

Arizona Peace Officer Standards and Training

Basic Curriculum Lesson Plan

LESSON TITLE: FIRST AID - TRAUMA 8.1

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| SUBJECT: | First Aid (Trauma) |
| AZ POST DESIGNATION: | 8.1.12/13 |
| HOURS: | 1.5 |
| COURSE CONTENT: | Trauma is addressed in this section with a look at the mechanism of injury and the injuries it may have caused. A description of anatomy, the skull and its structures along with the function and design of the chest will be discussed. Students will address the treatment(s) for head and chest injuries. Specific injuries to the cervical spine, back, dislocations, fractures, pelvic, extremities and eyes are addressed. |
| PERFORMANCE OBJECTIVES: | <p>Upon completion of this course of instruction, students using notes, handouts and other support materials as references, within the allotted time, will:</p> <p>8.1.12 Given a written, verbal or visual description of a deformed and tender extremity, identify the appropriate treatment steps for stabilization to include:</p> <ul style="list-style-type: none">A. Open fractures.B. Closed fractures.C. Force-produced injuries are examined. A description of the skull and chest, their design and functions. Treatment for open and closed fractures and treatment for specific injuries to:<ul style="list-style-type: none">1. Cervical spine trauma.2. Back injuries.3. Head injuries.4. Pelvic injuries.5. Extremity injuries. |

6. Eye injuries.

8.1.13 Given a written, verbal or visual description of the following injuries, identify the appropriate treatment steps to include:

A. Impaled objects.

B. Chest injuries affecting respiration:

1. Penetrating chest wound.

DATE FIRST PREPARED: January 1998

PREPARED BY:

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|-----------------------------|----------------------------------|---------------------|
| REVIEWED – REVISED : | David Kleinman | DATE: December 1998 |
| REVIEWED – REVISIED: | Sgt. William Wright | |
| | ALEA Course Revision 2001 | DATE: 2001 |
| REVIEWED – REVISED : | SME Committee | DATE: October 2003 |
| REVIEWED – REVISED : | Officer Tim Taylor, SME Chairman | DATE: February 2004 |
| REVIEWED – REVISED : | First Aid SME Group | DATE: November 2017 |
| REVIEWED – REVISED : | AZPOST (DocX) | DATE: March 2022 |
| AZ POST – APPROVAL: | Don Yennie | DATE: November 2017 |
| AZ POST – APPROVAL: | Lori Wait | DATE: March 2022 |

INSTRUCTOR REFERENCES:

CLASS LEVEL: Student

TRAINING AIDS:

INSTRUCTIONAL STRATEGY: Lecture and class discussion.

SUCCESS CRITERIA: 70% or higher on a written, multiple-choice examination.

COMPUTER FILE NAME: 8.1.12/13 Trauma

DATE RELEASED TO THE SHARE FILE: May 27, 2022

I. INTRODUCTION

- A. Instructor – (self) introduction.
- B. Preview of performance objectives.

II. IDENTIFY AN INJURY CAUSED BY EXTERNAL OR INTERNAL FORCES

- A. The goal is to identify that an injury has occurred to an extremity and to be able to respond appropriately to reduce further injury.
 - 1. It is not law enforcement’s responsibility to provide complete treatment individually. In most situations we do not have the necessary equipment.
 - 2. We must provide life-saving measures and request proper assistance.
- B. Injuries of the extremities are due to the amount of force or energy applied either against or toward the extremity. Three (3) types of force are:
 - 1. Direct force – a cinder block falls on the head. (Baton strikes)
 - 2. Indirect force – jump from a high place and land on the feet, but injure the spine.
 - 3. Twisting force – whiplash.

III. HEAD/SPINE INJURIES

P. O. 8.1.12C5

- A. Design/cranium.
 - 1. The cranium has a number of broad, flat bones that are fused together in an adult to form a hollow shell.
 - 2. It protects the brain, which is the control center for the body – the brain controls all body functions, voluntary or involuntary.
 - 3. Although the cranium is very strong in an adult, a blow can still cause a break or, even if there is no break, can result in damage to the brain tissue.
 - 4. Closed head injuries are a true medical emergency.

- B. Design/spine.

P. O. 8.1.12C1

- 1. The spine begins at the base of the skull and extends down into the pelvis. It is made up of 33 bones known as vertebrae. It gives support to the head and upper body. It provides a protective housing for the spinal cord.

C. Skull fractures.

P. O. 8.1.12C5

1. Fractures of the skull are common in accident victims. Their seriousness depends on the amount of injury to the brain. Serious brain injury is much more common when there is no skull fracture.
 - a. Types – skull fractures may be open or closed. They may also be:
 - i. Depressed – pieces of the bone are pushed inward pressing on, and sometimes causing the tearing of, the brain tissue.
 - ii. Penetrated skull – objects such as bullets or knives may penetrate the skull and lodge in the brain. Remember, do not remove foreign objects impaled in the skull.
 - iii. Basal – fractures of the base of the skull.
2. Cerebrospinal Fluid (CSF).
 - a. Cerebrospinal fluid may drain from the nose or ears when a person has a skull fracture. It will appear as a clear fluid.
 - b. **Do not** attempt to stop the bleeding and cerebrospinal fluid from the nose or ears when a skull fracture is suspected. Doing so may cause increased pressure on the brain or an infection around the brain.
3. Signs and symptoms of a skull fracture include:
 - a. An injury which has produced a deep cut, tear or bruise to the scalp or forehead.
 - b. Any pain or swelling at the site of a head injury.
 - c. Deformity of the skull, depressions in the cranium, large swellings (“goose eggs”) or anything that looks wrong about the shape of the person’s cranium.
 - d. Any bruise behind the ear (a sign of a basal skull fracture). (Battle sign.)
 - e. Black eyes or discoloration under the eyes (“raccoon eyes” – a sign of a basal skull fracture).
 - f. One (1) or both of the eyes appear to be sunken.
 - g. Unequal pupils.
 - h. Bleeding or clear fluids (CSF) coming from the ears or nose.

D. Injuries to the brain – head injuries.

1. Causes:

- a. Severe blows to the head can cause bleeding within the skull; resulting blood clots cause pressure on the brain tissue.
- b. Pressure damages the brain cells and loss of consciousness results.

2. Signs and symptoms of brain damage:

- a. Any signs of a skull fracture or external head injury: Bleeding, bumps, contusions, etc.
- b. Confusion – the patient usually becomes confused as time passes. Changes in mental status are usually the first and most important sign (altered mental status).
- c. Severe headaches.
- d. Unusual behavior – may be combative.
- e. Loss of consciousness or altered states of awareness.
- f. Unequal pupils.
- g. Paralysis – often, this will be on one (1) side of the body.
- h. Seizures.
- i. A rise in blood pressure, slowing of pulse or deep erratic respirations.
- j. Nausea and/or vomiting – usually projectile.
- k. Garbled or slurred speech – may ask repetitive questions.
- l. Disturbance in gait.
- m. Loss of bowel or bladder control.

E. Spinal injuries.

P. O. 8.1.12C1

1. Causes of spinal injuries:

- a. Forces to the head, neck, back, chest, pelvis, or legs.

2. Signs and symptoms of spinal injuries:
 - a. Pain with or without movement.
 - b. Tenderness.
 - c. Deformity.
 - d. Impaired breathing.
 - e. Paralysis of the extremities – numbness, weakness or tingling.
 - f. Loss of bladder control.
- F. Emergency care of head injuries/spinal injuries.
 1. Care for patients with suspected head injuries requires management of the injury as well as repeated evaluation over time.
 2. Suspect a cervical or other spine injury in vehicular accidents, falls and assaults.
 3. ABC's – maintain an open airway. Use the jaw-thrust maneuver with suspected cervical spine injuries and maintain manual stabilization of the head and neck.
 4. Correct any life-threatening problems and maintain respirations and circulation. Perform CPR as needed.
 5. Activate EMS.
 6. Control bleeding – note drainage of blood or fluid from nose, ears or open skull injuries (drainage relieves internal pressure on the brain).
 7. Dress and bandage open wounds – minimize pressure.
 8. Position according to associated injuries:
 - a. Keep the person still and lying flat. Minimize movement.
 - b. Be prepared for vomiting, roll the patient onto his/her side while maintaining alignment of the head and neck.
 9. Protect the patient from hurting himself/herself if he/she has a seizure.
 10. Continuously monitor the patient.

G. Mental exercise:

1. You are walking down the hall at your office. Up ahead you see one (1) of the secretaries walking towards you. As she approaches she slips and falls backwards on the hard floor. You get to her and ask if she is alright. She says she is okay and tries to get up. She gets to her feet and is very unsteady.
 - a. What should you do? (Convince her to lie back down.)
 - b. Who should you call? (Call EMS and supervisor.)
 - c. What interventions should you take? (C-Spine precautions.)
 - d. What is your biggest medical concern? (ABCs)

IV. EYE INJURIES

P. O. 8.1.13B

A. Emergency care for eye injuries:

1. A foreign object in the eye – if removal of the object is necessary:
 - a. Flush the eye with clean water, holding the eyelids apart.
 - b. A foreign object lodged under the upper lid down over the lid; as the upper lid returns to its normal position, the eyelashes will wipe away the object.
 - c. A foreign object in the eye also may be removed by grasping the eyelashes of the upper lid and turning the lid over a cotton swab. The object may then be removed with the corner of a piece of gauze.
 - d. Particles lodged under the lower lid may be removed by pulling down the lower lid. The corner of a piece of gauze may be used to remove it.
 - e. Should a foreign object become lodged in the eyeball, **DO NOT** attempt to remove it.
 - f. **DO NOT** attempt to remove objects within the colored circle of the eye.

2. Impaled objects:

P. O. 8.1.13A

- a. **DO NOT REMOVE.**
- b. Activate EMS.
- c. Use several layers of dressing to make a thick pad. (The dressing can be made of

any soft cloth material such as washcloths, bandannas, etc.) Place the dressing around the impaled object so that there will be a pad above, below and on both sides of the object. Encircle the object completely.

- d. Cover both eyes; this will reduce movement of the injured eye. Avoid placing any additional pressure on both eyes.
3. Eviscerated (extruded) eyeball.
 - a. Activate EMS.
 - b. **DO NOT** attempt to replace the eyeball into the socket.
 - c. Cover the eye with a moist, sterile dressing without applying any pressure to the eye.
 - d. Hold the dressing in place with a roller bandage.
 - e. Be sure to cover both eyes to prevent movement of the injured eye.

V. CHEST INJURIES

P. O. 8.1.13C

- A. Design.
 1. The rib cage includes: The ribs, the thoracic vertebrae and the sternum.
 2. The rib cage encloses the lungs and heart. Damage to the ribs can result in damage to these vital organs.
- B. Signs and symptoms of chest injuries:
 1. Failure of the chest to expand normally – one (1) or both sides. (Uneven chest movement)
 2. Dyspnea: Shortness of breath, difficulty or abnormal breathing.
 3. Bruising or obvious fractures.
 4. Pain at the injury site.
 5. Pain during breathing.
 6. It may be difficult to take a deep breath.
 7. Coughing up or vomiting blood – usually bright red and frothy.

8. Bloodshot and/or bulging eyes.
9. Shock: Low blood pressure; rapid, weak pulse and cyanosis (lips, skin, fingernail beds).
10. There may be a sucking sound or bubbling when the patient breathes.

C. Types of injuries:

1. Flail chest.

P. O. 8.1.13C2

- a. When two (2) or more ribs are broken in two (2) or more places, the resultant portion will not move with the rest of the rib cage when the patient attempts to breathe. The free-floating segment is referred to as the “flail area” and the motion of that area is opposite the motion of the rest of the chest during breathing (this is known as Paradoxical breathing).
- b. Signs and symptoms:
 - i. Paradoxical breathing is almost always accompanied by severe pain.
 - ii. Swelling over the injured area.
 - iii. Signs of shock.
 - iv. Increasing airway resistance; difficulty breathing.
 - v. The patient attempts to self-splint his/her chest wall with his/her hand or arm.
 - vi. May feel crepitus (a harsh grating sound caused when broken bones rub together).
 - vii. Uneven chest wall movement during breathing.
- c. Treatment:
 - i. Activate EMS.
 - ii. Have the patient lie on his/her back.
 - iii. Remove clothing from the chest area.
 - iv. Locate the flail section by gently feeling the injury site.
 - v. Apply a thick pad of dressing over the site. This pad should be several inches thick. A small pillow, or other soft, low-weight items can also be

used. The padding used should weigh less than five (5) pounds.

- vi. Secure the padding in place by using wide straps, belts, scarves or wide tape. If you do not have a securing device, you can hold the pad in place by hand.
- vii. Position the patient with the flail segment against a support in a semi-sitting position or lying on the injured side if sitting causes discomfort. This helps reduce the motion of the flail segment.

2. Penetrating chest wounds.

P. O. 8.1.13C1

- a. Commonly caused by trauma: Gunshot wounds, stabbing and/or penetrating objects that cause an open chest wound which allow for air to enter the chest cavity.
 - i. A penetrating chest wound can also occur in the thoracic back area.
 - ii. Be cautious of injuries in the lower chest/upper abdomen area. The injury may appear to be in the upper abdomen, but could actually be a penetrating chest wound depending on the position of the diaphragm during the onset of the injury.
 - iii. If the patient was exhaling, the diaphragm will be relaxed and lowered, making it possible to have a penetrating chest wound in what appears to be in the upper abdomen.
- b. Air enters the chest cavity when the chest is expanded during the patient's normal breathing. It moves into the wound as the patient inhales and air is forced back out of the wound when the patient exhales.
- c. The pressure of the air in the chest cavity presses against the lung, causing it to collapse.
- d. These wounds are typically called "sucking" chest wounds because of the moist sucking heard or the bubbling around the injured site each time the patient breathes.

3. Treatment.

- a. Activate EMS.
- b. Apply an airtight dressing (occlusive) over the injured site. An occlusive dressing can be made from aluminum foil, Vaseline™ gauze, plastic wrap from a cigarette pack, plastic gloves, plastic baggies, etc. or a commercially available chest seal can be used.

- c. Do not use household plastic wrap; it is not strong enough. Use a material that will create an airtight seal and prevent air from entering the chest cavity. The dressing should be large enough so that it is not sucked into the wound.
- d. Tape the dressing to the patient's chest, leave one (1) corner untapped to prevent a build-up of pressure. Depending on what each department is teaching, tape 3 or 4 sides.
- e. Be sure to seal both entrance and exit wounds when appropriate.

D. Mental exercise:

- 1. You and another officer are breaking up a street fight. You are cuffing your suspect when you hear the officer cry out in pain. You look and see him holding his chest and his suspect is holding a knife. The suspect turns and runs away. The officer is on the ground. There is blood coming from his chest and you hear air escaping when he breathes.
 - a. What is your first concern? (Officer safety and environmental awareness.)
 - b. What do you do first? (Call EMS and backup.)
 - c. What is your first medical intervention? (With gloved hand, form a three (3) sided bandage opening one (1) side when he breathes out.)
 - d. What do you want to monitor? (All vital signs.)

VI. CONCLUSION

- A. Review of performance objectives.
- B. Final questions and answers.
- C. Instructor closing comment(s).