Consider Early Prophylactic Intubation if:
• Burns involve head, neck or chest
• Inhalation injury
• Carbonaceous sputum
• Airway edema, hoarse voice, stridor or wheezing

Refer to Airway Management Guideline; consider closest ED if airway stabilization required

Provide wound care based on type of burn

Thermal
• Extinguish fire
• Briefly cool burns with room temp water or saline
• Remove wet, smoldering or potentially restrictive clothing including belts

Chemical
• Remove clothing which can trap or hold chemicals
• Flush liquid chemicals with water
• Brush off excess powdered/dry agent prior to irrigating
• Attempt to identify agent for special treatment considerations

Electrical
• Elevate extremity if involved

Remove all jewelry

Adult >20% TBSA 2º & 3º
Peds >15% TBSA 2º & 3º

Burn Fluid Resuscitation:
• Adults (over 40 kg): 500 mL/hr
• Peds (5 - 12 years 21 - 40 kg): 250 mL/hr
• Peds (Less than 5 years and 20 kg) 125 mL/hr

Assess for criteria for transport to burn center:
• Partial thickness burns more than 10% TBSA
• Burns to face, hands, feet, genitalia, perineum or major joints
• 3º burns – any age group
• Electrical burns, including lightning injuries
• Chemical burns
• Inhalation injury

Pt meets any criteria

No
Transport to closest appropriate facility

Yes

Patient age less than 12 - transport to CHW
Patient age over 12 – transport to Columbia St. Mary’s - Milwaukee

NOTES:
• Burn patients who also sustained major/multiple trauma must be transported to the Trauma Center.
• Patients who suffered electrical injury must have continuous ECG monitoring en route to the hospital.
Notes:

- Direct pressure is the best method to control bleeding.
- Tourniquets should not be used on limbs with dialysis fistulas except in cases of traumatic penetration, amputation, or crush injury without response to direct pressure.

Direct pressure should be applied with a gloved hand and/or pressure dressing.
Inhalation Injury: Practice Guideline

**1st Responder**

- BLS
- ILS
- ALS

### Process:

1. **Remove patient from toxic environment**
2. **Routine medical care for all patients**
3. **Begin CPR** Y/N
   - If Y, apply appropriate cardiac arrest protocol
4. **Cardiorespiratory arrest?**
   - Yes: Begin CPR
   - No: Evaluate degree of respiratory distress
5. **ALS care required?**
   - Yes: Contact medical control as necessary
   - No: Consider albuterol
   - Transport to appropriate facility
6. **Manage airway**

### Notes:

- Adult patients (> 8 years old) who suffered burns with an inhalation injury are to be transported to the Burn Center.
- All patients with suspected CO poisoning with altered mental status and *without* associated burns or trauma should be transported to the closest hyperbaric chamber.
- Pediatric patients (< 8 years old) who suffered burns with an inhalation injury are to be transported to Children's Hospital of Wisconsin.
- Pediatric patients (<8 years old) with suspected inhalation burn are to be transported to Children's Hospital of Wisconsin.
- If a fire victim has ROSC, hypotension or altered consciousness, evaluate for possibility of cyanide poisoning and consider administration of hydroxocobalamin (refer to Cyanide Poisoning protocol).
Definitions:

**Spinal Movement Precautions (SMP):** An effort to minimize unnecessary movement of the spine through a keen assessment, attention to maintaining a neutral, anatomic position of the spine and the use of adjuncts such as cervical collar, well-padded long backboard, scoop stretcher, or a flat ambulance stretcher (which essentially is a padded backboard); the goal of SMP is to minimize the risk of **spinal cord injury (SCI)** from an unstable fracture and reduce the need for and harm of using a backboard when possible.

**Alert patient:** GCS 15, cooperative, clearly communicates, not distracted by pain, injury or circumstance and can focus on your instructions and exam; not intoxicated.

**Normal spine exam:** No midline bone pain or anatomic deformity (“step-off”) and can subsequently passively rotate head 45 degrees to the left and right. An abnormal exam implies pain in the midline of the spine, palpable anatomic deformity of the spine, or an inability to passively rotate head 45 degrees to the left and right.

**Normal Neurologic exam:** Symmetrical hand squeeze, wrist extension, dorsiflexion, plantar flexion, gross sensation, NO numbness/weakness or priapism.

**Low SCI Risk (Mechanism or Patient):** EMS judgment of very low speed impact (e.g. minor MVC or ground level fall). Alert patients age 3 to 65 with no neurologic findings or no spine pain based on EMS judgment; ambulatory patients at scene; blunt trauma patients not meeting Level I or II trauma center evaluation criteria.

**High SCI Risk (Mechanism or Patient):** Blunt trauma meeting trauma transfer criteria for a Level I or II trauma center; penetrating trauma ONLY if an abnormal spine or neurologic exam AND transport not delayed by applying SMP (penetrating trauma to neck or torso alone does not make the patient high risk); age less than 3 or greater than 65 may be considered high risk when considering other major trauma factors.

### Routine care

- **Patient is alert with normal spine exam, normal neuro exam and low SCI risk?**
  - Yes
    - SMP generally not indicated
    - Transport in position of comfort and safety
  - No
    - Maintain neutral c-spine alignment and apply cervical collar
    - Maintain neutral alignment of thoracic/lumbar/sacral spine and facilitate all movement as a unit using the log roll method; provider maintaining c-spine will direct all patient movement
    - Use adjuncts as needed to deliver patient on to a stretcher for transport
    - Transport with c-collar and neutral supine positioning as able
    - Transfer to hospital bed using adjuncts as needed
NOTES:

- Do not strap or tape patient's head to the cot.
- It is mandatory to document the initial neurologic exam and upon each patient transfer (e.g. on to backboard/scoop/stretcher, prior to movement onto hospital bed and once transfer to hospital bed occurs). A simple one-line statement such as “patient's neurologic exam remained unchanged throughout all transfers” would suffice.
- Ideally, the backboard or scoop stretcher would be used as an adjunct if multiple extrication steps are needed in order to move a patient to a stretcher. Ambulatory patients or those patients with minor spine pain seated in a vehicle or at the scene may be gently assisted directly to an ambulance stretcher brought directly to them to minimize movement. EMS will make every effort to minimize movement to the spine in this process. A "short board" or K.E.D may be used as an extrication tool. It does not provide benefit and should not be used when implementing spinal movement precautions.
- Pediatrics age 3 to 8 that otherwise fit the low risk criteria may not require SMP based on the EMS provider’s judgment.
- Hospital inter-facility transfers should not require a backboard although they will often require SMP; careful coordinated movement from hospital to ambulance stretcher using a scoop stretcher or slide board should suffice; ambulance stretcher straps should be secured.
Trauma: TRAUMA FIELD TRIAGE GUIDELINES: Practice Guideline

1. **Ventilation**

   - Is the patient ventilating or can the patient be ventilated?
     - Yes
       - Measure Vital signs and Level of Consciousness
     - No
       - Transport to the closest appropriate hospital or ALS / Air Medical intercept for RSI / definitive airway management

2. **Physiologic**

   - Glasgow Coma Scale 13 or less
   - Systolic blood pressure less than 90 mm Hg
   - Respiratory rate less than 10 or more than 29 for adults
   - Less than 20 for infants less than 1 year
   - PEDS: 1 or more abnormalities in Pediatric Assessment Triangle

   - Yes
     - Transport to a trauma center. Steps 2-3 attempt to identify the most seriously injured patients. These patients should be transported preferentially to the highest level of trauma care within the defined trauma region.
     - PEDS: Consider transport to a pediatric trauma center within region
   - No
     - Assess anatomy of injury

3. **Anatomic**

   - All penetrating injuries to head, neck, torso, and extremities proximal to elbow or knees
   - Chest wall instability or deformity (e.g. flail chest)
   - Two or more suspected fractures involving the femur or humerus
   - Crushed, degloved, mangled, or pulseless extremity
   - Complete or partial amputation proximal to wrist or ankle
   - Pelvic fracture/unstable pelvis
   - Open or depressed skull fractures
   - New onset paralysis (paraplegia/quadriplegia)

   - Yes
     - Transport to a trauma center. Steps 2-3 attempt to identify the most seriously injured patients. These patients should be transported preferentially to the highest level of trauma care within the defined trauma region.
     - PEDS: Consider transport to a pediatric trauma center within region
   - No
     - Assess mechanism of injury and evidence of high-energy impact

4. **Mechanism**

   - Falls
     - Adults more than 20 feet (one story is equal to 10 feet)
     - Children more than 10 feet or 2 – 3 times the height of the child
   - High-Risk Auto Crash
     - Intrusion, including roof: more than 12 inches occupant site, more than 18 inches any site
     - Ejection (partial or complete) from automobile
     - Death in same passenger compartment
     - Vehicle telemetry data consistent with high risk of injury
     - Auto vs. pedestrian/bicyclist thrown, run over, or with significant (more than 20 mph) impact
     - Motorcycle crash more than 20 mph

   - Yes
     - Transport to a trauma center, which depending upon the defined trauma region, need not be the highest level trauma center
   - No
     - Assess special patient or system considerations

5. **Considerations**

   - Age: Risk of injury / death increases for patients 55 and older
     - Systolic blood pressure below 110 may represent shock for patients 65 and older
     - Low impact mechanisms (e.g. ground level falls) may result in severe injury for older adults
     - Consider transporting children to the pediatric trauma center
   - Burns: Adults burns without other trauma mechanism should be triaged to the burn center; burns with trauma mechanism should be triaged to the trauma center. Pediatric patients with burns should be transported to the pediatric trauma center
   - Anticoagulants and bleeding disorders: patients with head injury are at high risk for rapid deterioration
   - Pregnancy over 20 weeks
   - EMS provider judgement

   - Yes
     - Transport to a hospital capable of timely and thorough evaluation and initial management of potentially serious injuries.
   - No
     - Transport according to protocol

Initiated: 04/01/2014
Reviewed/Revised: 01/2017
Revision 1
Approved: M. Riccardo Colella, DO, MPH, FACEP
Approved: Program Director Sternig, RN

Pg. 1 of 1
Patient Care Goals:
2. Safe movement and transport of injured patients.

Patient Presentation:
Inclusion Criteria
All patients with injury from mechanical trauma.

ABDCE Primary Survey Approach and PRN Strategies:
Screen and treat for life-threatening injuries PRN based on assessment and injury.
Normal Saline Bolus 20 mL/kg max of 1 liter, may be repeated PRN if shock continues.
Pelvic Binder in blunt hypotensive trauma.
Use IO in conscious patients who are in shock if IV not successful do not delay IO use.
Identify patients that meet referral criteria to Level I/II trauma center and minimize scene time for these patients to 10 minutes or less.
Vital signs, secondary assessment and treatment of injuries not life-threatening can be done enroute or delayed prn.

Quality Improvement:
Key Documentation Elements
1. Exam findings to support treatment decisions.
2. Scene time ≤10 mins for major trauma PRN.
3. Appropriate hospital destination.

Patient Safety Considerations:
Routine use of lights and sirens is not recommended during transport unless severe or refractory to EMS interventions.

Initiated: 01/01/2017
Reviewed/Revised:
Revision: 00

Approved: M. Riccardo Colella, DO, MPH, FACEP
Approved: Program Director Sternig, RN
Trauma: TRAUMATIC CARDIAC ARREST - SUDDEN: Practice Guideline

Unwitnessed Trauma Arrest

Assess for:
- Respiratory effort
- Central pulse effort
- Motor effort
- ECG activity
- Pupil activity

No to all → Further resuscitation not indicated

Yes to any → Refer to Management of Deceased Patients Policy

Initiate Trauma Protocol and begin indicated Life Saving Interventions (LSI) such as:
- Effective ventilation / adjunct
- High quality CPR
- Fluid resuscitation
- Needle thoracentesis
- Pericardiocentesis
- Tourniquet hemorrhage control

ROSC?

Yes

Safe and rapid transport to trauma center; limit scene time

No

Trauma TOR criteria emerge

Yes

Medical control for further recommendations or TOR orders

No

If TOR order given:
- Cease resuscitation attempt
- Document time of death and
- Medical control physician number

Refer to Management of Deceased Patients Policy

EMS Witnessed Trauma Arrest

Penetrating Thoracic Chest Injury ONLY
ETA to trauma center <10 mins

Yes to both → Rapid and safe transport
Early EMSCOM notification
Begin indicated Life Saving Interventions (LSI) enroute:
✓ Effective ventilation / adjunct
✓ High quality CPR
✓ Fluid resuscitation
✓ Needle thoracentesis
✓ Pericardiocentesis
Medical Control PRN

No to any → No to any

No to all → Further resuscitation not indicated

Reviewed/Revised: Program Director Sternig, RN

Initiated: 03/01/2016
Revision 2

Approved: M. Riccardo Colella, DO, MPH, FACEP

Total Pages 2
Trauma: TRAUMATIC CARDIAC ARREST - SUDDEN: Practice Guideline

NOTES:
- NO ACLS drugs indicated (epi, amiodarone, calcium, bicarb) unless ordered by medical control.

Termination of Resuscitation (TOR) Criteria for Traumatic Arrest:
- Less than 20 weeks pregnant (fundus at umbilical height)
- Not believed related to environmental hypothermia
- High quality CPR unsuccessful
- Life Saving Interventions (LSI) unsuccessful
- ETCO2 10 mm Hg or less
- No agonal breaths
- No central pulses
- No muscle movement
- No ECG activity
- Fixed, non-reactive pupils

Trauma Arrest LSI and Decision to Transport Summary Matrix

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Site</th>
<th>TOR Criteria Met?</th>
<th>Start LSI?</th>
<th>Call Med Control?</th>
<th>Transport to Trauma Center?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Penetrating</td>
<td>Thoracic chest or back; above abdomen</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Perhaps if time from arrest to DELIVERY at trauma center is absolutely &lt;10 min. Logistically, this would be an exceptionally rare occurrence.</td>
</tr>
<tr>
<td>Penetrating</td>
<td>Multi-site</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Transport generally not recommended unless ROSC develops.</td>
</tr>
<tr>
<td>Blunt</td>
<td>Any</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Transport generally not recommended unless ROSC develops.</td>
</tr>
</tbody>
</table>