

**Solano County EMS  
Pre-TAC Meeting  
April 16, 2009  
Lessons Learned**

**I. CASE 3:**

64 year old female who reportedly fell from a loft in a horse barn 5-6 hours earlier and was just found. Patient complaining of difficulty moving arms and fingers. Physical exam show facial ecchymosis, neck tenderness and “limited movement to arms & fingers.” Placed on a backboard and transported to landing zone for transport to trauma center.

**Lesson Learned:**

1. *Suspected spinal injuries may benefit from treatment at a trauma center. Evaluate the mode of transportation carefully as gentle transport is critical to prevent further injury; helicopter may not always be the best method of transportation to the trauma center. There is ongoing controversy about the use of high dose IV Methylprednisolone for treatment of acute spinal cord injuries. For years many spinal cord injury patients were given IV steroids within 8-hours of injury in the hope that the steroids would reduce swelling and improve outcomes. Research studies that have been done have not shown any benefit from this treatment, however, without a good alternative treatment, many hospitals have been reluctant to stop giving the steroids. Although the literature suggests that patient's do not receive any benefit from the drug's administration, the trauma centers servicing Solano County patients are still using methylprednisolone in treating spinal cord injuries in the first eight (8) hours after the injury is sustained.*
  
2. *Here is the Summary from the Cochrane Database on the use of Steroids in Cases of Spinal Cord Injury:*

**Steroid treatment is shown to help patients with damage to the spinal cord, if given soon after injury.**

Every year, about 40 million people worldwide suffer a spinal cord injury. Most of them are young men. The results are often devastating. Various drugs have been given to patients in attempts to reduce the extent of permanent paralysis. Steroids have probably been used more for this purpose than any other type of drug. The review looked for studies that examined the effectiveness of this treatment in improving movement and reducing the death rate. Nearly all the research has involved just one steroid, methylprednisolone. The results show that treatment with this steroid does improve movement but it must start soon after the injury has happened, within no more than eight hours. It should be continued for 24 to 48 hours. Different dose rates of the drug have been given and the so-called high-dose rate is the most effective. The treatment does not, however, give back the patient a normal amount of movement and more research is necessary with steroids, possibly combining them with other drugs.

## II. CASE 4:

25 year old female stabbed in the posterior thorax over the scapula. Patient stated the knife was a “steak knife” used to stab her. No complaints of SOB. Physical exam skin pink; warm; dry; initial vital signs were 118/86; 110; 14 clear lung sounds; SpO2 100%. BH Contact made requesting approval to transport to local hospital as paramedic did not believe there was serious internal injury. BH Physician directed patient be taken directly to trauma center.

### Lessons Learned:

1. *Any patient stabbed in the thorax meets Solano County Trauma Triage criteria to be evaluated at a trauma center! It is impossible to accurately determine depth of the wound and damage to underlying structures based upon physical examination alone. In penetrating trauma, patients can initially appear to be stable and suddenly decompensate. Mode of transportation can be determined at the time the patient is evaluated in the field; those that appear unstable should be transported by the fastest method as these patients often need immediate surgery.*

## III. CASE 5:

70 year old male who had a ground level fall striking head on a table. Initial CGS 9 (E2, V2, M5) responding to pain only. Physical exam showed head with avulsion to the “R frontal lobe the size of an adult male fist.” Bleeding controlled by bandage to head. Waiting for the air ambulance the patient’s LOC improved to GCS 14 (E4, V4, M6). Ground PCR states “Bag of meds turned over to air ambulance crew” but, no specific medications are listed on ground PCRs. Air Ambulance PCR indicates patient is taking lovastatin, flexeril, neurontin, vicodin, dilantin, tenormin, **coumadin** and nortriptyline. Patient transported by air to trauma center.

### Lessons Learned:

1. *Medications should be checked and listed on the PCR. If time does not permit listing of all medications, it is important that paramedics identify and document on the PCR if the patient is taking any anticoagulant medication---look for warfarin, coumadin, heparin, Lovenox, Plavix, Aggrenox, and Aspirin. Anticoagulant medications substantially increase the risk of internal bleeding in any trauma patient and the presence of any of these medications is useful to appropriately triage the patient at the receiving hospital.*

## IV. CASE 6:

22 year old male victim of several GSWs while standing outside. The patient admitted to using illicit drugs before the incident and reported hearing multiple gun shots. He complained of pain in the right hip, leg and scrotum. Physical exam skin pale, moist with cool extremities and a warm core; initial heart rate 130, respiratory rate 30, BP 86/42; wound to left hip, an engorged scrotum and a GSW to right foot. Paramedics administered 1.5 l of IV fluid during ground transport to trauma center.

**Lessons Learned:**

1. *Fluid resuscitation with crystalloids has long been the standard of care in all trauma patients. Research has shown that there is an increase in mortality among penetrating trauma patients who receive large amounts of IV fluids prior to definitive surgery to control the internal bleeding. These patients need blood and rapid surgery—not Normal Saline. The theory is that increasing the blood pressure before stopping the internal bleeding actually increases the amount of internal bleeding which is bad. In recent years, there has been a movement among US trauma centers advocating “permissive hypotension”-- withholding aggressive IV fluid resuscitation by only giving enough IV fluids to keep the patient’s vital organs perfusing which usually means aiming for a systolic BP of 80-90. The concept of “permissive hypotension” has only been shown to benefit patients with penetrating trauma; it has not been validated in blunt trauma patients. Current Solano EMS Protocol uses bolus of 500cc normal saline to maintain systolic BP > 90 and does not distinguish between blunt and penetrating trauma. EMS providers should avoid overaggressive fluid resuscitation in penetrating trauma patients after the systolic BP is >90 as this may increase mortality even though the BP is higher on hospital arrival.*

**V. CASE 8:**

38 year old female driver involved in a MVA at approximately 35 MPH. Patient was seat belted, the airbag deployed, and there was no passenger space intrusion. Physical exam patient skin pink, warm, dry initial vital signs 123/83, heart rate 87, respiratory rate 24; complaining of neck pain “in the center of cervical spine” Patient complained of “numbness and tingling in hands and feet” and there was “negative movement in any extremity.” Also had right upper arm pain without deformity. Patient “withdrew @ shoulder during IV start.” Patient was transported by air ambulance to trauma center. Spinal injury was excluded and patient was found to have a brachial plexus injury.

**Lessons Learned:**

1. *It is not possible in the field to distinguish spinal cord injuries from peripheral nerve or brachial plexus injuries. For EMS, it is appropriate to treat as a spinal cord injury with full spinal immobilization.*

*This patient sustained neck strain and a brachial plexus injury; below is a picture of the brachial plexus---a grouping of nerves between the cervical spinal cord and the arm. Injuries to the brachial plexus are commonly cause by sports but may be the result of any blunt or penetrating trauma.*

*Severe brachial plexus injuries may tear or completely disrupt these vital nerves. This may cause complete loss of motor control of the effected arm, loss of feeling in the arm, or chronic neuropathic pain. Treatment of these injuries varies from observation and physical therapy to acute surgical intervention in an attempt to*

*repair the injured nerves. With either treatment option, outcomes are often poor after a severe brachial plexus injury and the potential for permanent disability is very high.*

