

# Pediatric Trauma Score Lecture Notes

## A. Overview

The Pediatric Trauma Score has been selected as the trauma scoring tool for use in evaluating the severity of injury in the pediatric patient in Oklahoma. The PTS is the approved method of triage used by Children's Hospital of Oklahoma, The Children's Hospital at St. Francis in Tulsa and the Oklahoma Trauma Registry. The PTS adjusts its scoring areas to account for the physiological and anatomical differences unique to the pediatric patient in turn more accurately identifying the critical patient. The PTS also allows for data gathering efforts which will be especially important with the development of a statewide trauma system and trauma registry. Locally the PTS can provide data on injury patterns for a geographical location which can be used to develop injury prevention programs and continuing education programs for EMS personnel.

## B. PTS Components and Scoring

The PTS consists of six parameters which are common determinants of the clinical condition in the injured child. During the initial assessment of the injured child each parameter is assessed and given a numeric score based upon its three associated variables: **+2 (no injury or non-life threatening), +1 (minor injury or potentially life-threatening), or -1 (life-threatening). Totals can range from a +12 to a -6 with the range of <8-9 being the critical break point for transport to a comprehensive pediatric trauma care facility.**

### 1. Size

Patient size is one of the most obvious parameters assessed. The smaller the child the greater the risk for severe injury due to an increased body surface-to-volume ratio and a potential for limited physiological reserve. Because there is less volume, energy is displaced over a greater portion of the body which increases the potential of multi-organ or organ system involvement.

Additionally younger patients are more susceptible to thermal stresses due to the lack of a fully development hypothalamus which regulates heat loss and gain.

**The scoring is as follows:**

**+2 >20 kg (44 lbs)**

**+1 10-20 kg (22 - 44 lbs)**

**-1 <10 kg (22 lbs)**

## **2. Airway**

As with all patient groups airway assessment and management is a first priority . However it becomes even more important in the pediatric patient because establishment of a patent and secure airway can be quite difficult due to the anatomical differences found in their airway structures as compared to the adult. It is because of the potential difficulty in establishing and keeping a patent airway that we see the PTS scores the airway component by the difficulty in it's management. Respiratory failure is the primary cause of death in most pediatric patients, aggressive management to control the airway should be instituted without delay. *All*

*pediatric trauma patients should receive supplemental O<sub>2</sub>.*

**Scoring of the airway parameter is as follows:**

**+2 ( Normal, no management necessary to provide an airway)**

**+1 (Constant observation needed to ensure an airway, use of basic airway management techniques, i.e. positioning, use of suction)**

**-1 ( Use of airway adjuncts both basic and advanced are needed to maintain airway)**

## **3. Systolic Blood Pressure**

Assessment of the hemodynamic state of the pediatric patient is of utmost importance since their circulating volumes are significantly less than the adult. Along with this smaller volume, children often do not show classic shock signs until late due

often do not show classic shock signs until late due to their healthy cardiovascular system and its reserve capacity.

The healthy heart has a 300% reserve capacity as a pump to help maintain the cardiac output longer. Most of the time B/P usually will not show signs of change until after 25% of the total volume has been lost. With the new EMT curriculum B/P determination in pediatric populations are correlated to other cardiovascular signs such as peripheral pulses and capillary refill times. No matter which assessment is made it is important

that any changes be noted and scored. **The scoring of this parameter is as follows:**

**+2 ( Systolic B/P >90, radial or brachial pulses present or capillary refill times of < 2 sec)**

**+1 (Systolic B/P 50-90, carotid pulses, or cap refill times >2<4 sec)**

**-1 (Systolic B/P <50, nonpalpable pulses radial or carotid, or cap refill >4 sec) .**

#### **4. LOC / Central Nervous System**

As with adults the assessment of the child's level of consciousness is one of the most important determiners of the potential for CNS injury. Any change in the level of consciousness will cause the score to be reduced no matter how brief the period of time. **The scoring of this parameter is as follows:**

**+2 ( Alert / Appropriately Awake with no loss of consciousness)**

**+1 ( Any loss of consciousness no matter how brief, Obtunded)**

**-1 ( Unresponsive, comatose)**

#### **5. Muskloskeletal / Fractures**

Because children's bones are more pliable and cartilaginous energy is transmitted throughout the body . Adults bones will break when forces are applied to them but a child's bones flex and give allowing the traumatic forces to be transmitted to underlying organ's. The skeletal framework doesn't cover the same organs as in the adult. The costal arch is a good example of this as the lower portion of each lung and large areas of the liver

and spleen are more exposed in the child than in the adult.

**This parameter is scored as follows:**

**+2 ( No evidence of fracture)**

**+1 ( Single, isolated closed fracture)**

**-1 (Multiple, closed, or, any open fractures) .**