The Pre-hospital Care System

Optimizing Care

for the

Head and Spinal Injured Patient

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History

• Paramedics in the United States started in the late 60’s
• Los Angeles was one of the first Counties to have paramedics
TRAUMA and the MILITARY

- Wars in Korea and Vietnam
  - Trained many paramedics who continued in the profession after returning to civilian life
  - Proving ground for innovative medical and surgical management
Los Angeles Emergency Medical Services “EMS”

- 34 Public Paramedic Providers
- 16 Private Paramedic
- More than 3k Paramedics
L.A. EMS

- 3 Public Helicopter Providers
- 1 Private Helicopter Provider
- 2 Military Helicopter Providers
- 3 EMS Watercraft Providers
Los Angeles Trauma System

• 13 Designated Adult Trauma Centers
• 7 Designated Pediatric Trauma Centers
Specialized Trauma Training

• PHTLS
• ITLS
Field Head and Spinal Injury Treatment

• Do not stay on scene for more than 10 minutes with a critical trauma patient
Treatment

• Consider advanced airway / Ventilation
  – BVM
  – ET
  – King Airway
  – DO NOT Hyperventilate Head Injury Patients (ETCO$_2$ < 35)
  – NO RSI or Sedition Intubation in LA County
Treatment

• Spinal immobilization
  – Backboard and c-collar
  – Extrication device
  – Rapid extrication

– **NOTE:** Do not delay hypotensive patients with penetrating torso trauma in order to apply spinal immobilization
Withholding Spinal Immobilization

Indications for NOT immobilizing the spine...

No mechanism

No pain
Treatment

• IV access enroute
  – 2\textsuperscript{nd} IV if possible
  – LA County currently does not allow for I.O. in trauma patients
  – Consider fluid resuscitation based on blood pressure
Base Station Hospital

• In significant head and spinal injuries paramedics work under standing orders
• Base Station coordinates and assists in getting patient to destination
Triage to Trauma Center

- No Airway obstruction
- 30 Minute criteria, ground ambulance
Triage Protocol
Modified for
Head and Spinal Injuries:
TRANSPORT TO A TRAUMA CENTER!

1. Systolic Blood Pressure less than 90 mm/Hg
   - 70 mm/Hg in infants less than one year

2. Respiratory Rate greater than 29 per minute OR less than 10 per minute
   - Less than 20 per minute in infants

3. All penetrating injuries to the head, neck
TRANSPORT TO A TRAUMA CENTER!

(2)

- Blunt head injury associated with
  - suspected skull fracture
  - altered level of consciousness (GCS < than or equal to 14)
  - seizures
  - unequal pupils
  - or focal neurological deficit
TRANSPORT TO A TRAUMA CENTER!

(3)

- Injury to spinal column associated with acute sensory or motor deficit
- Falls greater than 15 feet
  - Pediatrics greater than 10 feet or 3 times height of child
TRANSPORT TO A TRAUMA CENTER!

(4)

- Passenger space intrusion of greater than 12 inches occupant site, or greater than 18 inches into any other passenger space
- Ejected from vehicles
  - Partial or complete
TRANSPORT TO A TRAUMA CENTER!

(5)

• Auto vs pedestrian/bicyclist/motorcycle thrown, run over, or with greater than 20 MPH impact

• Unenclosed transport crash with greater than 20 MPH impact
• Consider the following Guidelines
  – Injured victim of vehicular crash in which fatality occurred in the same vehicle
  – Patients requiring extrication
  – Vehicle telemetry warning system activated
  – Patients on anticoagulants or bleeding disorders
• Special considerations
  – Adults over 55 years of age
  – Systolic blood pressure < 110mm/Hg in patients with hypertension history
  – Pregnancy greater than 20 weeks
  – Paramedic Judgment
Los Angeles County EMS Challenges

- Venous access in significant trauma patients in a urban setting
- PHC advanced airway management
- System Issues
  - Hospital closures
  - Emergency Departments overcrowding
  - Overwhelmed trauma centers
Prehospital Rapid Sequence Intubation Improves Functional Outcome for Patients with Severe Traumatic Brain Injury Randomized Controlled Trial

Annals of Surgery
Toronto prehospital hypertonic resuscitation – head injury and multiorgan dysfunction trial: Feasibility study of a randomized controlled trial

Journal of Critical Care
2011
Cervical Spine Motion During Extrication

Journal of Emergency Medicine 2013
High-Dose Steroids for Acute Spinal Cord Injury in Emergency Medical Services

Position Paper
National Association of EMS Physicians
Pre-Hospital Care

Thank You

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