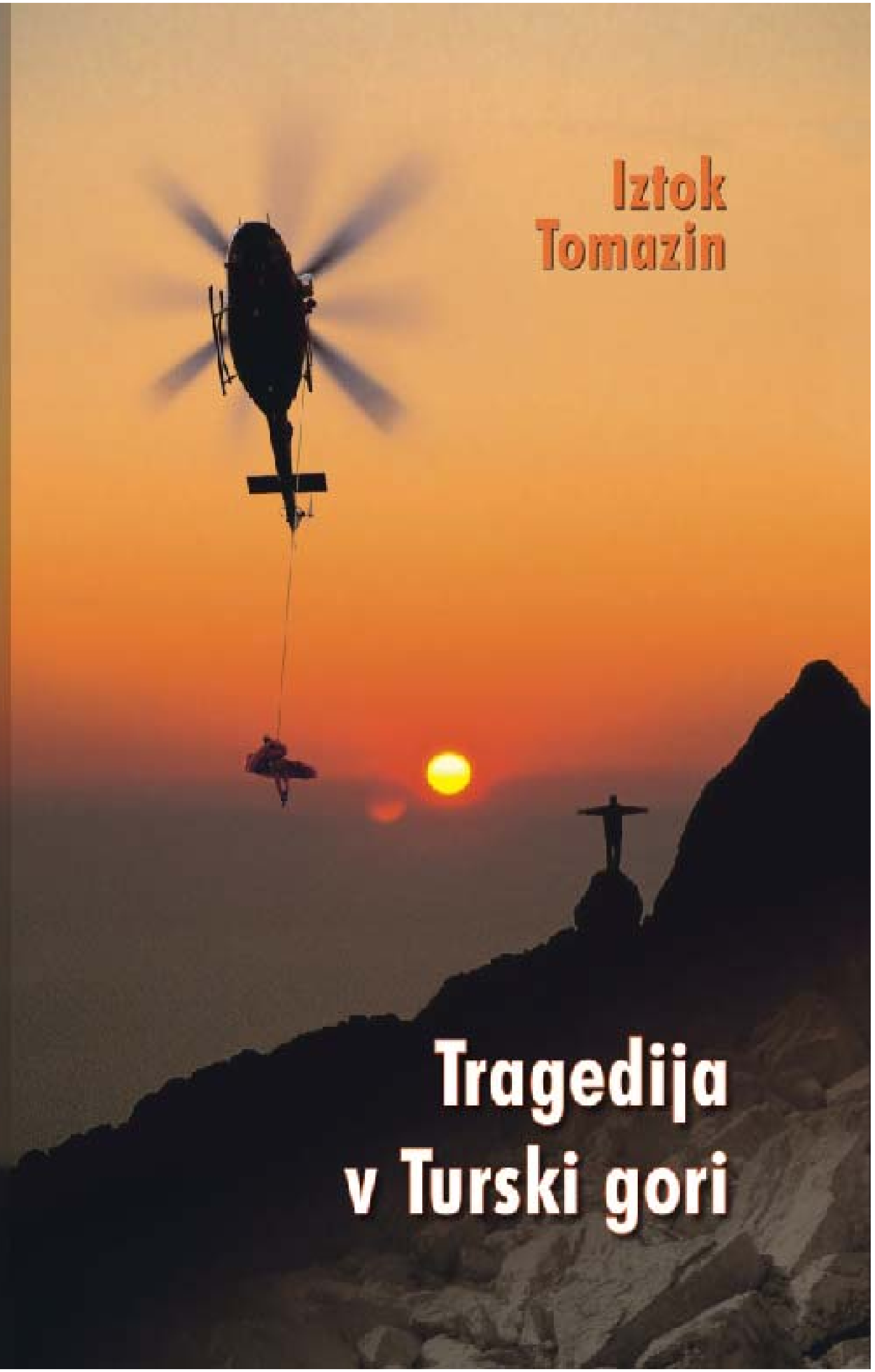
Survival is time dependant!

- HEMS activation time (from emergency call to take off) of < 5 minutes
- approach time (from emergency call to HEMS team reaching the victim) of < 20 minutes
- minimal standard should be **'as fast as feasible without compromising safety‘**
- **Safety supersedes medical considerations at all times!**



19. junija 1997 se je zgodila najhujša nesreča v zgodovini slovenskega gorskega reševanja, ki je pretresla slovensko in mednarodno javnost. Med vajo reševanja s helikopterjem nad Okrešljem so se smrtno ponesrečili pet odličnih gorskih reševalcev: Janko Brajnik, Luka Karničar, dr. Jani Kokalj, Rado Markič in Boris Mlekuž. Knjiga »Tragedija v Turški gori« je posvečena njihovemu spominu in zahvalena pod mostom slovenskih gorskih reševalcev. Skrbno in podrobno pripravil ter razsvetljena mnogih očividcev ter drugih z nesrečo povezanih ljudi ter ob pomoči bogatega fotografskega gradiva popeljala v svet gorskega reševanja. Prikazujejo dramatična dogajanja pred nesrečo, med njo in po njej. Avtor knjige je prim. Iztok Tomazin, alpinist, himalajec, gorski vodnik, fotograf, predvsem pa gorski reševalec, eden od najaktivnejših in najbolj izkušenih zdravnikov Gorske reševalne zveze Slovenije. Med 40 sodelavci so gorski reševalci, zdravniki, člani posadke helikopterja in svojci ponesrečenih.

Iztok Tomazin
Tragedija v Turški gori



Iztok
Tomazin

Tragedija v Turški gori

COMMUNICATION

- **Robust two-way communication** between HEMS crewmembers, dispatching centres, other EMS and the incident site is essential for safety, efficiency and medical outcome
- **personal helmet** with an integrated two-way radio headset allowing communication at all times.
- international recognized **hand signals**

TEAM - QUALIFICATION

- All members, including medical personnel, should be trained and regarded as members of the air crew
- Leadership qualities in their area of expertise
- Training in all aspects of mountain rescue and safety, and cooperation with terrestrial teams is essential
- The operator should ensure medical staff are trained in its safety management system and CRM
- Local knowledge is essential

TEAM - LOCATION

- Ideally all team members are present at the HEMS base ready for immediate activation
- Minimum standard: it may be appropriate, depending on the service, for rescue and medical members to be on call with an appropriate activation time

TEAM - TASKS

- **"Air rescue optimal crew"** concept allows for different persons to perform the tasks required, permitting flexibility in crewing depending on the nature and complexity of the mission, and the carrying capacity of the aircraft .
- Specific criteria and qualifications are recommended for the tasks
- **It is strongly recommended that medical personnel assess a casualty at the site of the accident** except when the terrain is extremely dangerous and beyond the competence of the medical crewmember

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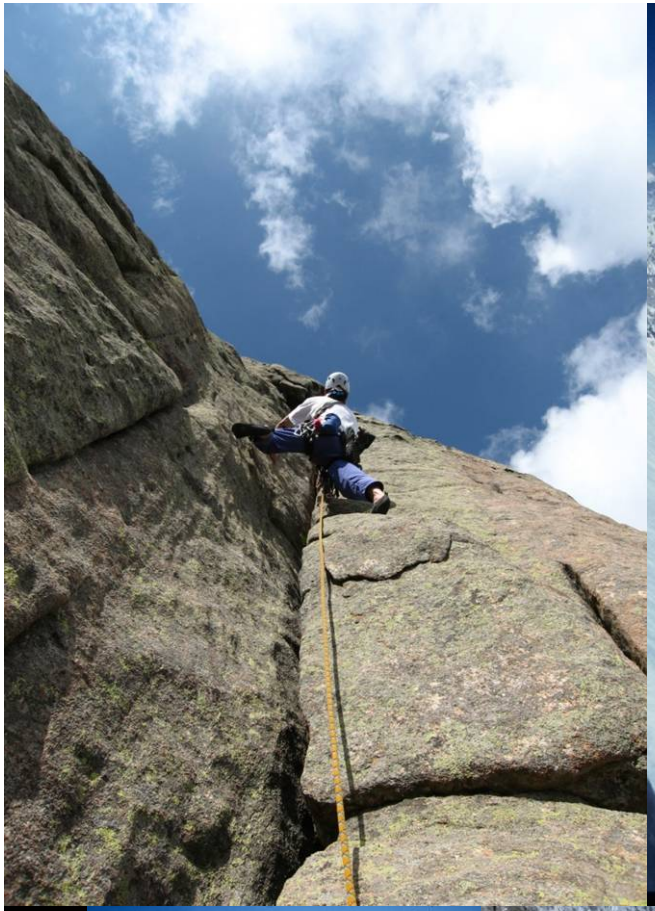
'AIR RESCUE OPTIMAL CREW MEMBER' CONCEPT

MEDICAL PERSPECTIVE

Task	Crewmember	Qualifications
MEDICAL	Doctor, Advanced Life Support (ALS) paramedics, EMT or nurse. Ideally a BLS-trained EMT, nurse or paramedic should assist the ALS-trained member.	According to relevant regulations and ICAR MEDCOM recommendation no. 3. This includes the ability to perform mountain and mountain rescue techniques as well as appreciate mountain safety. A higher qualification in Mountain Emergency Medicine should be aspired to (MEM diploma).
RESCUE	Mountain rescue (MR) specialist or mountain guide trained in MR. A minimum of BLS-level first aid but preferably higher training should be required.	A high level of experience, knowledge and proficiency in mountaineering and mountain rescue techniques.
SPECIAL TASKS Appropriate activation times should be predefined	Medical specialty personnel…	Regular education and training in helicopter safety and rescue.

Medical personnel (doctor) to the site of the accident !







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QUALIFICATION FOR EMERGENCY DOCTORS IN MOUNTAIN HELICOPTER RESCUE

- Physical and mental fitness
- Trained mountaineer
- Comfortable in exposed situations
- Well trained in mountain helicopter rescue
- Able to work under extreme conditions
- Experienced emergency doctor
- Familiar with mountain medicine

HELICOPTER – MEDICAL PERSPECTIVE

The helicopter must be able to:

- bring the HEMS team to the incident site with all necessary rescue and medical equipment
- pick up the casualty and HEMS crewmember(s) from the incident site
- provide adequate space and equipment for performing medical treatment and monitoring on board

From the medical point of view, helicopter is only flying ambulance vehicle


696


ELILARIO
ITALIA
I-MAGM


REGA


Bell
Helicopter
429
BULANCE


AgustaWestland
A Finmeccanica Company
I-CESR


D-HEOY
NUJNA MEDICINSKA POMOČ


D-HMBM

1. Bring HEMS team to the incident site with all necessary rescue and medical equipment

2. Pick up the casualty and HEMS crewmember(s) from the incident site

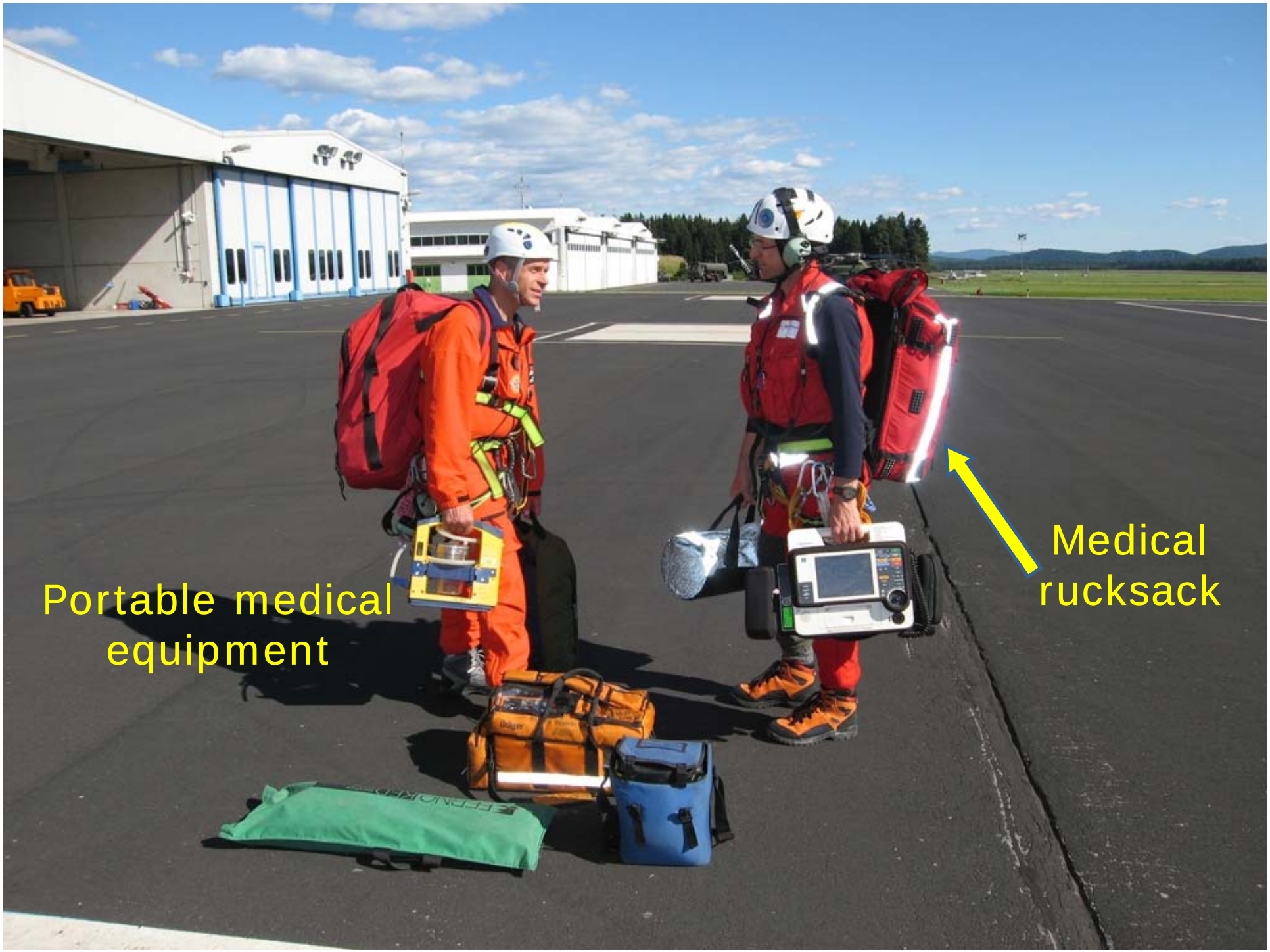
2. Pick up the casualty and HEMS crewmember(s) from the incident site

3. Provide adequate space and equipment for performing medical treatment and monitoring on board

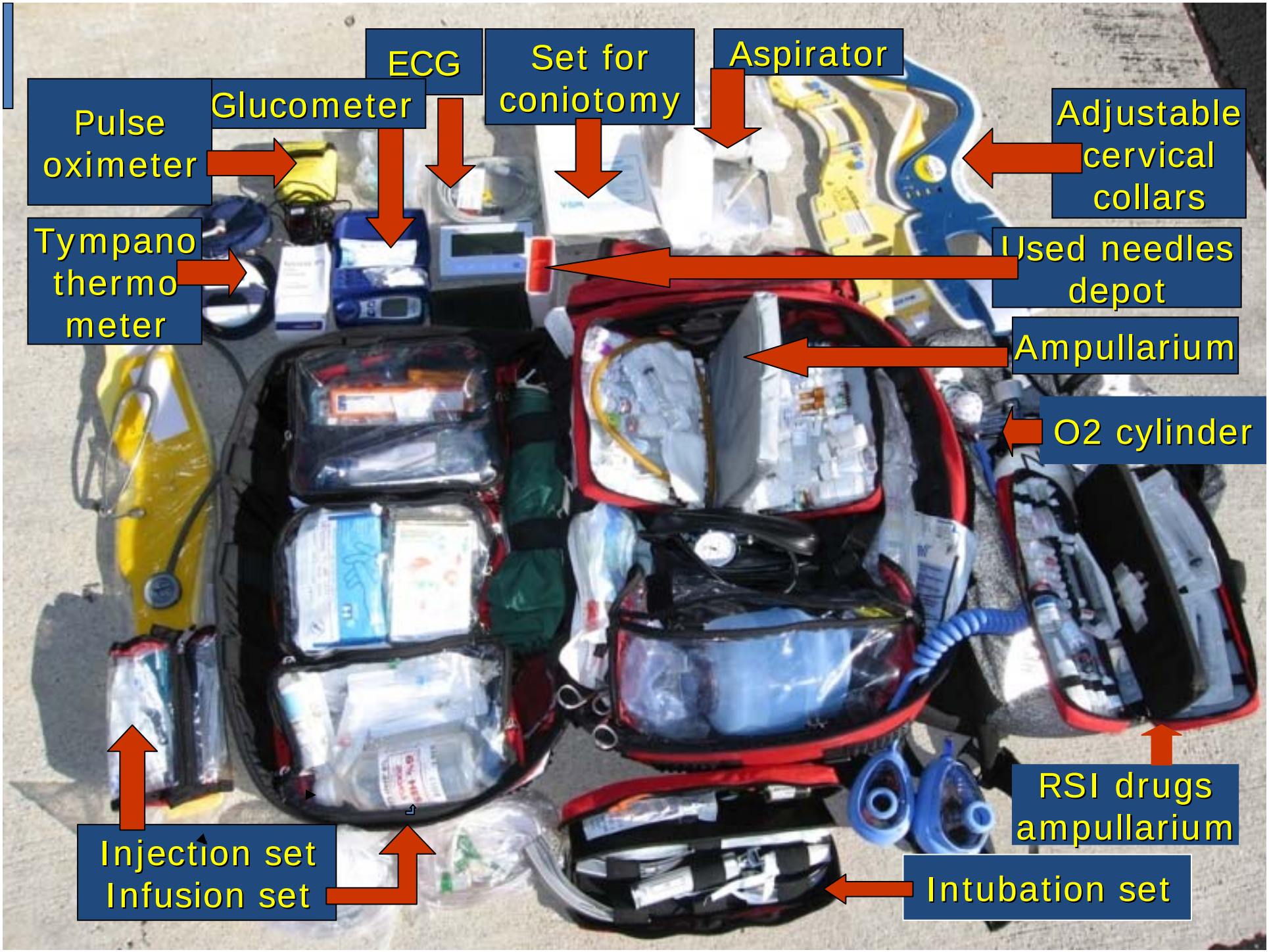
MEDICAL EQUIPMENT

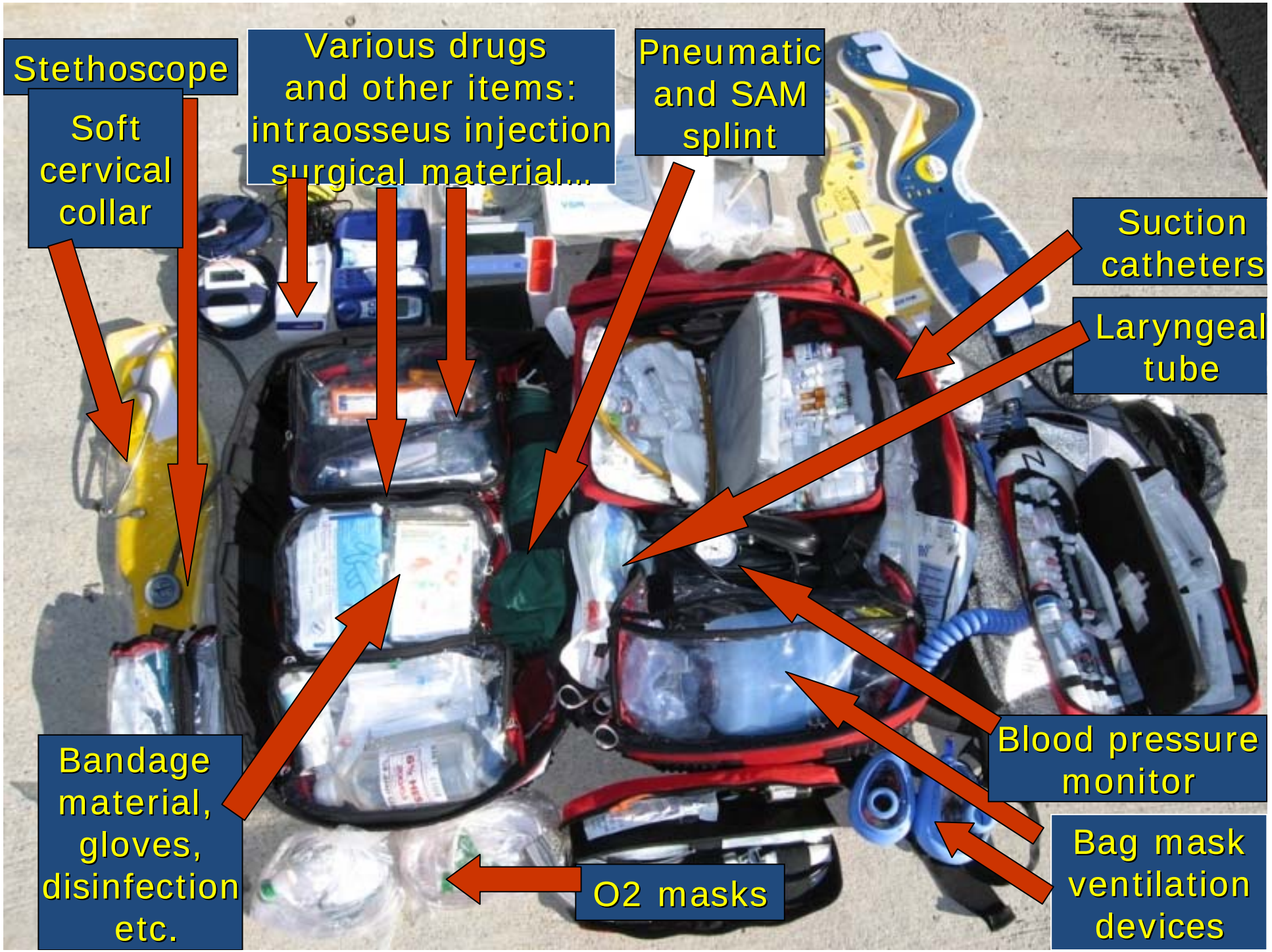
- Should meet national and international emergency medicine and other standards
- Must be light, portable (so as to be brought to the patient) and robust
- Must be safely secured during the mission
- Specialist medical equipment and drugs to manage specific mountain related emergencies (hypothermia, altitude illness, snakebite…)
- Ergonomic and compartmentalized medical rucksacks are recommended.


RNO KED
Dräger


Portable medical equipment
Medical rucksack

Medical rucksack


ECG
Set for coniotomy
Aspirator
Pulse oximeter
Glucometer
Adjustable cervical collars
Tympano thermo meter
Used needles depot
Ampullarium
O2 cylinder
RSI drugs ampullarium
Injection set
Infusion set
Intubation set


Stethoscope
Soft cervical collar
Various drugs and other items: intraosseus injection surgical material...
Pneumatic and SAM splint
Suction catheters
Laryngeal tube
Blood pressure monitor
Bag mask ventilation devices
Bandage material, gloves, disinfection etc.
O2 masks


Drugs


RESPECT
FRIENDSHIP
CONFIDENCE

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THANK YOU FOR YOUR KIND ATTENTION

Prim. Iztok Tomazin, MD, MSc, mountain guide
ICAR MEDCOM
Mountain Rescue Association of Slovenia


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