Iowa County EMS

Transport and Non-Transport

2023 Patient Care Protocols | Procedures | Formulary
Adult and Pediatric

Iowa County Ambulance Service
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Table of Contents

INTRODUCTION

Iowa Administrative Code 641 – Chapter 132: Emergency Medical Services – Service Program Authorization

132.3(2) Medical Director:

(4) Develop, approve, and update service program protocols that meet or exceed the minimum EMS clinical guidelines approved by the department.

(5) Ensure that the emergency medical care providers rostered with the service program are credentialed in the emergency medical skills to be provided and the duties of the emergency medical care provider do not exceed the provider's scope of practice as referenced in 641—subrule 131.5(2) and the service program's EMS service level of authorization.

Purpose

The Completed protocol approval page allows for a physician medical director to implement service specific protocols based off the *NASEMSO National Model EMS Clinical Care Guidelines* for one or more service programs where they serve as the program's medical director. Any changes to these protocols after initial approval will be listed as an appendix until such time as the need for such change no longer exists or the annual review would suggest incorporating the change permanently to these protocols. Any changes to these protocols shall be reviewed by all applicable EMS providers.

Instructions

Print or type the service name in the space provided. Next, select each service's corresponding type and level of authorization. The service program will post the completed protocol approval document in the AMANDA folder.

Scope of Practice

The Iowa Emergency Medical Care Providers Scope of Practice document outlines the skills each level of certified EMS provider can perform. Some skills will require the approval of the service program's physician medical director as well as documentation of additional training. Iowa EMS providers may not perform skills outside of their identified scope of practice as documented in the Iowa Emergency Medical Care Provider Scope of Practice. The most current version of the scope of practice document can be viewed and downloaded from the Bureau's website at: http://idph.iowa.gov/bets/ems/scope-of-practice .

Recommendations

It is recommended that each service program maintain records that document the review/education of all staff members on the programs most current protocols and the most current version of the Iowa Emergency Medical Care Provider Scope of Practice document

2023 Protocol Approval

Service(s) Name		Iowa County Ambulance	Williamsburg First Responders	Amana, Kinze, Victor First Responders	Millersburg & North English First Responders	Ladora First Responders
Service Type	Ambulance	X				
	Non-transport		X	X	X	X
Service's Level of Authorization	EMR					
	EMT		X	X	X	X
	AEMT					
	Paramedic	X				

Check All Medications Carried by the Service *Medication kit should contain only medications approved by the service's Medical Director*		
OTC Medications	**Medications**	
Aspirin	Adenosine	Magnesium Sulfate
Glucose Paste	Albuterol	Metoprolol
Naloxone (IN)	Amiodarone	Midazolam
Patient Assisted Medications	Atropine	Naloxone
Auto-injector Epinephrine	Dextrose	Nitroglycerin
Nitroglycerin	Diazepam	Nitroglycerin Infusion
Inhaler	Diphenhydramine	Norepinephrine
IV Fluids	DuoNeb	Ondansetron
Normal Saline	Epinephrine	Oxygen
D5W	Fentanyl	Solu-Medrol
D10W	Glucagon	Toradol
	Ketamine	Tranexamic Acid (TXA)
	Lidocaine	

2023 Protocol Approval

Additional Skills for the EMR, EMT, AEMT

	Mark "Yes" if the skill is approved by the medical director to be performed by the identified certification level	Certification Level	Yes	No
Approval of these additional skills must be within the Service Program's Level of Authorization and the Iowa EMS Provider's Scope of Practice	*Limited Use Beta Agonist*	EMT		X
		A-EMT	X	
	Ventilator	EMT		X
	Service carries auto-inject epinephrine	EMT		X
	Central line access	A-EMT		X
	CPAP	EMT, A-EMT		X
	Non-transport services will only utilize the long spinal immobilization device if applicable and available on a specific call for service			

NOTE: Iowa's Scope of Practice document requires medical director approval and documentation of additional training for these skills. Service program must maintain documentation of the additional training

Medical Director Statement of Approval

As the physician medical director, I have reviewed both the *2022 Iowa Approved EMS NASEMSO Treatment Guidelines* and the *Iowa Emergency Medical Care Provider Scope of Practice* document and approve the use of the skills, medications, and protocols as documented herein, for the authorized Iowa EMS program(s) listed within this document.

Medical Director's Printed Name	Signature	Date
Timothy Momany, M.D.		1/9/23

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Initial Patient Care Protocol – Adult and Pediatric

Revised 2022

This protocol serves to reduce the need for extensive reiteration of basic assessment and other considerations in each individual protocol when not directly included in those protocols.

Scene and Patient Assessment

1) Assess scene safety
   a. Evaluate for hazards to EMS personnel, patient(s), bystanders
   b. Safely move away from all hazards prior to beginning medical care
   c. Determine the number of patients
   d. Determine the mechanism of injury or potential source of illness
   e. Request additional resources if needed and weigh the benefits of waiting for additional resources against rapid transport to definitive care
2) Use appropriate personal protective equipment (PPE)
3) Wear high-visibility, retro-reflective apparel when deemed appropriate (e.g. operations at night or in darkness, on or near roadways
4) Consider cervical spine stabilization or spinal motion restriction if traumatic in nature

Primary Assessment

1) **A**irway, **B**reathing, **C**irculation is cited below; (although there are specific circumstances where **C**irculation, **A**irway, **B**reathing (**CAB**) may be indicated, such as cardiac arrest, or **M**assive hemorrhage, **A**irway, **R**espirations, **C**irculation, **H**ypothermia and head injury (**MARCH)** may be indicated for trauma or major arterial bleeding
   a. Airway (assess for patency and open the airway as indicated)
      i. Patient is unable to maintain airway patency – open airway
         1. Head tilt, chin lift
         2. Jaw thrust
         3. Suction
         4. Consider use of the appropriate airway management adjuncts and devices
            a. Oral airway
            b. Nasal airway
            c. Blind insertion or supraglottic airway device
            d. Laryngeal mask airway
            e. Endotracheal tube
         5. For patients with laryngectomies or tracheostomies, remove all objects or clothing that may obstruct the opening of these devices, maintain the flow of prescribed oxygen, and reposition the head and/or neck.
   b. Breathing
      i. Evaluate rate, breath sounds, accessory muscle use, retractions, patient positioning and oxygen saturation

ii. Administer oxygen as appropriate with a target of achieving 94-98% saturation for most acutely ill patients
iii. Apnea *(not breathing) – open airway see #4 above*

c. Circulation

i. Control any major external bleeding *(see Extremity Trauma/External Hemorrhage Management Guideline)*
ii. Assess pulse
    1. If none – see cardiac arrhythmia protocol
    2. Assess rate and quality of carotid and radial pulses
iii. Evaluate perfusion by assessing skin color and temperature
    1. Evaluate capillary refill time

d. Disability

i. Evaluate patient responsiveness using the **AVPU** scale (**A**lert, **V**erbal, **P**ainful, **U**nresponsive)
ii. Evaluate gross motor and sensory function in all extremities
iii. Check blood glucose in patients with altered mental status and treat if indicated.
iv. If acute stroke is suspected – see Stroke Guideline

***e.* Expose patient for exam as appropriate to complaint**

i. Be considerate of patient modesty
ii. Keep patient warm

f. Assess for urgency of transport

Secondary Assessment

1) The performance of the secondary assessment should not delay transport in critical patients. Secondary assessments should be tailored to patient presentation and chief complaint. Secondary assessments may not be completed if the patient has critical primary assessment problems

a. Head

i. Pupils
ii. Ears
iii. Oropharynx / nasopharynx
iv. Skull and scalp

b. Neck

i. Jugular venous distension (JVD)
ii. Tracheal position
iii. Spinal tenderness

c. Chest

i. Retractions
ii. Breath sounds
iii. Chest wall stability, tenderness, deformity, crepitus and excursion

d. Abdomen / back

i. Tenderness or bruising
ii. Abdominal distension, rebound or guarding
iii. Spinal tenderness or crepitus

iv. Pelvic stability or tenderness

e. Extremities

i. Edema
ii. Pulses
iii. Deformity, crepitus

f. Neurologic

i. Mental status / orientation
ii. Motor / sensory

g. **Evaluate for medical equipment** (e.g., pacemaker/defibrillator, left ventricular assist device (LVAD), insulin pump, dialysis fistula)

2) Obtain baseline vital signs (an initial full set of vital signs is required: pulse, blood pressure, respiratory rate, neurologic status assessment) (see chart below)

a. Neurologic status assessment: establish a baseline and note any change in patient neurologic status.

i. AVPU (alert, verbal, pain, unresponsive) or
ii. Glasgow Coma Score (GCS)

b. Patients with cardiac or respiratory complaints

i. Pulse oximetry
ii. 12 lead ECG should be obtained early in patients with cardiac or suspected cardiac complaints
iii. continuous cardiac monitoring, if available
iv. consider waveform capnography *(essential for critical patients and those who require invasive airway management)*

***c.* Patients with altered mental status**

i. Check blood glucose and treat appropriately
ii. Consider waveform capnography *(essential for critical patients and those who require invasive airway management)*

d. Stable patients should have at least two sets of pertinent vital signs recorded. Ideally, one set should be taken shortly before arrival at the receiving facility.

e. Critical patients should have pertinent vital signs frequently monitored

3) Obtain **OPQRST** history:

a. **O**nset of symptoms (circumstances surrounding onset such as gradual or sudden onset
b. **P**rovocation: location; any exacerbating or alleviating factors
c. **Q**uality of pain
d. **R**adiation of pain
e. **S**everity of symptoms: pain scale
f. **T**ime of onset and circumstances around onset

4) Obtain **SAMPLE** history:

a. **S**igns/Symptoms
b. **A**llergies – medication, environmental, dietary
c. **M**edications – prescription and over the counter; bring containers to the receiving facility if possible
d. **P**ast medical history

i. Look for medical alert tags, portable medical records, advance directives

ii. Look for medical devices/implants *(some common examples are a dialysis shunt, insulin pump, pacemaker, central venous access port, gastric tubes, urinary catheter)*

e. **L**ast oral intake
f. **E**vents leading up to the 911 call

Treatment and Interventions

1) Administer oxygen as appropriate with a target oxygen saturation of 94-98% and select the appropriate method of oxygen delivery.
2) Follow approved protocols to treat assessment findings.
    a. Alterations to these protocols or medications given in a different manner or for a different purpose than outlined here in the approved written protocols are allowable but only with a verbal order from a physician who is assuming patient care. This order must be within the providers Scope of Practice and must be followed up with a written order at the completion of the call for service.
3) Tier with an appropriate service if advanced level of care or assistance is needed and can be accomplished in a timely manner
4) Place appropriate monitoring equipment as dictated by assessment, within scope of practice – these may include:
    a. Continuous pulse oximetry
    b. Cardiac rhythm monitoring
    c. Waveform capnography or digital capnometry
    d. Carbon monoxide assessment
5) If within scope of practice, establish vascular access if indicated or in patients who are at risk for clinical deterioration.
    a. If IO is to be used for a conscious patient, follow Lidocaine dosing as indicated in the IO appendix.
6) Monitor pain scale if appropriate and treat pain if indicated
7) Reassess patient as indicated

Patient Safety Considerations

1) Routine use of lights and sirens is not warranted
2) Even when lights and sirens are in use, always limit speeds to a level that is safe for the emergency vehicle being driven and the road conditions on which it is being operated.
3) Be aware of legal issues and patient rights as they pertain to and impact patient care (e.g. patients with functional needs or children with special healthcare needs)
4) Be aware of potential need to adjust management based on patient age and comorbidities, including medication dosages.
5) The maximum weight-based dose of medication administered to a pediatric patient should not exceed the maximum adult dose.
6) Direct medical control should be contacted when mandated or as needed.

Key Considerations

Pediatrics:
Use an accurate weight or length-based assessment tool *(length-based tape or other system)* to estimate patient weight and guide medication therapy and adjunct choices.

a. The pediatric population is generally defined by those patients who weigh up to 40 kg or up to 14 years of age, whichever comes first
b. Consider using the pediatric assessment triangle (appearance, work of breathing, circulation) when first approaching a child to help with assessment.

Geriatrics:
The geriatric population is generally defined as those patients who are 65 years old or more.

a. In these patients, as well as adult patients, reduced medication dosages may apply to patients with renal disease *(i.e. on dialysis or a diagnosis of chronic renal insufficiency)* or hepatic disease *(i.e. severe cirrhosis or end stage liver disease)*

Co-morbidities:
Reduced medication dosages may apply to patients with renal disease *(i.e. on dialysis or a diagnosis of chronic renal insufficiency)* or hepatic disease *(i.e. severe cirrhosis or end stage liver disease).*

Normal Vital Signs

Age	Pulse	Respiratory Rate	Systolic BP
Preterm (>1 kg)	120-160	30-60	39-59
Preterm (1-3 kg)	120-160	30-60	60-76
Newborn	100-205	30-60	67-84
Up to 1 year	100-190	30-60	72-104
1-3 years	100-190	20-40	86-106
4-6 years	80-140	22-34	88-112
7-9 years	74-140	18-30	96-115
10-12 years	74-118	18-30	102-120
13-15 years	60-100	14-20	110-130
15 years or older	60-100	14-20	110-130

Glasgow Coma Scale

Adult Glasgow Coma Scale		Pediatric Glasgow Coma Scale	
Eye Opening (4)		Eye Opening (4)	
Spontaneous	4	Spontaneous	4
To Speech	3	To Speech	3
To Pain	2	To Pain	2
None	1	None	1
Best Motor Response (6)		Best Motor Response (6)	
Obeys Commands	6	Spontaneous Movement	6
Localizes Pain	5	Withdraws to Touch	5
Withdraws From Pain	4	Withdraws From Pain	4
Abnormal Flexion	3	Abnormal Flexion	3
Abnormal Extension	2	Abnormal Extension	2
None	1	None	1
Verbal Response (5)		Verbal Response (5)	
Oriented	5	Coos, Babbles	5
Confused	4	Irritable Cry	4
Inappropriate	3	Cries to Pain	3
Incomprehensible	2	Moans to Pain	2
None	1	None	1
Total:		**Total:**	

Abdominal Pain (non-traumatic)

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Give nothing by mouth
2) Identify life-threatening causes of abdominal pain

Advanced Care Guidelines

1) Consider pain and nausea control (see Pain Management Protocol)

Altered Mental Status

Revised 2023

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Identify treatable causes
2) Perform appropriate assessment and diagnostics (e.g., oxygen saturation, glucose check) and treat as indicated.
3) If conscious and able to swallow, administer oral glucose if indicated:
   a. **Adult** Dosing:15 grams
   b. **Pediatric** Dosing: 0.5-1 g/kg
4) Evaluate the need for Naloxone (Narcan) 2-4mg IN. May repeat in 3 minutes if needed.
5) Protect patient from complications of altered mental status (e.g., respiratory failure, shock, cardiopulmonary arrest)

Advanced Care Guidelines

1) If patient is unconscious or unable to protect their own airway and blood sugar is less than 60 mg/dl established IV** access and administer **Dextrose** ****Ensure quality IV access. Dextrose can cause significant tissue damage if IV infiltrates**
   Adult dosing 12.5g to 25g Dextrose IV
   a. D50 25-50ml IV *OR*
   b. D10 125ml -250ml IV
   Pediatric dosing 0.5-1g/kg of 10-25% Dextrose IV
   a. 2-4 ml/kg of 25% dextrose IV for those greater than 8 years old *OR*
   b. 5-10 ml/kg of D10 IV *OR*
   c. 2 ml/kg of D10 IV for newborns
2) If no vascular access, administer Glucagon
   Adult dosing
   a. 1 mg IM
   Pediatric dosing
   a. 1mg IM if over 20kg or more than 5 years old
   b. 0.5mg IM if less than 20kg or less than 5 years old
3) Evaluate the need for Naloxone
   Adult dosing
   a. 0.4 – 4.0 mg IV, IO, IM, IN. May repeat Naloxone in 3 minutes if needed
   Pediatric dosing
   a. 0.1mg/kg IV, IM, IN, IO. May repeat Naloxone in 3 minutes up to a total dose of 2mg IV, IM, IO and 4mg IN.
4) Evaluate the need for advanced airway management.

Amputated Part

Reviewed 2022

*****Follow Initial Patient Care Protocol*****
*****Follow Trauma Protocol if indicated*****

Basic Care Guidelines

1) Locate amputated part if possible. It should be transported with patient for possible re-implantation
2) It should remain cool but dry
3) Place the amputated part in a plastic bag
4) Place the bag with the amputated part on ice in a second bag if possible
5) DO NOT let the amputated part come into direct contact with the ice

Pediatric Specific Considerations:

a. External hemorrhage control to prevent shock is critical in infants and young children, due to their relatively small blood volume
b. Most commercial tourniquets can be used effectively on children over 2 years of age
c. Stretch-wrap tuck elastic type tourniquets can be used on any age patient
d. Direct pressure and wound packing may be more suitable for infants and young children
e. Consult with online medical direction regarding the use of traction splints for femur fractures in young children, to avoid the risk of possible nerve damage

Behavioral Emergencies

Revised 2022

*****Follow Initial Patient Care Protocol*****
*****If there is evidence of immediate danger, protect yourself and others by summoning law enforcement to help ensure safety and wait to enter the scene until it is safe to do so*****

Patient Care Goals

1. Provide emergency medical care to the agitated, violent, or uncooperative patient
2. Maximize and maintain safety for the patient, EMS personnel, and others.

Patient Presentation

Inclusion Criteria

Patients of all ages who are exhibiting agitated or violent behavior, are a danger to self or others and in the sole assessment of the EMS clinician require physical and/or pharmacologic restraint to mitigate injury to self or others.

Exclusion Criteria

1. Patients exhibiting agitated or violent behavior due to medical conditions including but not limited to:
    a. Head Injury
    b. Metabolic disorders (e.g., hypoglycemia, hypoxia)

General Treatment and Intervention Guidance

1. Establish patient rapport
    a. Attempt verbal reassurance and calm patient prior to use of pharmacologic and/or physical management devices.
    b. Engage family members/loved ones to encourage patient cooperation if their presence does not exacerbate the patient's agitation

Patient Safety Considerations

The management of violent patients requires a constant reevaluation of the risk/benefit balance for the patient and bystanders to provide the safest care for all involved. These are complex and high-risk encounters. There is no "one size fits all" solution for addressing these patients.

1. Do not attempt to enter or control a scene where physical violence or weapons are present
2. Dispatch law enforcement immediately to secure and maintain scene safety
3. Urgent de-escalation of patient agitation is imperative in the interest of patient safety as well as for EMS personnel and others on scene
4. Uncontrolled or poorly controlled patient agitation and physical violence can place the patient at risk for sudden cardiopulmonary arrest due to the following etiologies:
    a. **Delirium with agitated behavior:** A postmortem diagnosis of exclusion for sudden death thought to result from metabolic acidosis stemming from physical agitation or physical control measures and potentially exacerbated by stimulant drugs (e.g., cocaine) or alcohol withdrawal

b. **Positional asphyxia:** Sudden death from the restriction of chest wall movement and/or obstruction of the airway secondary to restricted head or neck positioning resulting in hypercarbia and or hypoxia.

5. Patients who require physical management should also receive pharmacological treatment for agitation to prevent consequences of delirium with agitated behavior
6. Placement of the stretcher in a sitting position prevents aspiration and reduces the patent's physical strength by placing the abdominal muscles in the flexed position
7. Patients who are more physically uncooperative should be physically secured with one arm above the head and other arm below the waist, and both lower extremities individually secured
8. Direct medical direction should be contacted at any such feasible time for advice, especially when patient's level of agitation is such that transport may place all parties at risk
9. Physical restraints should be soft restraints designed for this purpose
10. Sheets may be utilized if additional stretcher straps are needed and may be necessary to prevent flexion/extension of torso, hips, legs by being placed around the lower lumbar region, below the buttocks, and over the thighs, knees, and legs.
11. At no time should the patient be transported in the prone position with or without hands and feet behind the back (hobbling or "hog-tying')
12. No techniques or devices that constrict the neck or compromise the airway should be used
13. No cot straps or devices should restrict chest wall movement
14. EMS clinicians should not transport patients with key-locking devices (handcuffs) in place unless the agency who placed them accompanies the patient to the hospital. Advanced clinicians should consider pharmacological management medications then remove and replace with soft restraints.
15. PMS should be checked often with any physical restraints in place

Basic Care Guidelines

1) Note medications/substances on scene that may contribute to the agitation, or may be relevant to the treatment of a contributing medical condition
2) Maintain and support airway
3) Note respiratory rate and effort – If possible, monitor pulse oximetry and EtCO2
4) Asses circulatory status:
   a. Blood pressure (if possible)
   b. Pulse rate
   c. Capillary refill
5) Assess mental status
   a. Check blood glucose (if possible)
6) Obtain temperature (if possible)
7) Assess for evidence of traumatic injuries

Advanced Care Guidelines

1) Apply a cardiac monitor as soon as possible

2) All patients who have received pharmacologic management medications must be monitored closely for the development of hypoventilation and oversedation

3) Utilize capnography if available

4) **For severe anxiety**, consider a benzodiazepine such as **Diazepam**
   Adults:
   a. 5 mg IV (2–5-minute onset of action)
      OR
   b. 10 mg IM (15–30-minute onset of action)
   Pediatrics:
   a. 0.05-0.1 mg/kg IV (maximum dose is 5 mg)
      OR
   b. 0.1-0.2 mg/kg IM (maximum dose is 10 mg)

5) **For excited delirium or a high violence risk** use **Ketamine**,
   Adults:
   a. 2 mg/kg IV; (1 minute onset of action)
      OR
   b. 4 mg/kg IM; (3–5-minute onset of action)
   Pediatrics:
   a. 1 mg/kg IV; (1 minute of onset of action)
      OR
   b. 3 mg/kg IM; (3–5-minute onset of action)

Breathing Difficulty

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*****Follow Initial Patient Care Protocol*****

Patient Care Goals

1. Maintain a patent airway
2. Provide effective oxygenation and adequate ventilation using the least invasive possible method to achieve these goals paired with pulse oximetry and (EtCO2) if available
3. Anticipate, recognize and alleviate respiratory distress
4. Provide necessary interventions quickly and safely to patients with the need for respiratory support
5. Anticipate, identify, and plan for a potentially difficult airway
6. Optimize the patient for any advanced airway attempts.

Key Considerations

1. Oxygen is a drug with an appropriate dose range and undesirable effects from both too much and too little supplementation. Effective oxygenation meets the oxygen saturation target set for that specific patient in the context of their acute and chronic medical condition. Permissive hypoxia (SPO2>90%) may be appropriate in patients with COPD or other complex respiratory pathology.
2. Adequate ventilation provides sufficient minute ventilation to meet the patient's acute respiratory and metabolic needs and is generally titrated to an EtCO2 goal
3. EtCO2 is not indicated for every patient with shortness of breath. Rather, it is a monitoring and decision-making tool for patients with significant respiratory distress where interpretation of the capnography waveform and EtCo2 values assist in determining the appropriate course of treatment as well as the patient's response.

Inclusion Criteria

1. Patients with signs of respiratory distress (i.e., Asthma, COPD, etc.) or respiratory failure

Basic Care Guidelines

Treatment and Interventions

1. Generally, the approach is to implement the interventions below in an escalating fashion to meet the patient care goals above.
2. **Administer oxygen if needed** for air hunger or respiratory distress and titrate to a target SPO2 of 94-98%. Depending on patient presentation, this may be accomplished with a nasal cannula, nonrebreather or BVM at appropriate rates.
3. **Utilize an OPA, NPA or SGA if needed** to maintain a patent airway and make BVM ventilation more effective.
4. **During CPR, maximal oxygen supplementation should be provided if possible**

Advanced Care Guidelines

1. **Non-invasive ventilation (NIV)** should be considered early for severe respiratory distress or impending respiratory failure. CPAP or BiPAP if available should be considered if no patient contraindications are present.
2. **Endotracheal intubation** when less-invasive methods are ineffective or inappropriate, consider endotracheal intubation to maintain oxygenation and/or ventilation.
3. **Needle Cricothyroidotomy** is a reasonable option for patients who cannot be oxygenated/ventilated effectively using any of the above interventions, if the provider has competency and training in the procedure, and the risk of death for not escalating airway management seems to outweigh the risk of a procedural complication

Basic Care Guidelines

1) If a patient has a physician prescribed, hand-held, metered dose inhaler:
    a. Assist the patient in administering a single dose if they have not done so already
    b. Reassess the patient and assist with a second dose, if necessary, per medical direction

Advanced Care Guidelines *Adult*

1) Administer DuoNeb (Albuterol 2.5 mg and Atrovent 0.5 mg in 3 mL NS) by nebulizer with 8 liters per minute of oxygen. May repeat DuoNeb or Albuterol up to 5.0 mg via nebulizer as needed for ongoing respiratory distress.
2) Evaluate the need for 0.3 mg of epinephrine, 1:1,000 concentration
3) Evaluate the need for Solu-Medrol, 40-125 mg IV/IM
4) Evaluate the need for Magnesium Sulfate, 2 grams in 100ml NS given over 20 minutes
5) Evaluate the need for advanced airway management

Advanced Care Guidelines *Pediatric*

1) Administer Albuterol by nebulizer with 8 liters per minute of oxygen. May repeat Albuterol as needed for ongoing respiratory distress.
2) Evaluate the need for Epinephrine 0.01mg/kg not to exceed the adult dosage
3) Evaluate the need for Magnesium Sulfate, 40mg/kg, not to exceed the adult dosage, in 100ml NS given over 20 minutes
4) Refer to the length-based tape for approved references
5) Evaluate the need for advanced airway management

Burns

Revised 2022

General Burn Guidelines

*****Follow Initial Patient Care Protocol. Providers should also consider <u>possible</u> trauma in addition to the burns, inhalation exposures such as carbon monoxide and cyanide and possible pediatric or elder abuse situations*****

1) Stop the burning process
2) Do not use any type of ointment, lotion, or antiseptic
3) Maintain normal patient temperature
4) Transport according to the Out-of-Hospital Trauma Destination Decision Protocol (Appendix B)

Basic Care Guidelines

1) Continually monitor the airway for evidence of obstruction or impending obstruction.
2) High flow O2 should be considered for any burn patient rescued from an enclosed space.
3) Estimate percent of body surface area injured (BSA) using the "Rule of 9's" and depth of injury. First-degree/superficial burns are not included in TBSA calculations.
4) Remove smoldering clothing and jewelry; expose the area
5) Leave blisters intact
6) Cover the burned area loosely with plastic wrap or a clean, dry dressing

Advanced Care Guidelines ***<u>Adult & Pediatric</u>***

1) Monitor SPO2, EtCo2 and EKG.
2) Establish an IV of NS. **<u>For severe burns if shock is suspected</u>**, consider administering a 500 mL bolus of normal saline for adults & 20ml/kg for pediatrics not to exceed the adult dose.
3) Contact medical control for further fluid administration orders.
4) Follow Pain Management Protocol

<u>Chemical Burns</u>

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Don the appropriate PPE and attempt to identify the contaminant
2) Brush off powders prior to flushing. A lint roller may also be used to remove powders prior to flushing.
3) Immediately begin to flush with large amounts of water
4) Continue flushing the contaminated area while enroute to the receiving facility
5) Do not contaminate uninjured areas while flushing

Advanced Care Guidelines

1) Follow Pain Management Protocol

Toxin in Eye

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Flood eye(s) with lukewarm water and have patient blink frequently during irrigation. Use caution not to contaminate other body areas.
2) Attempt to identify contaminant

Advanced Care Guidelines

1) Establish an IV if indicated and infuse normal saline as patient condition warrants
2) Follow Pain Management Protocol

Electrical Burns

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Treat soft tissue injuries associated with burns using dry dressings
2) Treat for shock if indicated

Advanced Care Guidelines

1) Follow Pain Management Protocol
2) Monitor ECG

Cardiac Arrhythmias

Revised 2023

*****Follow Initial Patient Care Protocol*****

IF NO PULSE:

Basic Care Guidelines

1) Immediately begin high quality CPR following current AHA guidelines, apply AED, follow device prompts
2) Compression only CPR is appropriate if unable to support airway while applying and using AED
3) May place appropriate airway if unable to adequately ventilation patient noninvasively if:
    a. It does not interrupt compressions
    b. Return of spontaneous circulation is achieved
4) May apply mechanical compression device (if available) after ensuring high quality compressions and application of the AED. An emphasis should be placed on minimizing interruptions in chest compressions.
5) Evaluate the need for Naloxone (Narcan) 2-4mg IN, may repeat in 3 minutes if needed.

Advanced Care Guidelines

1) Immediately perform high quality CPR following current AHA guidelines, apply monitor and check rhythm as soon as possible

VENTRICULAR FIBRILLATION / VENTRICULAR TACHYCARDIA

Defibrillation

2) ***Adult***:
   Defibrillate at manufacturer's specification if known, otherwise 200 joules biphasic & immediately resume CPR for two minutes.
   Pediatric:
   Defibrillate at 2j/kg & immediately resume CPR. Weight estimation should be obtained from the length-based tape if not known. Repeat defibrillations should be at 4j/kg for all following defibrillations if needed after each 2-minute check.

3) Evaluate and treat underlying causes

Medications

Epinephrine

4) ***Adult:***
   Administer 1.0 mg of epinephrine every 3-5 minutes

   Pediatric:
   Administer 0.01 mg/kg (0.1ml) of epinephrine every 3-5 minutes, 1:10,000 concentration, max dose of 1mg per each individual administration. Refer to the length-based tape for more information.

Amiodarone

5) Consider Amiodarone for refractory pulseless v-tach or v-fib.

   Adult: 300 mg IV/IO. May repeat at 150 mg in 5 minutes after initial dose if needed

   Pediatric: 5mg/kg IV/IO not to exceed the adult does. *May repeat 5mg/kg dose after 5-minute periods X2, if needed for refectory VF/Pulseless VT* Refer to the length-based tape for more information.

Magnesium Sulfate

6) **Adult:** Consider 1-2 grams of Magnesium Sulfate IV/IO delivered 5-10 minutes for Torsades de Pointes
   Pediatric: 50mg/kg IV/IO not to exceed the adult dose.

ASYSTOLE / PEA

7) Evaluate and treat underlying causes

Epinephrine

8) Adult:
Administer 1.0 mg of epinephrine every 3-5 minutes

Pediatric:
Administer 0.01 mg/kg (0.1ml) of epinephrine every 3-5 minutes, 1:10,000 concentration, max dose of 1mg per each individual administration. Refer to the length-based tape for more information

Cardiac Arrythmia WITH PULSE:

Basic Care Guidelines

1) Follow Chest Pain protocol
2) Assess and treat underlying causes

Advanced Care Guidelines

BRADYCARDIA

1) ***If symptomatic***:

   Adult
   Administer **Atropine at 0.5 mg** IV or IO every 3-5 minutes as needed to a maximum dose of 3.0 mg
2) Initiate transcutaneous pacing if blood pressure is less than 90 mmHg systolic, if atropine is unsuccessful, or atropine administration is not immediately available.
   OR
3) Consider administration of epinephrine at 2-10 mcg/min IV or IO

Pediatric

4) If patient is unresponsive and heart rate is less than 60 despite attempts at adequate ventilation, begin CPR.
5) Administer **0.01 mg/kg (0.1ml) of Epinephrine** IV or IO, every 3-5 minutes, 1:10,000 concentration, max dose of 1mg per each individual administration. Refer to the length-based tape for more information
6) ***For increased vagal tone or primary AV block:***
   Administer **0.02mg/kg Atropine** IV or IO, not to exceed 0.5mg per each individual administration. May repat once if needed. Refer to the length-based tape for more information

TACHYCARDIA

Adults who are symptomatic with rates greater than 150 beats per minute or children with rates greater than 180 beats per minute or infants with rates greater than 220 beats per minute)

7) If patient is unstable:
   a. Perform synchronized cardioversion (consider sedation) if available but do not delay synchronized cardioversion if immediately needed. Follow AHA guidelines.
8) If patient is stable with *narrow QRS*:
   a. Perform vagal maneuvers
   b. If vagal maneuvers do not resolve the issue administer ***Adenosine***:

      Adult: 6 mg rapid push IV. May be repeated at 12 mg after 2 minutes.

      Pediatric: 0.1mg/kg not to exceed 6mg, rapid push IV. May be repeated at 0.02mg/kg not to exceed 12mg, rapid push IV. Refer to the length-based tape for more information.
9) If patient is stable with *wide QRS*:

   Adult
   a. Consider administration of adenosine at 6 mg IV.
      OR
   b. Consider administration of amiodarone at 150 mg over 10 minutes IV or IO

   Pediatric
   c. Consider administration of adenosine 0.1mg/kg not to exceed 6mg, rapid push IV or IO. Refer to the length-based tape for more information.
   d. Consider administration of amiodarone 5mg/kg not to exceed 150mg IV or IO over 10 minutes. Refer to the length-based tape for more information.

   e. Consider expert consultation with medical control.

10) For atrial fibrillation with rapid ventricular response with a ventricular rate >140 beats per minute, consider:

   Adult
   a. Metoprolol (Lopressor) 5 mg IV, give over 3-5 minutes
      If condition persists, contact medical control for additional assistance

Chest Pain

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Place patient in a position of comfort, loosen tight clothing, and provide reassurance. If the patient is complaining of shortness of breath, has signs of respiratory distress, or pulse oximetry is less than 94%, titrate oxygen to symptom improvement or to maintain oxygen saturation of 94-98%

2) If capability exists, obtain a 12 lead ECG and transmit to the receiving facility and/or medical control for interpretation as soon as possible. An initial management goal is to identify STEMI and transport the patient to the most appropriate facility

3) If patient is alert and oriented and expresses no allergy to aspirin assist the patient by having them chew non-enteric aspirin 324 mg. Amount may be reduced as needed if patient has already taken aspirin within the past 12 hours so long as a total of 324mg has been taken.

4) Evaluate if erectile dysfunction or pulmonary hypertension medications have been taken in the past 24-48 hours including: Sildenafil (Viagra, Revatio), Vardenafil (Levitra, Staxyn), or Avanafil (Stendra), Tadalafil (Cialis, Adcirca).

5) If the patient has not taken any of these above medications in the last 48 hours and has a systolic blood pressure of 100 mmHg or above, assist the patient in self-administering one dose of nitroglycerin. (Patient's nitro dose only).

6) Repeat one dose of nitroglycerin in 5 minutes if pain continues and systolic blood pressure is 100 mmHg or above.

7) Reassess patient and vital signs following each dose of nitroglycerin.

Advanced Care Guidelines

11) Monitor EKG-evaluate for evidence of STEMI and treat dysrhythmias.

12) If STEMI is present, determine appropriate destination.
    a. If transport time to a facility capable of providing emergency PCI care is 60 minutes or less, it is recommended that all of these patients be transported directly to the emergency PCI capable facility.
    b. If transport time to a facility capable of providing emergency PCI care is between 60 - 90 minutes, transport to the PCI capable facility should be considered.

13) Establish IV access at TKO rate unless otherwise ordered or indicated.

14) Administer nitroglycerin (tab or spray) 0.4 mg sublingually if systolic blood pressure 100 mmHg or above for symptoms of chest pain or atypical cardiac pain. May repeat every 3-5 minutes if systolic blood pressure is 100 mmHg or above.

15) If ST segment changes exist, consider administration of nitroglycerin (Tridil®) infusion. Initiate 5-10 microgram per minute infusion.
    a. Titrate infusion in 5 microgram increments until:
        i. Pain is relieved
        ii. Systolic blood pressure is <100 mmHg
        *****IV infusion pump must be used*****
        *****Vented IV tubing must be used*****

16) Care should always be taken when giving nitroglycerin when the patients' blood pressure is marginal. The clinician should weigh the risk and benefit of nitrate administration over the administration of an opiate analgesic and be ready to respond to hypotension with fluid bolus or pressor.

17) If pain continues after administration of nitroglycerin and systolic blood pressure remains above 90 mmHg administer:
    c. Fentanyl 25-50 mcg IV may repeat every 5 minutes to a maximum dose of 200 mcg.
    d. If Fentanyl is not available, Morphine 1-2mg IV every 5-10 minutes may be used instead, up to a maximum of 10mg. Morphine should be used with caution in unstable angina (UA)/non-STEMI due to an association with increased mortality.

18) For atrial fibrillation with rapid ventricular response with a ventricular rate >140 beats per minute, consider:
    b. Metoprolol (Lopressor) 5 mg IV, give over 3-5 minutes
    *****If condition persists, contact medical control for additional assistance*****

19) Continually monitor for signs of clinical deterioration.

20) If time permits, perform serial 12-Lead EKG's if clinical changes are noted

21) Consider placing defibrillator pads on high-risk patients

Childbirth

Revised 2022

*****Follow Initial Patient Care Protocol*****

Patient Care Goals

1. Obtain necessary history to plan for birth and resuscitation of the newborn
2. Recognize imminent birth
3. Plan for resources based on number of anticipated patients (e.g., mother and child or multiple births)
4. Assist with uncomplicated delivery of term newborn
5. Recognize complicated delivery situations (e.g., nuchal or prolapsed umbilical cord, breech delivery, shoulder dystocia) and plan for management and appropriate transport destination
6. Apply appropriate techniques when an obstetric complication exists

Assessment

1. Signs of imminent delivery:
    a. Crowning or other presentation in vaginal opening
    b. Urge to push
    c. Urge to move bowels
    d. Mother's sense of imminent delivery
2. Signs of active labor
    a. Contractions
    b. Membrane rupture
    c. Bloody show

Treatment and Interventions

1. If patient in labor but no signs of imminent delivery, transport to appropriate receiving facility

2. Delivery should be controlled to allow a slow controlled delivery of infant – This will prevent injury to mother
    a. Support the infant's head as needed and apply gentle counterpressure to help prevent the head from suddenly popping out

3. Check for nuchal cord (i.e., around the baby's neck)
    a. If present, slip it over the head
    b. If unable to free the cord from the neck, double clamp the cord and cut between the clamps

4. Do not routinely suction the infant's airway (even with a bulb syringe) during delivery

5. Grasping the head with hand over the ears, gently guide head down to allow delivery of the anterior shoulder

6. Gently guide the head up to allow delivery of the posterior shoulder

7. Slowly deliver the remainder of the infant

8. After 1 minute, clamp cord about 5–6 inches from the abdomen with two clamps; cut the cord between the clamps

    a. If resuscitation is needed, the baby can still benefit from a 1-minute delay in cord clamping. Start resuscitation immediately after birth and then clamp and cut the cord at 1 minute

c. While cord is attached, take care to ensure the baby is not significantly higher positioned than the mother to prevent blood from flowing backwards from baby to placenta

9. Dry, warm, and stimulate infant, wrap in towel and place on maternal chest unless resuscitation needed

10. Resuscitation takes priority over recording APGAR scores. Record APGAR scores at 1 and 5 minutes once neonate is stabilized

11. After delivery of infant, suctioning (including suctioning with a bulb syringe) should be reserved for infants who have obvious obstruction to the airway or require positive pressure ventilation (follow Neonatal Resuscitation Guideline for further care of the infant) The placenta will deliver spontaneously, often within 5–15 minutes after the infant is delivered

    a. Do not force the placenta to deliver; do not pull on the umbilical cord

    b. Contain all tissue in plastic bag and transport

12. After delivery, massaging the uterus (should be located at about the umbilicus) and allowing the infant to nurse will promote uterine contraction and help control bleeding

    a. Estimate maternal blood loss

    b. Treat mother for hypovolemia as needed

13. Transport infant secured to mother with approved neonatal restraint system, in car seat or isolette unless resuscitation is needed

14. Keep infant warm during transport

15. Most deliveries proceed without complications – If complications of delivery occur, apply high flow oxygen to mother and expedite transport to the appropriate receiving facility. Maternal resuscitation is critical for best fetal outcome. Contact medical direction and/or closest appropriate receiving facility for direct medical oversight and to prepare the receiving team.

The following are *recommendations* for specific complications:

a. Shoulder Dystocia – if delivery fails to progress after head delivers, quickly attempt the following

i. Hyperflex mother's hips to severe supine knee-chest position (i.e., McRoberts' maneuver)

ii. Apply firm suprapubic pressure to attempt to dislodge shoulder. This often requires two EMS clinicians to perform and allows for delivery in up to 75% of cases

iii. Attempt to angle baby's head as posteriorly as possible but NEVER pull

iv. Continue with delivery as normal once the anterior shoulder is delivered

b. Prolapsed Umbilical Cord

i. Placed gloved hand into vagina and gently lift head/body off the cord

1. Assess for pulsations in cord, if no pulses are felt, lift the presenting part off the cord

2. Wrap the prolapsed cord in moist sterile gauze

3. Maintain until relieved by hospital staff

ii. If previous techniques are not successful, mother should be placed in prone knee-chest position or extreme Trendelenburg with hips elevated

c. Breech Birth

i. Place mother supine, allow the buttocks, feet, and trunk to deliver spontaneously, then support the body while the head is delivered

ii. If needed, put the mother in a kneeling position which may assist in the delivery of the newborn

iii. Assess for presence of prolapsed cord and treat as above

iv. If head fails to deliver, place gloved hand into vagina with fingers between infant's face and uterine wall to create an open airway. Place your index and ring

fingers on the baby's cheeks forming a "V" taking care not to block the mouth and allowing the chin to be tilted toward the chest flexing the neck

v. When delivering breech, you may need to rotate the baby's trunk clockwise; or sweep the legs from the vagina

vi. Once the legs are delivered support the body to avoid hyperextension of the head; keep the fetus elevated off the umbilical cord

vii. NEVER pull on the body, especially a preterm or previable baby – just support the baby's body while mother pushes when she feels the urge to

d. <u>The presentation of an arm or leg through the vagina is an indication for immediate transport to hospital</u>

e. <u>Nuchal cord</u>

i. After the head has been delivered, palpate the neck for a nuchal cord, if present, slip over the head

ii. If the loop is too tight to slip over the head, attempt to slip the cord over the shoulders and deliver the body through the loop

iii. The cord can be doubly clamped and cut between the clamps; the newborn should be delivered promptly

f. <u>Excessive bleeding during active labor may occur with placenta previa or placental abruption</u>

i. Obtain history from patient – known previa, recent pre-eclampsia symptoms, hypertension history, recent trauma, drug use especially cocaine

ii. Placenta previa most likely will prevent delivery of infant vaginally

iii. Place large bore IV and administer IV fluids as indicated

iv. If available, transfusion or the administration of whole blood as indicated

v. C-Section most likely needed – transport emergently

g. <u>Postpartum hemorrhage</u>

i. Obtain history from patient – history of prenatal or delivery complications, recent trauma, prescription anticoagulants, drug use especially cocaine

ii. Perform fundal massage

iii. Initiate IV fluid resuscitation

iv. Consider administration of **Tranexamic Acid (TXA)** 1 gm IV in 100ml NS or D5W given over 10 minutes if blood pressure is less than 90 mmHg systolic and signs/symptoms of hemorrhagic shock are present

h. Maternal Cardiac Arrest

i. Apply manual pressure to displace uterus from midline

ii. Treat per the Cardiac Arrest Guideline (VF/VT/Asystole/PEA) for resuscitation care (defibrillation and medications should be given for same indications and doses as if non-pregnant patient)

iii. Transport as soon as possible if infant is estimated to be over 24 weeks gestation (perimortem Cesarean section (also known as resuscitative hysterotomy) at receiving facility is most successful if started within 5 minutes of maternal cardiac arrest)

APGAR Score	**0**	**1**	**2**
Appearance:	Blue, Pale	Body pink, Extremities blue	Completely pink
Pulse:	Absent	Slow (less than l00)	≥ 100
Grimace:	No response	Grimace	Cough or Sneeze
Activity:	Limp	Some flexion	Active motion of extremities
Respirations:	Absent	Slow, Irregular	Good, Crying

Congestive Heart Failure (CHF)

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Maintain oxygen saturation 94% - 98%
2) If capability exists, obtain a 12-lead EKG and transmit it to the receiving facility and/or medical control for interpretation prior to patient's arrival
3) Consider nitroglycerin (tab or spray) 0.4 mg sublingually (patients nitro only) if systolic blood pressure 100 mmHg or above. May repeat every 3 to 5 minutes. Maximum of 3 doses.

Evaluate if Erectile Dysfunction or Pulmonary hypertension medications taken in the past 24 hours including: Sildenafil (Viagra, Revatio), Vardenafil (Levitra, Staxyn), or Avanafil (Stendra), Tadalafil (Cialis, Adcirca). Hold nitrates for 48 hours following the last dose

4) Reassess patient and vital signs after each dose of nitroglycerin
5) If capability exists, consider CPAP

Advanced Care Guidelines

1) Monitor EKG and treat arrhythmias
2) Administer nitroglycerin (tab or spray) 0.4 mg sublingually if systolic blood pressure 100 mmHg or above. May repeat every 3 to 5 minutes. Maximum of 3 doses.
3) Consider administration of nitroglycerin (Tridil®) infusion. Initiate 10 microgram per minute infusion.
    a. Titrate infusion in 10 microgram increments until:
        i. Systolic blood pressure is <100 mmHg
        ii. Maximum dose of 50 micrograms per minute is reached
        *****IV infusion pump must be used*****
        *****Vented IV tubing must be used*****

Determination of Death – Withholding Resuscitation Efforts

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic and Advanced Care Guidelines

Resuscitation should be started on all patients who are found apneic and pulseless unless the following medical cause, traumatic injury or body condition clearly indicating biological death (irreversible brain death) exist such as:

1) Signs of trauma are conclusively incompatible with life
    - Decapitation
    - Transection of the torso: the body is completely cut across below the shoulders and above the hips through all major organs and vessels.
    - Incineration: 90% of the body surface area with full thickness burns
    - Injuries incompatible with life such as, massive crush injury or brain matter.
    - In blunt and penetrating trauma if the patient is apneic, pulseless and without other signs of life (movement, EKG activity, pupillary response)
    - Cardiac and respiratory arrest with obvious signs of death including, rigor mortis and dependent lividity
2) Physical decomposition of the body

OR

1) A valid DNR order (form, card, bracelet) or other actionable medical order (e.g. I-POST form) present, when it:
    a. Conforms to the state specifications
    b. Is intact: it has not been cut, broken or shows signs of being repaired
    c. Displays the patient's name and the physician's name

<u>If apparent death is confirmed, continue as follows</u>:

    d. The county Medical Examiner and law enforcement shall be contacted
    e. When possible, contact Iowa Donor Network at 1-800-831-4131.
    f. At least one EMS provider should remain at the scene until the appropriate authority is present
    g. Provide psychological support for grieving survivors
    h. Document the reason(s) no resuscitation was initiated

2) Preserve the crime scene if applicable

Frostbite

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Remove the patient from the cold environment
2) Protect the cold injured extremity from further injury (manual stabilization)
3) Remove wet or restrictive clothing
4) Do not rub or massage
5) Do not re-expose to the cold
6) Remove jewelry
7) Cover with dry clothing or dressings

Advanced Care Guidelines

8) Refer to pain control protocol
9) Consider IV access at a TKO rate. Use warmed IV fluid if possible

Heat Illness

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Remove from the hot environment and place in a cool environment if one is available or simply a shaded area if possible
2) Loosen or remove clothing
3) Place in recovery position
4) Initially cool patient by fanning and cool mist if available
5) Consider cooling patient with cold packs to neck, groin and axilla
6) If alert, stable, and not nauseated, you may have the patient slowly drink small sips of water or other fluids e.g. sports drinks

Advanced Care Guidelines

7) Monitor EKG and treat dysrhythmias following the appropriate protocol(s)
8) Consider IV access at TKO rate or administer fluid bolus as indicated

Hypothermia

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Remove wet clothing
2) If able, check core temperature
3) Handle patient very gently
4) Cover patient with blankets

Advanced Care Guidelines

1) Administer warm IV fluids if available, do not administer cold fluids
2) Monitor EKG and treat dysrhythmias
3) If body temp is confirmed or suspected to be below 86 degrees Fahrenheit
   a. ONLY give epinephrine every 8 minutes if indicated
   b. Defibrillation is indicated ONLY once
   c. Consider spacing other medications used for resuscitation until body temp is returned to a normal level

Nausea and Vomiting

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Obtain history of present illness
2) Limit oral intake to sips

Advanced Care Guidelines

3) Consider fluid bolus IV/IO if evidence of hypovolemia and lung sounds are clear
4) If patient nauseated or is vomiting, consider anti-emetic medication such as ondansetron **(Zofran)**
   Adult: 4 mg IV or PO. May repeat x 1 after 5 minutes
   Pediatric: 0.15 mg/kg IV/PO, follow the length-based tape, not to exceed the adult dose

Pain Control

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Attempt to manage all painful conditions:
    a. Splint extremity injuries
    b. Place the patient in a position of comfort
    c. Hot or Cold packs as needed

Advanced Care Guidelines

2) Consider administration of pain medications for patients that have significant pain, do not have a decreased level of consciousness, are hemodynamically stable, have oxygen saturations above 94% and pain is not a result of active labor.

Toradol

-Adult: 30mg IM or 15 mg IV

-Pediatric: 0.5mg/kg not to exceed the adult dose of 30mg IM or 15mg IV

OR

Fentanyl

-Adult: 1mcq/kg IM, IN, IV or IO. Max initial dose 100 mcq. May repeat as needed as long as patient remains stable and GCS intact.

-Pediatric: 1mcq/kg not to exceed the adult dose.

*If Fentanyl is not available, Morphine may be used instead, 0.1mg/kg with a max cumulative dose of 10mg for adults. Pediatric: 0.05mg/kg not to exceed the adult dose, should follow the length-based tape not to exceed the adult dose. *

3) For severe pain consider anxiolytic medication
    a. **Versed**
    -Adult 0.5-2.5 mg IV /IM/IN repeated every 5 minutes as needed to a max of 5mg
    -Pediatric: Follow length-based tape not to exceed the adult dose.
    OR
    b. **Valium**
    -Adult 2-5 mg IV /IM/IN repeated every 5 minutes as needed to a max of 10 mg
    -Pediatric: 0.1mg/kg Follow length-based tape not to exceed the adult dose.
    OR
    c. **Ketamine**
    -Adult 0.25mg/kg IM/IV/IO maximum initial dose is 25mg. May repeat if needed with a maximum cumulative dose of 100mg. May follow up with 1mg Versed if pt is presenting with post medication hallucinations.
    -Pediatric:0.1mg/kg Follow length-based tape not to exceed the adult dose.

4) The patient must have vital signs taken prior to each dose, after each dose, and be monitored closely

5) After drug administration, reassess the patient using the appropriate pain scale.

6) Use of non-invasive capnography is an earlier predictor of hypoventilation than pulse oximetry alone

7) Consider **Zofran** to prevent nausea
-Adult: 4mg IV/PO
-Pediatric:0.15 mg/kg IV, follow the length-based tape, not to exceed the adult dose

Patient Safety Considerations

1. All patients should have drug allergies identified prior to administration of pain medication

2. Administer opioids with caution to patients with Glasgow Coma Score (GCS) less than 15, hypotension, identified medication allergy, hypoxia (SPO2 less than 90%) after maximal supplemental oxygen therapy, or signs of hypoventilation

3. Opioids are contraindicated for patients who have taken monoamine oxidase inhibitors (MAOI) during the previous 14 days

4. Avoid non-steroidal anti-inflammatory medications such as ibuprofen and ketorolac in patients with NSAID allergy, aspirin-sensitive asthma, renal insufficiency, pregnancy, or known peptic ulcer disease

5. Ketorolac should not be used in patients with hypotension (due to renal toxicity)

6. Use of splinting techniques and application of ice should be done to reduce the total amount of medication used to keep the patient comfortable

Poisoning

Revised 2023

*****Follow Initial Patient Care Protocol*****

1. Identify contaminate and call Poison Control and follow directions given to provide care: 1-800-222-1222
2. Contact Medical Direction as soon as possible with information given by Poison Control and care given

Basic Care Guidelines

1) Attempt to identify substances ingested or exposed by interviewing witnesses. Try to establish the exact time of ingestion, as well as the amount and type of ingestion. Medication containers or chemical labels should be taken with you.

Suspected Opioid Overdose:

a. Support ventilations if needed via bag-valve-mask and oxygen

b. Consider Naloxone (Narcan) If prefilled atomizer device is available: 2-4 mg IN. May repeat in 3 minutes if needed.

Advanced Care Guidelines

2) Initiate IV access for infusion of treatment medications if available
3) Consider fluid bolus of 20ml/kg for hypotension
4) Monitor EKG
5) If patient is agitated refer to behavioral emergency protocol
6) If s/s of possible allergic reaction exists consider
   Diphenhydramine
   Adult: 25-50mg IV/IO or IM
   Pediatric: 1.25mg/kg IV/IO or IM, refer to length-based tape, not to exceed adult dose.

Bradycardia with Unknown Overdose:

c. Consider Atropine 0.5 mg IV every 5 minutes as needed up to total dose of 3 mg.
d. Consider transcutaneous pacemaker

Tachycardia with Unknown Overdose:

e. Consider benzodiazepine such as
   f. Versed 0.5-2.5 mg IV/IM/IN repeated every 5 min as needed to a maximum of 5mg
   OR
   g. Valium 2-5 mg IV /IM/IN repeated every 5 min as needed to a maximum of 10 mg

h. **AVOID** lidocaine and beta-blockers, particularly Labetalol.
i. Cool patients presenting with agitation, delirium, seizure and elevated body temperature

Suspected Opioid Overdose:

j. Support ventilations via bag-valve-mask and oxygen while preparations are made for Naloxone (Narcan) administration

k. Initial dose of Naloxone (Narcan)
Adult: 0.4mg to 4 mg IV/IM/IN. May repeat dose in 3 minutes if needed.
Pediatric: 0.1mg/kg IV/IM/IN. Repeated doses may be required. Max dose 2mg IV/IM and 4mg IN. Refer to the length-based tape and online medical control for further reference if needed.

Calcium Channel Blocker (Norvasc, Cardizem) or Beta Blocker (Atenolol, Lopressor, Inderal) Overdose:

l. Consider Glucagon 1-3 mg slow IV push over 1-2 minutes, may repeat in 10-15 minutes if no response is seen

Digitalis Overdose:

m. Consider normal saline IV
n. Consider Atropine 0.5 mg IV every 5 minutes as needed up to total dose of 3 mg
o. Consider transcutaneous pacemaker

Post Resuscitation Care (with ROSC)

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Maintain oxygen saturation between 94% - 98%
2) Attempt to maintain normal patient temperature
3) If available, obtain blood glucose and treat per altered mental status protocol
4) If capability exists, obtain a 12-lead EKG and transmit it to the receiving facility and/or medical control for interpretation prior to patient's arrival

Advanced Care Guidelines

5) If available, perform waveform capnography, maintaining EtCO2 35-40 mm Hg
6) Treat hypotension per shock protocol
7) Post-cardiac arrest patients with evidence of ST elevation should be transported preferably to a facility capable of emergent cardiac catheterization
8) Continue to monitor blood sugar and treat accordingly
9) Treat seizures accordingly if they develop

Hyperventilation is a significant cause of hypotension and recurrence of cardiac arrest in the post resuscitation phase and must be avoided. Similarly, hypoventilation, suggested by an EtCo2 greater than 40-45 mm Hg contributes to worsening acidosis and may precipitate re-arrest

Seizure and Post Seizure Care

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Monitor and protect airway
2) Administer oxygen as appropriate with a target saturation of 94-98%
3) Assess perfusion
4) Assess neurologic status
5) Check blood sugar, if available, and treat hypoglycemia if present per altered mental status protocol

Advanced Care Guidelines

6) Routes for treatment
    a. IN/IM routes are preferred over IV or IO routes if not already established to treat active seizures. IV/IO routes may be established when possible.
    b. If no other routes are available, rectal (PR) route may be used as an alternative and the appropriate medication choice is Valium Adults: 0.2mg/kg PR with a maximum dose of 20mg. Pediatric: 0.5mg maximum dose of 10mg
    c. Otherwise consider one of the following
    d. Adult and Pediatric: Valium 0.2mg/kg IV/IM/IN titrated until seizure stops or maximum dose of 10 mg is given
    OR
    e. Versed 0.1 mg/kg IV/IO push titrated until the seizure stops or until maximum dose of 4 mg is given
    OR
    f. Versed 0.2mg/kg IM/IN titrated until the seizure stops or until a maximum dose of 10mg is given
7) Check blood glucose level, if available, and treat hypoglycemia if present

8) For febrile seizures, consider the following after stopping the seizure. Please note the administration of Toradol is contraindicated in infants less than 6 months of age. The following interventions provide symptomatic relief for fevers, but do not stop the seizure:
    a. Toradol 0.5mg/kg IV, maximum dose of 15mg IV or 30mg IM.
    b. Remove excessive layers of clothing
    c. Apply cool compresses to the body if needed

9) Consider acquiring a 12-Lead EKG following cessation of seizure in patients without a history of seizure to determine possible cardiac cause

*****Be prepared to treat recurrent seizures*****

Spinal Care

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic and Advanced Care Guidelines

1) This protocol is intended for patients who present with a traumatic mechanism of injury.
2) Patients with penetrating injury to the neck should not be placed in a cervical collar or other spinal precaution regardless of whether they are exhibiting neurologic symptoms or not. Doing so can lead to delayed identification of injury or airway compromise and has been associated with increased mortality.

Patient Management:

3) Assessment while maintaining spinal alignment:
    a. mental status,
    b. neurological deficits,
    c. spinal pain,
    d. tenderness,
    e. evidence of intoxication,
    f. tenderness on palpation or deformities.

Treatment and Interventions:

4) Apply cervical restriction if there is any of the following:
    g. Patient complains of neck pain.
    h. Any neck tenderness on palpation.
    i. Any abnormal mental status, including extreme agitation, or neurological deficit.
    j. Any evidence of alcohol or drug intoxication
    k. There are other severe or painful injuries present.
    l. Any communication barrier that prevents accurate assessment.

Spinal and cervical motion restriction and a long spine board OR full body vacuum splint OR scoop stretcher OR similar device if:

- Patient complains of midline back pain
- Any midline back tenderness

If Extrication is required:

5) From a vehicle: After placing a cervical collar, if indicated, children in a booster seat and adults should be allowed to self-extricate. For infants and toddlers already strapped in a car seat with a built-in harness, extricate the child while strapped in his/her car seat.

6) If a long board is indicated: using the lift and slide (rather than a logroll) technique is preferred.

Helmet Removal

7. If a football helmet needs to be removed, it is recommended to remove the face mask followed by manual removal of the helmet while keeping the neck manually immobilized. Occipital and shoulder padding should be applied as needed, with the patient in a supine position to maintain neutral cervical spine positioning.
8. If available, utilize athletic trainers on scene who have been trained in these specific situations to help prepare the patient for EMS transport.

Note 1: Distracting injuries or altered mental status does not necessitate long spine board use.

Note 2: ***Patients should not routinely be transported on long boards, unless the clinical situation warrants long board use.*** An example of this may be facilitation of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities. In these rare situation, **long boards should be padded or have a vacuum mattress applied to minimize secondary injury to the patient.**

Shock

Revised 2022

*****Follow Initial Patient Care Protocol*****

Hypovolemic Shock (External Bleeding)

Basic Care Guidelines

1) Avoid further heat loss
2) Splint extremities as needed
3) Follow Hemorrhage Control Protocol
   p. Control bleeding with direct pressure. Wounds may need application of a bulky sterile gauze dressing with direct pressure.
   q. Consider application of tourniquet if unable to control hemorrhage with direct pressure
   r. Consider need for wound packing if unable to control hemorrhage with a tourniquet

Advanced Care Guidelines

4) Establish IV/IO access
5) If radial pulse is absent or systolic blood pressure is less than 90 mmHg, administer 20ml/kg, up to 250ml, NS. Repeat as needed to until radial pulse returns or systolic blood pressure reaches 90 mmHg.
6) For adult patients Consider **Tranexamic Acid (TXA)** 1 gm IV in 100ml NS or D5W given over 10 minutes if within first 3 hours of injury and systolic blood pressure is below 90 mmHg.

Hypovolemic Shock (Internal Bleeding)

Basic Care Guidelines

7) Place patient in supine position
8) Consider stabilizing lower extremity fractures
9) Consider use of pelvic stabilizer for pelvis fractures

Advanced Care Guidelines

10) Establish IV/IO access
11) If radial pulse is absent or systolic blood pressure is less than 90 mmHg, administer 20ml/kg, up to 250ml, NS. Repeat as needed to until radial pulse returns or systolic blood pressure reaches 90 mmHg.

Cardiogenic Shock

Basic Care Guidelines

12) Place in position of comfort
13) If capability exists, obtain a 12-lead EKG and transmit it to the receiving facility and/or medical control for interpretation prior to patient's arrival

Advanced Care Guidelines

14) Establish IV/IO access
15) Obtain 12-lead EKG
16) Consider Levophed (norepinephrine) infusion at 1-30 mcg/min IV or IO. Titrate to systolic blood pressure of 90 or greater

Obstructive Shock: Tension Pneumothorax

Basic Care Guidelines

17) Place in position of comfort

Advanced Care Guidelines

18) Perform needle decompression

Obstructive Shock: Pericardial Tamponade

Basic Care Guidelines

19) Place in position of comfort

Advanced Care Guidelines

20) The goal should be to minimize scene time with time critical injuries, including establishing IV access enroute.
21) Administer 20 ml/kg, up to 500ml, NS. Repeat as needed to maintain a systolic pressure of 90 mmHg.

Obstructive Shock: Pulmonary Embolus

Basic Care Guidelines

22) Place in position of comfort
23) Avoid further heat loss

Advanced Care Guidelines

24) Administer 20 ml/kg, up to 500ml, NS. Repeat as needed to maintain a systolic pressure of 90 mmHg
25) If available, obtain 12-lead EKG
26) Evaluate the need for pain and nausea control
27) Refer to the length-based tape for pediatric references
28) If patient is alert and oriented and expresses no allergy to aspirin, consider having patient chew non-enteric aspirin 160 – 325 mg
29) Consider administration of Levophed (norepinephrine) 1-30 mcg/min IV or IO if systolic blood pressure is less than 90 mmHg.

Distributive Shock: Neurogenic

Basic Care Guidelines

30) Place supine
31) Avoid further heat loss

Advanced Care Guidelines

32) Administer 20 ml/kg, up to 500ml, NS. Repeat as needed to maintain a systolic pressure of 90 mmHg
33) Refer to the length-based tape for pediatric references
34) Consider administering Levophed (norepinephrine) infusion at 1-30 mcg/min IV or IO.
    - If symptomatic bradycardia is present and does not respond to the treatments above, consider:
        i. Administering atropine 0.5 mg every 5 minutes, up to 3 mg **OR** consider transcutaneous pacing

Distributive Shock: Anaphylactic

Basic Care Guidelines

35) If the patient has a physician prescribed Auto-Inject Epinephrine assist with administering it for signs of anaphylaxis

Advanced Care Guidelines

36) Administer epinephrine
    Adult: 1:1,000 concentration 0.01 mg/kg IM, up to a single dose of 0.5 mg. May repeat once, maximum total dose 1 mg.
    Pediatric: 0.01mg/kg IM, not to exceed the adult dosage. May repeat once.
37) Administer diphenhydramine
    Adult: 25 – 50 mg IV/IM
    Pediatric 1-2mg/KG IV/IM not to exceed the adult dosage. Use the length-based tape for accurate reference
38) Administer albuterol 2.5mg by nebulizer if respiratory distress
39) Evaluate need for early intubation if severe anaphylaxis
40) For cases of severe anaphylaxis consider administration of epinephrine 1:10,000 concentration 0.3 mg - 0.5 mg IV/IO slowly over 3-5 minutes. Use the length-based tape for accurate pediatric reference

Distributive Shock: Septic

Basic Care Guidelines

41) Maintain oxygen saturation between 94% - 99%
42) Place patient in supine position
43) If temperature is over 102°F/38.9°C, cool patient (i.e. cool sponges)

Advanced Care Guidelines

44) Administer 20 ml/kg, up to 500ml, NS. Repeat as needed to maintain a systolic pressure of 90 mmHg
45) Refer to the length-based tape for pediatric reference
46) If temperature is over 102oF/38.9oC, cool patient
47) Consider administering Levophed (norepinephrine) at 1 mcg/min IV or IO up to 30 mcg/min or to a systolic blood pressure of 90 mmHg or greater.
    - Septic patients may require higher doses to maintain systolic blood pressure
48) Consider administering diphenhydramine 25 – 50 mg IV/IM

Stroke (CVA)

Revised 2022

*****Follow Initial Patient Care Protocol*****

*****Refer to "Appendix G"*****

Basic Care Guidelines

1) Complete a validated stroke exam such as the MEND or Cincinnati exam. Notify receiving facility as soon as possible if stroke is suspected
2) Attempt to determine time of onset or last known well time
   a. Positive stroke scale with time of onset or last known well time of less than 4 ½ hours may be eligible for thrombolytic agents
   b. Positive stroke scale with time of onset or last known well time of less than 24 hours may be eligible for mechanical thrombectomy
3) Check blood glucose, if available
4) Place patient in position of comfort, loosen tight clothing and provide reassurance.
5) If patient is complaining of shortness of breath, has signs of respiratory distress and pulse oximetry of less than 94% then titrate oxygen to maintain a saturation of 94-98%

Advanced Care Guidelines

6) If blood sugar less than 60 mg/dL administer
   a. D50 12.5 - 25 gm IV
      OR
   b. D10 125ml – 250ml IV
   c. If no vascular access, administer glucagon 1 mg IM
7) Monitor patient's level of consciousness and blood pressure every five (5) minutes, and keep patient as calm as possible
8) Obtain IV access and set rate to TKO
9) Do not treat hypertension
10) Obtain EKG
11) Transport should be to a primary stroke center if possible

Termination of Resuscitative Efforts

Revised 2022

Indications to consider termination of resuscitation:

1. Paramedic level care has been initiated to include rhythm analysis and defibrillation if indicated, airway management, and medications given per protocol
2. There is no return of spontaneous circulation or respirations
3. Correctable causes or special resuscitation circumstances have been considered and addressed
4. Patient does not have profound hypothermia
5. Patient has no other signs of life (no response to pain, non-reactive pupils, no spontaneous movement)

   Non-Traumatic Arrest Considerations
6. Asystole or slow wide complex PEA that has persisted for 20 minutes and the EtCO2 is less than 20 mmHg
7. If narrow complex PEA with a rate above 40 or refractory ventricular fibrillation/ventricular tachycardia remain, resuscitation should be considered for up to 60 minutes from the time of dispatch. Termination of efforts may be considered before 60 minutes based on factors including but not limited to, EtCO2 less than 20 mmHg, age, co-morbidities, distance from and resources available at the closest hospital.

Termination of resuscitation:

1. A valid DNR order, such as IPOST, is obtained by the EMS provider at any level
   OR
2. Patient meets all criteria under 'indications' above and as applicable to scope of practice
   a. *On-line medical direction* is contacted (while advanced care continues) to discuss any further appropriate actions.
   b. Advanced care may be discontinued if *physician on-line medical direction* authorizes.

Other considerations:

1. **Documentation must reflect that the decision to terminate resuscitation was determined by *physician on-line medical direction***.
2. An EMS/health care provider must attend the deceased until the appropriate authorities arrive.
3. All IVs, tubes, etc. should be left in place until the medical examiner authorizes removal.
4. Implement survivor support plans related to coroner notification, funeral home transfer, leaving the body at the scene, and death notification/grief counseling for survivors.
5. **Iowa Donor Network should be contacted for Organ and Tissue Donation.**

Safety Considerations

1. All patients over 18 years old who are found in ventricular fibrillation or whose rhythm changes to ventricular fibrillation should in general have full resuscitation continued on scene if possible. This is not intended to prevent transport of these patients, rather it is intended to serve as a reminder of the safety risks to all involved.

Trauma

Revised 2022

*****Follow Initial Patient Care Protocol*****

1) Follow the Out-of-Hospital Trauma Triage Destination Decision Protocol for the identification of time-critical injuries, method of transport and destination decision for treatment of those injuries
2) The goal should be to minimize scene time with time critical injuries, including establishing IVs enroute.

Hemorrhage Control

Basic Care Guidelines

1) Control bleeding with direct pressure. Large gaping wounds may need application of a bulky sterile gauze dressing and direct pressure by hand
2) If direct pressure/pressure dressing is ineffective or impractical, apply a tourniquet to extremity
3) If bleeding site is not amenable to tourniquet placement (i.e. junctional injury), apply a topical hemostatic agent with direct pressure or consider wound packing

Advanced Care Guidelines

4) If radial pulse is absent or systolic blood pressure is less than 90 mmHg, administer 20ml/kg, up to 250ml, NS or LR. Repeat as needed to until radial pulse returns or systolic blood pressure reaches 90 mmHg.
5) For adult patients Consider **Tranexamic Acid (TXA)** 1 gm IV in 100ml NS or D5W given over 10 minutes if within first 3 hours of injury and systolic blood pressure is below 90 mmHg.

Chest Trauma

Basic Care Guidelines

6) Seal open chest wounds immediately. Use occlusive dressing taped down. If the breathing becomes worse, loosen one side of the dressing to release pressure and then reseal
7) Impaled objects must be left in place and should be stabilized by building up around the object with multiple trauma dressings or other cushioning material
8) Take care that the penetrating object is not allowed to do further damage

Advanced Care Guidelines

9) If concerned for symptomatic pneumothorax, perform needle decompression.

Abdominal Trauma

Basic and Advanced Care Guidelines

10) Control external bleeding. Dress open wounds to prevent further contamination
11) Evisceration should be covered with a sterile saline soaked occlusive dressing
12) Impaled objects should be left in place, stabilized with bulky dressings for transport

Head, Neck, and Facial Trauma

Basic Care Guidelines

13) Place the head in a neutral in-line position unless the patient complains of pain or the head does not easily move into this position
14) Closely monitor the airway. Provide suctioning of secretions or vomit as needed. Be prepared to log roll the patient if they vomit.
15) Impaled objects in the cheek may be removed if causing airway problems, or you are having trouble controlling bleeding.
16) Reassess vitals and Glasgow Coma Score (GCS) frequently
17) Consider eye shield for any significant eye trauma. If the globe is avulsed, do not put it back into socket; cover with moist saline dressing and then place cup over it.

Advanced Care Guidelines

18) Consider intubation if GCS is less than 8 or airway cannot be maintained
19) If patient is intubated or has an airway such as the King or LMA, the EtCO2 levels should be continually monitored and maintained at 35 – 40 mmHg if available

Extremity Trauma

Basic and Advanced Care Guidelines

20) Assess extent of injury including presence or absence of pulse
21) Establish and maintain manual stabilization of injured extremity by supporting above and below the injury
22) Remove or cut away clothing and jewelry
23) Cover open wounds with a sterile dressing
24) Do not intentionally replace any protruding bones
25) Apply cold pack to area of pain or swelling
26) If severe deformity of the distal extremity is cyanotic or lacks pulses, align with gentle traction before splinting, and transport immediately

Pediatric Specific Treatment Protocols

Brief Resolved Unexplained Event (BRUE) & Acute Events in Infants

Created 2022

*****Follow Initial Patient Care Protocol*****

Patient Care Goals

1. Recognize patient characteristics and symptoms consistent with a BRUE
2. Promptly identify and intervene for patients who require escalation of care
3. Choose proper destination for patient transport

Basic Care Guidelines

1) Obtain a full history of circumstances and symptoms before, during and after the event
2) Obtain a full patient and family history to include any similar events
3) Perform a full patient assessment to include:
   a. Full set of vital signs (pulse, blood pressure, respiratory rate, skin color and condition, neurologic status. SpO2 and glucose level should be included if available)
   b. Look for and treat any signs of respiratory distress or increased work of breathing
   c. Suction excess secretions from the nose and or mouth if needed
   d. Full head to toe exam, including physical exam for signs of trauma or neglect, pupillary response and the anterior fontanelle

Advanced Care Guidelines

4) Monitor EKG
5) IVs should only be placed for clinical concerns of shock or to administer IV medications

High Risk Criteria

-Less than 2 months of age
-History of prematurity (less than or equal to 32 weeks gestation)
-More than one BRUE, now or in the past
-Event duration greater than 1 minute
-CPR or resuscitation by caregivers or trained rescuers

Contact with medical direction is advised if parent/guardian is refusing medical care and/or transport, especially if any high-risk criteria are present

Newborn Resuscitation and Care

Revised 2022

*****Follow Initial Patient Care Protocol*****

Basic Care Guidelines

1) Suction the airway using a bulb syringe as soon as the head is delivered and before delivery of the body. Suction the mouth first, then the nose
2) Once the body is fully delivered, dry the baby, replace wet towels with dry ones, and wrap the baby in a thermal blanket or dry towel. Cover the scalp to preserve warmth
3) Open and position the airway. Suction the airway again using a bulb syringe. Suction the mouth first, then the nose
4) Assess breathing and adequacy of ventilation
5) If ventilation is inadequate, stimulate by gently rubbing the back and flicking the soles of the feet
6) If ventilation is still inadequate after brief stimulation, begin assisted ventilation at 40 to 60 breaths per minute using a bag-valve-mask device with room air. If no improvement after 30-60 seconds, apply 100% oxygen
7) If ventilation is adequate and the infant displays central cyanosis, administer oxygen at 5 L via blow-by. Hold the tubing 1/2 to 1 inches from the nose
8) If the heart rate is slower than 60 beats per minute after 30 seconds of assisted ventilation with high-flow, oxygen
9) Begin chest compressions at a combined rate of 120/minute (three compressions to each ventilation)

Advanced Care Guidelines

10) If there is no improvement in heart rate after 30 seconds. Perform endotracheal intubation
11) If there is no improvement in heart rate after intubation and ventilation, administer
    a. epinephrine 1:1000 concentration at 0.1 mg/kg (maximum individual dose 10.0 mg) via endotracheal tube,
    b. or epinephrine 1:10,000 concentration at 0.01 mg/kg (maximum individual dose 1.0 mg) IV/IO
    c. Repeat epinephrine at the same dose every 3 to 5 minutes as needed
12) Initiate transport. Reassess heart rate and respirations enroute

If the heart rate is between 60 & 80 beats per minute, initiate the following actions:

13) Continue assisted ventilation with high-flow, 100% concentration oxygen. If there is no improvement in heart rate after 30 seconds, initiate management sequence described in step H above, beginning with chest compressions

14) Initiate transport. Reassess heart rate and respirations enroute

If the heart rate is between 80 & 100 beats per minute, initiate the following actions:

15) Continue assisted ventilation with high-flow, 100% concentration oxygen. Stimulate as previously described
16) Initiate transport. Reassess heart rate after 15 to 30 seconds

If the heart rate is faster than 100 beats per minute, initiate the following actions:

17) Assess skin color. If central cyanosis is still present, continue blow by oxygen. Initiate transport. Reassess heart rate and respirations enroute

If thick meconium is present:

18) Initiate endotracheal intubation before the infant takes a first breath. Suction the airway using an appropriate suction adapter while withdrawing the endotracheal tube. Repeat this procedure until the endotracheal tube is clear of meconium. If the infant's heart rate slows, discontinue suctioning immediately and provide ventilation until the infant recovers

Note: If the infant is already breathing or crying, this step may be omitted

Key Considerations

1. Approximately 10% on newly born infants require some assistance to begin breathing at birth and 1% require resuscitation to support perfusion
2. Most newborns require only drying, warming and stimulating to help them transition from fetal respiration to newborn respiration. The resuscitation sequence can be remembered as **Dry, Warm, and Stimulate – Ventilate – Evaluate – and Resuscitate**
3. Blow-by oxygen is appropriate with a heart rate above 100 BPM and no signs of respiratory distress or apnea, especially if central cyanosis is present.
4. Bag-Valve Mask ventilation should be utilized if heart rate is 60-100 BPM or any signs of respiratory distress/apnea are present
5. Bag-Valve-Mask ventilation and Chest Compressions should be performed if heart rate is less than 60 BPM

Projected Pulse Oximetry in Infants Over Time

Time Since Birth	Projected Increase
1 minute	60-65%
2 minutes	65-70%
3 minutes	70-75%
4 minutes	75-80%
5 minutes	80-85%
10 minutes	85-90%

Measuring the pulse oximetry on the right hand provides the most accurate oxygen saturation in infants that are transitioning from fetal to normal circulation. Both hypoxia and excess oxygenation can result in harm to the infant. If prolonged oxygen is required, titrate to maintain an SpO2 of 85-95%

EMS Protocol Appendices

Appendix A - EMS Out-of-Hospital Do-Not-Resuscitate Protocol

Purpose: This protocol is intended to avoid unwarranted resuscitation by emergency care providers in the out-of-hospital setting for a qualified patient. There must be a valid Out-Of-Hospital Do-Not-Resuscitate (OOH DNR) order signed by the qualified patient's attending physician or the presence of the OOH DNR identifier indicating the existence of a valid OOH DNR order.

No resuscitation: Means withholding any medical intervention that utilizes mechanical or artificial means to sustain, restore, or supplant a spontaneous vital function, including but not limited to:

1. Chest compressions
2. Defibrillation,
3. Esophageal/tracheal/double-lumen airway; endotracheal intubation, or
4. Emergency drugs to alter cardiac or respiratory function or otherwise sustain life.

Patient criteria: The following patients are recognized as qualified patients to receive no resuscitation:

1. The presence of the uniform OOH DNR order or uniform OOH DNR identifier, or
2. The presence of the attending physician to provide direct verbal orders for care of the patient.

The presence of a signed physician order on a form other than the uniform OOH DNR order form approved by the department may be honored if approved by the service program EMS medical director. However, the immunities provided by law apply only in the presence of the uniform OOH DNR order or uniform OOH DNR identifier. When the uniform OOH DNR order or uniform OOH DNR identifier is not present contact must be made with on-line medical control and on-line medical control must concur that no resuscitation is appropriate.

Revocation: An OOH DNR order is deemed revoked at any time that a patient, or an individual authorized to act on the patient's behalf as listed on the OOH DNR order, is able to communicate in any manner the intent that the order be revoked. The personal wishes of family members or other individuals who are not authorized in the order to act on the patient's behalf shall not supersede a valid OOH DNR order.

Comfort Care (♥): When a patient has met the criteria for no resuscitation under the foregoing information, the emergency care provider should continue to provide that care which is intended to make the patient comfortable (a.k.a. ♥ **Comfort Care**). Whether other types of care are indicated will depend upon individual circumstances for which medical control may be contacted by or through the responding ambulance service personnel.

♥ Comfort Care may include, but is not limited to:

1. Pain medication.
2. Fluid therapy.
3. Respiratory assistance (oxygen and suctioning).

Qualified Patient means an adult patient determined by an attending physician to be in a terminal condition for which the attending physician has issued an Out of Hospital DNR order in accordance with the law. Iowa Administrative Code 641-142.1 (144A) Definitions.

Appendix B: Adult Out-Of-Hospital Trauma Triage Destination Decision Protocol

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
- Suspected pelvic fractures
- Crushed, degloved, mangled, or pulseless extremity
- Open or depressed skull fracture
- Amputation proximal to wrist or ankle
- Paralysis or Paresthesia
- Partial or full thickness burns > 10% TBSA or involving face/airway

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
- EMS provider judgment
- Low impact mechanisms (e.g. ground level falls) might result in severe injury
- ETOH/Drug use
- Pregnancy > 20 weeks
- 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.

Pediatric Out-Of-Hospital Trauma Triage Destination Decision Protocol

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
- Suspected pelvic fractures
- Crushed, degloved, mangled, or pulseless extremity
- Open or depressed skull fracture
- Amputation proximal to wrist or ankle
- Paralysis or Paresthesia
- Partial or full thickness burns > 10% TBSA or involving face/airway

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
- >10 feet 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
- Anticoagulants and bleeding disorders
- Patients with head injury are at high risk for rapid deterioration
- EMS provider Judgment
- ETOH/Drug use

Transport to the nearest **(Any 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

Appendix C: Physician on Scene

Your offer of assistance is appreciated. However, this EMS service, under law and in accordance with nationally recognized standards of care in Emergency Medicine, operates under the direct authority of a Physician Medical Director. Our Medical Director and physician designees have already established a physician-patient relationship with this patient. To ensure the best possible patient care, and to prevent inadvertent patient abandonment or interference with an established physician-patient relationship, please comply with our established protocols.

Please review the following if you wish to assume responsibility for this patient:

1. You must be recognized or identify yourself as a qualified physician.
2. You must be able to provide proof of licensure and identify your specialty.
3. If requested, you must speak directly with the on-line medical control physician to verify transfer of responsibility for the patient from that physician to you.
4. EMS personnel, in accordance with state law, can only follow orders that are consistent with the approved protocols.
5. You must accompany this patient to the hospital, unless the on-line medical control physician agrees to re-assume responsibility for this patient prior to transport.

Appendix D: Air Medical Transport - Utilization Guidelines for Scene Response

These guidelines have been developed to assist with the decision making for use of air medical transport by the emergency medical services community. The goal is to match the patient's needs to the timely availability of resources in order to improve the care and outcome of the patient from injury or illness.

Clinical indicators:

1. Advanced level of care need (skills or medications) exists that could be made available more promptly with an air medical tier versus tiering with ground ALS service, and further delay would likely jeopardize the outcome of the patient

2. Transport time to definitive care hospital can be significantly reduced for a critically ill or injured patient where saving time is in the best interest of the patient

3. Multiple critically ill or injured patients at the scene where the needs exceed the means available

4. EMS Provider 'index of suspicion' based upon mechanism of injury and patient assessment

Difficult access situations:

1. Wilderness or water rescue assistance needed

2. Road conditions impaired due to weather, traffic, or road construction / repair

3. Other locations difficult to access

The local EMS provider must have a good understanding of regional EMS resources and strive to integrate resources to assure that ground and air services cooperate as efficiently and effectively as possible in the best interest of the patient.

Medical directors for ambulance services should assure that EMS providers are aware of their own service's abilities and limitations given the level of care and geographic response area being served. Audits should be conducted on an ongoing basis to assure that utilization of regional resources (ground and air) is appropriate in order to provide the level of care needed on a timely basis.

Appendix E: Intentionally Blank

Appendix F: Fibrinolytic Checklist

This checklist should be completed for patients suffering from Acute Coronary Syndromes and/or-STEMI. This tool will be used to triage patients to the appropriate receiving facility, and provide a template for passing information on to the receiving facility. Fibrinolytic screening may be done at the EMT level; however, the decision to bypass a local hospital to transport to a Percutaneous Coronary Intervention (PCI) capable facility is reserved for the Paramedic level.

Any **YES** findings will be relayed to medical control. **Absolute Contraindications** preclude the use of fibrinolytics. **Relative Contraindications** require consultation with medical control.

DATE: PATIENT AGE: MALE FEMALE INCIDENT/RECORD #:	**YES**	**NO**
ABSOLUTE CONTRAINDICATIONS		
Any known intracranial hemorrhage?		
Known structural cerebral vascular lesion?		
Ischemic stroke within 3 months EXCEPT acute ischemic stroke within 3 hours?		
Suspected aortic dissection?		
Active bleeding or bleeding diathesis (excluding menses)?		
Significant closed head trauma or facial trauma within 3 months?		
RELATIVE CONTRAINDICATIONS		
History of chronic, severe, poorly controlled hypertension?		
Severe, uncontrolled hypertension on presentation (S >180mmHg or D>110mmHg)		
History of prior ischemic stroke >3 months, dementia, or known intracranial pathology?		
Traumatic or prolonged (>10 min) CPR or major surgery (<3 weeks)		
Non-compressible vascular punctures?		
Pregnancy?		
Active peptic ulcer?		
Current use of anticoagulants?		
EMS Provider Print Name: Signature:		

Appendix G: Strategies for Reperfusion Therapy: Acute Stroke

Reperfusion Therapy Screening Not Limited to Paramedic Level

This appendix should be used for suspected acute stroke. This tool will be used to triage patients to the appropriate receiving facility, and provide a template for passing information to the receiving facility.

1. Perform a validated stroke assessment such as the MEND exam.

2. If assessment is positive for stroke, and onset of symptoms can be established within the past 4.5 hours, then determine the appropriate destination:
    a. If transport time to a Primary Stroke Center is less than 30 minutes, it is recommended that all of these patients be transported directly to the Primary Stroke Center
    b. If transport time to a Primary Stroke Center is greater than 30 minutes, then transport to the nearest stroke capable hospital.

3. Consider the use of air transport if it will facilitate the arrival of the acute stroke patient for treatment within 4.5 hours to a Primary Stroke Center or stroke capable hospital.

4. If transport to a Primary Stroke Center or stroke capable hospital cannot be achieved to arrive within 4.5 hours, then transport to the closest appropriate facility.

5. In all instances, those patients requiring immediate hemodynamic or airway stabilization should be transported to the closest appropriate facility.

6. Complete the fibrinolytic checklist-Appendix F

Levels of Stroke Care Capacity:

Comprehensive Stroke Center: Hospitals that have been certified by the Joint Commission-accredited acute care hospitals and must meet all the criteria for Primary Stroke Certification

Primary Stroke Center: Hospitals that have been certified by the Joint Commission on Hospital Accreditation or an equivalent agency to meet Brain Attack Coalition and American Stroke Association guidelines for stroke care

Stroke capable hospital: Hospitals that have the following:

- rt-PA readily available for administration
- Head CT, laboratory and EKG capabilities 24/7
- Process in place for transporting appropriate patients to a Primary Stroke Center
- Stroke protocol in place that follows American Stroke Association guidelines
- Emergency department coverage by physician, or advanced practitioner

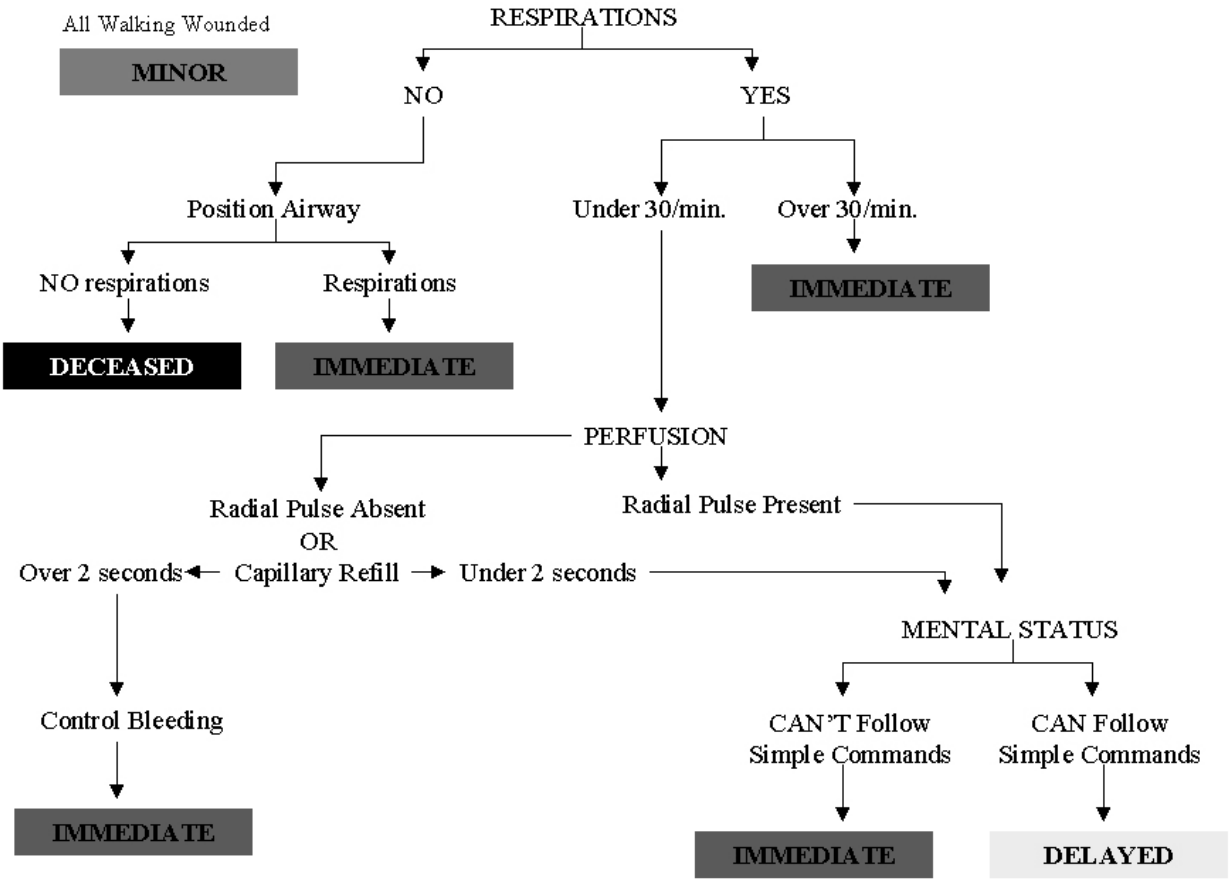
Appendix H: Simple Triage and Rapid Treatment (START)

S T A R T

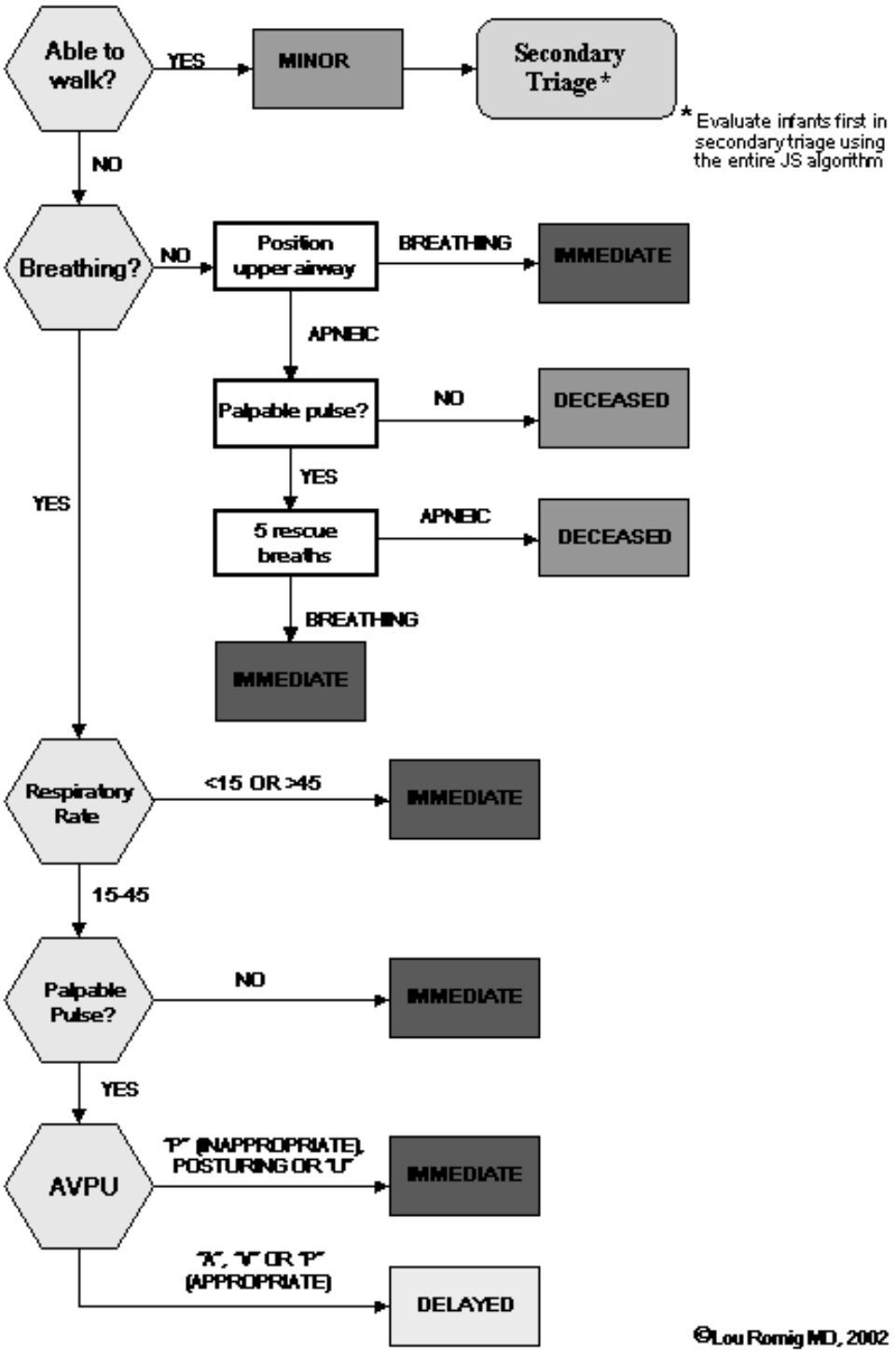
The following are guidelines for initial tactical triage using the START method. START is most useful in initially clearing the disaster zone where there are numerous casualties. **It focuses on respiration rate, perfusion, and mental status and takes under one minute to complete.** Once the patient moves toward a higher level of care (evacuation), a more detailed approach to triage may be needed.

Respirations
Perfusion
Mental Status

Green = Minor/Ambulatory
Yellow = Delayed
Red = Immediate
Black = Deceased/Expectant



Appendix H: Pediatric Triage (JUMP START)



Appendix I: Suspected Abuse, Assault, Neglect, Maltreatment

a) Provide reassurance
b) Contact local law enforcement if not present
c) Provide appropriate medical care per protocol
d) Do not burden patient with questions about the details of the assault
e) Be alert to immediate scene and document what you see.
f) Touch only what you need to touch at the scene
g) Do not disturb any evidence unless necessary for treatment of patient. (If necessary to disturb evidence, document why and how it was disturbed.)
h) Preserve evidence; such as clothing you may have had to remove for treatment, and make sure that it is never left unattended at any time, to preserve "chain of evidence"
i) Provide local referrals as available
j) Communicate vital information only – additional info can be given to receiving RN and/or Physician on arrival
k) Record observations and factual information on run report

Pediatric Considerations:

a) Approach child slowly in order to establish rapport (except in life-threatening situations), then perform exam
b) Provide appropriate medical care per protocol
c) Genital exam only if indicated in the presence of blood, known or obvious injury and or trauma
d) Interview parents separate from child, if possible
e) Transport if permitted by parents
f) If parents do not allow transport, notify law enforcement for assistance

Report all suspected abuse to the pediatric and dependent adult hotline at 1-800-362-2178 within 24 hours of your contact of the patient. This will be an oral report only. Within 48 hours of oral reporting, you must submit a written report for all suspected abuse to the Iowa Department of Human Services

Appendix J: Guidelines for Initiating Organ and Tissue Donation

1. All appropriate patient care protocols will be enacted to assure patient care is provided according to prevailing standards.

2. If resuscitation efforts are unsuccessful or if upon arrival the patient is deceased and without indications to initiate resuscitation, then on-line medical direction will be contacted to confirm that no further medical care is to be given.

3. As per Iowa Code 142C.7 a medical examiner or a medical examiner's designee, peace officer, fire fighter, or emergency medical care provider may release an individual's information to an organ procurement organization, donor registry, or bank or storage organization to determine if the individual is a donor.

4. As per Iowa Code 142C.7 any information regarding a patient, including the patient's identity, however, constitutes confidential medical information and under any other circumstances is prohibited from disclosure without the written consent of the patient or the patient's legal representative.

5. At least one EMS provider should remain at the scene until the appropriate authority (medical examiner, funeral home, public safety, etc.) is present.

6. Contact Iowa Donor Network at 800-831-4131

Appendix K: Guidelines for Providers Responding to Patient's with Special Needs

This protocol is not intended for interfacility transfers

These guidelines should be used when an EMS provider, responding to a call, is confronted with a patient using specialized medical equipment that the EMS provider has not been trained to use, and the operation of that equipment is outside of the EMS provider's scope of practice. The EMS provider may treat and transport the patient, as long as the EMS provider doesn't monitor or operate the equipment in any way while providing care.

When providing care to patients with special needs, EMS personnel should provide the level of care necessary, within their level of training and certification. When possible, the EMS provider should consider utilizing a family member or caregiver who has been using this equipment to help with monitoring and operating the special medical equipment if necessary during transport.

Some examples of special medical devices:

- PCA (patient controlled analgesic)
- Chest Tube

Appendix L: EMS Approved Abbreviations

ā	before
ABC	airway, breathing, circulation
ALS	advanced life support
AMI	acute myocardial infarction
amps	ampules
ASA	aspirin
AT	atrial tachycardia
AV	atrioventricular
bicarb	sodium bicarbonate
BID	twice a day
BLS	basic life support
BP	blood pressure
BS	blood sugar
c̄	with
CAD	coronary artery disease
CC	chief complaint
cc	cubic centimeter
CCU	coronary care unit
CHB	complete heart block
CHF	congestive heart failure
cm	centimeter
CNS	central nervous system
c/o	complains of
CO	carbon monoxide
C02	carbon dioxide
COPD	chronic obstructive pulmonary disease
CPR	cardiopulmonary resuscitation
CSF	cerebral spinal fluid
CVA	cerebral vascular accident
D/C	discontinue
DOA	dead on arrival
D5W	5% dextrose in water
Dx	diagnoses
ED	emergency department
EKG/ECG	electrocardiogram
Epi	epinephrine
ER	emergency room
ET	endotracheal
ETOH	alcohol
fib	fibrillation
fl	fluid
fx	fracture
GI	gastrointestinal
gm	gram
gr	grain
gt(t)	drop(s)
h, hr	hour
hx	history
ICU	intensive care unit
IM	intramuscular
IV	intravenous
Kg	kilogram
KVO	keep vein open
L	liter
LOC	level of consciousness
LR	lactated ringers
*M*gtt	microdrip
MD	medical doctor
mEq	milliequivalents
mg	milligram
MI	myocardial infarction
min	minute
ml	milliliter
mm	millimeter
MS	morphine sulfate
NaCI	sodium chloride
NaHCO3	sodium bicarbonate
NG,N/G	nasogastric
nitro	nitroglycerine
NPO	nothing by mouth
NS	normal saline
NSR	normal sinus rhythm
NTG	nitroglycerine
0_2	oxygen
OB	obstetrics
OD	overdose
OR	operating room
P	pulse
p	after
PAC	premature atrial contraction
PAT	paroxysmal atrial tachycardia
PCR	patient care record
PE	physical exam, pulmonary edema
pedi	pediatric
PERL	pupils equal, reactive to light
PJC	premature junctional
po	by mouth
pr	per rectum
prn	whenever necessary, as needed
PVC	premature ventricular contraction
q	every
QID	four times a day
R	respirations
R/O	rule out
RN	registered nurse
Rx	treatment
s̄	without
SC	subcutaneous
Sec	second
SL	sublingual
SOB	shortness of breath
SQ	subcutaneous
STAT	immediately
s/s	sign, symptoms
SVT	supraventricular tachycardia
Sx	symptoms
TIA	transient ischemic attack
TID	three times a day
TKO	to keep open
VF	ventricular fibrillation

Appendix M: Guidelines for New Protocol Development

Making a decision to develop a new protocol or evaluate an existing one should be based on a rational process. Questions that should be asked and answered when considering a new drug therapy or procedure are as follows:

Key Questions for any New Protocol

1. Is the drug therapy or procedure medically indicated and safe?
2. Is it within the scope of practice for the provider?
3. How specifically will this protocol benefit patient care?
4. What specifically is needed to implement this protocol (education/training, medical director protocol development/authorization, equipment needs, etc.)?
5. How will this protocol impact operation?
6. What is the opinion of providers concerning this protocol?
7. Does the medical community support this protocol change?
8. What are all the costs versus benefits associated with implementation and maintenance?
9. What are the medical-legal implications?
10. What ongoing provider involvement such as skills maintenance and continuous quality improvement is necessary?
11. How will success be measured?

Rational Protocol Development Process to Make the Right Protocol Decision

1. Study the issue thoroughly
2. Identify key questions
3. Compare with goals
4. Assess fit with system
5. Cost benefit analysis
6. Identify measuring tools

Stakeholders in this process are recognized to include, but not be limited to:

1. Medical direction (on-line and off-line)
2. Educators/training programs
3. Regulators of policy and rules
4. Service directors
5. Service providers
6. Consumers
7. Third party payers

Procedure Reference and Medication Formulary

EZ-IO AD & EZ-IO PD INFUSION SYSTEM

TRAINING:
The EZ-IO AD & EZ-IO PD infusion systems require specific training prior to use.

INDICATIONS:
EZ-IO AD (40kg and over) EZ-IO PD (3-39kg)

1) Immediate vascular access in emergencies.
2) Intravenous fluids or medications are urgently needed and peripheral IV cannot be established in 2 attempts or 90 seconds **AND** the patient exhibits one or more of the following:
    a. An altered metal status (GCS of 8 or less)
    b. Respiratory compromise (SaO2 90% or less after appropriate oxygen therapy, respiratory rate of <10 or >40 min.
    c. Hemodynamic instability (Systolic BP of <90)
3) EZ-IO AD & EZ-IO PD should be considered **PRIOR** to peripheral IV attempts in the following situations:
    a) Cardiac arrest (medical or trauma)
    b) Profound hypovolemia with alteration of mental status
    c) Patient with immediate need for delivery of medications or fluids.

CONTRAINDICATIONS

a) Fracture of the bone selected for IO infusion. (Consider alternate site)
b) Excessive tissue at insertion site with the absence of anatomical landmarks.
c) Previous significant orthopedic procedures. (IO within 24 hours, prosthesis)
d) Infection at the site selected for insertion. (Consider alternate site)
e) Previous failed IO attempts in same bone

CONSIDERATIONS
Flow rate: Due to the anatomy of the IO space, flow rates may appear to be slower than those achieved with an IV catheter.

- Ensure the administration of an appropriate rapid **SYRINGE BOLUS (flush)** prior to infusion. **NO FLUSH= NO FLOW**
    - Rapid syringe bolus (flush) the EZ-IO AD with 10 ml of normal saline
    - Rapid syringe bolus (flush) the EZ-IO PD with 5 ml of normal saline

- Repeat bolus flush as needed

- To improve continuous flow rates always use a syringe, pressure bag or infusion pump

Pain: Insertion of the EZ-IO AD & EZ-IO PD in conscious patients has been noted to cause mild to moderate discomfort (usually no more painful than a large bore IV) However, IO infusion for conscious patients has been noted to cause severe discomfort.

- Prior to IO syringe bolus (flush) or continuous infusion in alert patients, SLOWLY administer Lidocaine 2% through the EZ-IO hub. Ensure that patient has no allergies or sensitivity to Lidocaine.
    - EZ-IO AD SLOLWY administer 20-40mg Lidocaine 2%
    - EZ-IO PD SLOWLY administer 0.5mg/kg Lidocaine 2%

PRECAUTIONS:
The EZ-IO AD & the EZ-IO PD are not intended for prophylactic use

EQUIPMENT:
EZ-IO Driver
EZ-IO AD or EZ-IO PD Needle Set
Alcohol or Betadine Swab
EZ-Connect or Standard Extension Set
10ml Syringe
Normal Saline (or suitable sterile fluid)
Pressure Bag or Infusion Pump
2% Lidocaine
EZ-IO Yellow wristband

PROCEDURE: *If the patient is conscious, advise of EMERGENT NEED for this procedure and obtain informed consent*

1. Wear appropriate BSI precautions
2. Determine EZ-IO AD or EZ-IO PD indications
3. Rule out contraindications
4. Locate appropriate insertion site (Proximal Tibia, Distal Tibia or Proximal Humerus)
5. Prepare insertion site using aseptic technique
6. Prepare the EZ-IO driver and appropriate needle set
7. Stabilize site and insert appropriate needle set
8. Remove EZ-IO driver from needle set while stabilizing catheter hub

9. Remove stylet from catheter, place stylet in shuttle or approved sharps container
10. Confirm placement
11. Connect primed EZ-Connect
12. Slowly administer appropriate dose of Lidocaine 2% IO to conscious patients
13. Syringe bolus (flush) the EZ-IO catheter with the appropriate amount of normal saline
14. Utilize pressure (syringe bolus, pressure bag or infusion pump) for continuous infusions where applicable
15. Begin infusion
16. Dress site, secure tubing and apply wristband as directed
17. Monitor EZ-IO site and patient condition
18. Remove Catheter within 24 Hour

KING LTS-D AIRWAY

1. Indications

A. A need to secure an airway and provide ventilation for patients who are unconscious, have no gag reflex and are over 4 feet tall (sizes 3, 4 & 5).

B. This is a secondary/bridge device for the EMT-P/PS levels to be used when attempts to manage the airway with endotracheal intubation are unsuccessful or improbable.

C. This is the primary airway device for FR-EMT-I levels. In the event the King LTS-D cannot be successfully placed, manual BVM with an OPA and high flow O2 should be used.

D. EMT-P/PS levels: if this device has been placed upon your arrival to the scene it shall be the primary airway of choice for patients in cardiac arrest. Should the device be improperly placed or inadequate to secure the patients airway, orotracheal intubation may then be attempted. Orotracheal intubation remains the primary airway of choice for all other patients if time and resources permit.

2. Procedure

A. Choose the correct size airway, based on patient height.

1. Size 3(yellow) 4-5 feet tall.
2. Size 4(red) 5-6 feet tall.
3. Size 5(purple) greater than 6 feet tall.

B. Test the cuff inflation system by injecting the maximum recommended volume of air into the cuffs. Remove all air from both cuffs prior to insertion.

1. Size 3- 60ml.
2. Size 4- 80ml.
3. Size 5- 90ml.

C. Apply a water-based lubricant as needed to the beveled distal tip and posterior aspect of the tube taking care to avoid introduction of lubricant in or near the ventilatory openings.

D. Have a spare King LTS-D ready and prepared for immediate use.

E. Pre-oxygenate / ventilate the patient.

F. Ensure gag reflex is not intact.

G. Position the head. The ideal position is the “sniffing position”, however in cases of trauma neutral position is acceptable.

H. Hold the airway at the connector with the dominant hand. With non-dominant hand, hold mouth open and apply tongue/jaw lift.

I. With the airway rotated 45-90 degrees laterally (outward), introduce the device in to the corner of the mouth and advance until the tip is under the base of the tongue. Rotate the airway medially back to upright position and in to the midline position in the mouth. Advance the airway, without using excessive force, until the base of the colored connector is even with the teeth/gums. It is better to insert the device too deep initially and withdraw as needed for proper ventilation.

J. Inflate the cuffs to 50-70 ml. Using a standard luer-tipped syringe, use minimum amount of pressure necessary to seal the airway at the peak ventilatory pressure employed. (See maximum amounts above.)
K. Check lung ventilation by auscultation, chest movement and verification of CO2 by capnography or CO2 detector if available. Bagging should be able to be done with relative ease.
L. If ventilation is not sufficient, gently retract the airway 1cm at a time to achieve optimal ventilation and easy bagging. Add 10-20 ml of additional cuff volume as needed to ensure proper seal. Do not exceed the maximum cuff volume indicated for each size.
M. Depth markings are provided at the proximal end of the airway which refers to the distance from the distal ventilatory opening. When properly placed, with the distal tip and cuff in the esophagus, and the ventilatory openings aligned with the opening to the larynx, the depth markings give an indication of the distance, in centimeters, from the vocal cords to the teeth.
N. Secure the airway using an appropriate tube holder such as the Thomas ET holder.
O. Monitor End Tidal CO2 if available

3. Removal
A. Removal should always be carried out with suction equipment and intubation equipment readily available for use.
B. It is important that both cuffs are completely deflated before removal.

4. Contraindications
A. Responsive patients with an intact gag reflex.
B. Patients with known esophageal disease.
C. Patients who have ingested caustic substances.

5. Considerations
A. The King LT does not protect the airway from the effects of regurgitation and aspiration.
B. Intubation of the trachea cannot be ruled out as a potential complication.
C. Lubricate only the posterior surface of the airway.
D. Medications cannot be given down this airway

OROTRACHEAL INTUBATION

1. Assemble all equipment (ET tube, blades/handle, syringe, stylette, lubricant, confirmation devices, bag-valve, suction)
2. Position patient supine with head hyperextended (maintain manual in-line stabilization for suspected/know cervical spine trauma)
3. Hyper oxygenate the patient with 100% oxygen for at least one minute; avoid excessive tidal volumes
4. May consider directing an assistant to perform a Sellick maneuver
5. Insert the laryngoscope blade into right side of the mouth, sweeping the tongue to the left, and lift to visualize the vocal cords; avoid a rocking motion/contact with the upper teeth
6. Insert the endotracheal tube under direct visualization, seeing the tube pass through the vocal cords, and advancing it so the cuff lies **just below** the vocal cords, <u>if difficulty in visualization exists, consider use of bougie device.</u>
7. Inflate the cuff.
8. Confirm placement of the endotracheal tube

<u>Primary Confirmation Techniques</u>

A. Direct visualization of tube passing through the vocal cords

B. Observation of bilateral chest rise and fall with each ventilation and exhalation and ABSENCE of breath sounds over the epigastric region

C. Auscultation with a stethoscope to verify the presence of breath sounds with each ventilation over: □Right and left sides of the anterior chest and □Right and left midaxillary lines

<u>Secondary Confirmation Techniques</u>

A. Positive end-tidal capnography/capnometry

B. Esophageal detector device (immediate re-expansion of deflated bulb attached to ET tube; false positives may occur with the morbidly obese/late pregnancy patient, copious tracheal secretions, status asthmaticus, or gastric inflation from BVM)

C. In the event that esophageal placement is suspected, IMMEDIATELY remove the tube and provide BVM until tracheal intubation or alternative airway placement (i.e., Combitube, KING) can be achieved

9. Prevent dislodgement by securing the endotracheal tube with a commercial tracheal tube holder; note/document placement at the front teeth (typically approx. 22 cm.) and at commercial tube holder
10. Apply cervical collar and place patient on long spineboard with head blocks to prevent dislodgement
11. A maximum of 3 intubation attempts may be made, depending upon the patient's clinical situation. In the event that endotracheal intubation is NOT achieved and the patient has no contraindications, place a Combitube or KING airway
12. Monitor End Tidal CO2 if available

BLOOD GLUCOSE MONITORING

Services who choose to provide Glucose Monitoring shall follow the guidelines set out by the Clinical Laboratory Improvement Amendment (CLIA) and follow a protocol approved by the service program's medical director. To order a C.L.I.A. waiver form call 319-335-4500.

Indications:

1. Known diabetic with signs & symptoms of blood sugar derangements
2. Altered mental status
3. Signs/symptoms of a stroke, to rule out hypoglycemia

Precautions:

1. Use approved procedure to minimize exposure to infectious agents by the patient and the provider
2. Correlate reading with patient's clinical condition

Procedure:

Obtain a fresh blood sample from the patient by either of the following:

1. Capillary technique
    a. Clean fingertip thoroughly with alcohol pad
    b. Puncture fingertip and allow a large drop of blood to form
    c. Wipe puncture site with clean, dry 2x2
    d. Allow large drop of blood to form again to place on reagent/test strip
2. Venous technique
    a. Using sterile procedure, draw/acquire small blood sample from the IV catheter/needle for testing

Interpretation:

1. Visual: perform visual interpretation according to manufacturer's guidelines
2. Metered: obtain metered reading according to manufacturer's guidelines
3. Correlate reading with the patient's clinical condition

PULSE OXIMETRY PROCEDURE

Application of the pulse oximeter is not a priority in the initial management of the critically ill or injured patient. The pulse oximeter can be used to help monitor the patient's oxygenation after the usual procedures to stabilize the patient are completed (ABC's management).

Procedure/Treatment:

1. Start treatment based on initial assessment to stabilize the patient while applying pulse oximeter.
2. Position patient comfortably and support dependent extremity to be used for monitoring.
3. Remove fingernail polish. Polish can falsely alter saturation.
4. Attach sensor probe to finger or bridge of nose. May also use the earlobe or toes.
5. Oxygen should be titrated to maintain a reading of 94-98%

Potential problems:

1. Inaccuracy if O2 saturation less than 70%.
2. Possible interference with ambient light.
3. Presence of carboxyhemoglobin will produce normal reading in the presence of severe tissue hypoxemia.

Measurements can be difficult to get in the presence of vasoconstriction, hypotension and anemia.

MAINTENANCE OF NON-MEDICATED IVs

I. DISCONTINUING AN IV:

A. Procedure

1. Advise or receive orders from medical direction to discontinue IV.
2. Take appropriate BSI precautions.
3. Explain procedure to the patient and/or family members.
4. Turn off IV fluid by closing pressure wheel on administrative tubing.
5. Remove tape and other securing material from IV tubing and catheter.
6. Remove IV catheter and administration tubing still connected.
7. Cover the puncture site with an alcohol wipe, 2x2, or 4x4 and hold pressure until bleeding stops.
8. Cover wound with appropriate dressing
9. Discard IV administration set, fluid, and catheter in an approved fashion.
10. Document discontinuance of IV.

II. CHANGING IV FLUIDS:

A. Rationale

1. During long distance transfers.
2. Change of fluids by medical direction.

B. Procedure

1. Check orders/authorization for change of IV fluids from medical direction.
2. Check for correct IV fluid.
3. Take appropriate BSI precautions.
4. Prepare new IV solution, remove covers.
5. Turn off IV flow rate by closing pressure wheel on administration tubing.
6. Invert IV container, remove the IV container to be changed from the administration set, maintaining a sterile environment.
7. Invert the new solution container; puncture the replacement solution container with spike of administration set.
8. Turn IV container over (upright).
9. Fill drip chamber of administration set to marked line if needed.
10. Adjust IV flow rate to desired amount.
11. Reassess IV site and flow.
12. Discard used IV container in an appropriate manner.
13. Document procedure.

III. Precautions

1. Do not allow an IV to "run dry".
2. If the drip chamber is empty, will need to "bleed" air from the tubing before adjusting the IV flow rate.

12-LEAD ELECTROCARDIOGRAM ACQUISITION

Purpose:
1. To obtain a diagnostic quality 12 Lead ECG for the patient with a suspected acute cardiac event.

Indications:
1. Chest pain or pressure in any patient over age 25
2. Syncopal episode in any patient over age 25
3. Unexplained respiratory distress
4. Atypical cardiac pain (i.e., shoulder, arm, or jaw pain in absence of chest pain, especially in patients with past cardiac history or irregular pulse. Check for history of illicit drugs such as cocaine and methamphetamine use
5. Suspected Stroke

Precautions:
1. Care must be taken to avoid an unnecessary extension of scene time
2. Obvious ECG changes may or may not be present in the patient experiencing an acute myocardial infarction. Patients on whom a 12 Lead ECG is performed should be strongly encouraged to accept transport by ambulance to a hospital.

Contraindications:
1. On scene 12 Lead ECG acquisition of the unstable patient
2. On scene 12 Lead ECG acquisition of the critically unstable trauma patient

Procedure:
1. Turn monitor “ON”
2. Assure limb and precordial leads are appropriately connected to monitor
3. Prepare patient’s skin for electrode application by:
    a. Shaving excessive hair at the electrode site
    b. Cleaning oily or dirty skin with an alcohol pad, then drying briskly
    4. Avoid locating electrodes over tendons and major muscle masses
5. Identify electrode sites and apply electrodes as follows:
a. RUE or RA-right arm
b. LUE or LA-left arm
c. RLE or RL-right leg
d. LLE or LL-left leg

Precordial Lead Placement
1. V1-Fourth intercostal space to the right of the sternum
2. V2-Fourth intercostal space to the left of the sternum
3. V3-Directly between leads V2 and V4
4. V4-Left fifth intercostal space, midclavicular line
5. V5-Level with V4, left anterior axillary line

6. V6-Level with V5, left midaxillary line

Acquisition

1. Encourage the patient to relax all muscles and remain as still as possible; prevent any tension on ECG cable
2. Be sure patients correct age and sex are entered in the monitor, push acquire; acquisition takes approximately 10 seconds
    a. 12 Lead ECG will automatically print
    b. Avoid acquiring ECG in a moving vehicle unless pt is unstable
3. Activate a **"Cardiac Alert"** in patients with 12 Lead ECG ST elevation of > 1mm in 2 or more contiguous leads and transport the patient lights and sirens to a receiving facility with interventional cath lab capabilities.
4. If capability exists, transmit the 12 Lead ECG to the receiving hospital

ELECTRICAL CARDIOVERSION

Purpose:
To restore an effective heart rhythm in the **hemodynamically unstable** patient with tachycardia. The unstable condition MUST be related to the tachycardia.
Signs and symptoms of instability may include:
1. Chest pain
2. Shortness of breath
3. Decreased level of consciousness
4. Hypotension
5. Shock
6. Pulmonary congestion; CHF
7. Acute MI

Indications:
1. Ventricular Tachycardia with a pulse
2. Supraventricular tachycardia
3. Atrial Fibrillation/Atrial Flutter

Precautions:
1. Delay of cardioversion because of problems with synchronization resulting in worsening patient condition
2. Risk of thromboembolic complications (i.e., stroke) in patients with history of atrial fibrillation duration > 48 hours

Procedure:
1. Consider sedation for the alert patient such as Morphine 2-5mg slow IVP, Valium 5-10mg slow IVP, or other benzodiazepines.
2. Turn on defibrillator
3. Attach monitor leads to the patient
4. Place defibrillation pads on the patient as directed by the manufacturer
5. Engage the synchronization mode by pressing the “sync” control button
6. Look for markers on the “R” waves indicating sync mode
7. If necessary, adjust monitor gain/EKG size until sync markers occur with each R wave
8. Set initial joules to:
   Adult 50-100J for SVT or A-Flutter, Pediatric:0.5j/kg
   Adult 100J for Ventricular Tachycardia, Pediatric 1j/kg
   Adult 120J for Uncontrolled A-fib

Announce to team members: “Charging defibrillator…stand clear”
9. Press “Charge” button
10. When the defibrillator is charged, announce the shock
11. Press and hold the “shock” button
12. Check the monitor. If tachycardia persists, increase the joules in a stepwise fashion, 100J, 120J, 150J, 200J and consult medical direction.
13**. Remember to reset the sync mode after EACH synchronized cardioversion; most defibrillators default back to the unsynchronized mode. This default allows an immediate shock if the cardioversion produces VF. If sync is retained remember to shut it off if VF presents.**

PACING, EXTERNAL DEMAND CARDIAC

INDICATIONS: A qualified EMS provider* may use this skill for the following:
a. Profound bradycardia with hemodynamic compromise.

PRECAUTIONS:
a. Not to be used on children under 12 unless Medical Control ordered.
b. The patient must be monitored with both the defibrillation/pacing pads and the patient electrode cable.

CONTRAINDICATIONS: Noninvasive pacing is contraindicated for the treatment of ventricular fibrillation. Severe hypothermia is a relative contraindication to pacing a patient with bradycardia.

SPECIAL CONSIDERATION: Patients with implantable pacemakers may require higher energy and rate.

PROCEDURE:
BRADYCARDIC PATIENTS
1.Turn on pacemaker
2. Set the rate @ 60-80 BPM start the amperage @ 0mA
3. Assess the patient for both mechanical and electrical capture.
4. Increase the output in 10 mA increments until mechanical capture occurs; this will be dependent upon the electrical resistance of the patient. Following capture, back amperage down in increments of 2-5 mA to ensure lowest possible setting.
5. The patient will experience pain or discomfort with this and should be provided with sedation per guidelines if time allows and pt is stable enough to wait for sedation
6. The adjustment of the amperage to maintain capture maybe necessary with prolonged use or with increased discomfort of the patient.
If at any point the **BRADYCARDIA** paced patient goes into either V-fib or V-tach, immediately shut pacer off and proceed to deliver defibrillation as normal with the defibrillator portion of the unit.

NEEDLE CRICOTHYROTOMY

Indications: A trained Paramedic may use this skill when unable to gain airway access by other means, or there is an upper airway obstruction.

Contraindications:
1. Pre-existing laryngeal pathology.
2. Anatomical barriers
3. Anticoagulation therapy.

Complications:
1. Injury to surrounding tissue. 2. Hemorrhage.3. Infection.4. Edema.5. Aspiration of blood. 6. Subcutaneous and mediastinal emphysema.

Procedure/Treatment:
1. Stabilize the patient's head in the neutral position.
2. Identify the cricothyroid membrane and prepare the skin.
3. Stabilize the cricoid and thyroid cartilages with the nondominant hand.
4. Once the cricothyroid membrane has been identified, insert the 14 or smaller gauge (larger diameter) gauge over-the needle catheter device just below the midpoint of the cricothyroid membrane with the needle angled at 45 degrees caudally.
5. Withdraw the needle carefully while advancing the plastic catheter caudally into the trachea.
6. Aspirate with the attached 10 cc syringe.
7. Attach the hub of the catheter to a prepared ventilation device.

Prepared Ventilation Device
A. While the end of a #3 ETT tube is the preferred device, one prong of a nasal cannula may be attached as a last resort or if a #3 ETT end is not readily available, occlude the other prong of the nasal cannula during ventilation.
B. Turn oxygen to 15 liters per min
C. Ventilate with a #3 ETT **end** connected and ventilation rate of 12/min. at a **1:4** ratio to allow for exhalation.

Reference the length-based tape for Pediatric Patient References

NEEDLE THORACOSTOMY

Indications: A trained Paramedic may use this skill for respiratory compromise associated with one or more of the following:
1. Tension Pneumothorax.
2. Absent or greatly decreased breath sounds over the hemothorax area.
3. Trachea shifted to unaffected side and/or JVD.
4. Subcutaneous emphysema.
5. Multiple rib fractures.

Procedure/Treatment:
1. If possible, perform this procedure when en route to the receiving facility, lights and sirens
2. Expose and cleanse anterior chest at level of the 2nd intercostal space on the affected side.
3. Find 2nd intercostal space midclavicular line with gloved finger.
4. Using 14 gauge over-the-needle catheter and syringe attached direct needle **over** the third rib into the 2nd intercostal space.
5. Apply enough pressure to push the needle through the intercostal muscle and into the pleural cavity.
6. You should pull back air in the syringe or if no syringe on the needle you should hear a rush of air, either of these should be considered a positive placement.
7. Remove the needle leaving catheter in place and securing with tape.
8. Connect to one-way valve.
9. Assess patient for improvement in status.

Reference the length-based tape for Pediatric Patient References

CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

Purpose:
Continuous Positive Airway Pressure has been shown to rapidly improve vital signs, gas exchange, the work of breathing, decrease the sense of dyspnea, and decrease the need for endotracheal intubation in the patients who suffer from shortness of breath from congestive heart failure and acute carcinogenic pulmonary edema. CPAP is also shown to improve dyspnea associated with pneumonia, (COPD) chronic obstructive pulmonary disease (asthma, bronchitis, & emphysema). In patients with CHF, CPAP improves hemodynamics by reducing preload and afterload.

Indications:
Dyspnea / Hypoxemia secondary to congestive heart failure (CHF), acute carcinogenic pulmonary edema pneumonia, (COPD) - chronic obstructive pulmonary disease (asthma, bronchitis, emphysema) and:

A. Any patient who is complaining of shortness of breath for reasons other than pneumothorax
B. Is awake and oriented
C. Has the ability to maintain an open airway (GCS>10)
D. Has a systolic blood pressure above 90 mmHg
E. Uses accessory muscles during respirations
F. Sign and Symptoms consistent with asthma, COPD, pulmonary edema, CHF, or pneumonia

Contraindications
Do NOT use if patient has:

1. Pneumothorax
2. Tracheostomy
3. Respiratory arrest
4. Agonal respirations
5. Unconscious
6. Shock associated with cardiac insufficiency
7. Penetrating chest trauma
8. Persistent nausea/vomiting
9. Facial anomalies / stroke obtundation / facial trauma

10. **Pediatrics – Do not use for children under 12 years of age**

Precautions:
Use care if patient:

A. Has impaired mental status and is not able to cooperate with the procedure
B. Had failed at past attempts at non-invasive ventilation
C. Has active upper GI bleeding or history of recent gastric surgery
D. Complains of nausea or vomiting
E. Has inadequate respiratory effort
F. Has excessive secretions
G. Has facial deformity that prevents the use of CPAP mask
H. CPAP should not be used with portable 02 because of the large amount of oxygen it takes to operate the device
I. Use Intubation if:
    a. Respiratory or cardiac arrest
    b. Unresponsive to verbal stimuli (GCS is <9)

Procedure:

1. Make sure the patient does not have a pneumothorax!
2. Place patient in a sitting position
3. Assess vital signs and SpO2 q5 min
4. Attach heart monitor and pulse oximeter (SA02)
5. If BP <90 systolic contact Medical Control prior to beginning CPAP
6. Use 1-10cmH20
7. Explain the procedure to the patient:
    i. Patient requires “verbal sedation” to be used effectively.
        a. Example: “You are going to feel some pressure from the mask but this will help you breathe easier.”
    ii. Place delivery device over mouth and nose.
    iii. Instruct patient to breath in through their nose slowly and exhale through their mouth as long as possible (count slowly and aloud to four, then instruct to inhale slowly).

8. Check for air leaks
9. Treatment should be given continuously throughout transport to ED.
10. Continue to coach patient to keep mask in place and readjust as needed
11. If respiratory status / level of consciousness deteriorates, remove device and consider bag valve mask ventilation and/or endotracheal intubation (see intubation protocol)
12. Documentation on the patient care record should include:
    a. CPAP level →(10cmH2O) or "PEEP"
    b. F_iO_2 →(100%)
    c. SpO2 q5 minutes
    d. Vital Sign q5 minutes
    e. Response to treatment
    f. Any adverse reactions

Special Notes:

1. Advise receiving hospital as soon as possible so they can prepare for the patient's arrival
2. Do not remove CPAP until hospital therapy is ready to be placed on the patient
3. Most patients will improve in 5-10 minutes. If no improvement, consider positive pressure ventilation
4. Monitor patient for gastric distension which may lead to vomiting
5. Use nitroglycerine tablets if needed – this avoids nitroglycerine spray from being dispersed on patient/EMS crew
6. May be the treatment of choice for a patient with a DNR order

MUCOSAL ATOMIZATION DEVICE PROCEDURE

Step 1:
Assess the patient to ensure the nasal cavity is free of blood or mucous. If these are present, you can:

-Choose a different method to deliver the drug
-Suction the nose prior to drug delivery

Step 2:
Draw up a weight-based dose of medication using the most concentrated form of the drug available. Include MAD nasal dead space of (0.01ml) in your volume.

Step 3:
Insert MAD nasal into nostril apply half the drug to one nostril, repeat in other nostril with remainder of the drug. Be sure to briskly compress the syringe. Failure to briskly compress will fail to automize the medication resulting in a steady flow of liquid which will run into the throat. Gently place your hand on the patients head to help control any movement.

Step 4:
Assess patients' response to the medication and repeat therapy or choose an alternate treatment if needed. Onset is usually within 3-5 minutes with a peak in 10-20 minutes.

Step 5:
Consider the need for IV/IO access if vital signs become unstable or pt has an immediate need for other medications or fluids.

Indications for Use

Drugs delivered with this method are absorbed via the nasal mucosa. Use of a MAD is a safe alternative for delivery of certain medications when IV/IO access is not available, not practical or not needed for long term pt care. Medications which may normally be administered via this method are Ativan, Fentanyl, Morphine, Narcan, Valium and Versed. All approved medications can be administered via MAD regardless of patient age however, per nare ML restrictions should be observed. Typical applications might include:
-Overdose with no IV access
-Pain control with no IV access
-Seizures
-Sedation for medical procedures or Behavioral Problems

Contraindications

-Excessive blood in or bleeding from the nose
-Each administration many not exceed 1 ml per nare with a preference of only 0.5ml per nare.
-Diluted medications

Side Effects

Normal side of effects of each drug remains a possibility. Some drugs especially Versed may cause an uncomfortable burning sensation in the nares which generally resolve in 30-45 seconds and should be explained to the patient.

Materials Needed for Procedure

Basic Care Guidelines

-Prefilled/Supplied MAD device and approved medication to be administered within protocol and providers SOP.

Advanced Care Guidelines

-MAD Nasal Device
-Syringe
-Needle or method of drawing up the medication
-Full Concentration Medication

MEDICATION ASSISTED INTUBATION

ATTEMPT TO CONTACT MEDICAL CONTROL PRIOR TO PREFORMING PROCEDURE

INDICATIONS

- Uncontrolled, obstructed or inadequate airway secondary to trauma or overdose when further sedation is needed.
- Decreased level of consciousness, combativeness or severe agitation secondary to trauma or suspected CVA.
- Combative or uncontrollable head trauma patient that presents potential for injury to self or others.
- CHF, COPD, or asthma patient with hypoxia and or respiratory exhaustion who cannot be easily orally intubated.
- Burn patient with potential or existing respiratory compromise

CONTRAINDICATIONS:

- Hypersensitivity to medications that would be used, (i.e., **VERSED**, **KETAMINE, FENTANYL)**.
- Patients with tissue destructive conditions: crushing injuries>72 hrs old, sepsis
- Patients with muscle wasting conditions: e.g. Parkinson's, Muscular Dystrophy, pre-existing spinal cord injuries resulting in paralysis.

PROCEDURE

Ensure all equipment is set up for intubation. Ensure adequate spinal precautions are taken. Pre-oxygenate with high flow oxygen by mask. Excessive manual ventilation may result in gastric distention with vomiting and aspiration. Be prepared to suction as needed.
If needed, sedate the patient with **Fentanyl** 2.0 mcg/kg IV, max dose of 250 mcg. Adult or Pediatric 1mcq/kg IV not to exceed the max adult dose.
Administer **Versed 2-5mg IV. Refer to length-based tape if needed for Pediatric.**
Administer **Ketamine 2mg/kg IV/IO Adult or Pediatric**
If bradycardia occurs associated with intubation, temporarily halt attempt and oxygenate the patient with BVM and 100% oxygen. If the patient remains bradycardic, consider **ATROPINE** 0.5 mg IV Adult or 0.02mgkg IV Pediatric not to exceed the adult dose.

Continuation of sedation **Versed** 2-5 mg slowly over 1-2 min to desired effect, max of 10 mg. No more than 10 mg used in 30 min period from initial dose. Refer to length-based tape if needed for Pediatric.

EMERGENCY INCIDENT REHABILITATION AKA FIREFIGHTER REHAB

Fire departments wishing to participate in the firefighter rehab program must submit this request in writing and have an agreement for such service on file with the providing agency and the Iowa County Ambulance Service. Fire departments shall utilize their local QRS groups for this service. If no QRS group is available the Iowa County Ambulance Service may provide this service if they are available, i.e. not out on calls. The following general Policy shall be used and may be edited upon medical director approval:

1. PURPOSE
To ensure that the physical and mental condition of members operating at the scene of an emergency or a training exercise does not deteriorate to a point that affects the safety of each member or that jeopardizes the safety and integrity of the operation.

2. SCOPE.
This procedure shall apply to all emergency operations and training exercises where strenuous physical activity or exposure to heat or cold exists.

3. RESPONSIBILITIES.
Incident Commander. The Incident Commander shall consider the circumstances of each incident and make adequate provisions early in the incident for the rest and rehabilitation for all members operating at the scene. These provisions shall include: medical evaluation, treatment and monitoring; food and fluid replenishment; mental rest; and relief from extreme climatic conditions and the other environmental parameters of the incident. The rehabilitation shall include the provision of Emergency Medical Services (EMS) at the Basic Life Support (BLS) level or higher.
Personnel. During periods of hot weather, members shall be encouraged to drink water and activity beverages throughout the workday. During any emergency incident or training evolution, all members shall advise their supervisor when they believe that their level of fatigue or exposure to heat or cold is approaching a level that could affect themselves, their crew, or the operation in which they are involved. Members shall also remain aware of the health and safety of other members of their crew.

4. ESTABLISHMENT OF REHABILITATION AREA.
Responsibility. The Incident Commander will establish a Rehabilitation Area when conditions indicate that rest and rehabilitation is needed for personnel operating at an incident scene or training evolution. An Iowa County EMS Staff member will be placed in charge of the sector and shall be known as the Rehab Officer. The Rehab Officer will typically report to the Logistics Officer in the framework of the incident management system. If no Logistics Officer then report to Incident Commander
Location. The Incident Commander will normally designate the location for the Rehabilitation Area. If a specific location has not been designated, the Rehab Officer shall select an appropriate location based on the site characteristics and designations below

Site Characteristics.

(1) It should be in a location that will provide physical rest by allowing the body to recuperate from the demands and hazards of the emergency operation or training evolution.

(2) It should be far enough away from the scene that members may safely remove their turnout gear and SCBA and be afforded mental rest from the stress and pressure of the emergency operation or training evolution.

(3) It should provide suitable protection from the prevailing environmental conditions. During hot weather, it should be in a cool, shaded area. During cold weather, it should be in a warm, dry area.

(4) It should enable members to be free of exhaust fumes from apparatus, vehicles, or equipment (including those involved in the Rehabilitation Operations).

(5) It should be large enough to accommodate multiple crews, based on the size of the incident.

(6) It should be easily accessible by EMS units.

(7) It should allow prompt reentry back into the emergency operation upon complete recuperation.

Site Designation.

(1) A nearby garage, building lobby, or other structure.

(2) Several floors below a fire in a high rise building.

(3) A school bus, municipal bus, or bookmobile.

(4) Fire apparatus, ambulance, or other emergency vehicles at the scene or called to the scene.

(5) Retired fire apparatus or surplus government vehicle that has been renovated as a Rehabilitation Unit. (This unit could respond by request or be dispatched during certain weather conditions.)

(6) An open area in which a rehab Area can be created using tarps, fans, etc.

Resources.

The Rehab Officer shall secure all necessary resources required to adequately staff and supply the Rehabilitation Area. The supplies should include the items listed below:

(1) Fluids - water, activity beverage, oral electrolyte solutions and ice.

(2) Food - soup, broth, or stew in hot/cold cups.

(3) Medical - blood pressure cuffs, stethoscopes, oxygen administration devices, cardiac monitors, intravenous solutions and thermometers."

(4) Other - awnings, fans, tarps, smoke ejectors, heaters, dry clothing, extra equipment, floodlights, blankets and towels, traffic cones and fire line tape (to identify the entrance and exit of the Rehabilitation Area).

5. GUIDELINES.

a. *Rehabilitation Area Establishment.*

Rehabilitation should be considered by staff officers during the initial planning stages of an emergency response. However, the climatic or environmental conditions of the emergency scene should not be the sole justification for establishing a Rehabilitation Area. Any activity/ incident that is large in size, long in duration, and/or labor intensive will rapidly deplete the energy and strength of personnel and therefore merits consideration for rehabilitation. Climatic or environmental conditions that indicate the need to establish a Rehabilitation Area are a heat stress index above 90 F (see table 1-1) or wind chill index below 10F (see table 1-2).

b. *Hydration.*

A critical factor in the prevention of heat injury is the maintenance of water and electrolytes. Water must be replaced during exercise periods and at emergency incidents. During heat stress, the member should consume at least one quart of water per hour. The re-hydration solution should be a 50/50 mixture of water and a commercially prepared activity beverage and administered at about 40 F. Re-hydration is important even during cold weather operations where, despite the outside temperature, heat stress may occur during firefighting or other strenuous activity when protective equipment is worn. Alcohol and caffeine beverages should be

avoided before and during heat stress because both interfere with the body's water conservation mechanisms. Carbonated beverages should also be avoided.

c. *Nourishment.*

The department shall provide food at the scene of an extended incident when units are engaged for three or more hours. A cup of soup, broth, or stew is highly recommended because it is digested much faster than sandwiches and fastfood products. In addition, foods such as apples, oranges, and bananas provide supplemental forms of energy replacement. Fatty and/or salty foods should be avoided.

d. *Rest.*

The "two air bottle rule," or 45 minutes of work-time, is recommended as an acceptable level prior to mandatory rehabilitation. Members shall re-hydrate (at least eight ounces) while SCBA cylinders are being changed. Firefighters having worked for two full 30-minute rated bottles, or 45 minutes, shall be immediately placed in the Rehabilitation Area for rest and evaluation. In all cases, the objective evaluation of a member's fatigue level shall be the criteria for rehab time. Rest shall not be less than ten minutes and may exceed an hour as determined by the Rehab Officer. Fresh crews, or crews released from the Rehabilitation Area, shall be available in the Staging Area to ensure that fatigued members are not required to return to duty before they are rested, evaluated, and released by the Rehab Officer.

e. ***Recovery.***

5. Members in the Rehabilitation Area should maintain a high level of hydration, Members should not be moved from a hot environment directly into an air conditioned area because the body's cooling system can shut down in response to the external cooling. An air conditioned environment is acceptable after a cool-down period at ambient temperature with sufficient air movement. Certain drugs impair the body's ability to sweat and extreme caution must be exercised if the member has taken antihistamines, such as Actifed or Benadryl, or has taken diuretics or stimulants.

f. ***Medical Evaluation.***

(1) Emergency Medical Services (EMS) - shall evaluate vital signs, examine members, and make proper disposition (return to duty, continued rehabilitation, or medical treatment and transport to medical facility). Continued rehabilitation should consist of additional monitoring of vital signs, providing rest, and providing fluids for rehydration. Medical treatment for members whose signs and/or symptoms indicate potential problems, should be provided in accordance with medical control procedures. EMS personnel shall be assertive in an effort to find potential medical problems early.

(2) (2) Heart Rate and Temperature-The heart rate should be measured for 30 seconds as early as possible in the rest period. If a member's heart rate exceeds 110 beats per minute, an oral temperature should be taken. If the member's temperature exceeds 100.6F, he/she should not be permitted to wear protective equipment. If it is below 100.6 F and the heart rate remains above 110 beats per minute, rehabilitation time should be increased. If the heart rate is less than 110 beats per minute, the chance of heat stress is negligible. (3) Documentation-All medical evaluations shall be recorded on standard forms along with the member's name and complaints. The EMS Rehab Log will be submitted to the Fire Chief/Incident Commander.

SPECIAL EVENT GUIDELINES

Purpose: To provide some guidance for EMS providers when providing on site medical coverage for special events such as recreational events and community celebrations.

If emergency treatment is needed or requested an ambulance should be requested immediately if not already present.

If the EMS provider feels a patient needs treatment at a hospital or treated/transported by ambulance and the patient refuses; a patient refusal form and patient care report needs to be completed.

Assessment: The EMS provider shall assess the patient as the patient condition indicates and to the EMS provider's level of training. All patients exhibiting changes in mental status or abnormal vital signs shall have a Paramedic assessment and/or ambulance requested.

First Aid Treatment: Only treatment that could be performed by a person with minimal medical training such as a First Aid Training.

First Aid Supplies: Only supplies and medications that could be obtained over the counter or in a basic first aid kit.

First Aid Log: When possible first aid treatment shall be documented in a First Aid Log to include patients' name, address, complaint, vital signs, treatment, and disposition.

OTC Medications: At certain special events we may have OTC medications available. These shall be documented in the First Aid OTC Log. We are only providing these as a courtesy and shall not assist the patient with administration when providing First Aid.

Patient Care Reports and Dispatch #'s: Anytime a patient refusal is necessary or ambulance transport is required a complete PCR shall be completed and assigned a Dispatch #.

Special Event Reports: A Special Event Report should be completed following each event and submitted to the EMS Director. The report should include at a minimum: EMS Service, EMS and First Aid providers, number of patients including complaints & treatments or attach log, supplies used, date of event, location of event, and time event started/ended.

ADENOSINE

MECHANISMS OF ACTION
ADENOSINE is a natural occurring nucleoside. In the heart it acts on the AV NODE to slow conduction and inhibits reentry pathways, it is also helpful in treatment of PSVT

THERAPEUTIC EFFECTS
May cause conversion of PSVT to SINUS RHYTHM.

INDICATIONS
Use in Stable PSVT to convert to SINUS RHYTHM, or use as a trial dose prior to synchronized cardioversion in UNSTABLE PSVT.

CONTRAINDICATIONS
In patient with ATRIAL FLUTTER, ATRIAL FIBRILLATION AND VENTRICULAR TACHYCARDIA. Should not be used in patient with 2ND and 3RD HEART BLOCK and patients who are allergic to the drug.

ADVERSE REACTIONS
Can cause blurred vision; numbness and tingling in arms; headache; hypotension; palpitations; sweating; nausea; shortness of breath and hyperventilation.

DOSAGE AND ADMINISTRATION
INITIAL DOSE - 6 MG RAPID IV PUSH OVER 1-2 SECONDS FOLLOWED IMMEDIATELY BY RAPID NORMAL SALINE BOLUS. If tachyarythmia not eliminated in 1-2 minutes, REPEAT AT 12 MG RAPID IV PUSH OVER 1-2 SECONDS. Pediatric dosing is 0.1mg/kg not to exceed 6mg 1st dose and 0.2mg/kg not to exceed 12mg 2nd dose.

ALBUTEROL
Proventil

MECHANISMS OF ACTION
Relaxes bronchial and smooth muscle by acting on beta adrenergic receptor.

INDICATIONS
Prevention and treatment of bronchospasm in patients with reversible obstructive airway.

CONTRAINDICATIONS
Should not be used in patients with cardiovascular disorders, patients with hypertension and hyperthyroidism.

ADVERSE REACTIONS
May cause tremor, dizziness, headache, tachycardia, hypertension, nausea, vomiting and muscle cramps.

DOSAGE AND ADMINISTRATION
Premixed PROVENTIL/NS 3 ml unit dose. Nebulizer treatment with 8 l/m oxygen times 8 minutes.

Unconscious patient 3 ml unit dose. Mechanical ventilation of nebulizer treatment with 8 l/m oxygen for 8 minutes with bag valve at 10 – 15 l/m via endotracheal tube

AMIODARONE
(Cordarone)

MECHANISMS OF ACTION
Considered class III antiarrhythmic, but possessed characteristics of all classes, thought to prolong the refractory period and action potential duration.

THERAPEUTIC EFFECTS
Inhibits abnormal automaticity, increases refractory period in all conduction system, anti-anginal effects.
Atrial effects: slow sinus node rate and atrioventricular node conduction.
Ventricular effects: Prolongs QT interval and QRS duration and has Peripheral vascular dilation.

INDICATIONS
AMIODARONE is indicated for recurrent v-fib, recurrent hemodynamically unstable v-tach. Refractory to other antiarrhythmics.

CONTRAINDICATIONS
AMIODARONE is contraindicated in patients with hypersensitivity to drug and in those with severe SA node disease resulting in preexisting bradycardia. Unless artificial pacemaker is present, drug is also contraindicated in patients with cardiogenic shock or 2nd or 3rd degree Av blocks and in those in whom bradycardia has caused syncope.

ADVERSE REACTIONS
Hypotension, usually rate related, PR and QT intervals prolongation, bradycardia, and AV block. GI disturbance, constipation.

DOSAGE AND ADMINISTRATION
Arrest; Pulseless VT/VF 300mg IVP; Repeat once at 150 mg IVP in 3-5 minutes to total dosage of 2200 mg /24hr period, as indicated per AHA guidelines.
Supplemental dose: 150mg/100ml of D5w or normal saline over 10 minutes as needed for recurrent VT with pulses or within AHA guidelines.

Pediatric reference is 5mg/kg not to exceed the adult dose.

ATROPINE SULFATE

MECHANISMS OF ACTION

ATROPINE SULFATE is an anti-cholenergic drug. **ATROPINE** produces stimulation of the medulla and higher cerebral centers manifested by mild central vagal excitation and moderate respiratory stimulation.

THERAPEUTIC EFFECTS

1. **ATROPINE** has two actions: The most important therapeutic action is the inhibition of smooth muscle and glands innervated by postganglionic cholenergic nerves. **ATROPINE** also has central nervous system activity, which may be stimulating or depressing depending on the dose.
2. It acts peripherally as a competitive antagonist of acetylcholine. These actions include: vasodilatation, drying of the mouth, increased pulse rate, inhibition of contractions of the gastrointestinal tract, ureter, and bladder, and reduction of salivary, bronchial, gastric, and sweat gland secretions. With larger doses: dilation of pupils and increased intraocular pressure.

INDICATIONS

ATROPINE is useful in the treatment of severe sinus bradycardia that is accompanied by hemodynamically significant hypotension or that is likely to impair coronary blood flow and/or when accompanied by frequent ventricular ectopic beats.
ATROPINE is also indicated in poisoning by organic phosphate cholinesterase inhibitors found in certain insecticides.

CONTRAINDICATIONS

ATROPINE is contraindicated for use in patients with glaucoma and asthma.
It has been suggested that **ATROPINE** be used with caution in Type II AV block and New 3rd Degree AV block

DOSAGE AND ADMINISTRATION

0.5 mg IV max 3mg for adult bradycardia.
0.02mg/kg IV not to exceed the adult dose

Contact medical control for organic phosphate dosing.

BABY ASPIRIN

MECHANISMS OF ACTION AND THERAPEUTIC EFFECT
Prevention of Transient Ischemia Attacks by effectively inhibiting platelet aggregation.

INDICATIONS
Aspirin is indicated to prevent Myocardial Infarction with unstable angina pectoris and to prevent recurrence of myocardial infarction with history of Myocardial Infarction.

CONTRAINDICATIONS
Do not use in patients with history of severe sensitivity to aspirin, nasal polyps, asthma, GI bleed, children less than 12 years, children with fever or flu like s/s, pregnancy, lactation Vitamin K deficiency, peptic ulcer.

ADVERSE REACTIONS
Potential side effects are allergic reaction, increased bleeding, and gastrointestinal toxicity.

DOSAGE AND ADMINISTRATION
4 x 81 mg tablets (total 324 mg). Chew and swallow. Dose may be reduced if patient has already taken ASA in the past 12 hours so long as patient receives a total of 324mg.

BENADRYL
(Diphenhydramine)

MECHANISMS OF ACTION AND THERAPEUTIC EFFECTS
Competes with histamine for H (1) receptor sites on the effector cells. Prevents but does not reverse histamine mediated responses particularly histamine's effects on smooth muscle of the bronchial tubes. Also suppresses the cough reflex by a direct effect in the medulla of the brain.

INDICATIONS
BENADRYL can be used for allergy symptoms, anaphylactic shock, motion sickness.

CONTRAINDICATIONS
BENADRYL is contraindicated in acute asthmatic attacks. Should be used with caution in patient with glaucoma, prostatic hypertrophy, newborns, hypertensive, or cardiac patients.

ADVERSE REACTIONS
BENADRYL may cause drowsiness, confusion, insomnia, headache, vertigo, palpitations, photosensitivity, nasal stuffiness, dry mouth, nausea and/or vomiting, urine retention, uticaria, diarrhea, constipation.

DOSAGE AND ADMINISTRATION
In anaphylactic shock in adults the dosage is 25-50 mg IM in the deltoid or IV. In children under the age of 12, the dosage is 1-2 mg/kg IM in the deltoid or /IV not to exceed the adult dosage.

DEXTROSE 50%

MECHANISMS OF ACTION AND THERAPEUTIC EFFECTS
Dextrose 50% restores circulating blood sugar level toward normal in states of hypoglycemia.

INDICATIONS
Dextrose 50% is indicated in treatment of: Coma due hypoglycemia, coma due to unknown etiology, to treat status epilepticus of uncertain etiology, and in conjunction with other medications.
Dextrose 50% may also be indicated during cardiac arrest, and known or suspected CVA's.

CONTRAINDICATIONS
Dextrose is contraindicated for treatment of known diabetic ketoacidosis. Otherwise, none for field use.

ADVERSE REACTIONS
None for field use.

DOSAGE AND ADMINISTRATION
Dextrose (D50) is supplied in 50 ml syringes containing 25 gm of Dextrose. 12.5gm-25gm given IV push.

IPRATROPIUM BROMIDE & ALBUTEROL SULFATE (DUO NEB)

MECHANISMS OF ACTION

Ipratropium Bromide & Albuterol Sulfate inhalation solution is expected to maximize the response to treatment in patients with COPD by reducing bronchospasm through two distinctively different mechanisms. Simultaneous administration of both these medications is designed to produce greater bronchodilation effects then when either drug is utilized alone.

INDICATIONS

Bronchospasm associated with Asthma, Chronic Bronchitis, COPD and Emphysema.

CONTRAINDICATIONS

Should not be used in patients with history of hypersensitivity to the drug or to Atropine and its derivatives.

ADVERSE REACTIONS

May cause anxiety, dizziness, headache, hypertension, nervousness, palpations, temporary vision changes.

DOSAGE AND ADMINISTRATION

Ipratropium Bromide 0.5mg & Albuterol 3mg in 3ml placed in small volume nebulizer over 8LPM O2

EPINEPHRINE

MECHANISM OF ACTION
Indigenous catecholamine with alpha and beta receptor stimulating actions. Usefulness in cardiac arrest with the following cardiovascular responses expected from dosages used during resuscitation.

- Increased heart rate.
- Increased myocardial contractile force.
- Increased systemic vascular resistance.
- Increased arterial blood pressure.
- Increased myocardial oxygen consumption.
- Increased automaticity.

THERAPEUTIC EFFECTS
CARDIAC ARREST
Clinically, **EPINEPHRINE** elevates perfusion pressure generated during chest compression, improves myocardial contractile state, and stimulates spontaneous contraction (eg. in ventricular stand still). Converts fine, low amplitude fibrillation to coarse, higher amplitude activity more susceptible to countershock.

ANAPHYLAXIS & ASTHMA
Acts chiefly as a brochodilator through beta action and maintains blood pressure through alpha effects.

INDICATIONS
In cardiac arrest, to restore electrical activity in asystole, and to enhance defibrillation in Ventricular Fibrillation. Also to increase perfusion pressure in cardiac arrest. In pulseless idioventricular rhythms and other forms of electro mechanical uncoupling. **EPINEPHRINE** may, in some instances, restore sufficient contractile force to generate a pulse and blood pressure. To treat life-threatening symptoms of anaphylaxis. To treat acute asthmatic attacks.

CONTRAINDICATIONS
Used with extreme caution in patients with angina, hypertension, hyperthyroidism. **EPINEPHRINE** should not be added directly to a sodium bicarbonate solution. No contraindications in cardiac arrest or anaphylactic shock.

ADVERSE REACTIONS
In a conscious patient, may cause palpitations from tachycardia or ectopic beats and elevation of blood pressure (may not be desirable if patient is already hypertensive). The asthmatic with pre-existing heart disease may experience dysrhythmias on treatment with **EPINEPHRINE**.

EPINEPHRINE (cont.)

DOSAGE AND ADMINISTRATION

CARDIAC ARREST ADULT:1 mg every 3-5 minutes, PEDS .01mg/kg

ANAPHYLACTIC REACTION ADULT: 0.3-0.5mg IM, PED .01mg/kg

EPINEPHRINE INFUSION: ADULT 2-10 mcg/min, PED Consult Medical Control

EPINEPHRINE DRIP

MECHANISM OF ACTION
EPINEPHRINE stimulates alpha and beta adrenergic receptors, cardiac stimulation.

INDICATIONS
To be administered if serious signs/symptoms persist in Bradycardia.

CONTRAINDICATIONS
Use with extreme caution in patients with angina, hypertension and hyperthyroidism.

ADVERSE REACTION
May cause palpitation from tachycardia or ectopic beats; increase blood pressure. Also may worsen effects of Parkinson's Disease because the drug temporarily increases rigidity or tremors.

PREPARATION
Add 2 mg of 1:1,000 or 1:10,000 epinephrine to 500 mL of normal saline to concentrate at 4 micrograms / milliliter.

ADMINISTRATION

Initiate infusion at 2-10 mcg/min

Epinephrine Infusion 2 mg mixed in 500 mL of NS (4 mcg/mL)									
Dose (mcg/min)	2	3	4	5	6	7	8	9	10
Rate mL/hr	30 mL/hr	45 mL/hr	60 mL/hr	75 mL/hr	90 mL/hr	105 mL/hr	120 mL/hr	135 mL/hr	150 mL/hr

FENTANYL
(Sublimaze)

MECHANISMS OF ACTION
Synthetic, potent narcotic agonist analgesic with actions similar to morphine but much more potent and less prolonged. Less emetic and vasodilator effects than with morphine. Binds with opiate receptors at many sites in the CNS, altering both perception of and emotional response to pain through an unknown mechanism.

THERAPEUTIC EFFECTS
Fentanyl inhibits pain pathways in the central nervous center and increases the pain threshold in people. It also alters the pain perception.

INDICATIONS
FENTANYL is used for pain control it is 10 times stronger than morphine, also used for sedation during intubations.

CONTRAINDICATIONS
Contraindicated in patients who have received MAO inhibitors within 14 days. Also in those with myasthenia gravis. Use cautiously in head injury, increased cerebrospinal fluid pressure, asthma, chronic obstructive pulmonary disease, respiratory depression, alcoholism, CNS depression, and shock.

ADVERSE REACTIONS
Reactions can be heavy sedation, nausea, respiratory depression, miosis, and hypotension. Rapid administration may result in chest wall rigidity that will not respond to neuromuscular blockage. There also can be dizziness, delirium, euphoria, and blurred vision.

DOSAGE AND ADMINISTRATION
Adult dosage 25-50 IVP slowly. Also, can be given IM at 50-100 mcg.
Pediatric dosage is 1mcq/kg not to exceed the adult dose

25mcq of Fentanyl is about the equivalent of 2.5mg of Morphine. Effects of Fentanyl typically wear off in about 30 minutes making it ideal for the pre-hospital setting.

In the event of acute adverse reactions, Fentanyl effects can be reversed with **NARCAN**

GLUCOSE PASTE

MECHANISM OF ACTION AND THERAPEUTIC EFFECTS
Glucose paste when smeared across the buccal mucosa will reverse the signs and symptoms related to hypoglycemia.

INDICATIONS
Indicated for the hypoglycemic patient when patient is conscious, comatose, stuperous, or having seizures and when an IV cannot be started.

CONTRAINDICATIONS
Contraindicated in confirmed diabetic ketoacidosis.

ADVERSE REACTIONS
None in the field. Caution should be used to maintain a patent airway when using glucose paste in stuperous, comatose, or seizure patient.

DOSAGE AND ADMINISTRATION
If unable to start IV, administer 1Single Dose tube to buccal mucosa of patient's cheek.

GLUCAGON

MECHANISM OF ACTION AND THERAPEUTIC EFFECTS

GLUCAGON raises blood glucose levels by promoting catalytic depolymerization of hepatic glycogen to glucose.

INDICATIONS

GLUCAGON can be used in patients with hypoglycemia.

CONTRAINDICATIONS

GLUCAGON is contraindicated in patients with hypersensitivity to GLUCAGON or patients with pheochromytemo.

ADVERSE REACTIONS

GLUCAGON may cause hypotension, nausea, vomiting, respiratory distress, hypersensitivity reaction (Bronchospasm), rash, dizziness, light-headedness.

DOSAGE AND ADMINISTRATION

In Hypoglycemia, 1 mg IM for adults and children weighing more than 20 kg. For children weighing less than 20 kg, give 0.5 mg IM.

KETAMINE

MECHANISM OF ACTION AND THERAPEUTIC EFFECTS

Nonbarbituate Anesthetic. Central Nervous System Agent. Chemical restraint for psychotic and/or combative patients. Medication assisted intubation. Pain control. Onset IV, 30-60 seconds. IM, 3-5 minutes. Duration, IV 5-10 minutes. IM, 12-25 minutes.

INDICATIONS

Agitation/combativeness, Pain Management, Medication Assisted Intubation.

CONTRAINDICATIONS

Conditions where significant elevations in blood pressure would be a serious hazard. Known allergies to the drug.

PRECAUTIONS

Hypertension, cardiac decompensation, alcohol intoxication, use of multiple analgesic agents.

ADVERSE REACTIONS

Bradyarrhythmia, Cardiac Dysrhythmia, Hypertension, Hypotension, Tachycardia, Malignant Hyperthermia, Excessive Salivation, Nausea, Vomiting, Muscle Spasms, Emergence Phenomenon, Increased Intracranial Pressure, Diplopia, Nystagmus, Apnea, Laryngeal Spasm, Pulmonary Edema and Respiratory Depression.

DOSAGE AND ADMINISTRATION

Agitation/Combative

Adult 4mg/kg IM or 2mg/kg IV/IO
PED 3mg/kg IM or 1mg/kg IV/IO

Medication Assisted Intubation

Adult or PED 2 mg/kg IV/IO

Pain Management

Adult 0.25mg/kg IV/IO may repeat 1 time.
PED 0.1mg/kg not to exceed the adult dose

MAGNESIUM SULFATE

MECHANISMS OF ACTION
Smooth muscle relaxant
THERAPEUTIC EFFECTS
Onset immediate. Peak 1-2 min, duration 30 min.

INDICATIONS
Acute respiratory distress/bronchospasm refractory to inhalation therapy
Torsades de Pointes

CONTRAINDICATIONS
Heart blocks, symptomatic bradycardia and hypotension. Maintain urine output >25mlhr.

ADVERSE REACTIONS
Magnesium is a potent CNS depressant. Observe for LOC, respirations, BP, ECG, Loss of deep tendon reflexes, hypotension, N/V and flushing. Watch ECG for signs of hypocalcemia.

DOSAGE AND ADMINISTRATION RESPIRATORY
Adult: 2 grams in 100 mL NS or D5W infused over 20 min
PED: 40mg/kg, not to exceed the adult dosage, in 100ml NS or D5W given over 20 min

DOSAGE AND ADMINISTRATION TORSADES DE POINTES
Adult: 1-2 grams IV/IO over 5-10 minutes
PED: 50mg/kg IV/IO not to exceed the adult dose over 5-10 minutes

METOPROLOL
(Lopressor)

MECHANISMS OF ACTION
B-1 selective adrenoceptor blocker

THERAPEUTIC EFFECT
Metoprolol is a selective B1 receptor blocker used in the treatment of cardiovascular disease. Metoprolol blocks the action of the sympathetic nervous system thereby reducing heart rate, force of myocardial contraction leading to decreased blood pressure and myocardial oxygen demand.

INDICATIONS
Used for uncontrolled atrial fibrillation for a rate of >140 beats per minute. May be used for blood pressure control, and other arrhythmias at the direction of a medical control physician.

CONTRAINDICATIONS
- Allergy or adverse drug reaction
- Acute heart failure
- Heart rate <60 bpm
- Systolic BP <90 mmHg
- Second or third degree AV block

ADVERSE REACTIONS
Hypotension may result after administration of Metoprolol. Bradycardia, palpitations, dizziness, and headache may also result. Use with caution.

DOSAGE AND ADMINISTRATION
May give 5 mg over 3-5 min. Slow administration is key to a therapeutic effect. Medication given too fast may result in side effects listed above. Any use other than listed in protocol must be approved by medical control.

NARCAN
(Naloxone)

MECHANISMS OF ACTION
NARCAN is essentially a pure narcotic antagonist. It does not produce respiratory depression or pupillary constriction. In the absence of narcotics, it exhibits essentially no pharmacologic activity.

THERAPEUTIC EFFECT
In the presence of physical dependence on narcotics, **NARCAN** will produce withdrawal symptoms. When administered intravenously, the onset of action is generally apparent within two minutes. The requirement for repeated doses of **NARCAN** will be dependent upon the amount, type, and route of administration.

INDICATIONS
NARCAN is indicated for the complete or partial reversal of narcotic depression, including respiratory depression induced by opioids. It is also indicated for suspected acute opioid overdose in the comatose patient.

CONTRAINDICATIONS
NARCAN is contraindicated in patients known to be hypersensitive to **NARCAN**.

ADVERSE REACTIONS
Abrupt reversal of narcotic depression may result in nausea, vomiting, sweating, tachycardia, increased blood pressure, and tremulousness. In some cardiac patients, the resultant hypertension and tachycardia may result in left ventricular failure and pulmonary edema. In addition to **NARCAN**, other resuscitative measures, such as maintenance of airway, artificial ventilation, and vasopressor agents should be available and employed when necessary.

DOSAGE AND ADMINISTRATION
The initial adult dose is 0.4mg-2.0 mg (1 ml) of **NARCAN** administered IV push slowly over one minute or until respirations improve. If no results, repeat immediately. If unable to obtain an intravenous line, **NARCAN** may be given intramuscular or intranasally at a 2mg-4mg dose. **NARCAN** may be repeated to maintain adequate respirations as needed.

The initial pediatric dose is 0.1mg/kg max dose of 2mg

NITROGLYCERIN

MECHANISMS OF ACTION AND THERAPEUTIC EFFECT
Reduces cardiac oxygen demand by decreasing left ventricular and diastolic pressure (preload) and, to a lesser extent, systemic vascular resistance (afterload). Also increases blood flow through the collateral coronary vessels.

INDICATIONS
NITROGLYCERIN is useful in the treatment of acute situations of angina pectoris. It is also used to treat acute hypertension and CHF associated with myocardial infarction.

CONTRAINDICATIONS
NITROGLYCERIN is contraindicated if hypersensitivity to nitrates, head trauma, cerebral hemorrhage, hypertrophic cardiomyopathy, or severe anemia. Use with caution in hypotension.

ADVERSE REACTIONS
NITROGLYCERIN may cause headache, sometimes with throbbing, dizziness, weakness, orthostatic hypotension, tachycardia, flushing, palpitations, fainting, nausea, vomiting, cutaneous vasodilatation, sublingual burning, and hypersensitivity reactions.

DOSAGE AND ADMINISTRATION
0.4 mg sublingual tablet or metered spray repeated every 5 minutes if needed for pain that persists and BP stays above 100 mmHg systolic.

For STEMI may stop SL NTG and consider:

5 – 10 mcg/min infusion of 100 mcg/mL solution (pre-mixed), titrating to effect.

WATCH BLOOD PRESSURE CAREFULLY!!!

NOREPINEPHRINE
(LEVOPHED)

THERAPEUTIC EFFECTS
Onset: 1-2 minutes
Peripheral vasoconstriction is primary mechanism of action. Norepinephrine is also a positive inotropic medication.

INDICATIONS
Neurogenic, cardiogenic, septic shock. Severe hypotension refractory to fluid resuscitation.

CONTRAINDICATIONS
Hypovolemia without adequate fluid resuscitation.

ADVERSE REACTIONS
Administration of Norepinephrine may cause anxiety, hypertension, headache, palpitations.

DOSAGE AND ADMINISTRATION
Adult: 1-30 mcg/min **(Initiation of Levophed should be done at 1 mcg/min and titrated to maintain a systolic blood pressure of 90 mmHg or a MAP of 65)**.

Pediatric: Rarely indicated. 0.01-0.3 mcg/kg/min for shock. Consult medical control.

Patients with profound septic shock may require higher doses of Norepinephrine

Patients requiring higher doses may require a second pressor. Contact medical control

NOREPINEPHRINE (LEVOPHED) DOSING GUIDELINES

- Add 4 milligrams of Norepinephrine to 250 mL of D5W. This results in a 16 microgram/milliliter solution.
- Initiate infusion at 1 mcg/min. ***Must use IV pump***
- Label medication with orange label

IV PUMP INFORMATION

- ICAS IV pumps are setup for 8 mg/500 mL
- No change is needed as concentration is the same. Input the desired dose per minute and begin infusion.
- Monitor blood pressure closely.

Norepinephrine (Levophed) Drip Rates								
Dose mcg/min	1	2	4	8	12	16	20	24
Rate mL/hr	4	8	15	30	45	60	75	90

SOLU-MEDROL

Methylprednisolone
Corticosteroid

THERAPEUTIC EFFECTS
Onset 2-5 min, peak effect <1 hr, Duration 12-24 hrs

INDICATIONS
Acute bronchospasm, status asthmaticus

CONTRAINDICATIONS
Viral/fungal/tubercular skin lesions, admin of live virus vaccinations and serious infections (**except sepsis**). Use Caution in patients with hyperthyroidism, cirrhosis, ulcerative colitis, HTN, Osteoporosis, CHF, HTN, seizures, myasthenia gravis, thrombophlebitis, peptic ulcer or diabetes.

ADVERSE REACTIONS
This dosing is for acute status asthmaticus/acute bronchospasm, **not for spinal injury**, or anti-inflammatory regiments.

DOSAGE AND ADMINISTRATION
Adult: 2mg/kg IVP loading dose
Peds: see adult dosing, reference length-based tape

TORADOL
(Ketorolac)

MECHANISMS OF ACTION
Toradol works by moderating hormones that cause inflammation and pain in the body. Toradol is used to relieve moderately severe pain, usually post-operative or inflammatory pain. Toradol is a non-steroidal anti-inflammatory medication (NSAID). Toradol is non-narcotic and non-habit forming. Additionally, Toradol is often used in concert with a narcotic pain medication for best effect.

INDICATIONS
Used for post-operative pain, kidney stones, and other pain resulting from inflammation of tissues or joints.

CONTRAINDICATIONS
- Allergy to aspirin or NSAID's
- Taking anticoagulants
- Severe renal disease or kidney transplant
- Closed head injury or potential intracranial bleeding
- Stomach ulcers or history of intestinal bleeding
- Post-partum mothers breastfeeding children

ADVERSE REACTIONS
Nausea, vomiting, drowsiness, dry mouth, abnormal taste can occur. Stomach upset is the most common side effect.

DOSAGE AND ADMINISTRATION
Toradol may be given intramuscularly or intravenously. Dosing is:
Adult 15 mg IV or 30 mg IM.
PED 0.5mg/kg not to exceed the adult dose of 15mg IV or 30 mg IM.

Tranexamic Acid
(TXA)

MECHANISMS OF ACTION
Tranexamic Acid (TXA) is a competitive inhibitor of plasminogen activation, which produces antifibrinolytic effects preserving and stabilizing the fibrins matrix structure. It reversibly binds to plasminogen at the lysine binding site, thus preventing the binding of plasmin to fibrin. It is categorized as an anti-fibrinolytic that inhibits the activation of plasminogen to plasmin and thereby prevents fibrinolysis and the breakdown of clots.

INDICATIONS
TXA has been used for many years to assist with the management of spontaneous hemorrhage in the hemophilia patient.

CONTRAINDICATIONS
- Not indicated for Gastrointestinal hemorrhage at this time
- Any patient with a known blood clot or clotting disorder

ADVERSE REACTIONS
- Gastrointestinal disturbances may occur but often disappear when the dosage is reduced.
- Hypotension has been observed when intravenous injection is too rapid
- Anaphylaxis
- Thrombosis
- Nausea, vomiting, diarrhea
- Visual disturbances, blurred vision, changes in color

DOSAGE AND ADMINISTRATION
Adults Only
1 gm TXA mixed in 100ml of NS or D5W given IV and administered over 10 minutes. 250ml of NS or D5W may be used if 100ml is not available and administration should be over 20-25 minutes

VALIUM
(Diazepam)

MECHANISMS OF ACTION
Diazepam is a benzodiazepine derivative. In animals, it appears to act on parts of the limbic system, the thalmus, and hypothalmus and induces calming effects.
THERAPEUTIC EFFECTS
Diazepam has no demonstratable peripheral autonomic blocking action, nor does it produce extra pyramidel side effects. It was found to have transient cardiovascular depressor effects in dogs.
INDICATIONS
VALIUM is indicated for the management of anxiety disorders or for the short term relief of the symptoms of anxiety. Injectable **VALIUM** is a useful adjunct in status epilepticus and severe recurrent convulsive seizures. It is also a useful premedication for relief of anxiety and tension in patients prior to cardioversion and to diminish the patient's recall of the procedure.
CONTRAINDICATIONS
Injectable **VALIUM** is contraindicated in patients with a known hypersensitivity to the drug and patients with acute narrow angle glaucoma. **VALIUM** is not recommended for use in pregnant or possibly pregnant women. Injectable **VALIUM** should not be administered to patients in shock, coma, or in acute alcoholic intoxication with depressed vital signs.
ADVERSE REACTIONS
Side effects most commonly reported are drowsiness, fatigue and ataxia, venous thrombosis and phlebitis at IV site. Other reactions less commonly reported include confusion, depression, headache, slurred speech, syncope, tremor, vertigo, bradycardia, cardiovascular collapse, hiccups, change in salivation, minor changes in EKG. Injectable **VALIUM** to the elderly, to the very ill patient, and to those with limited pulmonary reserve should be used with extreme care due to the increased risk of apnea and/or cardiac arrest. Resuscitation equipment should be readily available.
DOSAGE AND ADMINISTRATION
When used intravenously: to reduce the possibility of venous thrombosis, phlebitis, local irritation, swelling - the solution should be injected slowly, taking at least 1 minute for each 5 mg (1 ml) given.
DO NOT use small veins such as those on the dorsum of hand or wrist. DO NOT mix or dilute **VALIUM** with other solutions or drugs. The usual recommended dose varies based on the route of administration.

VERSED
(Midazolam)

MECHANISMS OF ACTION AND THERAPEUTIC EFFECT
VERSED is a short acting benzodiazepine CNS depressant.
The effects of **VERSED** on the CNS are dependent on the dose administered, the route and the presence or absence of other pre-medications.
Provides sedation without loss of consciousness and also provides relief of anxiety and partial or complete impairment of recall within 1-5 minutes of IV administration and generally persists for 20-40 minutes after IV injection of a single dose.
INDICATIONS
Conscious sedation and reduction of anxiety
Diminish recall of events associated with certain procedures. IE External Cardiac Pacing, Electrical Cardioversion, conscious intubations, etc.
CONTRAINDICATIONS

Known Hypersensitivity to benzodiazepines or specifically **VERSED**.
Pregnancy, acute alcohol intoxication, shock and coma.
Acute narrow angle glaucoma
Use with caution in Elderly, patients with renal impairment and CHF.

ADVERSE REACTIONS

Decreased total lung volume and or respiratory rate and apnea
Variations in Blood Pressure and heart rate
Cardio/Respiratory Arrest
Hiccoughs, nausea, vomiting, coughing, headache, drowsiness

DOSAGE AND ADMINISTRATION for ADULTS

For I.M. administration, Midazolam (**VERSED**) is injected into a large muscle mass.
For I.V. administration, Midazolam (**VERSED**) is injected in incremental doses.
Intranasal administration is also accepted.
For conscious sedation prior to short procedures (e.g., cardioversion).
Administer slowly IV immediately before the procedure, 1mg, over 2 minutes to desired effect—DO NOT EXCEED 2.5 mg of **VERSED** AS AN INITIAL DOSE for procedural sedation.

Additional dosing, if necessary should be at 2-5 minute intervals. A total of 5mg of **VERSED** generally is adequate for conscious sedation in an average, healthy adult less than 60 years of age.

ZOFRAN
(ondansetron)

MECHANISMS OF ACTION AND THERAPEUTIC EFFECT
A selective antagonist of a specific type of serotonin receptor which is located in the CNS that causes vomiting.

INDICATIONS
Nausea and vomiting. Motion sickness

CONTRAINDICATIONS
The only absolute contraindication is hypersensitivity. Patients taking medications like theophylline, phenytoin or warfarin should have their levels followed.

ADVERSE REACTIONS
Dizzy, transient blurred vision and drowsiness after administration.

DOSAGE AND ADMINISTRATION
Adults: 4mg IVP over 2 to 5 minutes – not less than 30 seconds. May repeat x1 after 5 minutes. It can also be administered 4mg IM.
Children 1- month to 12 years: 0.1mg/kg IVP over 2 to 5 minutes. It can also be administered 0.1mg/kg IM, not to exceed the adult dose, however contact medical control for any repeat dose requests as only 1 initial dose is authorized on standing order.