Highway Safety and Vehicle Extrication
OBJECTIVES

40.1 Describe the risks to EMS providers during highway emergency operations. Slides 12, 15

40.2 Given a variety of highway response scenarios, describe how to create as safe a work area as possible. Slides 12–14

continued
OBJECTIVES

40.3 Discuss particular considerations in ensuring safety during night operations. Slide 15

40.4 List the ten phases of vehicle extrication and rescue operations. Slides 19–20
40.5 In a rescue situation, recognize and manage hazards by wearing appropriate protective gear, safeguarding your patient, managing traffic, safely dealing with deployed air bags and energy-absorbing bumpers, and managing spectators, and exercising safe practices around electrical hazards. Slides 21, 23–26
40.6 Describe actions taken at a rescue scene by those trained to do so regarding control of vehicle fires, stabilizing a vehicle, and gaining access to patients. Slides 27–33
MULTIMEDIA

- **Slide 34** Information About Rapidly Extricating Patients Video
CORE CONCEPTS

• How to position emergency apparatus to create a safe work zone at a highway incident
• How to recognize and manage hazards at the highway rescue scene
• How to stabilize a vehicle
CORE CONCEPTS

- How to gain access to the patient in a crashed vehicle
- How to disentangle a patient from a crashed vehicle
Topics

- **Highway Emergency Operations**
- **Vehicle Extrication**
Highway Emergency Operations
Initial Response

• Limited access highways: only primary or first-due units should proceed directly to scene

• On-scene units: park single file in same direction to minimize on-scene congestion
Position Blocking Apparatus

• Create one-and-a-half to two lanes of blockage
• Position apparatus at angle; front wheels rotated away from incident
Position Other Apparatus

• Leave space immediately next to crash for vehicle extrication units

• Position ambulances, command vehicles, and other units downstream from crash
  – Allows safer patient loading and rapid departure from scene
Emergency Highway Safety

• Exit vehicle into safe zone
• Be alert for oncoming traffic
• Place flares or cones to slow traffic and channel away from incident lane
• Night operation: shut off vehicle’s white response lights and headlights
Think About It

• Is it safe to enter the highway scene?
• Which units are necessary?
Vehicle Extrication
Phases of Extrication

1. Preparing for rescue
2. Sizing up situation
3. Recognizing and managing hazards
4. Stabilizing vehicle prior to entering
5. Gaining access to patient

continued
Phases of Extrication

6. Providing primary patient assessment and rapid trauma exam
7. Disentangling patient
8. Immobilizing and extricating patient from vehicle
9. Providing assessment, care, and transport
10. Terminating rescue
Protective Gear for EMS Responders

- ANSI reflective safety vest
Think About It

• What does scene size-up tell me about the need for extrication?
Protective Gear for EMS Responders

- Helmets
- Eye protection
- Hand protection
- Body protection
Managing Traffic

• Use flares for traffic control
Supplemental Restraint System: Air Bags

- Air bags designed to inflate on impact, dissipate kinetic energy, minimize trauma to body
- Creates “smoke” in vehicle—cornstarch and talcum powder (and sometimes sodium hydroxide)
Electrical Hazards

- High voltage lines common
- Assume entire area around exposed wire dangerous—conductors may have touched and energized
- Ordinary protective clothing gives no protection against electrocution
Vehicle Fires

- Small fires: 15- or 20-pound class A:B:C dry chemical fire extinguisher extinguishes almost anything burning
- Fire under hood: do not attempt extinguishment unless hood fully open
Vehicle Fires

- Fire in passenger compartment: apply extinguisher sparingly until occupants can be freed
- Fire in trunk: apply same principles as engine compartment fire
Stabilizing a Vehicle

• Vehicle on wheels
  – Turn off engine; step-chock three sides
Stabilizing a Vehicle

- Vehicle on side
  - Stabilize with ropes, cribbing, or stabilizer bars

- Vehicle on roof
  - Utilize 4x4 wood blocks to build crib box
Gaining Access

• Simple access
  – Check if door or window can be opened
  – Try before you pry

• Complex access
  – Utilize tools and equipment
  – Break glass in side or rear window as far from passengers as possible
Disentanglement

• Gain access by disposing of doors and roof
  – Makes vehicle interior accessible
  – Creates large exit-way
  – Provides fresh air and helps cool heated patient

continued
Disentanglement

- Disentangle occupants by displacing front end
- Easily accomplished with heavy duty jacks and hacksaws
- Do not cut steering column or airbag wiring; may cause unexpected firing
Information About Rapidly Extricating Patients Video

Click [here](#) to view a video on the subject of rapidly extricating patients from a vehicle.
Chapter Review
Chapter Review

• Highway operations are a high-risk scene.
• Scene size-up is key to determine how many patients.
• Protect yourself from traffic, un-deployed airbags, loaded bumpers and sharp metal.
Chapter Review

- Ensure scene safety.
- Try simple means to gain access first.
- Protect your patient during the extrication process.
Remember

• Highway response is a significant safety hazard for EMTs. Specific safety planning and procedures must be utilized to keep responders safe.

• Responding units should evaluate need for further units, institute “blocking” to protect work area, and always exit apparatus into safe zone.
Remember

- Use protective equipment and warning devices.
- Vehicle extrication often requires specialized training and resources. Know local resources and procedure for activating those resources.

continued
Remember

• Determine extrication resources needed and patient extrication priority through thorough scene size-up.
• Extrication can pose a variety of threats. Evaluate the scene carefully and employ safety procedures.
Remember

- Gaining access to patients frequently requires mechanical and technological assistance. Always start simply and escalate only when simple measures fail.
Questions to Consider

- What is the best access for my unit?
- Where should I park the apparatus?
- Does the vehicle need to be stabilized?
Critical Thinking

• The highway crash you are dispatched to is a seven-car pile-up. Your unit is first on the scene. What steps are required that are different from those for a crash involving one car striking a tree?
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