CHICKASAW COUNTY MEDICAL DIRECTION PRE-HOSPITAL GUIDELINES

May 2024 Update

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MEDICAL DIRECTOR STATEMENT OF AFFIRMATION

As the physician medical director, I have reviewed these Pre-Hospital Guidelines and the Iowa Emergency Medical Care Provider Scope of Practice document. I approve the use of the skills and medications with these guidelines updated 2023 for the authorized Iowa EMS Program(s):

- Chickasaw County EMS
- Chickasaw County Rescue Squad

PRINTED NAME	SIGNATURE	DATE
Lucas Brinkman D.O.		

Foreword

Optimal pre-hospital care results from a combination of careful patient assessment, essential pre-hospital emergency medical services, and appropriate

medical consultation. The purpose of this manual is to provide guidance for ALL pre-hospital care providers.

These protocols are initially based off the Iowa scope of practice.

The goal of these guidelines is to standardize pre-hospital patient care. These guidelines are not intended to be absolute treatment doctrines, but to have sufficient flexibility to meet the complex challenges faced by EMS providers.

These guidelines have been written in adherence with nationally recognizes standards including but not limited to: DOT guidelines, American Heart Association's "Advanced Cardiac Life Support" and Pediatric Advanced Life Support," state standards and practices manuals. All providers will adhere to these guidelines as appropriate for medical circumstance and provider agency level.

To maintain the life of a specific patient, it may be necessary, in rare instances, for the physician providing on-line medical consultation, as part of the EMD consultation system, to direct a pre-hospital provider in rendering care that is not explicitly listed within these guidelines. To proceed with such an order both the inline medical control and the provider must acknowledge and agree that the patient's condition and extraordinary care are not addressed elsewhere within these medical guidelines, and that the orders is in the best interest of patient care. Additionally, the provider must feel capable, based on the instructions given by the online medical control, of correctly performing the directed care. Whenever such care is provided, the online medical control and the provider must immediately notify the QA/QI Committee of the extraordinary care situation. All such incidents will be entered into the Quality Improvement Review Process.

Occasionally a situation may arise in which a physicians' order cannot be carried out: e.g., the provider feels the administration of an ordered medication would endanger the patient, a medication is not available, etc. If this occurs, the provider must immediately notify the online medical control as to the reason the order cannot be carried out and indicate on the pre-hospital care report what was ordered, the time, and the reason the order could not be carried out. In addition, the provider must notify the Director of the respective service you are working under. All such incidents will be entered into the Quality Improvement Review Process.

If "On-line Medical Control" cannot be obtained, the provider may initiate appropriate guidelines as deemed necessary.

Items in **BOLD** and **UNDERLINED** are hyperlinked to the corresponding guideline.

Items in **BOLD** designate a medication or treatment.

Items in *[brackets]* and *italicized* designate treatments approved for a specific provider level. A provider level with ** indicates that that level must have additional training AND medical director approval to be able to perform the treatment. Treatments listed with a provider level followed by “Med Control” indicate that orders from online medical control must be obtained, except in situations where online medical control is unavailable. MercyOne New Hampton is the default and preferred on-line medical control for patient care questions and authorizations. This alone does not affect destination determination. Patients without a destination preference and not meeting any activation/diversion criteria should be transported to the hospital based on agency policy.

It is to be understood all treatments listed for a specific level can be used by a provider trained to a more advanced level, but only within the scope of practice to the level of care that the agency they are responsible for is licensed/certified by the respective state EMS licensing agency.

Examples:

> *[EMT]* Indicates all EMTs and every provider level above EMT may provide the treatment if the agency they are responding with are licensed/certified at that level. This includes AEMT, Paramedic, and Critical Care Paramedic.
>
> *[EMT**, AEMT]* Indicates that only EMTs who have received additional training AND Medical Director approval may provide the treatment and that all AEMTs and every provider level above AEMT may provide the treatment if the agency they are responding with are licensed/certified at that level. This includes Paramedic and Critical Care Paramedic.
>
> *[Paramedic/Med Control]* Indicates that Paramedics and provider levels above may provide the treatment after obtaining orders from online medical control, except in situations where online medical control is unavailable.

These guidelines have been developed specifically for all EMS and first response agencies for which medical direction is provided by Dr. Lucas Brinkman, and represent consensus amongst the Medical Director, QA/QI Committee, EMS Education Department, Clinical Departments, and Management Teams for these EMS systems. The guidelines demonstrate a commitment to a consistent approach to quality patient care.

From time to time, guidelines may be added or revised upon recommendations by the parties previously listed. Additional recommendations are welcome and appreciated at any time. They may be submitted to one of the parties listed below for consideration.

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General Principles of Patient Care

General Scope: Most of the following guidelines will begin with “Perform routine medical assessment.” A thorough assessment is needed for the treatment of complex medical conditions. It is understood that at times the assessment will need to be interrupted to perform life-saving treatment. Providers shall resume assessment as soon as they are able, after performing life-saving interventions. This shall serve as a general guideline for principles that apply to the assessment of all patients.

Applies to: All Medical Staff

Guideline:

- Universal precautions and personal protective equipment shall be always utilized as is appropriate for the situation.
  - PPE can include, but is not limited to:
    - Fluid barrier gloves
    - Safety eye protection/Face shield
    - Infection control gown
    - Infection control shoe covers
    - Infection control bouffant cap.
    - Surgical Mask
    - N-95 mask/PAPR/respirator.
- A patient is an individual requesting or potentially needing medical evaluation or treatment. The patient-provider relationship is established upon personal contact. It is the provider’s responsibility to ensure all potential patients are offered evaluation, treatment, and/or transport. (See Refusal of Evaluation, Treatment, and/or Transport Guidelines)
- All patients shall receive a primary assessment to include, but not limited to, the following:
  - Airway patency
  - Breathing (rate and quality)
  - Circulation
    - Pulse
    - Skin color, temperature, and condition
    - Assess for and treat life threatening bleeding.
  - Level on consciousness
- All patients shall receive a secondary assessment to include, but not limited to, the following:
  - Vital signs including, but not limited to:
    - Pulse

        - Blood pressure
        - SpO_2
        - Respiratory rate and effort
        - Temperature
    - S.A.M.P.L.E. history as possible
    - Rapid trauma and/or focused physical assessment
    - Secondary head-to-toe physical assessment
- Receiving facilities of patients being transported should be notified as soon as practical.
- All primary and initial secondary assessments shall be performed or supervised by the EMS provider with the most advanced level of training.
- All patients shall receive treatment as is appropriate per guideline and on-line medical direction.
- All patients shall be reassessed after an intervention is performed. The success, secondary effects, and possible side-effects of said intervention evaluated.
    - i.e., is a guideline give a medication dose such as Fentanyl 25-50 mcg Q 5 minutes; the care provider shall give the initial appropriate dose of 25-50 mcg and perform a re-assessment of the patient to include pain level, level of consciousness, and vital signs prior to giving a second dose.
    - The same principle applies to the titration of a medication. Titration is the adjustment of medication dosing until the desired endpoint is reached. The endpoint is the point at which the titration is complete as determined by an indicator.
- Medication dosing is considered acceptable within 20% of the calculated dose due to factors such as estimation of patient weight and difficulty in measuring exact volumes.
- For pediatric patients (1-8 years) and infants (newborn-1 year):
    - Equipment and medications must be appropriate for the size and weight of the patient. Use of a length-based tape is required.
    - The developmental age oof the infant/child must be considered in the communication and evaluation for treatment.
    - Treatment priorities are similar to the adult patient.
    - When appropriate, family members should remain with pediatric patients.
    - Infants and children must be properly restrained prior to and during transport.
- For inter-facility transports:

- Review interventions already in place for appropriateness, accuracy, and effect.
- For unfamiliar medications that are infused, ordered, and/or are to be administered by EMS, consult with physicians(s), nurse(s), and/or refer to the provided resources such as the drug reference book and/or online resources.

- Patients will be transported to the closest appropriate facility per local, state, and federal laws and guidelines.
  - If two hospitals are of similar distance and have similar capabilities/resources for the patient's nature of illness, mechanism of injury, or clinical impression, the patient will be transported to the hospital of their preference. If the patient is unable to answer, follow local department policy on where to transport the patient.

Airway

Airway/Ventilation Management

General scope: Guideline for airway management.

Guideline:

1. Perform routine medical assessment.
    a. Consider $EtCO_2$ monitoring if appropriate for scope of practice.
2. Titrate SpO_2 to ≥94%
    a. Use the lease amount of supplemental oxygen, as necessary.
    b. Patients on home Oxygen should remain on at least their minimum prescribed rate.
3. If patient presents with bronchospasm
    a. See Asthma/COPD Guidelines
4. If patient presents with pulmonary edema
    a. See Pulmonary Edema Guideline
5. If patient has a tracheostomy that requires replacement or suction
    a. See Tracheostomy Care Procedure
    b. Observe for signs and symptoms of respiratory failure.
        i. Failure to oxygenate.
        ii. Severy respiratory fatigue
        iii. Inability to successfully use CPAP.
        iv. RR<8 or >35 breaths per minute
        v. SpO_2<85% on 100% O_2
        vi. Acutely rising $EtCO_2$
        vii. Altered mental status.
        viii. Hemodynamic instability
        ix. Paradoxical respiratory efforts
6. *[EMR]* Provide supplemental oxygen via appropriate device.
    a. *[EMT**]* When providing ventilation via BCM, PEEP should be applied at 5-10 mmHg.
        i. Generally, PEEP is contraindicated in cardiac arrest but may be considered in patients with pulmonary edema.
    b. Tidal volumes of 6-8 cc/kg of ideal body weight should be attempted. Higher tidal volumes may be harmful to the patient.
7. *[EMR**]* Consider Supraglottic Airway Procedure
8. *[Paramedic]* Assess expected success of intubation, reference Airway Management Checklist
9. *[Paramedic]* If endotracheal intubation success likely and patient is >8y/o.
    a. Consider intubation.

        i. If RSI is necessary, see Resuscitation Sequence Intubation Procedure

10. If failed intubation (two total unsuccessful attempts):
    a. Consider BVM
    b. Consider Supraglottic Airway Procedure
    c. *[Paramedic]* consider Needle Cricothyroidotomy Procedure
        i. For children under ten, consider Needle Cricothyroidotomy Procedure

Airway Management Checklist

(ZOLL EVENT MARKERS)	NOTES
• Assess airway for difficulty - **LEMON/HEAVEN** • Perform neurologic exam before med administration • Monitor vital signs (HR, SpO2, ECG, ETCO2) • Use TurboCuf & consider defibrillator pads (RSI) • Prepare suction - turn on, check function (suction as needed using large bore suction catheter) • Place basic airway adjunct (NPA or OPA) • Ensure sniffing positioning - RAMP if obese (ear to sternal notch/face parallel to ceiling) • Pre-oxygenate - goal is ≥95% SpO2	**LEMON** • **L**ook externally (obesity, retracted mandible, beard, abnormal dentition) • **E**valuate the 3-2-2 rule (mouth opening, chin to hyoid & mandible to thyroid) • **M**allampati classification (how much of the posterior pharynx can be seen) • **O**bstruction (epiglottitis, tumor, trauma, abscess) • **N**eck mobility (c-spine, immobilization, arthritis, previous stabilization)
• Perform apneic oxygenation (regular nasal cannula at 15 lpm) • Prepare bag-valve mask (attach to oxygen, mask present, use PEEP valve) • Prepare intubation equipment (laryngoscope, bougie, ETT, syringe, securing device) • Ready primary airway device (test, lubricate) • Ready backup airway device • Ensure IV access (patent, appropriate size/location) • Administer vasopressors if indicated **(VPRES)**	**HEAVEN** • **H**ypoxemia (SpO2 <95% at epiglottoscopy) • **E**xtremes of size (clinical obesity) • **A**natomic challenge (trauma, mass, swelling, foreign body, other structural abnormality) • **V**omit/Blood/Fluid (fluid present in pharynx at epiglottoscopy) • **E**xsanguination (suspected anemia potentially accelerating desaturation during RSI associated apnea) • **N**eck (limited cervical range of motion)

• RSI: *[Paramedic]* Administer induction agents (SED/PAR) 0.5-2mg/kg KETAMINE & 1mg/kg ROCURONIUM (wait 60 seconds after each medication) • Intubation: Lead with suction & perform epiglottoscopy • Place airway without hypoxia (START/END)	• Ketamine doses as low as 0.5mg/kg should be used with hemodynamic compromise. • Standard dose is 1.5-2mg/kg

• Retain necessary equipment in case of problem (syringe, BVM mask, laryngoscope, medications) • Confirm placement with waveform capnometry (print strip and obtain snapshot on monitor) • Confirm lack of epigastric sounds & presence of lung sounds	**DOPES** • **D**isplacement or **D**isconnect • **O**bstruction • **P**neumothorax • **E**quipment failure • **S**tacked breaths if asthmatic

- Secure ETT using securing device or properly placed tape & stabilize head
- Provide continued hemodynamic support as needed
- Provide sedation & pain management as needed (re-paralyze if necessary)
- Reassess through completion of patient contact (vital signs & interventions)
- Use **DOPES** mnemonic to troubleshoot if necessary

Airway Obstruction

General Scope: Guideline for airway obstruction

Guideline:

1. Perform routine medical assessment.
2. If patient is unable to speak and is conscious
    a. Perform abdominal thrusts until the foreign body is expelled of the victim becomes unconscious.
3. If patient is unconscious
    a. Perform CPR per current AHA guidelines.
4. *[Paramedic]* If unable to ventilate consider direct laryngoscopy and removal with Magill forceps.
5. *[Paramedic]* If unsuccessful in removing foreign body or relieving upper airway obstruction.
    a. See Needle Cricothyroidotomy Guideline
6. [CCP] If unsuccessful in removing foreign body or relieving upper airway obstruction.
    a. Fore pediatric patients (<10 y/o), see Needle Cricothyroidotomy Guideline

Asthma/COPD

General scope: Guideline for treatment of asthma and chronic obstructive pulmonary disease.

Guideline:

1. Perform routine medical assessment.
2. Begin initial treatment per Airway/Ventilatory Management Guideline
3. If severe attack (Respiratory rate more than twice norma, loud wheezes or silent chest, patient anxious, and/or gray or ashen skin color)
    a. **ALBUTEROL** via nebulizer
        i. *[EMT]* 2.5-5.0mg
        ii. *[Paramedic]* Continuous administration
    b. *[AEMT]* consider IV TKO
    c. *[EMT/AEMT]* **DUO-NEB** nebulizer treatment
    d. *[Paramedic]* **METHYLPREDNISOLONE** 125mg IV/IO
        i. Pediatric (<8 y/o) – 1mg/kg
    e. *[Paramedic/Med Control]* **MAGNESIUM SULFATE** 2 grams/100mL HS IV/IO over 15 minutes
    f. *[AEMT]* **EPINEPHRINE** 0.3mg (1mg/mL [1:1,000]) IM
        i. Pediatric (<8 y/o) 0.15mg f.
4. For impending respiratory failure
    a. Consider CPAP
        i. See NIPPV Procedure
        ii. See Airway/Ventilatory Management guideline.
5. If mild attack (slight increase in respiratory rate, mild wheezes, and good skin color)
    a. Consider **ALBUTEROL** via nebulizer.
        i. *[EMT]* 2.5-5.0mg
        ii. *[AEMT]* Consider IV **TKO**
6. If moderate attack)Marked increase in respiratory rate, wheezes easily heard, and accessory muscle use)
    a. Consider **ALBUTEROL** via nebulizer.
        i. *[EMT]* 2.5-5.0mg
        ii. *[AEMT]* Consider IV **TKO**
7. For patients with advanced airway and bronchoconstriction
    a. ALBUTEROL
        i. *[Paramedic]* consider continuous nebulizer.

Assessment

Interfacility Pre-Transport Care

General Scope: Establishment of pre-transport standard of care for all intra/inter-facility transports.

Guideline:

1. Establish contact with referring facility and patient.
2. Complete “Primary Curvey
    a. Resuscitate if necessary.
3. Complete “Secondary Survey:
    a. To include vital signs, SpO_2 and cardiac monitor (if indicated)
4. Assess pre-arrival diagnostics and interventions.
    a. Paramedics can continue all antibiotics and electrolyte solutions; they can also transport other medications not found in the guideline with online Medical Control approval. If you are unfamiliar with any medication, consult with physician(s), nurse(s), and/or refer to the provided resources such as the drug reference book and/or online resources like drugs.com to insure you have a general understanding of the medication order, does, and side effects.
5. Confirm correct placement and position of ETT, NG/OG, PEG/PEJ, IVs, urinary catheter, etc.
6. Review X-rays, lab results, CT results, and EKG’s.
7. Review/confirm written orders from the referring physician are within you SOP and the PCS form has been properly filled out.
    a. Special attention should be paid to blood pressure and/or heart rate management, ventilator settings, and medications to be infused.
8. Prepare to load patients, consider spinal immobilization for trauma patients.

Cardiovascular

Cardiovascular – Adult

Asystole

General Scope: Guideline for treatment of a patient in aystolic cardiac arrest.

Guideline:

1. Perform routine medical assessment.
    a. Refer to Cardiac Arrest Guideline
    b. Initiate CPR and continue throughout resuscitation with minimal interruptions.
2. *[Paramedic]* Confirm asystole in two leads.
    a. If rhythm is unclear, see V-Fib/Pulseless V-Tach Guideline
3. *[AEMT]* Establish IV/IO
4. *[AEMT]* **EPINEPHRINE** (1mg/10mL [1:10,0000]) 1mg every 3-5 minutes
5. Establish airway per Airway/Ventilatory Management Guideline
6. Consider possible causes and treatments (H's &T's)
    a. Hypoxia – see Airway/Ventilatory Management Guideline
    b. Hypoglycemia – see Hypoglycemia/Hyperglycemia Guideline
    c. Hypothermia – see Hypothermia Guideline
    d. Hyperkalemia – *[Paramedic]* see Hyperkalemia Guideline
    e. Hypovolemia – consider IV **NORMAL SALINE** bolus.
    f. (H+) Pre-existing acidosis – Ventilate and for adults only, consider *[Paramedic]* **SODIUM BICARBONATE** 25mEq.
    g. (Toxins) Drug overdose – see Poisoning and Overdose Guideline
    h. Tension pneumothorax – consider *[Paramedic]* Needle Decompression Procedure
    i. Tamponade (Cardiac Tamponade)
    j. Thrombosis – PE/MI
7. After three doses of **EPINEPHRINE** (1mg/10mL [1:10,0000])
    a. *[Paramedic]* Consider **CALCIUM GLUCONATE** 1 gram.
    b. *[Paramedic]* Consider **SODIUM BICARBONATE** 25 mEq.
8. After the above, may consider termination of resuscitation – see 2. Termination of Resuscitation

Bradycardia

General Scope: Guideline for treatment of an adult patient with symptomatic bradycardia.

Guideline:

1. Perform routine medical assessment.
2. Monitor SpO_2
3. Airway support as needed per Airway/Ventilatory Management Guideline
4. Identify patient as having serious signs or symptoms.
    a. *[EMT**]* obtain and transmit a 12-Lead ECG
    b. *[Paramedic]* Review ECG if available
5. *[AEMT]* Establish IV/IO
6. If patient is asymptomatic, observe closely.
7. *[Paramedic]* is symptomatic or IV/IO readily available.
    a. Begin TRANSCUTANEOUS PACING per monitor manufacturer's guidelines.
        i. Consider Pain Management Procedure and/or Sedation Procedure as needed.
    b. *[Paramedic]* Administer **ATROPINE** 1mg every 3-5 minutes to a max of 3mg.
    c. *[Paramedic]* Consider **EPINEPHRINE** infusion (1mg.100mL D_5W or **NORMAL SALINE**-10mcg/mL)
        i. Initiate infusion at 2-10 mcg/min
        ii. Titrate every 5 minutes by increments of no more than 1mcg/min.
        iii. Maximum of 10 mcg/min

Cardiac Arrest (Benchmark)

General Scope: Guideline for initiating, performing, and/or terminating resuscitation of a cardiac arrest.

Guideline:

Initiation of Resuscitation

1. *[EMR]* Resuscitation must be initiated unless one of the following conditions exist.
    a. Valid DNR
        i. The presence of the uniform OOH DNR order or uniform OOF DNR identifier, or
        ii. The presence of the attending physician to provide direct verbal orders for care of the patient.
    b. Written order from physician
    c. Order from Medical Control physician.
    d. Pulseless and apneic with one of more of the following:
        i. Decomposition
        ii. Rigor Mortis
        iii. Dependent lividity
        iv. Decapitation
        v. MCI
        vi. Traumatic death with extrication >20 minutes with no CPR
    e. *[Paramedic]* For adult patient only, BLS resuscitation may be discontinued, including when performed by an ALS unit, without ALS intervention in the following conditions:

Arrest was not witnessed. **AND** There is no return of spontaneous circulation (ROSC) After three full rounds of CPR and AED analysis **AND** No AED shocks were delivered at any time. **AND** Cardiac rhythm is asystole as verified on cardiac monitor in multiple leads

2. PERFORMANCE OF RESUSCITATION
    a. *[EMR]* Resuscitation of the cardiac arrest patient should be performed utilizing current ECC guidelines.
        i. Utilize a team approach and pre-plan rotations & interventions.
        ii. Emphasis on quality chest compressions with minimal interruptions
            1. Consider use of mechanical CPR when available
        iii. Provide appropriate ventilation without PEEP – avoid hyperventilation.
        iv. Place advanced airway with no interruption of chest compression.
        v. Refer to appropriate dysrhythmia guideline as needed.
    b. *[Paramedic]* For patients with refractory ventricular fibrillation or ventricular tachycardia (three of more defibrillations without or with transient conversion), consider replacing defibrillation pads with pads in a different vector.
3. TERMINATION OF RESUSCIATION
    a. *[EMR]* Resuscitation should be continued until one of the following occurs.
        i. Valid DNR is provided.
        ii. Resuscitation efforts have been transferred to other person of at least equal skill and training.
        iii. Effective ROSC and ventilation have been restored.
        iv. The rescuers are physical unable, or it is unsafe to continue efforts.
        v. ALS determines termination of resuscitation is appropriate per 2b.
        vi. Medical Control orders efforts to stop.
    b. *[Paramedic]* Resuscitation should be continued until the following criteria are met.
        i. High quality CPR has been administered.
        ii. Adequate ventilation has been provided via BV< or advanced airway.
        iii. IV/IO access has been achieved.
        iv. Appropriate cardiac dysrhythmia guidelines have been followed.
        v. Persistent asystole or agonal rhythm is present.
        vi. No reversible causes are identified.
        vii. A minimum of 20 minutes of ALS resuscitation and 30 minutes total.
            1. May consider earlier termination in traumatic arrest with consultation from Medical Control prior to termination.
        viii. If transport has been initiated, efforts must continue until patient care has been turned over to receiving hospital.
        ix. Is resuscitation is not initiated or continues, or is terminated, ensure Coroner/Medical Examiner is notified.

Cardiac Arrest Benchmarks

CLINICAL BENCHMARKS	
☐	No interruptions of **chest compressions** > 10 seconds
☐	Rhythm interpreted **every two minutes** and defibrillation administered as needed
☐	First dose of **epinephrine** administered within five minutes in asystole
☐	**Advanced airway** successfully placed on first attempt
☐	Obtain **12-lead ECG** < 10 minutes after ROSC
☐	If STEMI, **transport directly to PCI center**
☐	Compliance with medical guidelines/MD orders

DOCUMENTATION BENCHMARKS	
☐	Document **patient demographics - age and gender**
☐	Document estimated **patient weight**
☐	**Attach** acquired ECGs & rhythm strips
☐	Document **vital signs every five minutes after ROSC**
☐	Document **hospital notification time**
☐	Document **disposition (ER or Cath Lab)**

Coronary Insufficiency (Benchmark)

General Scope: Guideline for treatment of patients who present with signs or symptoms of possible cardiac events.

Guideline:

1. Perform routine medical assessment.
2. Airway support as needed, see Airway/Ventilatory Management Guideline
3. *[EMT]* obtain and transmit a 12-Lead ECG
4. *[Paramedic]* Review ECG
    a. *[Paramedic]* If 12-Lead ECG is consistent with STEMI contact appropriate PCI Center and activate STEMI ALERT
        i. *[Paramedic]* Transport to nearest PCI center is recommended if travel time is expected to be 60 minutes or less.
5. *[AEMT]* Establish IV/IO
6. *[EMT]* Give **ASPIRIN** 324mg PO.
7. *[EMT]* Assist the patient with they own **NITROGLYCERIN** 0.4mg sublingual every 3-5 minutes until pain free (see below)
8. *[AEMT]* Give **NITROGLYCERIN** 0.4mg sublingual every 3-5 minutes until pain free or infusion established. (see below)
    a. IF SBP <120 See Blood Pressure Management Procedure
        i. Do not administer sublingual **NITROGLYCERIN** until SBP >120.
    b. *[Paramedic]* if SBP >90 consider NITROGLYCERIN INFUSION (50mh/250mL **NORMAL SALINE** or D_5W – 200mcg/mL)
        i. For patients <75kg, start at 10mcg/min.
        ii. For patients >75kg, start at 20mcg/min.
            1. Titrate by 5-10mcg/min every 5-10 minutes to desired response.
    c. Discontinue NITROGLYCERIN INFUSION is SBP <90.
9. *[Paramedic]* is STEMI ALERT, administer anti-platelet agent.
    a. Administer only one anti-platelet agent.
    b. Do not administer if already received by the patient (IFT)
        i. Option 1: 180mg **TICAGRELOR (BRILINTA)** PO OR
        ii. Option 2: 600mg **CLOPIDOGREL (PLAVIX)** PO
10. *[Paramedic]* If SBP >100 consider **FENTANYL** 25-50mcg fore refractory pain.
11. *[Paramedic]* Consider **MIDAZOLAM** 0.5-1mg.

Note:
Nitroglycerin

- Avoid if any history of PDE 5 inhibitor (Viagra, Levitra, Cialis) use in the past 48 hours.

STEMI Benchmarks

CLINICAL BENCHMARKS	
□	Obtain **12-lead ECG** < 10 minutes from patient side
□	**Notify receiving facility** of STEMI < 15 minutes from patient side
□	**Transmit ECG** to receiving facility
□	Perform **"right-sided" ECG** for suspected inferior infarcts
□	**Maintain O_2 saturation** of ≥94% with minimum Oxygen necessary
□	**Administer Aspirin** to eligible STEMI patients
□	**Administer Nitroglycerin** to eligible STEMI patients
□	**Administer analgesic** to eligible STEMI patients
□	Prep patient for Cath lab **(remove clothing/jewelry and place pads/patches appropriately)**

DOCUMENTATION BENCHMARKS	
□	Document **patient demographics - age and gender**
□	Document estimated **patient weight**
□	**Attach** all acquired ECGs
□	Document **vital signs every 15 minutes**
□	Document **pain scores with vital signs**
□	Document **hospital notification time**
□	Document **disposition (ER or Cath Lab)**

Narrow Complex Tachycardia

General Scope: Guideline for treatment of an adult patient with symptomatic narrow complex tachycardia.

Guideline:

1. If patient ≤ 8 years old, refer to appropriate Pediatric Tachycardia Guideline
2. Perform routine assessment.
    a. Consider underlying causes of tachycardia (i.e., sepsis, dehydration, shock, DKA)
3. Determine cardia rhythm and assess for stability.
    a. *[AEMT]* Attempt IV/IO (antecubital IV preferred)
4. If ventricular rate is >180 beats/minute and patient is unstable:
    a. Consider sedation per Sedation Procedure
    b. *[Paramedic]* Preform SYCHRONIZED CARDIOVERSION
        i. Utilize does range of 100-200J.
    c. Consider pharmacological intervention (see #6ci)
5. If ventricular rate is ≥ beats/minute and patient is stable, and rhythm is atrial fibrillation or atrial flutter:
    a. *[Paramedic]* Perform MODIFIED VALSALVA MANEUVER **[YouTube Link]**
    b. *[EMT]* Obtain 12-lead ECG if not converted.
        i. *[Paramedic]* Consider **AMIODARONE** 150mg/100mL **NORMAL SALINE** over 10 minutes.
6. If ventricular rate is >180 beats/minute and patient is stable, and rhythm is SVT:
    a. *[Paramedic]* Perform MODIFIED VALSALVA MANEUVER **[YouTube Link]**
    b. *[EMT]* Obtain 12-lead ECG is not converted.
    c. *[Paramedic/Med Control]* If patient is ≥50 years old – PRIOR to treatment below, contact Medical Control
        i. *[Paramedic]* **ADENOSINE** 12mg rapid push
            1. Adolescent (8-16 y/o) – 0.1mg/kg up to 12mg
        ii. *[Paramedic]* Consider **AMIODARONE** 150mg/100mL **NORMAL SALINE** over 10 minutes.

Notes:

Amiodarone precautions:

- Hypotension secondary to vasodilation
- May prolong QT interval
- Negative inotropic effects
- Use with caution in renal failure

Post Arrest (ROSC)

General Scope: Guideline for treatment of a patient who has regained a pulse following cardiac resuscitation.

Guideline:

1. Perform routine medical assessment.
2. *[AEMT]* Establish IV/IO if not previously initiated.
3. Establish airway per Airway/Ventilatory Management Guideline
4. *[Paramedic]* Consider titration of Oxygen to maintain saturation ≥ 94%.
5. *[AEMT]* Monitor $EtCO_2$
    a. Target range is 30-35mmHg with RR ≥10.
    b. Do NOT Hyperventilate.
6. [Paramedic} If patient received >2 minutes of CPR consider NG per Nasogastric Tube Procedure
7. Continuous monitoring if vital signs
8. If patient is hypotensive see Blood Pressure Management Procedure
9. Is patient has significant cardiac Dysrhythmia see appropriate guideline
10. If patient has bradycardia see Bradycardia Guideline
11. *[EMT]* Obtain and transmit a 12-Lead ECG to the receiving facility.
    a. *[Paramedic]* is 12-Lead is consistent with STEMI, contact closest appropriate PCI center to activate STEMI Alert
12. If arrest reoccurs, revert to appropriate guideline.

Pulmonary Edema

General Scope: Guideline for management of patients with suspected pulmonary edema.

Guideline:

1. Perform routine medical assessment.
2. Position patient is upright sitting position.
3. If respiratory arrest is imminent see Airway/Ventilatory Management Guideline
    a. Add PEEP 5-10mmHg.
4. If moderate to severe respiratory distress:
    a. *[EMT**]* Consider CPAP
        i. Administration of sublingual nitroglycerin noted below should be performed prior to placement of CPAP.
    b. *[Paramedic]* See Sedation Procedure as needed.
5. *[AEMT]* IV **NORMAL SALINE TKO**
6. If SBP <90 mmHg
    a. See Blood Pressure Management Procedure
7. If SBP >120mmHg
    a. *[AEMT]* **NITROGLYCERIN** 0.4mg SL Q 3-5 minutes to desired response to SBP ≤140
    b. *[Paramedic]* **NITROGLYCERIN INFUSION**[1] (20mg/100ml D_5W or **NORMAL SALINE**-200mcg/mL)
        i. Start at 20mcg/min.
        ii. Titrate by 10mcg/min every 5-10 minutes to desired response or SBP ≤140.
8. If SBP >180mmHg
    a. *[AEMT]* **NITROGLYCERIN**[1] 0.4-0.8mg SL every 3-5 minutes to desired response or SBP ≤140
    b. *[Paramedic]* NITROGLYCERIN INFUSION[1] (20mg/100ml D_5W or **NORMAL SALINE**-200mcg/mL)
        i. Start at 50mcg/min.
        ii. Titrate by 10mcg/min every 5-10 minutes to desired response or SBP ≤140.

[1] If use of PDE 5 inhibitor (Viagra, Levitra, Cialis) in the past 48 hours, contact medical control for direction on nitroglycerin administration.

Pulseless Electrical Activity

General Scope: Guideline for treatment of a patient with PEA in cardiac arrest.

Guideline:

1. Perform routine medical assessment.
2. Initiate CPR and continue throughout resuscitation with minimal interruptions.
3. Consider possible causes and treatments (H's & T's)
    a. Hypoxia – ventilation see Airway/Ventilatory Management Guideline
    b. Hypoglycemia – see Hypoglycemia/Hyperglycemia Guideline
    c. Hypothermia – see Hypothermia Guideline
    d. Hyperkalemia – see Hyperkalemia Guideline
    e. Hypovolemia – consider 250-500mL IV **NORMAL SALINE** boluses.
    f. (H+) Pre-existing acidosis – Ventilate and for adults only, consider *[Paramedic]* **SODIUM BICARBONATE** 25mEq.
    g. (Toxins) Drug overdose – see Poisoning and Overdose Guideline
    h. Tension pneumothorax – consider *[Paramedic]* Needle Decompression Procedure
    i. Tamponade (Cardiac Tamponade)
    j. Thrombosis – PE/MI
4. *[AEMT]* Establish IV/IO
5. *[AEMT]* Administer **EPINEPHERINE** 1mg every 3-5 minutes.
6. Establish airway per Airway/Ventilatory Management Guideline
    a. *[Paramedic]* Consider **CALCIUM GLUCONATE** 1gram.
    b. [Paramedic] Consider **SODIUM BICARBONATE** 25mEq.
7. After the above, may consider termination of resuscitation – see 2. Termination of Resuscitation

Ventricular Fibrillation/Pulseless Ventricular Tachycardia

General Scope: Guideline for treatment of a patient presenting with ventricular fibrillation or pulseless ventricular tachycardia in cardia arrest.

Guideline:

1. Perform routine medical assessment.
2. Initiate high-quality CPR and continues throughout resuscitation with minimal interruptions.
    a. *[Paramedic]* May administer precordial thump if witnessed arrest.
3. Apply defibrillator or AED.
    a. *[Paramedic]* If manual; defibrillate at manufacturer recommended energy settings, typically 120J – 200J.
    b. Repeat defibrillation (consider escalating energy if available) every 2 minutes with medications administered as listed below.
4. *[AEMT]* Establish IV/IO
5. Establish airway per Airway/Ventilatory Management Guideline
6. *[AEMT]* Administer **EPINEPHRINE** (1mg/10mL [1:10,000]) 1mg Q 3-5 minutes.
7. If torsades de pointes[1]
    a. *[Paramedic]* Administer **MAGNESIUM SULFATE** 2 grams (2G in 100mL D_5W or **NORMAL SALINE**) over 1-2 minutes.
8. If NOT torsades de pointes
    a. *[Paramedic]* Administer anti-arrhythmic:
        i. Option 1: **LIDOCAIN**E 1-1.5mg/kg or;
        ii. Option 2: **AMIODARONE** 300mg
            1. May repeat with 150mg.
    b. *[Paramedic]* Consider **MAGNESIUM SULFATE** 2 grams (2G in 100mL D_5W or **NORMAL SALINE**) over 1-2 minutes.
9. *[Paramedic]* Consider **CALCIUM GLUCONATE**[2] 1 gram and flush with normal saline[3].
10. *[Paramedic]* Consider **SODIUM BICARBONATE** 25mEq and flush with normal saline[3].
11. If pulse is returned see Post Arrest Guidelines

Notes:

[1]Risk factors for torsades include alcohol abuse, malnourishment, and QT prolongation.

[2]Priority administration is known or suspected cases of hyperkalemia.

[3]CALCIUM GLUCONATE and SODIUM BICARBONATE are not compatible so flush line well is using the same IV between administrations.

Wide Complex Tachycardia

General Scope: Guideline for treatment of a patient in presenting a wide or ventricular tachycardic rhythm.

Guideline:

1. Perform routine medical assessment.
2. *[AEMT]* Establish IV/IO
3. If patient is hemodynamically unstable:
    a. *[Paramedic]* Consider sedation per Sedation Procedure
    b. *[Paramedic]* SYNCHRONIZED CARDIOVERSION starting at 100J-200J.
        i. *[Paramedic]* If successful, begin **AMIODARONE** infusion (150mg in 100 D_5W or **NORMAL SALINE**=1.5mg/mL) at 1mg/min (400cc/he=1mg/min)
4. If patient is hemodynamically stable:
    a. *[EMT]* obtain 12-lead ECG.
    b. *[Paramedic]* If rhythm is regular and monomorphic consider **ADENOSINE** 12mg.
    c. *[Paramedic]* Administer **AMIODARONE** 150mg over 10 minutes.
        i. *[Paramedic]* If successful, begin **AMIODARONE** infusion (150mg in 100 D_5W or **NORMAL SALINE**=1.5mg/mL) at 1mg/min (400cc/he=1mg/min)
        ii. *[Paramedic]* If unsuccessful consider cardioversion (see#3)
5. *[Paramedic]* Consider **MAGNESIUM SULFATE** 2 grams (2G in 100mL D_5W or **NORMAL SALINE**) over 1-2 minutes for polymorphic wide complex tachycardia (Torsades de Pointes).

Note:

- For rates less than 150 bpm, evaluate for non-cardiac causes of tachycardia (hypovolemia, infection, bleeding, pain, etc.)
- Amiodarone Precautions
    - Hypotension secondary to vasodilation
    - May prolong QT interval.
    - Negative inotropic effects
    - Use with caution in renal failure; long $T_{1/2}$ lifw.

Cardiovascular – Pediatric

Pediatric Asystole/PEA

General Scope: Guideline for treatment of pediatric patient in a systolic cardiac arrest.

Guideline:

1. Perform routine medical assessment.
2. Initiate CPR and continue throughout resuscitation with minimal interruptions.
3. Consider possible causes and treatments.
    a. Hypoxia – ventilation see Airway/Ventilatory Management Guideline
    b. Preexisting acidosis – increase ventilations.
    c. Drug overdose – see Poisoning and Overdose Guideline
    d. Hypothermia – see Hypothermia Guideline
    e. Hyperkalemia – see Hyperkalemia Guideline
4. *[Paramedic]* Confirm asystole in two leads.
    a. If rhythm is unclear, see Pediatric V-Fib/Pulseless V-Tach Guideline
5. *[AEMT]* Establish IV/IO
6. Establish airway per Airway/Ventilatory Management Guideline
7. *[AEMT]* Administer **EPINEPHRINE** (1mg/10mL [1:10,000]) 0.01mg/kg every 3-5 minutes.

Pediatric Bradycardia

General Scope: Guideline for treatment of a pediatric patient with symptomatic bradycardia.

Guideline:

1. Perform routine medical assessment.
2. Monitor SpO_2
    a. Airway support as needed per Airway/Ventilatory Management Guideline
3. If heart rate <60; start CPR.
4. Identify patient as having serious signs or symptoms.
    a. *[EMT]* Consider obtaining and transmitting ECG.
        i. *[Paramedic]* Review ECG
5. *[AEMT]* Establish IV/IO
6. *[Paramedic]* Administer **EPINEPHRINE** (1mg/10mL [1:10,000]) 0.01mg/kg every 3-5 minutes.
7. *[Paramedic]* Consider TRANSCUTANEOUS PACING (rate at 100-120)

Pediatric Tachycardia with Adequate Perfusion

Guideline scope: Guideline for treatment of a pediatric patient with tachycardia.

Guideline:

1. Perform routine medical assessment.
2. *[Paramedic]* Determine cardiac rhythm and assess for stability/significant tachycardia.
    a. HR >180 for ages 1-8 years
    b. HR > 220 for ages newborn-1 year
3. *[AEMT]* Attempt IV/IO
4. IF QRS≥0.09 seconds:
    a. *[Paramedic]* Evaluate rhythm.
    b. If ventricular tachycardia:
        i. *[Paramedic]* **AMIODARONE** 5mg/kg over 10 minutes
        ii. *[Paramedic/Med Control]* Perform SYNCHRONIZES CARDIOVERSION 0.5-1K/kg.
            1. *[Paramedic]* Repeat at 0.2mg/kg (may repeat twice)
5. If QRS≤0.09 seconds:
    a. *[Paramedic]* Evaluate rhythm.
    b. If SVT
        i. Attempt MODIFIED VALSALVA MANEUVER
        ii. *[Paramedic]* **ADENOSINE** 0.1mg/kg rapid push
            1. *[Paramedic]* Repeat at 0.2mg/kg (may repeat twice)

c. If Sinus Tachycardia
    i. Search for and treat causes.

Pediatric Tachycardia with Poor Profusion

General scope: Guideline for treatment of a pediatric patient with symptomatic tachycardia.

Guideline:

1. Perform routine medical assessment.
2. *[Paramedic]* Determine cardiac rhythm and assess for stability/significant tachycardia.
    a. HR>180 for ages 1-8 years
    b. HR>220 for ages newborn-1 year
3. *[AEMT]* Attempt IV/IO
4. If QRS≥0.09 seconds and cardiopulmonary compromise:
    a. Consider sedation per Sedation Procedure
    b. *[Paramedic]* Perform SYCHRONIZED CARDIOVERSION 0.5-1 J/kg.
        i. Repeat as needed at 2-4 J/kg.
5. If QRS≤0.09 seconds:
    a. *[Paramedic]* Evaluate rhythm.
    b. If SVT:
        i. Consider sedation per Sedation Procedure
        ii. *[Paramedic]* Perform SYCHRONIZED CARDIOVERSION 0.5-1 J/kg.
            1. Repeat as needed at 2-4 K/kg.
        iii. *[Paramedic]* **AMIODARONE** 5mg/kg over 10 minutes
    c. If sinus tachycardia

i. Search for and treat causes.

Pediatric Ventricular Fibrillation/Pulseless Ventricular Tachycardia

General Scope: Guideline for treatment of a pediatric patient presenting with ventricular fibrillation or pulseless ventricular tachycardia in cardiac arrest.

Guideline:

1. Perform routine medical assessment.
2. Initiate CPR and continue throughout resuscitation with minimal interruptions.
3. Apply defibrillator or AED.
    a. *[Paramedic]* Defibrillate at 2-4 J/kg.
4. [AEMT} Establish IV/IO
5. Establish airway per Airway/Ventilatory Management Guideline
6. *[AEMT]* Administer **EPINEPHRINE** (1mg/10mL [1:10,000]) 0.01mg/kg every 3-5 minutes.
7. *[Paramedic]* Defibrillate at 4J/kg.
    a. Any time a shockable rhythm is present at pulse check.
8. *[Paramedic]* Administer **AMIODARONE** 5mg/kg.
    a. *[Paramedic]* May repeat 5mg/kg up to two times.
9. If pulse is returned see Post Arrest Guidelines

Environmental

Decompression Sickness

General Scope: Guideline for treatment of patients with potential decompression sickness.

Guideline:

1. Perform routine medical and trauma assessment.
2. Place patient on 100% 0xygen via tight fitting mask is spontaneously breathing, see Airway/Ventilatory Management Guideline
3. *[AEMT]* Establish IV/IO
4. Evaluate for hypothermia, see Hypothermia Guideline
5. See Blood Pressure Management Procedure
6. See Pain Management Procedure
7. Transport to the nearest hyperbaric chamber (consider air transport). Medical Control must call to ensure chamber is available, working, and establish an accepting physician.
    a. Contact
        i. Diver's Alert Network, 919-694-8111, asl for diving emergencies
        ii. Hennepin County Medical Center
            1. 800-424-4262 Ed Physician
            2. 612-873-3132 ED
            3. 612-873-7420 Hyperbaric Department
        iii. St. Lukes, Milwaukee 414-649-6577
        iv. University of Iowa, Iowa City
            1. 319-356-7706 (8-5)
            2. 319-356-2233 (after hours)
            3. 319-356-8220 HBO Physician

A. Decompression illness occurs when the gas dissolved in the body fluids separates from those fluids to form bubbles.
B. In a rapid ascent, the pressure differential between the body tissues, blood, and alveoli becomes great enough to cause separation of nitrogen from the liquid phase resulting in the formation of bubbles in the tissues or blood.
C. Predisposing factors that increase the incidence of decompression illness:
    1. Dehydration
    2. Cold Temperatures
    3. Obesity
    4. Exercise during the dive.
    5. Older individuals
    6. Previous joint injury
    7. Previous recent dives
    8. Flying after recent dives
D. Decompression illness can occur during ascent or up to 72-hours after a dive (especially if multiple dives/day
E. Manifestations
    1. Pain
        i. Limb Pain
        ii. Girdle Pain
    2. Cutaneous e.g., itching, lymphedema
    3. Neurological (including audio vestibular, i.e., loss of balance
    4. Pulmonary e.g., CHF, cough dyspnea
    5. Constitutional (malaise, anorexia, fatigue)
    6. Hypotension
    7. Barotraumas (lung, sinus, ear, dental)
F. Important information
    1. Time of onset
    2. Gad burden (depth-time profile): Depth of dive, dive time, and number of dives

Envenomation

General Scope: Guideline for treatment of patients with potential envenomation.

Guidelines:

1. Perform routine medical and trauma assessment.
2. Obtain and document history of time and type of bite (bring offending agent is safe to do so)
3. Remove and constrictive items (clothing, jewelry) on effected extremity.
4. *[AEMT]* Establish IV/IO in non-affected extremity.
5. See Blood Pressure Management Procedure
6. See Pain Management Procedure

Heat Related Illness

General Scope: Guideline for treatment of all patients with potential heat related illnesses.

Guideline:

1. Perform routine medical assessment.
    a. Obtain temperature.
2. Remove from heat source.
3. Remove clothing, as necessary.
4. Maintain cool air flow over patient.
5. Determine Heat Exhaustion vs Heat Stroke and treat accordingly.

	Heat Exhaustion	Heat Stroke
	• Core temperature 98.6° F – 104° F • Anxiety • Confusion • Hypotension • Oliguria • Tachycardia • Vomiting	• Core temperature > 104° F • Altered mental status • Anhidrosis • Arrhythmia • Hyperventilation • Pulmonary Edema • Shock

	• Oral fluids as tolerated • *[AEMT]* IV fluids TKO if transporting • Consider blood pressure management as needed	• Airway support as needed • Provide active cooling (cool packs to chest wall, groin, or axilla) • Sponge with cool water or cover with wet sheet and fan body • *[AEMT]* Establish IV/IO & administer room temperature **NORMAL SALINE** • Consider blood pressure management as needed • *[Paramedic]* If shivering, consider **MIDAZOLAM** 2mg • For seizures, see Seizure Guideline

Notes:

1. Consider hyperthermia from overdose – specifically sympathomimetics.
2. Extremes of age are more prone to heat related illness.
3. Patients on tricyclic antidepressants, anticholinergics, and diuretics are more susceptible to heat related illness.
4. Cocaine, amphetamines, and salicylates may elevate body temperature or interfere with autoregulation.

Hypothermia

General Scope: Guideline for treatment of all patients with potential hypothermia.

Guideline:

1. Perform routine medical and trauma assessment.
2. If patient is responsive:
    a. Remove wet clothing, cover with warm blankets, apply heat packs to axilla, groin, neck, and thorax.
    b. If signs of frostbite:
        i. Protect injured parts (blisters) with light sterile dressings. Avoid pressure to area.
        ii. Cover affected part with warm blankets and prevent re-exposure to cold or refreezing of part.
    c. *[AEMT]* Establish IV/IO
    d. *[AEMT]* Give up to two liters of warmed **NORMAL SALINE**
3. If patient is unresponsive:

a. Airway support as needed, see Airway/Ventilatory Management Guideline
b. *[AEMT]* Establish IV/IO
c. *[AEMT]* Five up to two liters of warmed **NORMAL SALINE**
d. If bradycardic do not start CPR
e. If patient is pulseless:
    i. Check for pulse, respiration, and/or viable rhythm for at least 1 minute.
    ii. If patient is pulseless
        1. Start CPR
        2. Follow appropriate cardiac arrest guideline.
        3. Consider transport as soon as possible for rewarming.

** Field resuscitation may be withheld if the victim has obvious lethal injuries or if the body is frozen so that nose and mouth are blocked by ice and chest compression is impossible.

Medical

Medical – Adult

Altered Mental Status (AMS)

General Scope: Guideline for treatment of patients who present with altered mental status.

Guideline:

1. Provide routine medical assessment (with frequent rechecks every 5-10 minutes)
    a. Attempt to identify cause.
        i. Consider, among other causes, hypoxia, hypovolemia, trauma, diabetes, poisoning/overdoes, etc.
    b. If suspected trauma, see General Trauma Guideline
    c. If suspected overdose, see Poisoning and Overdose Guideline
        i. Consider opiate overdose in patients with respiratory depression/compression, SBP <90, and decreased LOC.
    d. If hypo/hypertensive see Blood Pressure Management Procedure
2. Provide airway support as needed, see Airway/Ventilatory Management Guideline

a. *[Paramedic]* Consider intubation for GSC <8, see Resuscitation Sequence Intubation Procedure as needed.

3. *[AEMT]* Establish IV/IO
4. If blood glucose <60 or >250 see Hypoglycemia/Hyperglycemia Guideline

Anaphylaxis/Allergic Reaction

General Scope: Guideline for treatment of patients who present with severe allergic reaction.

Guideline:

1. Perform routine medical assessment.
    a. Remove offending agent.
    2. Airway support as needed, see Airway/Ventilatory Management Guideline

ANAPHYLAXIS

a. EPINEPHRINE (use with caution in elderly/patients with coronary artery disease)
    i. *[EMT]* Epinephrine auto-injector if available
    ii. *[AEMT]* 0.3mg (1mg/mL [1:1,000]) IM
        1. Pediatric (<8y/o) – 0.15mg

iii. May repeat IM Epinephrine every 5 minutes up to three times if needed.

3. If bronchospasm is present:
    a. **ALBUTEROL** via nebulizer
        i. *[EMT]* consider 2.5-5.0mg
        ii. *[Paramedic]* Consider continuous **ALBUTEROL NEBULIZER** (10-20mg)
4. *[AEMT]* Establish IV/IO but do not delay administration of **EPINEPHRINE**.
    a. *[Paramedic]* if continues signs of anaphylaxis after three doses of IM Epinephrine, establish **EPINEPHRINE INFUSION** (1mg/100ml D_5w or **NORMAL SALINE**-10mcg/mL)
        i. Initiate IV infusion at 2-5mcg/min.
            1. Titrate by 1mcg/min every 5 minutes up to 10mcg/min.
        ii. Pediatric (<8y/o) – initiate at 0.1mcg/kg/min.
            1. Titrate by increments of up to 0.2mcg/kg/min every 5-10 minutes as needed, up to 1mcg/kg/min.
    b. *[Paramedic]* **DIPHENHYDRAMINE** 25-50mg IV/IO or 50mg IM
        i. Pediatric (<8y/o) – 1mg/kg IV/IO/IM
    c. *[Paramedic]* **METHYLPREDNISOLONE** 125mg
        i. Pediatric (<8y/o) – 1mg/kg (Max 125mg)

ALLERGIC REACTION

    d. Ice and elevate affected area as practical.
    e. *[Paramedic]* Consider **DIPHENHYDRAMINE** 25-50mg IV/IO or 50mg IM.
        i. Pediatric (<8y/o) – 1mg/kg IV/IM

Notes:

a. Symptoms may begin immediately or be delayed up to several hours from exposure.
b. Localized swelling and redness are not Anaphylaxis.

General Medical

General Scope: Guideline for treatment of patients with medical emergencies.

Guideline:

1. Perform routine medical assessment.
2. Check respirations, SpO_2, and apply oxygen if needed, see Airway/Ventilatory Management Guideline
3. Check pulse and apply cardiac monitor, see appropriate Cardiac Dysrhythmia Guideline
4. Check blood pressure, see Blood Pressure Management Procedure
5. Consider checking blood glucose, see Hypoglycemia/Hyperglycemia Guideline
6. *[AEMT]* Establish IV/IO

Hyperkalemia

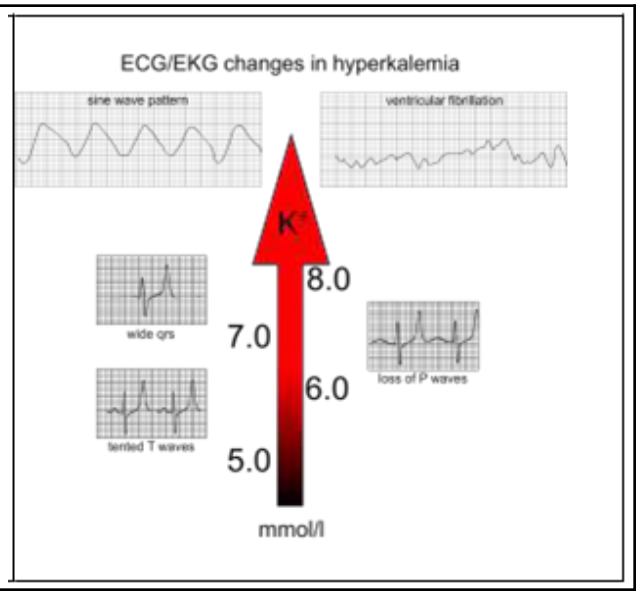
General Scope: Guideline for treatment of patients who are or are suspected to be Hyperkalemic.

Guideline:

1. Perform routine medical assessment.
2. Identify as symptomatic: Patients with profound weakness or shock with EKG changes as below AND history of any of the following: dialysis, renal failure, rhabdomyolysis, hyperglycemia, or laboratory confirmed diagnosis of Hyperkalemia.
3. Airway support as needed, see Airway/Ventilatory Management Guideline
4. *[EMT]* Obtain 12-kead EKG.
5. *[AEMT]* Establish IV/IO
6. *[Paramedic]* **CALCIUM GLUCONATE** 1g

a. Pre-Arrest: Mix in 100ml D_5W or **NORMAL SALINE** and administer over 10 minutes.
b. Cardiac Arrest: Administer rapidly as IV/IO bolus.
c. Do not mix this with **SODIUM BICARBONATE**
    i. Do not administer in same line without flushing with at least 20mL.

7. *[Paramedic]* **ALBUTEROL** – continuous nebulizer
8. *[Paramedic]* **SODIUM BICARBONATE** 50mEq over 10 minutes
    a. May repeat up to two total doses.
    b. Avoid in dialysis and CHF patients.
    c. Do not mix with **CALCIUM GLUCONATE**
        i. Do not administer in same line without flushing with at least 20mL.

Cardiac effects (may or may not be present): 5.6-6.0mEq/L – peaked T waves due to increased repolarization 6.0-6.5mEq/L – diminished P waves and depressed ST segments; may result in an intracardiac block affecting in the following order: atria, AV node, ventricles 7.5-8.0mEq/L – P waves disappear, QRS complex widens, S&T waves tend to merge 10-12mWq/L – classic sine wave occurs which represents loss of P wave and wide QRS complexes. Other effects: Skeletal muscle weakness to flaccid paralysis with preservation of diaphragm muscle function. Parathesis Respiratory depression	

Hypoglycemia/Hyperglycemia

General scope: Guideline for treatment of patients who present with diabetic emergencies.

Guideline:

1. Perform routine medical assessment with blood glucose check.
2. Airway support as needed, see Airway/Ventilatory Management Guideline
3. *[AEMT]* Establish IV/IO
4. If blood pressure <60mg/dL:
    a. Assess patient for insulin pump and suspend if found.
        i. Be sure to resume or advise patient of your intervention after treatment.
    b. *[EMT]* Consider **ORAL GLUCOSE** if patient is conscious and able to follow commands.

c. *[AEMT]* **GLUCAGON** 1mg IM/SQ or 2mg IN
   i. *[EMT]* May only assist with a patient prescribed auto-injector.
   ii. Pediatric (<8y/o) – 0.5mg IM/SQ
   iii. Fire response agencies: Contact responding transport ambulance for ETA to the scene prior to glucagon administration. Glucagon may be administered only if transport ambulance ETA is > 10 minutes.

Patients under 20 kg	Patients over 20 kg
• Administer bolus of 0.5g/kg D_{50} slow IVP and evaluate response for at least 2 minutes. Reassess blood glucose level and mental status. Monitor IV site for infiltration and discontinue immediately if noted. Utilize length-based resuscitation tape to confirm dose. • If desired results are not achieved, administer additional 0.5g/kg up to 25g	• Administer 12.5g (25mL) D_{50} slow IVP and evaluate response for at least 2 minutes. Reassess blood glucose lever and mental status. • If desired results are not achieved administer additional 12.5g (25mL) D_{50} every 2 minutes until improvement in blood glucose level and mental status.

d. Determine any prescribed anti-diabetic medications and recent history of administration.
   i. If a patient is prescribed and uses an oral hypoglycemic agent, transport is strongly encouraged due to potential for rebound hypoglycemia.

5. If blood glucose >350mg/dL:
   a. *[AEMT]* **NORMAL SALINE** 1L bolus
      i. Pediatric (<8y/o) – 20ml/kg/hr.
   b. *[Paramedic]* Acquire 12-lead EKG and assess for signs of electrolyte derangement.

Nausea/Vomiting/Vertigo

General Scope: Guideline for treatment of patients who have complaints of nausea, vomiting, or vertigo.

Guideline:

1. Perform routine medical assessment.
2. Airway support as needed, see Airway/Ventilatory Management Guideline
3. Suction as needed.
4. *[AEMT]* Consider IV/IO
5. *[AEMT]* **ONDANSETRON** 4mg IV or SL tablet
    a. Pediatric (<2y/o) – 0.1mg/kg IV up to 2mg
        i. (2y/o – 8y/o) – 2mg IV or approximately ½ SL tablet (~2mg)

ii. (>8y/o) – 4mg IV or SL tablet

6. *[Paramedic]* **MIDAZOLAM** 0.5-1mg after failure of **ONDANSETRON (Adult Only)**

Note:

1. If suspected vertigo, concurrent administration of ONDANSETRON and MIDAZOLAM is preferred.

Poisoning and Overdose

General Scope: Guideline for treatment of patients who have been exposed to a toxic substance or have experienced an accidental or intentional overdose.

Guideline:

1. Perform routine medical assessment.
    a. Special consideration given to time of exposure.
    b. Obtain blood glucose level to rule in/out Hypoglycemia/Hyperglycemia
2. Airway support as needed, see Airway/Ventilatory Management Guideline
3. Check blood pressure, see Blood Pressure Management Procedure
4. Frequently reassess level of consciousness throughout patient care

5. Determine type of toxic agent
6. Eliminate Source
    a. If agent on skin and dermally absorbed
        i. Remove clothing.
        ii. Brush any remaining toxic agent off skin
        iii. Flush affected area with water for a minimum of 15 minutes prior to transport
    b. If agent has been inhaled:
        i. Remove patient from environment.
        ii. Remove clothing.
        iii. Provide high concentration oxygen, see Airway/Ventilatory Management Guideline
        iv. If bronchospasm present, see Asthma/COPD Guideline
7. *[AEMT]* Establish IV/IO
8. If agent is potentially an opioid and patient is exhibiting respiratory depression with inadequate oxygenation/ventilation:
    a. *[EMR]* Give **NALOXONE**
        i. Auto dose IN and repeat every 5 minutes as needed (adult and pediatric)
        ii. Auto inject IM and repeat every 5 minutes as needed (adult and pediatric)
    b. [AMET] Give **NALOXONE**
        i. 1-4mg IN and repeat every 5 minutes as needed (adult and pediatric)
        ii. 0.4-4mg IV/IO and repeat every 5 minutes as needed (adult and pediatric)
            1. Titrate to adequate ventilation & oxygenation.
9. If agent is a tricyclic antidepressant and patient exhibiting toxicity (HR>120, DBP<90, decreased LOC, and/or widening of QRS)
    a. *[Paramedic]* Give **SODIUM BICARBONATE** 25mEq followed by 25mEq in 1000mL **NORMAL SALINE** over 1 hour.

Seizure

General Scope: Guideline for treatment of patients who are or suspected to be experiencing seizures.

Guideline:

1. Perform routine medical assessment.
2. Airway support as needed, see Airway/Ventilatory Management Guideline
3. Consider Pregnancy, see Pre-Eclampsia/Eclampsia Guideline
4. Rule out hypoglycemia, trauma, infection, hypoxia, withdrawal, or toxins
    a. If blood glucose <60 or >250 see Hypoglycemia/Hyperglycemia Guideline
    b. See Altered Mental Status Guideline
5. If actively seizing:

a. *[AEMT]* Establish IV/IO
b. *[Paramedic]* **MIDAZOLAM**
    i. Adult:
        1. 5mg IM if no IV/IO access
        2. 1-3mg IV/IO
        3. Do not delay IM administration for IV access.
    ii. Pediatric (<8y/o):
        1. 0.1mg/kg IM (Max single dose 5mg) if no IV/IO access
        2. 0.05mg/kg IV/IO (Max single dose 3mg)
        3. Do not delay IM administration for IV access.
    iii. May repeat administration every 5 minutes as needed.
c. *[Paramedic]* If convulsions continue after 15mg **MIDAZOLAM** has been administered, consider **KETAMINE** administration.
    i. Adult – 0.5-2mg/kg IV/IO
    ii. Pediatric (<8y/o) – 0.5-1mg/kg IV/IO
d. If seizure has resolved and patient is postictal:
    i. *[AEMT]* Establish IV/IO

Sepsis/Septic Shock

General Scope: Guideline for identification and treatment of adult patients with sepsis and septic shock. For children, contact medical direction if concerns of sepsis.

Guidelines:

1. Perform routine medical assessment.
2. Compare assessment results in chart below to help determine sepsis vs septic shock.

SEPSIS	SEPTIC SHOCK

Known or suspected infection, or patient is at high risk of infection. ● i.e., Immunocompromised, residents of SNFs, and those with indwelling devices (PICC line, Foley, Trach, etc.) **AND** Two or more of the following: ● Acutely altered mental status ● Temperature >100.4°F or <96.8°F ● Respiratory Rate>20 breaths/min ● Heart rate > 90beats/min	Presence or suspicion of sepsis **AND** At least one of the following **<u>in each category</u>**: ● Perfusion o Systolic blood pressure <90 o Mean Arterial Pressure (MAP) <65. ● Cellular Metabolism o $ETCO_2$ ≤25mmHg o Lactate >4mmol

3. Administer oxygen to maintain SpO_2 ≥94%
    a. Establish airway per Airway/Ventilatory Management Guideline if necessary.
4. *[AEMT]* Establish IV/IO
5. *[AEMT]* Treat as described in chart below. ALS intercept recommended is septic shock.

SEPSIS	SEPTIC SHOCK
● Administer NORAML SALINE as a rate of 500mL/hr.	● Establish second IV per guideline. ● Administer 1-2L NORMAL SALINE bolus over 60 mins if not contraindicated. ● *[Paramedic]* If adequate response, concurrently administer NEOEPINEPHRINE INFUSION at 0.1mcg/kg/min; titrated by 0.01-0.05mcg/min every 3-5 minutes to reach a MAP>65mmHg (mac of 0.3mch/kg/min

6. Notify hospital of sepsis/septic shock patient as soon as possible. If transporting to MercyOne and patient meets criteria in chart below, state that patient is a Sepsis Alert in the radio report.

SEPSIS ALERT CRITERIA (Gunderson transport only)
Patient will need to meet ALL 3 criteria: 1. Suspected or known infection. 2. Two or more of the following:

a. Temperature >100.4° F or <96.8° F
b. Respiratory Rate >20 breaths/min
c. Heart Rate >90beats/min

3. $ETCO_2$ ≤25mmHg (used as a surrogate for lactate; evidence shows this helps eliminate false positives)

Stroke / Cerebrovascular Accident (Benchmark)

General Scope: Guideline for treatment of patients who present with signs or symptoms of a stroke.

Guideline:

1. Perform routine medical assessment with FAST-ED scale and determine time last known well.
    a. If stroke is positive, and time last know well is within 24 hours, transport service to notify receiving hospital within 10 minutes of being at patient side.
        i. If FAST-ED score is 1-3, activate STROKE ALERT
        ii. If FAST-ED score ≥4, activate LVO STROKE ALERT
2. Airway support as needed, see Airway/Ventilatory Management Guideline
    a. *[Paramedic]* Consider intubation for GCS <8.
3. Rule out hypoglycemia, hypoxia, hypovolemia, trauma, or positions/overdose
4. *[AEMT]* Establish IV/IO **(≥18ga AC Preferred)**
5. *[Paramedic/Med Control]* On a 911 call or otherwise unknown type of stroke if patient is hypertensive with SBP >220 or DBP >120 consider slowly lowering blood pressure. If a patient has a severe headache or vomiting, consider contacting Medical Control for lower parameters. On interfacility transport, obtain foal blood pressure parameters from sending facility or contact Medical Control.
    a. See Blood Pressure Management Procedures
6. Evaluate vital signs and FAST-ED Stroke Scale every 15 minutes.

FAST-ED SCORE	0	1	2
Facial Weakness	Normal or minor paralysis	Partial or complete paralysis	N/A
Arm Weakness	No drift	Unilateral drift with effort against gravity	No effort against gravity or movement
Speech Changes	No changes	Mild to moderate	Severe aphasia or mute
Eye Deviation	Absent	Gase preference	Forced deviation
Denial/Neglect	Absent	Extinction to bilateral simultaneous stimulation	No recognition of own hand; orients to one side only

Note:

Signs of Herniation: Sudden decrease in level of consciousness, ipsilateral papillary dilation, contralateral hemiparesis, and decerebrate or decorticate posturing.

Stroke/Cerebrovascular Accident Benchmarks

CLINICAL BENCHMARKS	
□	Obtain and report **last known well** time
□	Perform **FAST-ED Stroke Scale every 15 minutes**

□	**Notify** hospital of stroke alert **within 10 minutes** of patient side
□	Obtain and document **blood glucose level**
□	Obtain and document **vital signs every 15 minutes**
□	**Maintain O_2 saturation** of ≥94% with minimum Oxygen necessary
□	**Establish IV (AC preferred - 18ga or larger)**; do not delay transport for additional IV. access
□	Transport with **head of bed elevated 30°**

DOCUMENTATION BENCHMARKS	
□	Document **patient demographics - age and gender**
□	Document estimated **patient weight**
□	Document **last known well time**
□	Document **FAST-ED Stroke Scale every 15 minutes**
□	Document **blood glucose level**
□	Document **vital signs every 15 minutes**
□	Document **hospital notification time**
□	Document **disposition (ER or CT)**

Medical - Pediatric

Obstetrical/Newborn

Abnormal Delivery

General Scope: Guideline for delivering infants presenting with ominous signs.

Guideline:

1. Perform routine medical assessment.
2. *[AEMT]* Establish IV without delaying transport or other care.
3. If prolapsed cord is present:
    a. Prepare for immediate transport while performing care described below.
    b. Do not push cord back in
    c. Place mother in Trendelenburg knee to chest position.
    d. With gloved hand, push presenting part off cervix to decompress cord and maintain this position in route to hospital.
4. If infant is breech (buttocks or feet first):
    a. Never pull-on breech infant, wait until maternal efforts deliver infant past umbilicus before touching infant.
    b. Once the infant is delivered past umbilicus, if baby is not already rotated so they are facing the mother's back, gently rotate the infant to this position.
    c. If arms do not deliver on their own over the course of a couple of contractions, help deliver them once axilla are visible by sweeping the arms across the chest by hooking them one at a time with your finger.
    d. Being careful not to extend the neck, create breathing space around baby's face with gloves hand (middle and index finger along the baby's face and up to its nose).
    e. Suprapubic pressure may help to maintain head flexion and facilitate delivery.
5. If other part is presenting (arm, foot, etc.):
    a. Do not pull-on part and place mother in left lateral position.
6. Multiple births:
    a. After initial delivery, clamp and cut cord after 1-2 minutes.
    b. Proceed with subsequent deliveries.
7. After delivery refer to Neonatal Resuscitation Guideline. If neonate is extremely premature (known to be less than 24 weeks) resuscitation efforts are unlikely to be successful. Contact Medical Control for further directions. If available use Telehealth.

8. *[Paramedic]* After delivery, administer **OXYTOCIN** 10u IM to prevent postpartum hemorrhage.

APGAR SCORING:

Sign	0	1	2
Pulse	Absent	<100	>100
Respirations	Absent	Slow or Irregular	Good Crying
Muscle Tone	Limp	Some flexion	Active motion
Reflex irritability	None	Grimace	Cough or sneeze
Color	Pale or Blue	Pink body/blue extremities	Completely pink

Childbirth

General Scope: Guideline for delivering infants.

Guideline:

1. Perform routine medical assessment.
    a. Systolic & Diastolic BP may be decreased by 5-15mmHg.
    b. Respirations may increase by 1-2 breaths per minute.
    c. Resting HR may increase by 15-20 beats per minute.
2. If signs of abnormal delivery, see Abnormal Delivery Guideline
3. If imminent delivery:
    a. *[AEMT]* Establish IV (consider IO is unstable and unable to obtain IV)
    b. Place mother in lateral position or position of mother's choosing and prepare delivery equipment.
    c. Have mother pant through contractions and relax between, do not tell her not to push or coach pushing.
    d. AS head crowns, apply slight pressure to prevent explosive delivery.
    e. Is umbilical cord is wrapped around the infant's neck, unloop it gently with your finger while waiting for shoulders to deliver. If the cord is too tight to unloop easily, angle infant's forehead to mother's thick to allow baby's body to deliver while keeping head close to perineum and unwrap the cord after delivery.
    f. *[Paramedic]* After the shoulders are delivered, administer **OXYTOCIN** 10u IM to prevent postpartum hemorrhage.
    g. Place baby on mother's abdomen and cover with dry towel to prevent heat loss.
        i. Baby should be lying on its stomach.
    h. Take APGAR scores at 1 and 5 minutes.
    i. If HR<100 see Neonatal Resuscitation Guideline
    j. Wait 305 minutes before clamping and cutting the cord>6in from the infant between two clamps.
    k. If placenta delivers, place cord and placenta in container and bring to receiving facility.

l. Massage uterus if bleeding is brisk after delivery of the placenta (not before)
m. If heavy bleeding is present, see Postpartum Hemorrhage Guideline

APGAR SCORING:

Sign	0	1	2
Pulse	Absent	<100	>100
Respirations	Absent	Slow or Irregular	Good Crying
Muscle Tone	Limp	Some flexion	Active motion
Reflex irritability	None	Grimace	Cough or sneeze
Color	Pale or Blue	Pink body/blue extremities	Completely pink

Neonatal Resuscitation

General Scope: Guideline for resuscitation of a neonatal patient. If neonate is extremely premature (known to be less than 24 weeks), resuscitation efforts are unlikely to be successful. Contact Medical Control for further directions.

Guideline:

1. Perform routine medical assessment.
    a. Oxygen saturation should be measured on right extremity (See SpO_2 targets below)
    b. Obtain blood glucose lever from heel (See Glucose target below).
2. Cord clamping should be delayed for 3-5 minutes unless it interferes with resuscitation. Perform resuscitation on mother's abdomen if possible.
3. Provide tactile stimulation, assess tone, breathing, and crying.
    a. If normal: maintain temperature and dry infant, position airway, clear secretions.
    b. If abnormal: maintain normal temperature and dry infant, place head in sniffing position, suction mouth then nose.
        i. Routine intubation for tracheal suction is no longer recommended in meconium staining.
4. If cardiac arrest – **GO DIRECTLY TO 7b(i)**
5. If labored breathing or cyanosis and heart rate above 100:
    a. Provide supplemental oxygen as needed.
6. If apnea, gasping, or heart rate below 60:
    a. Begin positive pressure ventilation at a rate of 40-60 breaths/min with a tidal volume of 8-10ml/kg.
    b. If condition unchanged after one minute of ventilation, consider supraglottic airway.
7. If heart rate below 60:
    a. Initiate positive pressure ventilations.

b. Is after 30 seconds of positive pressure ventilation the heart rate remains below 60:
    i. Perform chest compression and continue positive pressure ventilation.
        1. Three compressions & one ventilation every 2 seconds
    ii. *[Paramedic]* Administer **EPINEPHERINE** (1mg/19mL [1:10,000]) 0.01-0.01mg/kg.
    iii. *[AEMT]* Consider **NORMAL SALINE** bolus of 10ml/kg.
    iv. *[Paramedic]* Consider NEEDLE DECOMPRESSION in suspected tension pneumothorax.

SPO_2 Targets	
1 minute	60%
2 minutes	65%
3 minutes	70%
4 minutes	75%
5 minutes	80%
10 minutes	85%

Glucose Target
>45mg/dL
Treat hypoglycemia with 2-3ml/kg D_{10} repeated every 5 minutes as needed.

Postpartum Hemorrhage

General Scope: Guideline for post-delivery hemorrhage.

Guideline:

1. Perform routine medical assessment.
2. *[Paramedic]* Administer **OXYTOCIN** 10u IM if not given already.
3. Perform uterine massage after delivery of the placenta to promote uterine tone.
4. Apply direct pressure to any area of lower genital tract trauma.
5. If hemorrhage remains uncontrolled with brisk bleeding, decreasing blood pressure, and increasing heart rate.
    a. [AEMT} Establish IV/IO
    b. Airway support as needed, see Airway/Ventilatory Management Guideline
    c. If birth has occurred within 3 hours, see Shock in Trauma Guideline for Tranexamic acid (TXA) administration instructions.
    d. Maintain blood pressure, see Blood Pressure Management Procedure

Pre-Eclampsia/Eclampsia

General Scope: Guideline for pre-eclamptic or eclamptic patients (SBP >160/DBP >110).

Guideline:

1. Perform routine medical assessment.
2. Airway support as needed, see Airway/Ventilatory Management Guide
3. *[AEMT]* Establish IV/IO
4. If patient is seizing:
    a. *[Paramedic]* Give **MAGNESIUM SULFATE** 4g/100mL **NORMAL SALINE** over 10 minutes.
    b. *[Paramedic]* Give **MIDAZOLAM** 2mg every 2 minutes.
        i. See Seizure Guideline
    c. [Paramedic/Medical Control] Consider more **MAGNESIUM SULFATE**
5. If patient is no longer seizing prior to the administration of **MAGNESIUM SULFATE**:
    a. Place patient in position of comfort.
    b. *[Paramedic]* Give **MAGNESIUM SULFATE** 4g/100mL **NORMAL SALINE** over 20 minutes.
    c. See Blood Pressure Management Procedure

Notes:

1. Pre-Eclampsia: Toxic state which occurs in the last half of pregnancy or early postpartum period in which mother exhibits the following:
    a. Can still be present after delivery.
    b. Hypertension (SBP>160, DBP>110, or an increase in DBP of 15mmHg from previous baseline.
    c. Hyperreflexia
    d. Generalized peripheral edema.
    e. Proteinuria

2. Hyperreflexia and visual changes indicate imminent seizure.
3. Magnesium
    a. Stop or decrease if knee jerk reflex absent, respiratory depression occurs, or cardiac arrest.
    b. Antidote is *[Paramedic]* **CALCIUM GLUCONATE** 1g in 100mL over 10 minutes.
        i. Caution if maternal renal disorder or history of Myasthenia Gravis

Special Operations

Multiple Patient Incident

General Scope: Procedure for MCI.

Guideline:

1. Incident with three or more patients
2. Utilize SALT triage system and triage tags.
3. Implement Incident Command System as appropriate.
4. Notify possible receiving facilities as soon as possible.
    a. Notification should be done by designated “officer” within ICS System.

Pandemic Triage and Non-Transport

THIS GUIDELINE IS ONLY ACTIVE WITH WRITTEN ORDER AND NOTIFICATION BY THE MEDICAL DIRECTOR!

General Scope: Procedure for Triage & Non-Transport of patients and provision of stay-at-home instructions during pandemic situations.

Procedure:

Patients with influenza-like illness (ILI) and no emergency warning signs may be considered for non-transport with instructions for self-care. Err on the side of caution when, despite a symptom match, clinical impression is that of something other than ILI. Patients who demand transport despite inclusion criteria and urging of non-transport from EMS providers should be transported or have Medical Control consultation via phone.

Criteria for inclusion:

- Patients over 8 years old with symptoms of influenza-like illness, including COVID-19
    - Symptoms may include cough, fever, body aches, nasal congestion, headache, nausea, and diarrhea.
        - Patients must not have emergency warning signs described below.
        - Patients with a history of respiratory disease (COPD/Asthma), active cancer, diabetes, morbid obesity, heart disease, neuromuscular disorders, or are immunocompromised must have

Medical Control consultation via phone or telemedicine for inclusion.
        - Patients eight or younger must have Medical Control consultation via phone for inclusion.
- Patients or responsible adults must have the capacity to understand stay at home restrictions.
- Vital signs at the time of release (see below for normal0:
    - Heart rate under 110 or upper limit of age based normal.
    - MAP of 65 or higher (or systolic at lower limit of normal)
    - Respiratory rate under twenty-four or upper limit of age based normal.
    - SpO_2 >92%
    - Temperature under 103° F (39.4° C)

Determining capacity for understanding instructions

- Patients and responsible adults are considered capable of understanding instructions if they are oriented to person, place, time, and event (or to their baseline mental status) and can express understanding of the instructions provided.
- If the patient is a resident of a long-term facility and staff are available to review and carry out the stay-at-home instruction.

Provide stay-at-home instructions.

- Provide patient or responsible adult with stay-at-home instruction form.
- In addition, the following information must be provided to the patient or responsible adult:
    - IF you develop emergency warning signs for COVID-19, get medical attention immediately.
        - Emergency Warning Signs*:
            - Difficulty breathing or shortness of breath.
            - Persistent pain or pressure in the chest
            - New confusion or inability to arouse.
            - Bluish lips or face

*Please consult your medical provider or appropriate flu line for any other symptoms that are severe or concerning

Normal Vital Sings Reference (Low-High)			
Age Category	Heart Rate	Respiratory Rate	Systolic BP

Adult	60-100	12-20	80-120
Adolescent (13-18 years)	55-105	12-20	100-120
School Age (5-12 years)	70-110	20-30	80-120
Preschool (3-5 years)	80-120	20-30	80-110
Toddler (12-36 months)	80-130	20-30	70-100
Newborn/Infant (Birth-12 months)	100-160	40-60	70-90

Scene Rehabilitation

General Scope: Guideline for rehabilitation of rescue personnel when requested to a standby.

Guideline:

1. Establish/join rehab area in consultation with incident command.
2. Encourage removal of all PPE including bunker pants pushed down to boots.
3. Perform rehabilitation screening & sort after five minutes of rest.
    a. Vital signs

	Level 0	Level 1	Level 2
Heart rate	< 70% Max	≥ 70% Max	≥ 85% Max
Blood pressure	≤ 180 Systolic	> 180 Systolic	> 200 Systolic
Temperature	≤ 99.5° F	99.6° - 103°	> 103° F
Respiratory rate	8 – 24	25 – 40	< 8 or > 40
SpO_2	> 94%	91 – 94%	< 91%
Carbon monoxide	< 6%	6-10%	> 10%

(if available)			

Age	Max HR	Age	Max HR
20	200	45	175
25	195	50	170
30	190	55	165
35	185	60	160
40	180	65	155

b. Assessment

	Level 0	Level 1	Level 2
Cramping		X	
Dizziness or syncope			X
Confusion or altered mental status			X
Chest pain			X
Shortness of breath			X
Vomiting			X

4. After screening, the following rehabilitation activities should be performed for a minimum of 20 minutes.

Level 0	Level 1	Level 2
Rest		
Oral rehydration		Oral and IV rehydration
Passive cooling		Passive & active cooling
	Vital sign evaluation at 10 minutes	Vital sign evaluation every five minutes
		Routine medical assessment

Follow appropriate guidelines
Transport recommended

5. Participants must reach the following vital signs after a minimum of 20 minutes of rehabilitation prior to return to duty (NFPA 1584 [2015])

Heart rate	< 100 bpm
Blood pressure	< 160 systolic AND < 100 diastolic
Temperature	≤ 99° F
Respiratory rate	12 – 20
SpO_2	> 94%
Carbon monoxide (if available)	< 6%

Notes:
Consider rehabilitation for EMS personnel, law enforcement, or other responders, after 45 minutes of duty.

Trauma

Amputation

General Scope: Guideline for treatment of patients who have experienced an amputation.

General Scope:

1. Perform routine trauma assessment.
2. Consider tourniquet for uncontrolled bleeding.
3. *[AEMT]* Establish IV/IO
4. See General Trauma Guideline
5. See Pain Management Guideline
6. Irrigate amputated part with **NORMAL SALINE** to remove gross contaminants (do not debride)
7. Place amputated part in sterile gauze moistened in **NORMAL SALINE**.
8. Place amputated part in sterile waterproof container if available.
9. Place sealed container in ice of place activated cols packs around container.

Burns

General Scope: Guideline for treatment of patients who have experienced a burn.

Guideline:

1. Perform routine trauma assessment.
2. Consider activation of air ambulance for transport to medical center with a specialized burn center.
3. Airway support as needed, see Airway/Ventilatory Management Guideline
4. *[AEMT]* Establish IV/IO
5. See General Trauma Guideline
6. See Blood Pressure Management Procedure
7. See Pain Management Procedure
8. If burn is thermal in nature:
    a. Stop the burning process with causing hypothermia.
    b. Remove clothing and jewelry (Do not pull away clothing that is stuck to burn)
    c. *[AEMT]* If burn if >10% BSA and ETS to hospital is >15 minutes, **NORMAL SALINE** 150ml/hr.
    d. *[Paramedic]* Consider early intubation if signs of airway burns are present.
9. If burn is chemical in nature:
    a. Remove agent as appropriate.
    b. Irrigate for at least 15 minutes with **NORMAL SALINE**.
        i. Use at least 1000mL for eye irrigation.
        ii. Use continuous irrigation for alkali buns.
10. If burn is electrical in nature (severe high voltage injury):
    a. Once scene is safe, remove patient from the source.
    b. See Cardiac Dysrhythmia Guideline as needed.
    c. *[AEMT]* Establish IV/IO
        i. Consider 500-1000mL bolus.
        ii. *[Paramedic/Med Control]* Consider **SODIUM BICARBONATE** 50mEq per liter at 500-1000mL.hr
11. Dress burned area with non-adhesive plastic wrap (“Saran Wrap”)
12. Consider using burn sheet with additional clean, dry sheer and blanket to conserve body heat.
13. **DO NOT BREAK BLISTERS. DO NOT APPLY CREAMS, OINTMENTS, OR ANTIDOTES TO BURNS.**
14. Consider air medical transport.

Crush Syndrome

General Scope: Guideline for treatment of patients with prolonged (over one hour) crush/pinning. This guideline is also appropriate for suspension trauma.

Guideline:

1. Perform routine medical and trauma assessment.
2. Airway supper as needed, see Airway/Ventilatory Management Guideline
3. *[AEMT]* Establish IV/IO (initiate volume replacement prior to extrication if possible)
    a. *[AEMT]* IV/IO **NORMAL SALINE** up to 2L bolus.
4. See General Trauma Guideline
5. Evaluate for hypothermia, see Hypothermia Guideline
6. Apply direct pressure to control external bleeding.
7. *[EMR]* Consider using a tourniquet on affected limb before extrication if possible.
    a. Leave the tourniquet in place for transport.
    b. *[Paramedic]* If transport >20 minutes, consider slowly releasing tourniquet.
8. Early stabilization of all extremity fractures aids in controlling blood loss
9. *[Paramedic/Med Control]* Consider **NORMAL SALINE** with **SODIUM BICARBONATE** infusion (50mEq per liter) at 500-1000mL/hr.
10. See Pain Management Procedure
11. If signs or symptoms of Hyperkalemia are present, refer to Hyperkalemia Guideline.

General Trauma

General Scope: Guideline for treatment of all patients with potential traumatic injuries.

Guideline:

1. Perform routine trauma assessment.
2. Consider Trauma Activation with transport to nearest appropriate trauma center as per state trauma guideline.
3. Consider spinal precautions, see Selective Spinal Precautions Procedure.
4. Control massive hemorrhage.
    a. Consider tourniquet.
    b. Consider pressure points, wound packing, and hemostatic agent per Hemostatic Agent Procedure
5. Airway support as needed, see Airway/Ventilatory Management Guideline
    a. If suspected tension pneumothorax, see Needle Decompression Procedure.
6. Apply occlusive dressing for sucking chest wound.
    a. Consider intubation.
7. Control bleeding with direct pressure.
8. {AEMT} Establish IV/IO
    a. Avoid excessive fluid administration.
    b. Goal of maintaining SCP ~90mmHg
    c. See Blood Pressure Management Procedure
9. See Shock in Trauma Guideline
10. Splint extremity fractures.
11. For suspected unstable pelvis fracture, consider placement of pelvic binder or wrap.
12. See Pain Management Procedure.

Head Injury

General Scope: Guideline for treatment of all patients with potential head injuries.

Guideline:

1. Provide routine medical and trauma assessment.
2. See General Trauma Guideline
3. Consider spinal precautions, See Selective Spinal Precautions Procedure.
4. Prevent hypotension.
5. Prevent hypoxemia.
6. Prevent hyperventilation.
7. {AMET} Establish IV/IO
8. If no signs of herniation:
    a. Maintain normal $EtCO_2$ of 35-45mmHg.
    b. See guidelines as needed.
        i. Nausea/Vomiting/Vertigo Guideline
            1. *[AEMT]* **ONDANSETRON** 4mG IV or SL tablet
                a. Pediatric (<2y/o) – 0.1mg/kg IV up to 2mg
                    i. (2y/o – 8y/o) – 2mg IV or approximately ½ SL tablet (~2mg)
                    ii. (>8y/o) – 4mg IV or SL tablet.
        ii. Seizure Guideline
9. If signs of herniation[1] are present:
    a. Mildly hyperventilate patient (14-16 breaths/minute) to maintain $EtCO_2$ 30-35mmHg.

Note:

Elevate the head of bed approximately 30° for transport if possible.

1. Signs of Herniation: Sudden decrease in level of consciousness, ipsilateral papillary dilation contralateral hemiparesis, and decerebrate of decorticate posturing.

Shock in Trauma

General Scope: Guideline for management of shock in all patients.

Guideline:

1. Control obvious hemorrhage.
2. Position patient supine when possible.
3. Consider Air Medical Transport.
4. *[AEMT]* Establish IV/IO
    a. Two access points if evidence of ≥Class II shock; do not delay transport for access.
    b. Titrate **NORMAL SALINE** with a SBP goal of ≥90 in trauma patients (permissive hypotension except in patients with significant head injuries).
5. *[Paramedic]* For hemorrhagic shock in patients ≥ 12 years of age: **TRANEXAMIC ACID (TXA)** 2g in 100mL D_5W or **NORMAL SALINE** over 10 minutes (faster may result in hypotension); use filter needs to draw up. Optional: Administer **TRANEXAMIC ACID (TXA)** 2g as a slow IV push over 10 minutes.
    a. Indications: Evidence of acute blood loss – Class II or greater.
    b. One-time administration as soon as possible, but no later than 3 hours after initial injury.
    c. Considerations:
        i. Contact Medical Control for patients <12 years of age. If order is given, administer **TRANEXAMIC ACID (TXA)** 15mg/kg (max 1g) in 100 mL of D_5W or **NORMAL SALINE** over 10 minutes (faster may result in hypertension); use filter needle to draw up. Optional: administer **TRANEXAMIC ACID (TXA)** 15mg/kg (max 1g) as a slow push over 10 minutes. The receiving facility should follow with an infusion of 2mg/kg/hr. in **NORMAL SALINE** over 8 hours (max 1g).
        ii. Contact Medical Control for non-traumatic hemorrhagic shock (≥Class II).
    d. Exclusion:
        i. Known time of injury greater than 3 hours or unknown time.
        ii. Known DIC.
        iii. Recent history of thrombosis or thromboembolism (DVT, PE, Embolic Stroke).
6. Shock Classifications:

	CLASS I	CLASS II	CLASS III	CLASS IV
Blood Loss (mL)	Up to 750	750-1500	1500-2000	>2000
Blood Loss (%BV)	Up to 15%	15-30%	30-40%	>40%
Pulse Rate	<100	>100	>120	>140
Blood Pressure	Normal	Normal	Decreased	Decreased
Pulse Pressure (mmHg)	Normal or increased	Decreased	Decreased	Decreased
Respiratory Rate	14-20	20-30	30-40	>35
Urine Output (mL/hr.)	>30	20-30	5-15	Negligible
CNS/ Mental Status	Slightly anxious	Mildly anxious	Anxious and confused	Confused and lethargic
Fluid Replacement (3:1)	Crystalloid	Crystalloid	Crystalloid and blood	Crystalloid and blood

Trauma in Pregnancy

General Scope: Guideline for treatment of all potentially pregnant patients with potential trauma.

Guideline:

1. Perform routine medical and trauma assessment.
2. See General Trauma Guideline.
3. Position on left side (minimize uterine compression on the Inferior Vena Cava.
4. *[AEMT]* Establish IV/IO
5. Maintain blood pressure, see Blood Pressure Management Procedure.
    a. SBP & DBP is usually 5-15mmHg less starting in the second trimester.
    b. HR is usually 15-20 BPM more during the third trimester.
    c. Shock is not always obvious in the pregnant patient (because of an increase in circulating blood volume during pregnancy, the pregnant female will show signs of hypovolemia later in their course).

Procedures

Blood Pressure Management

General Scope: Guideline for treatment of patients who present with abnormally high or low blood pressure.

Procedure:

1. Perform routine medical assessment.
2. Airway support as needed, see Airway/Ventilatory Management Guideline.
3. *[AEMT]* Establish IV/IO

Hypotension	Hypertension
1. If patient is hypotensive and symptomatic with no overload: a. *[AEMT]* 250-500mL NORMAL SALINE bolas up to 2L total 2. If NORMAL SALINE unsuccessful and vasopressor is indicated, NOREPINEPHRINE is preferred except in anaphylaxis, symptomatic bradycardia, and hypotensive pulmonary edema. a. *[Paramedic]* Consider Push Dose Epinephrine 10-20mcg as a bridge to infusion. b. *[Paramedic]* Consider NOREPINEPHRINE INFUSION (4mg/250ml D_5W or **NORMAL SALINE** – 16mcg/mL) i. Initiate at 0.1mcg/kg/min via IV pump. 1. Titrate by 0.01-0.05mcg/kg/min every 3-5 minutes.	1. If patient is hypertensive per applicable guidelines: a. *[Paramedic/Med Control]* LABETALOL 20mg slow push i. May repeat at 40mg every 10 minutes to a max of 300mg. 2. *[Paramedic/Med Control]* Consider NITROGLYCERIN INFUSION (20mg/100mL D_5W or **NORMAL SALINE** – 200mcg/mL) a. For patients <75kg, start at 10mcg/min. b. For patients >75kg, start at 20mcg/min. c. Titrate by 5-10mcg/min every 5-10 minutes for desired response. d. Monitor BP every 3-5 minutes

2. Magnesium of 0.3mcg/kg/min c. *[Paramedic]* Consider EPINEPHRINE INFUSION (1mg/100mL D_5W or **NORMAL SALINE** – 10mcg/mL) when norepinephrine is not the preferred vasopressor. i. Initiate IV infusion at 2.5mcg/min. ii. Titrate by increments of no more than 1mcg/min every 5 minutes. iii. Maximum of 10mcg/min	

Notes:

1. Nitroglycerine
    a. Specifically indicated in patients with acute hypertensive pulmonary edema or myocardial ischemia.
    b. Consider lower doses in the elderly.
    c. Avoid if any history of PDE 5 inhibitor (Viagra, Levitra, Cialis use in the past 48 hour.
2. Norepinephrine/Epinephrine
    a. May worsen under lying ischemia, tachycardia, or acidosis.
    b. Increases peripheral vascular resistance.

Pediatric Blood Pressure Management

General Scope: Guideline for treatment of pediatric patients, age eight or under, who present with abnormally low blood pressure.

Procedure:

1. Perform routine medical assessment.
2. Airway support as needed, see Airway/Ventilatory Management Guideline.
3. *[AEMT]* Establish IV/IO
4. If hypotensive and patient is symptomatic with no signs of fluid overload:
    a. *[AEMT]* Administer 20ml/kg **NORMAL SALINE** over 10-20 minutes.
        i. If suspected cardiogenic shock, consider 10mL/kg **NORMAL SALINE** over 10-20 minutes.
        ii. Repeat bolus once if needed.
5. If patient has inadequate response to fluid:
    a. *[Paramedic/Med Control]* Consider EPINEPHRINE INFUSION (1mg/100mL D_5W or **NORMAL SALINE** – 10mcg/mL)
    b. Initiate at 0.1mcg/kg/min.
    c. Titrate by increments of up to 0.2mcg/kg/min every 5-10 minutes, up to 1mcg/kg/min.

Blood Transfusion Continuation and Monitoring

General Scope: Guideline and criteria for transport of blood product.

Applies to: Paramedics & Critical Care Paramedics

Procedure:

1. Obtain written order for rate and total volume of blood product to be infused, confirm with RN or Physician.
2. Confirm with RN or Physician that name on patient's wristband matches the name on the infusing blood product. The patient must have a wristband, no exceptions!
3. Infusion of blood product:
    a. *[Paramedic]* Blood product infusion must be initiated prior to transport of patient.
        i. No additional infusions of blood products may be established during transport.
    b. [Critical Care Paramedic] Blood product infusion may be initiated during transport.
4. Vital signs (including body temperature) must be recorded pre-transport and q10 minutes during transport.
5. If the patient develops any sign of allergy/sensitivity reaction, including chills, fever, chest pain, flank pain, hives, wheezing, uticaria, or the patient shows signs of shock, the following actions should be taken immediately:

a. Infusion of blood product must be immediately stopped, disconnected, and all tubing and product saved for delivery to receiving facility.
b. IV/IO **NORMAL SALINE** initiated.
c. See Blood Pressure Management Procedure.
d. See Anaphylaxis/Allergic Reaction Guideline.
e. Hemolytic reactions (fever, chills, chest pain, flank pain, and/or shock) may occur. Contact Medical Control if a hemolytic reaction is suspected.

6. Written orders must accompany the patient and be included in the patient care report.

Note:

- Blood products that are not infusing at the time of transport should remain in a cooler; must be provided by sending facility.

Cancellation of Call

General Scope: Procedure for cancelling an ambulance or air transport while in route to a call. This applies to EMS agencies (EMR and above) who have approval from their leadership team or board.

Procedure:

1. When EMS is activated but a request to cancel is made, dispatch will advise responding transport crew to continue in a non-emergency fashion.
2. The responding crew may cancel under the following conditions:
    a. At the discretion of the service's designated leadership with consideration given to call circumstances, system status, and/or weather.
    b. No physical patient exists, or patient has left the scene.
    c. The call or address has been determined to be false in nature.
    d. The patient's personal physician is in attendance and determines the ambulance is not needed.
    e. Non-transport EMS services have advised the patient is refusing further care and/or transport and non-transport EMS service will complete the refusal documentation. Refer to Refusal Protocol.

First responders on scene can assess and cancel auto-launched air transport based on their assessment, need of air transport, or safety issues, if transport ambulance is in route.

Triage Clearance

General Scope: Procedure for triage and clearance with limited EMS resources. This applies to EMS agencies (EMR and above) who have approval from their leadership team or board.

Procedure:

1. In the circumstance of simultaneous calls occurring with sufficient resources, the initial agency/unit at patient side may clear the scene after ALL the following have been met:
    a. AN assessment has been performed.
    b. No immediate care or assistance is needed.
    c. The patient's condition is deemed low acuity after assessment.
    d. Patient or patient representative is able to recontact 9-1-1 if conditions change.
    e. Patient or patient representative is informed of the triage and reason for clearing.
    f. Arrangements for secondary EMS resources to respond to complete the call have been made.
2. Each agency will follow department policy for communicating with dispatch and the transporting agency.
3. Patient care report must be completed with an explanation for utilizing triage clearance procedure.

Chest Tube Monitoring

General Scope: Chest tube monitoring

Applies to: Paramedics and Critical Care Paramedics

Procedure:

1. Routine trauma and/or medical assessment.
2. Asure that the chest tube(s) is securely fastened to patient.
3. Check chest tube(s) for patency and proper function prior to transport.
4. Assure that the long flexible tubing is securely fastened to the container that acts as a drainage device, water seal, and suction control device. Assure that the tubing is free of kinks.
5. Make note of the fluid and blood levels in the drainage and water seal compartments.
6. Obtain orders as to the water seal level.
7. When suction is used, ensure that there is bubbling in the suction control chamber. (if not, check the suction unit).
8. If the water seal fails to stop bubbling after the lung is re-inflated or later begins to bubble:
    a. Momentarily clamp the flexible tubing near the chest. If bubbles quit emanating from the tube while it is clamped, then the problem is either a persistent air leak in the patient's lung or the chest tube is not sealed at the chest wall.
    b. Never leave the clamp on for more than a few seconds.
    c. Evaluate the insertion site.

   d. Apply occlusive dressings to the site.
   e. Evaluate the patient for distress.
   f. Consult with a physician immediately is needed.
   g. If the bubbling does not cease during the clamping of the proximal end, then suspect a leak at a connection site in the tubing or the tubing itself.
      i. Check all connections and secure with tape.
      ii. Seal the leak with occlusive dressing and tape or replace the tubing. When replacing the tubing, remember to clamp the distal end of the chest tube to avoid the formation of pneumothorax.
9. If the water device becomes damaged, a temporary water seal can be accomplished by putting flexible tubing into a bottle of sterile saline. Keep this device and tubing below chest level.
10. Consult with the physician/staff for the best patient positioning.
11. If the chest tube is not functioning and a tension pneumothorax is suspected, perform a needle decompression of the affected side.

Critical Care Sedation (Adult)

General Scope: Guideline for treatment of adult patients who require sedation during critical care transports. All patients who receive sedation should have continuous monitoring of vital signs including cardiac monitoring.

Applies to: Critical Care Paramedics

Procedure:

1. Perform routine medical assessment.
2. Airway support as needed, see Airway/Ventilatory Management Guideline.
3. Consider hypoxia or hypovolemia.
4. If patient is combative, maintain adequate restraints, see Restraint Guideline.
5. Establish IV/IO.
6. For routine sedation, see Sedation Procedure.
7. If patient is intubated:

MIDAZOLAM	KETAMINE	PROPOFOL
***** Infusions of controlled substances must be stopped and wasted by the transporting crew. Controlled substances in any form may not be turned over to receiving facilities. *****		
Adult • Bolus dosing	**Adult** • Bolus dosing	**Adult** • PROPOFOL may not be

○ 1-3mg IV/IO ○ 5mg IM • Infusion dosing ○ Mix 10mg in 100mL NORMAL SALINE ○ Use MIDAZOLAM calc function on pump ▪ Start at 1-2 mg/hr. ▪ Titrate by 0.5 mg/hr. max of 7 mg/hr.	○ 0.5-2 mg/kg IV/IO/IM • Infusion dosing ○ Mix 100mg in 100mL NORMAL SALINE ○ Use GENERIC calc function on pump ▪ Start at 0.8 mcg/kg/min ▪ Titrate by 0.4 mcg/kg/min: max of 6 mcg/kg/min	initiated and is only for continuation during IFTs • Infusion dosing Use PROPOFOL calc function on pump 5-50 mcg/kg/min. If greater than 50mcg is required, contact medical control. Absolute maximum dose is 80 mcg/kg/min May increase 5-10 mcg/kg/min every five minutes based on required sedation Bolus dosing 0.1-0.5 mg/kg IVP slowly to quickly increase depth of sedation for patients not at risk for hypotension

Critical Care Sedation (Pediatrics)

General Scope: Guideline for treatment of pediatric patients who require sedation during critical care transports. Pediatric patients are considered such between 5kg and 49.9kg.

All patients who receive sedation should have continuous monitoring of vital signs including cardiac monitoring.

Applies to: Critical Care Paramedics

1. Perform routine medical assessment.
2. Airway support as needed, see Airway/Ventilatory Management Guideline.
3. Consider hypoxia or hypovolemia.
4. If patient is combative, maintain adequate restraints, see Restraint Procedure.
5. Establish IV/IO
6. For routine sedation, see Sedation Procedure
7. If patient is intubated:

MIDAZOLAM	KETAMINE	PROPOFOL
*** Infusions of controlled substances must be stopped and wasted by the transporting crew.		

Controlled substances in any form may not be turned over to receiving facilities. ***		
Pediatric (< 8 y/o) • Bolus dosing ○ 0.05 mg/kg IV/IO or 0.1 mg/kg IM • Infusion dosing ○ Mix 5mg in 100mL **NORMAL SALINE** ○ Use GENERIC drug calc function on pump ・Start at 1mcg/kg/min ・Titrate by 0.5mcg/kg/min; max of 5mcg/kg/min	**Pediatric (< 8 y/o)** • Bolus dosing ○ 0.5-2 mg/kg IV/IO/IM • Infusion dosing ○ Mix 50mg in 100mL **NORMAL SALINE** ○ Use GENERIC drug calc function on pump ・Administer 1mcg/kg/min ・Titrate by 0.5 mcg/kg/min: max of 6 mcg/kg/min	**Pediatric (< 8 y/o)** • PROPOFOL may not be initiated and is only for continuation during IFTs • Infusion dosing ○ Use PROPOFOL calc function on pump ○ Start at 125 mcg/kg/min ○ May increase 5-10 mcg/kg/min every five minutes up to 300 mcg/kg/min ○ Bolus dosing 0.1-0.5 mg/kg slowly to quickly increase depth of sedation for patients not at risk for hypotension

EZ-IO® Intraosseous Vascular Access System

General Scope: Procedure for placement of EZ-IO Intraosseous Vascular Access System

INDICATIONS FOR USE

For adult and pediatric patients, vascular access is difficult to obtain in emergent, urgent, or medically necessary situations for up to 48-hours.

APPROVED INSERTION SITES**

Adults	Pediatrics
• Proximal humerus • Proximal tibia • Distal tibia**	• Distal femur** • Proximal humerus • Proximal tibia • Distal tibia**

**MUST HAVE ADDITIONAL TRAINING AND MEDICAL DIRECTOR APPROVAL

CONTRAINDICATIONS

- Fracture of the targeted bone.
- Previous, significant orthopedic procedures at insertion site (e.g., prosthetic limb or joint).
- IO in the targeted bone within the past 48-hours.
- Infection at area of insertion.
- Excessive tissue or absence of adequate anatomical landmarks.

EQUIPMENT/SUPPLIES

• EZ-IO® Power Driver • EZ-IO® Needle Set and EZ-Connect® Extension Set • EZ-Stabilizer® Dressing • Cleansing agent of choice • Luer lock syringe with sterile Normal Saline flush (5-10 mL for adults, 2-5 mL for infant/child)	● Sharps container ● Intravenous 2% Lidocaine for placement in conscious patient. ● Intravenous fluid ● Infusion pressure pump or pressure bag, tubing, 3-way stop cock

General Placement Principles

INSERTION SITE IDENTIFICATION

Palpate site to locate appropriate anatomical landmarks for needle set placement and to estimate soft tissue depth overlying the insertion site. Utilize the correct techniques below based on patient and site selected:

NEEDLE SET SELECTION

Select EZ-IO® Needle Set based on patient weight, anatomy, and clinical judgment.

The EZ-IO® Catheter is marked with a black line 5 mm proximal to the hub. Prior to drilling, with the EZ-IO® Needle Set inserted through the soft tissue and the needle tip touching bone, adequate needle length is determined by the ability to see the 5 mm black line above the skin.

- EZ-IO® 45 mm Needle Set (yellow hub) should be considered for proximal humerus insertion in patients ≥ 40 kg and patients with excessive tissue over any insertion site
- EZ-IO® 25 mm Needle Set (blue hub) should be considered for patients 3 kg and greater
- EZ-IO® 15 mm Needle Set (pink hub) should be considered for patients 3-39 kg

INSERTION INITIATION

1. Use a clean, “no touch” technique, maintain asepsis.
2. Prepare supplies.
3. Prepare site using antiseptic; stabilize extremity.
4. See specific patient & site location.

ADULTS	PEDIATRICS
Proximal humerus Proximal tibia Distal tibia**	Proximal tibia Distal tibia** Proximal humerus Distal Femur**

****MUST HAVE ADDITIONAL TRAINING AND MEDICAL DIRECTOR APPROVAL.**

INSERTION COMPLETION

1. Hold the hub in place and pull the driver straight off; continue to hold the hub while twisting the stylet off the hub with counterclockwise rotations; catheter should feel firmly seated in the bone (first confirmation of placement):
    a. Dispose of all sharps and biohazard materials using standard biohazard practices and disposal containers.
    b. If using the NeedleVISE® 1 port sharps block, place on stable surface and use a one-handed technique.
2. Place the EZ-Stabilizer® Dressing over the hub.
3. Attach a primed extension set to catheter hub, firmly secure by twisting clockwise.
4. Pull the tabs off the dressing to expose the adhesive, apply to the skin.
5. Aspirate for blood/bone marrow (second confirmation of placement).
    a. Inability to withdraw/aspirate blood from the catheter hub does not mean the insertion was unsuccessful.
6. Proceed with technique below, based on situation:

    a. *[AEMT] ADULT – RESPONSE TO PAIN*
        i. Observe recommended cautions/contraindications to using 2% preservative and epinephrine-free lidocaine (intravenous lidocaine) and confirm lidocaine dose per institutional protocol.
        ii. Prime extension set with lidocaine.
        iii. Slowly infuse **LIDOCAINE** 40mg IO over 120 seconds.
            1. Allow lidocaine to dwell in IO space 60 seconds.
            2. Flush with 5 to 10mL of **NORMAL SALINE**
            3. Slowly administer an additional 20mg of **LIDOCAINE** IO over 60 seconds.
        iv. Repeat as needed; consider systemic pain control for patients not responding to IO lidocaine.

b. ADULT – UNRESPONSIVE TO PAIN

i. Prime extension set with **NORMAL SALINE**.
ii. Flush the IO catheter with 5-10mL of **NORMAL SALINE.**
    1. If a patient develops signs indicating responsiveness to pain, refer to adult – responsive pain techniques.

c. *[Paramedic]* Infant/Child – Responsive to Pain

i. Observe recommended cautions/contraindications to using 2% preservative and epinephrine-free lidocaine (intravenous lidocaine)
ii. Prime extension set with lidocaine.
iii. Slowly infuse **LIDOCAINE** 0.5mg/kg (max 40mg) IO over 120 seconds
    1. Allow lidocaine to dwell in IO space for 60 seconds.
    2. Flush with 5 to 10mL of **NORMAL SALINE**
    3. Slowly administer an additional 0.25mg/kg (max 20mg) of **LIDOCAINE** IO over 60 seconds.
iv. Repeat as needed; consider systemic pain control for patients not responding to IO lidocaine.

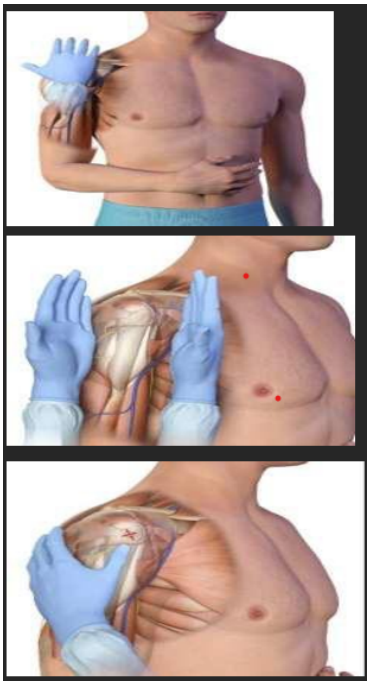
d. Infant/Child – Unresponsive to Pain

i. Prime extension set with normal saline.
ii. Flush the IO catheter with 5-10mL of **NORMAL SALINE.**
    1. If patient develops signs indicating responsiveness to pain, refer to infant/child responsiveness to pain technique.

7. Connect fluids if ordered and pressurize up to 300mmHg for maximum flow.
8. Verify placement/patency prior to all infusions. Use caution when infusing hypertonic solutions, chemotherapeutic agents, or vesicant drugs.
9. Stabilize and monitor site and limb for extravasation or other complications.
10. For a proximal humerus insertion, apply arm immobilizer or another securement device.
11. For distal femur insertions, immobilize the leg to ensure the knee does not bend.
12. Document date and time on wristband and place on patient.

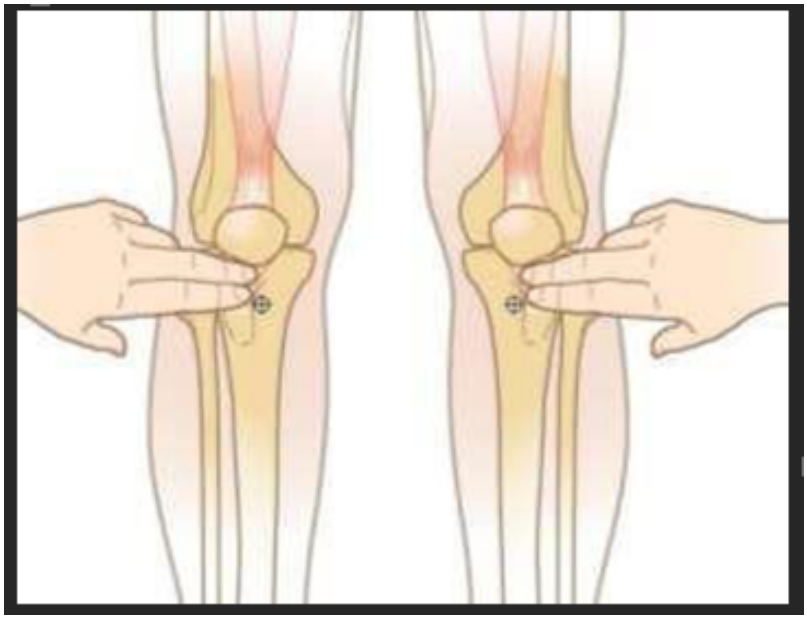
Adult Proximal Humerus Placement

Site Identification	Insertion
1. Place the patient's hand over the abdomen (elbow adducted and humerus internally rotated). 2. Place your palm on the patient's shoulder anteriorly; the "ball" under your palm is the general target area. 3. Place the ulnar aspect of your hand vertically over the axilla and the ulnar aspect of your other hand along the midline of the upper arm laterally. 4. Place your thumbs together over the arm; this identifies the vertical line of insertion on the proximal humerus. 5. Palpate deeply up the humerus to the surgical neck: a. This may feel like a golf ball on a tee – the spot where the "ball" meets the "tee" is the surgical neck. b. The insertion site is 1 to 2cm above the surgical neck, on the most prominent aspect of the greater tubercle.	1. Aim the needle set at a 45° angle to the anterior plane and posteromedial. 2. Push the needle set tip through the skin until the tip rests against the bone. **a. The 5mm mark must be visible above the skin for confirmation of adequate needle set length.** 3. Gently drill into the humerus approximately 2cm or until the hub is close to the skin; the hub of the needle set should be perpendicular to the skin.



Adult Proximal Tibia Placement

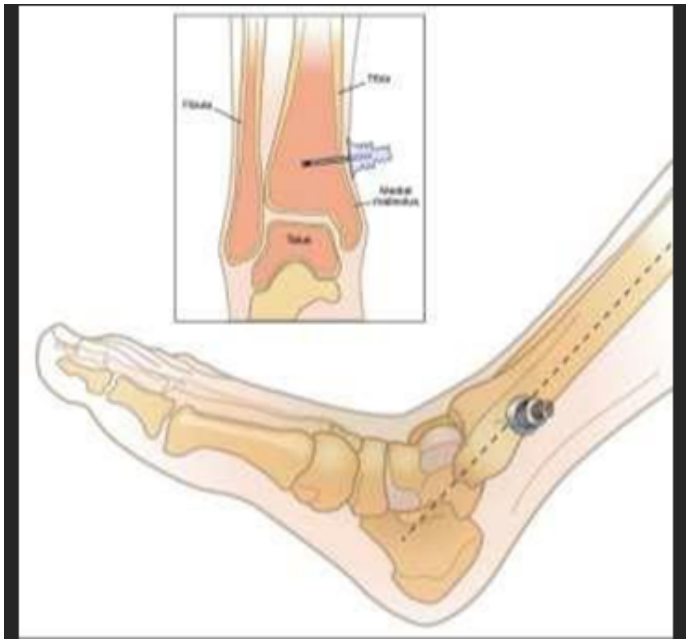
Site Identification	Insertion
1. Extend the keg. 2. Insertion site is approximately 2cm medial to the tibial tuberosity, or approximately 3cm below the patella and approximately 2cm medial, along the flat aspect of the tibia.	1. Aim the needle set at a 90° angle to the bone. 2. Push the needle set tip through the skin until the tip rests against the bone. **a. The 5mm mark must be visible above the skin for confirmation of adequate needle set length.** 3. Gently drill, advancing the needle set approximately 1-2cm after entry into the medullary space or until the needle set hub is close to the skin.



Adult Distal Tibia Placement

Site Identification	Insertion
1. The insertion site is located approximately 3cm proximal to the most prominent aspect of the medial malleolus. 2. Palpate the anterior and posterior borders of the Tibia to assure insertion site is on the flat center aspect of the bone.	1. Aim the needle set at a 90° angle to the bone. 2. Push the needle set tip through the skin until the tip rests against the bone. **a. The 5mm mark must be visible above the skin for confirmation of adequate needle set length.**

	3. Gently drill, advancing the needle set approximately 1-2cm after entry into the medullary space or until the needle set hub is close to the skin

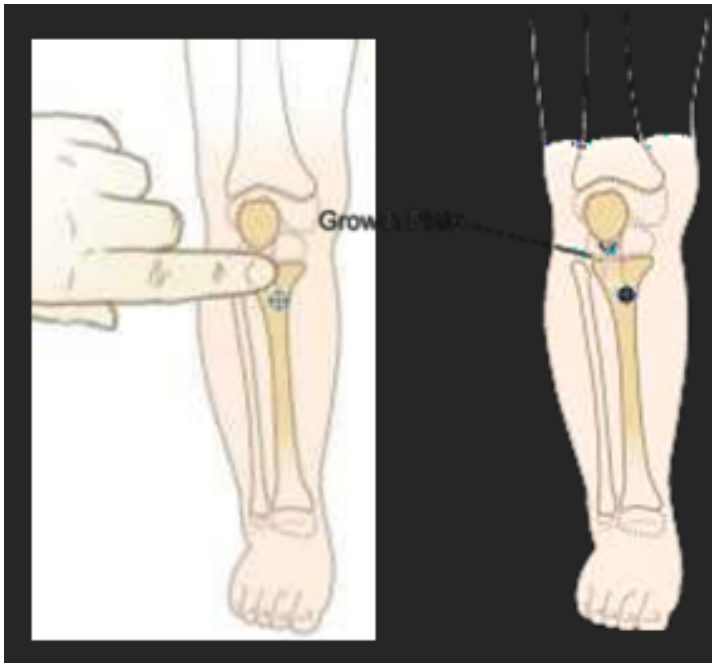


****MUST HAVE ADDITIONAL TRAING AND MEDICAL DIRECTOR APPROVAL****

Infant/Child Proximal Tibia Placement

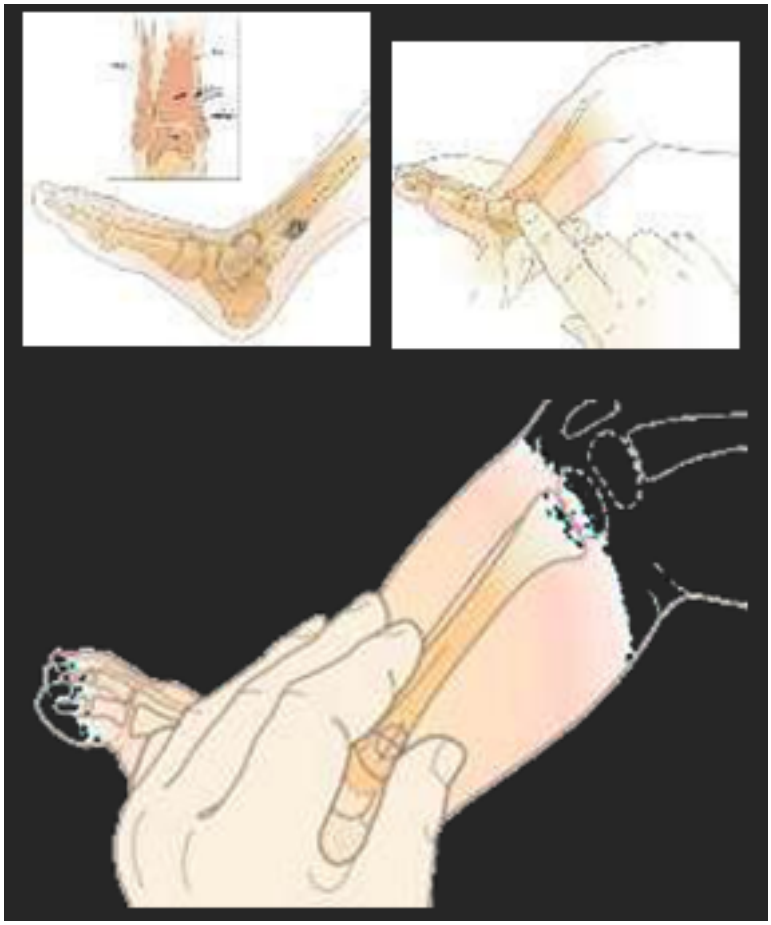
Site Identification	Insertion

1. Extend the leg. Pinch the tibia between your fingers to identify the medial and lateral borders. 2. Insertion site is approximately 1cm medial to the tibial tuberosity, or just below the patella (approximately 1cm) and slightly medial (approximately 1cm), along the flat aspect of the tibia.	1. Aim the needle set at a 90º angle to the bone. 2. Push the needle set tip through the skin until the tip rests against the bone. a. **The 5mm mark must be visible above the skin for confirmation of adequate needle set length.** 3. Gently drill, immediately release the trigger when you feel the loss of resistance as the needle set enters the medullary space; avoid recoil – do NOT pull back on the driver when releasing the trigger.



Infant/Child Distal Tibia Placement

Site Identification	Insertion
1. Insertion site is located approximately 1-2cm proximal to the most prominent aspect of the medial malleolus. 2. Palpate the anterior and posterior boarders of the tibia to assure insertion site is on the flat center aspect of the bone.	1. Aim the needle set at a 90^{o} angle to the bone. 2. Push the needle set tip through the skin until the tip rests against the bone. **a. The 5mm mark must be visible above the skin for confirmation of adequate needle set length.** **3.** Gently drill, immediately release the trigger when you feel the loss of resistance as the needle set enters the medullary space; avoid recoil – do NOT pull back on the driver when releasing the trigger.



****MUST HAVE ADDITIONAL TRAINING AND MEDICAL DIRECTOR APPROVAL****

Infant/Child Proximal Humerus Placement

Site Identification	Insertion

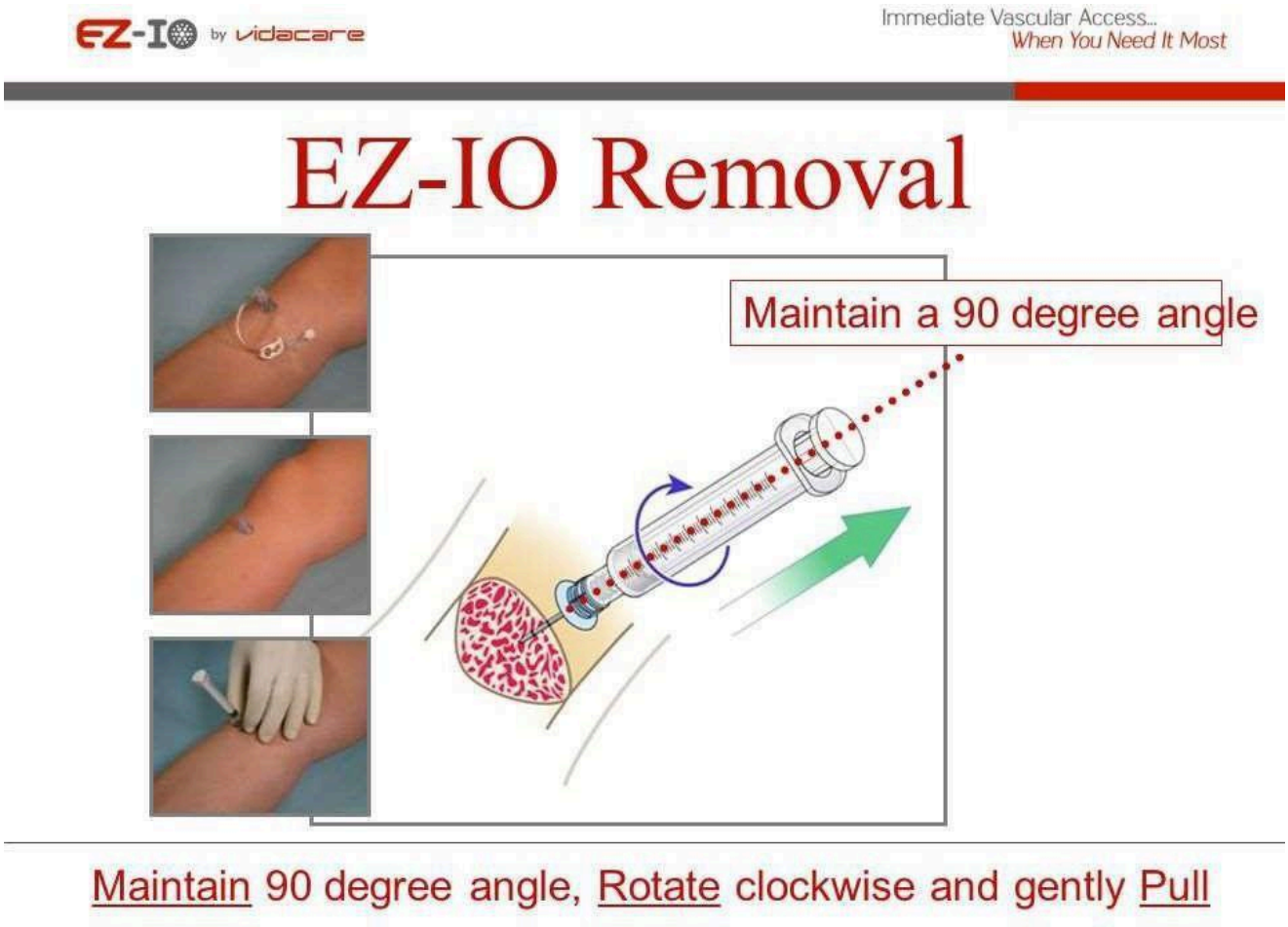
1. Place the patient's hand over the abdomen (elbow adducted and humerus internally rotated). 2. Place your palm on the patient's shoulder anteriorly; the ball under your palm is the general target area. a. You should be able to feel this ball, even on obese patients, by pushing deeply. 3. Place the ulnar aspect of your hand vertically over the axilla and the ulnar aspect of your other hand along the midline of the upper arm laterally. 4. Place your thumbs together over the arm. a. This identifies the vertical line of insertion on the proximal humerus. 5. Palpate deeply up the humerus to the surgical neck. a. This may feel like a gold ball on a tee – the spot where the "ball" meets the "tee" is the surgical neck. b. The insertion site is 1 to 2cm above the surgical neck, on the most prominent aspect of the greater tubercle.	1. Aim the needle set tip at a 45^{o} angle to the anterior plane and posteromedial. 2. Push the needle set tip through the skin until the tip rests against the bone. **a. The 5mm mark must be visible above the skin for confirmation of adequate needle set length.** 3. Gently drill, immediately release the trigger when you feel the loss of resistance as the needle set enters the medullary space; avoid recoil – do NOT pull back on the driver when releasing the trigger.

Infant/Child Distal Femur Placement

Site Identification	Insertion
1. Secure the leg outstretched to ensure the knee does not bend. 2. Identify the patella by palpation. The insertion site is just proximal to the patella (maximum 1cm) and approximately 1-2cm medial to the midline.	1. Aim the needle set at a 90° angle to the bone. 2. Push the needle set tip through the skin until the tip rests against the bone. a. **The 5mm mark must be visible above the skin for confirmation of adequate needle set length.** 3. Gently drill, immediately release the trigger when you feel the loss of resistance as the needle set enters the medullary space; avoid recoil – do NOT pull back on the driver when releasing the trigger.

EZ-IO® Removal Technique

1. Remove extension set and dressing.
2. Stabilize catheter hub and attach a Luer Lock syringe to the hub.
3. Maintaining axial alignment, twist clockwise and pull straight out.
    a. Do NOT rock the syringe.
4. Dispose of catheter with syringe attached into sharps container.
5. Apply pressure to the site as needed to control bleeding and apply dressing as indicated.



Hemostatic Agent Use

General Scope: Procedure for use of hemostatic gauze.

Procedure:

1. Identify the source of bleeding.
    a. Place proximal tourniquet is appropriate.
    b. Wipe pooled blood from wound if necessary.
2. Apply hemostatic gauze, packing into wound as per manufacturer's instructions.
3. Pack the entire length of gauze into wound.
4. Apply direct pressure for 1-3 minutes with hemostatic gauze.

   a. If bleed-through occurs, the entire dressing must be removed before repacking.
5. Apply standard dressing and bandage.

Note: specific brands of hemostatic gauze must not cause thermal reaction.

IFT of TPA (Tissue Plasminogen Activator)

General Scope: Guideline for IFT transport of TPA infusion.

Procedure:

1. Perform routine medical assessment with FAST-ED stroke severity scale, repeat stroke scale every 15 minutes.
2. *[Sending Hospital RN]* Bolus – 0.09mg/kg (10% of total), MAX 9mg via pump over a minute, USE DEDICATED LINE, NO IV fluids running with Alteplase during bolus or infusion.

3. *[Sending Hospital RN]* Continuous Infusion: 0.81mg/kg (90% of total), MAX 81mg via pump over 60 minutes beginning immediately following the bolus.
4. Verify total dose given. Document total TPA does to be administered, start and stop times; start TPS on IV pump. Hald set may be needed to insure no medication loss.
5. BP goal during and after TPA SBP<180 and DBP<105.
6. *[Paramedic/Med Control]* Start with 10mg **LABETALOL** IV push over 1-2 minutes if BP is not within range. Re-contact Med Control for further orders if needed.
7. If excess medication remains in the bag after correct amount is given for not flush primary tubing. Disconnect Alteplase tubing from the patient, then remove from the pump and discard immediately.
8. If the complete bag needs to be given to receive the correct dose, follow TPA administration with **NORMAL SALINE** infusion at the same rate. Make sure this is done before the pump alarm “air in line.”

Stop infusion if:

- Neurologic deterioration and/or new headache
- SBP>180 or DBP>105 – after treatment with medication. Contact Medical Control.
- Symptoms of internal bleeding, see Stroke/Cerebrovascular Accident Guideline
- Nausea/Vomiting
- Allergic reactions including rash, itching, anaphylaxis, or angioedema.

Notify Medical Control:

- If the infusion was stopped.
- Change in patient’s condition (improved or deteriorating).
- Temp >38.5ºC
- Pulse <50 or >100.
- RR <10 or >24

Notes:

1. Ensure patient has two IVs [at least one AC if possible] – do not delay transport to establish.
2. If the receiving hospital does not have a half set ready, you may need to wait or leave IVAC pump.

Never discard TPA if you are unsure if a complete dose was given. TPA has significant costs and should never be discarded in error.

Intranasal Medication Administration

General Scope: Procedure for administration of intranasal medications via the Mucosal Atomization Device (MAD)

Procedure:

1. Determine MAD/Intranasal indications.
2. Rule out contraindications:
    a. Epistaxis.

   b. Nasal trauma.
   c. Nasal septal abnormalities.
   d. Significant nasal congestion/discharge.
3. Draw up medication not to exceed 2ml total volume.
4. Attach MAD to syringe and place MAD in nostril.
5. Briskly compress syringe to administer atomized medication.
   a. Point outwards and upwards.
   b. Do not exceed 1mL total volume per nostril.
      i. Medications may be repeated in 5-10 minutes as needed and indicated.

Mechanical CPR – LUCAS

General Scope: Procedure for use of LUCAS mechanical CPR device.

Procedure:

1. DO NOT DELAY MANUAL CHEST COMPRESSION FOR PLACEMENT OF MECHANICAL CPR.
2. Be sure to turn the device on immediately upon opening case to allow for self-test.
3. Ensure the defibrillator pads, CPR feedback devices, and ECG cables will not interfere with suction cup placement.

4. Stage backplate and stabilization strap superior to the patient's head prior to placement.
5. Place the backplate at the next natural pause in resuscitation.
    a. Coordinate placement of backplate with compressor to ensure minimal interruption of chest compressions.
    b. Lift patient's shoulders and slide backplate under patient's head until the top of backplate is just below the patient's armpits (center should align with nipple line).
        i. May also roll patient side to side and place backplate as described above.
6. Resume manual chest compressions immediately upon placement of backplate.
7. Remove LUCAS from case and pull on both release rings to assure that claw locks are open.
8. Attach claw to the backplate on opposite side of compressor while chest compressions continue.
9. Coordinate with compressor to place the device at the next natural pause in resuscitation.
    a. Pivot the device through the manual compressors arms and lock the opposite claw.
    b. Pull up on device once to ensure that claws are locked.
10. Position the suction cup so that the lower edge is just proximal to the Xiphoid Process.
    a. Assure that nothing interferes with placement of suction cup.
11. Push suction cup down with two fingers until pressure pad touches the patient's chest.
12. Press 2 (PAUSE) button to lock the start position and remove fingers from suction cup.
    a. Verify position is correct. If not, press 1 (ADJUST), pull suction cup up, and reposition.
    b. If the patient is too large or too small, remove device and immediately restart manual compressions.
13. If appropriate press 3 (ACTIVE) button.
    a. Use 30:2 when no advanced airway is present and CONTINOUS when one is.
14. Secure stabilization strap and mark superior location of suction cup on patient's chest.
15. Place patient's wrist/arms in appropriate straps on device.

LUCAS Considerations:

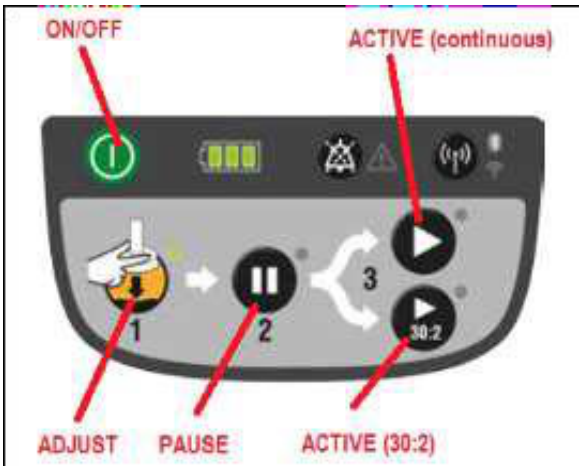
- Defibrillation can and should be performed with the LUCAS device in place and in operation.

- If the process pad and suction cup are incorrectly positioned, there is an increased risk of damage to the rib cage and the internal organs, and cardiac output is further decreased.
- If the position of the suction cup changes during operation, immediately press 2 (ADJUST) and adjust the position. Always use the stabilization strap to help maintain the correct position.
- The upper part of the device must remain vertical relative to the patient's chest at all times. Reposition is the device goes off-axis.

LUCAS troubleshooting:

- A red alarm LED will illuminate, and a high priority alarm will sound if there is any malfunction during operation.
    - In the event of an alarm, remove the battery for one to three seconds and replace.
        - If the alarm condition is no longer present, follow steps 10-13 above.
        - If alarm condition remains, immediately remove LUCAS and resume manual chest compressions.

LUCAS reference



Medical Personnel on Scene

General Scope: Guideline for dealing with extraneous medical professionals on the scene of a call.

Procedure:

1. If bystander is non-physician, they may assist as crew deems appropriate but may not direct care.
2. If bystander is a physician, involvement options include:
    a. Adjust and/or offer suggestions while EMS acts under guidelines and medical control.

b. Request to talk to medical control and directly offer medical advice and assistance if medical control deems it appropriate.
c. Request to direct patient care (must meet ALL the following criteria):
    i. Show valid state medical license unless known to crew.
    ii. Contact medical control who must relinquish control to an on-scene physician.
    iii. Physically accompany patient to hospital.
    iv. Give orders which are reasonable, accurate, and within the scope of practice for the EMS crew.

If orders are given that the crew members feel to be unreasonable, medically inaccurate, and/or not within their capabilities, the crew members DO NOT have to do that which they know by their training, skill, and experience would be detrimental to the patient.

Orogastric Tube

General Scope: Procedure for the OG tube placement with an advanced airway.

Guideline:

1. With an advanced airway, consider orogastric tube (OG) placement if assessment reveals the following:
    a. Vomiting
    b. Distended abdomen after resuscitative efforts (air-filled stomach)
    c. Avoid in patients with significant facial and head injuries.

2. Determine length of insertion
    a. Mouth: center of lips → earlobe → bottom of sternum
    b. King LTS-D: nose → earlobe → bottom of sternum
    c. iGel: proximal end → earlobe → bottom of sternum
3. Lubricate OG with water-based lubricant.
4. If spinal precautions are not applicable, carefully place patient's head in a neutral or slightly flexed position.
5. Insert OG through mouth (ETT) or gastric channel (King LTS-D or iGel) to determined length.
6. Inspect for coiled OG.
7. Inject air through OG and auscultate over epigastrium.
8. Tape OG to mouth or advanced airway and connect to intermittent suction set at 40-60mmHg (max 80mmHg). If intermittent suction is not available, set suction unit at 40-60mmHg (max of 80mmHg) and suction in intervals of 30-60 seconds every 3-5 minutes.

Needle Cricothyroidotomy

General Scope: Procedure for needle cricothyroidotomy. Preferred for children under ten.

Procedure:

1. Determine need.
2. Palpate cricothyroid membrane and clean area with antiseptic wipe

3. Puncture membrane with 14ga catheter, advance caudally, drawing back on syringe until air return.
4. Withdraw needle and attach 3.0mm pediatric ETT adapter with BVM.
5. Auscultate chest and secure device.

Needle Decompression

General Scope: Procedure for needle chest decompression.

Procedure:

1. Determine need.
    a. Suspected TENSION pneumothorax (hypoxia with hypotension)

   b. Traumatic cardiac arrest with suspected chest injury
2. If conscious see Sedation Procedure
3. Cleanse site with antiseptic wipe.
   a. Fifth intercostal space mid-axillary is preferred.
   b. Second intercostal space mid-clavicular is secondary.
4. Insert 10g – 14g catheter.
5. Listen for rush of air.
6. Remove needle leaving catheter in place.
7. Auscultate chest and secure device.

Non-invasive Positive Pressure Ventilation (NIPPV)

General Scope: Procedure for disposable CPAP / Bi-Level CPAP** (not ventilator driver)

Applies to: EMTs**/Paramedics (EMTs & AEMTs must have additional training and approval for CPAP and/or Bi-Level CPAP; paramedics must have additional training and approval for Bi-Level CPAP only)

Procedure:

1. Determine need (Clinical Indications):
2. Moderate to severe respiratory distress with signs and symptoms of pulmonary edema, CHF, or COPD, refractory to initial interventions, and all the following apply:
    a. Awake and able to follow commands.
    b. Over 12 years old and is able to fit the CPAP mask.
    c. Has the ability to maintain an open airway.
        i. And exhibits **two** or more of the following:
            1. A respiratory rate >26 breaths a minute
            2. SPO_2 <92% on high flow oxygen
            3. Use of intercostal or accessory muscles during respirations
            4. Wheezing or wet lung sounds
3. *[AEMT]* Establish IV/IO
4. Talk patient through procedure and cautiously sedate as needed, see Sedation Procedure
5. Start CPAP at 5-7cm$H_2$0 or pre-set level (verify with manometer)
    a. If using Bi-Level CPAP, start with 8-10 cmH_2O IPAP.
    b. Using manometer, verify at least 4-5 cmH_2O of EPAP.
    c. Adjust IPAP and EPAP, as necessary

Note:

Indications	Exclusion Criteria
• Acute pulmonary edema as a bridge device • Patients already on CPAP • Mild respiratory failure due to muscle fatigue • COPD	• Recurrent aspiration • Large volumes of secretions • Inability to protect airway. • Vomiting • Obstructed bowel • Upper airway obstruction

	● Uncooperative, confused, or combative patient ● Inability to tolerate a right mask. ● Orofacial abnormalities which interfere with mask/face interface ● Untreated pneumothorax

Pain Management

General Scope: Guideline for treatment of patients who are or are suspected to be experiencing pain.

Guideline:

1. Perform routine medical assessment.
2. Air support as needed, see Airway/Ventilatory Management Guideline
3. Treat underlying cause of pain
    a. Splint and pad known or suspected fractures and dislocations.
    b. Apply ice packs to suspected fractures and dislocations.
    c. Elevate injured extremities when possible.
4. Consider the chart below for determining pain management options.
5. *[AEMT]* Consider IV/IO

Mild Pain	**Severe Pain**
1. *[Paramedic]* KETOROLAC[1] a. 15mg IV/IO/IM one time b. Pediatric (>1y/o) – 0.5mg/kg IV/IO/IM ONLY one time (Max 30mg) **AND** 2. *[Paramedic]* ACETAMINOPHEN[1] a. 600mg-650mg PO one time b. Pediatric (1y/o) – 10mg/kg PO one time (Max 650mg) Evidence suggests that the administration of an NSAID + acetaminophen is as effective as opiate medications. It is okay to administer only one if the other is contraindicated.	1. *[Paramedic]* FENTANYL a. 25-50mcg IV/IO/IN b. Pediatric (8y/o) – 1mcg/kg IV/IO/IN c. May repeat every 10 minutes as needed. d. Recheck vital signs between doses. 2. *[Paramedic]* KETAMINE a. 0.25mg/kg IV/IO (Adult & Pediatric) b. May repeat every 15 minutes as needed. c. Recheck vital signs between doses. 3. *[Paramedic]* Consider MIDAZALOM a. 1-2mg IV/IO/IM b. Pediatric (<8y/o) 0.1mg/kg up to 1mg c. May repeat every 15 minutes as needed

1. For transport >15 minutes, patients treated with **FENTANYL**, **KETAMINE**, or **MIDAZOLAM** should have end tidal CO_2 monitoring,

Notes:

Ketorolac is contraindicated for all patients over forty-nine, or any patient with known renal insufficiency, any patient in third trimester of pregnancy, any patient with hypersensitivity to NSAIDs, or concern for intercranial bleeding.

Ibuprofen is contraindicated for all patients over forty-nine, any patient with known renal insufficiency, any patient in third trimester of pregnancy, patients with inability to swallow, known sensitivity to NSAIDs, or if patient has taken NSAIDs in the last four hours.

Acetaminophen is contraindicated for use in patients with inability to swallow, known sensitivity to acetaminophen, or if patient has taken anything containing acetaminophen in the last four hours.

PICC Line Usage

General Scope: Guideline and criteria for accessing and using PICC lines.

Applies to: Paramedic.

Guideline:

1. May administer medications through previously placed PICC lines when no other option is available.
    a. Maintenance of aseptic techniques is of significant importance.
    b. If inter-facility transport, consult with referral facility RN for port selection.
    c. If cardia arrest, use any port.
    d. Flush medication with 10mL **NORMAL SALINE** using at least a 10cc syringe.
        i. Syringes smaller than 10cc can exert excessive pressure on PICC lines.
    e. Maintain dressing at PICC site.

Resuscitation Sequence Intubation

General Scope: Procedure for resuscitation sequence intubation. This procedure may only be initiated when two paramedics are at patient side unless single medic RSI is approved by the Medical Director and EMS service policy.

Applies to: Paramedics.

Procedure:

1. Ensure adequate ventilation/pre-oxygenation via appropriate adjunct.
2. High flow (15L/min) O^2 via nasal cannula for apneic oxygenation
3. Prepare equipment, medication, and patient.
    a. See Airway Management Checklist
4. If systolic blood pressure <90 and symptomatic, see Blood Pressure Management Procedure. Pressor infusion is preferred over push dose epinephrine if time allows.
    a. Consider Push Dose **EPINEPHRINE**** (10mcg/1mL)
    b. Administer 10-20mcg (1-2mL) Push Dose **EPINEPHRINE**** (10mcg/1mL) at least one minute prior to sedation and every 2-5 minutes as needed.
5. Administer **KETAMINE** 0.5-2mg/kg.
    a. For patients with systolic blood pressure <90, use 0.5mg/kg dose.
    b. Pediatric (<8y/o) – 0.5-2mg/kg
6. Administer **ROCURONIUM** 1mg/kg (~20 min duration)
7. Secure airway
8. Confirm placement with waveform capnography and auscultation.
9. Monitor $EtCO_2$, and secure ETT.
10. Consider, at least every 15 minutes, re-sedation & pain management as needed; consider lower doses in patients with continued hemodynamic compromise.
    a. **KETAMINE** 0.5-1mg/kg
        i. Pediatric (<8y/o) – 0.5-1mg/kg
    b. **MIDAZALOM** 1-2mg
        i. Pediatric (<8y/o) – 0.5mg/kg
    c. **FENTANYL** 25-50mcg
        i. Pediatric (<8y/o) – 1mcg/kg

Only re-paralyze with **ROCURONIUM** 0.5mg/kg if sedation/pain management fails.

Refusal of Evaluation, Treatment, and/or Transport

General Scope: Procedure for patient refusal of evaluation, treatment, and/or transport. This applies to EMS agencies (EMR and above) who have approval from their leadership or board.

Procedure:

Determining capacity to refuse

Patients are considered to be capable of refusing care if they do not endorse suicidal or homicidal ideations, are oriented to person, place, time, and event (or to their baseline mental status) and can express understanding of the risks of refusal.

The use of alcohol or other drugs should not be used solely as a criterion for rendering a person incapable of making a medical decision. Rather, the circumstances of the event should be considered. For example, the patient who has used alcohol or other drugs with a potential for head trauma and altered mental stats will be transported under implied consent whereas the substance-using patient in their home with no evidence of trauma who meets the capacity criteria above may be capable of making a medical decision.

1. Upon identification of a patient, recommend evaluation, treatment, and/or transport.
2. Determine mental stats and extend of illness and/or injury.
    a. If subject is believed to lack capacity to refuse:
        i. Treat/transport under implied consent if possible
        ii. Consider law enforcement involvement for possible chapter hold.
3. Provide appropriate assessment and treatment as allowed.
4. Advise patient and/or representative of potential risks of refusal and obtain acknowledgement of understanding and acceptance of risks and responsibility.
5. Consider contacting Medical Control for consultation about and/or with the patient and/or representative.
6. Read to the patient and/or representative the General Refusal Statement below.
7. Advise patient and/or representative call 011 for additional service if needed.
8. If refusal obtained, ePCR/run report must be completed with a copy of the signed refusal form.

General Refusal Statement

You understand that the EMS personnel are not physicians, and our care is not a substitute for that of a physician. You recognize that you may have a serious injury or illness which could fare worse without

medical attention even though you (or the patient on whose behalf I legally sign this document) may feel fine at the present time.

Restraint Use

General Scope: Physical restraints are permitted for patients who have a potential or recognized medical emergency, are exhibiting violent or combative behavior, where less restrictive means of gaining patient cooperation have failed and are at immediate risk for harming themselves or others because they are incapable of making appropriate healthcare decisions.

Procedure:

1. Choose appropriate/approved restraints in combination with cot seatbelts.
    a. Under no circumstances are patients to be restrained in the prone position
    b. Patient must be restrained in a position where continual assessment of patient's airway, breathing, and circulation can be maintained and not obstructed.
2. Physical
    a. Soft restraints
        i. Restrain all extremities to the cot.
        ii. Assess to ensure airway patency.
        iii. Assure adequate distal circulation of all extremities.
    b. Handcuffs
        i. Law enforcement must always accompany a patient in handcuffs.
        ii. Transition to soft restraints if adequate help is available.
        iii. Spit Hood
3. Chemical
    a. *[Paramedic]* **MIDAZOLAM**
        i. Adult
            1. 1-3mg IV/IO or 5mg IM
        ii. Pediatric (<8y/o)
            1. 0.5mg/kg IV/IO or 0.1mg/kg IM
    b. *[Paramedic]* consider **KETAMINE** 0.5-2mg/kg IV/IO/IM
    c. For continues sedation (infusion), see Sedation Procedure
4. Document
    a. Reason for restraint
    b. Method used.
    c. Document LOC, vital signs (including SpO_2 and $EtCO_2$) and distal circulation at least every 5 minutes.

Sedation

General Scope: Guideline for treatment of patients who require sedation in the prehospital setting. All patients who receive sedation should have continuous monitoring of vital signs including cardiac monitoring.

Guideline:

1. Perform routine medical assessment.
2. Airway support as needed, see Airway/Ventilatory Management Guideline.
3. Consider hypoxia or hypovolemia.
4. If patient is combative, maintain adequate physical and/or chemical restraints, see Restraint Use Procedure
5. *[AEMT]* Establish IV/IO is possible.
6. *[Paramedic]* Consider the following infusions:

<table>
<tr><th>MIDAZOLAM</th><th>KETAMINE</th></tr>
<tr><td colspan="2">*** Infusions of controlled substances must be stopped and wasted by the transporting crew.

Controlled substances in any form may not be turned over to receiving facilities. ***</td></tr>
<tr><td>Adult
• Bolus dosing
○ 1-3mg IV/IO
○ 5mg IM
• Infusion dosing
○ Mix 10mg in 100mL NORMAL SALINE
○ Use MIDAZOLAM calc function on pump
・Start at 1-2 mg/hr.
・Titrate by 0.5 mg/hr.: max of 7 mg/hr.

Pediatric (< 8 y/o)
• Bolus dosing</td><td>Adult
• Bolus dosing
○ 0.5-2 mg/kg IV/IO/IM
• Infusion dosing
○ Mix 100mg in 100mL NORMAL SALINE
○ Use GENERIC calc function on pump
・Start at 0.8 mcg/kg/min
・Titrate by 0.4 mcg/kg/min: max of 6 mcg/kg/min

Pediatric (< 8 y/o)
• Bolus dosing</td></tr>
</table>

○ 0.05 mg/kg IV/IO or 0.1 mg/kg IM • Infusion dosing ○ Mix 5mg in 100mL **NORMAL SALINE** ○ Use GENERIC drug calc function on pump ▪ Start at 1 mcg/kg/min ▪ Titrate by 0.5 mcg/kg/min: max of 5 mcg/kg/min	○ 0.5-2 mg/kg IV/IO/IM • Infusion dosing ○ Mix 50mg in 100mL **NORMAL SALINE** ○ Use GENERIC drug calc function on pump ▪ Administer 1 mcg/kg/min ▪ Titrate by 0.5 mcg/kg/min: max of 6 mcg/kg/min

Selective Spinal Precautions

General Scope: Criteria to exclude patients selectively from spinal precautions when a low index of suspicion of injury and reassuring assessment is present. Applies to EMTs and above.

Guideline:

1. Perform routine trauma assessment while cervical spine is manually immobilized.
2. *[EMT]* Determine if patient meets any of the following spinal precautions criteria. If referred to spinal precaution guidelines at any time, subsequent exams are unnecessary.
    a. Altered level on consciousness? If YES, see Spinal Precautions Procedure
    b. >65y/o or <5y/o with significant mechanism of injury? If YES, see Spinal Precautions Procedure
    c. Evidence of impairment by drugs/alcohol? If YES, see Spinal Precautions Procedure
    d. Painful distracting injuries? If YES, see Spinal Precautions Procedure
    e. Perform neuro exam: Does the patient have any focal deficit? If YES, See Spinal Precautions Procedure
    f. Perform Spinal Exam: Point tenderness over the spinous process(es) or pain during range of motion? If YES, see Spinal Precautious Procedure
3. *[EMT]* If the answer if NO to all the above, spinal precautions may be deferred.
    a. All deferred spinal precautions shall have the criteria above documented in the patient care report. When in doubt always refer to Spinal Precautions Procedure

Pearls

- You should not assume a walking patient has a clear C-Spine.
- Consider precautions in any patient with arthritis, cancer, dialysis, or other underlying spinal or bone disease.

- When present, the decision to NOT implement spinal precautions in a patient is the responsibility of the paramedic solely.
- In very old and very young patients, a normal exam maybe not be sufficient to rule out spinal injury.
- Range of motion should NOT be assessed if the patient has midline spinal tenderness. Patient's range of motion should not be assisted. The patient should touch his chin to his chest, extend his neck (look up), and turn his head from side to side (shoulder to shoulder) Without spinal pain.

Spinal Examination

General Scope: This procedure details the spinal examination process and must be used in conjunction with the spinal precaution's clearance guideline.

Procedure:

1. Explain to the patient the actions you are going to take. Ask the patient to immediately report any pain, and to answer questions with a "yes" or "no" rather than shaking the head.
2. With the patient's spine supported to limit movement, begin palpation at the base of the skill at the midline of the spine.
3. Palpate the vertebrae individually from the base of the skull to the bottom of the sacrum.
4. On palpation of each vertebral body, look for evidence of pain and ask the patient if they are experiencing pain. If evidence of pain along spinal column is encountered, the patient should be immobilized.
5. If the capable patient is found to be pain free, ask the patient to turn their head first to one side (so that the chin is pointing toward the shoulder on the same side as the head is rotating) and if pain free, to the other side. If there is evidence of pain, the patient should be immobilized.
6. With the head rotated back to its normal position, ask the patient to flex and extend their neck. If there is evidence of pain, use Spinal Precautions Procedure.

Spinal Precautions

General Scope: Procedure for spinal precautions

Procedure:

1. Explain the procedure to the patient.
2. Assess CMS.
3. Hold manual stabilization of the c-spine in neutral position until secured to movement device/stretcher or selective spinal precaution evaluation is performed.
4. Measure and place cervical collar.
    a. If cervical collar does not fit due to obesity or physical abnormality, attempt stabilization with blanket roll around neck.
5. If the patient is supine or prone, place the patient on a backboard/scoop stretcher by the safest method available (i.e., log-roll, lift, etc.). For the patient in a vehicle or seated position or otherwise unable to be placed prone or supine, and the patient condition does not allow them to self-extricate to adjacent cot (i.e., other injury, pain, altered level of consciousness), place them on a backboard/scoop stretcher by the safest method available that allows maintenance of in-line spinal stabilization.
    a. Patients may be moved to cot via chair stretcher with c-collar and all straps including head strap.
6. Using straps, secure patient to the movement device (backboard/scoop stretcher).
    a. If CIDs are used, manual stabilization may be discontinued.
7. Once extricated and moved, patients should be taken odd the backboard or scoop stretcher if possible and placed directly on the ambulance stretcher. It is acceptable to leave a patient on a backboard for transport (transport <5min, or life-threatening patient condition), but every effort should be made to secure the patient to the stretcher and not the backboard/scoop during transport.

8. Once the backboard/scoop is removed or the patient self-extricates to adjacent ambulance stretcher, spinal precautions for at-risk patients are paramount. These include cervical collar, blanker/padding rolls around head, securing to stretcher with all cot straps (including shoulder belts), minimal movement/transfers, and maintenance of in-line spine stabilization during necessary movement/transfers.

Note:

- Spinal precautions may be achieved by many appropriate methods. In addition, some patients, due to size and age, will not be able to be immobilized through in-line stabilization with standard devices and C-collars. Never force a patient into a non-neutral position to immobilize him or her. Manual stabilization may be required during transport. Special situations such as athletes in full shoulder pads and helmet may remain immobilized with helmet and pads in place, unless a sports medicine trainer that is knowledgeable regarding the proper removal of that athletic equipment is present. The sports medicine trainer may be the most appropriate person involved in the care of the athlete to properly remove athletic equipment.

Spit Hood

General Scope: Guideline for use of protective hoods. This guideline should be used for patients who are combative and/or aggressive, and purposely attempting to spit on providers or other public safety personnel. Spitting carries potential risk of disease transmission. Use of a protective hood minimizes said risk.

Guideline:

1. Use of one-piece surgical mask or oxygen mask is preferred for minimizing risk of disease transmission by patients who are purposely spitting.
2. CONDITIONS FOR USE:
    a. DO NOT USE unless the patient is under control and restrained.
    b. DO NOT USE on anyone that is vomiting, having difficulty breathing, or is bleeding profusely from the area around the mouth or nose.
    c. Patient must be under constant visual supervision and should never be left unattended.
    d. Remove patient's jewelry and eyewear before application.
    e. If there is difficulty applying due to large size head, discontinue use.
    f. Conditions for use should be constantly monitored during patient encounters.
3. PROCEDURE FOR USE:
    a. Open and remove the spit hood.
    b. Place the spit head over the hood of the person with the mesh fabric positioned just below the eyes to allow the person to see.
    c. For the best fit, place the center elastic under the nose and over the ears. For better protection, the elastic may be placed above the nostrils.
    d. Carefully push the plastic Secure-Lock Tab down toward the top of the head while holding the top of the mesh fabric. This should take the slack out of the top and help secure the spit hood in position.

i. **DO NOT push so tightly as to be uncomfortable or impair the vision of the wearer.

4. See manufacturer instructions included in packaging for visual representation of procedure for use.
5. Patient should be transported in either left or right lateral position.
6. CONTINOUSLY monitor patient's airway, respiratory status, and pulse oximetry.
7. IMMEDIATELY remove surgical mask, oxygen mask, or spit hood if any questions of airway patency or potential compromise.

Supraglottic Airway – I-Gel

General Scope: Procedure for placement of I-Gel

Procedure:

1. Consider spinal precautions as needed.
2. Select proper I-Gel size (see table below).
3. Apply water-based lubricant to the anterior, posterior, and lateral edges of the gel cuff.
4. Position head as able:
    a. "Sniffing position" is ideal but neutral position is acceptable.
5. Hold the I-Gel at the integrated bite block.
6. Open mouth and apply chin lift, unless contraindicated.
7. Position the device so the gel cuff outlet faces the patient's chin.
8. Advance tip into the patient's mouth toward the midline of the hard palate.
9. Without exerting excessive force, advance the device downward and backward along the hard palate until a definitive resistance is felt.
10. Confirm proper position with auscultation and $EtCO_2$ detection device.
11. Upon verification of placement, secure using commercial device or tape.
12. Reassess as needed.
13. Suction as needed.
14. For sizes 1.5-5, decompress stomach as needed.
    a. Gastric channel allows insertion of the following size gastric tubes:
        i. Size 1.5 – 10 fr
        ii. Size 2-4 – 12 fr
        iii. Sizes 5 – 14 fr
    b. Measure gastric tube from tip of I-Gel to earlobe to Xiphoid Process.
    c. Lubricate gastric tube prior to insertion.
    d. Advance gastric tube total distance noted in step b.

15. Use the least amount of suction that effectively decompresses the stomach.

Size	Color	Patient Category	Patient Weight
1	Pink	Neonate	2-5 kg
1.5	Blue	Infant	5-12 kg
2	Gray	Small pediatric	10-25 kg
2.5	White	Large pediatric	25-35 kg
3	Yellow	Small adult	30-60 kg
4	Green	Medium Adult	50-90 kg
5	Orange	Large Adult	90+ kg

Tracheostomy Care

General Scope: General recommendations for tracheostomy care.

1. Consult with patient's caregiver(s) for assistance.
2. Do not remove tracheostomy tube unless obviously blocked or improperly placed.
3. If patient with tracheostomy is in respiratory distress:
    a. Look for possible causes of distress that may be easily correctable such as a detached Oxygen source.
    b. Assess for causes of distress other than issues with tracheostomy (asthma, pneumonia, pulmonary edema, etc.).
    c. *[EMR]* If breathing is adequate but patient exhibits signs of respiratory distress, administer Oxygen vis non-rebreather mask or blow-by over the tracheostomy.
    d. *[EMT]* Suction visible mucus to help clear the airway.
    e. *[AMET]* If needed, suction tracheostomy (approx. 2-3 inches) using no more than 100mmHg of suction.
        i. *[Paramedic]* May use 2-3mL **NOMRAL SALINE** flush to loosen secretions.
    f. *[EMT]* Is patient's breathing remains inadequate after suctioning, assist ventilations using BVM.
        i. If on a ventilator and breathing is inadequate, remove patient from ventilator and use BVM to rule out problem with ventilator.
4. *[Paramedic]* If tracheostomy tube has been removed or dislodged, replace with same (cleaned) or another tracheostomy tube or endotracheal tube.

Reference

Air Ambulance Use

General Scope: Procedure and criteria for air ambulance request.

Procedure:

1. Routine medical and/or trauma assessment.
2. Determine the need for air transport.
3. Assess appropriateness of air transport for distance/terrain.
    a. Air ambulance is likely inefficient if ground transport time is <30 minutes to 30 miles.
4. Request Gunderson AIR or appropriate air transport through the agency communications center.
5. Assure provision of a secure landing zone.

Amiodarone Infusion

Amiodarone Infusion 150 mg / 100ml D_5W or NORMAL SALINE (1.5 mg/ml)	
Medication Dose	**Infusion Rate**
1 mg/min	40 ml/hr.

Critical Care Paramedic Medications

General Scope: Along with all medications included on the Paramedic Medication List, the following medications have been Medical Director approved to be transported at the Critical Care Paramedic level when initiated by the sending physician.

Cisatracurium Besilate (Nimbex)
Clonidine (Catapres)
Dexmedetomidine (Precedex)
Eptifibatide (Intergrilin)
Nitroprusside (Nipride)
Propofol (Diprivan)

Dopamine Infusion

200mg/250cc D_5W

(800mcg/mL)

Dose in mcg/kg /Min	Weight in Kilograms													
	45	50	55	60	65	70	75	80	85	90	95	100	105	110
	Infusion Rate (ml/hr.)													
5	17	19	21	23	24	26	28	30	32	34	36	38	39	41
7	24	26	29	32	34	37	39	42	45	47	50	53	55	58
10	34	38	41	45	49	53	56	60	64	68	71	75	79	83
15	51	56	62	68	73	79	84	90	96	101	107	113	118	124
20	68	75	83	90	98	105	113	120	128	135	143	150	158	165

200mg/250cc D_5W (800mcg/mL)

Dose in mcg/kg /Min	Weight in Kilograms													
	115	120	125	130	135	140	145	150	155	160	165	170	175	180
	Infusion Rate (ml/hr.)													
5	43	45	47	49	51	53	54	56	58	60	62	64	66	68

7	60	63	66	68	71	74	76	79	81	84	87	89	92	95
10	86	90	94	98	101	105	109	113	116	120	124	128	131	135
15	129	135	141	146	152	158	163	169	174	180	186	191	197	203
20	173	180	188	195	203	210	218	225	233	240	248	255	263	270

Epinephrine Infusion

Epinephrine Infusion **1mg / 100ml D_5W or NORMAL SALINE** **(10mcg/ml)**	
Medication Dose	**Infusion Rate**
2 mcg/min	12 ml/hr.
3 mcg/min	18 ml/hr.
4 mcg/min	24 ml/hr.
5 mcg/min	30 ml/hr.
6 mcg/min	36 ml/hr.
7 mcg/min	42 ml/hr.
8 mcg/min	48 ml/hr.
9 mcg/min	54 ml/hr.
10 mcg/min	60 ml/hr.

Ideal Body Weight Chart

MALE		
Height	LBS	KG
4'6"	63-77	29-35
4'7"	68-84	31-38
4'8"	74-90	34-41
4'9"	79-97	36-44
4'10"	85-103	39-47
4'11"	90-110	41-50
5'0"	95-117	43-53
5'1"	101-123	46-56
5'2"	106-130	48-59
5'3"	112-136	51-62
5'4"	117-143	53-65
5'5"	122-150	55-68
5'6"	128-156	58-71
5'7"	133-163	60-74
5'8"	139-169	63-77
5'9"	144-176	65-80
5'10"	149-183	68-83
5'11"	155-189	70-86
6'0"	160-196	73-89
6'1"	166-202	75-92
6'2"	171-209	78-95
6'3"	176-216	80-98
6'4"	182-222	83-101
6'5"	187-229	85-104
6'6"	193-235	88-107
6'7"	198-242	90-110
6'8"	203-249	92-113
6'9"	209-255	95-116
6'10"	214-262	97-119
6'11"	220-268	100-122

FEMALE		
Height	LBS	KG
4'6"	63-77	29-35
4'7"	68-83	31-38
4'8"	72-88	33-40
4'9"	77-94	35-43
4'10"	81-99	37-45
4'11"	86-105	39-48
5'0"	90-110	41-50
5'1"	95-116	43-53
5'2"	99-121	45-55
5'3"	104-127	47-58
5'4"	108-132	49-60
5'5"	113-138	51-63
5'6"	117-143	53-65
5'7"	122-149	55-68
5'8"	126-154	57-70
5'9"	131-160	59-73
5'10"	135-165	61-75
5'11"	140-171	64-78
6'0"	144-176	65-80
6'1"	149-182	68-83
6'2"	153-187	69-85
6'3"	158-193	72-88
6'4"	162-198	73-90
6'5"	167-204	76-93
6'6"	171-209	78-95
6'7"	176-215	80-98
6'8"	180-220	82-100
6'9"	185-226	84-103
6'10"	189-231	86-105
6'11"	194-237	88-108

Ketamine Infusion (Adult)

100mg/100cc D_5W

(1,000mcg/mL)

Dose in mcg/kg/min	Weight in Kilograms															
	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
	Infusion Rate (ml/hr.)															
0.8	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	6
1.2	3	4	4	4	5	5	5	6	6	6	7	7	8	8	8	9
1.6	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	12
2	5	6	7	7	8	8	9	10	10	11	11	12	13	13	14	14
2.4	6	7	8	9	9	10	11	12	12	13	14	14	15	16	17	17
2.8	8	8	9	10	11	12	13	13	14	15	16	17	18	18	19	20
3.2	9	10	11	12	12	13	14	15	16	17	18	19	20	21	22	23
3.6	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25	26
4	11	12	13	14	16	17	18	19	20	22	23	24	25	26	28	29
4.6	12	14	15	17	18	19	21	22	23	25	26	28	29	30	32	33
5	14	15	17	18	20	21	23	24	26	27	29	30	32	33	35	36
5.4	15	16	18	19	21	23	24	26	28	29	31	32	34	36	37	39
5.8	16	17	19	21	23	24	26	28	30	31	33	35	37	38	40	42

100mg/100cc D_5W (1,000 mcg/mL)

Dose in mcg/kg/min	Weight in Kilograms														
	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195
	Infusion Rate (ml/hr.)														
0.8	6	6	6	7	7	7	7	8	8	8	8	9	9	9	9
1.2	9	9	10	10	10	11	11	12	12	12	13	13	13	14	14
1.6	12	12	13	13	14	14	15	15	16	16	17	17	18	18	19
2	15	16	16	17	17	18	19	19	20	20	21	22	22	23	23
2.4	18	19	19	20	21	22	22	23	24	24	25	26	27	27	28
2.8	21	22	23	24	24	25	26	27	28	29	29	30	31	32	33
3.2	24	25	26	27	28	29	30	31	32	33	34	35	36	36	37
3.6	27	28	29	30	31	32	33	35	36	37	38	39	40	41	42
4	30	31	32	34	35	36	37	38	40	41	42	43	44	46	47
4.6	35	36	37	39	40	41	43	44	46	47	48	50	51	52	54
5	38	39	41	42	44	45	47	48	50	51	53	54	56	57	59
5.4	41	42	44	45	47	49	50	52	53	55	57	58	60	62	63
5.8	44	45	47	49	50	52	54	56	57	59	61	63	64	66	68

Ketamine Infusion (Pediatric)

50mg/100cc D_5W
(500mcg/mL)

Dose in mcg/kg/min	Weight in Kilograms															
	5	10	15	20	25	30	40	45	50	55	60	65	70	75	80	85
	Infusion Rate (ml/hr.)															
1	1	1	2	2	3	4	5	5	6	7	7	8	8	9	10	10
1.5	1	2	3	4	5	5	7	8	9	10	11	12	13	14	14	15
2	1	2	4	5	6	7	10	11	12	13	14	16	17	18	19	20
2.5	2	3	5	6	8	9	12	14	15	17	18	20	21	23	24	26
3	2	4	5	7	9	11	14	16	18	20	22	23	25	27	29	31
3.5	2	4	6	8	11	13	17	19	21	23	25	27	29	32	34	36
4	2	5	7	10	12	14	19	22	24	26	29	31	34	36	38	41
4.5	3	5	8	11	14	16	22	24	27	30	32	35	38	41	43	46
5	3	6	9	12	15	18	24	27	30	33	36	39	42	45	48	51
5.5	3	7	10	13	17	20	26	30	33	36	40	43	46	50	53	56
6	4	7	11	14	18	22	29	32	36	40	43	47	50	54	58	61

Lidocaine Infusion

Lidocaine Infusion Premixed (4 mg/ml)	
Medication Dose	**Infusion Rate**
1 mg/min	15 ml/hr.
2 mg/min	30 ml/hr.
3 mg/min	45 ml/hr.
4 mg/min	60 ml/hr.

Midazolam Infusion (Adult)

Midazolam Infusion 10mg/100mL D_5W or NORMAL SALINE (100 mcg/mL)	
Medication Dose	**Infusion Rate**
1 mg/hr.	10 ml/hr.
1.5 mg/hr.	15 ml/hr.
2 mg/hr.	20 ml/hr.
2.5 mg/hr.	25 ml/hr.
3 mg/hr.	30 ml/hr.
3.5 mg/hr.	35 ml/hr.
4 mg/hr.	40 ml/hr.
4.5 mg/hr.	45 ml/hr.
5 mg/hr.	50 ml/hr.
5.5 mg/hr.	55 ml/hr.
6 mg/hr.	60 ml/hr.
6.5 mg/hr.	65 ml/hr.
7 mg/hr.	70 ml/hr.

Midazolam Infusion (Pediatric)

5mg/100cc D_5W
(50mcg/mL)

Dose in mcg/kg/min	Weight in Kilograms													
	5	10	15	20	25	30	40	45	50	55	60	65	70	75
	Infusion Rate (ml/hr.)													
1	6	12	18	24	30	36	48	54	60	66	72	78	84	90
1.5	9	18	27	36	45	54	72	81	90	99	108	117	126	135
2	12	24	36	48	60	72	96	108	120	132	144	156	168	180
2.5	15	30	45	60	75	90	120	135	150	165	180	195	210	225
3	18	36	54	72	90	108	144	162	180	198	216	234	252	270
3.5	21	42	63	84	105	126	168	189	210	231	252	273	294	315
4	24	48	72	96	120	144	192	216	240	264	288	312	336	360
4.5	27	54	81	108	135	162	216	243	270	297	324	351	378	405
5	30	60	90	120	150	180	240	270	300	330	360	390	420	450

Nitroglycerin Infusion

Nitroglycerin Infusion 20mg/100mL D_5W or NORMAL SALINE (200 mcg/mL)	
Medication Dose	**Infusion Rate**
5 mcg/min	2 ml/hr
10 mcg/min	3 ml/hr
15 mcg/min	4 ml/hr
20 mcg/min	6 ml/hr
25 mcg/min	8 ml/hr
30 mcg/min	9 ml/hr
35 mcg/min	11 ml/hr
40 mcg/min	12 ml/hr
45 mcg/min	14 ml/hr
50 mcg/min	15 ml/hr
60 mcg/min	18 ml/hr
70 mcg/min	21 ml/hr
80 mcg/min	24 ml/hr
100 mcg/min	30 ml/hr
120 mcg/min	36 ml/hr
140 mcg/min	42 ml/hr
160 mcg/min	48 ml/hr
180 mcg/min	54 ml/hr
200 mcg/min	60 ml/hr

Norepinephrine Infusion

4mg/250cc D_5W (16 mcg/mL)

Dose in mcg/kg/min	Weight in Kilograms															
	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120
	Infusion Rate (ml/hr.)															
0.10	17	19	21	23	24	26	28	30	32	34	36	38	39	41	43	45
0.11	19	21	23	25	27	29	31	33	35	37	39	41	43	45	47	50
0.12	20	23	25	27	29	32	34	36	38	41	43	45	47	50	52	54
0.13	22	24	27	29	32	34	37	39	41	44	46	49	51	54	56	59
0.14	24	26	29	32	34	37	39	42	45	47	50	53	55	58	60	63
0.15	25	28	31	34	37	39	42	45	48	51	53	56	59	62	65	68
0.16	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72
0.17	29	32	35	38	41	45	48	51	54	57	61	64	67	70	73	77
0.18	30	34	37	41	44	47	51	54	57	61	64	68	71	74	78	81
0.19	32	36	39	43	46	50	53	57	61	64	68	71	75	78	82	86
0.20	34	38	41	45	49	53	56	60	64	68	71	75	79	83	86	90

4mg/250cc D_5W (16 mcg/mL)

Dose in mcg/kg/min	Weight in Kilograms															
	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	
	Infusion Rate (ml/hr.)															
0.10	47	49	51	52	54	56	58	60	62	64	66	68	69	71	73	
0.11	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	
0.12	56	58	61	63	65	68	70	72	74	76	79	81	83	86	88	
0.13	61	63	66	68	71	73	76	78	80	83	85	88	90	93	95	
0.14	66	68	71	74	76	79	81	84	87	89	92	95	97	100	102	
0.15	70	73	76	79	82	84	87	90	93	96	98	101	104	107	110	
0.16	75	78	81	84	87	90	93	96	99	102	105	108	111	114	117	
0.17	80	83	86	89	92	96	99	102	105	108	112	115	118	121	124	
0.18	84	88	91	95	98	101	105	108	111	115	118	122	125	128	132	
0.19	89	93	96	100	103	107	110	114	118	121	125	128	132	135	139	
0.20	94	98	101	105	109	113	116	120	124	128	131	135	139	143	146	

Oral Pain Management – Acetaminophen

ACETAMINOPHEN: Pediatric >1y/o
Dose: 10mg/kg PO one time (max 600-650mg)
Concentration: 160mg/5mL of 650mg/20.3mL, 32mg/mL

lb	kg	mg	mL
2.2	1	10	0.3
4.4	2	20	0.6
6.6	3	30	0.9
8.8	4	40	1.2
11	5	50	1.6
13.2	6	60	1.9
15.4	7	70	2.2
17.6	8	80	2.5
19.8	9	90	2.8
22	10	100	3.1
24.2	11	110	3.4
26.4	12	120	3.7
28.6	13	130	4.1
30.9	14	140	4.4
33	15	150	4.7
35.3	16	160	5
37.5	17	170	5.3
39.7	18	180	5.6
41.9	19	190	5.9
44.1	20	200	6.2
46.3	21	210	6.6
48.5	22	220	6.9
50.7	23	230	7.2
52.9	24	240	7.5
55.1	25	250	7.8
57.3	26	260	8.1
59.5	27	270	8.4
61.7	28	280	8.7
63.9	29	290	9.1
66.1	30	300	9.4
68.3	31	310	9.7
70.5	32	320	10
72.8	33	330	10.3

lb	kg	mg	mL
75	34	340	10.6
77.2	35	350	10.9
79.4	36	360	11.2
81.6	37	370	11.6
83.8	38	380	11.9
86	39	390	12.2
88.2	40	400	12.5
90.4	41	410	12.8
92.6	42	420	13.1
94.8	43	430	13.4
97	44	440	13.7
99.2	45	450	14.1
101.4	46	460	14.4
103.6	47	470	14.7
105.8	48	480	15
108	49	490	15.3
110.2	50	500	15.6
112.5	51	510	15.9
114.6	52	520	16.2
116.8	53	530	16.6
119	54	540	16.9
121.3	55	550	17.2
123.5	56	560	17.5
125.7	57	570	17.8
127.9	58	580	18.1
130.1	59	590	18.4
132.3	60	600	18.7
134.5	61	610	19.1
136.7	62	620	19.4
138.9	63	630	19.7
141.1	64	640	20
145.5	65	650	20.3

Oral Pain Management – Ibuprofen

IBUPROFEN: Pediatric >6m/o
Dose: 10mg/kg PO one time (max 400mg)
Concentration: 100mg/5mL, 20mg/mL

lb.	kg	mg	mL
2.2	1	10	0.5
4.4	2	20	1
6.6	3	30	1.5
8.8	4	40	2
11	5	50	2.5
13.2	6	60	3
15.4	7	70	3.5
17.6	8	80	4
19.8	9	90	4.5
22	10	100	5
24.2	11	110	5.5
26.4	12	120	6
28.6	13	130	6.5
30.9	14	140	7
33	15	150	7.5
35.3	16	160	8
37.5	17	170	8.5
39.7	18	180	9
41.9	19	190	9.5
44.1	20	200	10
46.3	21	210	10.5
48.5	22	220	11
50.7	23	230	11.5
52.9	24	240	12
55.1	25	250	12.5
57.3	26	260	13
59.5	27	270	13.5
61.7	28	280	14

63.9	29	290	14.5
66.1	30	300	15
68.3	31	310	15.5
70.5	32	320	16
72.8	33	330	16.5
75	34	340	17
77.2	35	350	17.5
79.4	36	360	18
81.6	37	370	18.5
83.8	38	380	19
86	39	390	19.5
88.2	40	400	20

Paramedic Medications

A-D	E-N	O-Z
• 0.45% sodium chloride (1/2 **NORMAL SALINE**) • 5% dextrose in 0.45% NaCL (D_5 ½ **NORMAL SALINE**) • 5% dextrose in LR • 5% dextrose in water (D_5W) • Abciximab (Reopro) • Acetominophen (Tylenol) • Acetylcysteine (Mucomyst) • Activated charcoal. • Adenosine (Adenocard) • Aggrastat (Tirofiban) • Albuterol • Alteplase (Activase) • Antibiotics (if hung by facility)	• Esmolol • Etomidate (Amidate) • Famotidine (Pepcid) • Fentanyl (Sublimaze) • Flumazenil (Romazicon) • Fosphenytonin (Cerebyx) • Furosemide (Lasix) • Glucagon • Glucose • Haloperidol (Haldol) • Heparin • Hydromorphone (Dilaudid) • Ibuprofen • Insulin • Ipratropium (Atrovent) • Ketamine (Ketalat) • Ketorolac (Toradol) • Labetalol • Lactated Ringer's	• Ocetreotide (Sandostatin) • Olanzapine (Zyprexa) • Ondansetron (Zofran) • Oxygen • Oxytocin (Pitocin) • Pencuronium (Payulon) • Phenergan (Promethazine) • Phenytoin (Dilantin) • Potassium • Pralidoxime (2-oam chloride) • Procainamide • Prochlorperazine (Compazine) • Propranolol • Protamine Sulfate • Proton Pump Inhibitors (ALL) • Racemic Epinephrine

• Argatroban
• Aspirin
• Atropine
• Blood
• Blood Products
• Calcium chloride
• Calcium gluconate
• Ceftiaxone (Rocephin)
• Clonazepam (Klonopin)
• Clpoidogrel (Plavix) – oral only
• Cyanide antidote package (Cyanokit)
  ○ Amyl nitrate
  ○ Sodium nitrate
  ○ Sodium thiosulfate
• Dexamethasone (Decadron)
• Dextrose (50%, 25%, 10%)
• Diazepam (Valium)
• Diltiazem (Cardizen)
• Diphenhydramine (Benadryl)
• Divalproex sodium (Depakote)
• Dobutamine
• Dopamine
• Droperidal (Inapsine)
• Enalaprilat
• Epinephrine
	• Levalbuterol (Xopenex)
	• Levetiracetam (Keppra)
	• Lidocaine (xylocaine)
	• Lorazepam (Ativa)
	• Magnesium Sulfate
	• Mannitol (Osmitrol)
	• Methylprednisolone (Solu-Medrol)
	• Metoclopramide (Reglan)
	• Metoprolol (Lopressor)
	• Midazolam (Versed)
	• Milrinone
	• Morphine
	• Nalbuphine (Nubain)
	• Naloxone (Narcan)
	• Nicardipine
	• Nifedipine (Procardia)
	• Nitroglycerin
	• Nitrous Oxide
	• Norepinephrine (Leyophed)
	• Normal Saline (0.9% sodium chloride)
		• Reteplase (Retayase)
		• Rocuronium (Zemuron)
		• Sodium Bicarbonate
		• Succinylcholine (Anectine)
		• Terbutaline (Brethine)
		• Tricagrelor (Berlinta)
		• Thiamine
		• Toradol
		• TPA (tissue plasminogen activator)
		• TPN (total parental nutrition)
		• Tranexamic Acid (TXA)
		• Vasopressin (Pitressin)
		• Vasotec
		• Vecuronium (Norcuron)
		• Ziprasidone (Geodon)

Push Dose Epinephrine

General Scope: Reference for dilution/creation of “push dose epinephrine”

Procedure:

1. Expel one mL of **NORMAL SALINE** from a 10mL preloaded **NORMAL SALINE** syringe.
2. Attach needle to preloaded **NORMAL SALINE** syringe and draw **1mL** of 1:10,000 epinephrine (1mg/10mL – “cardiac epinephrine”).
3. Verify syringe now contains **0.1mg EPINEPHRINE** in **10mL** of solution.
    a. Concentration is not **100mcg/10mL** or **10mcg/mL.**
4. Label syringe with appropriate notation.

Radio Report Outline

General Scope: To provide a general guideline for the EMS to hospital patient report. The report should be provided as soon as practical. EMS can request on-line medical control orders during the report, but it is often more expedient to initiate a request for orders prior to giving the patient report.

Medical Patients
• Identify service, unit number and radio frequency. • Patient age, sex, and level of consciousness (GCS) • Chief complaint and/or primary impression • Pertinent medical history related to illness. • Pertinent assessment findings and most recent vitals (BP, HR, RR, SpO2) • Treatments provided. • Estimated time of arrival

Hospital to Hospital Transfer Checklist
• Any SBP less than 90mmHg? • Any HR greater than 120bpm? • Supplemental O_2 4lmp or more? • GCS less than 15? • New or persistent chest pain or concern for cardiac event? • Any other concerns? • Estimated time or arrival.

Trauma Patients
• Identify service, unit number and radio frequency. • Origin – transporting from the scene or another facility? • Age, sex, and level of consciousness (GCS) • Weight (pediatric patient) • Mechanism of injury including time of injury • Injuries found, pertinent history, and use of blood thinners. • Most recent vitals (BP, HR, RR, SpO_2) including lowest BP and highest HR. • Treatments provided. • Estimated time of arrival

Trauma Activation

General Scope: Guideline/criteria for activation of trauma team at Gunderson Health System.

Applies to: Tri-State Ambulance Personnel (Reference for all other agencies)

RED ACTIVATION	YELLOW ACTIVATION
TRANSPORT TO THE HIGHEST-LEVEL TRAUMA CENTER ● Traumatic arrest: active or history of ● Intubated, advanced airway adjunct and/or respiratory compromise, obstruction, stridor, or grunting in children. ● Systolic blood pressure, confirmed by sequential readings of: o Adult <90mmHg o Pediatric ▪ <60mmHg (0-6m/o) ▪ <70mmHg (6m/o-5y/o) ▪ <80mmHg (5-14.9y/o) ● Penetrating injury to head, nek, torso to include axilla, shoulder, groin, and buttocks. ● Tourniquet in place to control extremity hemorrhage. ● Blood products in Emergency Department or prior to arrival ● Extremity injuries o Complete or partial amputation proximal to wrist of ankle o Crushed, de-gloved, or mangled proximal to wrist or ankle. ● Evisceration ● GCS <9 with mechanism attributed to trauma, including isolated	TRANSPORT TO THE HIGHEST-LEVEL TRAUMA CENTER ○ Glascow Coma Scale <14 ○ Open/depressed skull fracture ○ ≥2 long bone fractures ○ New onset paralysis ● Systolic blood pressure, confirmed by sequential reading of: o Adult over age 65 <110mmHg ● Extrication greater than 20 minutes ● Combination of trauma with burns ● Burns o Adult >20% TBSA or involving face/airway. o Pediatric >15% TBSA of involving face/airway. ● Ejection from *enclosed* vehicle ● Falls: o Adult >20 feet o Pediatric >15 feet ● Auto-pedestrian/auto-bicycle with speeds > 20mpg ● High-voltage electrocution ● Moderate hypothermia (core temp 28°C – 32.2°C [90°F])

hanging, traumatic asphyxia, or cold water drowning with signs of life. ● Flail chest ● Unstable pelvis ● Sever hypothermia (core body temp <28°C [82.4°F])	

Iowa Trauma Triage Destination – Adult

The following criteria shall be utilized to assist the EMS provider in the identification of time critical injuries, method of transport, and trauma care facility resources necessary for treatment of those injuries.

Step1 – Assess for time critical injuries: Level of Consciousness & Vital Signs

- Glasgow Coma Scale ≤13.
- Respiratory rate <10 or >29 breaths per minute or need for ventilatory support.
- Systolic B/P (mmHg) less than <90mmHg

If ground transport time to a Resource (Level 1) or Regional (Level 2) Trauma Care Facility is less than 30 minutes, transport to the nearest Resource (Level 1) or Regional (Level2) Trauma Care Facility. If greater than 30 minutes, ground transport time to Resource (Level 1) or Regional (Level 2) Trauma Care Facility, transport to the nearest appropriate Trauma Care Facility. If time can be saved or level of care needs exist, tier with ground or air ALS service program.

If step 1 does not apply, move on to step 2.

Step 2 – Assess for anatomy of an injury.

- All penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee.
- Chest wall instability or deformity (e.g., flail chest)
- Suspected two or more proximal long-bone fractures.
- Crushed, degloved, mangled, or pulseless extremity.
- Amputation is proximal to wrist or ankle.
- Partial or full thickness burns ≥10% TBSA or involving face/airway.
- Suspected pelvic fractures.
- Open or depressed skull fracture.
- Paralysis or paresthesia

If ground transport time to a Resource (Level 1) or Regional (Level 2) Trauma Care Facility is less than 30 minutes, transport to the nearest Resource (Level 1) or Regional (Level 2) Trauma Care Facility. If greater than 30 minutes ground transport time to Resource (Level 1) or Regional (Level 2) Trauma Care Facility, transport to the nearest appropriate Trauma Care Facility. If time can be saved or level of care needs exist, tier with ground or an air ALS program.

If step 2 does not apply, move on to step 3.

Step 3 – Consider mechanism of injury & high energy transfer

- Falls
    - Adult >20 feet (one story is equal to 10 feet)
- High-risk auto crash
    - Interior compartment intrusion, including roof: >12 inches occupant sire; >18 inches any site.
    - Ejection (partial or complete) from automobile.
    - Death in the same passenger compartment.
    - Vehicle telemetry data consistent with high risk of injury.
    - Auto vs. pedestrian/bicyclist thrown, runover, or with significant (>20mph) impact.
    - Motorcycle crash >20mph.

Transport to the nearest appropriate Trauma Care Facility, need not be the highest-level Trauma Care Facility.

If step 3 does not apply, move on to step 4.

Step 4 – Consider risk factors:

- Older adults
    - Risk of injury/death increases after age 55 years.
    - SBP<110 might represent shock after age 65 years.
    - Low impact mechanisms (e.g. ground level falls) might result in sever injury.
- Anticoagulants and bleeding disorders
    - Patients with head injury are at high risk for rapid deterioration.
- Pregnancy >20 years
- EMS provider judgement
- ETOH/Drug use

Transport to the nearest appropriate Trauma Care Facility, need not be the highest-level Trauma Care Facility.

If none of the criteria in the above 4 steps are met, follow local protocol for patient disposition. When in doubt, transport to nearest trauma care facility for evaluation.

For all Transported Trauma Patients:

1. Patient report to include MOI, injuries, vital signs & GCS, Treatment, Age, Gender, and ETA.
2. Obtain further orders from medical control as needed.

Iowa Trauma Triage Destination – Pediatric

The following criteria shall be utilized to assist the EMS provider in the identification of time critical injuries, method of transport, and trauma care facility resources necessary for treatment of those injuries.

Step 1 – Assess for time critical injuries: Level of consciousness & vital signs.

- Abnormal Responsiveness: abnormal or absent cry or speech. Decreased response to parents or environmental stimuli. Floppy of rigid muscle tone or not moving. Verbal, pain, or unresponsive on AVPU scale.

  OR

- Airway/Breathing Compromise: obstruction to airflow, gurgling, stridor, or noisy breathing. Increases/excessive retractions or abdominal muscle use, nasal flaring, stridor, wheezes, grunting, gasping, or gurgling. Decreased/absent respiratory effort or noisy breathing. Respiratory rate is outside normal range.

  OR

- Circulatory Compromise: cyanosis, mottling, paleness/pallor, or obvious significant bleeding. Absent to weak peripheral or central pulses, pulse, or systolic BP outside normal range. Capillary refill >2 seconds with other abnormal findings. Glascow Coma Scale ≤13

If ground transport time to a Resource (Level 1) or Regional (Level 2) Trauma Care Facility is less than 30 minutes, transport to the nearest Resource (Level1) or Regional (Level 2) Trauma Care Facility. If greater than 30 minutes, ground transport time to Resource (Level 1) or Regional (Level 2) Trauma Care Facility, transport to nearest appropriate Trauma Care Facility. If time can be saved or level of care needs exist, tier with ground or air ALS program.

If step 1 does not apply, move on to step 2.

Step 2 – Assess for anatomy of an injury.

- All penetrating injuries to head, neck, torso, and extremities proximal to elbow or knee.
- Chest wall instability or deformity (e.g., flail chest)
- Suspected two or more proximal long-bone fractures.
- Crushed, degloved, mangled, or pulseless extremity.
- Amputation is proximal to wrist or ankle.
- Partial or full thickness burns ≥10% TBSA or involving face/airway.
- Suspected pelvic fractures.
- Open or depressed skull fracture.
- Paralysis or paresthesia

If ground transport time to a Resource (Level 1) or Regional (Level 2) Trauma Care Facility is less than 30 minutes, transport to the nearest Resource (Level 1) or Regional (Level 2) Trauma Care Facility. If greater than 30 minutes ground transport time to Resource (Level 1) or Regional (Level 2) Trauma Care Facility, transport to the nearest appropriate Trauma Care Facility. If time can be saved or level of care needs exist, tier with ground or an air ALS program.

If step 2 does not apply, move on to step 3.

Step 3 – Consider mechanism of injury & high energy transfer

- Falls
    - Adult >20 feet (one story is equal to 10 feet)
- High-risk auto crash
    - Interior compartment intrusion, including roof: >12 inches occupant sire; >18 inches any site.
    - Ejection (partial or complete) from automobile.
    - Death in the same passenger compartment.
    - Vehicle telemetry data consistent with high risk of injury.
    - Auto vs. pedestrian/bicyclist thrown, runover, or with significant (>20mph) impact.
    - Motorcycle crash >20mph.

Transport to the nearest appropriate Trauma Care Facility, need not be the highest-level Trauma Care Facility.

If step 3 does not apply, move on to step 4.

Step 4 – Consider risk factors.

- EMS provider judgement
- ETOH/Drug use
- Anticoagulants and bleeding disorders.

- Patients with head injury are at a high risk for rapid deterioration.

Transport to the nearest appropriate Trauma Care Facility, need not be the highest-level Trauma Care Facility.

If none of the criteria in the above 4 steps are met, follow local protocol for patient disposition. When in doubt, transport to the nearest trauma care facility for evaluation.

For all transported trauma patients:

1. Patient report to include MOI, injuries, vital signs & GCS, treatment, age, gender, and ETA.
2. Obtain further orders from medical control as needed.

Ventilator/BiPAP Use

General Scope: Guideline and criteria for transport ventilator and BiPAP use.

Applies to: All Paramedics

Reference:

1. Ventilator Settings
    a. If time allows during response, turn on ventilator connected to test lung.
    b. Mode: set at assist control or SIMV
    c. GO to powerup setting. Change to powerup with user one. Go to save setting and save user one settings. This should allow the vent to turn on with your recent settings. Note: This will only save the most basic settings, such as mode, Vt, and I:E ratio. This will not save high- and low-pressure alarm settings or trigger level settings.
    d. Turn vent off until patient side.
    e. Turn vent on.
    f. Set high- and low-pressure alarms to desired settings.
    g. Press the menu button.
    h. Adjust trigger level to desired setting.
    i. Adjust control to desired setting.
    j. Initial tidal volume: 6-8cc/kg IDEAL BODY WEIGHT; max of 800cc.
    k. FiO2 100% or adjust FiO2 to maintain SaO2 at >95%
    l. PEEP: 5cm. Titrate in increments of 2cm (max of 10cm) every 15 minutes to increase oxygenation saturations where other measures (sedation, paralysis) have failed and SBP is >90mmHg.
    m. RR: 8-10
        i. If attempting to decrease intracranial pressure [ICP] hyperventilate keeping $EtCO_2$ between 30-35. Start at a rate of ten and increase or decrease rate in increments of two to obtain desired $EtCO_2$.
        ii. If RR 16-20, use no PEEP.
    n. Be aware of pneumothorax risk (especially with traumatic chest injuries).
    o. Maintain $EtCO_2$ between 35-40 for most patients; 30-35 if evidence of lateralizing signs.

p. Pressure alarm: monitor patient's inspiratory pressure and set it at 10cm above Peak Inspiratory Pressure.
q. Increase sensitivity slowly if ventilator does not capture inspiratory effort.
r. Monitor I:E ratio and maintain at a minimum of 1:2 if patient is prone to air-trapping.

2. NPPV (BiPAP)
    a. NPPC delivers CPAP, but also senses when an inspiratory effort is being made and delivers a higher-pressure during inspiration. This positive pressure wave during inspirations unloads the diaphragm decreasing the work of breathing.
    b. Indications:
        i. Recent and rapid worsening of dyspnea.
        ii. Respiratory rate >30
        iii. pH <7.28
        iv. PaCO2 >50mmHg
        v. Hypoxemia
            1. Pneumonia
            2. Fluid overload
        vi. CHF
        vii. Moderate to severe respiratory failure.
        viii. Post-op patients with rising $EtCO_2$ levels
        ix. COPD patients with acute-on-chronic respiratory failure.
    c. Exclusion criteria
        i. Recurrent aspiration.
        ii. Large volumes of secretions.
        iii. Inability to protect the airway.
        iv. Vomiting.
        v. Obstructed bowel.
        vi. Upper airway obstruction.
        vii. Uncooperative, confused, or combative patient.
        viii. ARDS
        ix. Inability to tolerate a tight mask.
        x. Orofacial abnormalities which interfere with mask/face interface.
        xi. Hemodynamic instability.
        xii. Untreated pneumothorax.
3. Settings for Impact Ventilator BiPAP
    a. Preset alarms and setting by turning the unit on let the vent start in default mode.

b. Select CPAP under the mode menu. Then change PPV to NPPV in the upper right-hand corner of the mode menu. Always make sure to use the green check mark when changing a setting.
c. If the BiPAP settings are unknown start with ten over five. This is done by setting the PEEP at 5 and the pressure support to five. Remember pressure support is found in the secondary PIP menu. This is achieved by pressing and holding the PIP menu button for greater than 5 seconds.
    i. Pressure support of five and PEEP of 5 is equal to BiPAP of 10/5
d. Use a standard resuscitation mask with blue elbow and the head strap when providing BiPAP with the Impact Ventilator.
e. If improvement in ventilation and oxygenation is not achieved, discontinue NPPV and consider tracheal intubation.

4. Pediatric recommendations
    a. Less than 1 year of age:
        i. Assist control pressure ventilation mode.
        ii. PIP 15 (increase pressure only if needed to get normal chest rise).
        iii. Inspiratory time of 0.7 seconds.
        iv. Rate of 15 (increase by increments of five to maintain $EtCO_2$ between 40-50.
        v. PEEP of 4.
        vi. FiO2 to maintain sats >95%.
        vii. Monito TV.
    b. Greater than 1 year of age:
        i. Assist control volume mode.
        ii. Start with default Pediatric settings.
        iii. Change to Volume Mode; calculate 10mL/kg TV.
        iv. Inspiratory time of 0.7 seconds/
        v. Rate of 15 (increase by increments of five to maintain $EtCO_2$ between 40-50.
        vi. PEEP of 4.
        vii. FiO2 to maintain sats >95%
        viii. Monitor TV
5. Recommended settings for specific scenarios
    a. Severely brain injured (i.e., localizing signs such as dilated pupil and posturing)
        i. Assist control.
        ii. RR 8-12
        iii. TV 6-8c/kg IDEAL BODY WEIGHT
        iv. PEEP 5cm
        v. FiO2 100% or adjust FiO2 to maintain SaO2 at >95%

b. Depressed respiratory drive (e.g., intoxicated or overdose patient)
    i. Assist control or SIMV.
    ii. RR 6-15
    iii. TV 6-8cc/kg IDEAL BODY WEIGHT
    iv. PEEP 5cm
    v. FiO2 100% or adjust FiO2 to maintain SaO2 at >95%
c. Acute bronchospasm
    i. Assist control.
    ii. RR 8-10
    iii. TV 6-8cc/kg IDEAL BODY WEIGHT
    iv. PEEP 5cm
    v. FiO2 100% or adjust FiO2 to maintain SaO2 at >95%
    vi. May need to increase peak flow setting to 50-80 lpm.
    vii. Consider decreased inspiration time.
d. Multilobar disease (e.g., pneumonia, pulmonary edema/ARDS, extensive disease patterns)
    i. Assist control.
    ii. RR 10-20
    iii. TV 6-8cc/kg IDEAL BODY WEIGHT
    iv. PEEP 5 cm with titration to maintain oxygen saturations.
    v. FiO2 100% or adjust FiO2 to maintain SaO2 at >95%

Set inspiratory flow rate above patient demand, usually greater than eighty lpm.