UNIVERSAL CARE – TRAUMA MANAGEMENT

PURPOSE: To provide EMS providers with a standardized framework for efficiently assessing and managing life-threatening injuries while also facilitating the safe transportation of patients with **Traumatic Injuries**.

INCLUSION Criteria: All patients with **Traumatic Injuries** that require assessment and care delivery by EMS personnel

EXCLUSION Criteria: None

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Patient Management: Assessment

- **Universal Care**
- Assess scene safety and evaluate for hazards to EMS personnel, patient, bystanders
  - Determine number of patients
  - Determine mechanism of injury or nature of illness
  - Request additional resources if needed
  - Consider declaration of **Mass Casualty** incident if needed
- Use appropriate personal protective equipment

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- **Perform Primary Survey:** Rapid evaluation of Circulation, Airway, Breathing to identify hemorrhage and other immediate life threats. This process allows for prioritization of life-saving interventions prior to moving the patient or transporting from the scene.
- **Circulation:**
  - Assess pulse
    - If pulse absent, resuscitative efforts should be withheld for any patient in traumatic cardiac arrest if, on arrival of first EMS unit, the patient has one or more of the following:
      - Pulseless, apneic, and without other signs of life (pupillary reflexes, spontaneous movement, response to pain)
      - Asystole on ECG
    - If above criteria are not met, or if mechanism of injury suggests possible non-traumatic cause of arrest, initiate resuscitation according to **Cardiac Arrest** guideline
    - **Termination or Withholding Resuscitative Efforts**
      - Resuscitative efforts should be withheld for a patient of any age who is pulseless and apneic if any one or more of the following criteria is present:
        - Decapitation
        - Hemicorporectomy (trans-lumbar amputation)
        - Incineration
        - Decomposition of body tissue
        - Rigor mortis and/or dependent lividity
        - Cold death
          - Body frozen preventing chest from being compressed
          - Ice in the airway
          - Signs of predation
          - Head underwater for more than 60 minutes in an adult or 90 minutes in a child

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  - Control any major bleeding or life-threatening hemorrhage
    - **Hemorrhage Control**
    - **Tourniquet – Intentional**
    - **Tourniquet – Junctional**
    - **Hemostatic Agents**
    - **Wound Packing**
    - **Pelvic Binder**
    - **Splinting**
    - **IF AUTHORIZED AND AVAILABLE:** without contraindications, consider **Tranexamic Acid (TXA)**

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- **Airway:** Assess for patency and open the airway as indicated
  - Consider **Spinal Motion Restriction**
  - If patient is unable to maintain airway patency, consider:
    - Opening airway using jaw thrust
    - **Airway Obstruction**
    - **Airway Management**
    - **Basic Airway Adjunct – OPA**, **Basic Airway Adjunct – NPA**
    - **Suctioning**
    - **i-gel®**
    - **Endotracheal Intubation**
    - **Cricothyrotomy – Surgical**
- **Breathing:** Evaluate rate, effort, breath sounds, accessory muscle use, retractions, patient positioning
  - **Pulse Oximetry**
    - If pulse oximetry is less than 93%, titrate **Oxygen** to lowest level to maintain pulse oximetry at 93% or greater
    - Do not withhold oxygen if patient is having difficulty breathing or if unable to assess an oxygen saturation
    - If respirations ineffective, support ventilation with **Bag Valve Mask (BVM) Ventilation**
  - Perform **Needle Decompression** on affected side if chest trauma present and tension pneumothorax suspected
  - Cover open chest wounds with an occlusive dressing and secure on three sides
  - Stabilize flail chest
  - Consider **Waveform Capnography**
  -
- **Disability:** Evaluate baseline neurological function
  - Evaluate patient responsiveness: Glasgow Coma Scale, AVPU
- **Expose:** Expose the patient
  - Keep patient warm; prevent hypothermia
  - Assess the back
  - Splint fractures if life-threats have been corrected
  - Stabilize impaled objects
- Consider ALS early if patient has any of the following:
  - Hemodynamic instability
  - Inability to control hemorrhage
  - Inability to maintain and secure an airway
  - Need for medications or advanced procedures

- **Perform a Rapid Trauma Survey**
- **Maintain Perfusion**
  - **Obtain Baseline Vital Signs**
    - An initial full set of vital signs is required for all patient contacts:
      - Blood pressure, heart rate, respiratory rate, SpO2, neurologic status assessment
  - Establish **IV/IO Access**. If major trauma, establish 2 large-bore IVs.
    - Do NOT delay transport to start IV
    - If SBP < 90 mmHg (adult) administer **Fluid Bolus – IV/IO** 20 mL/kg
- **Head Injury or Suspected TBI**
  - **Disability:** Evaluate baseline neurological function
    - Evaluate patient responsiveness: Glasgow Coma Scale, AVPU
    - Evaluate gross motor and sensory function in all extremities
    - Evaluate **Blood Glucose** in patients with **Altered Mental Status**; avoid hypoglycemia
    - If **Suspected Stroke**, complete **Stroke Scale**
  - Manage head wounds/injuries
  - **Adult (age 15 years and older):**
    - Maintain SBP at 110 mmHg
    - May repeat initial fluid bolus to maintain SBP at 110 mmHg
  - **Pediatric (age < 15 years):**
    - May repeat fluid bolus up to 60 mL/kg to maintain age appropriate minimum SBP

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- **Destination Determination** should be based on whether patient meets the trauma field triage guidelines. Scene time should be minimized to < 10 minutes whenever possible
  - Trauma field triage guidelines
    - Patients meeting any one of the listed RED criteria should be transported to the highest-level trauma center (Level I) available within the geographic constraints of the regional trauma system.
    - Patients meeting any one of the YELLOW *CRITERIA WHO DO NOT MEET* RED *CRITERIA* should be preferentially transported to a trauma center (Level I or Level II), as available within the geographical constraints of the regional trauma system. (need not be the highest-level trauma center)
    - If over 30 minutes by ground to a Level I or Level II, any of the following are acceptable:
      - Helicopter transport to Level I or Level II, for RED criteria only
      - Transport by ground to Level I or Level II *OR*
      - Transport by ground to the highest-level trauma center within a 30-minute transport time

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Treatment And Interventions:

- Provide **Oxygen** supplementation as needed to reach target SpO2 of greater than 93%
  - If patient has underlying lung disease, **Oxygen** should be titrated to achieve SpO2 88-92%
- Appropriate monitoring equipment as dictated by patient assessment. These may include:
  - Continuous **Pulse Oximetry**
  - Continuous **Cardiac Monitoring**
  - **12 Lead ECG**
  - **Waveform Capnography**
- Critical patients should undergo continuous monitoring and documentation of pertinent vital signs, with readings recorded every 5 minutes or more frequently as the patient's condition dictates
- Provide **Pain Management**, monitor and document pain scale in response to interventions
- Reassess patient after every intervention

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- For witnessed traumatic arrest, start resuscitation on scene if patient cannot be transported to an emergency hospital within 15 minutes of initial assessment or arrest onset. Resuscitation may be terminated when:
  - Pulses and other signs of life are absent following 15 minutes of resuscitation
  - Patient develops asystole or a pulseless, wide complex rhythm less than 30 beats per minute

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Patient Safety Considerations:

- Routine use of lights and siren is not warranted
- **CONTACT ONLINE MEDICAL CONTROL** when indicated in the guidelines or as needed for specific consultation

PARA

NOTES

GLASGOW COMA SCALE				
RESPONSE	ADULT	CHILD	INFANT	VALUE
Eye Opening	Spontaneous	Spontaneous	Spontaneous	4
	To speech	To speech	To speech	3
	To pain	To pain	To pain	2
	None	None	None	1
Best Verbal Response	Oriented	Oriented, appropriate	Coos and babbles	5
	Confused	Confused	Irritable, cries	4
	Inappropriate words	Inappropriate words	Cries in response to pain	3
	Incomprehensible sounds	Incomprehensible words or nonspecific sounds	Moans in response to pain	2
	None	None	None	1
Best Motor Response	Obeys	Obeys commands	Moves spontaneously and purposely	6
	Localizes	Localizes painful stimulus	Withdraws in response to touch	5
	Withdraws	Withdraws in response to pain	Withdraws in response to pain	4
	Abnormal flexion	Flexion in response to pain	Decorticate posturing (abnormal flexion) in response to pain	3
	Extensor response	Extension in response to pain	Decerebrate posturing (abnormal extension) in response to pain	2
	None	None	None	1
TOTAL SCORE:				3-15

- **Pediatrics:** Use a weight-based assessment tool such as a length-based tape, to estimate patient's weight and guide medication therapy and properly sized equipment.

RTS coded values	Respiratory Rate	Systolic Blood Pressure	Glasgow Coma Scale score
4	10–29 ("normal")	>89 ("good radial pulse")	13–15
3	>29 ("fast")	76–89 ("weak radial pulse")	9–12
2	6–9 ("slow")	50–75 ("femoral pulse")	6–8
1	1–5 ("gasp")	1–49 ("only carotid pulse")	4–5
0	0 ("no respiration")	0 ("no carotid pulse")	3

PEDIATRIC VITAL SIGNS				
Age	Pulse	Respiratory Rate	Systolic BP Lowest Normal	Lowest Normal MAP
Newborn	120-160	30-60	60	40
Up to 1 year	100-140	30-60	70	42
1-3 years	100-140	20-40	76	45
4-6 years	80-120	20-30	80	48
7-9 years	80-120	16-24	84	52
10-12 years	80-120	16-20	90	55
13-14 years	60-100	16-20	90	60

Primary Assessment		
X-Severe External Bleeding	Assess and treat major bleeding	
Level of Consciousness	State findings - AVPU	
Airway	Is airway patent? Identify airway compromise or potential for this to develop	
Breathing	Is the patient breathing? Is breathing adequate?	Report rate, depth, work of breathing
Circulation	Is there a pulse? Assess central vs radial pulse Identify hypoperfusion	Report skin color, condition, temperature
Priority of Transport	State high or low priority patient	
Rapid Trauma Assessment		
Inspect Head	***LOOK*** - Major Facial injuries, bruising, swelling, penetrations, pupils	***FEEL*** - Sub Q emphysema
Inspect Neck	***LOOK*** - Neck veins-flat or JVD?	
	LOOK - Trachea- Midline or Deviation?	
Inspect Chest	***LOOK*** - Asymmetry, contusions, penetrations, paradoxical motion	***FEEL*:** Crepitation, Instability
	***LISTEN* - Breath sounds**	Present? Equal? Abnormal?
Inspect Abdomen	***LOOK*** - Bruising, Evisceration, Distention	***FEEL*** - tenderness, rigidity
Inspect Pelvis	***FEEL*** - Tenderness, instability, crepitation	
Lower/Upper extremities	***LOOK*** - Swelling, deformity	***FEEL*** –Instability, Pulse, motor and sensory
Posterior	***LOOK*** - Penetrations, deformity, presacral edema	

EXAMINATION BY ASSESSING BODY SYSTEMS (CONSIDER DIFFERENTIAL DIAGNOSIS)	
Cardiovascular	Cardiac tamponade, cardiac contusion
Pulmonary	Pneumothorax, tension pneumothorax, hemothorax
Neurological	Traumatic brain injury, increased intracranial pressure, head bleed, spinal cord injury
Musculoskeletal	Pelvic fracture, femur fracture, extremity fractures
Integumentary	DCAP BTLS
GI/GU	Ruptured spleen, ruptured liver, intraabdominal bleeding
Reproductive	Priapism, ruptured uterus, fetal distress
Psychological/Social	Depression, mood changes, difficulty concentrating, anxiety, irritability, sleep disturbances, fatigue, suicidal ideations, homicidal ideations