COURSE PURPOSE: The purpose of this course is to provide officers with basic skills and familiarity with possible emergency wounds they could receive during a critical injury incident.

LEARNING OUTCOMES: Officers will gain the skills and understanding of how to address a variety of possibly life-threatening wounds while maintaining a focus on tactical considerations.

I. Introduction

A. Overview of facilities

1. Restrooms, parking, etc.

B. Registration

1. Roster, check-in

C. Instructor and student introductions

1. Name

2. Agency

3. Background

II. Course Objectives

A. Objective

1. Students will be shown the acronym MARCHE (massive hemorrhage, airway, respiration, circulation, hypothermia, evacuation) represents.

2. Students will understand the importance of the MARCHE algorithm as it relates to patrol oriented tactical casualty care incidents.

3. Students will gain a better understanding of patrol oriented tactical casualty care under stressful conditions.

4. Students will understand legal issues arising from lack of proper planning, medical equipment selection, duty to act.

III. Basic trauma care for patrol

A. The importance of understanding the MARCHE algorithm.

1. Current industry standards for tactical emergency casualty care.

2. Data supporting the MARCHE algorithm

B. The three top preventable causes of battlefield death will be explained:

1. Massive hemorrhage

2. Tension pneumothorax

3. Airway compromise

C. Goals of Tactical Medicine

1. Save lives

2. Tactical considerations for tactical casualty care*-incidents*

3. Demonstrate knowledge of team coordination, command, and control

4. Incident Command System (ICS) and National Incident Management System (NIMS)

5. Mutual Aid considerations (Fire / EMS)

6. Unified Command

7. Communications, including radio inter-operability

8. Command post operation / Staging areas

9. Ingress/egress

10. Managing priorities—some priorities must be managed simultaneously

D. Legal issues

1. Proper planning

2. Equipment selection

3. Duty to act

4. Post-critical incident

E. MARCHE Overview

1. Massive Hemorrhage
2. Airway
3. Respiration
4. Circulation
5. Hypothermia
6. Evacuation

IV. Massive Hemorrhage

A. Tactics and safety during a patrol oriented tactical casualty care incidents

1. Proper tactics
2. Officer safety
3. Care under fire
4. Self-aid
5. Cover and concealment

B. Patient Assessment

1. Systematic and sequential

C. Controlling life threatening bleeding using combat tourniquets

1. Combat Application Tourniquet ® (CAT)
2. SOF brand Tactical Tourniquet (SOFT-T)

D. Techniques for the use of combat tourniquets

1. Strap
2. Windlass
3. Locking bar
4. Application
a) High and tight versus two inches above wound

Learning Exercise:

Students, under the supervision of the course instructor, students will work in pairs and will apply a tourniquet to themselves and to each other, using the techniques taught above. Instructor will check for proper application.

E. Stopping a Hemorrhage

1. Wound packing

2. Instructor demonstration using combat gauze, Celox Rapid and X-Stat Hemostatics on a Fokus Labs brand wound pack simulator

3. Wound pack technique

a) Power ball

b) Finger over finger

c) Filling the cavity

d) Holding pressure

e) Removing saturated gauze

4. Learning Exercise:

a) Students, under the supervision of the course instructor, students will demonstrate and practice wound packing techniques on the wound pack simulator. Students will be shown the following California-EMSA-approved products: utilizing

b) 1. Quick Clot®, Z-Medica®

c) a. Quick Clot®, Combat Gauze® LE

d) b. Quick Clot®, EMS Rolled Gauze, 4x4 Dressing, TraumaPad®

e) 2. Celox®

f) a. Celox® Gauze, Z-Fold Hemostatic Gauze

g) b. Celox® Rapid, Hemostatic Z-Fold GauzE

*h) 3. HemCon® Chito Flex Pro Dressing. (Note: utilizing California-EMSA-approved products) ***Other products will be discussed in the event some students have self- purchased items***.*

V. Airway

A. Airway Compromise

1. Importance of clearing the airway rapidly

B. Techniques to Open the Airway

1. Head tilt/chin lift

2. Jaw thrust

3. Recovery position

a) Instructor will emphasize the importance and simplicity of the recovery position

VI. Respiration

A. Tension Pneumothorax

1. Definition - occurs when air leaks from a punctured lung into the chest cavity and cannot escape. Scope of Practice regulations for Public Safety students will be shown and equipment considerations (ie. Bag Valve Mask) will be discussed.

2. Why it is considered life-threatening

a) *The buildup of air crushes the lungs and puts pressure on the large arteries leading to the heart, eventually occluding them, preventing blood flow to the heart and brain, and causing death*

3. *Signs and symptoms*
   a) *Trouble breathing*
   b) *Uneven chest rise and fall*
   c) *Jugular vein distention*
   d) *Tracheal deviation (late sign)*
4. *Takes 15-20 minutes to develop, and the best method to treat it, is rapid transport to a trauma center*

B. Occlusive Dressing (Various Occlusive Dressings will be discussed with the students including: EMSA approved, preferably vented chest seals.

1. *Used for chest wounds*
2. *Applied to the chest and abdomen area, between the neckline and the belly button*
3. *Applied to injuries on the back*
4. *Used to keep air from escaping the lungs while the casualty tries to breath*

VII. Circulation

A. Tourniquet Reassessment

1. Reassess all prior tourniquet applications originally applied under stress.

a) Reassess placement and effectiveness

b) Effectiveness ensured by elimination of distal pulse

2. Once a tourniquet is properly placed and distal pulses have stopped, it should not be removed unless by someone with a higher level of medical training than you.

B. Control Bleeding

1. Assess for other hemorrhage and control all sources of bleeding

2. Assess for and treat shock

a) If in shock, provide rapid transport and/or transfer to paramedics while enroute to trauma center

3. If not in shock and no altered level of consciousness, casualty can have fluids if conscious and he or she can swallow

4. Reassess bleeding control measures to make sure they are still effective

VIII. Hypothermia

A. Importance of Maintaining Temperature

1. Minimize casualty's exposure to the elements

2. Keep protective gear on or with the casualty

3. Replace wet clothing with dry if feasible

4. Get the patient onto an insulated surface quickly

5. Wrap the patient in a dry blanket or anything that will retain heat and keep the casualty dry

IX. Evacuation

A. Rapid Evacuation

1. The casualty should be transported to a trauma center as soon as life threatening wounds are treated

a) Explain the difference between a trauma center and normal hospital

2. Use whatever means available

a) Load and go

3. Consider meeting with ALS transport as opposed to waiting for them

4. Have a medical evacuation plan in place for preplanned events

5. Casualty drags will be shown and demonstrated to the students. The lifts include a single man carry, seal team carry or shoulder belt carry, etc.

Learning Activity:

Objective: Students will be able to determine appropriate interventions for life threatening traumatic injuries with scenario-based group exercises. Students will be broken up into several groups (depending on number of students). Each group will be given a scenario where a life-threatening situation has taken place. The groups will be given an allotted amount of time to develop a tactically sound plan of action. The group's collective plan must possess a tactically sound plan where:

a) Tactical awareness is maintained

b) An officer rescue or self-aid is properly managed

c) The casualty is removed from the danger when tactically feasible using lifts, drags, and carries

d) A proper assessment of the casualty is preformed, and the MARCHE algorithm is applied

e) The injuries are addressed and treated with appropriate interventions

f) A proper evacuation plan is developed and carried out

Learning Assessment

The students will be divided into several groups (depending on size of class) and have four interactive scenarios where each of the discussed topics will be:

***Scenario One**: Wound packing and bandaging (45 Minutes)*

With guidance from the instructor, each student in this scenario will demonstrate wound packing simulation with a hemostatic dressing trainer and bandaging on a wound pack simulator. The students will also demonstrate proper bandaging techniques that are proficient for hemorrhage control.

Wound packing

- *Power ball*
- *Finger over finger*
- *Filling the cavity*
- *Holding pressure*
- *Removing saturated gauze*

Bandaging

- *Direct pressure*
- *Application of a bandage dressing*
- *Assessing the patient to ensure hemorrhage control*

***Scenario Two**: Low Light/low visibility tourniquet application (45 Minutes)*

With guidance from the instructor, each student will be paired up with a partner. The two students participating in the exercise will have their visibility restricted. The students will be required to locate their tourniquets they carry on their person. The student will be required to properly apply a tourniquet, demonstrating the ability to self-place it on each extremity with adequate pressure for hemorrhage control.

Once each student has properly demonstrated the ability to ability to self-aid with tourniquet, they will be required to place a tourniquet on each extremity on their partner. The instructor will check the placement and pressure of the tourniquet to ensure adequate hemorrhage control.

***Scenario Three**: Officer down sensory overload (45 Minutes)*

The students in the group will be given a scenario where they are a patrol shift. Shortly after briefing, one of their deputies responds to a domestic disturbance at a residence. As the deputy is approaching the residence, they are met with simulated rifle fire coming from the second story of the residence. The initial responding officer is hit (simulated) and is suffering life threatening hemorrhage. The wounded officer will call out (Shots fired, I am hit). The wounded officer will be expected to self-aid until additional units arrive on scene.

A second officer will be instructed to wait 2-3 minutes (simulating a patrol response to a deputy in need) until they can arrive on scene and help the wounded deputy

A third and fourth officer will be asked to respond 2-4 minutes after the second officer on scene.

*********(RESPONDING UNITS WILL ENCOUNTER LOUD AUDIBLE GUNFIRE AND NOISE TO INDUCE STRESS INNOCULATION) *********

The students will encounter a trauma dummy simulator with active life-threatening bleeding.

Once all responding officers are on scene, they will be expected to:

a) Maintain tactical awareness

b) Properly manage and formulate a plan to rescue the wounded officer

c) The wounded officer will be removed from the danger when tactically feasible (casualty care movements include lifts, drags, and carries)

d) A proper assessment of the wounded officer is preformed, and the MARCHE algorithm is applied

e) The injuries are addressed and treated with appropriate interventions

f) A proper evacuation plan is developed and carried out to a pre-meditated location.

***Scenario Four**: Live fire officer rescue (45 Minutes)*

***********A SAFETY BRIEF SHALL BE CONDUCTED BEFORE ANY LIVE FIRE TRAINING************

Each student will be given 5 rounds of ammunition. A steel silhouette target will be the point of aim. With a Range Safety Officer behind each student, the student will be instructed to fire 5 rounds on the move to the steel target. After each student has fired their rounds they will see a 185 pound drag dummy (The drag dummy is only for visual aid). The student's weapon systems will be rendered safe and empty. The students will conduct a rapid trauma assessment utilizing the MARCHE algorithm. The drag dummy will have hemorrhage control and be ready for evacuation. The students will be required to demonstrate a buddy carry of their choice, utilizing the entire group. The instructor will become the patient and the students will have to get the instructor to the staged marked patrol unit. The students will be required to demonstrate the ability to:

a) Maintain tactical awareness

b) Properly manage and formulate a plan to rescue the wounded officer

c) The wounded officer will be removed from the danger when tactically feasible (casualty care movements include lifts, drags, and carries)

d) A proper assessment of the wounded officer is preformed, and the MARCHE algorithm is applied

e) The injuries are addressed and treated with appropriate interventions

f) A proper evacuation plan is developed and carried out to a pre-meditated location.

The students will get the patient (instructor) to the awaiting marked patrol unit. Once the students have reached the patrol unit, two students will be asked to jump into the back seat. One student will simulate being the wounded patient and one student will simulate providing aid to the wounded officer. The driver (Instructor) will drive the students as the medical provider is treating the wounded officer. Once the driver has reached their destination, the students within the group will rotate.