Chapter 39, Vehicle Extrication and Special Rescue

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1. Introduction to Vehicle Extrication and Special Rescue in EMS

- This chapter covers vehicle extrication and special rescue operations for ems personnel.
- It details ems rescue operations, including vehicle extrication and its 10 phases.
- Various specialized components of ems operations are described, such as tactical ems, trench rescue, and high angle rescue.
- The role of EMTs in these operations is explained.
- Safety aspects of these operations are also discussed.
- EMTs will usually not be responsible for rescue but may assist with extrication.

2. Safety Considerations in Extrication Operations

- Extrication requires mental and physical preparation.
- Priority is patient care, but personal and team safety must come first.
- Vehicle safety systems can become hazards after a collision.
  - Shock-absorbing bumpers may be compressed or loaded.
  - Approach vehicles from the side to avoid injury from releasing bumpers.

    - Airbags are supplemental restraints required in all cars.
    - Airbags fill with gas and quickly deflate.
    - Airbags are located in the steering wheel, dash, doors, and seats.
    - Non-deployed airbags may inflate spontaneously.
    - Maintain clearance around side-impact (5-inch), driver-side (10-inch), and passenger-side (20-inch) airbags.
    - Haze from deployed airbags is caused by corn starch or talc.
    - Protective gear reduces eye or lung irritation.
- alternative fuel vehicles present hazards.
    - Vehicles can be powered by electricity, hybrid mix, propane, natural gas, methanol, or hydrogen.
    - Disconnect the battery to prevent fire or explosion.
    - Batteries may be in the trunk or under seats in alternative fuel vehicles.
    - Hybrid vehicles may have more than one battery.
    - Hybrid batteries have higher voltage than traditional ones.
    - High voltage systems may take up to 10 minutes to de-energize.
    - Avoid high voltage cables, which are typically orange.
    - Damaged high voltage batteries may give off toxic fumes.
    - Do not approach vehicles if an unusual odor is detected.
    - Retreat if you experience burning in your eyes or throat.

3. Fundamentals of Extrication: Roles, Responsibilities, and Communication

- Your primary concern in extrication is safety.
- Primary roles of ems providers are to provide emergency medical care and prevent further injury.
- You may provide care while extrication is ongoing.
- Extrication is removal from entrapment or a dangerous situation.
- entrapment is being caught with no way out or having a body part trapped.
- Roles and responsibilities often vary by jurisdiction.
- **ems providers** assess, provide medical care, triage, package patients, and provide transport.
- **The rescue team** secures and stabilizes the vehicle, provides access, and

extricates patients.

- **Law enforcement** controls traffic, maintains order, and establishes a perimeter.
- **Firefighters** extinguish fires, prevent ignition, ensure vehicle safety, and remove spilled fuel.
- Good communication and clear leadership are essential for safe and efficient care.

4. The 10 Phases of Extrication

- There are 10 phases of extrication.

Phase	Description	Source
1. Preparation	Preparing for an incident requiring extrication. Includes pre-incident training and checking tools.	
2. En Route	Following procedures and safety precautions similar to an ambulance call.	
3. Arrival and Size Up	Positioning the ambulance for safety and access. Putting on PPE and looking for hazards. Evaluating hazards and determining patient count.	
4. Hazard Control	Dealing with hazards like downed electrical lines, family members, bystanders, and unstable vehicles. Disconnecting battery cables.	
5. Support Operations	Lighting the scene, establishing staging areas, or marking helicopter landing zones. Fire and rescue personnel work together.	
6. Gaining Access	Accessing the patient after stabilizing the vehicle and controlling hazards. Method depends on the situation.	
7. Emergency Care	Providing emergency care to the trapped patient. Performing a primary assessment. Addressing	

	hemorrhaging and stabilizing the spine.	
8. Patient Removal	Coordinating with rescue personnel for the best removal route. Participating in preparation for removal. Re-evaluating the need for rapid extrication.	
9. Transfer	Performing a complete primary assessment after freeing the patient. Moving the patient in smooth, slow, controlled steps. Moving the patient as a unit.	
10. Termination	Returning units to service. Checking and cleaning equipment and the ambulance. Completing necessary reports.	

5. Gaining Access to the Patient

- Gaining access is a critical phase of extrication.
- The way to gain access depends on the situation, including terrain and vehicle position.
- Consider the patient's location and position, hazards, and vehicle stability.
- **Rapid vehicle extrication** may be needed for urgent situations.
  - This is done to quickly remove a patient if the environment is threatening or CPR is needed.
  - Experienced EMTs can perform this in one minute or less.
  - Protect the patient from hazards during assessment and extrication.
  - Always describe actions to the patient, even if unresponsive.
  - Minimize heat, noise, and force.
- **simple access** is trying to get the patient out quickly without tools or breaking glass.
  - Automobiles are built for ease of entry and exit.
  - Use door handles or roll down windows before breaking glass.
  - Forcible entry tools may be necessary.
  - The rescue team should provide access.
  - If the rescue team hasn't arrived, use tools like hammers, pry bars, or hacksaws if available.

- **complex access** requires special tools and training.
  - This includes pneumatic or hydraulic devices.
  - It also includes breaking windows and removing roofs.
  - These advanced skills are typically done by specialized teams.

6. Emergency Care and Patient Removal During Extrication

- Providing emergency care to a trapped patient is similar to any other patient.
- Perform a primary assessment and provide care once the scene is safe.
- Address hemorrhaging with direct pressure or a tourniquet.
- Provide manual stabilization for the cervical spine.
- Open the airway and give high-flow O2 if needed.
- Assist with ventilations if necessary.
- Control external bleeding and treat critical injuries.
- Rescue personnel should coordinate with you on the best removal route.
- Participate in preparing for patient removal.
- Determine the urgency of extrication.
- Determine where to position yourself to protect the patient.
- Plan how to move the patient to the backboard and stretcher.
- Your input helps the rescue team plan extrication that protects the patient.
- Re-evaluate if rapid extrication is needed.
- You will often be placed in the vehicle alongside the patient.
- Wear proper protective equipment.
- Perform a complete primary assessment once the patient is freed.
- Manually stabilize the spine.
- Move the patient with smooth, slow, controlled steps.
- Designate one person to be in charge of the move.
- Choose a path that requires the least manipulation.
- Ensure everyone understands the steps and is ready.
- Move only on the team leader's command.
- Move the patient as a unit.
- Continue to protect the patient from hazards.
- Continue additional assessment and treatment after placing the patient on the stretcher.

7. Specialized Rescue Situations

- Sometimes patients can only be reached by teams trained in special technical rescues.
- These teams have special skills.

Specialized Rescue Type	Description and Considerations	Source
Technical Rescue Situations	Requires special skills and equipment. Only trained personnel should enter. Many team members are also EMRs or EMTs. Ensure the team is summoned and en route.	
Search and Rescue	Ambulance is usually summoned to the incident command post when a person is lost outdoors. Your role is to stand by until the person is found. May stay with family members.	
Trench Rescue	Cave-ins and trench collapses often have poor outcomes. Falling dirt weighs about 100 pounds per cubic foot. Risk of secondary collapse exists. Vehicles must park 500 feet away.	
Tactical Emergency Medical Support	EMTs take precautions due to potential violence. Responding units wait until law enforcement secures the scene. Specially trained EMTs are incorporated into SWAT units.	
Structure Fires	Ambulance is often dispatched with the fire department. Ask the incident commander where to park and stage. Determine if there are injured patients or if you are standing by.	

- Trench collapse victims may become hypoxic from dirt weight.
- All vehicles should be turned off at trench scenes to avoid vibration.
- Road traffic should be diverted from the 500-foot safety area.
- Construction vehicles at the site may be unstable.

- Medical or rescue personnel should never enter a trench without proper shoring.
- Medical personnel trained in these rescues provide most medical care.
- Be prepared to receive patients once extricated.
- For tactical situations, wait for law enforcement to secure the scene.
- Many communities integrate trained EMTs into police SWAT units.
- Report to the incident commander for instructions at tactical scenes.
- Turn off lights, sirens, and outside radio speakers when nearing the scene.
- The command post is usually in an area safe from the suspect.
- Remain in the command post area.
- Planning measures are key in tactical situations.
- The incident commander identifies locations, determines scene safety, and designates landing zones.
- Search and rescue in a burning building requires special training and equipment.
- Firefighters in turnout gear and breathing apparatus perform these operations.
- Hazardous materials can complicate a scene.

8. Key Takeaways and Review Questions

- Proper protective equipment varies depending on hazards.
- Blood and fluid impermeable gloves should be used during all patient contacts.
- The first phase of extrication is preparation.
- If a power line is entangled in a wrecked vehicle, retreat until the power is off.
- Entering a vehicle by breaking a back window is complex access because it requires tools.
- simple access is rolling the window down.
- Once access is gained to a patient pinned by the steering wheel, perform a primary assessment and provide emergency care.
- While the EMT is assessing the patient in the vehicle, the rescue team assesses entrapment and determines the safest way to extricate.
- Proper removal of a critically injured patient involves moving in slow, smooth, controlled steps as a unit.

- Rescue from a grain silo bin is a confined space rescue.
- A backboard should be left in the ambulance during a search in a wooded area.
- At a trench collapse scene, the ambulance should be parked at least 500 feet away.