

# Caring for Head, Neck and Back Injuries



Every year, there are approximately 11,000 spinal cord injuries in the United States. Approximately 9 percent of these injuries occur during sports and recreation, some from diving into shallow water.<sup>1</sup>

Head, neck and back injuries rarely happen during supervised diving into deep water. Most injuries occur during unsupervised activity. In pools, head, neck and back injuries most often occur at the shallow end, in a corner or where the bottom slopes from shallow to deep water. They also occur when someone strikes

a floating object, like an inner tube or person, while diving. Head, neck or back injuries also occur out of the water when a person trips or falls on a pool deck or in a locker room.

At lakes, rivers and oceans, head, neck and back injuries usually occur in areas where depths change with the tide or current. At beaches, these injuries often occur mainly when someone plunges head-first into shallow water or a breaking wave. These injuries also result from collisions with an underwater hazard, such as a rock, tree stump or sandbar.

This chapter describes how to recognize and care for possible head, neck or back injuries.

<sup>1</sup> The Spinal Cord Injury Information Network, June 2006.

## CAUSES OF HEAD, NECK AND BACK INJURIES

Lifeguards should suspect that a head, neck or back injury occurred in the following situations:

- Any injury caused by entry into shallow water
- Injury as a result of a fall greater than a standing height
- An injury involving a diving board, water slide or a person entering water from a height, such as an embankment, cliff or tower
- A person holding his or her neck or head and complaining of pain
- A person complaining of neck or back pain, tingling in the extremities or weakness
- Someone who appears to be frail or over 65 years of age
- A person who is not fully alert
- Someone who appears to be intoxicated
- Someone with a head or neck injury
- Injury by a force to the head

Signs and symptoms of possible head, neck or back injury include—

- Changes in the level of consciousness.
- Severe pain or pressure in the head, neck or back.
- Loss of balance.
- Partial or complete loss of movement of any body area.
- Tingling or loss of sensation in the hands, fingers, feet or toes.
- Persistent headache.
- Unusual bumps, bruises or depressions on the head, neck or back.
- Seizures.
- Blood or other fluids in the ears or nose.
- Heavy external bleeding of the head, neck or back.
- Impaired breathing or vision as a result of injury.
- Nausea or vomiting.
- Bruising of the head, especially around the eyes and behind the ears.

## CARING FOR HEAD, NECK AND BACK INJURIES

Caring for a head, neck or back injury is similar to caring for other serious bone or muscle injuries. A lifeguard must stabilize and restrict motion of the head, neck and back. Because movement can cause further damage, keep the victim as still as possible until emergency medical services (EMS) personnel arrive and take over. If unsure whether the victim has a serious injury, always provide care as if the head, neck or back is injured. The care provided to a victim with a head, neck or back injury depends on—

- The victim's condition, including whether he or she is breathing and shows signs of life (movement and normal breathing).

- The location of the victim (shallow or deep water, at the surface of the water, submerged or not in the water).
- The availability of additional help, such as other lifeguards, bystanders, fire fighters, police or EMS personnel.
- The facility's specific procedures.
- The air and water temperature.

## CARING FOR HEAD, NECK AND BACK INJURIES IN THE WATER

If a head, neck or back injury is suspected, follow these general rescue procedures:

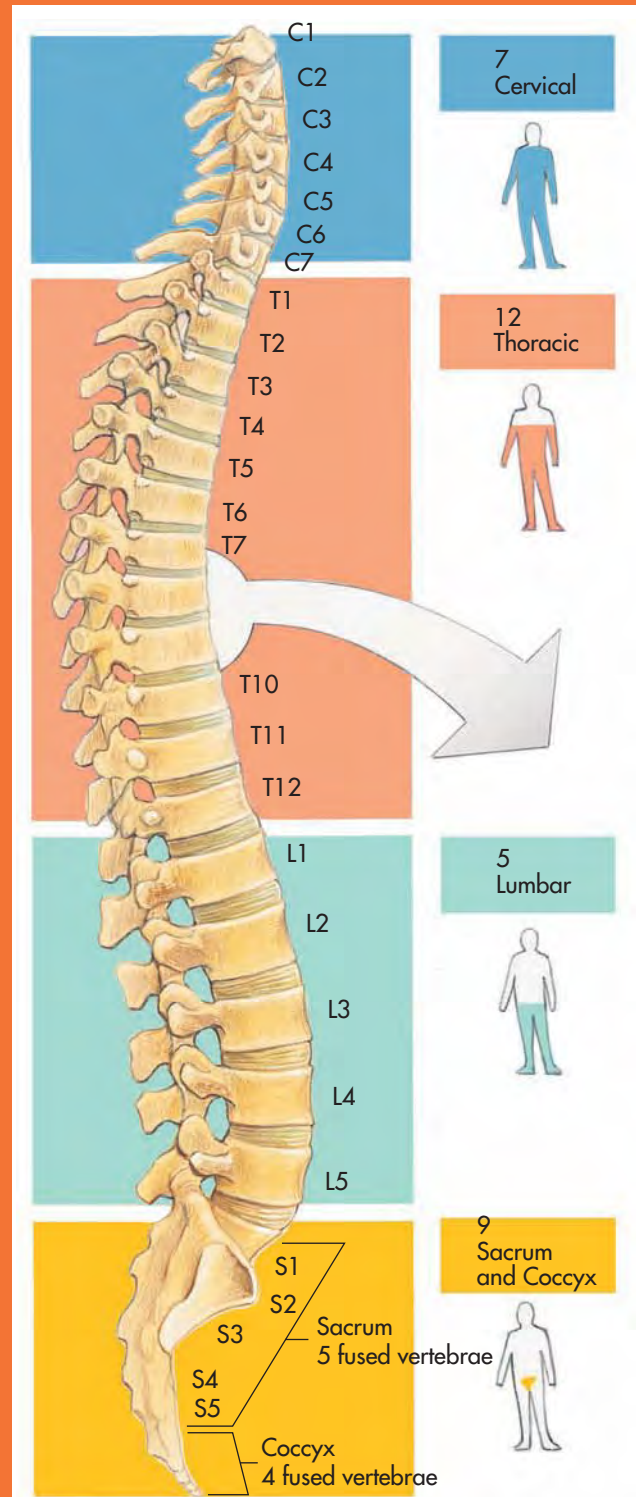
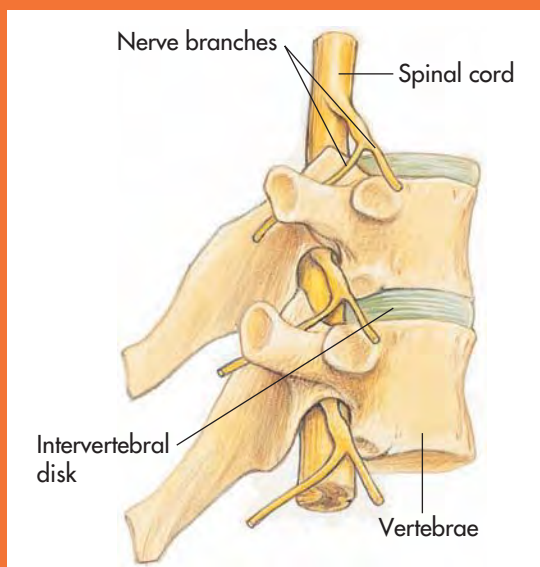
- 1. Activate the facility's emergency action plan (EAP).** Alert other lifeguards that a victim has a possible head, neck or back injury in addition to any other problems identified. The other lifeguards will perform their responsibilities as indicated in the facility's EAP for head, neck and back injuries. These responsibilities may include:
  - Providing backup coverage.
  - Clearing the water of patrons.
  - Getting the backboard and head immobilizer.
  - Summoning EMS personnel by calling 9-1-1 or the local emergency number.
- 2. Assess the victim's condition.** Determine if the victim's condition has changed. For example, the victim may have been at the surface of the water, but may have submerged before a lifeguard approached.
- 3. Safely enter the water.** If the victim is near a pool wall or pier, minimize water movement by using a slide-in entry rather than a compact jump or stride jump. If a running entry is used, slow down before reaching the victim.
- 4. Perform an appropriate rescue.** Swim to the victim to make contact and use an in-line stabilization technique to minimize movement of the victim's head, neck and back. Use an appropriate in-line stabilization technique based on the victim's location and whether the victim is face-up or face-down.
- 5. Move the victim to shallow water whenever possible.** It is much easier to care for the victim in shallow water. If the victim cannot be moved to shallow water—for example, the victim is in a deep-water pool—both the victim and lifeguard can be supported with a rescue tube. Whenever possible, seek the help of other rescuers for head, neck and back injuries in deep water.
- 6. Check for consciousness and signs of life.** A victim who can talk is conscious and breathing. If the victim is unconscious, look for movement and check for normal breathing for no more than 10 seconds. If there are no signs of life, immediately remove the victim



## The Spine

The spine is a flexible column that supports the head and trunk and protects the spinal cord. The *spinal column* extends from the base of the skull to the tip of the tailbone. It is made of small bones called *vertebrae*. The *vertebrae* are separated by cushions of cartilage, called disks. This cartilage acts as a shock absorber when you walk, run or jump. The *spinal cord*, a bundle of nerves extending from the skull to the lower back, runs through openings inside the vertebrae. Nerves reach the body through openings on the sides of the vertebrae.

The spine is divided into five regions: cervical (neck), thoracic (mid-back), lumbar (lower back), sacrum and coccyx (small triangular bone at the bottom of the spine). Although injuries can occur anywhere along the spine, most aquatic injuries damage the cervical region. A serious injury is likely to cause temporary or permanent paralysis, even death. The extent of paralysis depends on which area of the spinal cord is damaged.



from the water using a backboard (see page 169, Caring for Head, Neck and Back Injuries—An Unconscious Victim).

7. **Remove the victim from the water.** Place and secure the victim on a backboard and remove the victim from the water.
8. **Provide emergency care as needed.** Once the victim is out of the water—
  - Use personal protective equipment, such as disposable gloves and breathing barriers.
  - Perform an initial assessment and perform rescue breathing, cardiopulmonary resuscitation (CPR) or first aid, if needed.
  - Continue to monitor the victim.
  - Minimize shock by keeping the victim from getting chilled or overheated.
  - Administer emergency oxygen, if available and trained to do so.
  - If the victim vomits, tilt the backboard on its side to help clear the vomit from the victim's mouth.

### Manual In-Line Stabilization Techniques

Two different techniques are used in the water to minimize movement of the victim's head and neck: the head splint technique and the head and chin support. Both techniques can be used in shallow or deep water and with a face-up or face-down victim at, near or below the surface.

Fig. 10-1



### Head Splint

To perform the head splint technique on a face-down victim in shallow or deep water who is at or near the surface, the lifeguard should—

1. Approach the victim from the side. In deep water, use the rescue tube for support (**Fig. 10-1**).
2. Grasp the victim's arms midway between the shoulder and elbow. Grasp the victim's right arm with the right hand and the victim's left arm with the left hand. Gently move the victim's arms up alongside the head.
3. Squeeze the victim's arms against his or her head to help hold the head in line with the body (**Fig. 10-2**).
4. Glide the victim slowly forward. If in shallow water, the lifeguard should lower him or herself to shoulder depth before gliding the victim forward. Continue moving slowly and turn the victim until he or she is face-up. To do this, push the victim's arm that is closest to the lifeguard under the water while pulling the victim's other arm across the surface toward the lifeguard (**Fig. 10-3**).
5. Position the victim's head close to the crook of the lifeguard's arm, with the head in line with the body (**Fig. 10-4**).
6. Hold the victim in this position until help arrives. If the victim is in deep water, move the victim to shallow water, if possible.

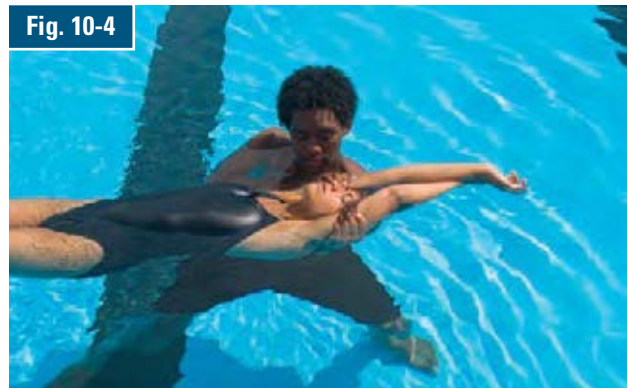
Fig. 10-2



Fig. 10-3



Fig. 10-4





7. Check for consciousness and signs of life. If there are no signs of life, immediately remove the victim from the water.

To perform the head splint technique on a face-up victim in shallow or deep water at or near the surface, the lifeguard should—

1. Approach the victim's head from behind, or stand behind the victim's head. In shallow water, the lifeguard should lower his or her body so that the water level is at his or her neck. In deep water, the lifeguard should use the rescue tube for support.
2. Grasp the victim's arms midway between the shoulder and elbow with the thumbs to the inside of each of the victim's arms (Fig. 10-5, A-B). Grasp the victim's right arm with the right hand and the victim's left arm with the left hand. Gently move the victim's arms up alongside the head while the lifeguard repositions him or herself to the victim's side while trapping the victim's head with his or her arms.
3. Slowly and carefully squeeze the victim's arms against his or her head to help hold the head in line with the body. Do not move the victim any more than necessary (Fig. 10-5, C-D).

Fig. 10-5



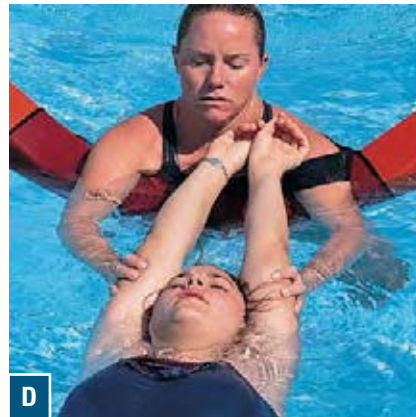
A



B



C



D



E



F

4. Position the victim's head close to the crook of the lifeguard's arm, with the head in line with the body (Fig. 10-5, E-F).
5. Hold the victim in this position until help arrives. If the victim is in deep water, move the victim to shallow water if possible.
6. Check for consciousness and signs of life. If there are no signs of life, immediately remove the victim from the water.

### Head and Chin Support

The head and chin support is used for face-down or face-up victims who are at or near the surface in shallow water at least 3 feet deep. In deep water, the head and chin support can be used for a face-up victim. Use a rescue tube for support. The head and chin support is not appropriate in all situations:

- Do not use the head and chin support for a face-down victim in water less than 3 feet deep. This technique requires the lifeguard to submerge and roll under the victim while maintaining in-line stabilization. It is difficult to do this in water less than 3 feet deep without risking injury to the lifeguard or the victim.
- Do not use the rescue tube for support when performing the head and chin support on a face-down victim in deep water. This impedes the lifeguard's ability to turn the victim over. However, once the victim is turned face-up, another lifeguard can place a rescue tube under the rescuer's armpits to help keep the victim and rescuer afloat (Fig. 10-6).

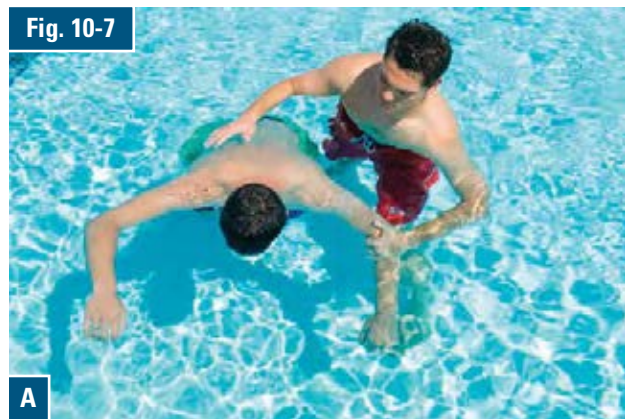
To perform the head and chin support for a face-up or face-down victim at or near the surface, the lifeguard should—

1. Approach the victim from the side (Fig. 10-7, A).
2. With the lifeguard's body at about shoulder depth in the water, place one forearm along the length of the victim's breastbone and the other forearm along the victim's spine.
3. Use the hands to gently hold the victim's head and neck in line with the body. Place one hand on the victim's lower jaw and the other hand on the back of the



Fig. 10-6

Fig. 10-7



A



B



C

lower head. Be careful not to place pressure or touch the front and back of the neck (Fig. 10-7, B-C).

4. Squeeze the forearms together, clamping the victim's chest and back. Continue to support the victim's head and neck.
  - If the victim is face-down, the lifeguard must turn him or her face-up. Using the head and chin support to stabilize the spine, slowly move the victim forward to help lift the victim's legs. The lifeguard should turn the victim toward him or herself while submerging (Fig. 10-7, D).
  - Roll under the victim while turning the victim over (Fig. 10-7, E). Avoid twisting the victim's body. The



Fig. 10-7



Fig. 10-8



victim should be face-up when surfacing on the other side (Fig. 10-7, F).

5. Hold the victim face-up in the water until help arrives. If the victim is in deep water, move the victim to shallow water if possible.
6. Check for consciousness and signs of life. If there are no signs of life, immediately remove the victim from the water.

### Submerged Victims

The head and chin support or head splint technique can be used for a submerged victim found face-up, face-down or on one side (Fig. 10-8, A-B). Lifeguards

should follow the general steps for the head and chin support or the head splint while bringing the victim to the surface at an angle. Turn the victim face-up, if needed, just before reaching the surface or at the surface (Fig. 10-8, C).

### Using a Backboard in Shallow Water

At least two lifeguards are needed to place and secure a victim on a backboard, but additional lifeguards or bystanders should also help, if available. After stabilizing the victim's head and neck with either the head splint or the head and chin support, the lifeguards should place and secure the victim on a backboard. Lifeguards should

## The Backboard

A backboard is a standard piece of rescue equipment at all aquatic facilities. Lifeguards place and secure a victim suspected of head, neck or back injury on a backboard to restrict motion of the head, neck and back when removing the victim from water. Backboards come in different shapes, sizes and buoyancy. They vary in materials, such as plastic or marine plywood, and should have a non-absorptive surface that can be cleaned easily. Desirable qualities for a backboard at an aquatic facility include—

- Ample handholds positioned on all sides of the backboard.
- Multiple anchoring points for the straps to permit adjustments for victims of various sizes.
- Slats or “runners” under the bottom of the backboard to allow for easier lifting.
- Large size and width to place and secure victims of various sizes.
- Features that allow for the attachment of head immobilizers.



Lifeguards should be familiar with the backboard(s) used at their facility and should practice backboarding techniques regularly during in-service training to maintain their skills.

follow these steps to backboard a victim in shallow water:

1. **Rescuer 1** continues to provide manual in-line stabilization until another rescuer(s) arrives (**Fig. 10-9, A**). **Rescuer 2** enters the water, submerges the backboard and positions it under the victim so that it extends slightly beyond the victim’s head (**Fig. 10-9, B**).
2. While **Rescuer 2** raises the backboard into place, depending on the manual in-line stabilization technique used, both rescuers should follow the steps below.

### Head Splint

- **Rescuer 1** moves the elbow that is under the victim toward the top of the backboard while continuing to apply pressure on both arms. **Rescuer 2** uses the head and chin support to stabilize the victim (one hand and arm on the chin and chest, the other hand and arm under the backboard) (**Fig. 10-10, A**).
- Once the backboard is in place, **Rescuer 1** lowers the victim’s arms, moves to the victim’s head and places the rescue tube under the head of the backboard (**Fig. 10-10, B**). **Rescuer 1** supports the backboard with his or her forearms. Lastly, **Rescuer 1** stabilizes the victim’s head by placing his or her hands along each side of the victim’s head (**Fig. 10-10, C**).

### Head and Chin Support

- **Rescuer 1** carefully removes his or her arm from beneath the victim. **Rescuer 1** then keeps the hand on the chin and arm on the chest and places the other hand and arm under the backboard (**Fig. 10-11, A**).
- Once the backboard is in place, **Rescuer 2** moves to the victim’s head and places a rescue tube under the head of the backboard (**Fig. 10-11, B**). **Rescuer 2** then supports the backboard with his or her forearms. Lastly, **Rescuer 2** stabilizes the victim’s head by placing his or her hands along each side of the victim’s head (**Fig. 10-11, C**).

3. The rescuer who is not positioned at the victim’s head secures the victim on the backboard (**Fig. 10-12, A**). The victim should be secured with a minimum of three straps: across the victim’s chest, hips and thighs. Secure the straps in the following order:
  - Strap high across the chest and under the victim’s armpits. This helps prevent the victim from sliding on the backboard during the removal.



Fig. 10-9



Fig. 10-10

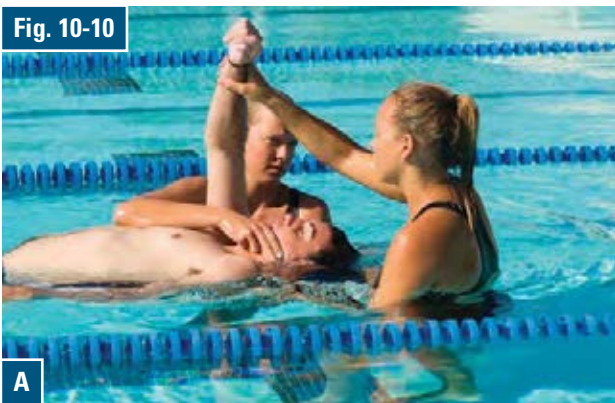


Fig. 10-11



- Strap across the hips with the victim's arms and hands secured.
  - Strap across the thighs.
  - Recheck straps to be sure that they are secure (Fig. 10-12, B).
4. After all the straps have been checked and properly secured, the lifeguard secures the victim's head to the backboard, using a head immobilizer and a strap across the victim's forehead (Fig. 10-13, A-B).
  5. If not done so already, the rescuers should bring the victim to the side of the pool.

If additional lifeguards are available to assist in the backboarding of a victim in shallow water, they can assist the rescuers by—

- Assuming a position at the victim's head to provide stabilization.
- Assisting in submerging and positioning the backboard under the victim.
- Supporting the backboard while the straps and head immobilizer are secured.
- Retrieving the head immobilizer.

### Removal from the Water

Once the victim is secured on the backboard, the rescuers should remove the victim from the water. To remove the victim from a pool—

1. Position the backboard with the head end by the side of the pool and the foot end straight out into the pool.
2. With one rescuer at each side, lift the head of the backboard slightly and place it on the edge of the gutter or on the edge of the pool deck, if possible (Fig. 10-14). Use one or two rescue tubes if needed to support the foot end of the board (Fig. 10-15).
3. One rescuer gets out of the pool while the other rescuer maintains control of the backboard. Once out of the pool, the rescuer on deck then grasps the head of the backboard while the other rescuer gets out of the pool (Fig. 10-16).
4. Together, the rescuers stand and step backward, pulling the backboard and sliding it up over the edge of the deck and out of and away from the water (Fig. 10-17). Use proper lifting techniques to prevent injury:
  - Keep the back straight.
  - Bend at the knees.
  - Move in a controlled way without jerking or tugging.

If additional lifeguards are available to assist, they can help guide and remove the backboard and victim onto the deck.

Fig. 10-12



A



B

Fig. 10-13



A



B



Fig. 10-14



Fig. 10-15



Fig. 10-16



Fig. 10-17



### Removal from the Water—Extreme Shallow Water (Zero-Depth)

Many facilities have extreme shallow water areas, such as zero-depth pools, wave pools and sloping beaches at waterfront facilities. Some pools may also have zero-depth entries, such as a wheel chair ramp. To remove a victim from a zero-depth, have sufficient rescuers on each side of the backboard to support the victim's weight. After the victim is secured to the backboard, the rescuers—

- Carefully lift the backboard and victim up using proper lifting techniques to prevent injury.
- Remove the backboard and victim from the water by slowly walking out. Keep the board as level as possible during the removal (**Fig. 10-18**).
- Gently lower the backboard and the victim to the ground once out of the water using proper lifting techniques to prevent injury.

### Caring for Head, Neck and Back Injuries—An Unconscious Victim

Even though it is difficult to determine in the water if an unconscious victim is breathing, a lifeguard should attempt to check for signs of life by looking for movement

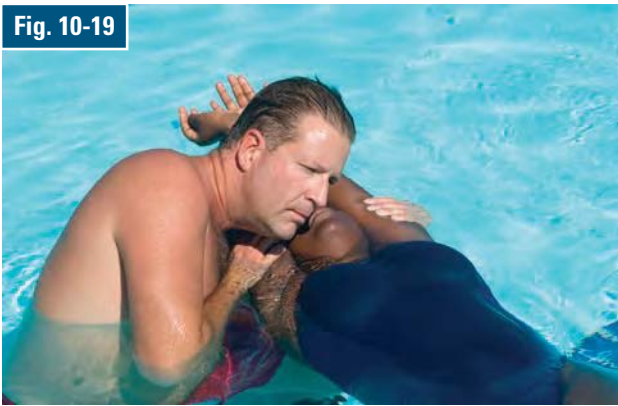
and looking, listening and feeling for normal breathing for no more than 10 seconds while maintaining in-line stabilization (**Fig. 10-19**). If a second lifeguard is available to assist, he or she can check for signs of life while the first lifeguard maintains in-line stabilization (**Fig. 10-20**). If the victim is not breathing or shows no signs of life, immediately remove the victim from the water.

- Remove the victim from the water using the two-person removal (see Chapter 5) or, if the facility has a zero-depth entry, by placing the victim on the back-

Fig. 10-18



Fig. 10-19



board and removing the backboard and victim by lifting the backboard and walking out of the water. Make every effort to minimize movement of the victim's head and neck.

- Do not waste time strapping the victim to the backboard because this would delay urgently needed care.

Once the victim is removed from the water—

- Use personal protective equipment, such as disposable gloves and breathing barriers.
- Perform an initial assessment. Use the two-handed jaw-thrust technique to open the airway to minimize movement of the head, neck and back. If the jaw-thrust maneuver does not open the airway, use the head-tilt/chin-lift technique to open the airway.
- Perform rescue breathing, CPR or first aid, if needed.
- Minimize shock by keeping the victim from getting chilled or overheated.
- Administer emergency oxygen if available and trained to do so.

### Caring for Head, Neck and Back Injuries in Deep Water

Fortunately, head, neck or back injuries rarely occur in deep water. If one does occur, the victim often can be moved to shallow water. A lane line or safety line may

Fig. 10-20



need to be removed to reach shallow water. If the victim cannot be moved to shallow water, such as in a separate diving well, a lifeguard should use the rescue tube to help support him or herself and the victim until help arrives.

To stabilize the victim's spine and secure the victim on the backboard in deep water, the lifeguards should slightly modify the procedures used in shallow water and follow these steps:

1. **Rescuer 1** minimizes movement of the victim's head, neck and back by using either the head splint technique or the head and chin support for a face-up victim (**Fig. 10-21, A-B**). If the victim is submerged, **Rescuer 1** leaves the rescue tube on the surface and does a feet-first surface dive to the victim. He or she brings the victim to the surface using the head and chin support or the head splint. **Rescuer 2** retrieves **Rescuer 1's** rescue tube and inserts it under **Rescuer 1's** armpits.
2. To place and secure the victim on a backboard, **Rescuer 1** moves the victim to the side of the pool or, if possible, toward the corner of the pool. **Rescuer 2** places a rescue tube under the victim's knees to raise the legs (**Fig. 10-22**). This makes it easier to place the backboard under the victim. **Rescuer 2** then places the backboard under the victim while **Rescuer 1** continues to maintain manual in-line stabilization (**Fig. 10-23**). Both rescuers should follow the steps below when perform-

Fig. 10-21



A



B



Fig. 10-22



ing either the head splint technique or a head and chin support:

### Head Splint

- As the backboard is raised into place, **Rescuer 1** moves the re-  
elbow that is under the victim toward the top of the backboard while continuing to apply pressure on both arms. **Rescuer 2** uses the head and chin support to stabilize the victim (one hand and arm on the chin and chest, the other hand and arm under the backboard) (Fig. 10-24).
- Once the backboard is in place, **Rescuer 1** removes the rescue tube under the victim's knees by sliding the rescue tube towards him or herself. **Rescuer 1** then lowers the victim's arms, moves to the victim's head and places a rescue tube under the head of the backboard (Fig. 10-25). **Rescuer 1** supports the backboard with his or her fore-arms. **Rescuer 1** then stabilizes the victim's head by placing his or her hands along each side of the victim's head (Fig. 10-26).

### Head and Chin Support (Face-Up)

- As the backboard is raised into place, **Rescuer 1** carefully re-  
moves his or her arm from beneath the victim. **Rescuer 1** then keeps the hand on the chin and the arm on the chest and places the other hand and arm under the backboard.
- Once the backboard is in place, **Rescuer 2** removes the rescue tube under the victim's knees by sliding the rescue tube towards him or herself (Fig. 10-27). **Rescuer 2** then moves to the victim's head and places a rescue tube under the head of the backboard. **Rescuer 2** supports the backboard with his or her fore-arms and stabilizes the victim's head by placing his or her hands along each side of the victim's head (Fig. 10-28).

Fig. 10-23



Fig. 10-24



Fig. 10-25



Fig. 10-26





Fig. 10-27



Fig. 10-28

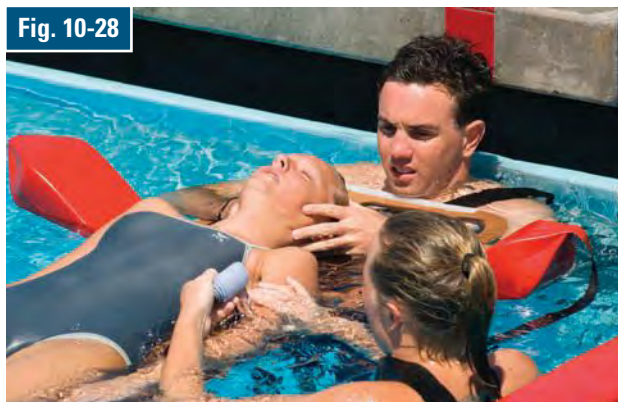


Fig. 10-29



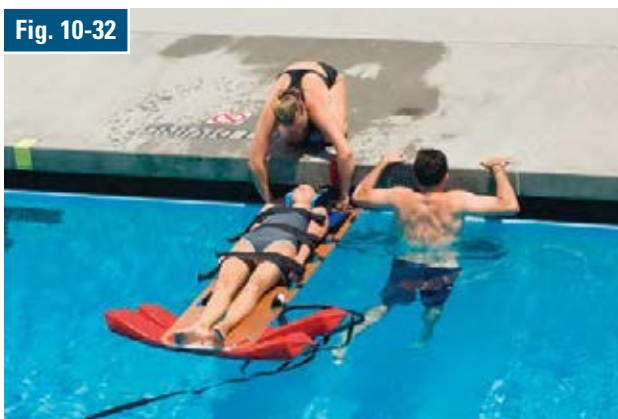
Fig. 10-30



Fig. 10-31



Fig. 10-32



3. The rescuer who is not positioned at the victim's head secures the victim on the backboard by placing straps at least across the victim's chest, hips and thighs (Fig. 10-29). After all the straps have been checked and properly secured, the rescuer secures the victim's head to the board, using a head immobilizer and a strap across the victim's forehead (Fig. 10-30).
4. Position the backboard with the head end by the side of the pool and the foot end straight out into the pool.

5. With one rescuer at each side, lift the head of the backboard slightly and place it on the edge of the gutter or the edge of the pool deck, if possible. Use one or two rescue tubes if needed to support the foot end of the board (Fig. 10-31).
6. One rescuer gets out of the pool while the other rescuer maintains control of the backboard. Once out of the pool, the rescuer on deck then grasps the head of the backboard while the other rescuer gets out of the pool (Fig. 10-32).



Fig. 10-33



Fig. 10-34

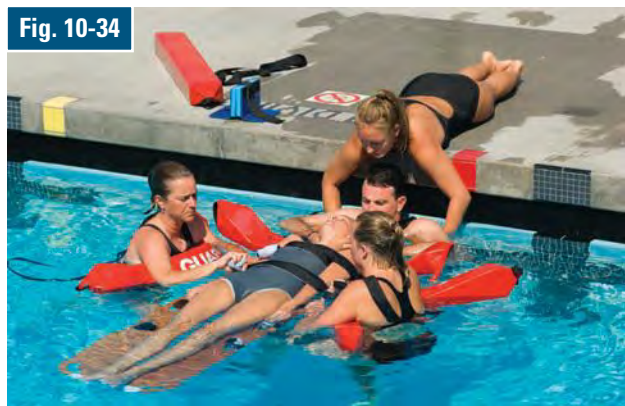
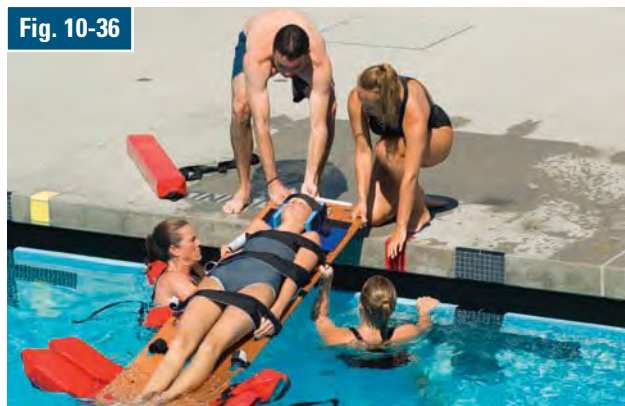


Fig. 10-35



Fig. 10-36



7. Together the rescuers stand and step backward, pulling the backboard and sliding it up over the edge of the deck and out of and away from the water. Use proper lifting techniques to prevent injury:
  - Keep the back straight.
  - Bend at the knees.
  - Move in a controlled way without jerking or tugging.

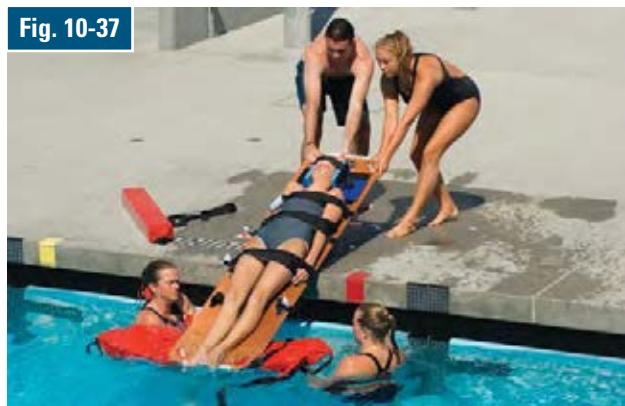
If additional lifeguards are available to assist in the backboarding of a victim in deep water, they can assist the rescuers by—

- Supporting the rescuer at the head of the backboard (Fig. 10-33).
- Placing and securing the straps along the chest, hips and thighs (Fig. 10-34).
- Placing the head immobilizer and securing the strap across the forehead (Fig. 10-35).
- Guiding the backboard as it is being removed from the water (Fig. 10-36).
- Removing the backboard from the water (Fig. 10-37).

### Caring for Head, Neck and Back Injuries— Special Situations

In-line stabilization and backboarding can be more difficult to perform in some waterpark attractions and water-front facilities that have waves, currents and extreme

Fig. 10-37



shallow water. Moving water and confined spaces can cause problems. Facility management should provide information and skills practice for in-line stabilization and backboarding procedures used at the facility for specific attractions and environments during orientation and in-service trainings, which include emergency shut-off procedures for water flow and movement.

### Caring for Head, Neck and Back Injuries in Extreme Shallow Water

Caring for a victim of a head, neck or back injury who is face-down in extreme shallow water takes practice. If

the water level is such that the victim's upper body is partially out of the water (including the mouth and nose), the care for the victim is the same as care for a head, neck or back injury on land.

If a victim is found face-down in extreme shallow water, modify the head splint technique as follows:

1. The lifeguard should approach the victim from the side and move his or her arms slowly and carefully into po-

Fig. 10-38



Fig. 10-39



Fig. 10-40



sition. The lifeguard grasps the victim's right arm with his or her right hand and the left arm with his or her left hand and traps the victim's head between the arms (Fig. 10-38).

2. After the head is trapped between the arms, the lifeguard begins to roll the victim toward him or herself.
3. While rolling the victim, the lifeguard steps from the victim's side toward the victim's head and begins to turn the victim face-up (Fig. 10-39).
4. The lifeguard then lowers his or her arm on the victim's side that is closest to the lifeguard so that the victim's arms go over the top of the lifeguard's arm as he or she steps toward the victim's head. It is important to maintain arm pressure against the victim's head, since the lifeguard's hand position will change during this maneuver. The lifeguard will now be positioned above and behind the victim's head (Fig. 10-40).
5. The lifeguard should hold the victim in this position.
6. The lifeguard can comfort the victim while another rescuer monitors the victim's ABCs until EMS personnel arrive and take over.

### Moving Water

Lifeguards may need to modify the care provided to a person with a head, neck or back injury if waves or currents are moving the water. In water with waves, a lifeguard should move the victim to calmer water, if possible. At a waterfront, a pier or raft may reduce the waves. If there is no barrier from the waves, have other rescuers form a "wall" with their bodies to block the waves. At a wave pool, stop the waves by pushing the emergency stop button. Remember, even though the button has been pushed, residual wave action will continue for a short time.

Lifeguard orientation and in-service trainings will cover the specific conditions at the facility and teach lifeguards how to adapt the head, neck and back injury management procedures learned previously in this chapter.

**Rivers, Streams and Winding River Attractions.** A special problem in rivers, streams and winding rivers at waterparks is that the current can pull or move the victim. At waterparks, a facility's EAP may include signaling another lifeguard to stop the flow of water in a winding river by pushing the emergency stop button. In all cases, lifeguards should—

- Ask other lifeguards or patrons for help in keeping objects and people from floating into the rescuer while he or she is supporting the victim.
- Not let the current press sideways on the victim or force the victim into a wall. This would twist the victim's body. Keep the victim's head pointed upstream into the current (Fig. 10-41).
- This position also reduces the splashing of water on the victim's face. Once a manual in-line stabilization



Fig. 10-41



Fig. 10-42



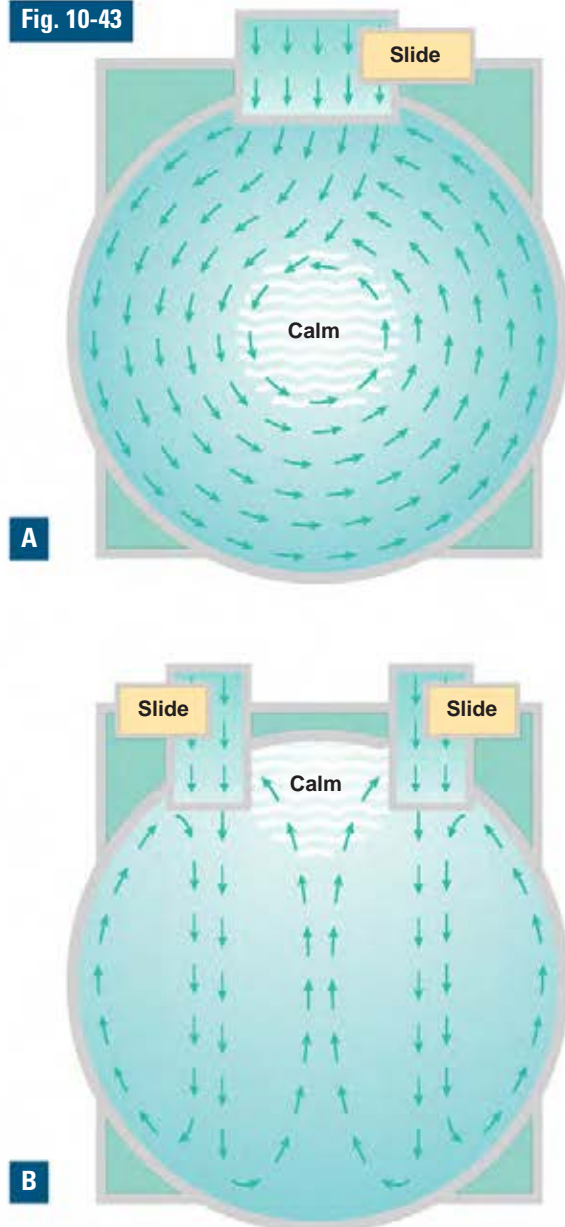
technique is performed and the victim is turned face-up, slowly turn the victim so that the current pulls his or her legs around to point downstream (Fig. 10-42).

- Place the victim on a backboard following the facility's backboarding procedures.

**Catch Pools.** The water in a catch pool moves with more force than in a winding river and can make it difficult to hold a victim still.

- If a person is suspected of having a head, neck or back injury in a catch pool, the lifeguard should immediately signal other lifeguards to stop sending riders.
- If possible, someone should stop the flow of water by pushing the emergency stop button.
- Once a manual in-line stabilization technique is performed and the victim is turned face-up, the lifeguard should move the victim to the calmest water in the catch pool if water is still flowing. If there is only one slide, the calmest water is usually at the center of the catch pool (Fig. 10-43, A). If several slides empty into the same catch pool, calmer water is usually between two slides (Fig. 10-43, B).
- The lifeguard should place the victim on a backboard following the facility's backboarding procedures.

Fig. 10-43

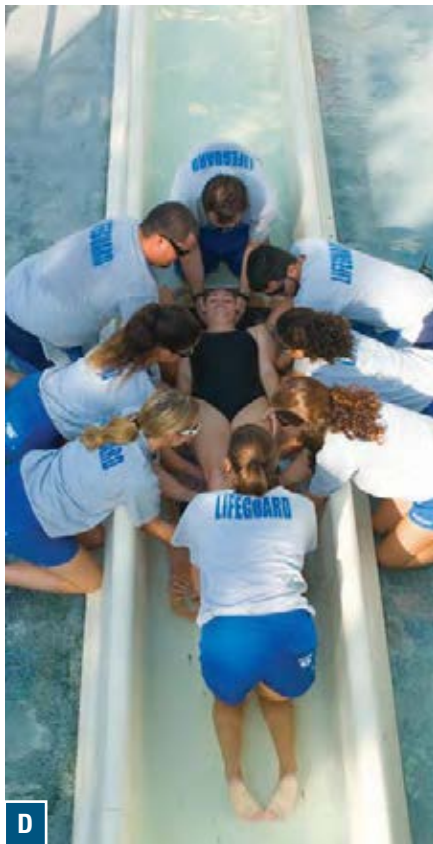
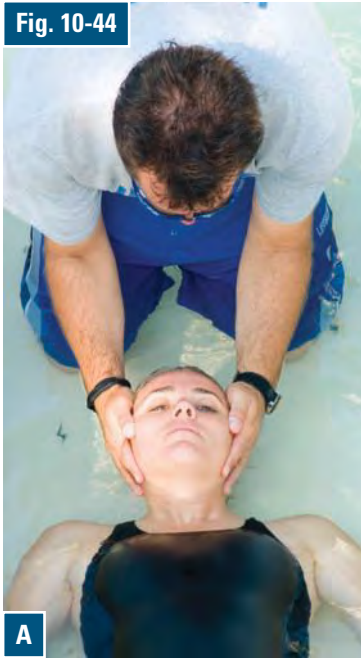


**Speed Slides.** The narrow space of a speed slide causes an extra problem for a head, neck or back injury. A head, neck or back injury may happen if the victim's body twists or turns the wrong way, someone strikes his or her head on the side of the slide or a patron sits up and tumbles down the slide. Backboarding can be a challenge because the water in the slide is only 2 or 3 inches deep and does not help support the victim.

This backboarding procedure requires several lifeguards:

1. The first rescuer performs manual in-line stabilization by placing his or her hands on both sides of the

Fig. 10-44





victim's head while the victim is on the slide (Fig. 10-44, A).

2. Other rescuers should carefully lift the victim so that the backboard may be slid in place (Fig. 10-44, B).
3. The backboard should be slid beneath the victim from the feet to the head (Fig. 10-44, C).
4. The victim should then be lowered onto the backboard (Fig. 10-44, D).
5. After the victim is secured to the backboard and the head is immobilized, the rescuers should lift the backboard and victim out of the slide (Fig. 10-44, E).

## HEAD, NECK AND BACK INJURIES ON LAND

If a head, neck or back injury is suspected, activate the facility's EAP and follow the general procedures for injury or sudden illness on land:

- Size up the scene.
- Perform an initial assessment.
- Summon EMS personnel.
- Perform a secondary assessment.

Use appropriate personal protective equipment, such as disposable gloves and breathing barriers.

### Caring for Head, Neck and Back Injuries on Land

If a victim is suspected of having a head, neck or back injury, the lifeguard should tell him or her not to nod or shake his or her head but to say yes or no. The goal is to minimize movement of the head, neck and back. To care for injuries to the head, neck or back for a victim who is sitting or lying down, the lifeguard should—

- Minimize movement of the victim's head, neck and back by putting the lifeguard's hands on both sides of the victim's head. Have the victim remain in the position in which he or she was found until EMS personnel arrive and take over.
  - For a victim in a sitting position, the lifeguard faces the victim and places his or her hands on both sides of the victim's head (Fig. 10-45, A).
  - For a victim lying down, the lifeguard positions him or herself behind the victim's head and places his or her hands on both sides of the victim's head (Fig. 10-45, B).
- Continue to monitor the victim—watch for changes in consciousness and breathing.

### Caring for a Standing Victim

If encountering a patron who is standing with a suspected head, neck or back injury, a lifeguard should not

Fig. 10-45



A



B

have the person sit or lie down. Minimize movement of the victim's head by placing his or her hands on both sides of the victim's head (Fig. 10-46).

If the victim's condition becomes unstable (e.g., the victim complains of dizziness, has a potential life-threatening condition or begins to lose consciousness), slowly lower the victim to the ground with the assistance of other lifeguards. Try to maintain in-line stabilization while the victim is being lowered.

If the victim's condition is stable and the facility's procedures require the victim to be secured to a backboard

Fig. 10-46



Fig. 10-47



and lowered to the ground, the following procedure can be used with a minimum of three lifeguards:

**1. Rescuer 1** approaches the victim from the front and performs in-line stabilization of the victim's head and neck by placing one hand on each side of the head (Fig. 10-47).

Fig. 10-48



**2. Rescuer 2** retrieves a backboard and places it against the victim's back, being careful not to disturb **Rescuer 1's** in-line stabilization of the victim's head. **Rescuer 3** assists **Rescuer 2** in positioning the backboard so that the board is centered behind the victim (Fig. 10-48).

Fig. 10-49



A



B



C



D



3. While **Rescuer 3** holds the backboard, **Rescuer 2** secures the victim to the backboard by placing and securing straps across the victim's chest and under the victim's armpits, hips and thighs (**Fig. 10-49, A-B**). This helps prevent the victim from sliding on the backboard when it is lowered. **Rescuer 2** rechecks the straps to be sure that they are secure (**Fig. 10-49, C**). **Rescuer 2** then secures the victim's head to the backboard using a head immobilizer and strap across the victim's forehead (**Fig. 10-49, D**).
4. **Rescuer 2** and **Rescuer 3** place their inside hands underneath the victim's armpit, in between the victim's arm and torso, and grasp the backboard. These rescuers should grasp a handhold that is at the victim's armpit level or higher (**Fig. 10-49, E**).
5. When the victim is secured to the board, **Rescuer 1** moves to the back of the board and grasps the top of the backboard (**Fig. 10-49, F**). **Rescuer 1** informs the victim that they will now begin to lower him or her to the floor. **Rescuer 1** then gives the signal to the other two rescuers to begin lowering the victim to the ground. While lowering the victim to the ground, **Rescuer 2** and **Rescuer 3** should walk forward and bend at the knees to avoid back injury (**Fig. 10-49, G**).

Fig. 10-49



E



F



G

### Concussions

Any significant force to the head can cause an injury ranging from bleeding to a concussion. A *concussion* is a temporary impairment of brain function. It usually does not cause permanent physical damage to the brain. In most cases, the victim may lose consciousness for only an instant and may say that he or she “blacked out” or “saw stars.” A concussion sometimes results in a loss of consciousness for longer periods of time. Other times, a victim may be confused or have memory loss. Be aware that a person in the water who receives a severe blow to the head could lose consciousness temporarily and submerge. Anyone suspected of having any head injury in or out of the water should be examined by a health-care provider immediately.

### PUTTING IT ALL TOGETHER

Lifeguards need to recognize and be able to care for victims with head, neck or back injuries. To decide whether an injury could be serious, consider both its cause and the signs and symptoms. If a victim in the water is suspected of having a head, neck or back injury, make sure EMS personnel are summoned immediately. Minimize movement by using manual in-line stabilization. Secure the victim to a backboard to restrict motion of the head, neck and back. Avoid injury by always removing a victim from the water using proper lifting techniques. When the victim is out of the water, provide care as needed until EMS personnel arrive and take over.