GUNDERSEN MEDICAL DIRECTION PRE-HOSPITAL GUIDELINES

September 2024
Iowa Version

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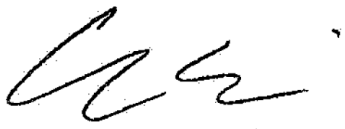

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Table of Contents

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 2024 for the authorized Iowa EMS Program(s):

- Tri-State Regional Ambulance, Inc. dba Gundersen Health System Ambulance – West Union, IA.

PRINTED NAME	SIGNATURE	DATE
CHRISTOPHER M. EBERLEIN, M.D.		09/01/2024

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 and Emergency Department Physicians within the Gundersen Health System medical direction.

These protocols are initially based off WI scope of practice. They have been edited to reflect the current scope of practice in Iowa.

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 the EMS providers.

These guidelines have been written in adherence with nationally recognized 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 willadhere 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 EMS 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 online 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 order 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 physician's 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 carereport what was ordered, the time, and the reason the order could not be carried out. In addition,the provider must notify the Quality Assurance Office. 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.

Foreword (Continued)

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. Gundersen Health System 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 responding for is licensed/certified by the respective state EMS licensing agency.**

Examples:

> **[*EMT*]** Indicates that 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, EMT-I, 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 as long as the agency they are responding with are licensed/certified at that level. This includes EMT-I, 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 Gundersen Health System, 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.

Foreword (Continued)

From time to time, guidelines may be added or revised upon recommendation by the parties previously listed. Additional recommendations are welcome and appreciated at any time. They may be submitted to any 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 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 utilized at all times 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 Guideline)
- 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, temp, and condition
        - Assess for and treat life threatening bleeding
    - Level of consciousness

General Principles of Patient Care (Continued)

- 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 practicable.
- 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., if a guideline gives 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.
- Adult medication dosing will be based on Ideal Body Weight (IBW) which will be calculated using the patient's height and the **Ideal Body Weight Chart**.
- 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 of 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.

General Principles of Patient Care (Continued))

- For unfamiliar medications that are infusing, ordered, and/or are to be administered by EMS, consult with physician(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 patient.

Airway

Airway / Ventilatory 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 least 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 Guideline**
4. If patient presents with pulmonary edema
    a. See **Pulmonary Edema Guideline**
5. If patient has a tracheostomy that requires replacement or suction, see **Tracheostomy Care Procedure**
6. Observe for signs and symptoms of respiratory failure
    - Failure to oxygenate and/or ventilate
    - Severe respiratory fatigue
    - Inability to successfully use CPAP
    - RR <8 or >35 breaths per minute
    - SpO_2 <85% on 100% O_2
    - Acutely rising $EtCO_2$
    - Altered mental status
    - Hemodynamic instability
    - Paradoxical respiratory efforts
7. [*EMR*] Provide supplemental Oxygen via appropriate device
    a. [*EMT***] When providing ventilation via BVM, 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.
8. [*EMR***] Consider **Supraglottic Airway Procedure**
9. [*Paramedic*] Assess expected success of intubation, reference **Airway Management Checklist**
10. [*Paramedic*] If endotracheal intubation success likely and patient is >8y/o
    a. Consider intubation
        i. If RSI is necessary, see **Resuscitation Sequence Intubation Procedure**
11. If failed intubation (two total unsuccessful attempts)
    a. Consider BVM
    b. Consider **Supraglottic Airway Procedure**
    c. [*Paramedic*] consider **Needle Cricothyroidotomy Procedure**
    d. [*CCP*] For adults, consider **Surgical Cricothyroidotomy Procedure**
        i. For children under 10, 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)	**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 is able to be seen) • **O**bstruction (epiglottitis, tumor, trauma, abscess) • **N**eck mobility (c-spine, immobilization, arthritis, previous stabilization)
• 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 • 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
• 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 • 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	**DOPES** • **D**isplacement or **D**isconnect • **O**bstruction • **P**neumothorax • **E**quipment failure • **S**tacked breaths if asthmatic

GOAL: FIRST PASS SUCCESS WITHOUT ADVERSE EVENTS

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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 or 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. For adult patients, see **Surgical Cricothyroidotomy Guideline**
    b. For 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 normal, loud wheezes or silent chest, patient anxious, and/or gray or ashen skin color)
    a. **ALBUTEROL** via nebulizer
        i. [*EMT*] 2.5- 5.0mg
        i. [*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) – 1 mg/kg
    e. [*Paramedic*] **MAGNESIUM SULFATE** 2 grams/100mL NS IV/IO over 15 minutes
    a. [*AEMT*] **EPINEPHRINE** 0.3mg (1mg/mL [1:1,000]) IM
        i. Pediatric (< 8 y/o) – 0.15mg
    f. For impending respiratory failure
        i. Consider non-invasive ventilatory support
            1. [*EMT**]* For non-ventilator driven, see **NIPPV Procedure**
            2. [*Paramedic*] For ventilator driven, see **VOCSN Procedure**
            3. See **Airway / Ventilatory Management Guideline**
4. 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
    b. [*AEMT*] Consider IV TKO
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
    b. [*AEMT*] Consider IV TKO
6. For patients with advanced airway and bronchoconstriction
    a. **ALBUTEROL** via in-line MDI (Critical Care IFT)
        i. [*Paramedic*] For chronic bronchoconstriction, 360 mcg (four puffs) every two hours (1 puff = 90 mcg)
        ii. [*Paramedic*] For severe bronchoconstriction, 360 mcg (four puffs) as needed until improvement (1 puff = 90 mcg)
        iii. [*Paramedic*] Consider continuous nebulizer

Assessment

Interfacility Pre-Transport Care

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

Guideline:

1. Establish contact with referring facility and patient
2. Complete "Primary Survey"
    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. [*Paramedic*] Can continue maintenance of any ordered medications or electrolyte solutions by the transferring physician with Service Medical Director authorization by protocol, agency formulary or online medical control. If you are unfamiliar with any medication, consult with physician(s), nurses(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, dose, and side effects.
    b. [*Critical Care*] Can administer additional medications authorized by Service Medical Director by protocol, agency formulary or online medical control. If you are unfamiliar with any medication, consult with physician(s), nurses(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, dose, 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 your 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 patient, consider spinal immobilization for trauma patients

Cardiovascular

Cardiovascular – Adult

Asystole

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

Guideline:

1. Perform routine medical assessment
    a. Refer to **Cardiac Arrest Guideline**

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 [1:10,000]) 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 [1:10,000])
    a. [*Paramedic*] Consider **CALCIUM GLUCONATE** 1gram
    b. [*Paramedic*] Consider **SODIUM BICARBONATE** 25mEq
8. After the above, may consider termination of resuscitation – see **2. Termination of Resuscitation**

Automatic Implantable Cardiac Defibrillator (AICD) Deactivation

General Scope: Guideline for deactivating AICDs.

Guideline:

1. Perform routine medical assessment
2. Patient must remain on cardiac monitor until transfer of care
3. [*Paramedic*] If patient has an AICD that is inappropriately discharging (for a non-shockable rhythm)
    a. Place magnet directly over AICD
    b. Secure magnet in place
    c. Document time of application, underlying rhythm, and if procedure is successful
4. If the patient develops a shockable rhythm, remove the magnet
    a. If AICD does not begin working, see appropriate arrhythmia guideline

Notes:
This magnet will not stop a pacemaker from functioning
Keep magnet away from computers, credit cards, electronics, etc.

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*] If symptomatic or IV/IO not readily available
    a. Begin **TRANSCUTANEOUS PACING** per monitor manufacture'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 NS—10mcg/ml)
        i. Initiate infusion at 2-10 mcg/min
        ii. Titrate every 5 minutes by increments of no more than 1 mcg/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

a. [*EMR*] Resuscitation must be initiated unless one of the following conditions exist
    i. Valid DNR
        1. Wisconsin DNR bracelet (metal or plastic)
        2. Valid POST/POLST/IPOST form with DNR orders
            a. Copy on canary paper is acceptable for SNF transports
    ii. Written order from physician
    iii. Order from Medical Control physician
    iv. Pulseless and apneic with one or more of the following:
        1. Decomposition
        2. Rigor mortis
        3. Dependent lividity
        4. Decapitation
        5. MCI
        6. Traumatic death with extrication >20 minutes with no CPR

a. [*Paramedic*] For <u>adult</u> patients 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

Cardiac Arrest (Continued)

1. 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 compressions
   v. Refer to appropriate dysrhythmia guideline as needed

b. [*Paramedic*] For patients with refractory ventricular fibrillation or ventricular tachycardia (three or more defibrillations without or with transient conversion), consider replacing defibrillation pads with pads in a different vector.

2. TERMINATION OF RESUSCITATION

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 persons of at least equal skill and training
   iii. Effective ROSC and ventilation have been restored
   iv. The rescuers are physically 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 BVM or advanced airway
   iii. IV or 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.

c. If transport has been initiated, efforts must continue until patient care has been turned over to the receiving hospital

d. If resuscitation is not initiated or continued, 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 ofpossible 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 Medical Communications (MedComm) to activate STEMI Alert
        i. [*Paramedic*] Transport to nearest PCI center is recommended if travel time isexpected to be 60 minutes or less
5. [*AEMT*] Establish IV/IO
6. [*EMR**/*EMT*] Give **ASPIRIN** 324mg PO
7. [*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** (20mg/100ml NS 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** if SBP <90
8. [*Paramedic*] If **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: 180 mg **TICAGRELOR (BRILINTA)** PO

OR

        ii. Option 2: 600 mg **CLOPIDOGREL (PLAVIX)** PO
9. [*Paramedic*] If SBP >100 consider **FENTANYL** 25-50mcg for refractory pain
10. [*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 medical assessment
    a. Consider underlying causes of tachycardia (i.e., sepsis, dehydration, shock, DKA)
3. Determine cardiac 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*] Perform **SYNCHRONIZED CARDIOVERSION**
        i. Utilize dose range of 100-200J
    c. Consider pharmacological intervention (see #6ci)
5. If ventricular rate is ≥150 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
    c. [*Paramedic*] **DILTIAZEM** 5mg over 2 minutes
        i. [*Paramedic*] If inadequate response, consider repeat doses; max total 25mg
    d. [*Paramedic*] Consider **AMIODARONE** 150mg/100mL NS 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 if 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 NS over 10 minutes

Notes:

Diltiazem is contraindicated**:**

- 2nd or 3rd degree heart block
- WPW or short PR syndrome

Common side effects of diltiazem: Symptomatic hypotension, flushing, burning or itching at injection site.

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. [*Paramedic*] Attach ventilator if advanced airway is established, see **VOCSN Procedure**
6. [*AEMT*] Monitor $EtCO_2$
    a. Target range is 30-35mmHg with RR ≥10
    b. **DO NOT HYPERVENTILATE**
7. [*Paramedic*] If patient received >2 minutes of CPR consider OG if advanced airway has been established per **Orogastric Tube Procedure**
8. Continuous monitoring of vital signs
9. If patient is hypotensive see **Blood Pressure Management Procedure**
10. If patient has significant cardiac dysrhythmia see appropriate guideline
11. If patient has bradycardia see **Bradycardia Guideline**
12. [*EMT*] Obtain and transmit a 12-Lead ECG to the receiving facility
    a. [*Paramedic*] If 12-Lead is consistent with STEMI contact Medical Communications (MedComm) to activate STEMI Alert
    b. If STEMI, consider transport directly to PCI center
13. 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 in upright sitting position
3. If respiratory arrest is imminent, see **Airway / Ventilatory Management Guideline**
    a. Add PEEP 5-10mmHg to BVM
4. If moderate to severe respiratory distress
    a. [*EMT***] Consider non-invasive ventilatory support, see **NIPPV Procedure**
        i. [*AEMT*] Administration of sublingual nitroglycerin noted below should be performed prior to mask placement
    b. [*Paramedic*] Consider non-invasive ventilatory support
        i. For non-ventilator driven, see **NIPPV Procedure**
        ii. For ventilator driven, see **VOCSN Procedure**
    c. [*Paramedic*] See **Sedation Procedure** as needed
5. [*AEMT*] IV NS TKO
6. If SBP<90 mmHg
    a. See Blood Pressure Management Procedure
7. If SBP>120 mm Hg
    a. [*AEMT*] **NITROGLYCERIN**[1] 0.4mg SL Q 3-5 minutes to desired response or SBP ≤140
    b. [*Paramedic*] **NITROGLYCERIN INFUSION**[1] (20mg/100ml D_5W or NS—200mcg/ml)
        i. Start at 20 mcg/min
        ii. Titrate by 10mcg/min every 5-10 minutes to desired response or SBP ≤140
8. If SBP>180 mm Hg
    a. [*AEMT*] **NITROGLYCERIN**[1] 0.4-0.8 mg SL every 3-5 minutes to desired response or SBP ≤140
    b. [*Paramedic*] **NITROGLYCERIN INFUSION**[1] (20mg/100ml D_5W or NS—200mcg/ml)
        i. Start at 50 mcg/min
        ii. Titrate by 10 mcg/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 presenting 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+) Preexisting acidosis – Ventilate and for adults only, consider [*Paramedic*] **SODIUMBICARBONATE** 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 **EPINEPHRINE** 1mg every 3-5 minutes
6. Establish airway per **Airway / Ventilatory Management Guideline**
7. After three doses of **EPINEPHRINE**
    a. [*Paramedic*] Consider **CALCIUM GLUCONATE** 1gram
    b. [*Paramedic*] Consider **SODIUM BICARBONATE** 25mEq
8. 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 cardiac arrest.

IBW Dosing: See **Ideal Body Weight Chart**

Guideline:

1. Perform routine medical assessment
2. Initiate high-quality CPR and continue throughout resuscitation with minimalinterruptions
    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 NS)over 1-2 minutes
8. If NOT torsades de pointes
    a. [*Paramedic*] Administer anti-arrhythmic:
        i. Option 1: **LIDOCAINE** 1-1.5mg/kg
            - May repeat with 0.5-0.75mg/kg

        OR

        ii. Option 2: **AMIODARONE** 300mg
            - May repeat with 150mg
    b. [*Paramedic*] Consider **MAGNESIUM SULFATE** 2 grams (2G in 100ml D5W or NS)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 Guideline**

Notes:

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

[2] Priority administration in known or suspected cases of hyperkalemia

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

Wide Complex Tachycardia

General Scope: Guideline for treatment of a patient in presenting in a wide or ventriculartachycardic 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 administer **AMIODARONE** 150mg over 10 minutes
        ii. [*Paramedic*] Consider **AMIODARONE** infusion (150mg in 100mL D_5Wor NS = 1.5mg/mL) at 1mg/min
4. If patient is hemodynamically stable
    a. [*EMT*] Obtain 12-lead ECG
    b. [*Paramedic*] If rhythm is regular & monomorphic consider **ADENOSINE** 12mg
    c. [*Paramedic*] Administer **AMIODARONE** 150mg over 10 minutes
        i. [*Paramedic*] Consider **AMIODARONE** infusion (150mg in 100mL D_5Wor NS = 1.5mg/mL) at 1mg/min
        ii. [*Paramedic*] If unsuccessful consider cardioversion (see #3)
5. [*Paramedic*] Consider **MAGNESIUM SULFATE** 2 grams (2G in 100mL D_5W or NS) 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 the 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 $T_{1/2}$ life

Cardiovascular – Pediatric

Pediatric Asystole / PEA

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

Guideline:

1. Perform routine medical assessment
2. Initiate CPR and continue throughout resuscitation with minimal interruptions
3. Consider possible causes and treatments
    - Hypoxia – ventilation see **Airway / Ventilatory Management Guideline**
    - Preexisting acidosis – Increase ventilations
    - Drug overdose – see **Poisoning and Overdose Guideline**
    - Hypothermia – see **Hypothermia Guideline**
    - Hyperkalemia – see **Hyperkalemia Guideline**
4. [*Paramedic]* Confirm asystole in two leads
    - 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 3-5minutes

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. [*EMT-I*] 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

General 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 likely ventricular tachycardia:
        i. [*Paramedic*] **AMIODARONE** 5mg/kg over 10 minutes
        ii. [*Paramedic/Med Control*] Perform **SYNCHRONIZED CARDIOVERSION** 0.5-1J/kg
    c. If likely SVT with aberrancy:
        i. [*Paramedic*] Attempt **MODIFIED VALSALVA MANEUVER [YouTube Link]** if possible
        ii. [*Paramedic*] **ADENOSINE** 0.1mg/kg rapid push
            1. [*Paramedic*] Repeat at 0.2mg/kg (May repeat twice)
5. If QRS≤0.09 seconds:
    a. [*Paramedic*] Evaluate rhythm
    b. If likely SVT:
        i. [*Paramedic*] Attempt **MODIFIED VALSALVA MANEUVER [YouTube Link]** if possible
        ii. [*Paramedic*] **ADENOSINE** 0.1mg/kg rapid push
            1. [*Paramedic*] Repeat at 0.2mg/kg (May repeat twice)
    c. If likely Sinus Tachycardia:
        i. Search for and treat causes

Pediatric Tachycardia with Poor Perfusion

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 **SYNCHRONIZED 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 **SYNCHRONIZED CARDIOVERSION** 0.5-1 J/kg
            1. Repeat as needed at 2-4 J/kg
        iii. [*Paramedic*] **AMIODARONE** 5mg/kg over 10 minutes
    c. If likely 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 ventricularfibrillation 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 - 4J/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 3-5minutes
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 Guideline**

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% O_2 via tight fitting mask if 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 and working and establish an accepting physician
    a. Contact:
        i. Diver's Alert Network, 919-694-9111 and ask for Diving Emergencies
        ii. University of IA, Iowa City
            1. 319-356-7706 (8a-5p)
            - 319-356-2233 (after hours)
            - 319-356-8220 HBO Physician

Notes:

A. Decompression illness occurs when the gas dissolved inthe body fluids separates from those fluids to form bubbles.
B. In a rapid ascent, the pressure differential between the body tissues and 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 dive

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. Gas burden (depth-time profile): Depth of dive, dive time and number of dives.

Envenomation

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

Guideline:

1. Perform routine medical and trauma assessment
2. Obtain and document history of time and type of bite (bring offending agent if safe to do so)
3. Remove any constrictive items (clothing, jewelry) on effected extremity
4. [*AEMT*] Establish IV/IO in non-effected 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
Signs	• 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
Treatment	• 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 part (blisters) with light sterile dressings. Avoid pressure to area
        ii. Cover affected part with warm blankets and prevent re-exposure to cold orrefreezing of part
    c. [*AEMT*] Establish IV/IO
    d. [*AEMT*] Give up to 2 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*] Give up to two liters of warmed **NORMAL SALINE**
    d. If bradycardic do not start CPR
    e. If patient is pulseless
        i. Check for pulse, respirations, 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

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

HYPOTHERMIA SIGNS AND SYMPTOMS		
EARLY WARNING: 35°C/95°F	**SERIOUS: 34°C/93.2°F**	**DEEP: 33°-24°C/91.4°-75.2°F**
• Feeling cold & tired • Numbness of hands & feet • Blue lips • Intermittent shivering	• Continuous shivering • Unusual/uncharacteristic behavior • Physical & mental lethargy • Slurring of speech • Violent outbursts of unexpected energy • Lack of muscle coordination • Failure or abnormality of vision	• Shivering stops, impaired consciousness (33°C) • Limbs stiffen up (32°C) • Victim drifts into deep unconsciousness (31°C) • Irregular pulse (29°C) • Unconsciousness, coma, death (24°C)

Medical

Medical - Adult

Abdominal/Thoracic Aortic Aneurysm/ Dissection

General Scope: Guideline for treatment of patients who present with signs and symptoms consistent with that of an aortic aneurysm.

IBW Dosing: See **Ideal Body Weight Chart**

Guideline:

1. Perform routine medical assessment
2. Airway support as needed, see **Airway / Ventilatory Management Guideline**
3. [*AEMT*] Establish IV/IO **(Two large bore lines if possible)**
4. Treat pain per **Pain Management Procedure**
5. If patient SBP >130:
    a) [*Paramedic/Med Control*] **NITROGLYCERIN INFUSION** (20mg/100ml D_5W or NS—200mcg/ml)
        i. For patients <75kg, start at 10mcg/min
        ii. For patients >75kg, start at 20mcg/min
        iii. Titrate by 5-10mcg/min every 5-10 minutes to SBP~110
        iv. Monitor BP every 3-5 minutes
    b) [*Paramedic/Med Control*] **LABETALOL** 20mg slow push
        i. May repeat at 40mg every 10 minutes to a max of 300mg
6. If patient SBP <90
    a) [*AEMT*] 250-500ml **NORMAL SALINE** bolus up to 2-3 liters total
    b) [*Paramedic*] Consider **NOREPINEPHRINE** infusion
        i. Initiate at 0.1 mcg/kg/min via IV pump
            1. Titrate by 0.01-0.05 mcg/kg/min every 3-5 minutes
            2. Maximum of 0.3 mcg/kg/min

Notes:

1. History:
    a. Thoracic:
        i. Relatively sudden onset
        ii. Severe "tearing" chest pain with possible radiation to back
    b. Abdominal:
        i. Intermittent or constant abdominal pain commonly localized to left middleor lower quadrant
        ii. Back pain and flank pain are the next most common symptoms
2. Physical exam:
    a. Possible hypotension
    b. Pulse discrepancy side-to-side or upper versus lower extremities
    c. Pulsatile abdominal or groin mass with or without a pulse

Altered Mental Status (AMS)

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

Guideline:

1. Perform 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/overdose, 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/compromise, 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 GCS <8, see **Resuscitation SequenceIntubation 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 (< 8 y/o) – 0.15mg
    iii. May repeat IM epinephrine every 5 minutes up to 3 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 continued signs of anaphylaxis after three doses of IM epinephrine, establish **EPINEPHRINE INFUSION** (1mg/100ml D_5W or NS—10mcg/ml)
        i. Initiate IV infusion at 2-5 mcg/min
            1. Titrate by 1 mcg/min every 5 minutes up to 10 mcg/min
        ii. Pediatric (< 8 y/o) - Initiate at 0.1 mcg/kg/min
            1. Titrate by increments of up to 0.2 mcg/kg/min every 5-10 minutesas needed, up to 1 mcg/kg/min
    b. [*Paramedic*] **DIPHENHYDRAMINE** 25-50mg IV/IO or 50mg IM
        i. Pediatric (< 8 y/o) – 1 mg/kg IV/IO/IM
    c. [*Paramedic*] **METHYLPREDNISOLONE** 125mg
        i. Pediatric (< 8 y/o) – 1 mg/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 (< 8 y/o) – 1 mg/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:

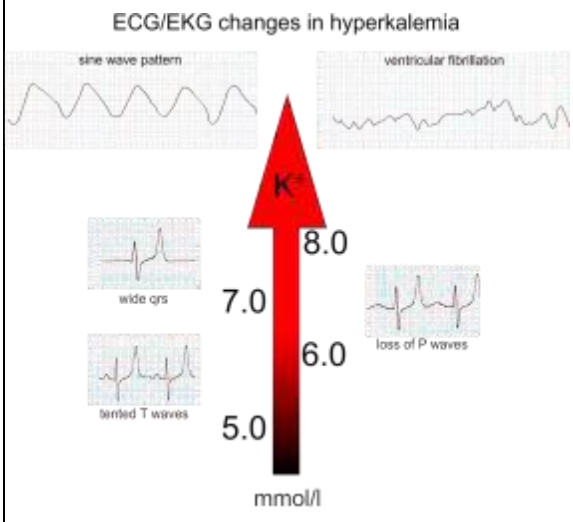
1. Perform routine medical assessment
2. Check respirations, SpO_2, and apply oxygen if needed, see **Airway / VentilatoryManagement Guideline**
3. Check pulse and apply cardiac monitor, see appropriate **Cardiac Dysrhythmia Guideline**
4. Check blood pressure, see **Blood Pressure Management Procedure**
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 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-lead EKG
5. [*AEMT*] Establish IV/IO
6. [*Paramedic*] **CALCIUM GLUCONATE** 1 Gram
    a. Pre-Arrest: Mix in 100ml D_5W or NS 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 20 mL
7. [*Paramedic*] **ALBUTEROL** – continuous nebulizer
8. [*Paramedic*] **SODIUM BICARBONATE** 50mEq over 10 minutes
    a. May repeat up to 2 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 20 mL

Cardiac effects (may or may not be present): 5.6-6.0mEq/L - peaked T waves due toincreased repolarization 6.0-6.5mEq/L - prolonged PR & QTintervals 6.5-7.0mEq/L - diminished P waves and depressed ST segments; may result in an intracardiac block affecting in the followingorder: atria, AV node, ventricles 7.5-8.0mEq/L - P waves disappear, QRS complex widens, S & T waves tend to merge 10-12mEq/L - classic sine wave occurs which represents loss of P wave and wideQRS complexes. Other effects: Skeletal muscle weakness to flaccid paralysis with preservation of diaphragm muscle function Paresthesias 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 with 10% dextrose solution (D_{10}) if hypoglycemic. Use normal saline if hyperglycemic.
4. If blood glucose < 60 mg/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 [*EMT-I***] 2mg IN
        i. [*EMT/Medical Control*] May only assist with a patient prescribed auto-injector
        ii. Pediatric (< 8 y/o) – 0.5mg IM/SQ or 1mg IN
        iii. **First response agencies:** Contact responding transport ambulance for ETAto the scene prior to glucagon administration. **Glucagon may be administered only if transport ambulance ETA is > 10 minutes.**
    d. [*AEMT*] Administer 10% dextrose solution (D_{10}) to achieve improved blood glucoselevel and mental status (GCS)

Patients under 20 kg	Patients over 20 kg
1. Administer bolus of 5 mL/kg D_{10}. Slow infusion to TKO and evaluate response for at least two minutes. Reassess blood glucose level and mental status.	1. Administer 100mL bolus of D_{10} (10 G dextrose). Slow infusion to TKO and evaluate response for at least two minutes. Reassess blood glucose level and mental status.
2. If desired results are not achieved, administeradditional 2 mL/kg boluses of D_{10} every two minutes until improvement in blood glucose level and mental status.	2. If desired results are not achieved, administeradditional 50mL boluses of D_{10} (5 G dextrose) every two minutes until improvement in blood glucose level and mental status.

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

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

Nausea / Vomiting / Vertigo

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

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 (< 2 y/o) - 0.1 mg/kg IV up to 2mg
        i. (2 y/o – 8 y/o) – 2mg IV or approximately ½ SL tablet (~2mg)
        ii. (> 8 y/o) – 4mg IV or SL tablet
6. [*Paramedic*] **MIDAZOLAM** 0.5-1mg after failure of ondansetron (Adult Only)

Notes:

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 is on skin and can possibly be dermally absorbed
        i. Remove clothing
        ii. Brush any remaining toxic agent off skin
        iii. Flush affected areas with water for a minimum of 15 minutes prior totransport
    b. If agent has been inhaled
        i. Remove patient from environment
        ii. Remove clothing
        iii. Provide high concentration oxygen, see **Airway / Ventilatory ManagementGuideline**
        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. [*AEMT*] Give **NALOXONE**
        i. 1-4mg IN and repeat every 5 minutes as needed (Adult & Pediatric)
        ii. 0.4-4mg IV/IO and repeat every 5 minutes as needed (Adult &Pediatric)
            1. Titrate to adequate ventilation & oxygenation
    c. If patient responds to naloxone and refuses transport, consider utilizing **Naloxone Leave-Behind Procedure** if your agency participates in the program.
9. If agent is a tricyclic antidepressant and patient exhibiting toxicity (HR>120, SBP<90,decreased LOC, and/or widening of QRS)
    a. [*Paramedic*] Give **SODIUM BICARBONATE** 25mEq followed by 25mEq in 1000mlnormal saline over 1 hour

Seizure

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

IBW Dosing: See **Ideal Body Weight Chart**

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 (< 8 y/o)
            1. 0.1 mg/kg IM (Max single dose 5mg) if no IV/IO access
            2. 0.05 mg/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 – 0.5-2 mg/kg IV/IO
        ii. Pediatric (< 8 y/o) – 0.5-1 mg/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.

IBW Dosing: See **Ideal Body Weight Chart**

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 >90 beats/min	**Presence or suspicion of sepsis** **AND** **At least one of the following <u>in each category</u>:** • **Perfusion** ○ Systolic blood pressure <90 ○ Mean Arterial Pressure (MAP) <65 • **Cellular Metabolism** ○ $ETCO_2 \leq 25mmHg$ ○ Lactate >4mmol

3. Administer Oxygen to maintain $SpO_2 \geq 94\%$
   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 if septic shock.

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

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

SEPSIS ALERT CRITERIA (Gundersen transports only)
Patient will need to meet ALL 3 criteria: 1. Suspected or known infection 2. Two or more of the following: ○ Temperature >100.4° F or <96.8° F ○ Respiratory Rate >20 breaths/min ○ Heart Rate >90 beats/min 3. $ETCO_2 \leq 25mmHg$ (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 astroke.

Guideline:

1. Perform routine medical assessment with FAST-ED scale and determine time **last knownwell.**
    a. If stroke scale is positive, and time last known well is within 24 hours, transportservice 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 is ≥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 **poisoning/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 patient has a severe headache or vomiting, consider contacting Medical Control for lower parameters. On interfacility transport, obtain goal blood pressure parameters from sending facility or contact Medical Control.
    a. See **Blood Pressure Management Procedure**
6. Evaluate vital signs and FAST-ED Stroke Scale every fifteen 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	Gaze 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 maintainthis position en route to hospital
4. If infant is breech (buttocks or feet first):
    a. Never pull on a breech infant, wait until maternal efforts deliver infant pastumbilicus before touching infant
    b. Once 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 helpto 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 withgloved 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 direction. If available, utilize 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 5-15 mmHg
    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 if 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 topush or coach pushing
    d. As head crowns, apply slight pressure to prevent explosive delivery
    e. If umbilical cord is wrapped around the infant's neck, unloop it gently with your finger while waiting for shoulders to deliver. If cord is too tight to unloop easily, angle infant's forehead toward mother's thigh 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 a 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 3-5 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:

	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 and 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 direction. If available, utilize Telehealth.

Guideline:

1. Perform routine medical assessment
    a. Oxygen saturation should be measured on right extremity (See SpO_2 targets below)
    b. Obtain blood glucose level 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 sniffingposition, suction mouth then nose
        1. 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 100
    a. Begin positive pressure ventilations at a rate of 40-60 breaths/min with a tidalvolume of 8-10 ml/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. If after 30 seconds of positive pressure ventilation the heart rate remains below 60
        i. Perform chest compressions and continue positive pressure ventilation
            1. 3 compressions & 1 ventilation every 2 seconds
        ii. [*Paramedic*] Administer **EPINEPHERINE** (1mg/10mL [1:10,000]) 0.01- 0.03mg/kg
        iii. [AEMT] Consider **NORMAL SALINE** bolus of 10 ml/kg
        iv. [*Paramedic*] Consider **NEEDLE DECOMPRESSION** if 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
> 45 mg/dL
Treat hypoglycemia with 2-3 mL/kg D_{10} repeated every five 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 Guideline**
3. [*AEMT*] Establish IV/IO
4. If patient is seizing:
    a. [*Paramedic*] Give **MAGNESIUM SULFATE** 4 grams/100mL NS over 10 minutes
    b. [*Paramedic*] Give **MIDAZOLAM** 2 mg 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** 4 grams/100mL NS over 20 minutes
    c. See **Blood Pressure Management Procedure**

Notes:

1. Preeclampsia: Toxic state which occurs in the last half of pregnancy or early postpartumperiod 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 15 mmHg fromprevious 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, orcardiac 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 & 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

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 (if available)	< 6%	6-10%	> 10%

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

Scene Rehabilitation (Continued)

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 45minutes of duty

Trauma

Amputation

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

Guideline:

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 Procedure**
6. Irrigate amputated part with NS to remove gross contaminants (do not debride)
7. Place amputated part in sterile gauze moistened in NS
8. Place amputated part in sterile waterproof container if available
9. Place sealed container in ice or place activated cold 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 without causing hypothermia
    b. Remove clothing and jewelry (Do not pull away clothing that is stuck to burn)
    c. [*AEMT*] If burn is >10% BSA and ETA to hospital >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 NS
        i. Use at least 1000ml for eye irrigation
        ii. Use continuous irrigation for alkali burns
10. If burn is electrical in nature (severe high voltage injury):
    a. Once scene is safe, remove the patient from the source
    b. See Cardiac Dysrhythmia Guidelines as needed
    c. [A*EMT*] 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 sheet and blanket to conserve body heat
13. **DO NOT BREAK BLISTERS. DO NOT APPLY CREAMS, OINTMENTS OR ANTIDOTES TOBURNS**

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 support 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 the transport
    b. [*Paramedic*] If transport >20 minutes, consider slowly releasing the 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 guidelines
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 SBP~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. Perform 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. [*AEMT*] 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** 4 mg IV or SL tablet
                a. Pediatric (< 2 y/o) - 0.1 mg/kg IV up to 2mg
                    i. (2 y/o – 8 y/o) – 2mg IV or approximately ½ SL tablet (~2mg)
                    ii. (> 8 y/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 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 or 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. [*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 (permissivehypotension except in patients with significant head injuries)
4. [*Paramedic*] For hemorrhagic shock in patients ≥12 years of age: **Tranexamic acid (TXA)** 2g in 100mL D_5W or NS over 10 minutes (faster may result in hypotension); use filter needle 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 surgery
    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 100mL of D_5W or NS over 10 minutes (faster may result in hypotension); 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 NS over 8 hours (max 1g).
        ii. Contact Medical Control for non-traumatic hemorrhagic shock (≥ Class II)
    d. Exclusions:
        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)

5. 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 patient 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 second trimester
    b. HR is usually 15-20 BPM more during 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 ofhypovolemia later in their course)

Procedures

Arterial Line, Central Line, and CVP Monitoring

General Scope: Guideline and criteria for accessing central lines and monitoring arterial lines and central venous pressure.

Applies to: All Critical Care Staff

Procedure:

Arterial Line Monitoring

1. Ensure the pressure bag is pressurized to 300 mm Hg
2. Use steps 3-6 if using arterial line to measure arterial blood pressure
3. With the transducer connected to the monitor, select arterial monitor, and perform a transducer check by fast flushing the line. As you do this, you should see a change in thewaveform. This is called a square wave test.
4. Zero the transducer and monitor
    a. Place the transducer at the phlebostatic axis of the patient.
    b. Close the line off to patient and open to air.
    c. Press zero on the monitor.
    d. To monitor pressure, close the port off to air and open to patient.
5. Connect the catheter and fast flush to clear the catheter of blood.
6. Check for good waveform.

Central Line Access

1. To access the line first clamp off the hub line you intend to use.
    a. It's important to clamp off the line to prevent air from being sucked into the line and blood stream.
    b. Any of the hub lines can be used; they all go to the same place and work the sameway.
2. Once you have the line clamped off, expose the end of the hub (it may have a cap or be tapedover) clean it well with an alcohol prep and put an INT hub on it.
3. With the INT hub in place, unclamp the tubing and let the INT hub seal out air.
4. Clean the INT hub and attach an empty 10 cc syringe to the INT hub
    a. Aspirate about 5ml of blood and heparin to confirm the line is in place,
        i. There should be no resistance to aspiration.
    b. Discard the syringe and contents as biohazard waste.
5. Attach a saline flush syringe to INT hub and flush it gently.
6. Attach a flushed 60 drop set (or blood set if you think you need volume replacement) andsaline bag and run it into the line at a TKO rate.
7. Use the y-sites on the IV tubing to give meds as needed; make sure to clean the y-sitecorrectly and flush with the saline IV line after each med.

Arterial Line, Central Line, and CVP Monitoring (Continued)

Continuous Venous Pressure Monitoring:

1. Assemble A-line set up as per arterial line monitoring system or Swan-Ganz multi-lumenmonitoring system instructions.
2. Make sure there are no air bubbles in the system.
3. Connect pressurized tubing to central venous catheter.
4. Zero and calibrate transducer system.
5. Validate waveform on monitor. Obtain 'mean' pressure reading.

Blood Pressure Management

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

IBW Dosing: See **Ideal Body Weight Chart**

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 signs of fluid overload a. [*AEMT*] 250-500ml **NORMAL SALINE** bolus up to two liters 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 NS – 16mcg/ml) i. Initiate at 0.1 mcg/kg/min via IV pump 1. Titrate by 0.01-0.05 mcg/kg/min every 3-5 minutes 2. Maximum of 0.3 mcg/kg/min c. [*Paramedic*] Consider **EPINEPHRINE INFUSION** (1mg/100ml D_5W or NS—10mcg/ml) when norepinephrine is not the preferred vasopressor i. Initiate IV infusion at 2-5 mcg/min ii. Titrate by increments of no more than 1 mcg/min every 5 minutes iii. Maximum of 10 mcg/min	1. If patient is hypertensive per applicable guidelines a. [*Paramedic/Med Control*] **LABETALOL** 20 mg slow push i. May repeat at 40 mg every 10 minutes to a max of 300mg 2. [*Paramedic/Med Control*] Consider **NITROGLYCERIN INFUSION** (20mg/100mL D5W or NS – 200 mcg/mL) i. For patients <75kg, start at 10 mcg/min ii. For patient >75kg, start at 20 mcg/min iii. Titrate by 5-10 mcg/min every 5-10 minutes to desired response iv. Monitor BP every 3-5 minutes

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 hours
2. Norepinephrine / Epinephrine
   a. May worsen underlying 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 withabnormally 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 20 ml/kg **NORMAL SALINE** over 10-20 minutes
        i. If suspected cardiogenic shock, consider 10 ml/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 orNS—10mcg/ml)
        i. Initiate at 0.1 mcg/kg/min
        ii. Titrate by increments of up to 0.2 mcg/kg/min every 5-10 minutes asneeded, up to 1 mcg/kg/min

Blood Transfusion Continuation and Monitoring

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

Applies to: Paramedics and Critical Care Paramedics

Procedure:

1. Obtain written order for rate and total volume of blood product to be infused, confirm withRN 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 products
    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 minutesduring transport
5. If the patient develops any sign of allergy/sensitivity reaction, including chills, fever, chestpain, flank pain, hives, wheezing, urticaria, 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 alltubing and product saved for delivery to the 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 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; mustbe provided by sending facility.

Cancellation of Call

General Scope: Procedure for cancelling an ambulance or air transport while en 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. See **Refusal of Evaluation, Treatment, and/or Transport**

First responders on scene can assess and cancel auto-launched air transport based on their assessment, need of air transport, or safety issues, as long as transport ambulance is en 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 without sufficient resources, the initial agency/unit at patient side may clear the scene after ALL of 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. Assure that the chest tube(s) is securely fastened to the 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 ofkinks.
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:
    - Momentarily clamp the flexible tubing near the chest. If the 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.
    - Never leave the clamp on for more than a few seconds.
    - Evaluate the insertion site.
    - Apply occlusive dressings to the site.
    - Evaluate the patient for distress.
    - Consult physician immediately if needed.
    - If the bubbling does not cease during the clamping of the proximal end, then suspecta leak at a connection site in the tubing or the tubing itself.
        - Check all connections and secure with tape.
        - 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 a pneumothorax.
9. If water seal 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 chestlevel.
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

IBW Dosing: See **Ideal Body Weight Chart**

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
  ○ 1-3mg IV/IO
  ○ 5mg IM
• Infusion dosing
  ○ Mix 10mg in 100mL NS
  ○ Use MIDAZOLAM calc function on pump
  ▪ Start at 1-2 mg/hr
  ▪ Titrate by 0.5 mg/hr; max of 7 mg/hr
	Adult
	• Bolus dosing
	  ○ 0.5-2 mg/kg IV/IO/IM
	• Infusion dosing
	  ○ Mix 100mg in 100mL NS
	  ○ 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
		Adult
		• PROPOFOL may not be 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 < 8yo. 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 NS
  ○ 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
	Pediatric (< 8 y/o)
	• Bolus dosing
	  ○ 0.5-2 mg/kg IV/IO/IM
	• Infusion dosing
	  ○ Mix 50mg in 100mL NS
	  ○ 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
		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

Applies to: AEMT and above

INDICATIONS FOR USE

For adult and pediatric patients any time 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 • Distal femur** • Proximal tibia • Distal tibia**	• Proximal tibia • Distal tibia** • Proximal humerus • Distal femur**

****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 inconscious patient • Intravenous fluid • Infusion pressure pump or pressure bag, tubing, 3-way stop cock

EZ-IO® Intraosseous Vascular Access System (Continued)

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 technique 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 and distal femur 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, maintaining asepsis
2. Prepare supplies
3. Prepare site using antiseptic; stabilize extremity
4. See specific patient & site location

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

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

EZ-IO® Intraosseous Vascular Access System (Continued)

General Placement Principles (Continued)

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 (1st 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 the 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 (2nd confirmation of placement)
    a. Inability to withdraw/aspirate blood from the catheter hub does not mean the insertionwas unsuccessful.
6. Proceed with technique below, based on situation:

a. [*AEMT*] **ADULT - RESPONSIVE 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 40 mg IO over 120 seconds
    1. Allow lidocaine to dwell in IO space 60 seconds
    2. Flush with 5 to 10 mL of normal saline
    3. Slowly administer an additional 20 mg of lidocaine IO over 60 seconds.
iv. Repeat as needed; consider systemic pain control for patients not responding toIO lidocaine

b. ADULT – UNRESPONSIVE TO PAIN

i. Prime extension set with normal saline
ii. Flush the IO catheter with 5-10 mL of normal saline
    1. If patient develops signs indicating responsiveness to pain, refer to adult - responsive to pain technique

EZ-IO® Intraosseous Vascular Access System (Continued)

General Placement Principles (Continued)

c. [*Paramedic*] INFANT/CHILD – RESPONSIVE TO PAIN

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

d. INFANT/CHILD – UNRESPONSIVE TO PAIN

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

7. Connect fluids if ordered and pressurize up to 300 mmHg 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
    a. For proximal humerus insertions, apply arm immobilizer or another securement device
    b. For distal femur insertions, immobilize the leg to ensure the knee does not bend
10. Document date and time on wristband and place on patient

EZ-IO® Intraosseous Vascular Access System (Continued)

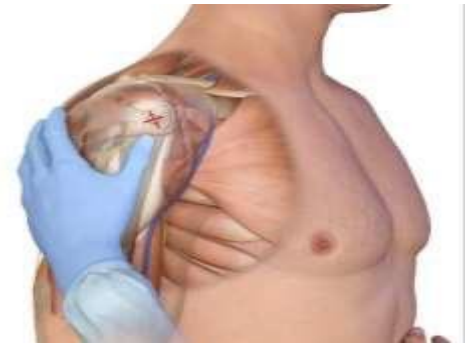
Adult Proximal Humerus Placement

SITE IDENTIFICATION

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; 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 2 cm above the surgical neck, on the most prominent aspect of the greater tubercle

INSERTION

1. Aim the 45mm needle set at a 45-degree 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 5 mm mark must be visible above the skin for confirmation of adequate needle set length
3. Gently drill into the humerus approximately 2 cm or until the hub is close to the skin; the hub of the needle set should be perpendicular to the skin



EZ-IO® Intraosseous Vascular Access System (Continued)

Adult Distal Femur Placement**

SITE IDENTIFICATION

1. Secure the leg outstretched to ensure the knee does not bend
2. Identify the patella by palpation. The insertion site is at the midline approximately 2 cm proximal to the patella

INSERTION

1. Aim the 45mm needle set at a 90-degree angle to the bone
2. Push the needle set tip through the skin until the tip rests against the bone
    a. **The 5 mm 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**

EZ-IO® Intraosseous Vascular Access System (Continued)

Adult Proximal Tibia Placement

SITE IDENTIFICATION

1. Extend the leg
2. Insertion site is approximately 2 cm medial to the tibial tuberosity, or approximately 3 cm below the patella and approximately 2 cm medial, along the flat aspect of the tibia

INSERTION

2. Aim the needle set at a 90-degree angle to the bone
3. Push the needle set tip through the skin until the tip rests against the bone
    a. **The 5 mm mark must be visible above the skin for confirmation of adequate needle set length**
4. Gently drill, advancing the needle set approximately 1-2 cm after entry into the medullary space or until the needle set hub is close to the skin

EZ-IO® Intraosseous Vascular Access System (Continued)

Adult Distal Tibia Placement**

SITE IDENTIFICATION

1. Insertion site is located approximately 3 cm 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

INSERTION

1. Aim the needle set at a 90-degree angle to the bone
2. Push the needle set tip through the skin until the tip rests against the bone
    a. **The 5 mm mark must be visible above the skin for confirmation of adequate needle set length**
3. Gently drill, advancing the needle set approximately 1-2 cm after entry into the medullary space or until the needle set hub is close to the skin

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

EZ-IO® Intraosseous Vascular Access System (Continued)

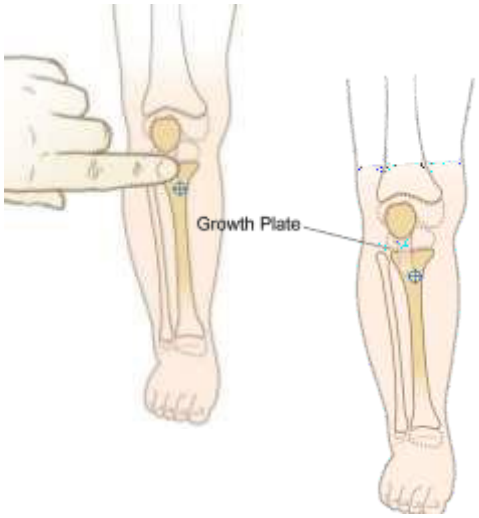
Infant/Child Proximal Tibia Placement

SITE IDENTIFICATION

1. Extend the leg. Pinch the tibia between your fingers to identify the medial and lateral borders
2. Insertion site is approximately 1 cm medial to the tibial tuberosity, or just below the patella (approximately 1 cm) and slightly medial (approximately 1 cm), along the flat aspect of the tibia

INSERTION

1. Aim the needle set at a 90-degree angle to the bone
2. Push the needle set tip through the skin until thetip rests against the bone
    a. **The 5 mm mark must be visible abovethe skin for confirmation of adequateneedle 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 NOTpull back on the driver when releasing the trigger



EZ-IO® Intraosseous Vascular Access System (Continued)

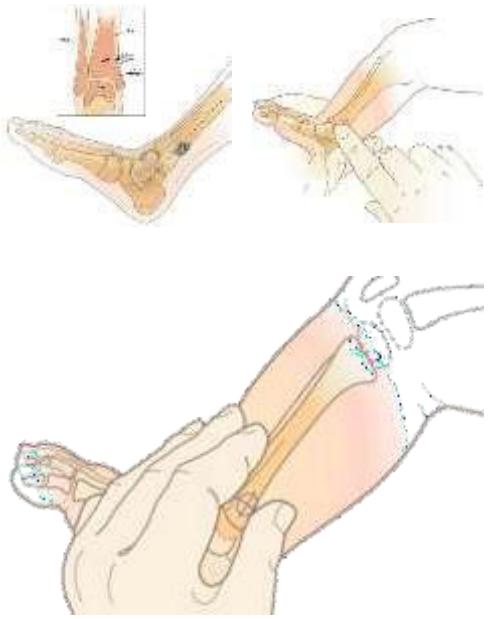
Infant/Child Distal Tibia Placement**

SITE IDENTIFICATION

1. Insertion site is located approximately 1-2 cm 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

INSERTION

1. Aim the needle set at a 90-degree angle to the bone
2. Push the needle set tip through the skin until the tip rests against the bone
    a. **The 5 mm 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



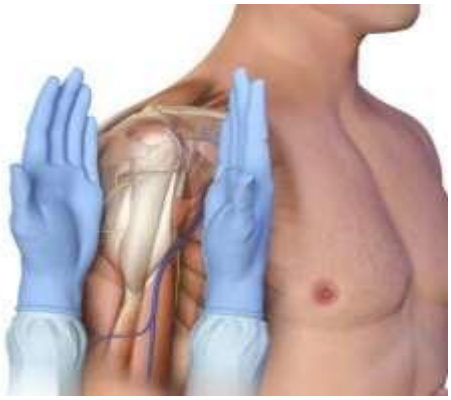
**** MUST HAVE ADDITIONAL TRAINING AND MEDICAL DIRECTOR APPROVAL**

EZ-IO® Intraosseous Vascular Access System (Continued)

Infant/Child Proximal Humerus Placement

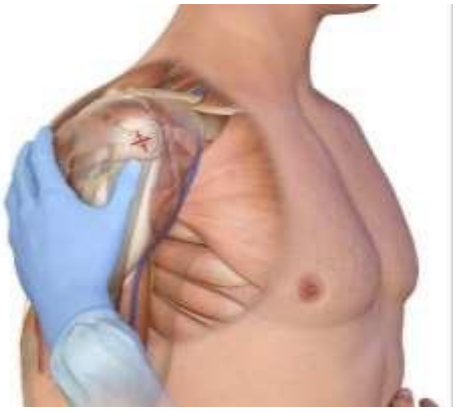
SITE IDENTIFICATION

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 golf ball on a tee – the spot where the "ball" meets the "tee" is the surgical neck
    b. The insertion site is 1 to 2 cm above the surgical neck, on the most prominent aspect of the greater tubercle - you must be able to palpate the greater tubercle before insertion to avoid errant placement



INSERTION

1. Aim the needle set tip at a 45-degree 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 5 mm 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® Intraosseous Vascular Access System (Continued)

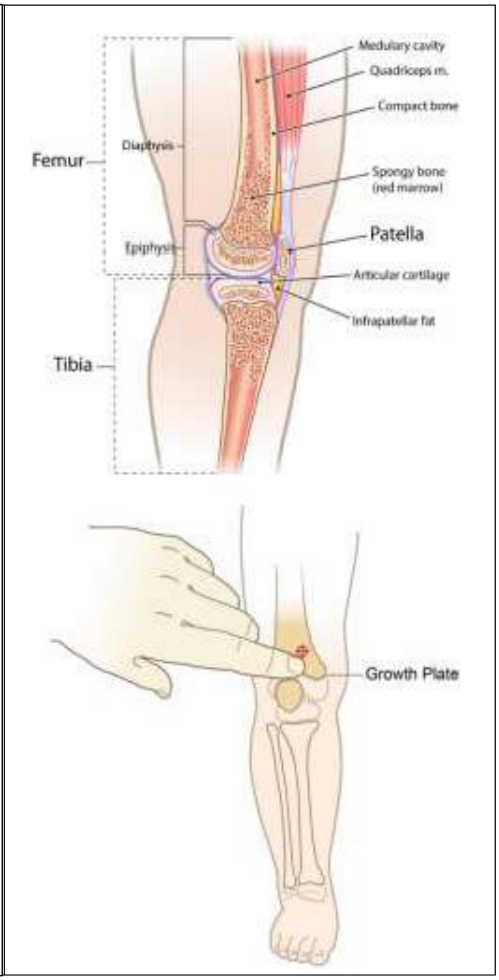
Infant/Child Distal Femur Placement**

SITE IDENTIFICATION

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 1 cm) and approximately 1-2 cm medial to midline

INSERTION

1. Aim the needle set at a 90-degree angle to the bone
2. Push the needle set tip through the skin until the tip rests against the bone.
    a. **The 5 mm 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.

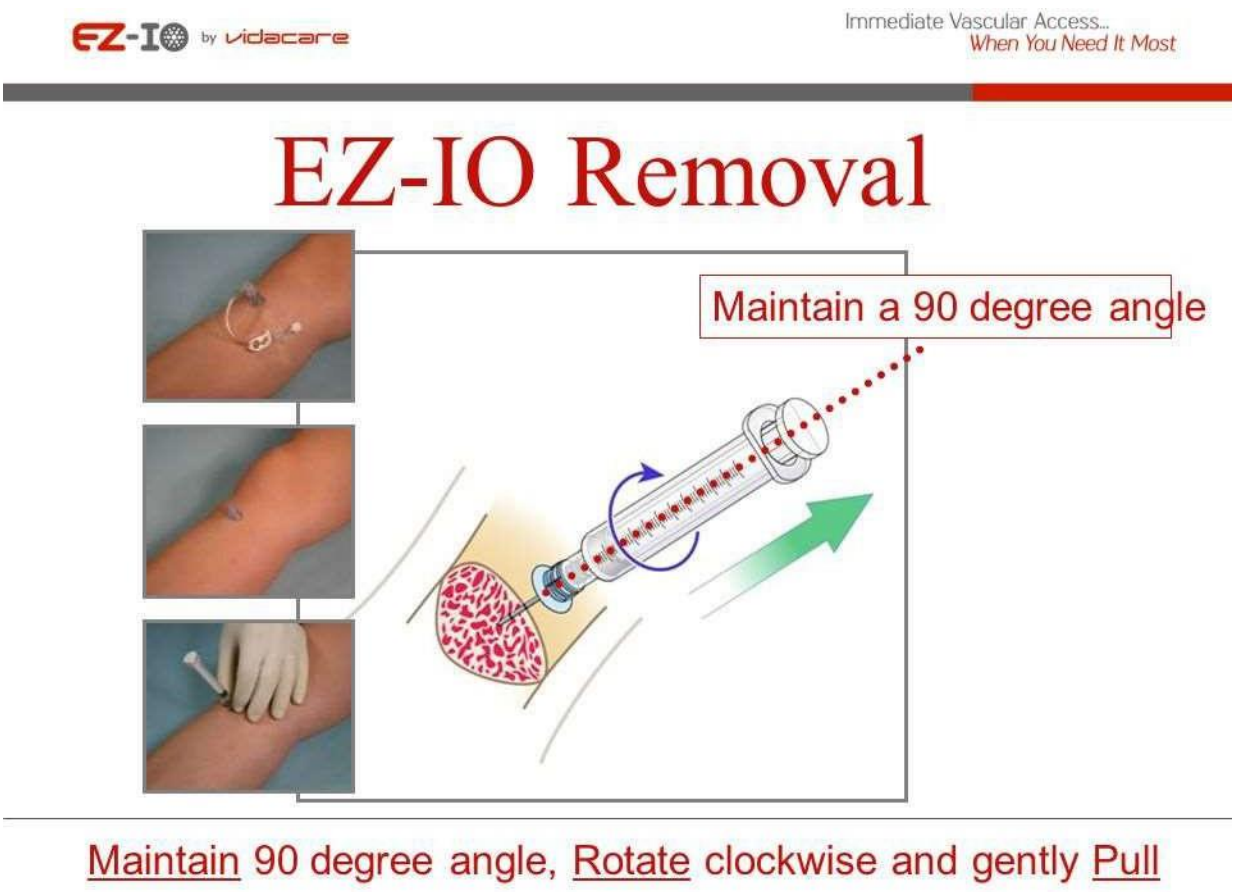


**** MUST HAVE ADDITIONAL TRAINING AND MEDICAL DIRECTOR APPROVAL**

EZ-IO® Intraosseous Vascular Access System (Continued)

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
   Do not rock the syringe
4. Dispose of catheter with syringe attached into sharps container
5. Apply pressure to site as needed to control bleeding and apply dressing as indicated



Foley Catheter Insertion

General Scope: Guideline and criteria for foley catheter insertion during IFTs

Applies to: Critical Care Paramedics

Procedure:

1. Gather equipment.
2. Explain procedure to the patient
3. Assist patient into supine position with legs spread and feet together
4. Open catheterization kit and catheter
5. Prepare sterile field, apply sterile gloves
6. Check balloon for patency.
7. Generously coat the distal portion (2-5 cm) of the catheter with lubricant
8. Apply sterile drape
9. If female, separate labia using non-dominant hand. If male, hold the penis with the non-dominant hand. Maintain hand position until preparing to inflate balloon.
10. Using dominant hand to handle forceps, cleanse peri-urethral mucosa with cleansing solution. Cleanse anterior to posterior, inner to outer, one swipe per swab, discard swab away from sterile field.
11. Pick up catheter with gloved (and still sterile) dominant hand. Hold end of catheter looselycoiled in palm of dominant hand.
12. In the male, lift the penis to a position perpendicular to patient's body and apply lightupward traction (with non-dominant hand)
13. Identify the urinary meatus and gently insert until 1 to 2 inches beyond where urine isnoted
14. Inflate balloon, using correct amount of sterile liquid (usually 10 cc but check actual balloonsize)
15. Gently pull catheter until inflation balloon is snug against bladder neck
16. Connect catheter to drainage system
17. Secure catheter to abdomen or thigh, without tension on tubing
18. Place drainage bag below level of bladder
19. Evaluate catheter function and amount, color, odor, and quality of urine
20. Remove gloves, dispose of equipment appropriately, wash hands
21. Document size of catheter inserted, amount of water in balloon, patient's response toprocedure, and assessment of urine

Hemostatic Agent Use

General Scope: Procedure for use of hemostatic gauze.

Applies to: EMR** and above

Procedure:

1. Identify source of bleeding
    a. Place proximal tourniquet if appropriate
    b. Wipe pooled blood from wound if necessary
2. Apply hemostatic gauze, packing into wound as per manufacturer's instructions
3. Pack 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 brand of hemostatic gauze must not cause thermal reaction.

IFT of TPA (Tissue Plasminogen Activator)

General scope: Guideline for the IFT transport of TPA infusion

Procedure:

1. Perform routine medical assessment with FAST-ED stroke severity scale, repeat stroke scale every15 minutes
2. **[Sending Hospital RN]** Bolus – 0.09 mg/kg (10% of total), Max 9mg via pump over a minute**, USEDEDICATED LINE. NO IV** fluids running with Alteplase during bolus or infusion.

3. **[Sending Hospital RN]** Continuous Infusion: 0.81 mg/kg (90% of total), Max 81 mg via pump over60 minutes beginning immediately following the bolus.

4. Verify total dose given. Document total **tPA** dose to be administered, start and stop times; Start tPAon IVAC pump. Half 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 **do 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 in order to receive the correct dose, follow tPA administration with a NS infusion at the same rate. Make sure this is done before the pump alarms "air in line".

Stop Infusion if:

a. Neurologic deterioration and / or new headache
b. SBP >180 or DBP > 105 – after treatment with medication. Contact Medical Control
c. Symptoms of internal bleeding. See **Stroke/Cerebrovascular Accident Guideline**
d. Nausea / Vomiting
e. Allergic reaction including: rash, itching, anaphylaxis or angioedema

Notify Medical control:

1. If infusion was stopped
2. Change in patient's condition (improved or deteriorating)
3. Temp > 38.5
4. Pulse <50 or >100
5. 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 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 complete dose was given. TPA has a significant cost and should never bediscarded in error.

Intranasal Medication Administration

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

Applies to: EMR** and above

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 COMPRESSIONS FOR PLACEMENT OF MECHANICAL CPR
2. Be sure to turn device on immediately upon opening case to allow for self-test
3. Ensure that defibrillator pads, CPR feedback devices, and ECG cables will not interfere withsuction cup placement
4. Stage backplate and stabilization strap superior to the patient's head prior to placement
5. Place backplate at the next natural pause in the 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 the backplate is just below the patient's armpits (center of 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 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, andreposition.
    b. If patient is too large or too small, remove device and immediately restart manualcompressions
13. Press appropriate 3 (ACTIVE) button
    a. Use 30:2 when no advanced airway is present and CONTINUOUS when one is
14. Secure stabilization strap and mark superior location of suction cup on patient's chest
15. Place patient's wrists/arms in appropriate straps on device

Mechanical CPR – LUCAS (Continued)

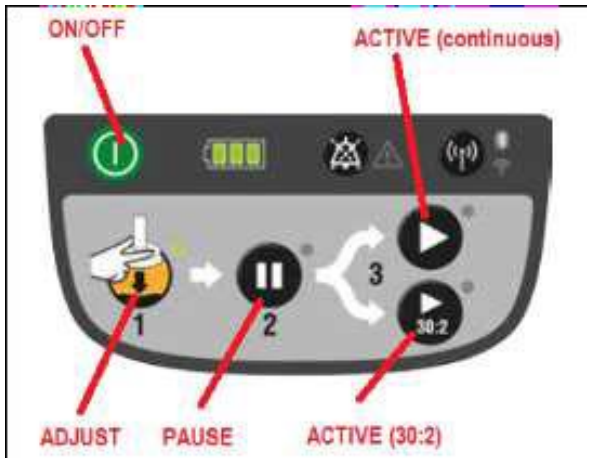
LUCAS considerations

- Defibrillation can and should be performed with the LUCAS device in place and in operation
- If the pressure pad and suction cup are incorrectly positioned, there is an increased risk ofdamage 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) andadjust 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 if 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 alarm condition is no longer present, follow steps 10-13 above.
        - If alarm condition remains, immediately remove LUCAS and resume manual chest compressions.

LUCAS references



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. Assist and/or offer suggestions while EMS act under guideline 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 on scene physician
        iii. Physically accompany patient to hospital
        iv. Give orders which are reasonable, accurate, and within the scope of practicefor the EMS crew

If orders are given that the crew members feel to be unreasonable, medically inaccurate, and/or notwithin 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.

Naloxone Leave-Behind

General Scope: Agencies that participate in the Naloxone Leave-Behind Procedure may distribute naloxone kits intended for layperson use after refusal of transport by suspected opioid overdoses.

Guideline:

1. Participating agencies will obtain or create naloxone kits intended for layperson use as available
2. Participating agencies will provide a naloxone kit if available to patient and/or bystander involved in a suspected opioid overdose case
3. Participating agencies can use their discretion and clinical judgement to distribute naloxone kits to a patient and/or bystander that may benefit from the program
4. Distribution of naloxone kits must be documented in an ePCR (RescueNet users should use "Naloxone Kit" under Interventions)
5. Naloxone from regular EMS supply shall not be distributed to patients or bystanders

Orogastric Tube

General Scope: Procedure for 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 i-Gel) 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 10.

Applies to: Paramedics

Guideline:

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

Applies to: Paramedics

Guideline:

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. 5th intercostal space mid-axillary is preferred
    b. 2nd 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 driven)

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)

Guideline:

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 of 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 **<u>two</u>** or more of the following:
            1. A respiratory rate > 26 breaths per 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. If patient is not already on nasal $EtCO_2$ monitoring, apply prior to fitting mask
6. Start CPAP at 5-7 cmH_2O 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 the airway • Vomiting • Obstructed bowel • Upper airway obstruction • Uncooperative, confused or combative patient • Inability to tolerate a tight mask • Orofacial abnormalities which interfere with mask/face interface • Untreated pneumothorax

Pain Management

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

IBW Dosing: See **Ideal Body Weight Chart**

Guideline:

1. Perform routine medical assessment
2. Airway 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 – MODERATE PAIN	**SEVERE PAIN**
1. [EMT**] IBUPROFEN a. 400 mg PO one time b. Pediatric (> 6 months) 10 mg/kg PO one time (Max 400mg) **OR** 2. [AEMT**] **KETOROLAC**[1] a. 15 mg IV/IO/IM one time b. Pediatric (>1 y/o) – 0.5 mg/kg IV/IO/IM ONLY one time (Max 15 mg) **AND** 3. [EMT**] ACETAMINOPHEN[2] a. 600mg-650mg PO one time b. Pediatric (>1 y/o) – 10 mg/kg PO one time (Max 650 mg) Evidence suggests that the administration of an NSAID + acetaminophen is as effective as opiate medications. It is OK to administer only one if other is contraindicated	1. [AEMT**] FENTANYL a. 25-50mcg IV/IO/IN b. Pediatric (< 8 y/o) - 1 mcg/kg IV/IO/IN c. May repeat every 10 minutes as needed i. Recheck vital signs between doses 2. [Paramedic] KETAMINE 0.25 mg/kg (Adult & Pediatric) a. May repeat every 15 minutes as needed 3. Recheck vital signs between doses 4. [Paramedic] Consider MIDAZOLAM 1-2 mg IV/IO/IM a. Pediatric (< 8 y/o) 0.1 mg/kg up to 1 mg b. May repeat every 15 minutes as needed

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

Notes:

Ketorolac is contraindicated for all patients over 49, 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 49, 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 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 last four hours.

PICC Line Usage

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

Applies to: Paramedics

Procedure:

1. May administer medications through previously placed PICC lines when no other option is available.
    a. Maintenance of aseptic technique is of significant importance.
    b. If inter-facility transport, consult with referral facility RN for port selection
    c. If cardiac arrest, use any port
    d. Flush medication with 10ml NS 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

IBW Dosing: See **Ideal Body Weight Chart**

Procedure:

1. Ensure adequate ventilation/pre-oxygenation via appropriate adjunct
2. High flow (15L/min) O2 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 10-20 mcg (1-2mL) **PUSH DOSE EPINEPHRINE** (10mcg/1mL)** atleast one minute prior to sedation and every 2-5 minutes as needed
5. Administer **KETAMINE** 0.5-2 mg/kg, see **RSI Dosing Chart**
    a. For patients with systolic blood pressure <90, use 0.5 mg/kg dose
6. Administer **ROCURONIUM** 1 mg/kg (~20 min duration), see **RSI Dosing Chart**
7. Secure airway
8. Confirm placement with waveform capnography and auscultation
9. Monitor $EtCO_2$, SpO_2, and secure ETT
10. Attach patient to ventilator, see **VOCSN Procedure**
11. Consider, at least every 15 minutes, re-sedation & pain management as needed; considerlower doses in patients with continued hemodynamic compromise
    a. **KETAMINE** 0.5-1 mg/kg
        i. Pediatric (< 8 y/o) – 0.5-1 mg/kg
    b. **MIDAZOLAM** 1-2mg
        i. Pediatric (< 8 y/o) – 0.05 mg/kg
    c. **FENTANYL** 25-50mcg
        i. Pediatric (< 8 y/o) – 1 mcg/kg

Only re-paralyze with **ROCURONIUM** 0.5 mg/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 team or board.

Procedure:

Determining capacity to refuse

Patients are considered to be capable of refusing care if they do not endorse suicidal or homicidal ideation, are oriented to person, place, time, and event (or to their baseline mental status) and canexpress 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 taken intoaccount. For example, the patient who has used alcohol or other drugs with a potential for head trauma and altered mental status 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 status and extent 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/orrepresentative
6. Read to the patient and/or representative the General Refusal Statement below
7. Advise the patient and/or representative call 911 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 get 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.

Applies to: EMR** and above

IBW Dosing: See **Ideal Body Weight Chart**

Procedure:

1. Choose appropriate/approved restraints in combination with cot seatbelts
    a. **Under no circumstances are patients to be restrained in prone position**
    b. Patient must be restrained in position where continual assessment of patient's airway, breathing, circulation can be maintained and not obstructed.
2. Physical
    a. Soft restraints
        i. Restrain all extremities to 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
    c. Spit Hood
3. Chemical
    a. [*Paramedic*] **MIDAZOLAM**
        i. Adult
            1. 1-3 mg IV/IO or 5mg IM
        ii. Pediatric (< 8 y/o)
            1. 0.05 mg/kg IV/IO or 0.1 mg/kg IM
    b. [Paramedic] Consider antipsychotic administration
        i. **ZIPRASIDONE (GEODON)** (≥ 12 y/o) 10-20mg IM
        ii. Use with caution in the elderly
        iii. Postural hypotension can result, patients receiving antipsychotic shouldremain supine or lateral recumbent position
    c. [*Paramedic*] consider **KETAMINE** 0.5-2 mg/kg IV/IO/IM
    d. For continued sedation (infusion), see **Sedation Procedure**
4. Document
    a. Reason for restraint
    b. Method used
    c. Document LOC, vital signs (including SpO2 and EtCO2) 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.

IBW Dosing: See **Ideal Body Weight Chart**

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 physical and/or chemical restraints, see Restraint Use Procedure
5. [*AEMT*] Establish IV/IO if possible
6. [*Paramedic*] Consider the following infusions

MIDAZOLAM	KETAMINE
***** 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
  ○ 1-3mg IV/IO
  ○ 5mg IM
• Infusion dosing
  ○ Mix 10mg in 100mL NS
  ○ 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
  ○ 0.05 mg/kg IV/IO or 0.1 mg/kg IM
• Infusion dosing
  ○ Mix 5mg in 100mL NS
  ○ 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
	Adult
	• Bolus dosing
	  ○ 0.5-2 mg/kg IV/IO/IM
	• Infusion dosing
	  ○ Mix 100mg in 100mL NS
	  ○ 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
	  ○ 0.5-2 mg/kg IV/IO/IM
	• Infusion dosing
	  ○ Mix 50mg in 100mL NS
	  ○ 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 only to paramedics.

Guideline:

1. Perform routine trauma assessment while cervical spine is manually immobilized
2. [*Paramedic*] Determine if patient meets any of the following Spinal Precautions criteria. Ifreferred to spinal precaution guidelines at any time, subsequent exams are unnecessary
    a. Altered level of consciousness? If **YES** see spinal precautions procedure
    b. >65 y/o or <5 y/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 SpinalPrecautions Procedure
    f. Perform Spinal Examination: Point tenderness over the spinous process(es) or pain duringrange of motion? If **YES** see Spinal Precautions Procedure
3. [*Paramedic*] If the answer is **NO** to all the above, spinal precautions may be deferred
    a. All deferred spinal precautions shall have the criteria above documented on 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 otherunderlying 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, a normal exam may not be sufficient to rule out spinalinjury.**
- **Range of motion should NOT be assessed if patient has midline spinal tenderness. Patient's range of motion should not be assisted. The patient should touch his chin tohis 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 precautions clearance guideline.

Procedure:

1. Explain to the patient the actions you are going to take. Ask the patient to immediatelyreport 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 skull 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 theyare experiencing pain. If evidence of pain along the 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 extendtheir 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, attemptstabilization with blanket roll around neck.
5. If patient is supine or prone place the patient on a backboard/scoop 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 conditiondoes not allow them to self-extricate to adjacent cot (i.e., other injury, pain, altered level of consciousness), place him or her 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 strapsincluding 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 off the backboard or scoop stretcher if possible and be placed directly on the ambulance stretcher. It is acceptable to leave a patient on a backboard for transport (transports < 5min, or life threating patient condition), but every effort should be made to secure the patient tothe stretcher and not the backboard/scoop during transport.
8. Once backboard/scoop is removed or patient self-extricates to adjacent ambulance stretcher, spinal precautions for at-risk patients are paramount. These include cervical collar, blanket/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 or 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 regardingthe proper removal of that athletic equipment is present. The sports medicine trainer maybe 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.

Procedure:

1. Use of one-piece surgical mask or oxygen mask is preferred for minimizing risk of diseasetransmission by patients who are purposely spitting.
2. CONDITIONS FOR USE
    a. DO NOT USE unless patient is under control and restrained.
    b. DO NOT USE on anyone that is vomiting, having difficulty breathing, or is bleedingprofusely from the area around the mouth or nose.
    c. Patient must be under constant visual supervision and should never be leftunattended.
    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 encounter.
3. PROCEDURE FOR USE
    a. Open and remove the spit hood
    b. Place the spit hood over the head of the person with the mesh fabric positioned justbelow 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 betterprotection, 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 helpsecure the spit hood in position.
        i. ** DO NOT push so tightly as to be uncomfortable or impair the vision of thewearer.
4. See manufacturer instructions included in packaging for visual representation ofprocedure for use.
5. Patient should be transported in either left or right lateral position.
6. CONTINUOUSLY monitor patient's airway, respiratory status, and pulse oximetry.
7. IMMEDIATELY remove surgical mask, oxygen mask, or spit hood if any question of airway patency or potential compromise.

Supraglottic Airway – King LT-D/LTS-D

General Scope: Procedure for placement of King LT-D/LTS-D.

Applies to: EMR** and above

Procedure:

1. Spinal precautions as needed
2. Select proper King Airway Device size (See table below)
3. Test cuff inflation (with volume as listed on table) and remove air prior to insertion
4. Apply water-based lubricant to beveled distal tip and posterior tube (avoid vent openings)
5. Position head as able
    a. "Sniffing position" is ideal but neutral position is acceptable
6. Open mouth and apply chin lift (unless suspected c-spine injury)
7. Insert King Airway Device rotated laterally 45-90°
8. Introduce tip into mouth and advance behind base of tongue
9. As tube passes tongue rotate back to midline
10. Advance until base of connector is aligned with teeth or gums
11. Inflate cuff with manufacturer recommended volume of air
12. Confirm proper position with auscultation and ETCO2 detection device
13. If unable to ventilate patient, gently and slowly pull back on King Airway Device until proper position is confirmed.
14. Upon verification of placement, secure using commercial device or tape
15. [*Paramedic*] Attach patient to ventilator, see **VOCSN Procedure**
16. Reassess as needed
17. Suction as needed
18. For King LTS-D, decompress stomach as needed
    a. Gastric access lumen allows insertion of up to a 18Fr gastric tube
    b. Measure gastric tube from nose to earlobe to xiphoid process
    c. Lubricate gastric tube prior to insertion
    d. Advance gastric tube total distance noted in step b
    e. Use least amount of suction that effectively decompresses the stomach

Size	Patient Height	Color	Inflation LT-D	Inflation LTS-D
3	4-5 feet	Yellow	45-60 ml	40-55 ml
4	5-6 feet	Red	50-70 ml	50-70 ml
5	Greater than six feet	Purple	60-80 ml	60-80 ml

Supraglottic Airway – i-Gel

General Scope: Procedure for placement of i-gel

Applies to: EMR** and above

Procedure:

1. Consider spinal precautions as needed
2. Select proper i-gel size based on ideal body weight, see **Ideal Body Weight Chart**
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 thehard palate until a definitive resistance is felt
10. Confirm proper position with auscultation and ETCO2 detection device
11. Upon verification of placement, secure using commercial device or tape
12. [*Paramedic*] Attach patient to ventilator, see **VOCSN Procedure**
13. Reassess as needed
14. Suction as needed
15. For sizes 1.5-5, decompress stomach as needed
    a. Gastric channel allows insertion of the following sized gastric tubes
        Size 1.5 – 10 fr
        Size 2-4 – 12 fr
        Size 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
16. Use 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

Surgical Cricothyroidotomy

General Scope: Procedure for surgical cricothyroidotomy.

Applies to: Critical Care Paramedics

Guideline:

1. Attempt to provide optimal O_2 saturation prior to starting
2. Palpate cricothyroid membrane and clean area with antiseptic wipe
3. Make midline incision with scalpel over cricothyroid membrane
4. Insert trach hook and provide upward and caudal traction
5. Use scalpel to open transversely into trachea keeping blade near or against trach hook
6. Introduce 6.0 mm ETT
    a. Inflate with 5-10ml air
7. Auscultate chest and secure device
8. Attach patient to ventilator, see **VOCSN Procedure**

Notes:

- **Needle Cricothyroidotomy** is recommended for children under 10 years old.

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 via non-rebreather mask or blow-by over the tracheostomy
    d. [*EMR***/EMT*] Suction any visible mucus to help clear the airway. If needed, suction tracheostomy (approx. 2-3 inches) using no more than 100mmHg of suction.
        i. [Paramedic] May use 2-3mL NORMAL SALINE flush to loosen secretions
    e. [*EMR***/EMT*] If 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

Transvenous Pacemaker

General Scope: Guideline and criteria for transporting a patient with a transvenous pacemaker.

Applies to: All Critical Care Staff

Procedure:

1. Locate pacemaker generator
2. Ensure battery is fresh
3. Identify each wire set as atrial or ventricular
    a. Epicedial ventricular wires exit from the left side of the chest
    b. Atrial wires exit from the right side of the chest generally
4. Verify wires are attached to the appropriate sites
5. Ensure power is on the pulse generator
6. Confirm set rate based on need and physician orders
7. Confirm amperage settings
8. Confirm sensitivity
    a. Start at 2-5mV
    b. If failure occurs turn sensitivity DOWN
    c. If pacer is sensing beats not present turn sensitivity UP
9. Observe patient for response
10. Secure all wires, connections, and pacemaker in a safe location

References

Air Ambulance Use

General Scope: Procedure and criteria for air ambulance request.

1. Routine medical and/or trauma assessment
2. Determine 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 or 30 miles
4. Request Gundersen AIR or appropriate air transport through agency communications center
5. Assure provision of a secure landing zone

Alternative Destination Transport

For Tri-State Ambulance only.

The most important factor in determination for appropriateness of transport to an alternate destination is the providers' clinical impression. Use telemedicine if unsure.

Patients that are expected to utilize a high number of resources that are typically unavailable in a clinic setting should be transported to the emergency room. Examples include, but are not limited to, social services, psychiatric, and detoxification. Use telemedicine if unsure.

If telemedicine is unavailable for consultation, contact Medical Control by phone.

VITALS

Patients with vital signs outside these parameters should be transported to the emergency room.

- Normal level of consciousness (per baseline)

Adult Vital Signs Limits		
Vital Sign	**Lower Limit**	**Upper Limit**
Heart Rate	60	110
Systolic BP	90	210
Respiratory Rate	10	24
SPO_2	92%	-
Temperature	96.8°	100.3°

Alternative Destination Transport (Continued)

Consider alternate destination transport for the following patient categories and criteria.

Endocrine

- Hypoglycemic incident with return to normal LOC after treatment
- Use telemedicine consult to determine need for transport and destination

Lacerations

- Simple isolated lacerations with controlled bleeding
- No evidence of self-harm

Nausea/Vomiting/Diarrhea

- Under 50
- Not pregnant
- No blood in stool or vomit
- Blood glucose between 60 and 200

Medication Issues (Telemedicine Recommended)

- Out of medication
- "Reaction" to medication
    - No signs of allergic reaction/anaphylaxis
- Took wrong medication/dose

Pain

- **Abdominal Pain**
  - Under 50 years old
  - Not pregnant
  - No recent trauma (72 hours)
  - Afebrile
- **Back Pain**
  - Under 50 years old
  - Not pregnant
  - Atraumatic
  - No new neuro deficits
- **Chest Pain**
  - Under 35 years old
  - Normal ECG
  - Not pregnant
  - Atraumatic
  - Normal lung sounds
- **Dental Pain - afebrile**
  - No swelling of floor of mouth or difficulty swallowing
- **Extremity Pain – excludes any potential femur/hip/pelvis injuries**
  - **Traumatic Injury**
    - Minor trauma with single extremity injury
    - CMS intact in injured extremity
    - No angulated deformity or sign of open fracture
  - **No traumatic injury**
    - History of same pain
    - No history of clotting disorder
    - CMS intact in same extremity

Syncope

- Under 35 years old
- Normal ECG
- Not pregnant
- Blood glucose level between 60 and 200

Amiodarone Infusion

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

Critical Care Paramedic Medications

General Scope: Critical Care Paramedics can administer additional medications authorized by Service Medical Director by protocol, agency formulary or online medical control. If you are unfamiliar with any medication, consult with physician(s), nurses(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, dose, and side effects. The following list are medications that are commonly initiated by the sending physician with hyperlinks included.

Cisatracurium besilate (Nimbex)

Clonidine (Catapres)

Dexmedetomidine (Precedex)

Eptifibatide (Integrilin)

Nitroprusside (Nipride)

Propofol (Diprivan)

Dopamine Infusion

IBW Dosing: See **Ideal Body Weight Chart**

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

IBW Dosing: See **Ideal Body Weight Chart**

100mg/100cc D_5W (1,000 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)															
0.8	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 (500 mcg/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 NS (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 (50 mcg/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 NS (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

IBW Dosing: See **Ideal Body Weight Chart**

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: Ped >1yo
Dose: 10mg/kg PO one time (max 600-650mg)
Concentration: 160mg/5mL or 650mg/20.3mL, 32mg/mL

Con: 160mg/5mL, 32mg/mL (max 640mg)							
Con: 650mg/20.3mL, 32mg/mL (max 650mg)							
lb	kg	mg	mL	lb	kg	mg	ml
2.2	1	10	0.3	75	34	340	10.6
4.4	2	20	0.6	77.2	35	350	10.9
6.6	3	30	0.9	79.4	36	360	11.2
8.8	4	40	1.2	81.6	37	370	11.6
11	5	50	1.6	83.8	38	380	11.9
13.2	6	60	1.9	86	39	390	12.2
15.4	7	70	2.2	88.2	40	400	12.5
17.6	8	80	2.5	90.4	41	410	12.8
19.8	9	90	2.8	92.6	42	420	13.1
22	10	100	3.1	94.8	43	430	13.4
24.2	11	110	3.4	97	44	440	13.7
26.4	12	120	3.7	99.2	45	450	14.1
28.6	13	130	4.1	101.4	46	460	14.4
30.9	14	140	4.4	103.6	47	470	14.7
33	15	150	4.7	105.8	48	480	15
35.3	16	160	5	108	49	490	15.3
37.5	17	170	5.3	110.2	50	500	15.6
39.7	18	180	5.6	112.5	51	510	15.9
41.9	19	190	5.9	114.6	52	520	16.2
44.1	20	200	6.2	116.8	53	530	16.6
46.3	21	210	6.6	119	54	540	16.9
48.5	22	220	6.9	121.3	55	550	17.2
50.7	23	230	7.2	123.5	56	560	17.5
52.9	24	240	7.5	125.7	57	570	17.8
55.1	25	250	7.8	127.9	58	580	18.1
57.3	26	260	8.1	130.1	59	590	18.4
59.5	27	270	8.4	132.3	60	600	18.7
61.7	28	280	8.7	134.5	61	610	19.1
63.9	29	290	9.1	136.7	62	620	19.4
66.1	30	300	9.4	138.9	63	630	19.7
68.3	31	310	9.7	141.1	64	640	20
70.5	32	320	10	145.5	65	650	20.3
72.8	33	330	10.3				

Oral Pain Management - Ibuprofen

IBUPROFEN: Ped >6mo
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 (½ NS)	Esmolol	Octreotide (Sandostatin)
5% dextrose in 0.45% NaCl (D_5½ NS)	Etomidate (Amidate)	Olanzapine (Zyprexa)
5% dextrose in LR	Famotidine (Pepcid)	Ondansetron (Zofran)
5% dextrose in water (D_5W)	Fentanyl (Sublimaze)	Oxygen
Abciximab (Reopro)	Flumazenil (Romazicon)	Oxytocin (Pitocin)
Acetominophen (Tylenol)	Fosphenytoin (Cerebyx)	Pancuronium (Pavulon)
Acetylcysteine (Mucomyst)	Furosemide (Lasix)	Phenergan (Promethazine)
Activated charcoal	Glucagon	Phenytoin (Dilantin)
Adenosine (Adenocard)	Glucose	Potassium
Aggrastat (Tirofiban)	Haloperidol (Haldol)	Pralidoxime (2-pam chloride)
Albuterol	Heparin	Procainamide
Alteplase (Activase)	Hydromorphone (Dilaudid)	Prochlorperazine (Compazine)
Amiodarone (Cordarone)	Ibuprofen	Propranolol
Antibiotics (if hung by facility)	Insulin	Protamine Sulfate
Argatroban	Ipratropium (Atrovent)	Proton Pump Inhibitors (ALL)
Aspirin	Ketamine (Ketalar)	Racemic Epinephrine
Atropine	Ketorolac (Toradol)	Reteplase (Retavase)
Blood	Labatelol	Rocuronium (Zemuron)
Blood products	Lactated Ringer's	Sodium bicarbonate
Calcium chloride	Levalbuterol (Xopenex)	Succinylcholine (Anectine)
Calcium gluconate	Levetiracetam (Keppra)	Terbutaline (Brethine)
Ceftiaxone(Rocephin)	Lidocaine (xylocaine)	Ticagrelor (Brilinta)
Clonazepam (Klonopin)	Lorazepam (Ativan)	Thiamine
Clopidogrel (Plavix) - oral only	Magnesium sulfate	Toradol
Cyanide antidote package (Cyanokit)	Mannitol (Osmitrol)	TPA(tissue plasminogen activator)
Amyl nitrite	Methylprednisolone (Solu-medrol)	TPN (total parental nutrition)
Sodium nitrite	Metoclopramide (Reglan)	Tranexamic acid (TXA)
Sodium thiosulfate	Metoprolol (Lopressor)	Vasopressin (Pitressin)
Dexamethasone (Decadron)	Midazolam (Versed)	Vasotec
Dextrose (50%, 25%, 10%)	Milrinone	Vecuronium (Norcuron)
Diazepam (Valium)	Morphine	Ziprasidone (Geodon)
Diltiazem (Cardizem)	Nalbuphine (Nubain)	
Diphenhydramine (Benadryl)	Naloxone (Narcan)	
Divalproex sodium (Depakote)	Nicardipine	
Dobutamine	Nifedipine (Procardia)	
Dopamine	Nitroglycerin	
Droperidal (Inapsine)	Nitrous oxide	
Enalaprilat	Norepineprine (Levophed)	
Epinephrine	Normal saline (0.9% sodium chloride)	

Push Dose Epinephrine

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

Applies to: Paramedics

Procedure:

1. Expel one milliliter of **normal saline** from a 10 mL preloaded **normal saline** syringe
2. Attach needle to preloaded **normal saline** syringe and draw one milliliter of **1:10,000epinephrine (1mg/10mL – "cardiac epinephrine")**
3. Verify syringe now contains 0.1mg **epinephrine** in 10mL of solution (concentration is now 100 mcg/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
□ Hospital to Hospital Transfer Checklist □ Any SBP less than 90mmHg? □ Any HR greater than 120 bpm? □ Supplemental O2 4lpm or more? □ GCS less than 15? □ New or persistent chest pain or concern for cardiac event? □ Any other concerns?
□ Estimated time of 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, SpO2) including lowest BP and highest HR
□ Treatments provided
□ Estimated time of arrival

RSI Dosing Chart

IBW Dosing: See **Ideal Body Weight Chart**

WEIGHT		KETAMINE				ROCURONIUM
LB	KG	0.5mg/kg	1mg/kg	1.5mg/kg	2mg/kg	1mg/kg
11lb	5kg	2.5mg	5mg	7.5mg	10mg	5mg
22lb	10kg	5mg	10mg	15mg	20mg	10mg
33.1lb	15kg	7.5mg	15mg	22.5mg	30mg	15mg
44.1lb	20kg	10mg	20mg	30mg	40mg	20mg
55.1lb	25kg	12.5mg	25mg	37.5mg	50mg	25mg
66.1lb	30kg	15mg	30mg	45mg	60mg	30mg
77.2lb	35kg	17.5mg	35mg	52.5mg	70mg	35mg
88.2lb	40kg	20mg	40mg	60mg	80mg	40mg
99.2lb	45kg	22.5mg	45mg	67.5mg	90mg	45mg
110.2lb	50kg	25mg	50mg	75mg	100mg	50mg
121.3lb	55kg	27.5mg	55mg	82.5mg	110mg	55mg
132.3lb	60kg	30mg	60mg	90mg	120mg	60mg
145.5lb	65kg	32.5mg	65mg	97.5mg	130mg	65mg
154.3lb	70kg	35mg	70mg	105mg	140mg	70mg
165.3lb	75kg	37.5mg	75mg	112.5mg	150mg	75mg
176.4lb	80kg	40mg	80mg	120mg	160mg	80mg
187.4lb	85kg	42.5mg	80mg	127.5mg	170mg	85mg
198.4lb	90kg	45mg	90mg	135mg	180mg	90mg
209.4lb	95kg	47.5mg	95mg	142.5mg	190mg	95mg
220.5lb	100kg	50mg	100mg	150mg	200mg	100mg
231.5lb	105kg	52.5mg	105mg	157.5mg	210mg	105mg
242.5lb	110kg	55mg	110mg	165mg	220mg	110mg
253.5lb	115kg	57.5mg	115mg	172.5mg	230mg	115mg
264.6lb	120kg	60mg	120mg	180mg	240mg	120mg
275.6lb	125kg	62.5mg	125mg	187.5mg	250mg	125mg
286.6lb	130kg	65mg	130mg	195mg	260mg	130mg
297.6lb	135kg	67.5mg	135mg	202.5mg	270mg	135mg
308.6lb	140kg	70mg	140mg	210mg	280mg	140mg
319.7lb	145kg	72.5mg	145mg	217.5mg	290mg	145mg
330.7lb	150kg	75mg	150mg	225mg	300mg	150mg

Telemedicine Evaluation

Telemedicine evaluation should be considered for patients with no obvious life threats who do not request transport. The most important factors in determination for appropriateness of telemedicine evaluation is the providers' clinical impression and the ability of the patient and/or support persons to comply with instructions provided by a telemedicine physician (i.e., obtain prescription medication, monitor vital signs, eat/drink, etc.).

Patients that are expected to need resources that are unable to be provided via telemedicine should be transported to the emergency room. Examples include, but are not limited to, social services, psychiatric, and detoxification.

Vital Signs

Patients with vital signs outside these parameters should not be considered for telemedicine evaluation only. Telemedicine evaluation may be used in addition to standard assessment, treatment, and transport for patients with vital signs outside the parameters.

- Normal level of consciousness (per baseline)
- Heart rate at or under upper limit of age based normal
- MAP of 65 or higher (or systolic at or above lower limit of normal)
- Respiratory rate under upper limit of age based normal
- SpO_2 > 92%
- Temperature under 100.3°

Normal Vital Signs Reference (Low-High)			
Age Category	**Heart Rate**	**Respiratory Rate**	**Systolic BP**
Adult	60-110	12-20	90-180
Adolescent (13-18 years)	55-110	12-20	80-140
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

Telemedicine Evaluation (Continued)

Consider use of telemedicine evaluation for the following patient categories and criteria.

Endocrine

- Hypoglycemic incident with return to normal LOC after treatment
    - Use telemedicine consult to determine need for transport and destination

Medication Issues

- Out of medication
- "Reaction" to medication
    - No signs of allergic reaction/anaphylaxis
- Took wrong medication/dose

Refusal of Transport

- Falls with refusal of transport
- Refusals of transport involving initial or active complaints of emergency symptoms
    - Emergency symptoms include, but are not limited to, shortness of breath, persistentpain or pressure in the chest, new confusion, or altered mental status.

Trauma Activation

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

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

RED ACTIVATION

TRANSPORT TO 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:**
  - **Adult < 90 mmHg**
  - **Pediatric < 60 mmHg (0-6 months)**
  - **< 70 mmHg (6 months-5 yrs)**
  - **< 80 mmHg (over 5 yrs – 14.9 yrs)**
- **Penetrating injury to head, neck, 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**
  - **Complete or partial amputation proximal to wrist of ankle**
  - **Crushed, de-gloved or mangled proximal to wrist or ankle**
- **Evisceration**
- **GCS < 9 with mechanism attributed to trauma, including isolated hanging, traumatic asphyxia, or cold water drowning with signs of life**
- **Flail chest**
- **Unstable pelvis**
- **Severe hypothermia (core body temp < 28° C [82.4° F])**

YELLOW ACTIVATION

TRANSPORT TO HIGHEST LEVEL TRAUMA CENTER

Glasgow Coma Scale < 14	≥ two long bone fractures*
Open/depressed skull fracture	New onset paralysis

- **Systolic blood pressure, confirmed by sequential reading of:**
  - ***Adult over age 65*** **<110 mmHg**
- **Extrication greater than 20 minutes**
- **Combination of trauma with burns**
- **Burns**
  - **Adult > 20% TBSA or involving face/airway**
  - **Pediatric > 15% TBSA or involving face/airway**
- **Ejection from *enclosed* vehicle**
- **Falls**
  - **Adult > 20 feet**
  - **Pediatric > 15 feet**
- **Auto-pedestrian/auto-bicycle with speeds > 20 mph**
- **High-voltage electrocution**
- **Moderate hypothermia (core temp 28° C - 32.2° C [90° F])**

*** Involving femur/humerus**

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

Step 1 - Assess for Time Critical Injuries: Level of Consciousness & Vital Signs

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

If ground transport time to a Resource (Level I) or Regional (Level II) Trauma Care Facility is less than 30 minutes, transport to the nearest Resource (Level I) or Regional (Level II) Trauma Care Facility. If greater than 30 minutes, ground transport time to Resource (Level I) or Regional (Level II) 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 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 Parasthesia

If ground transport time to a Resource (Level I) or Regional (Level II) Trauma Care Facility is less than 30 minutes, transport to the nearest Resource (Level I) or Regional (Level II) Trauma Care Facility. If greater than 30 minutes ground transport time to Resource (Level I) or Regional (Level II) 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 2 does not apply, move on to step 3

Step 3 - Consider Mechanism of Injury & High Energy Transfer

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

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 severe injury
- Anticoagulants and bleeding disorders
  - Patients with head injury are at high risk for rapid deterioration
- Pregnancy > 20 weeks
- EMS provider judgment
- 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 or rigid muscle tone or not moving. **V**erbal, **P**ain, or **U**nresponsive on AVPU scale.

OR

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

OR

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

If ground transport time to a Resource (Level I) or Regional (Level II) Trauma Care Facility is less than 30 minutes, transport to the nearest Resource (Level I) or Regional (Level II) Trauma Care Facility. If greater than 30 minutes, ground transport time to Resource (Level I) or Regional (Level II) 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 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 Parasthesia

If ground transport time to a Resource (Level I) or Regional (Level II) Trauma Care Facility is less than 30 minutes, transport to the nearest Resource (Level I) or Regional (Level II) Trauma Care Facility. If greater than 30 minutes ground transport time to Resource (Level I) or Regional (Level II) 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 2 does not apply, move on to step 3

Step 3 - Consider Mechanism of Injury & High Energy Transfer

- Falls
  - Pediatric: > 10 ft. or two times the height of the child
- High-risk auto crash
  - Interior compartment intrusion, including roof: >12 inches occupant site; >18 inches any site
  - Ejection (partial or complete) from automobile
  - Death in same passenger compartment
  - Vehicle telemetry data consistent with high risk of injury
  - Auto vs. pedestrian/bicyclist thrown, run over,or with significant (>20 mph) impact
  - Motorcycle crash >20 mph

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:

- Pregnancy > 20 weeks
- EMS Provider judgement
- ETOH/Drug use
- Anticoagulants and bleeding disorders
  - Patients with head injury are at 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 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.

VOCSN Ventilator/BiPAP/CPAP Use for Paramedics

General Scope: Guideline for Ventilator, BiPAP and CPAP use.

Applies to: Paramedics (911 and IFT)

Procedure:

1. **VENTILATOR SETTINGS**
    a. Attach circuit and oxygen supply hose to ventilator
    b. Turn on ventilator and select **EXIT** to bypass **Pre-Use Test**
    c. Select **Therapy** and then **VENTILATION**
    d. Highlight **STANDBY** preset and verify **NOW ACTIVE** – if not NOW ACTIVE, select START
    e. Highlight **VENTILATOR** preset – do not select **START** yet
    f. Select **SETTINGS & ALARMS**
    g. Scroll through **SETTINGS** and edit as needed:
        i. Verify **MODE** is **AC-Volume**
        ii. Verify **PATIENT TYPE** is **Adult**
        iii. Verify **HUMIDIFICATION** is **HME**
        iv. Verify **CIRCUIT TYPE** is **Active**
        v. **EDIT BREATH RATE** to appropriate rate
        vi. Verify **INSPIRATORY TIME** is **1.0 seconds**
        vii. **EDIT TIDAL VOLUME** to 6-8 mL/kg **IDEAL BODY WEIGHT**; max of 800mL
        viii. Verify **PEEP** is **5 cmH2O** (may match hospital PEEP setting for IFT only)
        ix. Verify **FLOW TRIGGER** is **6.0 L/min**
        x. Verify **APNEA RATE** is **10 Backup BPM**
        xi. Verify **LEAK COMPENSATION** is **OFF**
        xii. Verify **SIGH** is **OFF**
        xiii. Highlight **OXYGEN SETTINGS LINK** and select **EDIT OXYGEN PRESET SETTINGS**
    h. Select appropriate **Oxygen Preset**, select **START** and then **EXIT**
        i. Or for custom FiO2 select **SETTINGS & ALARMS**, highlight **FiO2**, select **EDIT**, enter custom FiO2, select **ACCEPT**, select **EXIT** and select **START**
    i. Select **VENTILATION**
    j. Highlight **VENTILATOR** preset and select **START**
    k. Verify circuit configuration by selecting **OK**
    l. Select **EXIT** to bypass the **Pre-Use Test**
    m. Attach circuit to patient

AT THE END OF PATIENT CARE YOU MUST RETURN ALL SETTINGS TO THE DEFAULT

VOCSN Ventilator/BiPAP/CPAP Use for Paramedics (Continued)

2. NPPV (BiPAP)

a. NPPV 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. Patient has spontaneous respirations requiring respiratory support, but not mechanical ventilation

1. Examples:
    a. Worsening of dyspnea
    b. Respiratory rate >30
    c. pH <7.28
    d. PaCO2 >50mmHg
    e. Rising EtCO2 levels

c. Exclusion criteria

i. Recurrent aspiration
ii. Large volumes of secretions
iii. Inability to protect the airway
iv. Vomiting
v. Upper airway obstruction
vi. Uncooperative, confused or combative patient
vii. Inability to tolerate a tight mask
viii. Orofacial abnormalities which interfere with mask/face interface
ix. Untreated pneumothorax

VOCSN Ventilator/BiPAP/CPAP Use for Paramedics (Continued)

3. BiPAP SETTINGS

a. Attach circuit and oxygen supply hose to ventilator
b. Turn on ventilator and select **EXIT** to bypass **Pre-Use Test**
c. Select **Therapy** and then **VENTILATION**
d. Highlight **STANDBY** preset and verify **NOW ACTIVE** – if not NOW ACTIVE, select START
e. Highlight **BiPAP** preset – do not select **START** yet
f. Select **SETTINGS & ALARMS**
g. Scroll through **SETTINGS** and edit as needed:
    1. Verify **MODE** is **Bi-LEVEL**
    2. Verify **PATIENT TYPE** is **Adult**
    3. Verify **HUMIDIFICATION** is **HME**
    4. Verify **CIRCUIT TYPE** is **Active**
    5. Verify **BREATH RATE** is **0 BPM**
    6. Verify **INSPIRATORY TIME** is **1.0 seconds**
    7. Verify **EPAP** is **5 cmH2O** or match current settings if patient is currently on BiPAP
    8. Verify **IPAP** is **10 cmH2O above ambient** or match current settings if patient is currently on BiPAP
    9. Verify **FLOW TRIGGER** is **3.0 L/min**
    10. Verify **FLOW CYCLE** is **25%**
    11. Verify **TIME CYCLE** is **1.5 seconds**
    12. Verify **RISE TIME** is **4**
    13. Verify **APNEA RATE** is **12 Backup BPM**
    14. Verify **LEAK COMPENSATION** is **ON**
    15. Highlight **OXYGEN SETTINGS LINK** and select **EDIT OXYGEN PRESET SETTINGS**
h. Select appropriate **Oxygen Preset**, select **START** and then **EXIT**
    1. Or for custom FiO2 select **SETTINGS & ALARMS**, highlight **FiO2**, select **EDIT**, enter custom FiO2, select **ACCEPT**, select **EXIT** and select **START**
i. Select **VENTILATION**
j. Highlight **BiPAP** preset and select **START**
k. Verify circuit configuration by selecting **OK**
l. Select **EXIT** to bypass the **Pre-Use Test**
m. Attach circuit to patient
n. Titrate FiO2 if needed
o. Titrate EPAP (max 10 cmH2O) and IPAP (max 15 cmH2O)
p. If improvement in ventilation and oxygenation is not achieved, discontinue NPPV and consider tracheal intubation

AT THE END OF PATIENT CARE YOU MUST RETURN ALL SETTINGS TO THE DEFAULT

VOCSN Ventilator/BiPAP/CPAP Use for Paramedics (Continued)

4. CPAP SETTINGS

a. Attach circuit and oxygen supply hose to ventilator
b. Turn on ventilator and select **EXIT** to bypass **Pre-Use Test**
c. Select **Therapy** and then **VENTILATION**
d. Highlight **STANDBY** preset and verify **NOW ACTIVE** – if not NOW ACTIVE, select START
e. Highlight **BiPAP** preset – do not select **START** yet
f. Select **SETTINGS & ALARMS**
g. Scroll through **SETTINGS** and edit as needed:
    1. Verify **MODE** is **SIMV-Volume**
    2. Verify **PATIENT TYPE** is **Adult**
    3. Verify **HIGH FLOW** is **OFF**
    4. Verify **HUMIDIFICATION** is **HME**
    5. Verify **CIRCUIT TYPE** is **Active**
    6. Verify **BREATH RATE** is **0 BPM**
    7. Verify **INSPIRATORY TIME** is **1.0 seconds**
    8. Ignore **TIDAL VOLUME** amount
    9. Verify **PEEP** is **5 cmH2O**
    10. Verify **PRESSURE SUPPORT** is **0 cmH2O above set PEEP**
    11. Verify **FLOW TRIGGER** is **3.0 L/min**
    12. Verify **FLOW CYCLE** is **25%**
    13. Verify **TIME CYCLE** is **1.5 seconds**
    14. Verify **RISE TIME** is **4**
    15. Verify **APNEA RATE** is **12 Backup BPM**
    16. Verify **LEAK COMPENSATION** is **ON**
    17. Verify **SIGH** is **OFF**
    18. Highlight **OXYGEN SETTINGS LINK** and select **EDIT OXYGEN PRESET SETTINGS**
h. Select appropriate **Oxygen Preset**, select **START** and then **EXIT**
    i. Or for custom FiO2 select **SETTINGS & ALARMS**, highlight **FiO2**, select **EDIT**, enter custom FiO2, select **ACCEPT**, select **EXIT** and select **START**
i. Select **VENTILATION**
j. Highlight **BiPAP** preset and select **START**
k. Verify circuit configuration by selecting **OK**
l. Select **EXIT** to bypass the **Pre-Use Test**
m. Attach circuit to patient
n. Titrate FiO2 if needed
o. If improvement in ventilation and oxygenation is not achieved, discontinue NPPV and consider tracheal intubation

AT THE END OF PATIENT CARE YOU MUST RETURN ALL SETTINGS TO THE DEFAULT

VOCSN Ventilator/BiPAP/CPAP Use for Critical Care

General Scope: Guideline for Ventilator, BiPAP and CPAP use.

Applies to: Critical Care Staff (IFT)

Procedure:

1. **VENTILATOR SETTINGS**
    a. Attach circuit and oxygen supply hose to ventilator
    b. Turn on ventilator and select **EXIT** to bypass **Pre-Use Test**
    c. Select **Therapy** and then **VENTILATION**
    d. Highlight **STANDBY** preset and verify **NOW ACTIVE** – if not NOW ACTIVE, select START
    e. Highlight **VENTILATOR** preset – do not select **START** yet
    f. Select **SETTINGS & ALARMS**
    g. Scroll through **SETTINGS** and edit as needed:
        1. Default **MODE** is **AC-Volume**
        2. Default **PATIENT TYPE** is **Adult**
        3. Default **HUMIDIFICATION** is **HME**
        4. Default **CIRCUIT TYPE** is **Active**
        5. **EDIT BREATH RATE** to appropriate rate
        6. Default **INSPIRATORY TIME** is **1.0 seconds**
        7. **EDIT TIDAL VOLUME** to 6-8 mL/kg **IDEAL BODY WEIGHT**; max of 800mL
        8. Default **PEEP** is **5 cmH2O**
        9. Default **FLOW TRIGGER** is **6.0 L/min**
        10. Default **APNEA RATE** is **10 Backup BPM**
        11. Default **LEAK COMPENSATION** is **OFF**
        12. Default **SIGH** is **OFF**
        13. Highlight **OXYGEN SETTINGS LINK** and select **EDIT OXYGEN PRESET SETTINGS**
    h. Select appropriate **Oxygen Preset**, select **START** and then **EXIT**
        1. Or for custom FiO2 select **SETTINGS & ALARMS**, highlight **FiO2**, select **EDIT**, enter custom FiO2, select **ACCEPT**, select **EXIT** and select **START**
    i. Select **VENTILATION**
    j. Highlight **VENTILATOR** preset and select **START**
    k. Verify circuit configuration by selecting **OK**
    l. Select **EXIT** to bypass the **Pre-Use Test**
    m. Attach circuit to patient

AT THE END OF PATIENT CARE YOU MUST RETURN ALL SETTINGS TO THE DEFAULT

VOCSN Ventilator/BiPAP/CPAP Use for Critical Care (Continued)

2. NPPV (BiPAP)

a. NPPV 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

1. Patient has spontaneous respirations requiring respiratory support, but not mechanical ventilation
    1. Examples:
        a. Worsening of dyspnea
        b. Respiratory rate >30
        c. pH <7.28
        d. PaCO2 >50mmHg
        e. Rising EtCO2 levels

c. Exclusion criteria

1. Recurrent aspiration
2. Large volumes of secretions
3. Inability to protect the airway
4. Vomiting
5. Upper airway obstruction
6. Uncooperative, confused or combative patient
7. Inability to tolerate a tight mask
8. Orofacial abnormalities which interfere with mask/face interface
9. Untreated pneumothorax

VOCSN Ventilator/BiPAP/CPAP Use for Critical Care (Continued)

3. BiPAP SETTINGS

a. Attach circuit and oxygen supply hose to ventilator
b. Turn on ventilator and select **EXIT** to bypass **Pre-Use Test**
c. Select **Therapy** and then **VENTILATION**
d. Highlight **STANDBY** preset and verify **NOW ACTIVE** – if not NOW ACTIVE, select START
e. Highlight **BiPAP** preset – do not select **START** yet
f. Select **SETTINGS & ALARMS**
g. Scroll through **SETTINGS** and edit as needed:
    1. Verify **MODE** is **Bi-LEVEL**
    2. Verify **PATIENT TYPE** is **Adult**
    3. Verify **HUMIDIFICATION** is **HME**
    4. Verify **CIRCUIT TYPE** is **Active**
    5. Verify **BREATH RATE** is **0 BPM**
    6. Verify **INSPIRATORY TIME** is **1.0 seconds**
    7. Verify **EPAP** is **5 cmH2O** or match current settings if patient is currently on BiPAP
    8. Verify **IPAP** is **10 cmH2O above ambient** or match current settings if patient is currently on BiPAP
    9. Verify **FLOW TRIGGER** is **3.0 L/min**
    10. Verify **FLOW CYCLE** is **25%**
    11. Verify **TIME CYCLE** is **1.5 seconds**
    12. Verify **RISE TIME** is **4**
    13. Verify **APNEA RATE** is **12 Backup BPM**
    14. Verify **LEAK COMPENSATION** is **ON**
    15. Highlight **OXYGEN SETTINGS LINK** and select **EDIT OXYGEN PRESET SETTINGS**
h. Select appropriate **Oxygen Preset**, select **START** and then **EXIT**
    i. Or for custom FiO2 select **SETTINGS & ALARMS**, highlight **FiO2**, select **EDIT**, enter custom FiO2, select **ACCEPT**, select **EXIT** and select **START**
i. Select **VENTILATION**
j. Highlight **BiPAP** preset and select **START**
k. Verify circuit configuration by selecting **OK**
l. Select **EXIT** to bypass the **Pre-Use Test**
m. Attach circuit to patient
n. Titrate FiO2 if needed
o. Titrate EPAP (max 10 cmH2O) and IPAP (max 15 cmH2O)
p. If improvement in ventilation and oxygenation is not achieved, discontinue NPPV and consider tracheal intubation

AT THE END OF PATIENT CARE YOU MUST RETURN ALL SETTINGS TO THE DEFAULT

VOCSN Ventilator/BiPAP/CPAP Use for Critical Care (Continued)

4. CPAP SETTINGS

a. Attach circuit and oxygen supply hose to ventilator
b. Turn on ventilator and select **EXIT** to bypass **Pre-Use Test**
c. Select **Therapy** and then **VENTILATION**
d. Highlight **STANDBY** preset and verify **NOW ACTIVE** – if not NOW ACTIVE, select START
e. Highlight **BiPAP** preset – do not select **START** yet
f. Select **SETTINGS & ALARMS**
g. Scroll through **SETTINGS** and edit as needed:
    1. Verify **MODE** is **SIMV-Volume**
    2. Verify **PATIENT TYPE** is **Adult**
    3. Verify **HIGH FLOW** is **OFF**
    4. Verify **HUMIDIFICATION** is **HME**
    5. Verify **CIRCUIT TYPE** is **Active**
    6. Verify **BREATH RATE** is **0 BPM**
    7. Verify **INSPIRATORY TIME** is **1.0 seconds**
    8. Ignore **TIDAL VOLUME** amount
    9. Verify **PEEP** is **5 cmH2O**
    10. Verify **PRESSURE SUPPORT** is **0 cmH2O above set PEEP**
    11. Verify **FLOW TRIGGER** is **3.0 L/min**
    12. Verify **FLOW CYCLE** is **25%**
    13. Verify **TIME CYCLE** is **1.5 seconds**
    14. Verify **RISE TIME** is **4**
    15. Verify **APNEA RATE** is **12 Backup BPM**
    16. Verify **LEAK COMPENSATION** is **ON**
    17. Verify **SIGH** is **OFF**
    18. Highlight **OXYGEN SETTINGS LINK** and select **EDIT OXYGEN PRESET SETTINGS**
h. Select appropriate **Oxygen Preset**, select **START** and then **EXIT**
    a. Or for custom FiO2 select **SETTINGS & ALARMS**, highlight **FiO2**, select **EDIT**, enter custom FiO2, select **ACCEPT**, select **EXIT** and select **START**
i. Select **VENTILATION**
j. Highlight **BiPAP** preset and select **START**
k. Verify circuit configuration by selecting **OK**
l. Select **EXIT** to bypass the **Pre-Use Test**
m. Attach circuit to patient
n. Titrate FiO2 if needed
o. If improvement in ventilation and oxygenation is not achieved, discontinue NPPV and consider tracheal intubation

AT THE END OF PATIENT CARE YOU MUST RETURN ALL SETTINGS TO THE DEFAULT