

# Trauma 101: What you need to know

## Objectives:

1. Describe the Washington State Trauma System
2. Discuss the initial assessment of the trauma patient
3. Describe the respiratory care provider role in caring for a trauma patient.

### I. Introduction

#### II. Washington State Trauma System established in 1995

##### A. Why a trauma "system"

1. Annual national death rate from trauma = 140,000
2. Leading cause of death ages 1 - 44
3. Trauma impacts **ENTIRE** society
  - a. Trauma occurs in all segments of society
  - b. Trauma care is costly
4. Trauma patients - 30 to 40% who die do so within hours of injury
5. When treated at designated trauma facilities, trauma patients experience:
  - a. ↓ mortality
  - b. ↓ morbidity

##### B. Washington State Trauma Fund (administered by Department of Health)

1. Sources of funding
  - a. Portion of license plate fees
  - b. Portion of infraction fines
2. Dedicated to trauma care (untouchable)
3. Washington State Trauma Fund recipients
  - a. Designated trauma facilities
  - b. EMS agencies
  - c. Physicians

##### C. Trauma Designation

1. "Right" patient to "right" facility in "right" amount of time
2. Facilities level (with examples)
  - a. Level I – Harborview
  - b. Level II – Providence Sacred Heart & Deaconess Medical Centers
  - c. Level III – Holy Family & Valley Hospital
  - d. Level IV – Samaritan (Moses Lake)
  - e. Level V - East Adams Rural Hospital (Ritzville)

### III. Initial assessment of the trauma patient

#### A. History - **MIVT**

1. **M** - Mechanism of injury
2. **I** - Injuries
3. **V** - Vital signs

4. **T - Treatment**

B. Primary Assessment Goal - Assess for, and treat, life threatening injuries as found

1. **A - Airway**

- a. Airway assessment
  - 1) Vocalization
  - 2) Tongue obstruction - Most common obstruction in the unconscious adult
  - 3) Loose teeth or foreign objects
  - 4) Bleeding
  - 5) Vomitus or other secretions
  - 6) Traumatic airway disruptions
- b. Airway interventions
  - 1) Positioning of patient
  - 2) Jaw thrust
  - 3) Chin lift
  - 4) Oro- or naso-pharyngeal airways
  - 5) Alternative airways
    - a) Combitube
    - b) King Airway
  - 6) ET intubation
    - a) Oral
    - b) Nasal
  - 7) Reassess after any intervention
- c. Maintain cervical spinal immobilization

2. **B. B - Breathing**

- a. Breathing assessment
  - 1) Spontaneous breathing
  - 2) Chest rise and fall
  - 3) Skin color
  - 4) Respiratory rate and depth
  - 5) Pulse oximetry – SpO<sub>2</sub>
  - 6) End tidal carbon dioxide - EtCO<sub>2</sub>
  - 7) Chest wall integrity
  - 8) Use of accessory and/or abdominal muscles
  - 9) Breath sounds – Listen anterior and lateral, both sides
  - 10) Jugular vein distention – Indicates increased pressure around heart
  - 11) Position of trachea
- b. Breathing interventions
  - 1) Oxygen is the trauma patient's best friend
  - 2) Chest darts/tubes – Evacuates air/fluid/blood from pleural space
  - 3) Open chest wound dressing
    - a) Occlusive material
    - b) Taped down on three sides
    - c) Open side down
  - 4) Assist with ventilations
  - 5) Intubate
    - a) Oral – Most injuries
    - b) Nasal
      - (1) Requires spontaneous breathing
      - (2) High incidence of sinus infection
    - c) intubation assessment

- (1) Primary assessment
      - (a) Negative epigastric sounds
      - (b) Bilateral equal breath sounds
        - (i) Right breath sounds only? → Withdraw ET 2 cm & reassess
      - (c) Misting in tube with exhalation
    - (2) Secondary assessment
      - (a) ETCO<sub>2</sub>
      - (b) Esophageal detector device (EDD)
      - d) Cricothyroidotomy
    - 6) Reassess after any intervention
3. **C - Circulation**
  - a. Circulation assessment
    - 1) Palpate carotid pulse – Especially in any direct neck trauma
    - 2) Inspect skin for:
      - a) Color
      - b) Temperature
      - c) Diaphoresis
      - d) Capillary refill
    - b. Inspect for active external bleeding
  - b. Circulation interventions
    - 1) Establish IV access
      - a) Two large bore (14 - 16 ga), short IV catheters
      - b) Intraosseous devices
        - (1) FAST 1 - Sternum
        - (2) Bone Injection Gun (BIG) – Humerus, tibia
        - (3) EZ-IO – Humerus, proximal and distal tibia
    - 2) Use blood tubing, if available
    - 3) Infuse warmed IV solution at a fast rate (NS or Lactated Ringer's) to maintain systolic BP > 90 mm/Hg
    - 4) Uncross matched blood after 2 liters of crystalloid
      - a) O negative – Universal donor
      - b) O positive
        - (1) Okay for most men
          - (a) 95% of black men
          - (b) 85% of white men
        - (2) Pre-menopausal women may need Rh immunoglobulin
    - 5) Control any external bleeding
      - a) Direct pressure
      - b) Add elevation
      - c) Add pressure points
      - d) Tourniquet as a **LAST RESORT**
    - 6) Obtain blood for type and cross match
    - 7) Reassess after any intervention
4. **D - Disability (neurological status)**
  - a. Disability assessment
    - 1) Assess level of consciousness
      - a) **A** – Alert?
      - b) **V** – Verbal?
      - c) **P** – Painful?
      - d) **U** – Unresponsive?

## Trauma 101: What you need to know - Page 4

- 2) Assess pupils
  - a) ? Equal ?
  - b) Equally responsive to light?
- 3) Posturing
- b. Disability interventions
  - 1) Hyperventilation
    - a) Only if signs and symptoms of ↑ intra-cranial pressure (ICP) are seen:
      - (1) Decreasing level of consciousness
      - (2) Posturing
      - (3) Abnormal or changes in pupillary response
    - b) Maintain ETCO<sub>2</sub> between 32 – 35 mm/Hg
    - c) Used only long enough to get Mannitol (osmotic diuretic) on board
  - 2) Maintain head at midline
  - 3) Maintain cervical spine immobilization until cleared
    - a) Physical examination **AND**
    - b) Multiple view X-rays or Computerized Tomography (CT)
  - 4) Reassess after any intervention

## IV. Respiratory care provider role in caring for a trauma patient

### A. Trauma team members

1. Team Leader
  - a. Emergency Department
    - 1) Physician
    - 2) Physician's Assistant
    - 3) Nurse Practitioner
  - b. Trauma surgeon or primary care physician
  - c. Orthopedic surgeon
  - d. Neurosurgeon
2. Registered Nurses
  - a. Emergency department
  - b. ICU nurse
  - c. Trauma Nurse Coordinator
3. Radiology
4. Laboratory
5. Anesthesia
6. Recorder
7. Respiratory care provider

### B. Respiratory care provider role in caring for trauma patients

1. Provide initial airway management
  - a. Assessment
  - b. Interventions
2. Provide initial breathing management
  - a. Assessment
  - b. Interventions
3. Provide information to team
  - a. Airway
    - 1) Assessment
      - a) Airway stability
        - (1) Ability of patient to maintain own airway, including vocalization
        - (2) Presence of airway adjuncts

- b) Airway obstructions
  - c) Traumatic disruptions of airway
  - 2) Interventions
    - a) Maneuvers to open airway
    - b) Suctioning of airway or airway devices
    - c) Placement of airway adjuncts
    - d) Assistance with intubation
      - (1) Tube depth, at teeth/gums/nare
      - (2) Primary assessment
      - (3) Secondary assessment
      - (4) Tube securing method
  - b. Breathing
    - 1) Assessment
      - a) Respiratory rate & effort
      - b) Fraction of inspired oxygen -  $FiO_2$  and delivery method
      - c) Skin color
      - d) Breath sounds
        - (1) Bilateral equal
        - (2) Decreased
        - (3) Absent
      - e)  $SpO_2$  reading
      - f)  $EtCO_2$  reading
      - g) Chest wall integrity
      - h) Jugular vein distension
      - i) Position of trachea
    - 2) Interventions
      - a) Intubation Route
        - (1) Oral
        - (2) Nasal
      - b) Manual ventilation
        - (1) Rate
        - (2) Airway resistance
  - c. On-going communication with trauma team
    - 1) Regularly timed information
      - a) Respiratory rate
        - (1) Spontaneous
        - (2) Assisted
      - b) Respiratory depth and/or effort
      - c)  $SpO_2$  readings
      - d)  $EtCO_2$  readings
    - 2) Immediately report significant changes in:
      - a) Respiratory effort
      - b) Breath sounds
      - c) Ease of manual ventilation
      - d)  $SpO_2$  readings
      - e)  $EtCO_2$  readings
      - f) Jugular vein distension
4. Reassessments
- a. Breath sounds of intubated patients after they are moved

## Trauma 101: What you need to know - Page 6

- b. Upon any significant changes in:
  - 1) Respiratory effort
  - 2) Ease of manual ventilation
  - 3) SpO<sub>2</sub> readings
  - 4) EtCO<sub>2</sub> readings
  - 5) Jugular vein distension

### V. Case study

### VI. Summary

Developed and presented by Michael W. Day, RN, MSN, CCRN; Trauma Nurse Coordinator, Providence Sacred Heart Medical Center and Children's Hospital, PO Box 2555, Spokane, WA 99220; 509.474.7111; [michael.day@providence.org](mailto:michael.day@providence.org)