



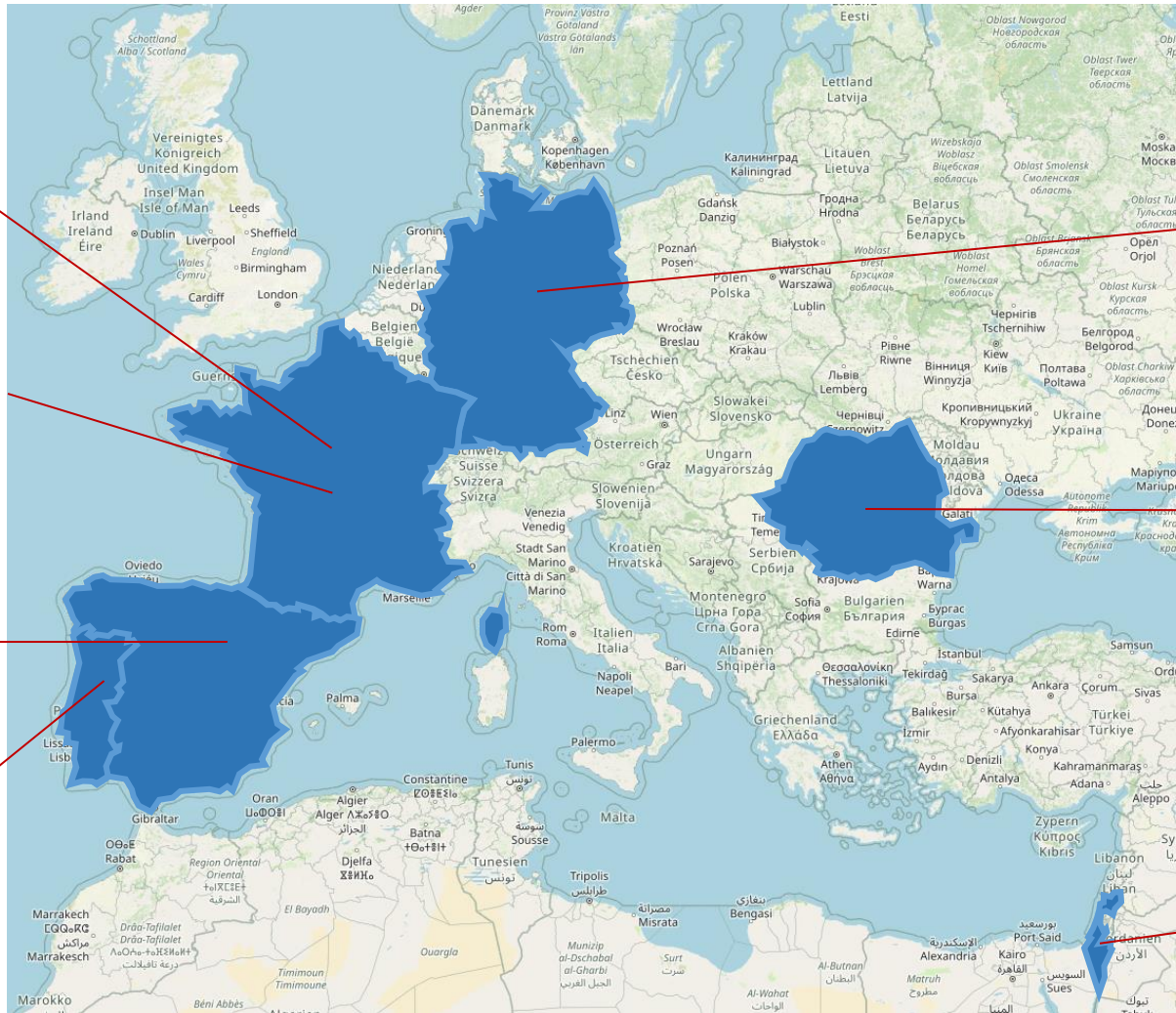
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Extrication of casualties in Road Traffic Collisions- SMURD Romania



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Objectives

- What is the context for current extrication approaches as delivered by rescue services?
- What injuries are sustained by patients who are trapped in their motor vehicles and how does this influence extrication practice?
- What are the needs of patients who are trapped following an MVC, how are these met and following extrication where is their care best delivered?

Romanian EMS

The mobile emergency, resuscitation and extrication system (SMURD)

- Helicopters rescue teams
- Prehospital first responders (EPA) and are generally composed of 3 paramedics.
 - The mobile intensive care unit (UTIM):
 - an emergency medicine/intensive care specialist or resident at least in the 3rd year
 - a nurse who is trained in emergency medicine department,
 - 2 paramedics, of whom one is the driver.
- Extrication teams





Team Approach

- Proper training and preparation -> protects EMS responders and improves outcomes for the victims.
- Collaboration, open communication, shared decision-making, in line with standard operating procedures
- A multidisciplinary, structured method of using individual skills and experiences collectively to achieve a common goal:
 - establish clear objectives,
 - respect and understand each other's roles,
 - collaborate to work as a single unit,
 - maintain effective communication.

Stages of Extrication

1. Safety and Scene Assessment
2. Stability and Initial Access
3. Space Creation
4. Glass Management
5. Full Access
6. Immobilisation and Extrication



Scene safety



Scene safety evaluation

- Crash sites often contain a combination of hazards, including wreckage, hazardous material, fire, and noxious fumes.
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- Depending on the location, season, and time of day there may also be different environmental hazards present
- Incident Commander establishes **an inner cordon** as well as identifies a tool staging area and debris dump.
- Police are responsible for creating **an outer cordon**.
- Safety equipment is required.
- Crash sites are highly dynamic environments and may change from safe to unsafe.
- EMS responders must continuously monitor scene safety and if the situation becomes unsafe, personnel should be withdrawn.



Safety and Scene Assessment

1. **Evaluate the kinematics** of the impact and determine the likely mechanisms of injury.
 - the impact speed,
 - level of intrusion into the passenger cell,
 - what is involved,
 - the type of collision
 - and if the occupants were wearing a seatbelt
2. Only once the surveys are complete, other members of the team approach the affected vehicles
 - Information gained during the inner and outer surveys should be communicated to the rest of the team
 - Control measures should be implemented at the earliest opportunity

Stability and Initial Access

1. Training and preplanning, will ensure that tool operators have a systematic approach to stabilising the vehicle whether it is on its roof, side or wheels
2. **Stabilisation is the foundation of a casualty centred rescue**
3. Preventing vehicle movement is vital to avoid further injuries to the occupants, offers a solid base for medical intervention and, avoid further structural deformation of the vehicle during the rescue process.
4. If medic is asking for immediate access, then providing this access is paramount- opening a door or breaking a window, making the rapid introduction of blocks and wedges an adequate control measure.

Stability phases

1. Manual Stabilisation- if a casualty is at immediate risk, then manual stabilisation should be considered - crew members can brace the vehicle by the wheel arches
2. Initial Stabilisation - usually involves chocking the wheels and creating four contact points between the vehicle and the ground using Chocks and Blocks. At this point entry to the vehicle can be gained by the medic.
3. Full Stabilisation which may be adding a fifth point if the vehicle is on its wheels

During the rescue process, stability must continuously be monitored cause the dynamics may alter.

This means a full check, adjustment of the blocks and any additional equipment that you may have used, must be carried out on a regular basis.



POMPIERI
SMURD

HOLM 911

Establishing the priorities

- EMS should switch off the vehicle ignition/ place an airbag restraint over the steering wheel
- The vehicle keys should be removed from the vehicle
- the medic will complete a primary assessment and establish the level of entrapment
- they should determine if the casualty is physically trapped by a part of the vehicle or medically trapped because of their clinical needs
- an initial assessment of the casualty's condition, reference to their stability, and confirm if an immediate extrication is required or whether their injuries are such that a controlled removal is more appropriate

Space creation

Space creation begins inside the vehicle!

1. the medic will need room to complete a full assessment and provide treatment to their patient
2. the EMS teams need enough access to remove the casualty in swift controlled movements, taking in to account their injuries, size and any manual handling concerns
3. determining which space creation options are available will impact the Incident Commanders planning to ensure full access can be provided
4. **an inner and outer structural assessment** of the vehicle to determine which components can be moved, opened or manipulated - by using the vehicle's natural design features
5. establish what obstructions and hazards will impact on space creating techniques

Tactical plan

- external evaluation will typically begin with unlocking and the opening of doors and winding down of windows
- potential pathway for an immediate extrication and access: checking the seats, posts, headlining, door panels and the dash
- provide the medic with more room to assess their patient
- determining if the seats operate electrically or manually
- a full assessment of their patient, determine the most appropriate extrication pathway based on their injuries

Extrication Plan

- their position in the vehicle,
- their size, the level of entrapment,
- environmental factors,
- the size and age of the vehicle,
- the outcomes of the vehicle assessment



Full Access

- Create space by opening doors and manipulating the inside of the vehicle
- Removing the roof, the side of the vehicle or, opening all the doors
- Dynamic Risk Assessment:
 - checking the stability of the vehicle,
 - covering all sharp materials created by the cutting process,
 - removal of any vehicle debris,
 - tools that will cause a hazard in the immediate working area

Extrication: Technical and Medical

- Remove the glass from all side and rear windows.
- Cut all seatbelts.
- Strip trim around cutting points.
- Cut all roof pillars except front A-pillars.
- Cut “hinge” cuts in roof rail at windshield at the front of the car.
- Flap roof forward and secure in position.

Glass Management

Controlled Removal or a Controlled Breakage.

- manage the glass that will be affected as part of the extrication process
- laminated front screen and toughened glass or polycarbonate glazing
- all types of glass present a hazard to rescue workers and casualties alike when broken or cut
- all glass should be appropriately managed to prevent the danger of cuts and possible contamination
- protective sheets should be used to control glass fragments and dust, rescue gloves



Immobilisation and extrication of casualty

- the casualty's condition
- the casualty's location and orientation
- available resources, equipment and personnel on the scene
- take care at sharp edges on the vehicle
- casualties require swift, yet gentle handling
- immobilize and protect spinal injuries, internal injuries, the pelvis -> significant blood loss which lead to hypovolemic

Triage coordination

Motor vehicle collisions (MVCs), particularly those associated with entrapment, are a common cause of major trauma.

Most crash sites are mass casualty incidents (MCI) with injuries ranging from uninjured to deceased.

EMS providers are required to triage patients quickly and efficiently to help prevent local resources from becoming overwhelmed

Scales used to evaluate

- AVPU
- ABCDE
- Glasgow Coma Score (GCS),
- The potential to deteriorating for a victim from one category to another as time goes on

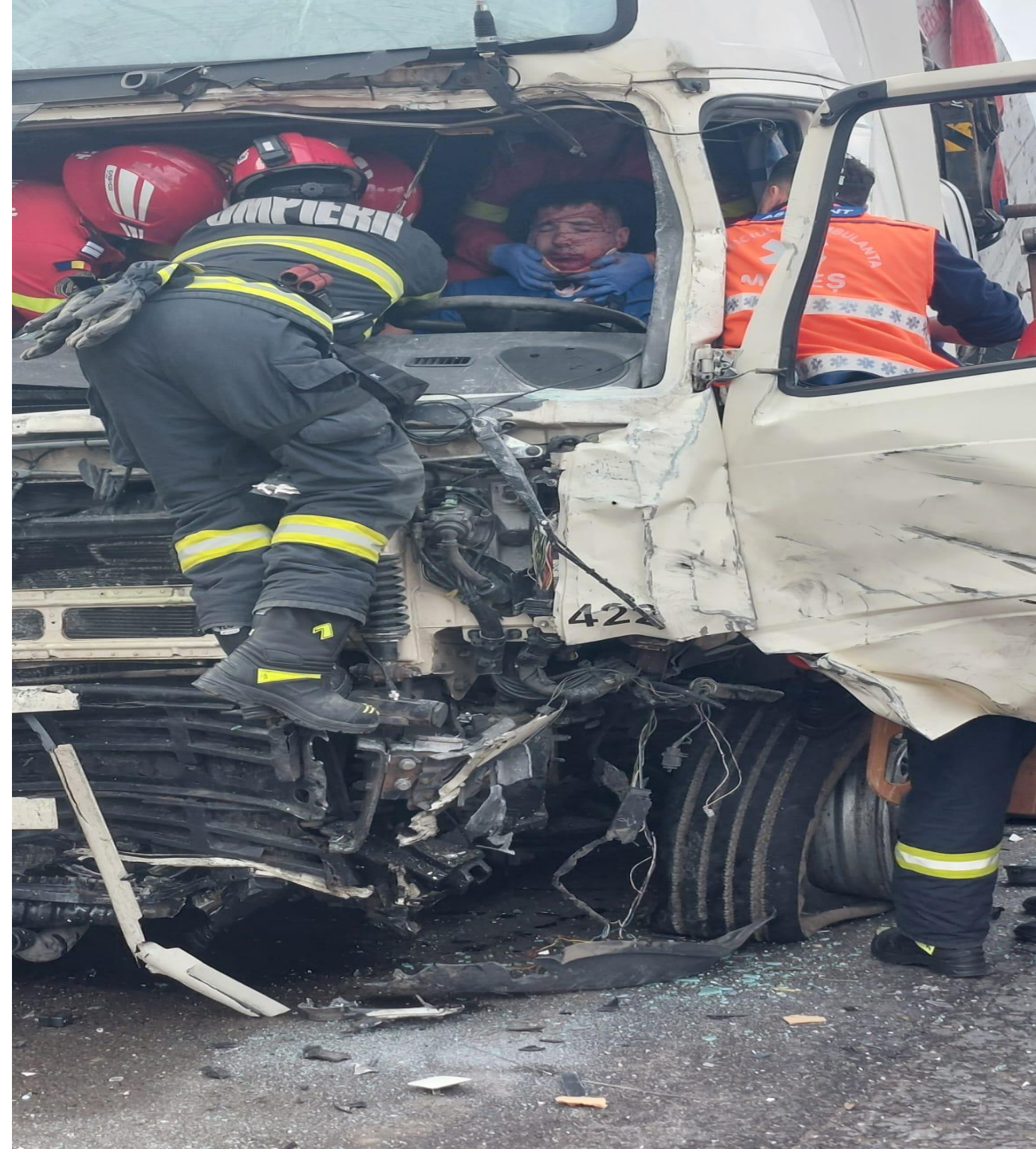
Prehospital treatment

Current extrication methods:

- focused on spinal movement minimisation and mitigation,
- self-extrication may be an appropriate alternative.

Devices used for extrication

- Kendrick Extrication Device (KED)
- Cervical Collar
- Spine Board
- pelvic girdle



Prehospital treatment

- Per Advanced Trauma Life Support (ATLS) protocol, responders treat life-threatening injuries first prior to victim transport from the crash site to a collection point.
- Less severe injuries will be treated at appropriate stages of patient evacuation per the triage system in place
- EMS leaders will designate collection points that are accessible from the crash site and accessible for transport to medical facilities.



Mechanisms of trauma

Motor vehicle collisions (MVCs)

- Intrusion results when the energy of the crash exceeds the strength of the vehicle frame, resulting in a violation of the occupant compartment- ONLY 10% requiring dismantling
- Injury may then occur either from direct contact with the vehicle structure, or passenger movement as a result of the acceleration imparted to the occupant from the vehicle.
- Passenger compartment intrusion, loss of integrity of the vehicle occupant compartment has frequently been used as a triage criterion
- Older drivers and passengers are increasingly injured in MVCs and may be at an increased risk of entrapment and its deleterious effects.
- exacerbating secondary spinal injury when assisted extrication

Trauma injuries

Trauma victims commonly have multiple injuries

- head injuries, face injuries
- spinal column injuries - consider c-spine immobilization for transports
- upper and lower extremity fractures
- internal organ damage: thoracic injuries, abdomen injuries
- open wounds



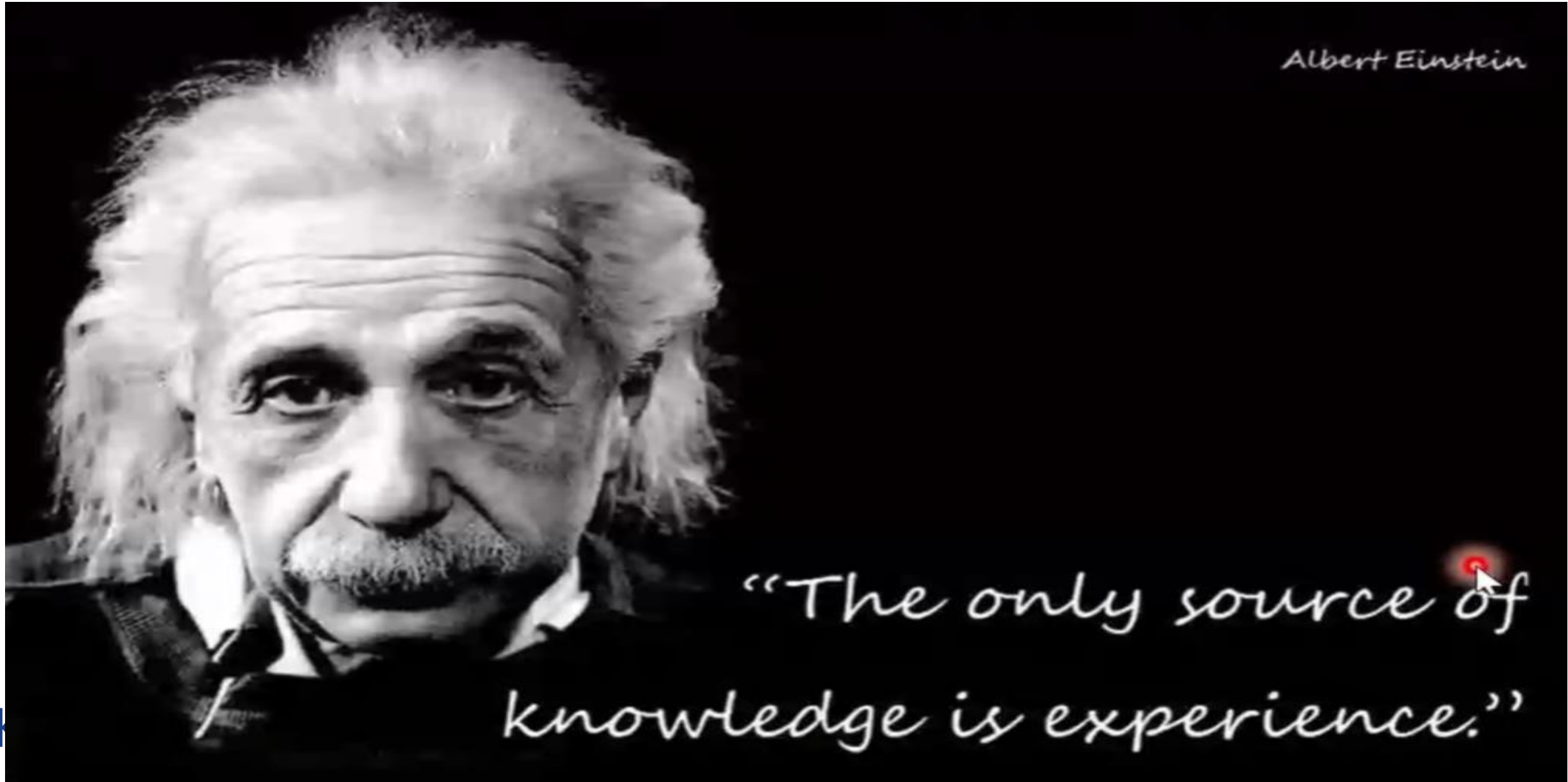
Take home messages

1. EMS have several responsibilities: including triage, patient care, and preparation of victims for transport, but remember...
2. **SAFETY must always come first!**
3. EMS plays a crucial role at the scene of a crash site -> maximal number of lives saved and a reduction in morbidity.
4. During the extrication process the dynamic of the vehicle will change, influencing the effectiveness of vehicle stabilization
5. Managing glass is not just about breaking windows!

Take home messages

6. Casualties require swift, yet gentle handling. Rough treatment can exacerbate injuries and worsen their medical condition rapidly
7. Teamwork is vital, clear communication from the lead medic before any movement is crucial
8. Casualty can be a technically and physically challenging task that must be completed safely and rapidly
8. Only by training can teamwork be developed and opportunities for simulations activities be identified and exploited

Thank you for your attention!!!



Albert Einstein

*"The only source of
knowledge is experience."*