Iowa County EMS

2025 Patient Care Protocols | Procedures | Formulary

Iowa County Ambulance Service
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Medical Director

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Iowa Administrative Code

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 that 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 a physician medical director to implement service-specific protocols based on 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 will follow the protocol development guidelines. All applicable EMS providers shall review any changes to these protocols.

Instructions
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 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 at: https://hhs.iowa.gov/media/197/download?inline=

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

Addendums
In the event that a medication listed in Iowa County EMS Patient Care Protocols becomes unavailable due to circumstances beyond the service's control, a suitable alternative may be substituted until the original medication becomes accessible. This substitution will be expressly documented in an addendum attached to the patient care protocols and will persist until either the original medication is reinstated or new patient care protocols are established, whichever occurs first. Any substitutions will require approval from the medical director, who will endorse the attached addendum.

System Structure

Service(s) Name	Service Type		Service Level of Authorization			
	Transport	Non-Transport	EMR	EMT	AEMT	Paramedic
Iowa County Ambulance	x					x
Amana QRS		x		x		
Kinze QRS		x		x		
Ladora QRS		x		x		
Millersburg QRS		x		x		
North English QRS		x		x		
Victor QRS		x		x		
Williamsburg QRS		x		x		

Authorized Medications

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

EMT/AEMT Skills Approval

Mark "yes" if the skill is approved by the medical director to be performed by the identified certification level	Certification Level	Yes	No
Nebulized Beta Agonist	EMT, AEMT	x	
Ventilator	EMT, AEMT		x
CPAP (12 years or >)	EMT, AEMT	x	

Note: Iowa Emergency Medical Care Providers may only perform the skills and procedures authorized (indicated by an X in the chart) within their active Iowa certification level and approved by the medical director.

Elective QRS Skills

Skill	Amana QRS	Kinze QRS	Ladora QRS	Millersburg QRS	North English QRS	Victor QRS	Williamsburg QRS
CPAP	x	x	x	x	x	x	x
CLIA					x		x

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
Daniel Kinker, D.O.		

IOWA COUNTY EMS TREATMENT PROTOCOLS

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Universal Patient Care

This protocol reduces the need for extensive reiteration of initial assessments and other considerations in each 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 patient away from all hazards prior to beginning medical care
    c. Determine number of patients
    d. Determine 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
    f. Consider declaration of mass casualty incident if needed
2. Use appropriate personal protective equipment (PPE)
3. Wear high-visibility, retro-reflective apparel when deemed appropriate (operations at night or in darkness, on or near roadways)
4. Consider cervical spine stabilization or spinal motion restriction if traumatic in nature; refer to Spinal Motion Restriction

Primary Assessment

1. **A**irway, **B**reathing, **C**irculation (**ABC**) 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. Supraglottic airway device
                d. Endotracheal tube

b. Breathing:
    i. Evaluate rate, breath sounds, accessory muscle use, retractions, patient positioning, and oxygen saturation, treat if indicated; refer to Difficulty Breathing
    ii. Apnea (not breathing) – open airway; refer to #4 above
c. Circulation:
    i. Control any major external bleeding; refer to Hemorrhage Control
    ii. Assess pulse:
        1. No pulse; refer to Cardiac Arrest
        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 **AVPU** (**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; refer to Diabetic Emergencies
    iv. For suspected stroke; refer to Stroke (CVA)
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 of critical patients. Secondary assessments should be tailored to patient presentation and chief complaint. The following are suggested considerations for secondary survey assessment:
    a. Head:
        i. Pupils
        ii. Ears
        iii. Nasopharynx/oropharynx
        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 tenderness, deformity, crepitus, and excursion
   d. Abdomen/Pelvis:
      i. Tenderness or bruising
      ii. Abdominal distension, rebound or guarding, pulsating mass
      iii. Pelvic stability
   e. Extremities:
      i. Pulses
      ii. Deformities, contusions, abrasions, punctures/penetrations, burns, tenderness, lacerations, and swelling
   f. Back:
      i. Spinal abnormalities, deformities, or tenderness
      ii. Bruising, tenderness, discoloration, swelling
      iii. Auscultation of lung sounds, if indicated
   g. Neurologic:
      i. Mental status/orientation
      ii. Motor/sensory
   h. Evaluate for medical equipment (pacemaker/defibrillator, left ventricular assist device (LVAD), insulin pump, dialysis fistula)
2. Obtain baseline vital signs (an initial complete set of vital signs is required: pulse, blood pressure, respiratory rate, pulse oximetry, and neurologic status assessment):
   a. 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)
   b. Critical patients should have pertinent vital signs frequently monitored
   c. Neurologic status assessment:
      i. Establish a baseline and note any change in patient's neurologic status:
         1. AVPU (Alert, Verbal, Pain, Unresponsive)
         2. Glasgow Coma Score (GCS)
         3. Richmond Agitation Sedation Scale (RASS)
3. Patients with cardiac or respiratory complaints:
   a. A 12-Lead electrocardiogram should be obtained and monitored continuously in patients with cardiac or suspected cardiac complaints
   b. Waveform capnography should be monitored in patients with respiratory complaints (essential for critical patients and those who require invasive airway management)

4. Obtain **OPQRST** history:
    a. **O**nset of symptoms
    b. **P**rovocation:
        i. Location
        ii. Exacerbating or alleviating factors
    c. **Q**uality
    d. **R**adiation
    e. **S**everity:
        i. Pain scale
    f. **T**ime:
        i. How long symptoms have been going on
        ii. Any changes since onset
5. Obtain **SAMPLE** history:
    a. **S**ymptoms
    b. **A**llergies:
        i. Medication, environmental, and food
    c. **M**edications:
        i. Prescription and OTC
    d. **P**ertinent past medical history:
        i. Medical alert tags, portable medical records, advance directives
        ii. Medical devices/implants (dialysis shunt, insulin pump, pacemaker, central venous access port, gastric tubes, urinary catheter)
    e. **L**ast oral intake
    f. **E**vents leading up to 911 call

Treatment and Interventions

1. Maintain airway
2. Administer oxygen as appropriate to achieve the target of 94-98% oxygen saturation (SPO2) based on clinical presentation and assessment of ventilation (EtCO2)
3. Establish vascular access if indicated or in patients who are at risk for clinical deterioration:
    a. If IO is used for a conscious patient, consider Lidocaine; refer to Intraosseous Vascular Access
4. Monitor pain if appropriate and treat if indicated; refer to Pain Management
5. Follow approved protocols to treat assessment findings
6. Reassess patient

Cardiovascular

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Bradycardia

1. Universal Patient Care

Basic Care Guidelines

2. If capability exists, obtain a 12-Lead ECG and transmit it to the receiving facility for interpretation as soon as possible
3. Pediatric bradycardia with a heart rate less than 60 despite attempts at adequate ventilation, begin CPR
4. Check blood glucose and treat if indicated; refer to Diabetic Emergencies

Advanced Care Guidelines

5. Monitor ECG
6. Establish IV/IO access
7. If symptomatic (hypotension, acutely altered mental status, signs of shock, ischemic chest discomfort, acute heart failure), administer Atropine:
    a. Adult:
        i. 1 mg IV/IO, every 3-5 minutes if indicated, up to 3 mg:
            1. If Atropine is ineffective or systolic blood pressure is less than 90 mmHg, initiate:
                a. Transcutaneous Pacing
                b. Consider Epinephrine infusion:
                    i. 2-10 mcg/min IV/IO [2 mg of 1:1000 or 1:10,000 in 500 mL NS (4 mcg/mL)]:
                        1. Use infusion pump
                        2. Initiate 2-10 mcg/min, titrate to response
                        3. Label bag with orange medication label
    b. Pediatric:
        i. Epinephrine: 0.01 mg/kg (0.1 mL of 1:10,000 concentration) IV/IO, every 3-5 minutes if indicated
8. For increased vagal tone or primary AV block, administer Atropine:
    a. Pediatric: 0.02 mg/kg (minimum 0.1 mg / maximum 0.5 mg) IV/IO, repeat once if indicated

Chest Pain

1. Universal Patient Care

Basic Care Guidelines

2. If capability exists, obtain a 12-Lead ECG and transmit it to the receiving facility for interpretation as soon as possible
3. Have patient chew non-enteric Aspirin 324 mg:
    a. Amount may be reduced if patient has already taken Aspirin within the past 12 hours for a total of 324 mg
4. Evaluate if erectile dysfunction or pulmonary hypertension medications have been taken in the past 48 hours:
    a. If the patient has not taken any erectile dysfunction or pulmonary hypertension medication in the past 48 hours and has a systolic blood pressure of 100 mmHg or above, assist the patient in self-administering one dose of their own Nitroglycerin:
        i. Repeat one dose of Nitroglycerin in 5 minutes if pain continues and systolic blood pressure is 100 mmHg or above
        ii. Reassess vital signs following each dose of Nitroglycerin

Advanced Care Guidelines

5. Monitor ECG
6. Establish IV access
7. 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
8. Administer Nitroglycerin:
    a. 0.4 mg sublingually, every 3-5 minutes if indicated and if systolic blood pressure is 100 mmHg or above:
        i. Reassess vital signs following each dose of Nitroglycerin
9. If ST segment changes exist, consider Nitroglycerin infusion:
    a. Initiate 5-10 micrograms per minute:
        i. Use infusion pump
        ii. Titrate infusion in 5 microgram increments
        iii. Discontinue infusion when:
            1. Pain is relieved
            2. Systolic blood pressure is below 100 mmHg
10. If pain continues after administration of Nitroglycerin and systolic blood pressure remains above 90 mmHg, administer:
    a. Fentanyl 25-50 mcg IV, every 5 minutes if indicated, up to 200 mcg

Hypertensive Emergencies

1. Universal Patient Care

Basic Care Guidelines

2. If capability exists, obtain a 12-Lead ECG and transmit it to the receiving facility for interpretation as soon as possible

Advanced Care Guidelines

3. Monitor ECG
4. Establish IV access
5. Symptomatic hypertension (systolic blood pressure greater than 180 or diastolic blood pressure greater than 120), administer:
    a. Labetalol:
        i. Adult:
            1. 10 mg IV over 2 minutes, repeat once after 10 minutes for continued hypertension:
                a. Goal is to reduce MAP by 20-25% initially
                b. Ensure heart rate is greater than 60 beats per minute prior to administration
6. If concern for drug-induced hypertension, ***do not use labetalol***
7. For pregnancy-related hypertension; refer to Eclampsia/Pre-Eclampsia

Stroke (CVA)

1. Universal Patient Care

Basic Care Guidelines

2. Complete a validated stroke exam and notify receiving facility as soon as possible if stroke is suspected
3. 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 4½ 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
4. Check blood glucose (if available):
    a. Treat if below 60 mg/dL; refer to Diabetic Emergencies

Advanced Care Guidelines

5. Establish IV access
6. Acquire 12-Lead ECG
7. Do not treat hypertension
8. Transport to a primary stroke center if possible; refer to Stroke Destination Decision

Tachycardia

1. Universal Patient Care

Basic Care Guidelines

2. If capability exists, obtain a 12-Lead ECG and transmit it to the receiving facility for interpretation as soon as possible

Advanced Care Guidelines

3. Monitor ECG and establish IV/IO access
4. Adults who are symptomatic with rates greater than 150 bpm, children with rates greater than 180 bpm or infants with rates greater than 220 bpm:
    a. Stable with Narrow QRS:
        i. Perform vagal maneuvers, if vagal maneuvers do not resolve the issue, administer Adenosine:
            1. Adult: 6 mg rapid IV push, repeat at 12 mg after 2 minutes if indicated
            2. Pediatric: 0.1 mg/kg rapid IV push (maximum 6 mg), repeat at 0.2 mg/kg if indicated (maximum 12 mg)
    b. Unstable with Narrow QRS:
        i. Perform synchronized cardioversion:
            1. Consider procedural sedation; refer to Midazolam
    c. Stable with Wide QRS (regular and monomorphic):
        i. Consider Adenosine or Amiodarone:
            1. Adult: Adenosine 6 mg rapid IV push, repeat at 12 mg after 2 minutes if indicated *OR* Amiodarone 150 mg in 100 mL NS or D5W over 10 minutes, repeat once if indicated
            2. Pediatric: Adenosine 0.1 mg/kg rapid IV push (maximum 6 mg) for SVT with aberrancy *OR* Amiodarone 5 mg/kg (maximum 150 mg) in 100 mL NS or D5W over 10 minutes
    d. Unstable with Wide QRS:
        i. Perform synchronized cardioversion:
            1. Consider procedural sedation; refer to Midazolam
5. For atrial fibrillation with rapid ventricular response (ventricular rate greater than 140 bpm), administer Metoprolol:
    a. Adult: 5 mg slow IV push over 2 minutes

General Medical

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Abdominal Pain (Non-Traumatic)

1. Universal Patient Care

Basic Care Guidelines

2. Place patient in position of comfort

Advanced Care Guidelines

3. Establish IV access if indicated
4. Consider a fluid bolus if indicated
5. Consider analgesia; refer to Pain Management
6. Consider antiemetic; refer to Nausea and Vomiting

Allergic Reaction/Anaphylaxis

1. Universal Patient Care

Basic Care Guidelines

2. If the patient is complaining of shortness of breath, has signs of respiratory distress, or pulse oximetry is less than 94%, titrate oxygen for symptom improvement or to maintain oxygen saturation of 94-98%
3. Respiratory distress with wheezing:
    a. Albuterol 2.5-5 mg (if available), nebulized at 8 lpm oxygen
4. Anaphylaxis:
    a. If the patient has a physician-prescribed Auto-Inject Epinephrine, assist with administering it for signs of anaphylaxis

Advanced Care Guidelines

5. Allergic reaction (urticaria or pruritus):
    a. Diphenhydramine:
        i. Adult: 25-50 mg IM/IV
        ii. Pediatric: 1 mg/kg IM/IV, up to 50 mg
6. Anaphylaxis:
    a. Epinephrine (1:1000):
        i. Over 25 kg: 0.3 mg IM; Under 25 kg: 0.15 mg IM:
            1. If signs of anaphylaxis and hypoperfusion persist following the first dose of epinephrine, repeat every 5-15 minutes
7. Hypoperfusion (systolic blood pressure less than 90 mmHg):
    a. Normal Saline:
        i. 20 mL/kg IV/IO
8. Severe Anaphylaxis:
    a. Consider Epinephrine (1:10,000):
        i. Adult: 0.3 mg - 0.5 mg IV/IO slowly over 3-5 minutes
9. Evaluate the need for early intubation

Altered Mental Status

1. Universal Patient Care

Basic Care Guidelines

2. Identify and treat possible causes:
    a. Evaluate oxygen saturation
    b. Evaluate the need for Naloxone; refer to Poisoning
    c. Check blood glucose (if available):
        i. Below 60 mg/dL or above 250 mg/dL; refer to Diabetic Emergencies

Advanced Care Guidelines

3. Establish IV access if indicated
4. Monitor ECG if indicated
5. Evaluate the need for advanced airway management

Behavioral Emergencies

1. Universal Patient Care

Basic Care Guidelines

2. If there is evidence of immediate danger, ensure your safety and that of others by summoning law enforcement for help, if not already done so, and only enter the scene once it's safe to do so
3. Establish patient rapport:
    a. Attempt verbal reassurance and calm patient prior to use of pharmacologic and/or physical management devices
4. Check blood glucose (if available)
5. Note medications/substances on scene that may contribute to the agitation or may be relevant to the treatment of a contributing medical condition

Advanced Care Guidelines

6. For anxiety or agitation:
    a. Diazepam:
        i. Adult: 5 mg IV (2-5 minute onset of action)
        ii. Adult: 10 mg IM (15-30 minute onset of action)
        iii. Pediatric: 0.05-0.1 mg/kg IV, not to exceed 5 mg
        iv. Pediatric: 0.1-0.2 mg/kg IM, not to exceed 10 mg
7. Severe agitation or a high risk of violence:
    a. Ketamine:
        i. Adult: 2 mg/kg IV (1 minute onset of action)
        ii. Adult: 4 mg/kg IM (3-5 minute onset of action)
        iii. Pediatric: 1 mg/kg IV
        iv. Pediatric: 3 mg/kg IM
8. Monitor vital signs before and after each dose:
    a. Consider EtCO2 as an earlier predictor of hypoventilation

Congestive Heart Failure

1. Universal Patient Care

Basic Care Guidelines

2. If capability exists, obtain a 12-Lead ECG and transmit it to the receiving facility for interpretation as soon as possible
3. Evaluate if erectile dysfunction or pulmonary hypertension medications have been taken in the past 24-48 hours:
    a. If the patient has not taken any erectile dysfunction or pulmonary hypertension medication in the past 48 hours and has a systolic blood pressure of 100 mmHg or above, assist the patient in self-administering one dose of their own Nitroglycerin:
        i. Repeat every 3-5 minutes if indicated and if systolic blood pressure is 100 mmHg or above, maximum of 3 doses
        ii. Reassess vital signs following each dose of Nitroglycerin
4. Consider continuous positive airway pressure (CPAP)

Advanced Care Guidelines

5. Monitor ECG and treat dysrhythmias if indicated
6. Administer Nitroglycerin:
    a. 0.4 mg sublingually, every 3-5 minutes if indicated and if systolic blood pressure is 100 mmHg or above, maximum of 3 doses:
        i. Reassess vital signs following each dose of Nitroglycerin
7. Consider Nitroglycerin infusion:
    a. Initiate 10 micrograms per minute:
        i. Use infusion pump
        ii. Titrate infusion in 10 mcg/min increments, up to 50 mcg/min
        iii. Discontinue infusion when:
            1. Systolic blood pressure is below 100 mmHg

Diabetic Emergencies

1. Universal Patient Care

Basic Care Guidelines

2. Check blood glucose (if available)
3. If patient is conscious with a blood sugar of less than 60 mg/dL and able to swallow, administer:
    a. Oral Glucose:
        i. Adult: 15 g
        ii. Pediatric: 0.5-1 g/kg

Advanced Care Guidelines

4. Establish IV access:
    a. Ensure IV is patent to minimize the risk of infiltration
5. If patient is unconscious or unable to protect their own airway and blood sugar is less than 60 mg/dL, administer:
    a. Dextrose (D10 is preferred):
        i. Adult (25 g of 10-50%):
            1. D50 (50 mL) IV
            OR
            2. D10 (250 mL) IV
        ii. Pediatric (0.5-1 g/kg of 10-25%):
            1. D10 (5-10 mL/kg) IV
            OR
            2. D10 (2 mL/kg) IV, newborns
6. If unable to gain vascular access, administer:
    a. Glucagon:
        i. Adult: 1 mg IM
        ii. Pediatric: 1 mg IM (over 20 kg or more than 5 years old)
        iii. Pediatric: 0.5 mg IM (less than 20 kg or less than 5 years old)
7. If blood sugar is greater than 250 mg/dL with symptoms of dehydration, vomiting, abdominal pain, or altered level of consciousness, administer:
    a. Normal Saline:
        i. Adult: 20 mL/kg
        ii. Pediatric: 10 mL/kg

Hyperthermia

1. Universal Patient Care

Basic Care Guidelines

2. Move to a cool area and shield from the sun or any external heat source
3. Loosen or remove clothing
4. Initially cool patient with cool mist and fanning (if available)
5. Cool patient with cold packs to neck, groin, and axilla if indicated:
    a. Cooling efforts should continue until patient's temperature is less than 102.2°F (39°C) or mental status improves
6. If alert, stable, and not nauseous, you may have the patient slowly drink small sips of water or other fluids such as sports drinks (if available)

Advanced Care Guidelines

7. Monitor ECG and treat dysrhythmias if indicated
8. Establish IV access and administer fluid bolus if indicated
9. For seizure activity; refer to Seizures

Hypothermia

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1. Universal Patient Care

Basic Care Guidelines

2. Remove the patient from the environment to prevent further heat loss, remove wet clothes, and cover with blankets:
    a. Handle patient gently and move only when necessary
3. Assess core temperature:
    a. Mild Hypothermia: 32.1°-35°C or 89.8°-95°F
    b. Moderate Hypothermia: 28.1°-32°C or 82.5°-89.7°F
    c. Severe Hypothermia: 24°-28°C or 75.2°-82.4°F
    d. Profound Hypothermia: less than 24°C or 75.2°F
4. Warm patient with hot packs to neck, groin, and axilla if indicated
5. With identified or suspected frostbite injuries:
    a. Protect the cold injured extremity from further injury (manual stabilization)
    b. Do not re-expose to the cold
    c. Remove wet or restrictive clothing and jewelry
    d. Do not rub or massage
    e. Cover with dry dressings
6. For alterations in mental status, consider measuring blood sugar and treat as indicated; refer to Diabetic Emergencies

Advanced Care Guidelines

7. Monitor ECG and treat dysrhythmias if indicated
8. Establish IV access and administer warm fluid bolus if indicated
9. Seizure activity; refer to Seizures
10. Consider analgesia; refer to Pain Management
11. For hypothermic arrest below 30°C or 86°F:
    a. The mainstay of therapy in severe hypothermia and cardiac arrest should be effective chest compressions and attempts at rewarming
    b. Defibrillation is indicated only once
    c. Medications should be withheld until the patient's core temperature is greater than 30°C (86°F)
    d. Contact Medical Control for further direction

Nausea and Vomiting

1. Universal Patient Care

Basic Care Guidelines

2. Limit oral intake
3. Transport patient in position of comfort
4. Consider having the patient smell an alcohol prep pad

Advanced Care Guidelines

5. Establish IV access if indicated
6. Consider fluid bolus if evidence of hypovolemia
7. Nausea or vomiting, consider:
    a. Ondansetron:
        i. Adult: 4 mg SL/IV, repeat once after five minutes if indicated
        ii. Pediatric: 0.15 mg/kg SL/IV, not to exceed 4 mg

Pain Management

1. Universal Patient Care

Basic Care Guidelines

2. Nonpharmacologic pain management:
    a. Place patient in a position of comfort
    b. Splint extremity injuries
    c. Apply hot or cold packs if indicated

Advanced Care Guidelines

3. Monitor ECG
4. Consider Antiemetic; refer to Nausea and Vomiting
5. Pain management, consider:
    a. Ketorolac (avoid in patients under 6 months or over 65):
        i. Adult: 30 mg IM or 15 mg IV
        ii. Pediatric: 0.5 mg/kg, not to exceed adult dose
    b. Fentanyl:
        i. Adult: 1 mcg/kg IM/IN/IV, maximum initial dose of 100 mcg, repeat if indicated as long as patient remains hemodynamically stable and GCS is intact
        ii. Pediatric: 1 mcg/kg; refer to length-based tape
6. Severe pain, consider:
    a. Ketamine:
        i. Adult: 0.25 mg/kg IM/IV/IO, maximum initial dose of 25 mg, repeat if indicated, up to 100 mg; refer to Ketamine Dose Table:
            1. If patient is presenting with hallucinations after administration, consider 1 mg Midazolam
        ii. Pediatric: 0.1 mg/kg IM/IV/IO
7. Muscle spasm and/or anxiolytic pain exacerbation, consider:
    a. Diazepam:
        i. Adult: 2-5 mg IM/IN/IV, every 5 minutes if indicated, up to 10 mg
        ii. Pediatric: 0.1 mg/kg IM/IN/IV, not to exceed adult dose
8. Monitor vital signs before and after each dose of medication:
    a. Consider EtCO2 as an earlier predictor of hypoventilation

Poisoning

1. Universal Patient Care

Basic Care Guidelines

2. Identify contaminate and engage Poison Control as early as reasonable to aid in appropriate therapy and track patient outcomes:
    a. National 24-hour phone number: 1-800-222-1222
3. Consider Naloxone (if pre-filled atomizer device is available), repeat every 3 minutes if indicated

Advanced Care Guidelines

4. Monitor ECG
5. Establish IV access if indicated
6. Bradycardia with unknown overdose, consider:
    a. Atropine:
        i. Adult: 1 mg IV, every 5 minutes if indicated, up to 3 mg
    b. Transcutaneous cardiac pacing
7. Tachycardia with unknown overdose, consider one of the following:
    a. Diazepam:
        i. Adult: 2-5 mg IM/IN/IV, every 5 minutes if indicated, up to 10 mg
    b. Midazolam:
        i. Adult: 0.5-2.5 mg IM/IN/IV, every 5 minutes if indicated, up to 5 mg
8. Opioid overdose:
    a. Naloxone:
        i. Adult: 0.4-2 mg IM/IV *OR* 4 mg IN, repeat in 3 minutes if indicated
        ii. Pediatric: 0.1 mg/kg IM/IN/IV, repeat in 3 minutes if indicated, up to 2 mg IM/IV *OR* 4 mg IN
9. Calcium Channel Blocker or Beta Blocker overdose, consider:
    a. Glucagon:
        i. Adult: 1-3 mg slow IV push over 1-2 minutes, repeat after 10-15 minutes if no response is seen
10. Digitalis overdose, consider:
    a. Atropine:
        i. Adult: 1 mg IV, every 5 minutes if indicated, up to 3 mg
        ii. Transcutaneous cardiac pacing
11. Consider fluid bolus of 20 mL/kg for hypotension

Seizures

1. Universal Patient Care

Basic Care Guidelines

2. Monitor and protect airway
3. Administer oxygen as appropriate with a target saturation of 94-98%
4. Check blood glucose (if available); refer to Diabetic Emergencies

Advanced Care Guidelines

5. Administer one of the following:
    a. Diazepam:
        i. Adult: 2-5 mg IM/IN/IV titrated until seizure stops or maximum dose of 10 mg is given
        ii. Pediatric: 0.2 mg/kg IM/IN/IV, maximum 10 mg
    b. Midazolam:
        i. Adult: 2-5 mg IM/IN titrated until seizure stops or maximum dose of 10 mg is given
        ii. Pediatric: 0.2 mg/kg IM/IN, maximum 10 mg
6. For febrile seizures, consider the following after stopping the seizure:
    a. Remove excessive layers of clothing
    b. Consider applying cool compresses to the body
    c. Ketorolac (avoid in patients under 6 months):
        i. 1 mg/kg IV/IM, not to exceed adult dose
7. Consider acquiring a 12-Lead ECG following cessation of seizure in patients without a history of seizure to determine possible cardiac cause

OB/Gyn

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Abnormal Delivery

1. Universal Patient Care

Basic Care Guidelines

2. Consider the following recommendations for specific conditions:
    a. Shoulder Dystocia:
        i. Hyperflex mother's hips to severe supine knee-chest position
        ii. Apply firm suprapubic pressure to attempt to dislodge shoulder
        iii. Angle baby's head as posteriorly as possible, NEVER pull
    b. Prolapsed Umbilical Cord:
        i. Assess for pulsations in cord:
            1. If no pulses are felt, lift the presenting part off the cord
        ii. Maintain assistive position until relieved by hospital staff
    c. Breech Birth:
        i. Allow the buttocks, feet, and trunk to deliver spontaneously
        ii. If needed, put the mother in a kneeling position
        iii. If head fails to deliver, place your index and ring fingers on the baby's cheeks, forming a "V," allowing the chin to be tilted toward the chest, flexing the neck
        iv. Once the legs are delivered, support the body to avoid hyperextension of the head
    d. Arm or Leg Presentation:
        i. Do not attempt to facilitate delivery
    e. Nuchal Cord:
        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

Advanced Care Guidelines

3. Postpartum Hemorrhage with signs of hemorrhagic shock:
    a. Attempt fundal massage and initiate IV fluid resuscitation
    b. Consider TXA 1 g IV in 100 mL NS or D5W over 10 minutes:
        i. Must be within 3 hours of delivery

Eclampsia/Pre-eclampsia

1. Universal Patient Care

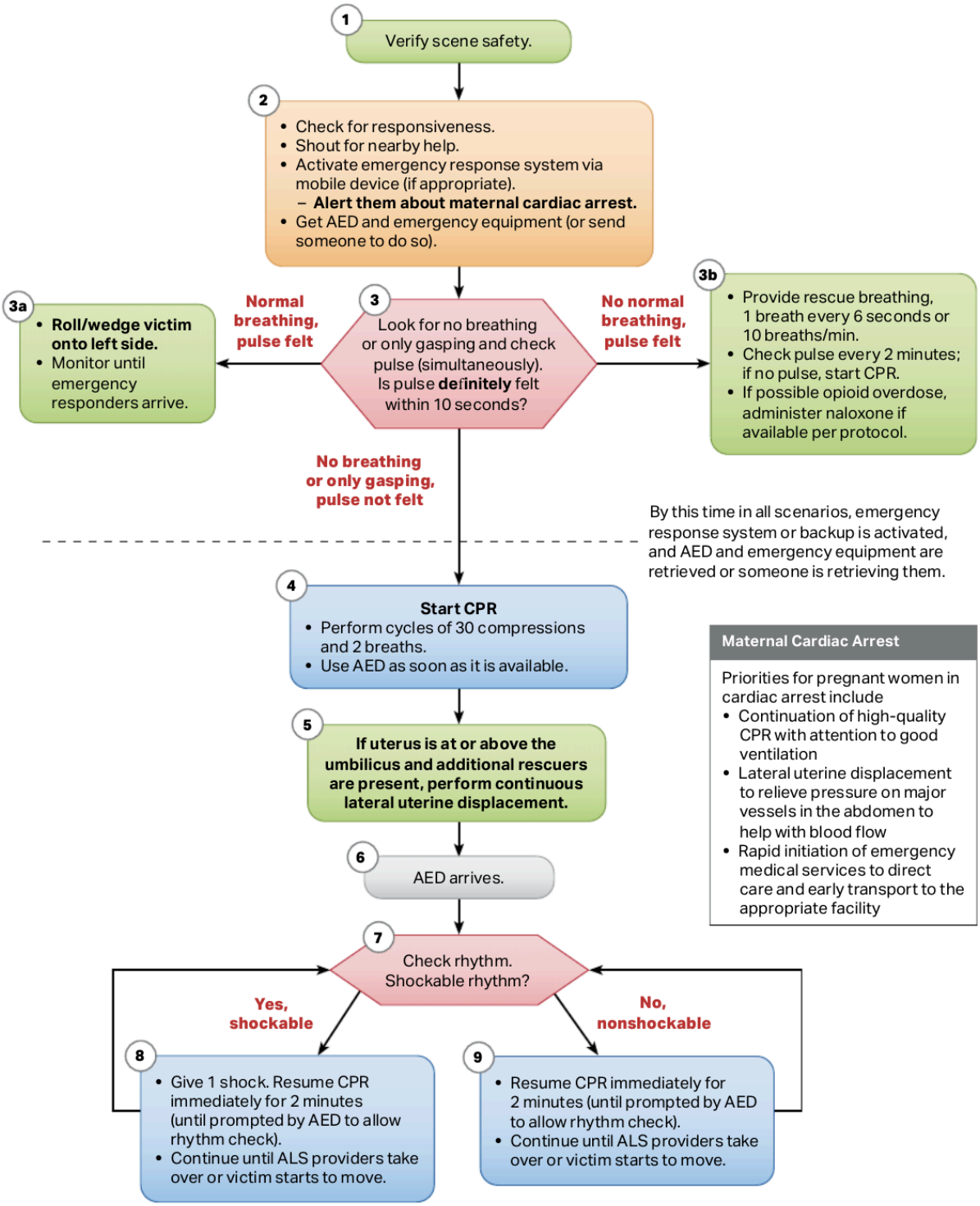
Basic Care Guidelines

2. Inclusion criteria:
    a. Female patient, more than 20-weeks gestation, presenting with symptomatic hypertension
3. If capability exists, obtain a 12 lead ECG and transmit it to the receiving facility for interpretation as soon as possible

Advanced Care Guidelines

4. Monitor ECG
5. Establish IV access
6. Severe hypertension (systolic blood pressure greater than 160 or diastolic blood pressure greater than 110) lasting more than 15 minutes with associated pre-eclampsia symptoms, administer:
    a. Labetalol:
        i. 20 mg IV over 2 minutes:
            1. Goal blood pressure is approximately 140/90 to reduce stroke risk but maintain uterine perfusion
            2. Ensure heart rate is greater than 60 beats per minute prior to administration
            3. Repeat every 10 minutes x 2 doses for persistent severe hypertension with preeclampsia symptoms
    b. Magnesium Sulfate:
        i. 4 g in 100 mL NS or D5W over 5-10 minutes
7. Active seizures not responding to Magnesium:
    a. Administer a benzodiazepine; refer to Seizures:
        i. Monitor EtCO2 for respiratory depression in patients who received Magnesium Sulfate prior to benzodiazepines

Maternal Cardiac Arrest



Normal Delivery

1. Universal Patient Care

Basic Care Guidelines

2. If patient is in labor without signs of imminent delivery:
    a. Transport to appropriate receiving facility
3. Imminent delivery:
    a. Support the infant's head and apply gentle counterpressure to help prevent the head from suddenly popping out:
        i. Do not routinely suction the infant's airway (even with a bulb syringe) during delivery
    b. Gently guide head down to allow delivery of the anterior shoulder
    c. Gently guide the head up to allow delivery of the posterior shoulder
    d. Deliver the remainder of the infant
    e. Dry and stimulate infant
    f. Wrap infant in a towel and place on maternal chest unless resuscitation is needed
    g. After one minute, clamp cord about 5-6 inches from the abdomen with two clamps, and cut cord between the clamps:
        i. While cord is attached, take care to ensure the baby is not significantly higher positioned than the mother to prevent blood from flowing backward from baby to placenta
    h. Record APGAR scores at 1 and 5 minutes once neonate is stabilized
4. Placenta delivery:
    a. Delivers spontaneously (often within 5-15 minutes after the infant):
        i. Do not force the placenta to deliver
        ii. Contain all tissue in a plastic bag and transport
5. Transport:
    a. Transport to appropriate receiving facility
    b. Transport infant secured to mother with approved neonatal restraint system, in car seat or isolette unless resuscitation is needed
    c. Keep infant warm during transport

Pediatrics

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Brief Resolved Unexplained Event (BRUE)

1. Universal Patient Care

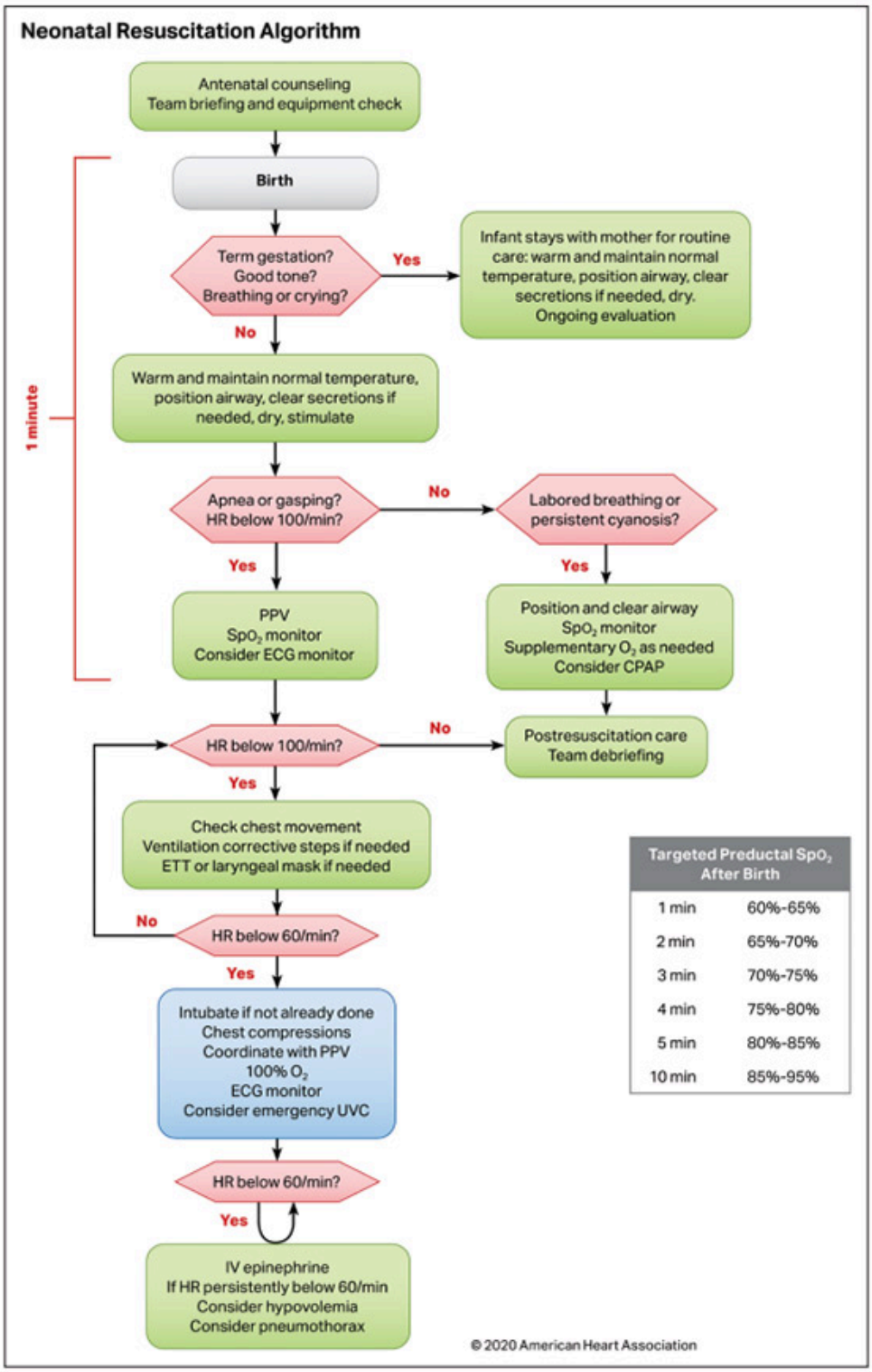
Basic Care Guidelines

2. Recognize patient characteristics and symptoms consistent with a BRUE:
    a. An event in an infant less than 1-year-old reported by a bystander as sudden, brief (less than 1 minute), unexplained, and completely resolved upon EMS arrival that includes one or more of the following:
        i. Breathing, color, or muscle tone change
        ii. Altered level of responsiveness
3. Obtain a full history:
    a. Circumstances and symptoms before, during, and after the event
4. Perform a full assessment:
    a. Pulse, blood pressure, respiratory rate, SpO2:
        i. Treat any signs of respiratory distress or increased work of breathing
        ii. Suction excess secretions from the nose and/or mouth if indicated
    b. Skin color and condition
    c. Pupillary response and anterior fontanelle
    d. Neurologic status
    e. Glucose level (if available)
    f. Signs of trauma or neglect
5. High-Risk Criteria:
    a. Less than two months of age
    b. History of prematurity (less than or equal to 32 weeks gestation)
    c. More than one BRUE, now or in the past
    d. Event duration greater than 1 minute
    e. CPR or resuscitation by caregivers or trained rescuers:
        i. Contact medical direction if parent/guardian is refusing medical care and/or transport, especially if any high-risk criteria are present

Advanced Care Guidelines

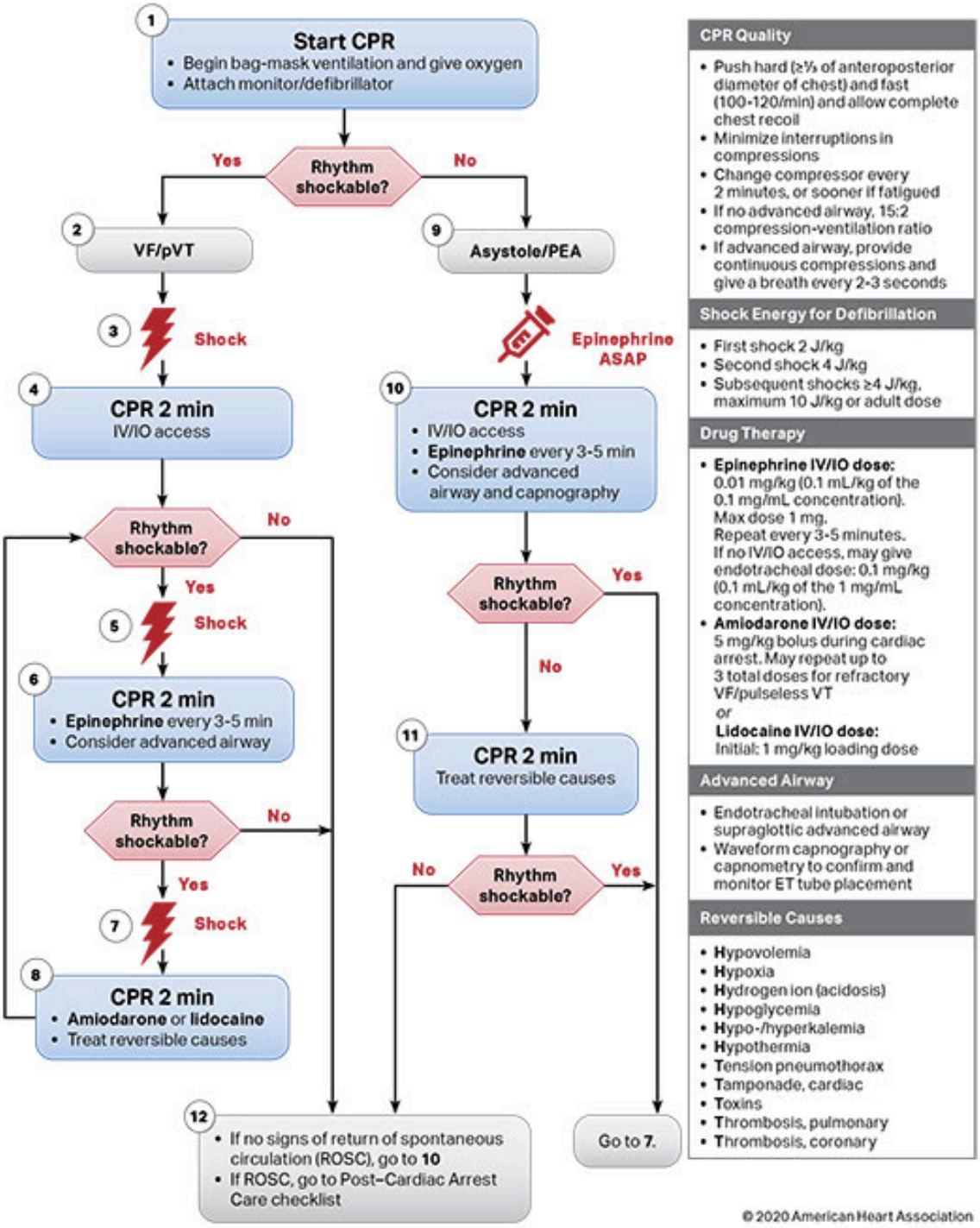
6. Monitor ECG
7. IV access:
    a. Only established for concerns of shock or to administer IV medications

Newborn Resuscitation



Pediatric Resuscitation

Pediatric Cardiac Arrest Algorithm



Respiratory

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Airway Management

1. Universal Patient Care

Basic Care Guidelines

2. Maintain oxygen saturation of 94-98%
3. Consider continuous positive airway pressure (CPAP)
4. Maintain a patent airway:
    a. Suction as needed
    b. Insert appropriate airway device (NPA, OPA, or SGA) if indicated
5. Use bag-valve-mask (BVM) ventilation in settings of respiratory failure or arrest

Advanced Care Guidelines

6. Monitor EtCO2:
    a. Patients without primary pulmonary pathology (ARDS, COPD):
        i. Maintain EtCO2 of 35-40 mmHg
7. When less invasive methods are ineffective or inappropriate:
    a. Consider endotracheal intubation; refer to Endotracheal Intubation
8. Patients who cannot be oxygenated/ventilated effectively using any of the above interventions or when other airway approaches are impossible:
    a. Consider needle cricothyroidotomy; refer to Needle Cricothyroidotomy

Difficulty Breathing

1. Universal Patient Care

Basic Care Guidelines

2. Maintain patent airway; refer to Airway Management
3. If the patient is complaining of shortness of breath, has signs of respiratory distress, or pulse oximetry is less than 94%, titrate oxygen for symptom improvement or to maintain oxygen saturation of 94-98%
4. Wheezing without respiratory distress:
    a. Albuterol 2.5 mg (if available), nebulized at 8 lpm oxygen
5. Respiratory distress with signs of bronchospasm:
    a. Albuterol 5 mg (if available), nebulized at 8 lpm oxygen, repeat as needed for ongoing respiratory distress

Advanced Care Guidelines

6. Monitor ECG
7. Monitor EtCO2
8. Establish IV access if indicated
9. Consider the need for the following:
    a. DuoNeb:
        i. Adult: Albuterol 3 mg and Ipratropium Bromide 0.5 mg, nebulized at 8 lpm oxygen, up to 3 doses
    b. Epinephrine:
        i. Adult (1:1000): 0.3 mg IM
        ii. Pediatric (1:1000): 0.01 mg/kg IM, not to exceed 0.3 mg
    c. Methylprednisolone:
        i. Adult: 40-125 mg IM/IV
    d. Magnesium Sulfate:
        i. Adult: 2 g in 100 mL NS or D5W over 10-15 minutes
        ii. Pediatric: 40 mg/kg in 100 mL NS or D5W over 10-15 minutes, not to exceed 2 g

Resuscitation

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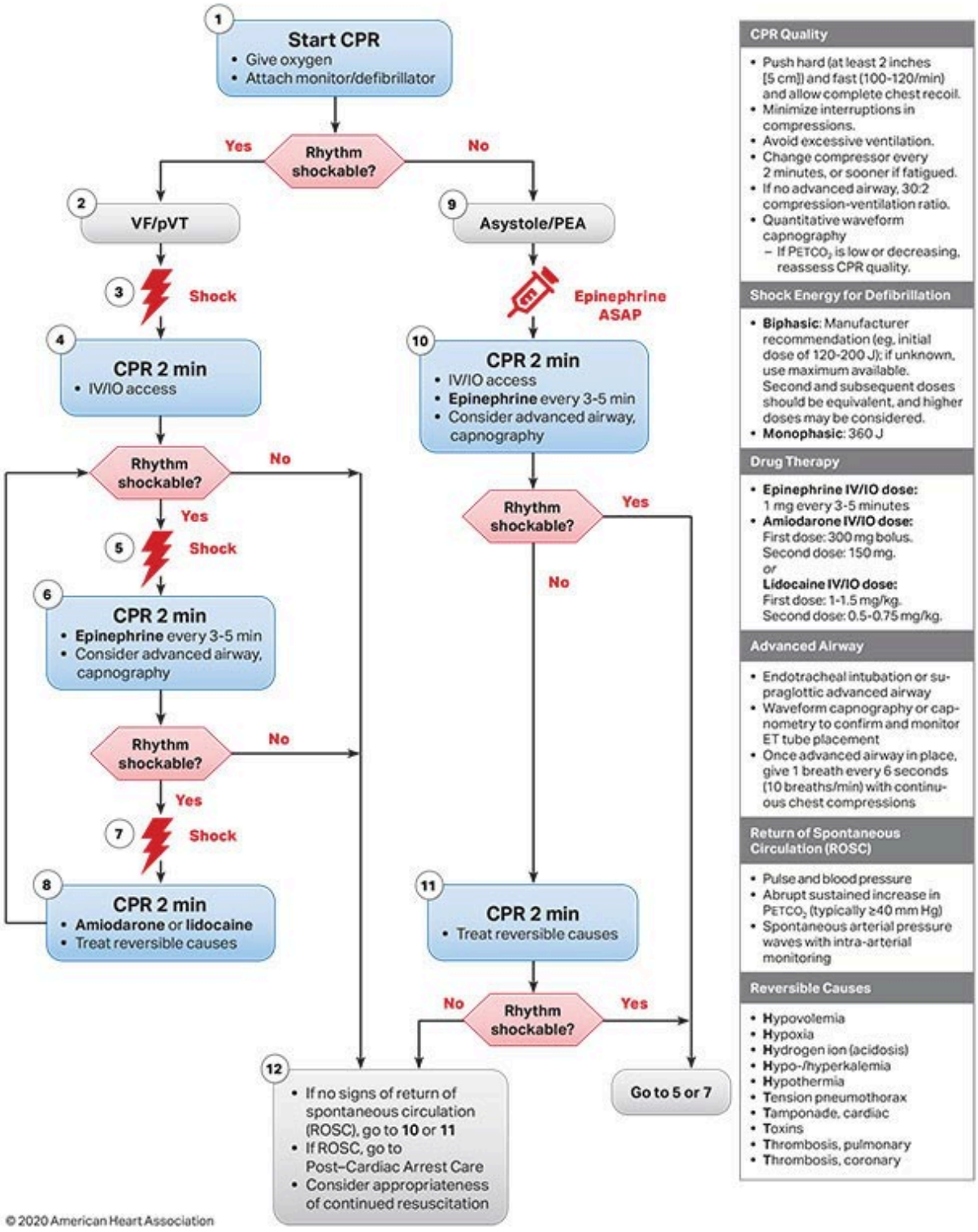
Cardiac Arrest

Adult Cardiac Arrest Algorithm (VF/pVT/Asystole/PEA)



Determination of Death - Withholding Resuscitation Efforts

1. Resuscitation should be started on all patients who are found apneic and pulseless unless the following medical cause, traumatic injury, or body condition clearly indicates biological death (irreversible brain death):
    a. Decapitation
    b. Transection of the torso (the body is completely transected below the shoulders and above the hips through all major organs and vessels)
    c. Incineration (90% of the body surface area with full-thickness burns)
    d. Massive crush injury or visible brain matter
    e. Blunt and penetrating trauma:
        i. No movement, ECG activity, or pupillary response present
    f. Nontraumatic arrest with obvious signs of death, including rigor mortis and dependent lividity
    g. Physical decomposition of the body
    OR
    h. A valid DNR order (form, card, bracelet) or other actionable medical order (e.g., IPOST) is present when it:
        i. Conforms to state specifications
        ii. Is intact:
            1. Has not been cut, broken, or shows signs of being repaired
        iii. Displays the patient's name and the physician's name
2. If apparent death is confirmed, continue as follows:
    a. Contact the county medical examiner and law enforcement
    b. When possible, contact Iowa Donor Network at 1-800-831-4131
    c. At least one EMS provider should remain at the scene until the appropriate authority is present
    d. Provide psychological support for grieving survivors
    e. Document the reason(s) no resuscitation was initiated
3. Preserve crime scene if applicable

Termination of Resuscitative Efforts

1. Indications to consider termination of resuscitation:
    a. Paramedic-level interventions have been initiated, including rhythm analysis, defibrillation when indicated, airway management, and medication administration as per protocol.
    b. There is no return of spontaneous circulation or respirations
    c. Correctable causes or special resuscitation circumstances have been considered and addressed
    d. Patient does not have profound hypothermia
    e. Non-traumatic arrest considerations:
        i. Asystole or slow wide complex PEA that has persisted for 20 minutes and EtCO2 is less than 20 mmHg
        ii. If narrow complex PEA with a rate above 40 or refractory ventricular fibrillation/ventricular tachycardia remains:
            1. Resuscitation should be considered for up to 60 minutes from the time of dispatch
            2. Termination of efforts may be considered before 60 minutes based on factors including but not limited to EtCO2 less than 20 mmHg, age, comorbidities, distance from and resources available at the closest hospital
2. Termination of resuscitation must meet one of the following:
    a. A valid DNR order is obtained by the EMS provider (any level)
    b. Patient meets all criteria under ‘indications’ above and as applicable to scope of practice:
        i. On-line medical direction is contacted while advanced care continues to discuss any further appropriate actions:
            1. Advanced care may be discontinued if physician's online medical direction authorizes
3. Other considerations:
    a. Documentation must reflect that the decision to terminate resuscitation was determined by physician's online medical direction
    b. An EMS/health care provider must attend to the deceased until the appropriate authorities arrive
    c. All IVs, tubes, etc., should be left in place
    d. Implement survivor support plans related to coroner notification, funeral home transfer, leaving the body at the scene, and death notification/grief counseling for survivors
    e. Consider organ donation; refer to Organ and Tissue Donation
4. Safety Considerations:
    a. All patients over 18 years old who are found with 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)

Shock

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Hypovolemic Shock

1. Universal Patient Care

Basic Care Guidelines

2. Avoid heat loss
3. Place patient in position of comfort
4. Stabilize fractures if indicated
5. Manage bleeding; refer to Hemorrhage Control

Advanced Care Guidelines

6. Monitor ECG
7. Monitor EtCO2:
    a. Reading of less than 25 mmHg may be a sign of poor perfusion
8. Establish IV/IO access:
    a. If systolic blood pressure is less than 90 mmHg:
        i. Administer Normal Saline:
            1. Adult: 250 mL rapid boluses, up to 20 mL/kg:
                a. Discontinue if:
                    i. Systolic blood pressure of 90 mmHg or MAP of 65 is reached, or pulmonary edema develops
            2. Pediatric: refer to length-based tape

Cardiogenic Shock

1. Universal Patient Care

Basic Care Guidelines

2. Place patient in position of comfort
3. If capability exists, obtain a 12 lead ECG and transmit it to the receiving facility for interpretation as soon as possible

Advanced Care Guidelines

4. Monitor ECG
5. Monitor EtCO2:
    a. Reading of less than 25 mmHg may be a sign of poor perfusion
6. Establish IV/IO access
7. Consider Norepinephrine infusion:
    a. Adult: 1-30 mcg/min IV/IO [4 mg in 250 mL D5W (16 mcg/mL)]:
        i. Use infusion pump
        ii. Initiate 1 mcg/min and titrate to maintain a systolic blood pressure of 90 mmHg or MAP of 65
        iii. Label bag with orange medication label
    b. Pediatric: 0.01-0.3 mcg/kg/min; consult medical control

Obstructive Shock (Tension Pneumothorax)

1. Universal Patient Care

Basic Care Guidelines

2. Place patient in position of comfort

Advanced Care Guidelines

3. Monitor ECG
4. Monitor EtCO2:
    a. Reading of less than 25 mmHg may be a sign of poor perfusion
5. Perform needle decompression; refer to Needle Thoracostomy

Obstructive Shock (Pulmonary Embolism)

1. Universal Patient Care

Basic Care Guidelines

2. Place patient in position of comfort
3. Consider Aspirin 324 mg:
    a. Amount may be reduced if patient has already taken Aspirin within the past 12 hours for a total of 324 mg

Advanced Care Guidelines

4. Monitor ECG
5. Monitor EtCO2:
    a. Reading of less than 25 mmHg may be a sign of poor perfusion
6. Establish IV/IO access:
    a. Administer Normal Saline:
        i. Adult: 500 mL rapid boluses, up to 20 mL/kg:
            1. Discontinue if:
                a. Systolic blood pressure of 90 mmHg or MAP of 65 is reached, or pulmonary edema develops
        ii. Pediatric: refer to length-based tape
7. Consider Norepinephrine infusion:
    a. Adult: 1-30 mcg/min IV/IO [4 mg in 250 mL D5W (16 mcg/mL)]:
        i. Use infusion pump
        ii. Initiate 1 mcg/min and titrate to maintain a systolic blood pressure of 90 mmHg or MAP of 65
        iii. Label bag with orange medication label
    b. Pediatric: 0.01-0.3 mcg/kg/min; consult medical control
8. Consider the following:
    a. Antiemetic; refer to Nausea and Vomiting
    b. Analgesia; refer to Pain Management

Distributive Shock (Neurogenic)

1. Universal Patient Care

Basic Care Guidelines

2. Place patient in supine position
3. Avoid heat loss

Advanced Care Guidelines

4. Monitor ECG
5. Monitor EtCO2:
    a. Reading of less than 25 mmHg may be a sign of poor perfusion
6. Establish IV/IO access:
    a. Administer Normal Saline:
        i. Adult: 500 mL rapid boluses, up to 20 mL/kg:
            1. Discontinue if:
                a. Systolic blood pressure of 90 mmHg or MAP of 65 mmHg is reached, or pulmonary edema develops
        ii. Pediatric: refer to length-based tape
7. Consider Norepinephrine infusion:
    a. Adult: 1-30 mcg/min IV/IO [4 mg in 250 mL D5W (16 mcg/mL)]:
        i. Use infusion pump
        ii. Initiate 1 mcg/min and titrate to maintain a systolic blood pressure of 90 mmHg or MAP of 65
        iii. Label bag with orange medication label
    b. Pediatric: 0.01-0.3 mcg/kg/min; consult medical control
8. If symptomatic bradycardia is present and does not respond to the treatments above, consider:
    a. Atropine:
        i. Adult: 1 mg IV/IO, every 5 minutes if indicated, up to 3 mg
    b. Transcutaneous pacing

Distributive Shock (Septic)

1. Universal Patient Care

Basic Care Guidelines

2. If temperature is over 102°F/38.9°C:
    a. Cool patient

Advanced Care Guidelines

3. Monitor ECG
4. Monitor EtCO2:
    a. Reading of less than 25 mmHg may be a sign of poor perfusion
5. Establish IV/IO access:
    a. Administer Normal Saline:
        i. Adult: 500 mL rapid boluses, up to 20 mL/kg:
            1. Discontinue if:
                a. Systolic blood pressure of 90 mmHg or MAP of 65 mmHg is reached, or pulmonary edema develops
        ii. Pediatric: refer to length-based tape
6. Consider Norepinephrine infusion:
    a. Adult: 1-30 mcg/min IV/IO [4 mg in 250 mL D5W (16 mcg/mL)]:
        i. Use infusion pump
        ii. Initiate 1 mcg/min and titrate to maintain a systolic blood pressure of 90 mmHg or MAP of 65
        iii. Label bag with orange medication label
        iv. Septic patients may require higher doses to maintain systolic blood pressure
    b. Pediatric: 0.01-0.3 mcg/kg/min; consult medical control
7. Consider Diphenhydramine:
    a. Adult: 25-50 mg IM/IV

Trauma

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Burns

1. Universal Patient Care

Basic Care Guidelines

2. General burn care:
    a. Stop the burning process
    b. Continually monitor airway for evidence of obstruction or impending obstruction:
        i. High-flow O2 should be considered for any burn patient rescued from an enclosed space
    c. Remove smoldering clothing and jewelry and expose the area
    d. Estimate percent of body surface area injured (BSA) using the “Rule of 9’s” and depth of injury:
        i. First-degree/superficial burns are not included in TBSA calculations
    e. Do not use any type of ointment, lotion, or antiseptic
    f. Leave blisters intact
    g. Cover the burned area loosely with a dry dressing and/or plastic wrap
    h. Maintain normal body temperature
3. Chemical burns:
    a. Don the appropriate PPE and attempt to identify contaminant
    b. Brush off powders prior to flushing
    c. Immediately begin to flush with large amounts of water:
        i. Continue flushing while en route to the receiving facility (do not contaminate uninjured areas while flushing)
4. Toxin in eye:
    a. Flood eye(s) with lukewarm water and have patient blink frequently during irrigation:
        i. Use caution not to contaminate other eye or body areas
    b. Attempt to identify contaminant

Advanced Care Guidelines

5. Establish IV/IO
6. For severe burns, administer:
    a. Normal Saline:
        i. Adult: 500 mL
        ii. Pediatric: 20 mL/kg, not to exceed 500 mL
    b. Contact medical control for further fluid administration
7. Electrical burn:
    a. Monitor ECG
8. Consider analgesia; refer to Pain Management

Abdominal & Chest Trauma

1. Universal Patient Care

Basic Care Guidelines

2. Manage any external bleeding; refer to Hemorrhage Control
3. Abdominal evisceration:
    a. Cover with a sterile saline-soaked dressing
4. Impaled objects:
    a. Leave in place
    b. Stabilize with bulky dressings
5. Open chest wounds:
    a. Seal immediately with a chest seal

Advanced Care Guidelines

6. Symptomatic pneumothorax:
    a. Perform needle decompression; refer to Needle Thoracostomy
7. Establish IV access if indicated
8. Consider analgesia; refer to Pain Management

Extremity Trauma & Amputations

1. Universal Patient Care

Basic Care Guidelines

2. Manage any external bleeding; refer to Hemorrhage Control
3. Remove or cut away clothing and jewelry
4. Stabilize suspected fractures/dislocations
5. Do not intentionally replace any protruding bones
6. Apply cold pack to area of pain or swelling
7. If severe deformity of the distal extremity is cyanotic or lacks pulses, align with gentle traction before splinting and transport immediately
8. Amputations:
    a. Locate amputated part if possible:
        i. Transport with patient for possible reimplantation
    b. Place amputated part in a plastic bag:
        i. Place bag with amputated part on ice in a second bag if possible:
            1. Do not let amputated part come into direct contact with ice

Advanced Care Guidelines

9. Establish IV access if indicated
10. Consider analgesia; refer to Pain Management

Head, Neck, and Facial Trauma

1. Universal Patient Care

Basic Care Guidelines

2. Manage any external bleeding; refer to Hemorrhage Control
3. Place head in a neutral in-line position unless the patient complains of pain or there is difficulty with movement to an in-line position
4. Monitor airway:
    a. Provide suctioning of secretions or vomit as needed
    b. Impaled objects in the cheek may only be removed if causing airway problems or with difficulty controlling bleeding
5. Head injury:
    a. Apply a moist sterile dressing to any potential open skull injury
    b. Severe injury:
        i. Elevate head of bed 30 degrees
6. Eye injury:
    a. If globe is avulsed, do not put back into socket:
        i. Cover with a moist dressing
    b. Place eye shield over injury
7. Epistaxis:
    a. Have patient lean forward
    b. Squeeze nose (or have patient do so) for 10-15 minutes continuously
8. Avulsed tooth:
    a. Avoid touching the root of the avulsed tooth
    b. If dirty, rinse with saline for 10 seconds
    c. Place in saline as the storage medium

Advanced Care Guidelines

9. Establish IV access if indicated
10. Moderate/severe closed head injury:
    a. Maintain a systolic blood pressure at or above 110 mmHg for patients over 10 years old:
        i. Do not wait until after the patient is hypotensive to administer fluids
11. Consider analgesia; refer to Pain Management
12. Consider intubation (if GCS is less than 8 or airway cannot be maintained):
    a. Monitor EtCO2 and maintain between 35-40 mmHg

Hemorrhage Control

1. Universal Patient Care

Basic Care Guidelines

2. Manage bleeding:
    a. Expose the wound and apply direct pressure to bleeding site, followed by a pressure dressing
    b. Epistaxis:
        i. Have patient lean forward and squeeze nose (or have patient do so) for 10-15 minutes continuously
    c. If direct pressure/pressure dressing is ineffective or impractical:
        i. Apply a commercial tourniquet to extremity:
            1. Tourniquet should be placed 2-3 inches proximal to wound, not over a joint, and tightened until bleeding stops and distal pulse is eliminated:
                a. If bleeding continues, place a second tourniquet proximal to the first
            2. For thigh wounds, consider placement of two tourniquets side-by-side, and tighten sequentially
    d. Wound packing (groin/axillary “junctional” injury or any limb wound with persistent bleeding despite direct pressure and/or application of commercial tourniquet):
        i. Pack hemostatic gauze or regular gauze tightly and fully to the depth of the wound until bleeding stops:
            1. Pack around bone fragments or foreign objects
        ii. Apply direct pressure and/or pressure dressing

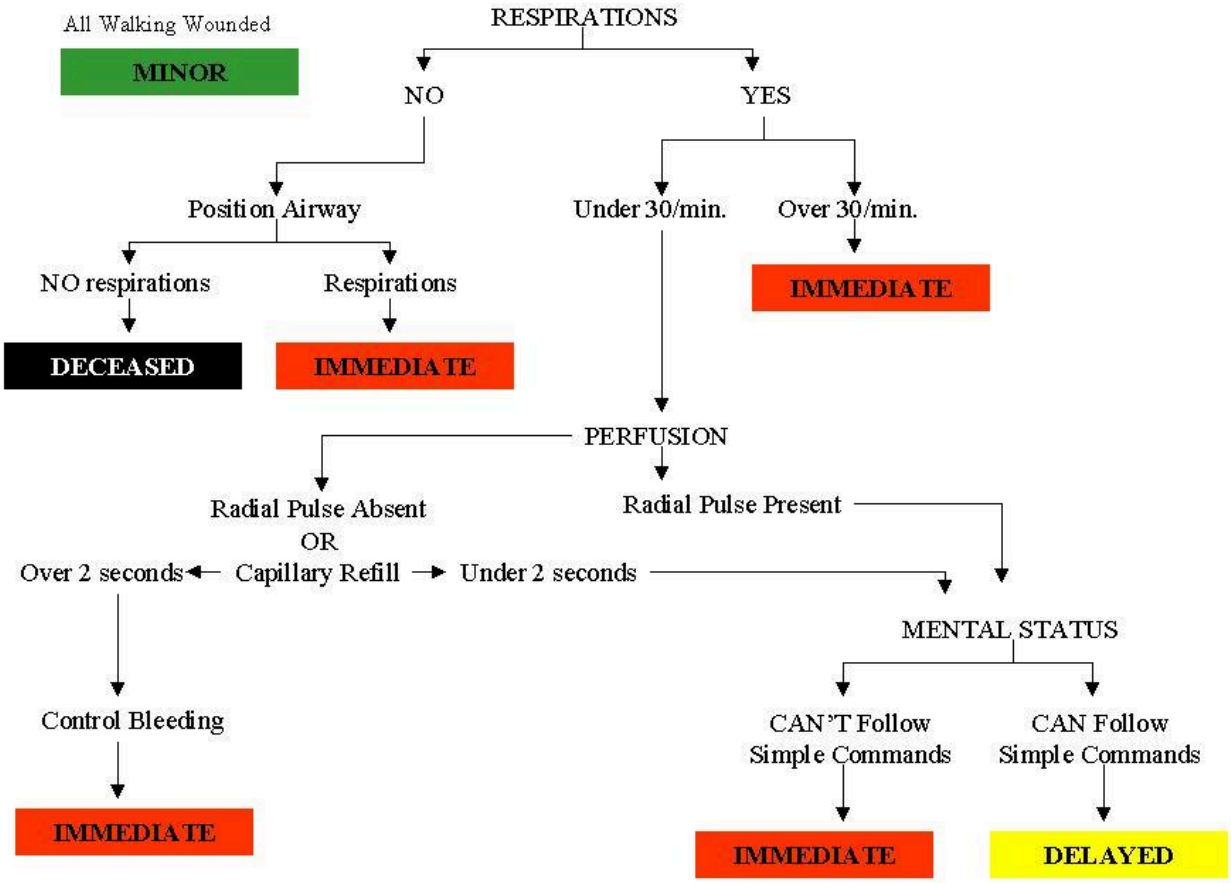
Advanced Care Guidelines

3. Establish IV access if indicated
4. Bleeding with signs of hemorrhagic shock, consider TXA:
    a. Adult: 1 g IV in 100 mL NS or D5W over 10 minutes:
        i. Must be within three hours of injury
5. Epistaxis, consider TXA:
    a. 500 mg IN or gauze soaked in 500 mg and packed into nostril(s)
6. Consider analgesia; refer to Pain Management
7. Symptoms of shock; refer to Hypovolemic Shock

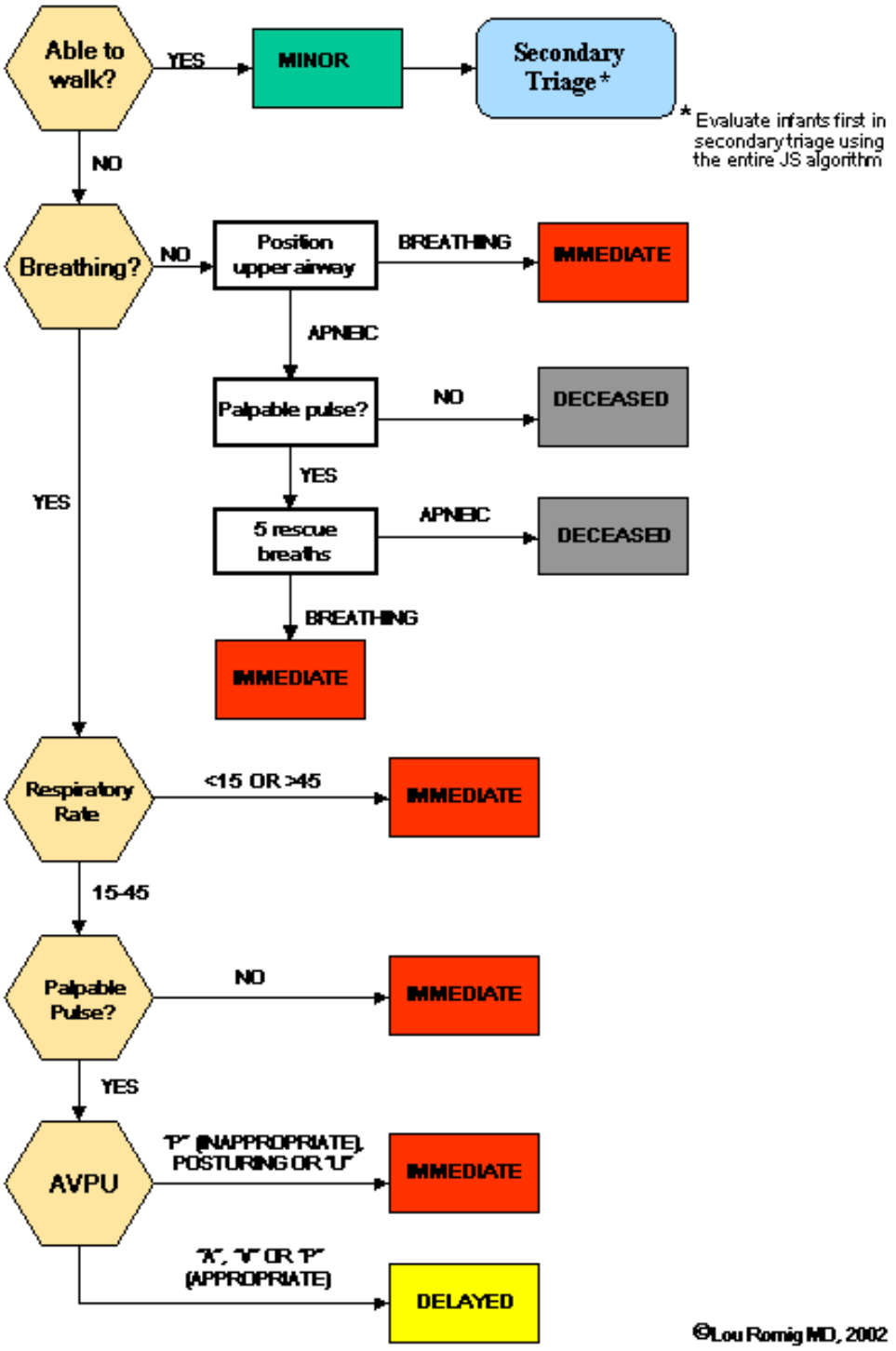
Spinal Motion Restriction

1. Universal Patient Care
2. Place patient in a cervical collar if there are any of the following after a traumatic mechanism of injury:
    a. Midline neck pain
    b. Midline neck or spinal tenderness with palpation
    c. Abnormal mental status
    d. Focal or neurologic deficit
    e. Evidence of alcohol or drug intoxication
    f. Severe or painful distracting injury
    g. Communication barrier that prevents accurate assessment
3. Patients with penetrating injury to the neck should not be placed in a cervical collar regardless of whether they are exhibiting neurologic symptoms or not (may lead to delayed identification of injury or airway compromise and has been associated with increased mortality)
4. Use spinal and cervical motion restriction and a long spine board *OR* full body vacuum splint *OR* scoop stretcher if:
    a. Patient complains of midline back pain
5. Do not transport patients on rigid long boards unless the clinical situation warrants longboard use, such as:
    a. Immobilization of multiple extremity injuries or an unstable patient where removal of a board will delay transport and/or other treatment priorities
6. If extrication is required from a vehicle:
    a. After placing a cervical collar, if indicated, adults should be allowed to self-extricate
    b. 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
7. Helmet removal:
    a. Remove face mask, followed by manual removal of helmet while keeping the neck manually immobilized
    b. Occipital and shoulder padding should be applied as needed, with the patient in a supine position to maintain neutral cervical spine positioning
    c. If available, utilize athletic trainers on scene who have been trained in these specific situations to help prepare the patient for EMS transport

Trauma Triage - START



Trauma Triage - JumpSTART



PROCEDURES

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Medical Procedures

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Blood Glucose Monitoring

Indications

1. Known diabetic with signs and symptoms of blood sugar derangement
2. Altered mental status
3. Stroke signs and symptoms

Procedure

1. Obtain a fresh blood sample from the patient by either of the following:
    a. Capillary technique:
        i. Clean fingertip thoroughly with alcohol pad
        ii. Puncture fingertip and allow a large drop of blood to form
        iii. Wipe puncture site with clean, dry 2x2
        iv. Allow large drop of blood to form again and place on test strip
    b. Venous technique:
        i. Using a sterile procedure, acquire small blood sample from IV catheter and place on test strip
2. Document reading from glucometer

Continuous Positive Airway Pressure (CPAP)

Indications

1. Dyspnea or Hypoxemia secondary to congestive heart failure (CHF)
2. Chronic obstructive pulmonary disease (COPD)
3. Respiratory distress due to asthma, pulmonary edema, or pneumonia

Contraindications

1. Pneumothorax
2. Tracheostomy
3. Respiratory arrest
4. Agonal respirations
5. Unconsciousness
6. Shock associated with cardiac insufficiency
7. Penetrating chest trauma
8. Blood pressure below 90 systolic

Precautions

1. Impaired mental status
2. Facial anomalies (facial trauma or stroke obtundation)
3. Active GI bleeding or history of recent gastric surgery
4. Nausea or vomiting
5. Excessive secretions

Procedure

1. Place patient in a sitting position
2. Explain procedure to patient
3. Connect mask to oxygen tubing with 10 lpm oxygen
4. Place mask on patient's face and secure with manufacturer's head strap
5. Adjust PEEP as indicated

Special Notes

1. Do not use in children under 12 years old
2. Most patients will improve in 5-10 minutes:
    a. If there is no improvement, consider bag valve mask ventilation

ECG 12-Lead Acquisition and Monitoring

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. Shoulder, arm, or jaw pain in the absence of chest pain in patients with past cardiac history or irregular pulse
5. Suspected Stroke

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” and ensure ECG cables are appropriately connected
2. Prepare patient’s skin for electrode application:
    a. Shave excessive hair at the electrode site
    b. Clean oily or dirty skin with an alcohol pad, then dry briskly
3. Position electrodes on patient:
    a. Avoid placing electrodes over tendons and major muscle masses
4. Electrode placement:
    a. RA - Right arm
    b. RL - Right leg
    c. LA - Left arm
    d. LL - Left leg
    e. V1 - Fourth intercostal space, right sternal border
    f. V2 - Fourth intercostal space, left sternal border
    g. V3 - Equidistant between V2 and V4
    h. V4 - Fifth intercostal space, left midclavicular line
    i. V5 - Fifth intercostal space, left anterior axillary line
    j. V6 - Fifth intercostal space, left midaxillary line
5. Acquisition:
    a. Encourage the patient to relax all muscles and remain as still as possible
    b. Enter patient demographics on the monitor and push button to acquire
    c. If capability exists, transmit to the receiving hospital
    d. When a STEMI is present, transport emergently to a receiving facility with interventional cath lab capabilities

Endotracheal Intubation

OROTRACHEAL

Indications

1. Airway control needed as a result of respiratory or cardiac arrest

Procedure

1. Assemble all necessary equipment
2. Preoxygenate patient for 2-3 minutes with 100% oxygen
3. Position patient in sniffing position (maintain manual in-line stabilization for suspected or known cervical spine trauma)
4. Insert the laryngoscope blade into the right side of the mouth and displace the tongue to the left
5. Gently lift the long axis of the laryngoscope handle until you can visualize the glottic opening and the vocal cords
6. Insert the ET tube through the right corner of the mouth:
    a. Advance tube till the cuff lies just below the vocal cords
    b. Remove stylet or bougie
7. Inflate the distal cuff of the ET tube and immediately detach the syringe from the inflation port
8. Placement confirmation:
    a. Direct visualization of tube passing through the vocal cords
    b. Observation of bilateral chest rise and fall with each ventilation
    c. Auscultation over both lungs and epigastrium
    d. Positive end-tidal capnography:
        i. If capnography is unavailable or inconclusive, use an esophageal detector device:
            1. If the ET tube is in the trachea, the bulb will reinflate with air
            2. False positives may occur with the morbidly obese/late pregnancy patient, copious tracheal secretions, status asthmaticus, or gastric inflation from BVM
9. Secure the endotracheal tube with a commercial tube holder and note the depth of the ET tube at the patient's teeth
10. A maximum of 3 intubation attempts may be made:
    a. If orotracheal intubation is not achieved and the patient has no contraindications, place a supraglottic airway

NASOTRACHEAL

1. Contact medical control

i-gels

Indications

1. Airway management in cardiac arrest
2. Inability to intubate when rapid control of airway is essential

Contraindications

1. Intact gag reflex
2. Inability to open the patient's mouth because of trauma, dislocation of the jaw, or a pathologic condition

Procedure

1. Preoxygenate patient
2. Select appropriately sized i-gel according to patient's weight
3. Remove i-gel from packaging and protective cradle
4. Lubricate back, sides, and front of the cuff with a thin layer of lubricant
5. Place patient in sniffing position
6. Gently press chin down to open airway
7. Position i-gel so that the cuff outlet faces toward the patient's chin
8. Insert soft tip of i-gel into patient's mouth, directing toward the hard palate
9. Glide i-gel downward along the hard palate with a continuous push until a definitive resistance is felt:
    a. Do not apply excessive force on the device during insertion
    b. If early resistance is felt:
        i. Apply jaw thrust maneuver or insert with deep rotation
10. Secure i-gel with manufacturer's strap
11. Ventilate patient and confirm chest rise and breath sounds
12. Attach capnography (if available)

Intranasal Medication Administration

Indications

1. Overdose with no IV access
2. Pain control with no IV access
3. Seizures
4. Sedation for medical procedures or behavioral problems

Contraindications

1. Excessive blood in or bleeding from the nose
2. Impeding nasal trauma

Procedure

1. Assess the patient to ensure the nasal cavity is free of blood or mucous:
    a. If blood or mucus is present:
        i. Suction the nose prior to delivery or choose a different method to deliver the medication
2. Draw up an appropriate dose of approved medication:
    a. Draw up an extra 0.1 mL of medication to account for MAD dead space
    b. Ensure volume does not exceed 1mL per nare
3. Insert MAD into nostril and apply half the medication:
    a. Briskly compress syringe:
        i. Not briskly compressing the syringe will fail to atomize the medication, resulting in a steady flow of liquid that will run into the patient's throat
4. Repeat in other nostril with remainder of the medication
5. Assess patient's response to the medication:
    a. Onset is usually within 3-5 minutes, with a peak in 10-20 minutes
    b. Some medications, especially Midazolam, may cause an uncomfortable burning sensation in the nares, which generally resolves in 30-45 seconds and should be explained to the patient
6. Consider the need for IV/IO access if vital signs become unstable or patient has an immediate need for other medications or fluids

Intraosseous Vascular Access

Indications

1. Immediate vascular access in emergencies or cardiac arrest
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. Altered mental status:
        i. GCS of 8 or less
    b. Respiratory compromise:
        i. SpO2 90% or less after appropriate oxygen therapy
        ii. Respiratory rate of less than 10 or greater than 40
    c. Hemodynamic instability:
        i. Systolic blood pressure of less than 90 mmHg

Contraindications

1. Fracture or infection at the site selected for IO infusion (consider alternate site)
2. Excessive tissue at the insertion site with the absence of anatomical landmarks
3. Previous significant orthopedic procedures, IO within 24 hours, prosthesis
4. Previous failed IO attempts in the same bone

Procedure

1. If the patient is conscious, advise of the emergent need for this procedure and obtain informed consent
2. Locate appropriate insertion site:
    a. Proximal Tibia, Proximal Humerus, Distal Tibia
3. Cleanse insertion site
4. Prepare supplies:
    a. Unlock clamp and prime extension set
    b. Attach appropriate size needle to power driver and remove safety cap
5. Push needle set through skin until tip rests against bone, squeezing the trigger and applying gentle, steady pressure:
    a. Immediately release the trigger when you feel a sudden “give” or loss of resistance as the needle set enters the medullary space
6. Stabilize needle set hub, disconnect driver, and remove stylet:
    a. Place stylet in sharps block
    b. Apply stabilizer dressing
7. Confirm placement
8. Administer an appropriate dose of Lidocaine 2% to conscious patients
9. Attach primed extension set to cannula hub and flush with normal saline
10. Begin fluid and/or medication administration:
    a. Utilize pressure bag or infusion pump for continuous infusions if indicated

Medication-Assisted Intubation

Indications

1. Uncontrolled, obstructed, or inadequate airway secondary to trauma or overdose when sedation is needed
2. Decreased level of consciousness, combativeness, or severe agitation secondary to trauma or suspected CVA
3. Combative or uncontrollable head trauma with potential for injury to self or others
4. CHF, COPD, or asthma patient with hypoxia and or respiratory exhaustion who cannot be orally intubated without sedation
5. Burn patient with potential or existing respiratory compromise

Contraindications

1. Hypersensitivity to medications that would be used
2. Patients with tissue-destructive conditions such as:
    a. Crushing injuries more than 72 hrs old or sepsis
3. Patients with muscle wasting conditions such as:
    a. Parkinson's
    b. Muscular Dystrophy
    c. Pre-existing spinal cord injuries resulting in paralysis

Procedure

1. Follow Endotracheal Intubation procedure
2. Consider pain management:
    a. Fentanyl:
        i. Adult: 2 mcg/kg IV, up to 250 mcg
        ii. Pediatric: 1 mcg/kg IV, not to exceed adult dose
3. Administer:
    a. Midazolam:
        i. Adult: 2-5 mg IV
        ii. Pediatric: contact medical control
    b. Ketamine:
        i. Adult: 2 mg/kg IV
        ii. Pediatric: 2 mg/kg IV
4. If bradycardia occurs, pause and assist ventilation with BVM and 100% oxygen
5. If the patient remains bradycardic, consider Atropine:
    a. Adult: 1 mg IV
    b. Pediatric: 0.02 mg/kg IV, not to exceed 1 mg
6. For continued sedation, administer Midazolam:
    a. Adult: 2-5 mg IV, over 1-2 minutes to desired effect, maximum 10 mg in a 30-minute period
    b. Pediatric: contact medical control

Needle Cricothyrotomy

Indications

1. Inability to ventilate patient by any other means
2. Massive maxillofacial trauma
3. Inability to open patient's mouth
4. Uncontrolled oropharyngeal bleeding

Contraindications

1. Severe airway obstruction above site of catheter

Procedure

1. Attach a 14-16 gauge IV catheter to a 10 mL syringe with 3 mL saline
2. Place the patient's head in a neutral position
3. Stabilize the thyroid cartilage and locate the cricothyroid membrane
4. Cleanse the area
5. Insert the catheter just below the midpoint of the cricothyroid membrane with the needle at a 45-degree angle caudally
6. Aspirate with the syringe to determine correct catheter placement
7. Withdraw the needle while advancing the plastic catheter into the trachea
8. Attach #3 ETT End to catheter
9. Secure catheter
10. Attach hub of catheter to a prepared ventilation device:
    a. Ventilate at a rate of 12 beats per minute at a 1:4 ratio to allow for exhalation

Needle Thoracostomy

Indications

1. Tension Pneumothorax
2. Absent or significantly decreased breath sounds over the hemothorax area
3. Trachea shifted to unaffected side and/or JVD
4. Subcutaneous emphysema
5. Multiple rib fractures with respiratory compromise

Procedure

1. Prepare and assemble all necessary equipment
2. Expose anterior chest at level of the 2nd intercostal space on the affected side
3. Locate 2nd intercostal space midclavicular line with gloved finger
4. Cleanse site
5. Using ARS or 14 gauge catheter, direct needle over the third rib into the 2nd intercostal space:
    a. Apply enough pressure to push the needle through the intercostal muscle and into the pleural cavity
    b. A release of air is a sign of positive placement
6. Remove the needle, leaving catheter in place
7. Connect one-way valve
8. Secure catheter
9. Assess patient for improvement in status

Pulse Oximetry

Indications

1. Monitor patient's oxygenation

Procedure

1. Position patient comfortably and support the extremity to be used for monitoring
2. Attach sensor probe to finger, earlobe, or toe

Potential Problems

1. Inaccuracy if oxygen saturation is less than 70%
2. Possible interference with ambient light
3. The presence of carboxyhemoglobin may produce a normal reading in severe tissue hypoxemia
4. Measurements can be difficult to get in the presence of vasoconstriction, hypotension, and anemia

Synchronized Cardioversion

Indications

1. Unstable tachycardia

Precautions

1. Risk of thromboembolic complications (e.g., stroke) in patients with a history of atrial fibrillation duration greater than 48 hours

Procedure

1. Consider procedural sedation; refer to Midazolam
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 size until sync markers occur with each R wave
8. Set initial joules:
    a. Supraventricular Tachycardia or Atrial Flutter:
        i. Adult: 50-100 J
        ii. Pediatric: 0.5 J/kg
    b. Ventricular Tachycardia:
        i. Adult: 100 J
        ii. Pediatric: 1 J/kg
    c. Uncontrolled Atrial Fibrillation:
        i. Adult: 120 J
9. Announce to team members: “Charging defibrillator…stand clear”
10. Press “Charge” button
11. When the defibrillator is charged, announce the shock
12. Press and hold the “shock” button
13. If tachycardia persists, increase the joules in a stepwise fashion, 100 J, 120 J, 150 J, 200 J, consult medical direction
14. Remember to reset the sync mode after each synchronized cardioversion:
    a. Most defibrillators default back to the unsynchronized mode (this default allows defibrillation if the cardioversion produces ventricular fibrillation):
        i. If sync is retained and the patient is in ventricular fibrillation, shut it off to administer an unsynchronized shock

Transcutaneous Cardiac Pacing

Indications

1. Profound bradycardia with hemodynamic compromise

Contraindications

1. Severe hypothermia is a relative contraindication:
    a. Bradycardia is a normal response to the decreased metabolic rate that occurs with hypothermia:
        i. Electrical stimulation from TCP may cause asymptomatic bradyarrhythmias to degenerate into more life-threatening arrhythmias

Special Considerations

1. Patients with implantable pacemakers may require higher energy and rate

Procedure

1. Consider procedural sedation if time allows and patient is stable enough to wait; refer to Midazolam
2. Apply pads according to manufacturer's recommendations
3. Turn on pacemaker
4. Set rate at 60-80 bpm start amperage at 0 mA
5. Increase the output in 10 mA increments until mechanical capture occurs:
    a. Assess the patient for both mechanical and electrical capture:
        i. Following capture, back amperage down in increments of 2-5 mA to ensure lowest possible setting
        ii. Adjustment of amperage to maintain capture may be necessary with prolonged pacing or with increased discomfort of the patient
6. If at any point the patient goes into either ventricular fibrillation or ventricular tachycardia:
    a. Shut pacing off and defibrillate the patient

Operational Procedures

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Air Medical Transport

Indications

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

Firefighter Rehab

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

Rehabilitation Area

The Incident Commander will establish a Rehabilitation Area when conditions indicate that rest and rehabilitation are needed for operating personnel:

1. Emergency operation or training evolution rehabilitation areas should:
    a. Be far enough away from the scene that members may safely remove their turnout gear, and SCBA providing physical and mental rest from the stress and pressures of the operation
    b. Provide suitable protection from the prevailing environmental conditions
    c. Enable members to be free of exhaust fumes from apparatus, vehicles, or equipment (including those involved in the Rehabilitation Operations)
    d. Be large enough to accommodate multiple crews based on the size of the incident and easily accessible by EMS units

Guidelines

1. Hydration: Members should consume at least a quart per hour of 50/50 mixture water and commercial activity beverage during strenuous activity with care to avoid carbonated and caffeinated beverages prior to and during the event
2. Nourishment: Food shall be provided for incidents engaging three or more hours; preference is given to quickly digested foods like soup or stew; fruits for energy replacement are advised; fatty and/or salty foods should be avoided
3. Rest: Firefighters having worked through two full 30-minute rated bottles or for 45 minutes shall go to rehabilitation for a minimum of 10 minutes and consume at least 8 ounces of fluid
4. Recovery: Members should not be moved directly from a hot environment into an air-conditioned space, as this may cause the body's cooling mechanisms to stop functioning properly; closely monitor members that have taken medications that impair the ability to sweat, such as antihistamines, diuretics, or stimulants
5. Evaluation: Heart rate should be measured for 30 seconds as early as possible in the rest period; if a member’s heart rate exceeds 110 bpm, an oral temperature should be taken; if the member’s temperature exceeds 100.6 F, he/she should not be permitted to wear protective equipment; if it is below 100.6 F and the heart rate remains above 110 bpm, rehabilitation time should be increased; if heart rate is less than 110 bpm, chance of heat stress is negligible
6. Document all medical evaluations and submit to Incident Commander

Mandatory Reporting (Suspected Abuse, Assault, Neglect)

Procedure

1. Contact local law enforcement if not present
2. Provide reassurance
3. Do not burden patient with questions about the details of the incident
4. Provide appropriate medical care per protocol
5. Be alert to immediate scene and document what you see:
    a. Touch only what you need to touch at the scene
    b. Do not disturb any evidence unless necessary for treatment of patient:
        i. If necessary to disturb evidence, document why and how it was disturbed
6. Preserve evidence, such as clothing that was removed for treatment, and make sure that it is never left unattended at any time to preserve "chain of evidence”
7. Provide local referrals as available
8. During radio report communicate vital information only; additional info can be given to the receiving nurse and/or physician on arrival
9. Only document objective information on run report
10. Provide an oral report for all suspected abuse within 24 hours of contact with the patient to the pediatric and dependent adult hotline at 1-800-362-2178

Organ and Tissue Donation

Procedure

1. All appropriate patient care protocols will be enacted to ensure 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 online 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, firefighter, 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

Patient Restraint

Inclusion Criteria

1. Patients of all ages who are exhibiting agitated or violent behavior are a danger to themselves or others and, in the sole assessment of the EMS clinician, require physical restraint to mitigate injury to themselves 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 (i.e., hypoglycemia, hypoxia)

Procedure

1. Do not attempt to enter or control a scene where active physical violence or weapons are present:
    a. If not already done so, dispatch law enforcement immediately to secure and maintain scene safety
2. Attempt verbal de-escalation
3. Place patient in sitting position
4. Secure patient using soft restraints:
    a. Patients who are more physically uncooperative should be physically secured with one arm above the head and other arm below the waist with both lower extremities individually secured
    b. Sheets may be utilized if additional restraint is needed by being placed around the lower lumbar region, below the buttocks, and over the thighs, knees, and legs
    c. 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
5. Unacceptable restraint methods:
    a. 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’)
    b. No techniques or devices that constrict the neck or compromise the airway should be used
    c. No cot straps or devices should restrict chest wall movement
6. Continuously monitor pulse, motor, and sensory function of restrained extremities
7. Patients who require physical management should also receive pharmacological treatment from an ALS provider

Physician On Scene

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

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 online medical control physician agrees to re-assume responsibility for this patient prior to transport

Protocol Development

Systematic Approach to Protocol Development

1. Thoroughly investigate the issue
2. Identify key questions
3. Assess compatibility with the system
4. Conduct a cost-benefit analysis

Key Questions

1. What process do you want improved?
2. What research needs to be conducted before moving further?
3. Who is going to conduct the research?
4. Is it medically indicated and safe?
5. Is it within the scope of practice for the provider?
6. What specifically is needed to implement this?
7. How will this impact operations?
8. What is the opinion of providers concerning this?
9. Does the medical community support this change?
10. What ongoing provider involvement, such as skills maintenance and continuous quality improvement, is necessary?

Follow-Up/Analysis of Data

1. What data must be collected to measure the improvement?
2. How will data be collected and analyzed?
3. Who is going to be involved in the analysis?

Recognized Stake Holders

1. Medical Direction (online and offline)
2. Educators/Training Programs
3. Regulatory Bodies
4. Service Directors
5. Service Providers
6. Consumers
7. Third-party payers

Special Events

Purpose

1. To offer guidance for EMS providers when delivering on-site medical coverage at special events, such as recreational activities and community celebrations

Assessment

1. The EMS provider shall assess the patient as the patient's condition indicates:
    a. All patients exhibiting changes in mental status or abnormal vital signs shall have an ALS assessment and/or ambulance requested

First Aid Treatment

1. Only treatments that can be performed by someone with minimal medical training, such as first aid, should be carried out:
    a. If emergency treatment is needed or requested, an ambulance should be requested immediately if not already present
2. At certain special events, OTC medications may be available for use:
    a. These shall be documented in the First Aid OTC Log
    b. OTC medications are only provided as a courtesy; providers should not assist the patient with administration when providing First Aid

First Aid Supplies

1. Only supplies and medications that can be obtained over the counter or in a basic first aid kit shall be used

First Aid Log

1. When possible, first aid treatment shall be documented in a First Aid Log to include patient’s name, address, complaint, vital signs, treatment, and disposition

Special Event Reports

1. A Special Event Report should be completed following each event and submitted to the EMS Director:
    a. The report should include:
        i. EMS Service, providers, number of patients, supplies used, date of event, location of event, and time event started/ended
        ii. First Aid Log
2. Anytime a patient refusal is necessary, or ambulance transport is required, a dispatch number should be assigned, and an ePCR shall be completed

Special Needs Patients

Purpose

1. To 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 when the operation of that equipment is outside of the EMS provider's scope of practice
2. This protocol is not intended for interfacility transfers

Procedure

1. EMS providers 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:
    a. EMS providers should consider utilizing a family member or caregiver who has experience using the equipment to help monitor and operate the special medical equipment if necessary during transport
2. When providing care to patients with special needs, EMS providers should only provide the necessary level of care within their training and certification

Medical Device Examples

1. PCA (patient controlled analgesic)
2. Chest Tube

Stroke Destination Decision

Procedure

1. Perform a validated stroke assessment (e.g., Cincinnati Stroke Scale)
2. If assessment is positive for stroke, and onset of symptoms can be established within the past 4.5 hours, transport directly to a primary stroke center
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
4. If transport to a primary stroke center or stroke-capable hospital cannot be achieved 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; refer to Fibrinolytic Checklist

Levels of Stroke Care Capacity

1. Comprehensive Stroke Center:
    a. Certified by the Joint Commission
    b. Accredited acute care hospitals must meet all the criteria for Primary Stroke Certification
2. Primary Stroke Center:
    a. 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
3. Stroke-Capable hospitals that have the following:
    a. rt-PA readily available for administration
    b. Head CT, laboratory, and ECG capabilities 24/7
    c. Process for transporting patients to a primary stroke center
    d. Protocols that follow American Stroke Association guidelines
    e. Emergency department coverage by a physician or advanced practitioner

Trauma Destination Decision - Adult

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

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

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

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

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

Step 2 - Assess for Anatomy of an Injury

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

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

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

Step 3 - Consider Mechanism of Injury & High Energy Transfer

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

Transport to the nearest appropriate Trauma Care Facility, need not be the highest level trauma care facility.

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

Step 4 - Consider risk factors:

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

Transport to the nearest appropriate Trauma Care Facility, need not be the highest level trauma care facility.

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

For all Transported Trauma Patients:
1. Patient report to include: MOI, Injuries, Vital Signs & GCS, Treatment, Age, Gender and ETA
2. Obtain further orders from medical control as needed.

Trauma Destination Decision - Pediatric

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

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

Abnormal Responsiveness: abnormal or absent cry or speech. Decreased response to parents or environmental stimuli. Floppy or rigid muscle tone or not moving. **V**erbal, **P**ain, or **U**nresponsive on AVPU scale.
OR
Airway/Breathing Compromise: obstruction to airflow, gurgling, stridor or noisy breathing. Increased/excessive retractions or abdominal muscle use, nasal flaring, stridor, wheezes, grunting, gasping, or gurgling. Decreased/absent respiratory effort or noisy breathing. Respiratory rate outside normal range.
OR
Circulatory Compromise: cyanosis, mottling, paleness/pallor or obvious significant bleeding. Absent or weak peripheral or central pulses; pulse or systolic BP outside normal range. Capillary refill > 2 seconds with other abnormal findings.
Glasgow Coma Score ≤13

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

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

Step 2 - Assess for Anatomy of an Injury

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

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

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

Step 3 - Consider Mechanism of Injury & High Energy Transfer

Falls: >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
EMS provider judgment
ETOH/Drug use
Anticoagulants and bleeding disorders
—Patients with head injury are at high risk for rapid deterioration
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.

Reference Tables & Transport Decision Guidelines

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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 system	central nervous
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
NaCl	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
□s	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

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?		

Infusion Reference Tables

The tables are for reference only. Providers should confirm calculations independently prior to administration.

Nitroglycerin Drip Rates - 250 mL Glass Container (100 mcg/1 mL)										
Dose mcg/min	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**
Rate mL/hr	**3**	**6**	**9**	**12**	**15**	**18**	**21**	**24**	**27**	**30**

Epinephrine Drip Rates - 2 mg mixed in 500 mL NS (4 mcg/1 mL)									
Dose mcg/min	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Rate mL/hr	**30**	**45**	**60**	**75**	**90**	**105**	**120**	**135**	**150**

Norepinephrine Drip Rates - 4 mg mixed in 250 mL D5W (16 mcg/1 mL)								
Dose mcg/min	**1**	**2**	**4**	**8**	**12**	**16**	**20**	**24**
Rate mL/hr	**4**	**8**	**15**	**30**	**45**	**60**	**75**	**90**

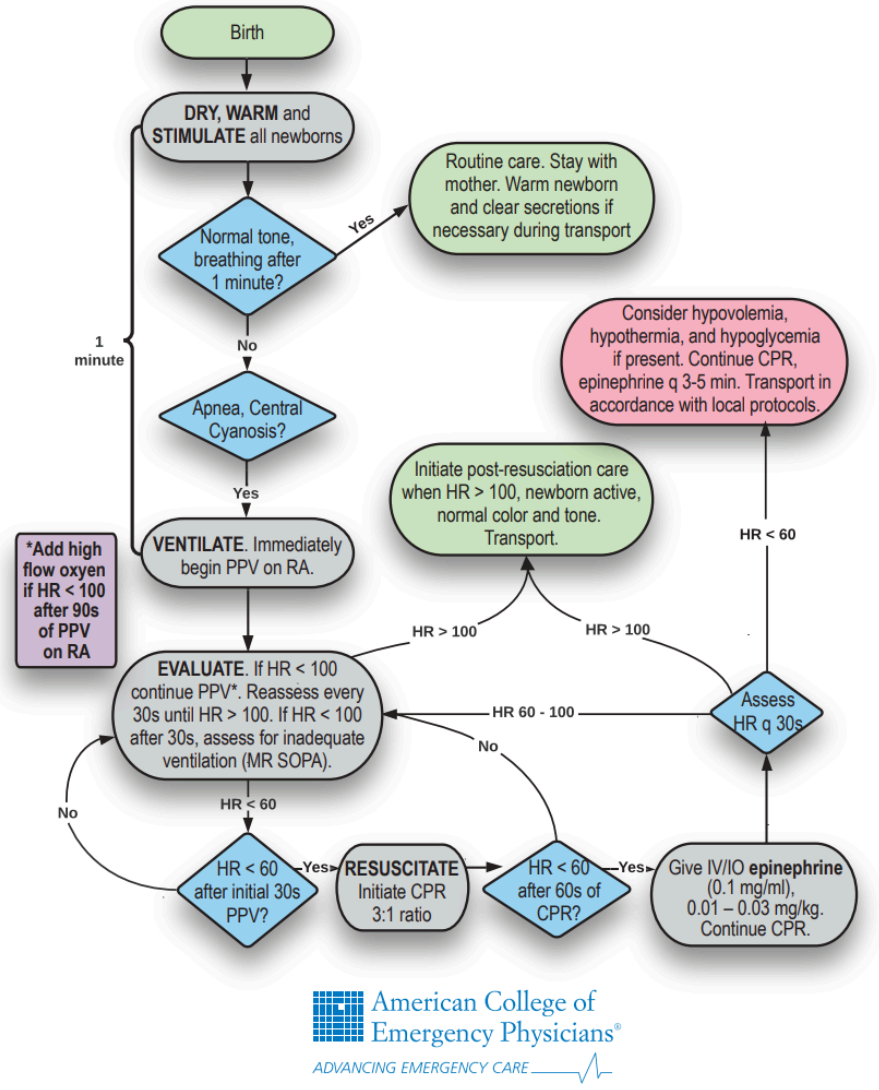
Ketamine Dose Table

This table is for reference only. Providers should confirm calculations independently prior to administration.

Patient Weight	50 kg 110 lbs	60 kg 132 lbs	70 kg 154 lbs	80 kg 176 lbs	90 kg 198 lbs	100 kg 220 lbs	110 kg 242 lbs	120 kg 264 lbs	130 kg 286 lbs	140 kg 308 lbs	150 kg 330 lbs
Pain Management (Adult): 0.25 mg/kg, max initial 25 mg, max cumulative 100 mg - Use 1mL syringe											
Dose	12.5 mg	15 mg	17.5 mg	20 mg	22.5 mg	25 mg	25 mg	25 mg	25 mg	25 mg	25 mg
Volume	0.25 mL	0.3 mL	0.35 mL	0.4 mL	0.45 mL	0.5 mL	0.5 mL	0.5 mL	0.5 mL	0.5 mL	0.5 mL
Medication Assisted Intubation: 2 mg/kg IV/IO											
Dose	100 mg	120 mg	140 mg	160 mg	180 mg	200 mg	220 mg	240 mg	260 mg	280 mg	300 mg
Volume	2.0 mL	2.4 mL	2.8 mL	3.2 mL	3.6 mL	4.0 mL	4.4 mL	4.8 mL	5.2 mL	5.6 mL	6.0 mL
Severe Agitation (Adult): 2 mg/kg IV/IO or 4 mg/kg IM											
IM Dose	200 mg	240 mg	280 mg	320 mg	360 mg	400 mg	440 mg	480 mg	520 mg	560 mg	600 mg
IM Volume	4.0 mL	4.8 mL	5.6 mL	6.4 mL	7.2 mL	8.0 mL	8.8 mL	9.6 mL	10.4 mL	11.2 mL	12 mL
IV/IO Dose	100 mg	120 mg	140 mg	160 mg	180 mg	200 mg	220 mg	240 mg	260 mg	280 mg	300 mg
IV/IO Volume	2.0 mL	2.4 mL	2.8 mL	3.2 mL	3.6 mL	4.0 mL	4.4 mL	4.8 mL	5.2 mL	5.6 mL	6.0 mL

Newborn Care References

Score	0	1	2
Appearance (Color)	Cyanotic, Pale	Peripheral Cyanosis	Pink
Pulse	Absent	<100	>100
Grimace (Reflexes)	No Response	Grimace	Cry When Stimulated
Activity	Limp	Some Flexion	Flexed/Resisting Extension
Respiration	Apneic	Slow, Irregular	Strong Cry



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Corrective Steps for Inadequate Mask Ventilation

M	Mask adjustment
R	Reposition airway
S	Suction mouth and nose
O	Open mouth
P	Pressure increase
A	Alternative airway

Protocol References

NASEMSO. “National Model EMS Clinical Guidelines.” 2022. nasemso.org/wp-content/uploads/National-Model-EMS-Clinical-Guidelines_2022.pdf.

NASEMSO Expert Panel. “2019 Revision to the National EMS Scope of Practice Model Talking Points for State EMS Officials.” *National Association of State EMS Officials*. 2019.

Miller, M., et al. ” Labetalol.” *StatPearls*. 2023.

MacCarthy, E., et al. “Labetalol: A review of its pharmacology, pharmacokinetics, clinical uses and adverse effects.” *Pharmacotherapy*. 1983;3(4):193-219.

Barlow, A., et al. “Hypertensive Emergency: Pearls and pitfalls for the ED physician.” *emDOCs.net - Emergency Medicine Education.* 2019.

Elling, B. “Appendix, Emergency Medications, Labetalol.” Nancy Caroline’s Emergency Care in the Streets. Eighth Edition. *Jones & Bartlett Learning*. 2018.

Sahu, N., et al. “Observational Study on Safety of Prehospital BLS CPAP in Dyspnea.” *Prehospital and Disaster Medicine*. 2017;32(6):610–614.

Richmond, N., et al. “Out-of-hospital administration of albuterol for asthma by basic life support providers.” *Academic Emergency Medicine*. 2005;12(6):576.

Savić, M., *et al.* “Are GABA(A) Receptors Containing alpha5 Subunits Contributing to the Sedative Properties of Benzodiazepine Site Agonists?” *Neuropsychopharmacology.* 2008;33(2):332–339.

Kruidering-Hall, M., et al. “Skeletal Muscle Relaxants.” *Basic and Clinical Pharmacology*. 2015;27(V):476.

Dellemijn, P., et al. “Do benzodiazepines have a role in chronic pain management?” *Pain.* 1994;57(2):137-152.

Schwerin, D., et al. “EMS Pain Assessment And Management.” *StatPearls.* 2023.

Serkan, S., et al. “Ketamine With and Without Midazolam for Emergency Department Sedation in Adults: A Randomized Controlled Trial.” Annals of Emergency Medicine. 2011;57(2):109-114.

Mejia, A., et al. Nancy Caroline’s Emergency Care in the Streets. Ninth Edition. *Jones & Bartlett Learning*. 2022.

System Hospitals and Capabilities Table

Hospital	Trauma Level	Cardiac	Stroke	Adult Psych	Peds Psych	Ortho	OB	Miles from MGO	Miles from WBG
CMH	4	no	no	no	no	no	no	446 feet	12.7
UIHC North Liberty	4	no	no	Call ahead	Call ahead	Yes	no	28.5	24.2
VA - IC	n/a	Call ahead	Call ahead	Call ahead	Call ahead	Call ahead	Call ahead	30.4	26.6
Virginia Gay	4	no	no	no	no	no	no	31.2	42.8
Mercy CR	3	yes	yes	yes	no	yes	yes	32.2	36.5
UPH St. Lukes	3	yes	yes	yes	yes	yes	yes	35.3	41.7
Grinnell	4	no	no	no	no	yes	yes	36.1	42.3
UIHC Main	1	yes	yes	yes	yes	yes	yes	37.2	26.8
UIHC Downtown	3	Yes	yes	yes	no	yes	no	37.9	27.5
Keokuk Co.	4	no	no	no	no	yes	no	39.3	32.4
UPH Marshalltown	4	no	no	no	no	yes	no	51.7	69.9
Wash Co.	4	no	no	yes	no	yes	no	54.2	43.1
MercyOne Waterloo	3	yes	yes	yes	yes	yes	yes	58.4	70.2
MercyOne Newton	4	no	no	no	no	yes	no	59.1	56.8
Oskaloosa	4	no	no	no	no	yes	yes	59.9	54.4
UPH Allen	3	yes	yes	Call ahead	Call ahead	no	yes	60.9	72.7

Vital Signs Tables

Normal Vitals

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

Eye		Verbal		Motor	
Spontaneous	4	Oriented	5	Obeys Commands	6
To Verbal	3	Confused	4	Localizes Pain	5
To Pain	2	Inappropriate Words	3	Withdraws From Pain	4
None	1	Incomprehensible Sounds	2	Flexion To Pain	3
		None	1	Extension To Pain	2
				None	1

FORMULARY

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Adenosine

PHARMACOLOGIC ACTION
Slows conduction through AV node and interrupts AV reentry pathways.

INDICATIONS
Conversion of regular, narrow complex tachycardia, stable supraventricular tachycardia (SVT) or regular, monomorphic wide complex tachycardia.

CONTRAINDICATIONS
Hypersensitivity. Second or third-degree heart block (except those on pacemakers), sick sinus syndrome.

DOSAGE AND ADMINISTRATION

- ➢ Tachycardia
  - ○ Stable with Narrow QRS:
    - ■ Adult: 6 mg rapid IV push, repeat at 12 mg after 2 minutes if indicated
    - ■ Pediatric: 0.1 mg/kg rapid IV push (maximum 6 mg), repeat at 0.2 mg/kg after 2 minutes if indicated (maximum 12 mg)
  - ○ Stable with Wide QRS (regular and monomorphic):
    - ■ Adult: 6 mg rapid IV push, repeat at 12 mg after 2 minutes if indicated
    - ■ Pediatric: 0.1 mg/kg rapid IV push (maximum 6 mg) for SVT with aberrancy

Albuterol

PHARMACOLOGIC ACTION
Beta-2 receptor agonist, relaxes bronchial smooth muscle.

INDICATIONS
Bronchospastic lung disease.

CONTRAINDICATIONS
Hypersensitivity. Tachycardia secondary to heart condition.

DOSAGE AND ADMINISTRATION

- Anaphylaxis:
  - 2.5-5 mg (if available), nebulized at 8 lpm oxygen
- Wheezing without respiratory distress:
  - 2.5 mg (if available), nebulized at 8 lpm oxygen
- Respiratory distress with signs of bronchospasm:
  - 5 mg (if available), nebulized at 8 lpm oxygen, repeat as needed for ongoing respiratory distress

Amiodarone

PHARMACOLOGIC ACTION
Inhibits adrenergic stimulation; affects sodium, potassium, and calcium channels; markedly prolongs action potential and repolarization; decreases AV conduction and sinus node function.

INDICATIONS
Regular wide complex tachycardia in stable patients, irregular wide complex tachycardia in stable patients, and as antidysrhythmic for the management of ventricular fibrillation (VF) and pulseless ventricular tachycardia (VT).

CONTRAINDICATIONS
Hypersensitivity. Severe sinus node dysfunction, second or third-degree heart block or bradycardia causing syncope (except with functioning artificial pacemaker), cardiogenic shock.

DOSAGE AND ADMINISTRATION
- ➢ Tachycardia:
  - ○ Stable with Wide QRS:
    - ■ Adult: 150 mg IV/IO in 100 mL NS or D5W over 10 minutes, repeat once if indicated
    - ■ Pediatric: 5 mg/kg IV/IO (maximum 150 mg) in 100 mL NS or D5W over 10 minutes
- ➢ VT or VF without a pulse:
  - ○ Adult:
    - ■ 1st Dose: 300 mg IV/IO
    - ■ 2nd Dose: 150 mg IV/IO
- ➢ Pulseless VT or Refractory VF:
  - ○ Pediatric:
    - ■ 5 mg/kg IV/IO
    - ■ Repeat up to 3 total doses
    - ■ Refer to length-based tape

Aspirin

PHARMACOLOGIC ACTION
Inhibits synthesis of prostaglandin by cyclooxygenase; inhibits platelet aggregation; has antipyretic and analgesic activity.

INDICATIONS
Antiplatelet agent for the care of patients suspected of suffering from an acute coronary syndrome.

CONTRAINDICATIONS
Hypersensitivity to aspirin or NSAIDs (aspirin-associated hypersensitivity reactions include aspirin-induced urticarial or aspirin-intolerant asthma), bleeding GI ulcers, hemolytic anemia from pyruvate kinase (PK) and glucose-6-phosphate dehydrogenase (G6PD) deficiency, hemophilia, hemorrhagic diathesis, hemorrhoids, lactating mother, nasal polyps associated with asthma, sarcoidosis, thrombocytopenia, ulcerative colitis.

DOSAGE AND ADMINISTRATION
- ➢ Chest Pain and Pulmonary Embolism:
  - ○ Have patient chew non-enteric Aspirin 324 mg:
    - ■ Amount may be reduced if patient has already taken Aspirin within the past 12 hours for a total of 324 mg

Atropine Sulfate

PHARMACOLOGIC ACTION
Competitively inhibits action of acetylcholinesterase on autonomic effectors innervated by postganglionic nerves.

INDICATIONS
Symptomatic bradycardia (primary or related to toxin ingestion), organophosphate, and carbamate insecticide toxicity.

CONTRAINDICATIONS
Hypersensitivity. Narrow-angle glaucoma, GI obstruction, severe ulcerative colitis, toxic megacolon, bladder outlet obstruction, myasthenia gravis, hemorrhage with cardiovascular instability, thyrotoxicosis.

DOSAGE AND ADMINISTRATION
- ➢ Bradycardia:
  - Adult: 1 mg IV/IO, every 3-5 minutes if indicated, up to 3 mg
  - Increased vagal tone or primary AV block:
    - Pediatric: 0.02 mg/kg (minimum 0.1 mg / maximum 0.5 mg) IV/IO, repeat once if indicated
- ➢ Bradycardia with unknown overdose:
  - Adult: 1 mg IV/IO, every 5 minutes if indicated, up to 3 mg
- ➢ Digitalis overdose:
  - Adult: 1 mg IV/IO, every 5 minutes if indicated, up to 3 mg
- ➢ Organic phosphate poisoning:
  - Contact medical control
- ➢ Symptomatic bradycardia in neurogenic shock unresponsive to initial treatments:
  - Adult: 1 mg IV/IO, every 5 minutes if indicated, up to 3 mg

Dextrose

PHARMACOLOGIC ACTION
Parenteral dextrose is oxidized to carbon dioxide and water and provides 3.4 kilocalories/gram of d-glucose.

INDICATIONS
Hypoglycemia.

CONTRAINDICATIONS
Hyperglycemia, anuria, diabetic coma, intracranial or intraspinal hemorrhage, dehydrated patients with delirium, glucose-galactose malabsorption syndrome.

DOSAGE AND ADMINISTRATION
- ➢ Diabetic emergencies:
  - ○ D10 is preferred
  - ○ Adult (25 g of 10-50%):
    - ■ D50 (50 mL) IV
      OR
    - ■ D10 (250 mL) IV
  - ○ Pediatric (0.5-1 g/kg of 10-25%):
    - ■ D10 (5-10 mL/kg) IV
      OR
    - ■ D10 (2 mL/kg) IV, newborns

Diazepam

PHARMACOLOGIC ACTION
Modulates postsynaptic effects of GABA-A transmission, resulting in an increase in presynaptic inhibition. Appears to act on part of the limbic system, as well as on the thalamus and hypothalamus, to induce a calming effect.

INDICATIONS
Anxiety/agitation, seizures, muscle spasms.

CONTRAINDICATIONS
Hypersensitivity. Acute narrow angle glaucoma.

DOSAGE AND ADMINISTRATION
- ➢ Anxiety or agitation:
  - Adult: 5 mg IV (2-5 minute onset of action)
  - Adult: 10 mg IM (15-30 minute onset of action)
  - Pediatric: 0.05-0.1 mg/kg IV, not to exceed 5 mg
  - Pediatric: 0.1-0.2 mg/kg IM, not to exceed 10 mg
- ➢ Muscle spasm and/or anxiolytic pain exacerbation:
  - Adult: 2-5 mg IM/IN/IV, every 5 minutes if indicated, up to 10 mg
  - Pediatric: 0.1 mg/kg IM/IN/IV, not to exceed adult dose
- ➢ Seizures:
  - Adult: 2-5 mg IM/IN/IV titrated until seizure stops or maximum dose of 10 mg is given
  - Pediatric: 0.2 mg/kg IM/IN/IV, maximum 10 mg
- ➢ Tachycardia with unknown overdose, consider:
  - Adult: 2-5 mg IM/IN/IV, every 5 minutes if indicated, up to 10 mg

Diphenhydramine

PHARMACOLOGIC ACTION
Histamine H1-receptor antagonist of effector cells in respiratory tract, blood vessels, and GI smooth muscle.

INDICATIONS
Urticaria or pruritus. Septic shock.

CONTRAINDICATIONS
Hypersensitivity. Premature infants and neonates.

DOSAGE AND ADMINISTRATION
- ➢ Allergic reaction (urticaria or pruritus):
  - Adult: 25-50 mg IM/IV
  - Pediatric: 1 mg/kg IM/IV, up to 50 mg
- ➢ Distributive shock (Septic):
  - Adult: 25-50 mg IM/IV

DuoNeb

PHARMACOLOGIC ACTION
Combination of Ipratropium Bromide, an anticholinergic (parasympatholytic) agent which inhibits vagally mediated reflexes by antagonizing acetylcholine action; prevents increase in intracellular calcium concentration that is caused by interaction of acetylcholine with muscarinic receptors on bronchial smooth muscles and Albuterol, a beta2-adrenergic receptor agonist.

INDICATIONS
Asthma and chronic obstructive pulmonary disease (COPD).

CONTRAINDICATIONS
Hypersensitivity to ipratropium, atropine, or derivatives.

DOSAGE AND ADMINISTRATION
- ➢ Difficulty Breathing:
  - Adult: Albuterol 3 mg and Ipratropium Bromide 0.5 mg, nebulized at 8 lpm oxygen, up to 3 doses

Epinephrine

PHARMACOLOGIC ACTION

Strong alpha-adrenergic effects which cause an increase in cardiac output and heart rate, a decrease in renal perfusion and peripheral vascular resistance, and a variable effect on BP, resulting in systemic vasoconstriction and increased vascular permeability. Strong beta-1- and moderate beta-2-adrenergic effects, resulting in bronchial smooth muscle relaxation.

INDICATIONS

Anaphylaxis, shock, cardiac arrest, bradycardia.

DOSAGE AND ADMINISTRATION

- ➢ Anaphylaxis:
  - Epinephrine (1:1000):
    - Over 25 kg: 0.3 mg IM; Under 25 kg: 0.15 mg IM:
      - If signs of anaphylaxis and hypoperfusion persist following the first dose of epinephrine, repeat every 5–15 minutes
  - Severe anaphylaxis, consider Epinephrine (1:10,000):
    - Adult: 0.3 mg - 0.5 mg IV/IO slowly over 3-5 minutes
- ➢ Cardiac arrest:
  - Adult (1:10,000): 1 mg every 3-5 minutes
  - Pediatric (1:10,000): 0.01 mg/kg, not to exceed 1 mg
- ➢ Difficulty breathing:
  - Adult (1:1000): 0.3 mg IM
  - Pediatric (1:1000): 0.01 mg/kg IM, not to exceed 0.3 mg
- ➢ Symptomatic bradycardia:
  - Pediatric: 0.01 mg/kg (0.1 mL, 1:10,000 concentration) IV/IO, every 3-5 minutes if indicated
- ➢ Symptomatic bradycardia refractory to Atropine:
  - Adult: 2-10 mcg/min IV/IO [2 mg of 1:1000 or 1:10,000 in 500 mL NS (4 mcg/mL)]:
    - Use infusion pump
    - Initiate 2-10 mcg/min, titrate to response
    - Label bag with orange medication label

Fentanyl

PHARMACOLOGIC ACTION
Narcotic agonist-analgesic of opiate receptors; inhibits ascending pain pathways, thus altering response to pain; increases pain threshold.

INDICATIONS
Acute pain.

CONTRAINDICATIONS
Hypersensitivity. Should be used with caution in the elderly and in patients with hypotension, suspected gastrointestinal obstruction, head injury, and concomitant CNS depressants.

DOSAGE AND ADMINISTRATION
- ➢ Chest pain:
  - Fentanyl 25-50 mcg IV, every 5 minutes if indicated, up to 200 mcg
- ➢ Medication-assisted intubation:
  - Adult: 2 mcg/kg IV, up to 250 mcg
  - Pediatric: 1 mcg/kg IV, not to exceed adult dose
- ➢ Pain management:
  - Adult: 1 mcg/kg IM/IN/IV, maximum initial dose of 100 mcg, repeat if indicated as long as patient remains hemodynamically stable and GCS is intact
  - Pediatric: 1 mcg/kg; refer to length-based tape

Glucagon

PHARMACOLOGIC ACTION
Insulin antagonist. Stimulates cAMP synthesis to accelerate hepatic glycogenolysis and gluconeogenesis. Glucagon also relaxes smooth muscles of GI tract.

INDICATIONS
Hypoglycemia. Beta-blocker or calcium channel blocker overdose.

CONTRAINDICATIONS
Hypersensitivity. Pheochromocytoma, insulinoma.

DOSAGE AND ADMINISTRATION
- ➢ Calcium Channel Blocker or Beta Blocker overdose:
  - Adult: 1-3 mg slow IV push over 1-2 minutes, repeat after 10-15 minutes if no response is seen
- ➢ Hypoglycemia:
  - Adult: 1 mg IM
  - Pediatric: 1 mg IM (over 20 kg or more than 5 years old)
  - Pediatric: 0.5 mg IM (less than 20 kg or less than 5 years old)

Glucose Paste

PHARMACOLOGIC ACTION
Increases blood glucose levels via buccal absorption.

INDICATIONS
Conscious hypoglycemic patients.

CONTRAINDICATIONS
Diabetic ketoacidosis. Inability to swallow.

DOSAGE AND ADMINISTRATION
- ➢ Hypoglycemia:
  - Adult: 15 g
  - Pediatric: 0.5-1 g/kg

Ketamine

PHARMACOLOGIC ACTION
Produces dissociative anesthesia. Blocks N-methyl D-aspartate (NMDA) receptor.

INDICATIONS
Agitated or violent behavior, severe pain, medication-assisted intubation.

CONTRAINDICATIONS
Hypersensitivity. Use caution with head trauma, intracranial mass/hemorrhage, hypertension, angina, stroke, or underlying psychiatric disorder.

DOSAGE AND ADMINISTRATION

- Medication-assisted intubation:
  - Adult: 2 mg/kg IV
  - Pediatric: 2 mg/kg IV
- Severe agitation or a high risk of violence:
  - Adult: 2 mg/kg IV (1 minute onset of action)
  - Adult: 4 mg/kg IM (3-5 minute onset of action)
  - Pediatric: 1 mg/kg IV
  - Pediatric: 3 mg/kg IM
- Severe pain:
  - Ketamine:
    - Adult: 0.25 mg/kg IM/IV/IO, maximum initial dose of 25 mg, repeat if indicated, up to 100 mg; refer to Ketamine Dose Table
    - Pediatric: 0.1 mg/kg IM/IV/IO

Ketorolac

PHARMACOLOGIC ACTION
Inhibits synthesis of prostaglandins in body tissues by inhibiting at least 2 cyclo-oxygenase (COX) isoenzymes, COX-1 and COX-2. May inhibit chemotaxis, alter lymphocyte activity, decrease proinflammatory cytokine activity, and inhibit neutrophil aggregation; these effects may contribute to anti-inflammatory activity.

INDICATIONS
Acute Pain. Febrile seizures.

CONTRAINDICATIONS
Allergy to aspirin, ketorolac, or other NSAIDs; women who are in active labor or are breastfeeding, significant renal impairment, particularly when associated with volume depletion, previous or current GI bleeding, intracranial bleeding, coagulation defects, patients with a high risk of bleeding.

DOSAGE AND ADMINISTRATION
- ➢ Febrile seizures (avoid in patients under 6 months):
  - 1 mg/kg IV/IM, not to exceed adult dose
- ➢ Pain management (avoid in patients under 6 months or over 65):
  - Adult: 30 mg IM or 15 mg IV
  - Pediatric: 0.5 mg/kg, not to exceed adult dose

Labetalol

PHARMACOLOGIC ACTION
Nonselective alpha and beta blocker with intrinsic sympathomimetic activity.

INDICATIONS
Severe hypertension.

CONTRAINDICATIONS
Hypersensitivity. Asthma or obstructive airway disease, severe bradycardia, second-degree or third-degree heart block without pacemaker, cardiogenic shock, bronchial asthma, uncompensated cardiac failure, sinus bradycardia, sick sinus syndrome without pacemaker; conditions associated with prolonged and severe hypotension.

DOSAGE AND ADMINISTRATION
- ➢ Eclampsia/Pre-eclampsia:
  - 20 mg IV over 2 minutes:
    - Goal blood pressure is approximately 140/90 to reduce stroke risk but maintain uterine perfusion
    - Ensure heart rate is greater than 60 beats per minute prior to administration
    - Repeat every 10 minutes x 2 doses for persistent severe hypertension with preeclampsia symptoms
- ➢ Hypertensive crisis:
  - Adult: 10 mg IV over 2 minutes, repeat once after 10 minutes for continued hypertension:
    - Goal is to reduce MAP by 20-25% initially
    - Ensure heart rate is greater than 60 beats per minute prior to administration

Lidocaine

PHARMACOLOGIC ACTION
Stabilizes the neuronal membrane by inhibiting the ionic fluxes required for the initiation and conduction of impulses thereby effecting local anesthetic action.

INDICATIONS
Local or regional anesthesia.

CONTRAINDICATIONS
Hypersensitivity to lidocaine or amide-type local anesthetic.

DOSAGE AND ADMINISTRATION
- ➢ Conscious IO insertion:
  - Adult: 20-40 mg
  - Pediatric: 0.5 mg/kg

Magnesium Sulfate

PHARMACOLOGIC ACTION

Depresses CNS, blocks peripheral neuromuscular transmission, produces anticonvulsant effects, and decreases the amount of acetylcholine released at the end-plate by motor nerve impulse. Slows rate of sinoatrial (SA) node impulse formation in myocardium and prolongs conduction time. Promotes movement of calcium, potassium, and sodium in and out of cells and stabilizes excitable membranes.

INDICATIONS

Torsades de pointes or for severe bronchoconstriction with impending respiratory failure, seizure during the third trimester of pregnancy, or in the postpartum patient.

CONTRAINDICATIONS

Hypersensitivity. Myocardial damage, diabetic coma, heart block, hypermagnesemia, hypercalcemia.

DOSAGE AND ADMINISTRATION

- Difficulty breathing:
  - Adult: 2 g in 100 mL NS or D5W over 10-15 minutes
  - Pediatric: 40 mg/kg in 100 mL NS or D5W over 10-15 minutes, not to exceed 2 g
- Eclampsia/Pre-eclampsia:
  - 4 g in 100 mL NS or D5W over 5-10 minutes
- Torsades de Pointes:
  - Adult: 1-2 g in 100 mL NS or D5W over 10 minutes
  - Pediatric: 50 mg/kg IV/IO over 10 minutes, not to exceed 1-2 g

Methylprednisolone

PHARMACOLOGIC ACTION
Modulates carbohydrate, protein, and lipid metabolism and maintenance of fluid and electrolyte homeostasis. Controls or prevents inflammation by controlling rate of protein synthesis, suppressing migration of polymorphonuclear leukocytes (PMNs) and fibroblasts, reversing capillary permeability, and stabilizing lysosomes at cellular level.

INDICATIONS
Acute bronchospastic disease.

CONTRAINDICATIONS
Hypersensitivity. Serious infections (except sepsis), IM route is contraindicated in idiopathic thrombocytopenic purpura, traumatic brain injury (high doses).

DOSAGE AND ADMINISTRATION
- ➢ Difficulty breathing:
  - Adult: 40-125 mg IM/IV

Metoprolol

PHARMACOLOGIC ACTION
Blocks response to beta-adrenergic stimulation.

INDICATIONS
Uncontrolled atrial fibrillation with rapid ventricular response.

CONTRAINDICATIONS
Hypersensitivity. Second-degree or third-degree heart block, significant first-degree heart block (PR interval at least 0.24 seconds), cardiogenic shock, sick sinus syndrome (unless permanent pacemaker in place), severe peripheral vascular disease, pheochromocytoma, severe sinus bradycardia with heart rate less than 45 beats per minute, systolic blood pressure less than 100 mmHg, moderate to severe cardiac failure.

DOSAGE AND ADMINISTRATION
- ➢ Atrial fibrillation with rapid ventricular response (ventricular rate greater than 140 bpm):
  - Adult: 5 mg slow IV push over 2 minutes

Midazolam

PHARMACOLOGIC ACTION
Binds receptors at several sites within the CNS, including the limbic system and reticular formation; effects may be mediated through gaba-aminobutyric acid (GABA) receptor system; increase in neuronal membrane permeability to chloride ions enhances the inhibitory effects of GABA; the shift in chloride ions causes hyperpolarization (less excitability) and stabilization of the neuronal membrane.

INDICATIONS
Ketamine-induced hallucinations, medication-assisted intubation, procedural sedation, seizures, tachycardia due to overdose.

CONTRAINDICATIONS
Hypersensitivity. Acute narrow angle glaucoma.

DOSAGE AND ADMINISTRATION
- ➢ Hallucinations after administration of Ketamine for pain:
  - Adult: 1 mg
- ➢ Medication-assisted intubation:
  - Adult: 2-5 mg IV
  - Pediatric: contact medical control
- ➢ Procedural sedation:
  - Adult: 1-2.5 mg slow IV push over 2 minutes, every 2-5 minutes, up to 5 mg
- ➢ Seizures:
  - Adult: 2-5 mg IM/IN titrated until seizure stops or maximum dose of 10 mg is given
  - Pediatric: 0.2 mg/kg IM/IN, maximum 10 mg
- ➢ Tachycardia with unknown overdose:
  - Adult: 0.5-2.5 mg IM/IN/IV, every 5 minutes if indicated, up to 5 mg

Naloxone

PHARMACOLOGIC ACTION
Competitive opioid antagonist.

INDICATIONS
Reversal of acute opioid toxicity.

CONTRAINDICATIONS
Hypersensitivity.

DOSAGE AND ADMINISTRATION
- ➢ Opioid overdose:
  - Adult: 0.4-2 mg IM/IV *OR* 4 mg IN
    - Repeat in 3 minutes if indicated
  - Pediatric: 0.1 mg/kg IM/IN/IV
    - Repeat in 3 minutes if indicated, up to 2 mg IM/IV *OR* 4 mg IN

Nitroglycerin

PHARMACOLOGIC ACTION
Relaxes smooth muscle via dose-dependent dilation of arterial and venous beds to reduce both preload and afterload and myocardial O2 demand.

INDICATIONS
Chest pain, acute pulmonary edema.

CONTRAINDICATIONS
Hypersensitivity. Severe anemia, recent use of erectile dysfunction medications (sildenafil (Viagra®-within last 24 hours), tadalafil (Cialis®-within last 48 hours), vardenafil (Levitra®-within last 48 hours), or other phosphodiesterase-5 inhibitors). Hypotension (systolic blood pressure less than 90 mmHg or ≥30 mmHg below baseline), bradycardia (less than 50 beats per minute), tachycardia in the absence of heart failure (greater than 100 beats per minute).

DOSAGE AND ADMINISTRATION
- ➢ Chest Pain:
  - BLS: 0.4 mg sublingually (patient's Nitro only), repeat once after five minutes if indicated
  - ALS: 0.4 mg sublingually, every 3-5 minutes if indicated and if systolic blood pressure is 100 mmHg or above:
    - Reassess vital signs following each dose of Nitroglycerin
  - If ST segment changes exist, consider Nitroglycerin infusion:
    - Initiate 5-10 micrograms per minute (infusion pump must be used):
      - Titrate infusion in 5 microgram increments
      - Discontinue infusion when:
        - Pain is relieved
        - Systolic blood pressure is below 100 mmHg
- ➢ Congestive Heart Failure:
  - BLS: 0.4 mg sublingually (patient's Nitro only), maximum of 3 doses
  - ALS: 0.4 mg sublingually, repeat every 3-5 minutes if indicated and if systolic blood pressure is 100 mmHg or above, maximum of 3 doses:
    - Reassess vital signs following each dose of Nitroglycerin
  - Consider Nitroglycerin infusion:
    - Initiate 10 micrograms per minute:
      - Use infusion pump
      - Titrate infusion in 10 mcg/min increments, up to 50 mcg/min
      - Discontinue infusion when:
        - Systolic blood pressure is below 100 mmHg

Norepinephrine

PHARMACOLOGIC ACTION
Strong beta-1 and alpha-adrenergic effects and moderate beta-2 effects, which increase cardiac output and heart rate, decrease renal perfusion and peripheral vascular resistance.

INDICATIONS
Shock. Hypotension refractory to fluid resuscitation.

CONTRAINDICATIONS
Hypersensitivity. Hypotension due to blood volume deficit, peripheral vascular thrombosis (except for lifesaving procedures).

DOSAGE AND ADMINISTRATION
- ➢ Shock (Cardiogenic, Obstructive, Neurogenic, Septic):
  - Adult: 1-30 mcg/min IV/IO [4 mg in 250 mL D5W (16 mcg/mL)]:
    - Use infusion pump
    - Initiate 1 mcg/min and titrate to maintain a systolic blood pressure of 90 mmHg or MAP of 65
    - Label bag with orange medication label
  - Pediatric: 0.01-0.3 mcg/kg/min; consult medical control

Ondansetron

PHARMACOLOGIC ACTION
Selective 5-HT3 receptor antagonist; binds to 5-HT3 receptors both in periphery and in CNS, with primary effects in GI tract.

INDICATIONS
Nausea and vomiting.

CONTRAINDICATIONS
Hypersensitivity. Coadministration with apomorphine (combination can cause profound hypotension and loss of consciousness).

DOSAGE AND ADMINISTRATION
- ➢ Nausea and vomiting:
  - Adult: 4 mg SL/IV, repeat once after 5 minutes if indicated
  - Pediatric: 0.15 mg/kg SL/IV, not to exceed 4 mg

Oxygen

PHARMACOLOGIC ACTION

Increases the partial pressure of oxygen in the blood, thereby enhancing the oxygen saturation of hemoglobin and improving tissue oxygenation to support cellular metabolism and function.

INDICATIONS

Hypoxemia.

DOSAGE AND ADMINISTRATION

- ➢ Titrate for symptom improvement or to maintain oxygen saturation of 94-98%

Tranexamic Acid

PHARMACOLOGIC ACTION

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

Bleeding with signs of hemorrhagic shock.

CONTRAINDICATIONS

Hypersensitivity. Known blood clot or clotting disorder, gastrointestinal hemorrhage.

DOSAGE AND ADMINISTRATION

- ➢ Bleeding with signs of hemorrhagic shock:
  - Adult: 1 g IV in 100 mL NS or D5W over 10 minutes:
    - Must be within three hours of childbirth or injury
- ➢ Epistaxis, consider TXA:
  - 500 mg IN or gauze soaked in 500 mg and packed into nostril(s)