



**State of Wisconsin**

**Emergency Medical Responder (EMR)**

**Advanced Skills**

**Standards & Procedures of**

**Practical Skills Manual**

**March 2013**



This manual is intended to provide examples of tried and proven techniques of caring for patients with the various injuries or illnesses that emergency medical responder personnel will encounter in the field. It does not provide the only method or technique that may be an acceptable approach in caring for an injury or illness. However, since the certification examinations used within the state are based on the current edition of this document as well as the current edition of the National EMS Educational Standards, the State of Wisconsin Scope of Practice, and is a companion to the emergency medical responder curriculum, it is an advantage to use these skill procedures as the basis for practice. This is a consensus document, endorsed by the EMS Training Centers, the Department of Health Services, the Bureau of Communicable Diseases and Emergency Response - EMS Program, as well as the EMS Physician Advisory Committee.

The Bureau of Communicable Diseases and Emergency Response - EMS Program, Wisconsin's EMS State Medical Director, the EMS Physician Advisory Committee, as well as regional and local physician medical direction are charged with developing and promulgating these minimum standards of care for emergency medical responder personnel.

This manual contains descriptions of those skills included in the scope of practice for the emergency medical responder and are identified as "advanced skills". The scope of practice for each level of provider and local protocol shall define which of these skills may be used at the local level.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

**TABLE OF CONTENTS**

**SECTION 1 – NON-VISUAL ADVANCED AIRWAY ..... 1-2**

**SECTION 2 – AUTO INJECTED EPINEPHRINE ..... 2-1**

**SECTION 3 – SPINAL IMMOBILIZATION ..... 3-1**

**GLOSSARY OF COMMON ABBREVIATIONS..... GLOSSARY 1**

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

**SECTION 1 – NON-VISUAL ADVANCED AIRWAY**

OBJECTIVE:

1. To properly set-up and place an advanced non-visualized dual lumen airway device in a patient to support respiration.

IMPORTANT POINTS:

1. Use appropriate body substance isolation precautions.
2. Ventilate the patient per AHA guidelines for a minimum of thirty (30) seconds prior to attempting placement.
3. Patient must have inadequate or absent breathing.
4. Patient must not have a gag reflex **and** no foreign body airway obstruction.
5. All contraindications for airway use must be considered prior to insertion.
6. A maximum of thirty (30) seconds should be allowed for each airway attempt.
7. A maximum of three (3) attempts per patient to place airway may be made.
8. The patient should be ventilated per AHA guidelines for a minimum of thirty (30) seconds between airway placement attempts.
9. Definitive assurance of placement through proper auscultation of breath and gastric sounds must be made.
10. Removal, when necessary, should not be delayed by repeated attempts to contact medical control.
11. The ability to suction the airway must be constantly available when inserting or removing the airway.
12. Obtaining baseline breath sounds prior to advanced airway placement can assist with evaluation of tube placement.

Gastric distention should be relieved by using gentle pressure to the abdomen. Suctioning of the oropharynx should be done according to suctioning S and P.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

SKILL PROCEDURE:

A. ESOPHAGEAL-TRACHEAL COMBITUBE (ETC)

1. INSERTION

- a. Reconfirm assessment of absent or inadequate breathing without a gag reflex
- b. Determine cuff integrity.
  1. Inflate cuffs.
  2. Disconnect syringes.
  3. Carefully inspect pharyngeal and distal cuffs.
  4. Carefully inspect valves and pilot cuffs.
  5. Deflate both cuffs.
- c. Prepare all necessary accessories.
  1. Preset inflation syringes to 100 mL and 15 mL (For Small Adult [SA] Model – Preset at 85 mL and 12 mL).
  2. Bag-valve-mask with supplemental oxygen.
  3. Water soluble lubricant.
  4. Suction device.
  5. Stethoscope.
- d. Suction as necessary; inspect patient's airway for obstructions, broken teeth, dentures, dental appliances, tongue piercings or other items that could damage cuffs.
- e. Ventilate for a minimum of thirty (30) seconds .
- f. Lubricate airway with water soluble lubricant as necessary.
- g. Position the patient supine with head in the neutral position. Do not hyperextend the patient's head.
- h. Remove oropharyngeal or nasopharyngeal airway if previously inserted.
- i. Inspect patient's airway for obstructions, broken teeth, dentures, dental appliances or other items that could damage cuffs.

Use the tongue-jaw lift to open the airway. Use appropriate C-spine stabilization in cases of known or suspected trauma.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

- j. While holding the patient's tongue and lower jaw to facilitate insertion:
  - 1. Insert Combitube airway-following the normal anatomical curvature of the oropharynx.
  - 2. Insert firmly but gently until the insertion markers (two black lines which encircle the proximal end of the airway) are aligned on opposite sides of the patient's teeth or gums.
    - a. Do not use force – If airway does not insert easily, withdraw and reattempt.
    - b. Ventilate for a minimum of thirty (30) seconds between attempts.
    - c. Maximum of thirty (30) seconds for each attempt.
    - d. Maximum of three (3) attempts.
    - e. Suction as necessary between attempts
  
- k. When Combitube is positioned:
  - 1. Inflate the pharyngeal cuff with 100 mL of air using large syringe (85 mL for Small Adult [SA] Model) through line #1 (blue).
  - 2. Insure Combitube has remained in proper position. (Combitube will move slightly with inflation).
  - 3. Remove syringe and insure pharyngeal cuff inflation has occurred by observing pilot balloon.
  - 4. Inflate distal cuff with 15 mL of air using smaller syringe (12 mL for Small Adult [SA] Model) through line #2 (white).
  - 5. Remove syringe and insure distal cuff inflation has occurred by observing pilot balloon.
  
- l. Ventilate the patient.
  - 1. Attach bag-valve-mask (BVM) to primary tube #1 (blue) and ventilate patient.
  - 2. While ventilating, confirm tube placement by auscultation of breath and epigastric sounds.
    - i. Esophageal placement:
      - a. Breath sounds present high axillary.
      - b. Breath sounds present bilaterally.
      - c. Epigastric sounds are absent.

Always be certain that both syringes stay with the patient as long as s/he is intubated with the Combitube.

The presence of certain chest injuries (i.e. pneumothorax, hemothorax, etc) will result in absent or diminished breath sounds on the affected side(s) even with proper placement.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

- d. Continue to ventilate through tube #1 (blue).
- ii. Tracheal placement:
- a. Breath sounds are not present high axillary.
  - b. Breath sounds are not present bilaterally.
  - c. Epigastric sounds are present.
  - d. Discontinue ventilation through primary tube #1 (blue).
  - e. Ventilate through secondary tube #2 (clear).
  - f. Reassess breath and epigastric sounds to confirm tracheal placement.
- iii. Unknown placement:
- a. Breath sounds are not present high axillary.
  - b. Breath sounds are not present bilaterally.
  - c. Epigastric sounds are not present.
  - d. Deflate cuffs (blue then white).
  - e. Reposition airway – withdrawing approximately ½ inch.
  - f. Reinflate cuffs with appropriate volume of air (blue then white)
  - g. Begin ventilations through primary tube #1 (blue) and reassess breath and epigastric sounds to confirm placement.
  - h. Ventilate as appropriate.
- iv. Placement remains unknown:
- a. Follow removal procedures.
  - b. Ventilate patient for minimum of thirty (30) seconds.
  - c. Reattempt placement (maximum of three (3) attempts) starting at the beginning of the insertion steps.
- Local protocols may alter the sequence in which breath and epigastric sounds are checked. Regardless of the sequence order, epigastric and bilateral breath sounds must be assessed.
- Bilateral breath sounds, and/or epigastric sounds, may or may not be present due to reasons other than incorrect tube placement.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

2. REMOVAL

1. Contact medical control (local protocol).
2. Prepare suction and emesis collection devices.
3. Position patient in lateral recumbent position when feasible, observing appropriate C-spine precautions for trauma patients.
4. Use large syringe to deflate cuff #1 (blue) until pilot balloon is completely deflated.
5. Use small syringe to deflate cuff #2 (white) until pilot balloon is completely deflated.
6. Immediately withdraw airway with a smooth and steady motion while maintaining normal curvature of the pharynx.
7. Suction as necessary.
8. Monitor the patient's airway and breathing closely.
9. Provide high-flow oxygen via non-rebreather mask.
10. Consider nasopharyngeal airway and assist ventilations as necessary.

Expect that the patient will vomit.

B. KING LTS-D ADVANCED AIRWAY

1. INSERTION

1. Reconfirm assessment of absent or inadequate breathing without a gag reflex.
2. Determine correct size airway based on patient's height.
3. Determine cuff integrity:
  - a. Inflate cuffs.
  - b. Disconnect syringes.
  - c. Carefully inspect pharyngeal and distal cuff.
  - d. Carefully inspect valve and pilot cuff.
  - e. Deflate cuffs.
4. Prepare all necessary accessories:
  - a. Preset inflation syringe to correct amount for device size.
  - b. Bag-valve-mask with supplemental oxygen.
  - c. Water soluble lubricant.
  - d. Suction device.
  - e. Stethoscope.



## State of Wisconsin – Standards & Procedures of Practical Skills

### Emergency Medical Responder – Advanced Skills

#### TEACHING POINTS

5. Suction as necessary; inspect patient's airway for obstructions, broken teeth, dentures, dental appliances, tongue piercings or other items that could damage cuffs.
6. Ventilate for a minimum of thirty (30) seconds.
7. Lubricate airway with water soluble lubricant as necessary.
8. Position the patient supine with head in the neutral or sniffing position. Do not hyperextend the patient's head.

A chin lift or laryngoscope and tongue depressor can be used to lift the tongue anteriorly to allow easy advancement.

#### 2. Normal Insertion:

1. Hold the King LTS-D at the connector with dominant hand.
2. With non-dominant hand, hold mouth open and apply chin lift unless contraindicated by C-spine precautions or patient position.
3. Using a lateral approach, introduce the tip into the corner of the mouth.
4. Advance the tip behind the base of the tongue while rotating the tube back to midline so that the blue orientation line faces the chin of the patient.
5. Without exerting excessive force, advance tube until base of connector is aligned with teeth or gums.
6. Deeper placement and subsequent retraction is preferred.
7. When the King LTS-D is positioned:
  - a. Inflate cuffs to volume sufficient to seal the airway.
  - b. Attach ventilation device to the connector of the King LTS-D.
  - c. At the same time, gently bag the patient and withdraw the King LTS-D until ventilation is easy and free flowing.
  - d. Readjust cuff inflation to "just seal" volume.
  - e. Check breath sounds, epigastric sounds and chest rise and fall.

Obese patient may need padding under shoulders and upper back.

Important that the tip of the device be maintained at midline to assure that the distal tip is properly placed in the hypopharynx/upper esophagus.

During insertion, if tip is placed or deflected laterally, it may enter the periform fossa and will appear to bounce back upon full insertion and release.

Insertion can be accomplished via a midline approach by applying a chin lift and sliding the distal tip along the palate and into position in the hypopharynx – head extension may be helpful.

#### 3. Secure the airway:

1. Disconnect the ventilation device.
2. Securely tape the King LTS-D in the midline to the maxilla.
3. Avoid taping over gastric access lumen.
4. Reattach the ventilation device.

#### 4. Removal:

1. Remove the King LTS-D when protective reflexes have returned.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

2. Contact medical control (local protocol).
3. Prepare suction and emesis collection devices – suction as indicated.
4. Position patient in lateral recumbent position when feasible, observing appropriate C-spine precautions for trauma patients.
5. Deflate cuffs.
6. Immediately withdraw airway with a smooth and steady motion while maintaining normal curvature of the pharynx.
7. Monitor the patient's airway and breathing closely.
8. Provide high-flow oxygen via non-rebreather mask.
9. Consider nasopharyngeal airway and assist ventilations as necessary.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

**SECTION 2 – AUTO INJECTED EPINEPHRINE**

OBJECTIVES:

1. To prepare and administer the epinephrine auto-injector for allergic reaction.

IMPORTANT POINTS:

1. Use appropriate body substance isolation precautions.
2. Medication must be administered in compliance with local protocols and medical direction.
3. A comprehensive assessment must be performed on all patients to whom medications will be administered to determine:
  - a. Indication for medication.
  - b. Contraindication(s) for medication.
  - c. Appropriate dose for patient.
  - d. Response to medication.
4. All skills in this section assume the patient is being provided with supplemental oxygen as appropriate.
5. Before administering any medication, always be certain you have:
  - a. The right patient.
  - b. The right medication.
  - c. The right dose.
  - d. The right time.
  - e. The right route.
  - f. The right documentation.
6. Prior to medication preparation and delivery, inspect the medication to insure it:
  - a. Contains the correct medication.
  - b. Contains the correct dose.
  - c. Has not expired.
  - d. Has not been contaminated in any manner. Non-intact packaging may indicate loss of sterility.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

7. Documentation should include (per local protocol):
- a. Medication.
  - b. Dose delivered.
  - c. Route.
  - d. Site/method.
  - e. Time given.
  - f. Physician ordering medication.
  - g. EMR delivering medication.

SKILL PROCEDURE:

A. AUTO-INJECTOR

1. Prepare medication as previously described in this section.
2. Recheck medication label for the rights.
3. Select the vastus lateralis (lateral thigh) injection site.
4. Cleanse the injection site with an alcohol prep or other suitable antiseptic swab in an outward circular motion for about 2 inches.
5. Grasp the auto-injector by wrapping fist around the unit.
  
6. Place black end of auto-injector against the prepared site on the lateral thigh at a 90 degree angle.
7. Remove the gray protective cap.
8. Stabilize the patient's leg to prevent pulling away.
  
9. Apply a gentle pressure against leg with auto-injector until it clicks.
10. Hold in place for 10 seconds before removing auto-injector.
11. Properly dispose of the auto-injector in an appropriate sharps container.
12. Place a bandage over the injection site.

Allow alcohol to dry for 30 seconds for bacteria to be killed and to minimize discomfort of the injection.

Never place your thumb or finger over the ends of the auto-injector.

Prior to injection, tell the patient that they will feel a poke.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

**SECTION 3 – SPINAL IMMOBILIZATION**

**OBJECTIVES:**

1. To provide initial manual stabilization to the entire spinal column and head to facilitate a patent airway.
2. To restore and maintain normal anatomical alignment of the spinal column and head through application of manual stabilization until appropriate stabilization and immobilization is assumed by a mechanical device.
3. To provide total immobilization of the entire spinal column and head through the proper positioning and securing of a spinal injury or suspected spinal injury patient to a mechanical movement/stabilization device.
4. To provide stabilization and immobilization of the spinal column and head from the time at which manual stabilization is first initiated and neutral positioning achieved through all patient handling, packaging and transport procedures.
5. To determine the presence or absence of circulation, movement and sensation in the patient's extremities.

**IMPORTANT POINTS:**

1. Use appropriate body substance isolation precautions.
2. One rescuer is responsible for stabilization of the head, neck and maintenance of the airway
3. Rescuer maintaining manual stabilization directs patient movement.
4. Restoring spinal alignment may be appropriate during the spinal stabilization and immobilization process. However, if resistance to movement of the neck or spine is felt, or the patient experiences an increase in pain, stabilize the patient in the position found.
5. In general, a cervical collar should be used during the stabilization/immobilization process. A cervical collar alone is not adequate for protecting the cervical spine.
6. Stabilization and immobilization are the only adequate protection for suspected spinal injuries.
7. Once immobilization has been completed, the device may be positioned to assist in maintaining a patent airway.
8. Patients may be immobilized to a long or short immobilization device using straps, tape, cravats, Velcro closures, commercial devices, etc. Appropriate padding such as blankets, towels, dressings, etc, may be needed to prevent movement of the patient in or on the immobilization device.
9. Consider padding board for patient comfort.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

SKILL PROCEDURE::

A. KENDRICK EXTRICATION DEVICE (KED)

1. First rescuer:

- a. Stabilize and support the head in a neutral position.
- b. Maintain stabilization until patient's head is secured to KED.

2. Second rescuer:

- a. Check circulation, motor function, and sensation (CMS) in all four extremities.
- b. Assist in repositioning the patient's body to a neutral position, as necessary.
- c. Select and apply an appropriately sized cervical collar.
- d. Prepare and position KED behind patient (Request additional help in positioning patient if necessary).
- e. Secure KED with center and bottom chest straps. Assure firm contact of device with lower back and armpits.
- f. Pad any void between patient's head and the device to preserve neutral alignment as is necessary.
- g. Secure head to device; first strap over forehead, second strap over chin.  
NOTE: The chin strap may be omitted or removed if airway compromise exists.
- h. First EMR may now release manual stabilization.
- i. Recheck CMS in all four extremities.

It is permissible for rescuers to exchange positions while providing immobilization.

Depending on the style of C-collar in use, the chinstrap may be more appropriately placed on the C-collar below the chin.

3. Both rescuers:

- a. Secure groin and top chest straps, if not done previously.
- b. Tie hands together and lower extremities together, if necessary.
- c. Position long immobilization device adjacent to patient.
- d. Slide and pivot patient; support patient at thighs and with device handles.
- e. Lower patient to long immobilization device; maintain legs in flexed position.
- f. Move patient to head of long immobilization device.
- g. Release groin straps and lower the patient's legs to the long immobilization device. Loosen top chest strap as necessary to facilitate breathing and patient comfort.
- h. Secure patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary.

Groin strap must be properly positioned under the mid-line of each buttock to properly secure device to patient.

Reassess head, strap placement and tension.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

- i. Recheck CMS in all four extremities.

**B. SPINAL INJURY – XP-ONE (XP-1) (Optional)**

1. First rescuer:

- a. Stabilize and support the head in a neutral position.
- b. Maintain stabilization until patient's head is secured to XP-1.

2. Second rescuer:

- a. Check CMS in all four extremities.
- b. Assist in repositioning the patient's body to a neutral position, as necessary.
- c. Apply Med-Spec extrication collar.
- d. Prepare and position XP-1 behind patient. (Request additional help in positioning patient if necessary.)
- e. Secure XP-1 with center and bottom chest straps. Assure firm contact of device with lower back and armpits.
- f. Secure head to device, choose appropriate tabs and attach them to the Velcro on both sides of the collar. Place forehead pad on patient and attach tabs.

2. Both rescuers:

- a. Secure groin straps.
- b. Apply top chest strap; draw shoulder straps down, loop Velcro around top on top and middle chest straps and secure in place.
- c. Position long immobilization device adjacent to patient.
- d. Slide and pivot patient; support patient at thighs and with device handles.
- e. Lower patient to long immobilization device; maintain legs in flexed position.
- f. Move patient to head of long immobilization device.
- g. Release groin straps and lower the patient's legs to the long immobilization device. Loosen top chest strap as necessary to facilitate breathing and patient comfort.
- h. Remove chin strap, if needed, to assure an airway.
- i. Secure patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary.
- j. Recheck CMS in all four extremities.

It is permissible for rescuers to exchange positions while providing manual stabilization.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

C. LONG SPINEBOARD - Standing Patient

IMPORTANT POINTS FOR LONG SPINEBOARD - Standing Patient :

1. A standing patient with a potential spinal injury must be moved to a supine position as soon as possible.
2. Manual stabilization of the patient's head and neck can be maintained from either the front or the back of the patient depending on the rescuer's height. Shorter rescuers may need to stabilize from the front of the patient.
3. While holding manual stabilization from the rear, communicate with team members as your view of the patient will be obstructed by the immobilization device.

SKILL PROCEDURE:

1. Maintain manual stabilization of the patient's head, neck and spine.
2. Check CMS in all four extremities.
3. Select and apply a cervical collar.
4. Position the long spinal immobilization device behind the patient being certain it is centered directly behind the mid-line of the patient.
5. Two rescuers face the patient and stand on either side.
6. The two rescuers place their arms that are closest to the patient, under the patient's arms and grasp the device just above the patient's armpit.
7. The two rescuers, with their free hand, grasp the patient's arm at the elbow or the board to maintain a secure grip as the device is tilted backward.
8. The device is then tilted backward to the ground.
9. The patient's torso and lower extremities are secured to the device, followed by the patient's head, padding as necessary to maintain neutral alignment.
10. Recheck CMS in all four extremities.

D. SLING AND LONG SPINE BOARD

1. First rescuer:
  - a. Stabilize and support the head in a neutral position.
2. Second rescuer:
  - a. Check CMS in all four extremities.
  - b. Select and apply an appropriately-sized cervical collar.



**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

- c. Position sling across chest and under armpits of patient and tighten around body.
- d. Secure patient's hands together if possible.
- e. Position long spine board at slight elevation to patient's longitudinal axis. Support at this angle while pulling patient.
- f. On command, pull patient slowly onto board keeping sling close to board at all times as First rescuer guides patient's body and maintains stabilization of the head.
- g. As first rescuer approaches head of board, lower board gently and move back as pull is completed.
- h. Secure patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary.
- i. Secure patient's head to long spine board, padding as necessary.
- j. First rescuer may then release manual stabilization.
- k. Recheck CMS in all four extremities.

**E. LOG ROLL AND LONG IMMOBILIZATION DEVICE (Patient Supine – 3 Rescuers)**

**1. First Rescuer:**

- a. Stabilize and support the head in a neutral position.
- b. Maintain stabilization until patient's head is secured to long immobilization device.

**2. Second and Third Rescuers:**

- a. Check CMS in all four extremities.
- b. Select and apply an appropriately-sized cervical.
- c. Tie patient's lower extremities together
- d. Second rescuer raises patient's near arm over patient's head to prevent arm from obstructing roll or places arm along patient's side with hand against thigh.
- e. Second and third rescuers reach across patient and place their hands along patient's body evenly spaced between shoulder and knees.
- f. On signal from first rescuer, second and third rescuers roll patient toward them,

Hand spacing may be adjusted to accommodate patient's weight and height.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

TEACHING POINTS

maintaining spinal alignment.

- g. Second and third rescuers each use hand closest to patient's feet to position the long immobilization device on the floor next to the patient's back.
- h. On signal from first rescuer, all roll the patient back onto long immobilization device and lower arm to side.
- i. If centering of the patient is necessary; on signal from first rescuer, slide patient with gentle even motion while maintaining spinal alignment.
- j. Third rescuer secures patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary.
- k. Second rescuer secures patient's head to long immobilization device, padding as necessary to maintain neutral alignment.
- l. First rescuer may then release manual stabilization.
- m. Recheck CMS in all four extremities.

The patient may be centered through the use of either direct lateral movement or the "Z" method, which combines longitudinal and lateral movement.

**F. LOG ROLL AND LONG IMMOBILIZATION DEVICE (Patient Prone or on side – 3 Rescuers)**

1. First Rescuer:

- a. Stabilize head, neck and spine in position found.

2. Second and Third Rescuers:

- a. Check CMS in all four extremities.
- b. Secure patient's lower extremities together.
- c. Place long spinal immobilization device parallel to the patient so the back of the patient's head is next to the board.
- d. Both rescuers kneel on board facing the patient with second rescuer at the patient's chest and third rescuer at the patient's thighs.
- e. Second rescuer raises patient's arm nearest the device and positions it over the patient's head or alongside the patient's body with the hand against the thigh.
- f. Second and third rescuers reach across patient and place their hands along patient's body evenly spaced between shoulder and knees.
- g. On signal from first rescuer, second and third rescuers roll patient toward them onto long immobilization device.

Hand spacing may be adjusted to accommodate patient's weight and height.

## State of Wisconsin – Standards & Procedures of Practical Skills

### Emergency Medical Responder – Advanced Skills

#### TEACHING POINTS

- h. As patient is rolled, first rescuer brings head into neutral position, if possible, achieving spinal alignment (If resistance is felt, head is stabilized at that point).
- i. If centering of the patient is necessary; on signal from first rescuer, slide patient with gentle even motion while maintaining spinal alignment.
- j. Third rescuer secures patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary.
- k. Second rescuer selects and applies an appropriately-sized cervical collar, then secures patient's head to long immobilization device, padding as necessary to maintain neutral alignment.
- l. First rescuer may then release manual stabilization.
- m. Recheck CMS in all four extremities.

The patient may be centered through the use of either direct lateral movement or the "Z" method, which combines longitudinal and lateral movement.

#### G. ORTHOPEDIC STRETCHER (Two Rescuers – Patient Supine)

##### 1. First Rescuer:

- a. Stabilize head and neck in neutral position.

##### 2. Second Rescuer:

- a. Check CMS in all four extremities.
- b. Select and apply cervical collar.
- c. Adjust stretcher to height of patient.
- d. Place one half of stretcher on each side of patient.
- e. Slide stretcher halves under patient and latch head end together.
- f. Close foot end of stretcher being careful not to pinch patient.
- g. Secure patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary.
- h. Secure patient's head to orthopedic stretcher, padding as necessary to maintain neutral alignment.
- i. First EMR may then release manual stabilization.
- j. Recheck CMS in all four extremities.
- k. Place and secure patient to a long board.

Stretcher should remain closed when length is adjusted.

A bystander may be used to gently lift patient to help avoid pinching when closing stretcher halves.

#### H. STRADDLE SLIDE (4 Rescuer minimum)

##### 1. First Rescuer:

- a. Stabilize head, neck and spine in neutral position.

##### 2. Second, Third and Fourth Rescuers:

## State of Wisconsin – Standards & Procedures of Practical Skills

### Emergency Medical Responder – Advanced Skills

#### TEACHING POINTS

- a. Check CMS in all four extremities.
- b. Select and apply an appropriately-sized cervical collar.
- c. Second and third rescuers straddle patient facing first rescuer.
- d. Second rescuer bends and places hands under patient's chest below the shoulders.
- e. Third rescuer bends and places hands under patient's pelvis.
- f. Fourth rescuer positions long spine board lengthwise at the patient's head or feet.
- g. At signal from the first rescuer, second and third rescuers lift patient just enough to allow the long spine board to pass under the patient's body.
- h. Fourth rescuer slides long spine board under patient in one smooth, unbroken movement.
- i. On signal from first rescuer, second and third rescuers lower patient on the long spine board.
- j. If centering of the patient is necessary; on signal from first rescuer, slide patient with gentle even motion while maintaining spinal alignment.
- k. Third rescuer secures patient to long immobilization device at chest, pelvis, thighs, and below knees, padding as necessary.
- l. Second rescuer secures patient's head to long spine board, padding as necessary to maintain neutral alignment.
- m. First rescuer may then release manual stabilization.
- n. Recheck CMS in all four extremities.

#### I. HELMET REMOVAL

##### IMPORTANT POINTS FOR HELMET REMOVAL:

1. Use appropriate body substance isolation precautions.
2. The ability to maintain an airway is of ultimate importance when managing helmeted patients.
3. Stabilization and immobilization are the only adequate protection for suspected spinal injuries.
4. Consideration should be given to leaving a well-fitting helmet, which allows ready access to perform all necessary airway maneuvers, in place.
5. Proper immobilization of patients wearing helmets and other protective equipment often requires the patient's body or head to be padded to maintain appropriate neutral position.

# State of Wisconsin – Standards & Procedures of Practical Skills

## Emergency Medical Responder – Advanced Skills

### TEACHING POINTS

#### SKILL PROCEDURE:

##### 1. Open faced helmets/half helmets:

- a. From the top of the head position, first EMR provides manual stabilization by placing one hand on each side of the helmet with the fingers on the mandible.
- b. Second EMR removes the face shield, then and unfastens the restraining strap.
- c. Second EMR places one hand on each side of the patient's neck with thumbs resting against the angle of the jaw and the fingers extending behind the occiput to support the patient's head and maintain manual stabilization.
- d. First EMR then removes the helmet by grasping the straps or edges of the helmet to spread it as it is gently pulled along the long axis of the body and tilted slightly forward.
- e. Throughout the removal process, the second EMR maintains manual stabilization of the patient's head and neck.
- f. First EMR resumes control of manual stabilization.
- g. The second EMR selects and applies an appropriately-sized cervical collar in preparation for moving the patient to a long immobilization device.
- h. EMRs move patient to long immobilization device using appropriate technique as previously described in this section.

Glasses, microphones, head-sets or other obstructions must be removed before attempting to remove the helmet.

If the patient is wearing other protective equipment, once the helmet is removed, care must be taken to pad between the occiput and the immobilization device to maintain the head in a neutral alignment.

##### 2. Closed face (full face) helmet - (Minimum of three rescuers). Assumes a well fitted helmet and no immediate life-threat due to airway obstruction or respiratory arrest.

- a. Patient is positioned on long spine board using appropriate technique as described previously in this section.
- b. While maintaining manual stabilization, the head end of the long immobilization device is elevated approximately three inches from the horizontal and firmly blocked in that position.
- c. While the First EMR maintains manual stabilization from the cephalic position, the Second and Third EMRs straddle the patient and the long spine board.
- d. Second EMR grasps the patient under the armpits while Third EMR grasps patient at the pelvis.
- e. On signal from the First EMR, the patient is moved up the long spine board until the lower rim of the helmet is just beyond the top edge of the board.

## State of Wisconsin – Standards & Procedures of Practical Skills

### Emergency Medical Responder – Advanced Skills

#### TEACHING POINTS

- f. While the Third EMR continues to stabilize the patient's body, the Second EMR places one hand on each side of the patient's neck with thumbs resting against the angle of the jaw and the fingers extending behind the occiput to support the patient's head and maintain manual stabilization.
- g. Second EMR assumes manual stabilization of patient's head and cervical spine.
- h. When advised by Second EMR that s/he has assumed manual stabilization, First EMR slowly releases manual stabilization.
- i. First EMR ensures that any objects which could obstruct helmet removal (glasses, microphones, headset, etc) have been removed from the patient and/or helmet, then loosens and unfastens the helmet restraining strap.
- j. First EMR then removes the helmet by grasping the straps or edges of the helmet to spread it as it is gently pulled along the long axis of the body and tilted slightly rearward to clear the patient's nose.
- k. Once the lower edge of the helmet has cleared the patient's nose, the helmet is tilted slightly forward and removed.
- l. First EMR resumes manual stabilization of the patient's head and cervical spine
- m. Second EMR grasps patient under armpits.
- n. On signal from First EMR, all EMRs slide the patient down the long spine board until s/he is properly positioned.
- o. C-collar is applied and patient is secured to long spine board using appropriate technique as previously described in this section.

Second EMR may continue to straddle the patient or may move off to one side when assuming C-spine stabilization.

#### 3. Football Helmet (Patient supine):

- a. First EMR provides manual stabilization by placing one hand on each side of the helmet with the fingers on the mandible.
- b. Second EMR removes the face shield by using paramedic shears to cut the nylon straps holding the shield in position.
- c. Second EMR then unfastens chin strap(s) at the side snaps, removing it completely
- d. Using the closed trauma shears as a lever, the second EMR pries the lower lateral interior pads from the helmet and removes them.
- e. If the helmet is equipped with an air bladder, the second EMR releases the air valve of the helmet and deflates the bladder.
- f. Second EMR places one hand on each side of the patient's neck with the thumbs resting against the angle of the jaw and the fingers extending behind the occiput to

Depending on the style of helmet being worn, it may be necessary to use a closed face helmet procedure to remove the helmet.

Coaching or trainer staff may be able to assist with equipment removal.

Shoulder pads may elevate the patient's body to an extent that traditional immobilization devices will no longer provide adequate

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

- support the patient's head and maintain neutral alignment.
- g. First EMR then removes the helmet by grasping its edges to spread it as it is gently pulled along the long axis of the body and tilted slightly forward.
- h. Throughout the removal process the second EMR maintains manual stabilization of the patient's head and neck.
- i. First EMR resumes control of manual stabilization.
- j. Second EMR selects and applies an appropriately sized cervical collar in preparation for moving the patient to a long immobilization device.
- k. EMRs move the patient to a long immobilization device using appropriate technique as previously described in this section.
- l. The second EMR pads as necessary under the patient's head to maintain neutral alignment.
- m. Patient is secured to long immobilization device using appropriate technique as previously described in this section.

TEACHING POINTS

immobilization.

If the patient is wearing other protective equipment, extreme care must be taken to insure spinal alignment is maintained both during the log roll and once the helmet is removed.

Additional care must be taken to pad between the occiput and the immobilization device to maintain the head in a neutral position.

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**  
**Glossary of Common Abbreviations**

<b>ABCs.....</b>	<b>Airway Breathing &amp; Circulation</b>
<b>AED.....</b>	<b>Automated External Defibrillator or Defibrillation</b>
<b>AHA.....</b>	<b>American Heart Association</b>
<b>ALS .....</b>	<b>Advanced Life Support</b>
<b>ARC.....</b>	<b>American Red Cross</b>
<b>ASA.....</b>	<b>Aspirin</b>
<b>AVPU .....</b>	<b>Alert, Verbal, Painful, Unresponsive</b>
<b>BLS .....</b>	<b>Basic Life Support</b>
<b>BP .....</b>	<b>Blood Pressure</b>
<b>BSA.....</b>	<b>Body Surface Area</b>
<b>BSI .....</b>	<b>Body Substance Isolation</b>
<b>BVM .....</b>	<b>Bag-valve Mask</b>
<b>CC .....</b>	<b>Chief Complaint</b>
<b>cc .....</b>	<b>Cubic Centimeter</b>
<b>CO<sub>2</sub>.....</b>	<b>Carbon Dioxide</b>
<b>C-spine .....</b>	<b>Cervical Spine</b>
<b>CID/HID .....</b>	<b>Cervical Immobilization Device/Head Immobilization Device</b>
<b>CMS .....</b>	<b>Circulation, Movement &amp; Sensation</b>
<b>CNS.....</b>	<b>Central Nervous System</b>
<b>CPR.....</b>	<b>Cardiopulmonary Resuscitation</b>
<b>CSF .....</b>	<b>Cerebral Spinal Fluid</b>



**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

<b>DCAP/BTLS</b> .....	<b>Deformities, Contusions, Abrasions, Penetrations, Burns, Tenderness, Lacerations, Swelling</b>
<b>dL</b> .....	<b>Deciliter</b>
<b>EMS</b> .....	<b>Emergency Medical Services</b>
<b>EMR</b> .....	<b>Emergency Medical Technician</b>
<b>ET</b> .....	<b>Endotracheal</b>
<b>ETC</b> .....	<b>Esophageal Tracheal Combitube</b>
<b>IM</b> .....	<b>Intramuscular</b>
<b>IV</b> .....	<b>Intravenous</b>
<b>IVP</b> .....	<b>Intravenous push</b>
<b>KED</b> .....	<b>Kendrick Extrication Device</b>
<b>kg</b> .....	<b>kilogram</b>
<b>KTD</b> .....	<b>Kendrick Traction Device</b>
<b>lbs</b> .....	<b>Pounds</b>
<b>LOC</b> .....	<b>Level of Consciousness</b>
<b>lpm</b> .....	<b>Liters per Minute</b>
<b>MAST</b> .....	<b>Medical (or Military) Anti-Shock Trousers</b>
<b>mg</b> .....	<b>Milligram</b>
<b>mL</b> .....	<b>Milliliter</b>
<b>mmHg</b> .....	<b>Millimeters of Mercury</b>
<b>MOI</b> .....	<b>Mechanism of Injury</b>
<b>NOI</b> .....	<b>Nature of Illness</b>
<b>NPO</b> .....	<b>Nothing by Mouth</b>
<b>NTG</b> .....	<b>Nitroglycerine</b>

**State of Wisconsin – Standards & Procedures of Practical Skills**  
**Emergency Medical Responder – Advanced Skills**

<b>O<sub>2</sub></b> .....	<b>Oxygen</b>
<b>OB</b> .....	<b>Obstetrics</b>
<b>OPQRST</b> .....	<b>Onset, Provocation, Quality, Radiation, Severity, Time</b>
<b>PASG</b> .....	<b>Pneumatic Anti-Shock Garment</b>
<b>PO</b> .....	<b>By mouth</b>
<b>prn</b> .....	<b>as needed, as desired, as necessary</b>
<b>PSI</b> .....	<b>Pounds per square inch</b>
<b>pt</b> .....	<b>patient</b>
<b>SAMPLE</b> .....	<b>Signs &amp; Symptoms, Allergies, Medications, Past pertinent medical history, Last oral Intake, Events preceding incident</b>
<b>SC</b> .....	<b>Subcutaneous</b>
<b>SIDS</b> .....	<b>Sudden Infant Death Syndrome</b>
<b>SL</b> .....	<b>Sublingual</b>
<b>SQ</b> .....	<b>Subcutaneous</b>
<b>SOB</b> .....	<b>Shortness of Breath</b>
<b>SpO<sub>2</sub></b> .....	<b>Saturation percentage of oxygen</b>
<b>S/S</b> .....	<b>Signs &amp; Symptoms</b>
<b>USP</b> .....	<b>United States Pharmacopia</b>
<b>VS</b> .....	<b>Vital Signs</b>
<b>&gt;</b> .....	<b>Greater than</b>
<b>&lt;</b> .....	<b>Less than</b>



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