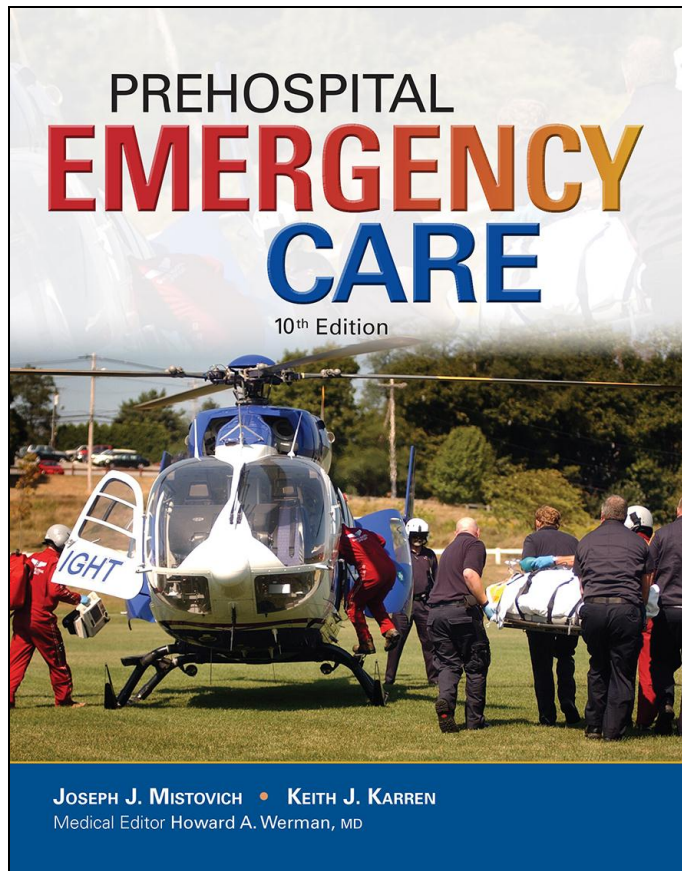


PREHOSPITAL EMERGENCY CARE

TENTH EDITION



CHAPTER 43

Gaining Access and Patient Extrication

Learning Readiness

- EMS Education Standards, text p. 1179

Learning Readiness Objectives

- Please refer to page 1179 of your text to view the objectives for this chapter.

Learning Readiness

Key Terms

- Please refer to page 1179 of your text to view the key terms for this chapter.

Setting the Stage

- Overview of Lesson Topics
 - Planning Ahead
 - Sizing Up the Scene
 - Gaining Access
 - Extrication
 - Specialized Stabilization, Extrication, and Disentanglement Techniques

Case Study Introduction

EMTs Jay Gilmore and Lana Ward arrive at the scene of a reported single-vehicle collision to find an SUV resting on the driver's side, with the windshield against a large tree.

Case Study

- What additional resources will Jay and Lana need?
- What additional personal protective equipment will the EMTs need in this situation?
- What actions must be taken before accessing patients inside the vehicle?

Introduction

- Motor vehicle collisions are a common situation requiring rescue.
- The process includes scene size-up, vehicle stabilization, gaining access, extrication, packaging, and moving the patient.
- The primary role of EMTs in rescue situations is patient care.

Planning Ahead

- Evaluate information from dispatch to determine if rescue may be required.
- Be familiar with locations that can present access difficulties.
- Anticipate situations in which vehicle entrapment is more likely.

Sizing Up the Scene

- Stay alert as you approach the scene, survey from a safe distance.
- Scenes are dynamic; scene size-up is a continual process.

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Sizing Up the Scene

- 360-degree assessment
 - Assess the scene from all directions.
 - Look for hazards.
 - Identify entrapped and ejected patients.
 - Identify the mechanism of injury.

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Sizing Up the Scene

- Evaluate the need for additional resources.
 - Extrication
 - Fire suppression
 - Law enforcement
 - Hazardous material team
 - Utility company
 - Air medical
 - Water rescue

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Sizing Up the Scene

- Personal protective equipment
 - Consider the presence of glass, sharp metal, flammable liquids, battery acid, and blood.
 - Wear a high-visibility vest.
 - Turnout gear is required for personnel involved in extrication.

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Sizing Up the Scene

- Scene safety
 - Electrical lines
 - Always assume downed power lines are electrically alive.
 - Stay away from vehicles in contact with power lines.
 - Request assistance from the power company.
 - Advise patients to remain in the vehicle.

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Sizing Up the Scene

- Scene safety
 - Control traffic flow
 - The safest method is to reroute traffic to different roads.
 - If traffic must be channeled around the scene, it should be routed at least 50 feet from the wrecked cars.

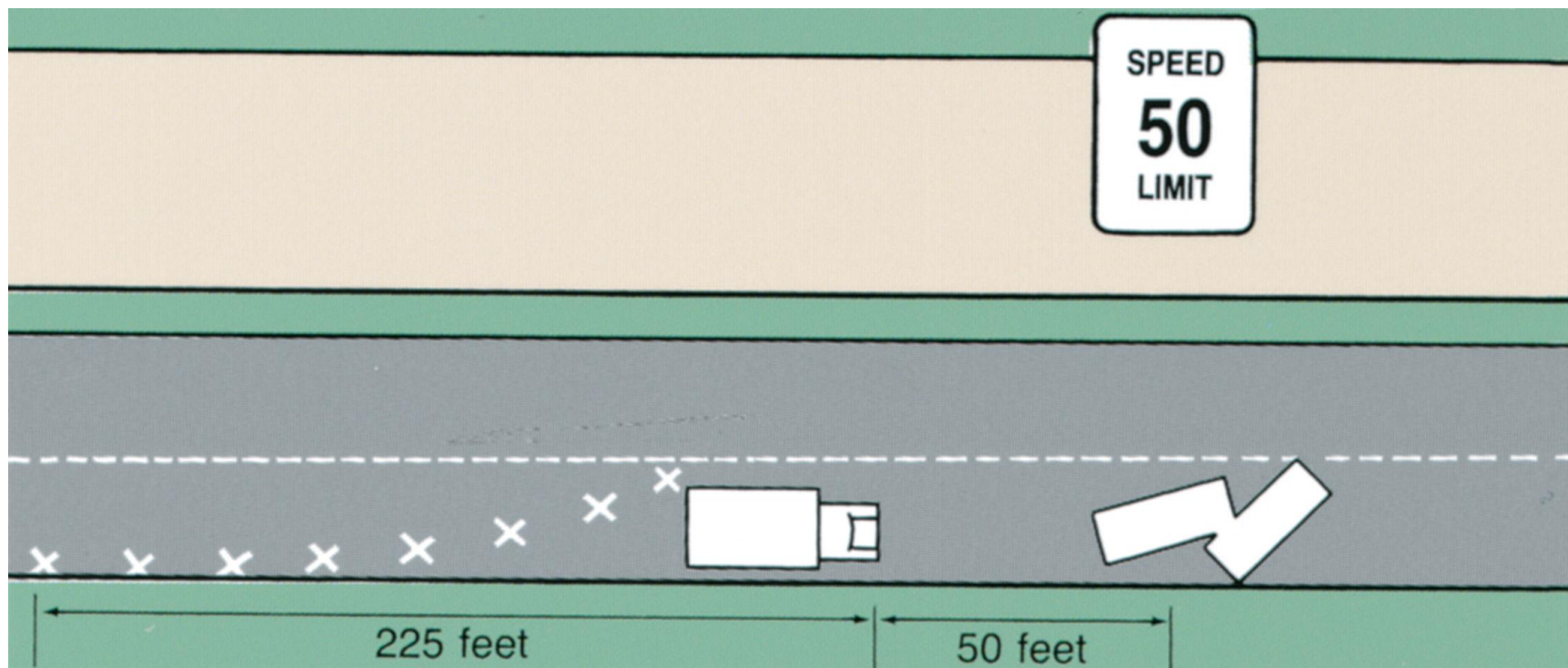
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Flares are positioned according to a formula that includes the stopping distance for the posted speed plus a margin of safety.

| Posted speed (mph) | Stopping distance for that speed | | Posted speed (in feet) | | Distance of the farthest warning device |
|--------------------|----------------------------------|---|------------------------|---|---|
| 20 mph | 50 feet | + | 20 feet | = | 70 feet |
| 30 mph | 75 feet | + | 30 feet | = | 105 feet |
| 40 mph | 125 feet | + | 40 feet | = | 165 feet |
| 50 mph | 175 feet | + | 50 feet | = | 225 feet |
| 60 mph | 275 feet | + | 60 feet | = | 335 feet |
| 70 mph | 375 feet | + | 70 feet | = | 445 feet |

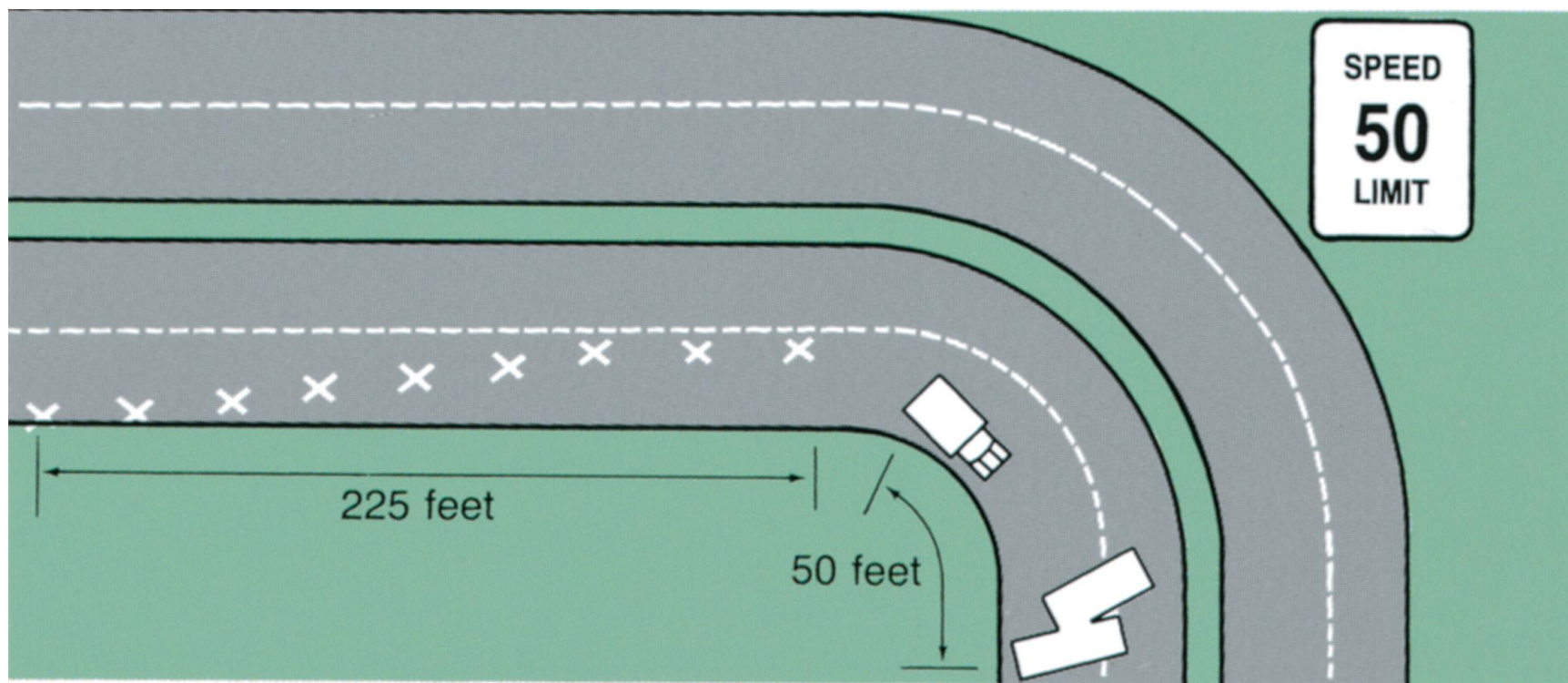
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Flares positioned on a straight road. Approaching vehicles are moved into the correct lane before they reach the edge of the danger zone.



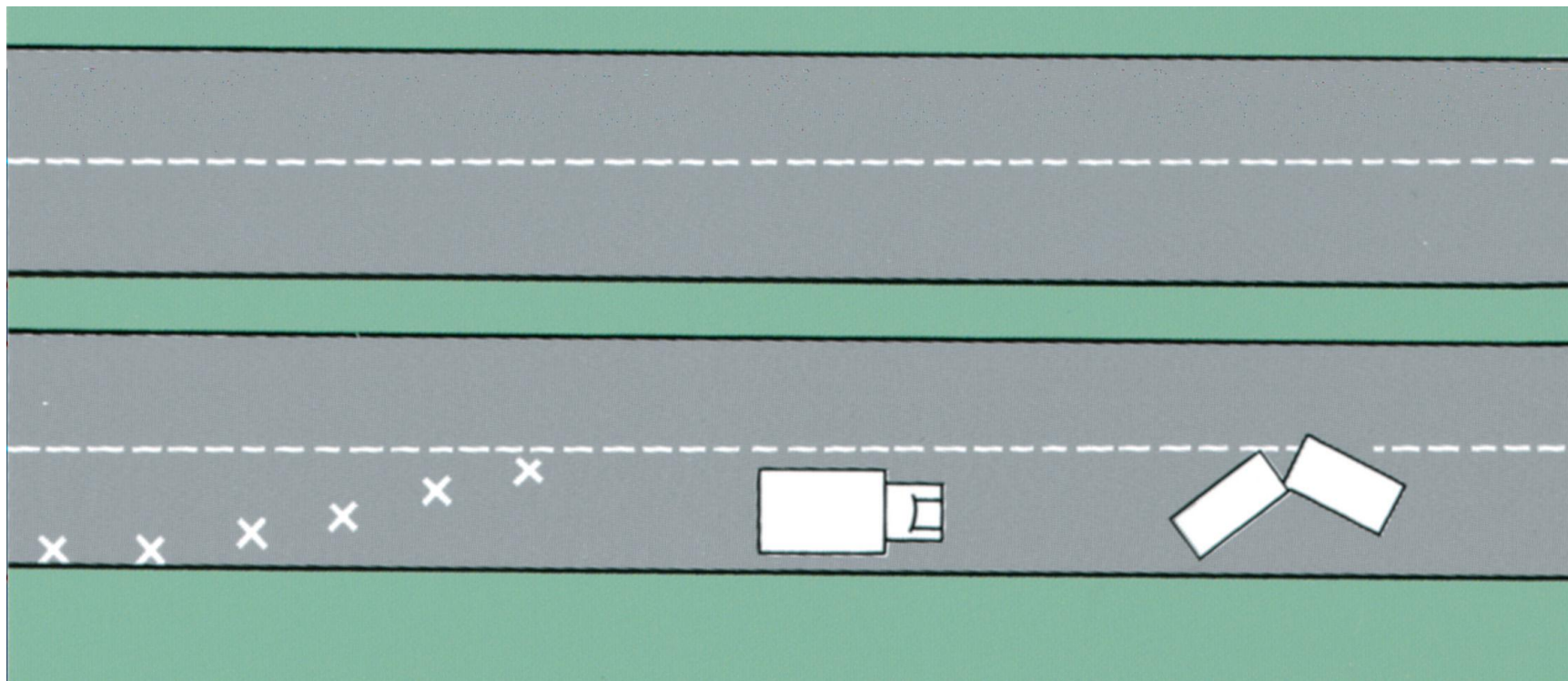
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Flares positioned ahead of a curved section of road. The start of the curve is considered to be the edge of the danger zone.



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Flares positioned on a hill. The flares slow approaching vehicles and make them turn into the correct lane before they reach the top of the hill.



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Sizing Up the Scene

- Scene safety
 - Control traffic flow
 - Use fire apparatus and other emergency vehicles to block traffic.
 - Position the ambulance so that the loading doors are angled away from traffic.
 - Always face the oncoming traffic.

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Sizing Up the Scene

- Scene safety
 - Alternative-fuel vehicles
 - Hybrid vehicles use a combination of gasoline and electricity; the high-voltage batteries and cables pose a risk of electric shock.
 - Natural gas and hydrogen are stored in high-pressure canisters that can pose a fire risk.

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Sizing Up the Scene

- Scene safety
 - Undeployed air bags
 - Air bags are deployed with significant force.
 - If a rescuer is positioned in front of an air bag that suddenly deploys, the force could cause severe injury.
 - Air bags must be deactivated before extrication.

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Sizing Up the Scene

- Scene safety
 - Energy-absorbing bumpers
 - A piston system can become "loaded" on impact and spring outward after impact, causing injury.

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Sizing Up the Scene

- Locate all patients
 - Some incidents involve multiple patients, and they may not all be readily identified.
 - Look for patients at the site and in the immediate vicinity.
 - Recognize clues that more than one patient may be involved, such as empty child car seats.

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Sizing Up the Scene

- Vehicle safety
 - Have a fire extinguisher available if an engine company is not on the scene.
 - The vehicle must be stabilized before accessing it.
 - Shutting off the engine, setting the parking brake, and using cribbing or chocks are all actions to help stabilize the vehicle.

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Sizing Up the Scene

- Vehicle safety
 - If the battery must be disconnected:
 - First unlock doors, lower windows, and move seats back.
 - Cut or remove the negative battery cable first, then the positive cable.

Gaining Access

- Simple access requires no special tools.
- Complex access requires the use of tools and specialized equipment.
- If complex access is required, request resources.

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Gaining Access

- Residential access
 - First check all doors and windows.
 - If you can contact the patient, determine if a neighbor has a key.
 - If you cannot contact the patient, check with neighbors.
 - If forced entry is required, request police and fire department.

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Gaining Access

- Residential access
 - If possible, wait for police before making forced entry.
 - Breaking a window is usually easiest and less costly.
 - Assess for hazards before making entry.
 - Select a room where there are no occupants.

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Gaining Access

- Residential access
 - Inform the patient what you are going to do.
 - Wear personal protective equipment.
 - Stand alongside the window and strike the upper corner with a flashlight or similar tool.
 - Clear the glass before accessing the window.

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The easiest and least costly method of gaining access to a patient inside a locked house usually is by breaking a window.



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Gaining Access

- Vehicle access
 - EMTs' main function is patient care.
 - Approach the vehicle from the front.
 - Advise the patient not to move his head.

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Gaining Access

- Vehicle access
 - Simple access
 - Begin by trying the doors and checking the door locks.
 - If necessary, instruct the patient not to move while attempting to unlock doors or roll down windows.

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Gaining Access

- Vehicle access
 - Complex access
 - The quickest means is to break a window.
 - Wear personal protective equipment.
 - Tell the patient what you are going to do.
 - If possible, cover the patient with a blanket or tarp.

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Gaining Access

- Vehicle access
 - Complex access
 - Select the window farthest from the patient.
 - Place a sharp tool against the lower corner of the window and strike the tool with a hammer, or use a spring-loaded punch.
 - Remove the broken glass.

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Position the punch in the corner of the side window and pull back on the spring.



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Keeping the tip of the punch in place, let go of the spring to shatter the window.



Starting at the top of the window, carefully push the broken glass away from the interior of the vehicle.



Click on the first method that should be attempted to gain access to a vehicle involved in a collision.

A. Try to open the door by the door handle.

B. Use a pry bar to open the driver's side door.

C. Use a spring-loaded punch to break a window.

D. Ask the patient to open the door.

Extrication

- Components of extrication
 - Scene size-up
 - Stabilization
 - Gaining access
 - Disentanglement
 - Patient removal

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Extrication

- Initial patient care precedes removal from the vehicle unless delaying to do so would endanger the life of the patient or others.
- Cooperate and coordinate with those performing the extrication.

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Extrication

- Caring for the patient
 - Ensure your own safety.
 - Maintain manual spinal stabilization at all times.
 - Perform a primary assessment and manage any immediate life threats.
 - Perform a controlled rapid extrication of the patient.

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Extrication

- Caring for the patient
 - Remove the vehicle from around the patient, if possible.
 - Use adequate personnel.
 - Use the path of least resistance to remove the patient.

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Extrication

- Caring for the patient
 - Communicate with the patient about the process.
 - Protect yourself and the patient with a tarp or cover.
 - Continually monitor the patient.
 - Communicate with the extrication team.

Specialized Techniques

- Stabilizing a vehicle requires specialized equipment.

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TABLE 43-1 Common Equipment Used for Vehicle Stabilization

| Type | Description and Use |
|---------------------------|---|
| Air bag | A rubber bag, found in various shapes and sizes, that, when inflated with air, has great lifting ability. |
| Come-along | A ratcheting cable device used to pull in a straight direction. |
| Cribbing | 4 × 4 or 2 × 4 blocks of hardwood cut to approximately 18-inch-long sections. |
| Hydraulic cutter | A hydraulic power tool used to cut metal. |
| Hydraulic ram | A hydraulic power tool used to push or pull in a straight direction. |
| Hydraulic spreader | A hydraulic power tool used to open, spread, and separate items such as vehicle doors. |
| Jack | A manual device used much as a ram would be used. |
| Step chock | A set of several 2 × 6 blocks of hardwood cut to varying lengths and secured together to form “steps.” Plastic step chocks are premanufactured, faster to deploy, lighter than wood, and resistant to most of the fluids spilled at motor vehicle collisions. |
| Wedge | A 4 × 4 piece of cribbing tapered to an edge at one end. |
| Winch | A powered cable reel usually electrically or hydraulically driven and mounted to a truck, which is used to pull. |

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Specialized Techniques

- Upright vehicle
 - Use step chocks or cribbing to immobilize the suspension.
 - Remove air from the tires.

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Plastic step chocks, as seen here, are strong and light and can be easily cleaned.



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Specialized Techniques

- Vehicle on its side
 - Do not enter the vehicle until it is stabilized.
 - Rescuers use a variety of cables and cribbing to stabilize the vehicle.

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Rescue struts can be used to prevent a vehicle on its side from rolling over onto its top or back onto its wheels.



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For extra safety, rescue struts can be placed against both the underside and the top of a vehicle on its side.



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Specialized Techniques

- Vehicle on its roof
 - The roof posts are not designed to support the vehicle's weight.
 - Opening a door decreases the support provided.
 - Cribbing and airbags can be used to stabilize the vehicle.

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Specialized Techniques

- Extricating a patient
 - The goal of extrication is to remove the car from around the patient.
 - Patient disentanglement requires specialized equipment, such as hydraulic spreaders, and specially trained personnel.

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While the EMT maintains spine stabilization from inside, rescue personnel will begin to stabilize the vehicle.



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The first step in stabilizing the vehicle is to place chocks under the vehicle. Chocks should be pushed in until they touch the undercarriage; the vehicle should not be lifted up to fit the chocks into place.



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The patient should be covered with a fire-retardant blanket. The air should be released from the tires and the battery should be disconnected. Always disconnect the negative terminal first.



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Hydraulic spreaders are used to "pop" open the rear door.



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Cut the B post at the top by the roof.



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Cut the B post at the bottom by the floor.



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Using a hydraulic ram or spreaders, "rip" the B post while pulling the doors open on the front hinges.



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Hydraulic cutters are used to cut the roof from a vehicle.



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Use as many people as necessary to safely lift the roof up and away from the vehicle.



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Hydraulic spreaders are used to free the patient from entrapment by the dashboard.



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To prevent further injury to the patient, it is best to remove him vertically out of the vehicle.



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Specialized Techniques

- Side-impact and head protection air bags
 - Special consideration must be used in cutting posts.
 - Air bags can be deployed during extrication, causing serious injury.

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Specialized Techniques

- Other methods of disentanglement
 - "Popping" or prying a door.
 - Removing the windshield and rolling the roof
 - Patients entrapped in a vehicle on its side must be removed quickly.

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To extricate a patient from a vehicle on its side, first cut the upper posts using a hydraulic cutter or other cutting tool. The windshield should also be cut.



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Then fold the roof down to provide an adequate space from which to remove the patient.



Case Study Conclusion

Lana looks for hazards and walks around the vehicle to get a look inside. She determines that they have five patients, two of whom appear to be unresponsive. Jay advises the incoming fire crew that they have a vehicle on its side with five occupants, and contacts dispatch to request additional ambulances.

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Case Study Conclusion

Jay coordinates with the extrication crew, letting them know which patients are thought to be most critical. Together, they decide on an approach to extrication that begins with stabilizing the vehicle.

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Case Study Conclusion

Once the crew gains access, Jay—wearing full turnout gear—accesses the patients and performs triage. They prioritize removal of the patients, assigning each patient to a waiting ambulance crew.

Lesson Summary

- In most cases, patient access is straightforward, but in some cases special techniques and equipment are required.
- During extrication, EMTs' primary responsibility is patient care.

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Lesson Summary

- EMTs must take precautions to protect themselves and their patients during the extrication process.