AMR Linn County

EMS Medical Protocols

Effective 2026

Updated 2025 — Includes Ketorolac and IV Acetaminophen

Medical Director
Dr. Ameet Deshmukh

For use by licensed Kansas EMS providers credentialed by the Medical Director to provide out-of-hospital care for AMR Linn County.

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UNIVERSAL GUIDELINES

AUTHORIZATION OF PROTOCOLS

The protocols that follow delineate treatment guidelines for the majority of patient presentations seen by AMR Linn County EMS providers. These protocols represent standing medical orders and are authorized by the Medical Director.

Responsibilities

The Medical Director will review and act on EMS-related issues including but not limited to:

1. Standing orders for ALS and BLS providers.
2. Approval of all therapeutics, equipment, and supplies used to deliver care.
3. Aspects of Indirect Medical Oversight for pre-hospital providers.
4. Transport destination criteria.
5. Practice parameters for pre-hospital medicine.

Medical Director: Provides oversight to ensure EMS providers are competent to employ these protocols. Promotes changes in patient care protocols to maintain care at the highest level possible.

Clinical Educators and Field Supervisors: Assure through education and quality assurance measures that EMS providers are prepared to function competently under these protocols. Provide feedback on trends to appropriate committees to ensure protocols remain effective.

AMR Linn County Procedures

- When an acute medication shortage occurs, the Medical Director may temporarily substitute an appropriate replacement until a resolution is found.
- Standing orders may be implemented when indicated and appropriate, prior to contact with Direct Medical Oversight.

SCOPE OF PRACTICE

Each EMS provider is responsible for knowing their authorized patient care activities and for ensuring they do not exceed their local scope of practice as designated by their credentialing level.

✓ Authorized	— Not Authorized	EMT / AEMT / PM

Airway and Ventilation	EMT	AEMT	PM
Chin lift / Jaw thrust	✓	✓	✓
NPA Insertion	✓	✓	✓
OPA Insertion	✓	✓	✓

Airway and Ventilation	EMT	AEMT	PM
Suction — Upper Airway	✓	✓	✓
Suction — Trachea / Stoma	—	—	✓
Gastric Decompression	✓	✓	✓
Nasal Cannula	✓	✓	✓
Non-Rebreather Mask	✓	✓	✓
Basic Choking Intervention	✓	✓	✓
Advanced Choking Intervention	—	—	✓
BVM with PEEP Valve	✓	✓	✓
ETCO2 Monitoring	✓	✓	✓
Ventilator Management	—	—	✓
Pulse Oximetry	✓	✓	✓
CPAP	✓	✓	✓
Supraglottic Airway (SGA)	✓	✓	✓
Orotracheal Intubation	—	—	✓
Cricothyrotomy	—	—	✓
Needle Decompression — Chest	—	—	✓

Circulation	EMT	AEMT	PM
CPR	✓	✓	✓
Mechanical Compression Device	✓	✓	✓
AED	✓	✓	✓
Manual Defibrillation	—	✓	✓
ECG — Limb Lead Acquisition	✓	✓	✓
ECG — 12-Lead Acquisition	✓	✓	✓
ECG — Limb Lead Interpretation	—	✓	✓
ECG — 12-Lead Interpretation	—	—	✓
Transcutaneous Pacing	—	—	✓
Synchronized Cardioversion	—	—	✓

Trauma and Hemorrhage Control	EMT	AEMT	PM
Hemorrhage Control — Direct Pressure	✓	✓	✓
Tourniquet Application	✓	✓	✓
Wound Packing	✓	✓	✓
Chest Seal — Occlusive Dressing	✓	✓	✓
Spinal Motion Restriction	✓	✓	✓
Traction Splint	✓	✓	✓
Extremity Splinting	✓	✓	✓
Physical Restraints	✓	✓	✓

	EMT	AEMT	PM
Peripheral IV	—	✓	✓
External Jugular IV	—	—	✓
Intraosseous (IO)	—	✓	✓
Pre-existing Central Line Access	—	—	✓
Dialysis AV Graft / Fistula (last resort)	—	—	✓

Medication Administration	EMT	AEMT	PM
Oral (PO)	✓	✓	✓
Sublingual (SL)	✓	✓	✓
Inhalation / Nebulized	✓	✓	✓
Intramuscular (IM)	✓	✓	✓
Intranasal (IN)	✓	✓	✓
Intravenous (IV) — Push	—	✓	✓
Intravenous (IV) — Infusion	—	—	✓
Intraosseous (IO)	—	✓	✓
Topical / Dermal	—	—	✓

Other	EMT	AEMT	PM
Assisted Childbirth	✓	✓	✓
Blood Glucose Monitoring	✓	✓	✓
Wound Irrigation	✓	✓	✓
Phlebotomy	—	✓	✓
Cincinnati Stroke Screen	✓	✓	✓

INTRODUCTION TO PATIENT GUIDELINES

These guidelines are designed to give AMR Linn County EMS providers a clear, evidence-based framework for managing the majority of clinical presentations encountered in the pre-hospital environment. All providers are expected to exercise clinical judgment and apply these protocols in the context of the individual patient encounter.

NOTE TREATMENT AND INTERVENTIONS are not necessarily sequential. They are intended to be considered in light of the clinical environment and the patient's presentation. Each patient care event is unique.

HOW TO USE THIS DOCUMENT

- UNIVERSAL CARE GUIDELINES are included to reduce redundancy across protocols. They apply to every patient encounter unless a specific protocol states otherwise.
- Unless explicitly stated, all guidelines apply to both adult and pediatric patients.
- Patient age and size (pediatric, geriatric, bariatric) are considered throughout where clinically relevant.
- Generic medication names are used throughout. Full drug information is found in the MEDICATION FORMULARY section.
- APPENDICES contain standardized reference material to which multiple protocols refer.

TARGET AUDIENCE

Licensed Kansas EMS providers credentialed by the Medical Director to provide out-of-hospital care for AMR Linn County. Credential levels: Emergency Medical Technician (EMT), Advanced Emergency Medical Technician (AEMT), Paramedic (PM).

VASCULAR ACCESS

PATIENT CARE GOALS

- Successfully achieve vascular access when clinically indicated.
- Select the safest, most appropriate method based on patient condition.

KEY CONSIDERATIONS

The decision to obtain vascular access, and the method used, requires clinical judgment. The number of attempts at any single method before transitioning to another also requires provider judgment. Benefits of vascular access must outweigh the risks (patient discomfort, transport delay, etc.).

Acceptable Methods — in order of preference:

Method	Notes
Peripheral IV	Including external jugular. First-line for most patients.
Intraosseous (IO)	Indicated for unstable patients or cardiac arrest. Acceptable sites: humeral head, proximal tibia, distal tibia (medial malleolus).
Pre-existing Central Access	For unstable or arrest patients with externally visible ports (tunneled catheters, Hickman, Groshong, Broviac, PICC, etc.). Withdraw 5 mL of blood from any port PRIOR to use to clear heparin lock.
Dialysis AV Graft / Fistula	LAST RESORT ONLY — after failed IV and IO attempts in unstable or cardiac arrest patients. Be prepared for hemorrhage (high-pressure system). A pressure bag may be required for IV fluid administration.

OBTAINING BLOOD SAMPLES

PATIENT CARE GOALS

- Assist hospital partners with pre-identified patient populations where prehospital blood samples reduce time to definitive care.
- Assist law enforcement with lawful blood sample requests when appropriate.

KEY CONSIDERATIONS

Blood samples for laboratory analysis may be obtained for patients with time-critical diagnoses (TCDs) as determined by the receiving hospital in accordance with EMS System Medical Director approved procedures.

Blood samples may be drawn at the request of law enforcement only if ALL of the following conditions are met:

- Patient care and patient condition will not be compromised.
- The risk to provider and patient is minimal.
- Obtaining the sample does not inappropriately delay transport or patient care.
- Law enforcement presents appropriate documentation (e.g., judicial order).

MEDICATION ADMINISTRATION AND VERIFICATION

PATIENT CARE GOALS

- Ensure every patient receives the correct, unexpired medication via the correct route at the right dose for the right indication.

CAUTION The Medication Cross-Check MUST be performed PRIOR to administration of ANY medication to confirm: correct patient, correct medication, correct dose, correct route, correct time.

PRINCIPLES OF SAFE MEDICATION ADMINISTRATION

1. No medication shall be administered to a patient with a known hypersensitivity.
2. Medications prepared for administration must not be mixed in the same syringe with any other medication.
3. Medication infusions initiated by a sending hospital may be continued. Titration outside the listed formulary requires written orders from the sending facility and/or an attending RN or physician during transport.
4. Any medication approved for IV administration may also be given via the IO route.
5. IM medications should be administered in the lateral thigh. Deltoid is acceptable when the lateral thigh is inaccessible or not feasible.
6. A maximum volume of 1 mL (ideally no more than 0.5 mL per nostril) may be given via the IN route.
7. NEVER administer the contents of an unlabeled syringe, or any syringe without first visualizing the vial from which it was drawn.
8. Draw up only the amount of medication intended for that specific administration when possible.

PEDIATRIC DOSING

For pediatric patients measured with a length-based tape, administer medications using the corresponding color-coded Broselow Tape cards. For pediatric patients whose height exceeds the length-based system, use adult dosing. For patients below the shortest length on the tape, use the minimum dose indicated.

DIRECT MEDICAL OVERSIGHT

Direct Medical Oversight (DMO) refers to real-time physician consultation with EMS providers during an active patient encounter. Providers should contact DMO when the clinical situation exceeds standing order authority, when a protocol specifically requires consultation, or when the provider has clinical uncertainty about the appropriate course of action.

KEY POINT When in doubt, contact Direct Medical Oversight. Early consultation improves patient outcomes and provides medicolegal protection for the provider.

PATIENT AND PROVIDER SAFETY DURING TRANSPORT

LIGHTS AND SIRENS

Routine use of emergency lights and sirens is not warranted and unnecessarily jeopardizes the patient, EMS providers, and the public. When emergency lights and sirens are used, every effort should be made to maintain speeds appropriate to the vehicle and road conditions.

RESTRAINTS DURING TRANSPORT

- Every patient must be appropriately restrained during transport.
- Pediatric patients, including newly born, must be secured to the cot using an appropriate pediatric restraint device.
- EMS providers must be appropriately restrained at all times during transport.

AIR MEDICAL TRANSPORT

Rotor-wing transport should be reserved for time-critical patients requiring a higher level of care at facilities not reachable in a reasonable ground transport time. See the Air Medical Transport guideline for criteria.

ABUSE, NEGLECT, AND HUMAN TRAFFICKING

EMS providers are mandatory reporters in the state of Kansas. Any reasonable suspicion of abuse, neglect, or human trafficking involving a child or vulnerable adult must be reported to the appropriate authorities in accordance with Kansas law and AMR policy.

CAUTION Document all objective findings thoroughly and accurately. Avoid leading questions. Your PCR documentation may be the most critical piece of evidence in a subsequent investigation.

INDICATORS OF ABUSE OR NEGLECT

- Injuries inconsistent with the reported mechanism.
- Multiple injuries in various stages of healing.
- Unexplained delays in seeking medical care.
- Caregiver unwilling to allow private conversation with patient.
- Patient appears fearful, withdrawn, or avoids eye contact with caregiver.

INDICATORS OF HUMAN TRAFFICKING

- Patient does not speak on their own behalf; another person controls communication.
- Patient appears disoriented regarding current location or date.
- Evidence of physical abuse, branding, or tattooing without consent.
- Patient lacks control of their own identification documents.
- Inconsistent or scripted-sounding history.

NOTE If safe to do so, attempt to speak with the patient privately. Document findings objectively. Notify law enforcement and follow AMR reporting protocols.

GENERAL MEDICAL PROTOCOLS

The following protocols address the most common medical presentations encountered in the prehospital environment. Each protocol is organized with consistent structure: Patient Care Goals, Patient Presentation, Treatment and Interventions, Key Considerations, and Patient/Provider Safety Considerations.

ABDOMINAL PAIN

PATIENT CARE GOALS

1. Identify life-threatening causes of abdominal pain.
2. Improve patient comfort.

PATIENT PRESENTATION

Any patient presenting with abdominal pain of medical origin. Assess for life-threatening etiologies including aortic aneurysm, ectopic pregnancy, and bowel obstruction.

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated. See Airway Management Protocol.
2. Establish vascular access as indicated. See Vascular Access Protocol.
3. Administer normal saline as indicated. See Normal Saline formulary.
4. Provide analgesia as indicated. See Pain Management Protocol.
5. Administer ondansetron for nausea/vomiting as indicated. See Nausea and Vomiting Protocol.
6. Treat shock as indicated. See Shock Protocol.
7. Allow patient to assume a position of comfort unless contraindicated. Flexion of the knees and hips may reduce pain.

KEY CONSIDERATIONS

KEY POINT Abdominal or back pain in women of childbearing age should be considered pregnancy-related until proven otherwise. Assess for ectopic pregnancy.

KEY POINT Consider aortic aneurysm or aortic dissection in patients over 50 with abdominal or back pain, diminished lower extremity pulses, or signs of shock. Notify receiving facility early if suspected.

KEY POINT Consider a cardiac etiology in patients over 50, diabetics, and women — especially with upper abdominal complaints. Obtain a 12-lead EKG in any patient with concern for ACS.

ADRENAL INSUFFICIENCY AND CRISIS

PATIENT CARE GOALS

8. Recognize adrenal crisis early.
9. Administer stress-dose corticosteroid if available and indicated.
10. Recognize and treat hypoglycemia and shock.
11. Improve patient comfort by treating vomiting and pain when appropriate.

PATIENT PRESENTATION

Suspect adrenal crisis in any patient with known adrenal insufficiency or chronic steroid use (prednisone, hydrocortisone, dexamethasone, etc.) who presents acutely ill or injured. Classic findings include refractory hypotension, altered mental status, nausea/vomiting, and hypoglycemia.

TREATMENT AND INTERVENTIONS

1. Establish vascular access as indicated. See Vascular Access Protocol.
2. Administer normal saline as indicated. See Normal Saline formulary.
3. Obtain blood glucose and treat as indicated. See Hypoglycemia/Hyperglycemia Protocol.
4. Treat nausea and vomiting as indicated. See Nausea and Vomiting Protocol.
5. Treat shock as indicated. See Shock Protocol.
6. Provide analgesia as indicated. See Pain Management Protocol.

CAUTION If the patient has known adrenal insufficiency AND is prescribed patient-specific stress-dose steroids AND is acutely ill or injured — administration of their prescribed stress-dose steroid is a high priority. Contact Direct Medical Oversight before administration.

KEY CONSIDERATIONS

KEY POINT Adrenal insufficiency results when the body fails to produce adequate cortisol and aldosterone — hormones essential to maintaining blood pressure, cardiac contractility, and electrolyte balance.

KEY POINT Patients on chronic corticosteroids who experience acute illness or trauma are at risk for acute adrenal crisis due to suppression of the hypothalamic-pituitary-adrenal (HPA) axis. This can result in refractory shock or death without stress-dose supplementation.

KEY POINT There is no reliable way to confirm adrenal crisis in the prehospital environment. Clinical suspicion based on history and hemodynamic status is the primary guide.

BEHAVIORAL EMERGENCY

PATIENT CARE GOALS

7. Provide emergency medical care to the agitated, violent, or uncooperative patient.
8. Maximize and maintain safety for the patient, EMS providers, and bystanders.

PATIENT PRESENTATION

Patients exhibiting agitated, violent, or uncooperative behavior, or who are a danger to themselves or others. Behavior may result from a primary psychiatric condition or an underlying medical emergency (hypoxia, hypoglycemia, head injury, stimulant toxicity, etc.).

TREATMENT AND INTERVENTIONS

1. Do NOT enter or attempt to control a scene where physical violence or weapons are present. Stage for law enforcement.
2. Obtain blood glucose and treat as indicated. See Hypoglycemia/Hyperglycemia Protocol.
3. Attempt verbal de-escalation. Establish rapport. Engage family/loved ones if their presence does not worsen agitation.
4. Consider physical restraints when de-escalation has failed. See Patient Restraint Protocol.
5. For persistent agitation: Midazolam — see Midazolam formulary. Limit to one pharmacologic agent at a time.
6. Initiate EKG monitoring for any patient receiving pharmacologic management of agitation when possible.
7. Obtain temperature when indicated. See Hyperthermia Protocol.
8. Continue verbal reassurance following chemical or physical restraint application.

KEY CONSIDERATIONS

KEY POINT Excited/Agitated Delirium is characterized by paranoia, disorientation, hyper-aggression, hallucinations, tachycardia, hypertension, diaphoresis, hyperthermia, and/or abnormal strength. It is a medical emergency with high risk of sudden cardiopulmonary arrest.

KEY POINT Agitated behavior may be the presenting sign of a correctable medical emergency. Always assess for and treat reversible causes before attributing behavior to a primary psychiatric etiology.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION Continuously monitor: airway patency, respiratory status via pulse oximetry and/or capnography, circulatory status with frequent blood pressure measurements, mental status trends, and extremity perfusion via capillary refill in physically restrained patients.

CAUTION The management of violent patients requires constant reassessment of the risk/benefit balance for the patient and bystanders. These are complex, high-risk encounters with no single protocol that fits every situation.

ALTERED MENTAL STATUS

Also known as: *Confusion, Altered Level of Consciousness, AMS*

PATIENT CARE GOALS

9. Identify and treat reversible causes of altered mental status.
10. Protect the patient from harm during the assessment and transport.

PATIENT PRESENTATION

Any patient with impaired decision-making capacity NOT due to trauma. AMS exists on a spectrum from mild confusion to unresponsiveness.

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated. See Airway Management Protocol.
2. Manage respiratory distress as indicated. See Respiratory Distress Protocol.
3. Obtain blood glucose and treat as indicated. See Hypoglycemia/Hyperglycemia Protocol.
4. Establish vascular access as indicated.
5. Treat seizure as indicated. See Seizure Protocol.
6. Treat shock as indicated. See Shock Protocol.
7. Initiate EKG monitoring and obtain 12-lead. See Dysrhythmias Protocol.
8. Monitor ETCO2 for hypercapnia as indicated.
9. Obtain temperature if concern for sepsis.
10. Consider naloxone administration. See Opioid Overdose Protocol.
11. Assess and treat poisoning/overdose as indicated. See Universal Toxins Guidelines.
12. If physical or chemical restraint required. See Patient Restraint and Behavioral Emergency Protocols.
13. Initiate active cooling or warming as indicated. See Hyperthermia/Hypothermia Protocols.
14. Assess for suspected CVA/TIA. See Stroke Protocol.

KEY CONSIDERATIONS

KEY POINT Assessment focus should center on reversible causes. Use the mnemonic AEIOU-TIPS: Alcohol/Acidosis, Epilepsy, Insulin/hypoglycemia, Opioids/Overdose, Uremia — Trauma, Infection, Psychiatric, Stroke/Structural.

KEY POINT Use bystanders, scene findings, and the environment for clues. Medication bottles, medical alert tags, and advanced directives should be actively sought.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION With depressed mental status, initial focus is airway patency, oxygenation, ventilation, and perfusion — before any diagnostic workup.

CAUTION Hypoglycemic and hypoxic patients may be irritable and combative. Identify and correct the physiologic cause before attributing behavior to a behavioral emergency.

ANAPHYLAXIS AND ALLERGIC REACTION

PATIENT CARE GOALS

15. Deliver timely epinephrine to prevent cardiorespiratory collapse.
16. Provide symptomatic relief for allergic reactions not meeting anaphylaxis criteria.

PATIENT PRESENTATION

Anaphylaxis — Rapid onset involving two or more organ systems after exposure to a likely allergen:

1. Skin/mucosal involvement: urticaria, angioedema, pruritus, flushing
2. Respiratory compromise: dyspnea, wheeze, stridor, hypoxia
3. Persistent GI symptoms: vomiting, abdominal pain, diarrhea
4. Hypotension or collapse: syncope, hypotonia, incontinence

Hypotension thresholds:

1. Adults: Systolic BP < 90 mmHg
2. Pediatric < 1 year: < 60 mmHg
3. Pediatric 1–10 years: < 70 mmHg + (age in years × 2)
4. Pediatric > 10 years: < 90 mmHg

Allergic Reaction (Non-anaphylactic) — Signs involving only one organ system (e.g., localized hives, mild angioedema not compromising the airway).

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated. See Airway Management Protocol.
2. Treat respiratory distress as indicated. See Respiratory Distress Protocol.
3. Establish vascular access as indicated.

If signs and symptoms of ANAPHYLAXIS:

- Epinephrine IM — or patient's own epinephrine auto-injector. See Epinephrine formulary. This is FIRST-LINE — do not delay.
- Albuterol and/or ipratropium as indicated for bronchospasm. See formularies.
- Diphenhydramine. See Diphenhydramine formulary.
- Methylprednisolone. See Methylprednisolone formulary.
- Normal saline fluid resuscitation as indicated. See Normal Saline formulary.
- Initiate EKG monitoring after epinephrine administration.

If ALLERGIC REACTION WITHOUT anaphylaxis:

1. Diphenhydramine as indicated. See Diphenhydramine formulary.
2. For bites and envenomations, see Bites and Envenomations Protocol.

KEY CONSIDERATIONS

KEY POINT Anaphylaxis is a life-threatening emergency. Epinephrine IM is first-line and has no absolute contraindications. Cardiovascular collapse may occur abruptly, without cutaneous prodrome.

KEY POINT Skin involvement may be ABSENT in up to 40% of anaphylaxis cases. Do not withhold epinephrine based on absence of hives or angioedema alone.

KEY POINT Patients with asthma are at significantly elevated risk for severe anaphylaxis. Maintain a low threshold for epinephrine in this population.

KEY POINT GI symptoms — nausea, vomiting, abdominal cramping, and diarrhea — are common, particularly in food-induced anaphylaxis, and can be severe.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION Failure to administer IM epinephrine when indicated is the most common critical error in anaphylaxis management and is directly associated with increased morbidity and mortality.

CAUTION Never substitute racemic epinephrine for IM epinephrine in anaphylaxis. Racemic epinephrine may be used as an adjunct for airway angioedema/stridor but does not replace systemic epinephrine.

CAUTION CAUTION: Inadvertent IV/IO epinephrine administration (instead of IM) can cause catastrophic cardiovascular events. Confirm route before administration. Use medication cross-check.

CAUTION Remove constricting bands, jewelry, rings, and tight clothing from swollen extremities.

EPISTAXIS

Also known as: *Nosebleed*

PATIENT CARE GOALS

3. Minimize ongoing blood loss.
4. Prevent aspiration or ingestion of large blood volumes.
5. Maintain adequate airway patency and oxygenation.

PATIENT PRESENTATION

Any patient with non-traumatic epistaxis.

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated. See Airway Management Protocol.
2. Treat shock as indicated. See Shock Protocol.
3. Treat nausea/vomiting as indicated. See Nausea and Vomiting Protocol.
4. For minor epistaxis: apply manual compression or nose clip for a minimum of 20 continuous minutes. Do not release to check early.
5. Position the patient with head tilted forward to prevent blood from flowing posteriorly into the airway.
6. Have suction readily available to prevent swallowing or aspiration of blood.

KEY CONSIDERATIONS

KEY POINT Posterior epistaxis can be occult — blood may drain into the posterior pharynx without visible anterior bleeding. Maintain a high index of suspicion in patients with unexplained hematemesis or hematochezia following a nosebleed.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION Ice packs to the back of the neck provide no clinical benefit for epistaxis and should not be used. The head-forward position and sustained direct pressure are the primary interventions.

HYPERGLYCEMIA

Also known as: *Diabetic Ketoacidosis (DKA), Hyperosmolar Hyperglycemic State, Hyperosmolar Nonketotic Coma*

PATIENT CARE GOALS

7. Recognize hyperglycemia and initiate fluid resuscitation when indicated.
8. Identify and treat life-threatening complications of DKA including hyperkalemia.

PATIENT PRESENTATION

Patient may present with any of the following:

- Altered mental status
- Stroke-like symptoms (hemiparesis, dysarthria)
- Seizure
- Classic symptoms of hyperglycemia: polyuria, polydipsia, fatigue, blurred vision, nausea
- Known diabetes with other acute medical complaints

TREATMENT AND INTERVENTIONS

1. Establish vascular access as indicated.
2. Initiate EKG monitoring and obtain 12-lead EKG.

If EKG findings consistent with hyperkalemia (peaked T-waves, widened QRS, sine wave pattern):

- Administer calcium chloride. See Calcium Chloride formulary.
- Administer albuterol. See Albuterol formulary.
- Consider normal saline fluid bolus.

1. Treat nausea/vomiting as indicated. See Nausea and Vomiting Protocol.
2. Treat shock as indicated. See Shock Protocol.

KEY CONSIDERATIONS

KEY POINT New-onset DKA in pediatric patients commonly presents with nausea, vomiting, abdominal pain, and/or urinary frequency — consider this diagnosis even without a prior history of diabetes.

KEY POINT Hyperglycemia in the absence of other symptoms may represent a physiologic stress response to another underlying condition (ACS, infection, trauma). Aggressive glucose management is not indicated prehospital without clinical deterioration attributable to hyperglycemia itself.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION

Asymptomatic hyperglycemia poses minimal immediate risk to the patient prehospital. Overly aggressive or inappropriate interventions — including insulin administration — can cause dangerous hypoglycemia.

HYPOGLYCEMIA

Also known as: *Diabetic Coma, Insulin Shock*

PATIENT CARE GOALS

3. Recognize and appropriately reverse symptomatic hypoglycemia.
4. Identify patients at risk for recurrent hypoglycemia requiring transport.

PATIENT PRESENTATION

Patient may present with any combination of the following:

- Blood glucose < 60 mg/dL (non-diabetic) OR < 80 mg/dL (diabetic)
- Altered mental status, confusion, or unresponsiveness
- Stroke-like symptoms: hemiparesis, dysarthria
- Seizure
- Known diabetes with acute medical complaints

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated. See Airway Management Protocol.
2. Treat seizure as indicated. See Seizure Protocol.
3. Treat shock as indicated. See Shock Protocol.
4. Initiate EKG monitoring.

If symptomatic AND blood glucose < 60 mg/dL (non-diabetic) OR < 80 mg/dL (diabetic):

- Conscious patient with patent airway: Instaglucose (or other approved sugar-containing alternative). See Instaglucose formulary.
- Unconscious patient or unable to protect airway: Dextrose 10% IV/IO. See Dextrose formulary.
- If IV/IO not available: Glucagon IM/IN. See Glucagon formulary.

1. Evaluate for automated external insulin delivery device (insulin pump).

NOTE Insulin pump management: If the patient is hypoglycemic with AMS (GCS < 15) AND cannot ingest oral glucose AND ALS is not available — stop the pump and disconnect at the insertion site. If the patient can ingest oral glucose or receive ALS interventions, leave the pump connected and running.

1. Reassess blood glucose after each intervention at appropriate intervals. Note: glucagon may take 20–45 minutes to reach full effect.
2. If maximal field dextrose dosage does not achieve euglycemia and normal mental status: initiate transport, continue treatment, and evaluate for alternative causes of AMS.

CRITERIA FOR RELEASE WITHOUT TRANSPORT

Release without transport may be considered ONLY if ALL of the following are met:

- Confirmed diagnosis of Type I or Type II Diabetes.
- No apparent disease process other than isolated hypoglycemia.
- No additional complaints (chest pain, vomiting, shortness of breath, etc.).
- Repeat blood glucose > 80 mg/dL (adult) or > 60 mg/dL (pediatric).
- Patient takes insulin OR metformin to control diabetes.
- Normal mental status and normal neurological exam.
- No seizure from hypoglycemia during this episode.
- Patient can promptly obtain and will eat a carbohydrate-containing meal.
- A reliable adult will remain with the patient.

NOTE Instruct patient to contact their primary healthcare provider as soon as possible to discuss medication regimen, and to recheck blood glucose frequently in the hours following the episode.

KEY CONSIDERATIONS

KEY POINT Sulfonylureas (e.g., glyburide, glipizide) have long half-lives of 12–60 hours. Patients taking these agents who present with corrected hypoglycemia are at high risk for recurrence and frequently require hospital admission.

KEY POINT Consider intentional overdose of hypoglycemic agents — especially insulin. Insulin overdose is exceptionally lethal and requires transport regardless of apparent clinical recovery.

KEY POINT Avoid overshoot hyperglycemia. Administer dextrose 10% in small, titrated doses until mental status improves or maximum field dose is reached.

NAUSEA AND VOMITING

Also known as: *Gastroenteritis, Emesis*

PATIENT CARE GOALS

3. Reduce patient discomfort from nausea and vomiting.
4. Identify underlying conditions requiring urgent or emergent treatment.

PATIENT PRESENTATION

Any patient with active nausea and/or vomiting. Nausea and vomiting are symptoms of illness — always pursue the underlying diagnosis.

TREATMENT AND INTERVENTIONS

1. Establish vascular access as indicated.
2. Consider the following treatments:
   - Ondansetron. See Ondansetron formulary.
   - Inhaled isopropyl alcohol (inhalation of saturated gauze pad as a non-pharmacologic adjunct).
   - Normal saline fluid resuscitation as indicated.
   - Provide analgesia as indicated when pain is contributing to nausea. See Pain Management Protocol.

KEY CONSIDERATIONS

KEY POINT Nausea and vomiting are symptoms, not diagnoses. A thorough history and physical exam are essential to identify potentially life-threatening underlying conditions such as bowel obstruction, myocardial infarction, ectopic pregnancy, or diabetic ketoacidosis.

KEY POINT Ondansetron has not been conclusively proven safe in pregnancy; however, it remains a reasonable treatment option for hyperemesis gravidarum when other measures fail. Weigh risks and benefits.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION Do NOT administer ondansetron prophylactically to prevent anticipated opioid-induced nausea. Treat nausea when it is present, not preemptively.

CAUTION In very young pediatric patients, ondansetron can be sedating and is frequently unnecessary in the prehospital environment. Apply clinical judgment based on severity.

PAIN MANAGEMENT

Also known as: *Analgesia, Pain Control*

PATIENT CARE GOALS

3. Reduce discomfort and anxiety in patients experiencing medical or traumatic pain.
4. Apply a stepwise analgesic approach — non-pharmacologic first, then non-opioid pharmacologic, then opioid — based on pain severity and patient presentation.
5. Avoid unnecessary opioid administration through appropriate use of non-opioid alternatives.

PATIENT PRESENTATION

Any patient experiencing pain — medical or traumatic in origin.

TREATMENT AND INTERVENTIONS

Step 1 — Assess Pain

1. Determine pain score using the appropriate scale:
   a. Adult: Numeric Rating Scale (NRS) 0–10.
   b. Pediatric: Wong-Baker FACES Pain Rating Scale.
2. Ask the patient about their pain's tolerability and whether they would like medication.

Step 2 — Non-Pharmacologic Interventions (first-line for all patients)

1. Allow patient to assume a position of comfort.
2. Apply ice packs where appropriate.
3. Immobilization and splinting of injured extremities.
4. Verbal reassurance and emotional support from EMS provider and/or family/friends.

Step 3 — Non-Opioid Pharmacologic Options (when non-pharmacologic measures are insufficient)

NOTE These agents are first-line pharmacologic options. Their use should be considered before or instead of opioids where clinically appropriate, particularly for musculoskeletal pain, mild-to-moderate pain, and patients in whom opioids carry elevated risk.

Agent	Dose	Indicated When	Key Contraindications
Acetaminophen PO	Adult: 1,000 mg PO Peds: 15 mg/kg PO (max 1,000 mg)	Mild-to-moderate pain in patients who can take oral medications	Liver disease; APAP within 6 hrs or > 3g in 24 hrs
Acetaminophen IV	Adult: 1,000 mg IV over 15 min Peds: 15 mg/kg IV over 15 min (max 1,000 mg)	Moderate-to-severe pain when oral route not feasible; opioid-sparing strategy	Liver disease; prior APAP dose within 6 hrs

Ketorolac (Toradol)	Adult: 15–30 mg IV/IO or 30 mg IM Peds (≥ 2 years): 0.5 mg/kg IV/IO or IM (max 15 mg single dose) Not for routine use in peds < 2 years	Moderate-to-severe pain; musculoskeletal and renal colic pain; opioid alternative or adjunct	Active GI bleeding; renal impairment; hypersensitivity to NSAIDs; coagulopathy; pregnancy; hypotension/shock

See Acetaminophen formulary and Ketorolac formulary for full dosing details, contraindications, and administration guidance.

Step 4 — Opioid Analgesics (when non-opioid measures are insufficient)

CAUTION Use one opioid agent at a time. Do not combine opioid agents. IV fentanyl has an immediate onset but peak effect at 10 minutes — avoid repeat dosing too quickly to prevent dose stacking and respiratory depression.

1. Fentanyl IV/IO/IN/IM. See Fentanyl formulary. First-line parenteral opioid.
2. Hydromorphone IV/IO/IM. See Hydromorphone formulary. Alternative when fentanyl is contraindicated or unavailable.
3. Morphine. See Morphine formulary (Extended Formulary). Use caution in ACS — morphine may reduce efficacy of P2Y12 inhibitors administered in-hospital.

Step 5 — Ketamine (adjunct or opioid alternative with specific criteria)

1. Ketamine infusion may be used when ANY of the following apply:
   a. Appropriate opioid dose has failed to adequately control pain.
   b. Contraindication to opioid administration is present.
   c. Patient presents with hemodynamic compromise or signs of shock.
   d. Patient refuses opioids and requests an alternative.

1. Tetracaine for eye trauma/pain. See Tetracaine formulary.

1. Treat nausea/vomiting as indicated when present — do not administer prophylactically. See Nausea and Vomiting Protocol.
2. Reassess and document pain response after each intervention.

KEY CONSIDERATIONS

KEY POINT Analgesic approaches must be safe and effective in the dynamic prehospital environment. Pain severity and hemodynamic status together determine the urgency and extent of intervention.

KEY POINT Splinting and ice application are not merely comfort measures — they reduce the total medication burden required to keep the patient comfortable and should always be deployed before pharmacologic escalation.

KEY POINT

Ketorolac and IV acetaminophen are effective opioid-sparing or opioid-alternative agents for moderate-to-severe pain, particularly musculoskeletal pain, renal colic, and patients where opioids carry elevated risk.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION

Administer opioids with caution when GCS < 15, hypotension is present, patient has a known opioid allergy, SpO2 < 90% after maximal supplemental O2, or signs of hypoventilation are present.

CAUTION

Monitor pulse oximetry continuously whenever opioids are administered. Naloxone must be immediately available to reverse respiratory depression.

CAUTION

Consider reduced opioid dosing for elderly patients, those with chronic comorbidities, multi-system trauma, or hemodynamic instability.

CAUTION

Ketamine should be avoided in active psychosis, active CHF exacerbation, ACS, or acute stroke. Ketamine is the preferred analgesic option in patients with hemodynamic compromise.

CAUTION

Ketorolac is contraindicated in patients with active GI bleeding, significant renal impairment, coagulopathy, NSAID hypersensitivity, hypotension or shock, and pregnancy. Do not administer ketorolac to patients with suspected hemorrhagic shock.

CARDIOVASCULAR PROTOCOLS

The following protocols address cardiac and vascular emergencies including acute coronary syndromes, dysrhythmias, stroke, syncope, and ventricular assist device complications.

CHEST PAIN

PATIENT CARE GOALS

3. Rapidly identify STEMI and activate the cardiac catheterization lab.
4. Provide early hospital notification.
5. Monitor vitals and cardiac rhythm continuously; be prepared for CPR and defibrillation.
6. Administer appropriate medications in a timely manner.
7. Minimize scene time. Transport to the closest facility capable of emergent revascularization.

PATIENT PRESENTATION

Chest pain or discomfort, or equivalent symptoms in other areas of the body (arm, jaw, neck, epigastrium) of suspected cardiac origin. Associated symptoms may include shortness of breath, diaphoresis, nausea, vomiting, and dizziness. May also present with CHF, syncope, or shock.

KEY POINT Atypical presentations are more common in women, elderly patients, and diabetics. Absence of classic chest pain does not rule out ACS. Maintain a high index of suspicion.

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated. See Airway Management Protocol.
2. Manage respiratory distress as indicated. See Respiratory Distress Protocol.
3. Initiate EKG monitoring and treat dysrhythmias as indicated. See Dysrhythmia Protocols.
4. Obtain 12-lead EKG. Target: within 10 minutes of patient contact.
5. Administer aspirin 324 mg PO (chewed) — unless patient has already taken at least 324 mg within the past 6 hours. See Aspirin formulary.
6. Establish vascular access.
7. Obtain bilateral blood pressures.
8. Provide analgesia as indicated. See Pain Management Protocol.
9. Consider nitroglycerin administration. See Nitroglycerin formulary.
10. Treat shock as indicated. See Shock Protocol.

CAUTION STEMI Alert — when the monitor flags STEMI/Acute AMI or the provider identifies a STEMI, contact the receiving facility immediately. Begin radio report with: (1) "STEMI Alert," (2) Estimated time of arrival, (3) Patient age and sex.

CAUTION Nitroglycerin is CONTRAINDICATED if sildenafil (Viagra, Revatio), vardenafil (Levitra, Staxyn), tadalafil (Cialis, Adcirca), or any other PDE5 inhibitor or pulmonary hypertension agent has been used within 48 hours. Also contraindicated with IV epoprostenol or treprostinil. Use caution with inferior wall STEMI or suspected right ventricular infarct.

NOTE Use caution when treating ACS-related chest pain with morphine. Co-administration of morphine with P2Y12 inhibitors (given in-hospital) may reduce their antiplatelet efficacy.

PEDIATRIC MANAGEMENT

1. Obtain 12-lead EKG for all pediatric patients with chest pain.
2. Do NOT administer aspirin or nitroglycerin routinely in pediatric patients.
3. Contact Direct Medical Oversight for treatment decision-making in pediatric chest pain.

KEY CONSIDERATIONS

KEY POINT Do NOT routinely apply supplemental oxygen unless SpO2 < 94%, severe respiratory distress is present, or pre-oxygenation is needed for anticipated airway management.

1. Obtain 12-lead PRIOR to any nitroglycerin administration. Obtain serial 12-leads — minimum of two.
2. Gather complete medication history, specifically: beta-blockers, calcium channel blockers, clonidine, digoxin, anticoagulants, and PDE5 inhibitors.
3. ACS may present with only vague or generalized complaints. Do not anchor on the absence of classic pain.

DYSRHYTHMIAS — BRADYCARDIA

PATIENT CARE GOALS

4. Identify life-threatening bradycardias.
5. Maintain adequate oxygenation, ventilation, and perfusion.
6. Treat underlying reversible causes.

PATIENT PRESENTATION

Heart rate less than 60 beats per minute WITH symptoms (altered mental status, chest pain, CHF, seizure, syncope, diaphoresis) OR evidence of hemodynamic instability.

EKG rhythms classified as bradycardia include:

- Sinus bradycardia
- Second-degree AV block: Type I (Wenckebach / Mobitz I)
- Second-degree AV block: Type II (Mobitz II)
- Third-degree AV block / Complete heart block
- Junctional rhythms
- Ventricular escape rhythms

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated.
2. Manage respiratory distress as indicated.
3. Initiate EKG monitoring.
4. Obtain 12-lead EKG. (May be delayed for life-threatening interventions.)
5. Establish vascular access as indicated.
6. Obtain blood glucose and treat as indicated.
7. Search for and correct reversible causes.

If bradycardia WITH hemodynamic instability — consider in order:

- Atropine IV/IO. See Atropine formulary. NOTE: Atropine is ineffective in hypothermic bradycardia — prioritize rewarming and transcutaneous pacing.
- Transcutaneous Pacing (TCP). Consider sedation and analgesia (midazolam/fentanyl) when pacing is performed.
- Norepinephrine infusion. See Norepinephrine formulary.

PEDIATRIC MANAGEMENT

1. Initiate chest compressions for HR < 60 with signs of poor perfusion (AMS, hypoxia, hypotension, weak pulse, delayed cap refill, cyanosis) despite oxygenation and ventilation.

2. Manage airway and assist ventilations with minimally interrupted compressions at 15:2 (30:2 if single provider).
3. Administer oxygen targeting SpO2 94–98%.
4. Initiate EKG monitoring and obtain 12-lead.
5. Establish vascular access.
6. Obtain blood glucose and treat as indicated.

Pediatric — if hemodynamically unstable:

- Epinephrine IV/IO/IM. See Epinephrine formulary. First-line agent for symptomatic pediatric bradycardia.
- Atropine — if increased vagal tone or cholinergic drug toxicity suspected.
- Transcutaneous pacing with sedation/analgesia if indicated.

KEY CONSIDERATIONS

KEY POINT Always treat the patient, not the monitor. Rhythm interpretation must be placed in context of the patient's signs and symptoms. Asymptomatic bradycardia with adequate perfusion requires no emergent intervention.

KEY POINT Hypoxia is a common cause of bradycardia in pediatric patients and must be corrected before attributing bradycardia to a primary cardiac etiology.

1. Consider hyperkalemia with very wide, bizarre QRS complexes — particularly in patients with a history of dialysis or end-stage renal disease.
2. Prepare for TCP early in patients with high-degree AV blocks (Mobitz II, third-degree/complete heart block).
3. TCP vs. atropine: either is acceptable as initial therapy depending on availability of IV access. Clinical judgment guides sequencing.
4. Sedation/analgesia during TCP is complex — contact Direct Medical Oversight when uncertain.

NOTE Pediatric bradycardia with adequate pulses, normal perfusion, and adequate respiratory effort requires no emergency intervention.

DYSRHYTHMIAS — TACHYCARDIA

PATIENT CARE GOALS

5. Maintain adequate oxygenation, ventilation, and perfusion.
6. Restore sinus rhythm in hemodynamically unstable tachycardia.
7. Identify and treat the underlying cause.

PATIENT PRESENTATION

Elevated heart rate for age, with or without associated symptoms: palpitations, dyspnea, chest pain, syncope/near-syncope, hemodynamic compromise, altered mental status, or other signs of poor perfusion.

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated.
2. Manage respiratory distress as indicated.
3. Initiate EKG monitoring.
4. Obtain 12-lead EKG. (May be delayed for life-threatening interventions.)
5. Establish vascular access as indicated.
6. Obtain blood glucose and treat as indicated.
7. Search for and correct reversible causes.

Treatment by rhythm type — if tachycardia WITH signs/symptoms of hemodynamic instability:

Rhythm Type	Common Rhythm	Treatment Sequence
Regular Narrow Complex	SVT	1. Vagal maneuvers (modified Valsalva) 2. Adenosine IV/IO 3. Synchronized cardioversion if hemodynamically unstable — consider sedation/analgesia (midazolam/fentanyl)
Irregular Narrow Complex	A-fib / A-flutter / MAT	1. Monitor for hemodynamic instability 2. Synchronized cardioversion if unstable — consider sedation/analgesia
Regular Wide Complex	Sustained VT	1. Monitor for hemodynamic instability 2. Lidocaine IV/IO 3. Synchronized cardioversion if unstable — consider sedation/analgesia
Irregular Wide Complex	A-fib with aberrancy / WPW	1. Monitor for instability 2. Synchronized cardioversion if unstable — AVOID AV nodal blockers (adenosine)
Polymorphic Wide Complex	Torsades de Pointes	1. Defibrillation 2. Magnesium sulfate (Extended Formulary)

KEY CONSIDERATIONS

CAUTION Use only ONE antidysrhythmic agent at a time.

CAUTION CRITICAL — Irregular wide-complex tachycardia (e.g., A-fib with WPW): AVOID all AV nodal blocking agents including adenosine and digoxin. These drugs may paradoxically increase the ventricular rate or precipitate ventricular fibrillation by forcing conduction exclusively down the accessory pathway.

1. A-fib/flutter rarely requires cardioversion in the field unless the patient is hemodynamically unstable.
2. Wide-complex irregular rhythms should be presumed pre-excited A-fib (WPW) until proven otherwise. Look for short PR interval and delta waves.
3. Pediatric vagal maneuver: apply ice to face for 15–20 seconds (as long as tolerated) — effective for SVT.

STROKE

Also known as: *Cerebrovascular Accident (CVA), TIA*

PATIENT CARE GOALS

4. Detect neurological deficits through rapid, systematic screening.
5. Establish time last known well as precisely as possible.
6. Transport to the appropriate stroke facility without delay.
7. Maintain efficient scene time.
8. Rule out hypoglycemia as a stroke mimic.

PATIENT PRESENTATION

Adult or pediatric patient with any of the following:

- Focal neurologic deficit: facial droop, unilateral weakness, gait disturbance, slurred speech, unilateral sensory deficits, altered mentation
- Hemiparesis or hemiplegia
- Dysconjugate gaze, forced or crossed gaze
- Severe sudden headache, neck pain/stiffness, or new visual disturbances

NOTE This protocol does NOT apply to patients found to be hypoglycemic or who have sustained head trauma. Correct hypoglycemia and reassess before applying this protocol.

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated.
2. Manage respiratory distress as indicated.
3. Establish vascular access as indicated.
4. Obtain blood glucose and treat as indicated. Hypoglycemia must be ruled out.
5. Perform Prehospital Cincinnati Stroke Scale.

If Cincinnati Stroke Scale is POSITIVE:

- Contact dispatch for Flight LZ rendezvous. See Flight Checklist.
- Initiate EKG monitoring and obtain 12-lead EKG.
- Treat seizures as indicated. See Seizure Protocol.
- Treat nausea/vomiting as indicated.
- Treat shock as indicated.
- Elevate head of bed 15–30 degrees when appropriate and patient condition permits.
- If flight not available: transport and notify hospital — declare "Code Stroke."

KEY CONSIDERATIONS

KEY POINT

Time last known well must be documented as specifically as possible. If the patient was last seen normal before sleep, that is the time last known well — NOT the time they woke up with symptoms.

Common stroke mimics to consider and exclude:

a. Hypoglycemia
b. Post-ictal state (seizure)
c. Sepsis
d. Complex migraine
e. Toxic or medication ingestion/intoxication

Key history elements to obtain:

f. Time last known well (most critical)
g. Recent head injury
h. Recent surgery
i. Anticoagulant or antiplatelet medications
j. Pregnancy status
k. Family contact number for consent and communication

1. All pediatric stroke patients should be transported to CMH-Main. Treatment principles otherwise remain the same.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION

DO NOT LOWER BLOOD PRESSURE in suspected stroke patients prehospital. Hypertension in stroke is a compensatory mechanism to maintain cerebral perfusion. Intervening may precipitate infarct extension.

CAUTION

Do NOT routinely administer supplemental oxygen unless SpO2 < 94% or respiratory failure/invasive airway management is anticipated.

1. Prevent aspiration: elevate head of stretcher 15–30 degrees if systolic BP > 100 mmHg. Have suction immediately available.

SYNCOPE

PATIENT CARE GOALS

2. Stabilize and resuscitate as necessary.
3. Initiate monitoring and diagnostics to evaluate possible cause.
4. Identify high-risk patients requiring emergent evaluation.

PATIENT PRESENTATION

Transient loss of consciousness with loss of postural tone, typically resolving quickly after becoming supine. Presyncope refers to symptoms of near-fainting without complete loss of consciousness.

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated.
2. Manage respiratory distress as indicated.
3. Establish vascular access as indicated.
4. Obtain blood glucose and treat as indicated.
5. Administer normal saline as indicated.
6. Initiate EKG monitoring and treat dysrhythmias as indicated.
7. Obtain 12-lead EKG.
8. Treat shock as indicated.

KEY CONSIDERATIONS

KEY POINT

Syncope often appears benign on EMS evaluation. A normal exam does NOT confirm a benign cause. Virtually all patients with syncope warrant cardiac monitoring and emergency department evaluation. Transport should be strongly encouraged.

High-risk features — heightened concern warranted when any of the following are present:

a. Age ≥ 60 years
b. Syncope with exertion
c. Syncope with associated chest pain, abdominal pain, back pain, dyspnea, or headache
d. Syncope in a seated or supine position
e. Syncope without prodrome/warning (suggests arrhythmia)
f. History of CHF or significant comorbidities
g. Abnormal EKG findings
h. Syncope associated with palpitations

1. Always consider dysrhythmia, GI bleed, ectopic pregnancy, and seizure as possible causes or mimics.
2. Geriatric patients who fell from standing after syncope should be diligently screened for traumatic injury. See Trauma Protocol.

3. Orthostatic vital signs are neither sensitive nor specific in evaluating syncope and should not drive decision-making in isolation.
4. The symptoms preceding the event are important diagnostic clues — obtain a detailed prodrome history.

VENTRICULAR ASSIST DEVICES

Also known as: *VAD, LVAD, RVAD, BiVAD*

PATIENT CARE GOALS

5. Rapidly identify VAD-related malfunctions or complications causing cardiovascular compromise.
6. Coordinate care with the patient's VAD team.
7. Transport to the VAD-implanting facility when clinically feasible.

PATIENT PRESENTATION

Adult patient with an implanted ventricular assist device (LVAD, RVAD, or BiVAD) presenting with signs of cardiovascular compromise: pallor, diaphoresis, altered mental status, or hemodynamic instability.

TREATMENT AND INTERVENTIONS

Assess the VAD immediately upon patient contact — before other interventions where safe to do so:

- Assess for active alarms.
- Auscultate for pump hum/whirring sound — loss of sound suggests pump failure.
- Utilize the VAD EMS Troubleshooting Guide to identify and correct malfunctions.
- Contact the patient's VAD-trained companion, if present.
- Contact the patient's VAD coordinator using the phone number on the device.
- Check all connections to the system controller.
- Replace VAD batteries if indicated — low battery is the most common cause of VAD alarms.

1. Manage airway as indicated.
2. Manage respiratory distress as indicated.
3. Initiate EKG monitoring and obtain 12-lead EKG.
4. Treat dysrhythmias as indicated. See Dysrhythmia Protocol.
5. Establish vascular access as indicated.
6. Administer normal saline as indicated.
7. Treat shock as indicated.
8. Obtain blood glucose and treat as indicated.

CARDIAC ARREST IN VAD PATIENTS

CAUTION CPR should NOT be initiated if there is evidence the pump is still functioning. The decision to perform CPR must be made using best clinical judgment in consultation with the patient's VAD companion and VAD coordinator — or Direct Medical Oversight if the coordinator is unavailable.

CPR may be initiated if:

- You have confirmed the pump has stopped AND troubleshooting to restart it has failed AND the patient is unresponsive with no detectable signs of life.
- Disconnecting the controller or batteries is NOT required for defibrillation, synchronized cardioversion, or 12-lead EKG acquisition.

KEY CONSIDERATIONS

KEY POINT

VF, VT, or asystole/PEA may be the patient's "normal" underlying rhythm. Always evaluate clinical condition in context and coordinate with the VAD coordinator and/or Direct Medical Oversight before intervening.

1. Automatic NIBP cuffs are often ineffective in VAD patients due to the narrow pulse pressure from continuous-flow pumps. MAP is usually accurate when a reading is obtained.
2. Many VAD patients have no palpable pulse and inaccurate pulse oximetry — do not use absence of pulse as the sole indicator of hemodynamic status.
3. If VAD complication is the primary problem: transport to the facility where the VAD was implanted when patient condition and time allow.
4. If a functioning VAD patient has a non-cardiovascular primary complaint: transport to the appropriate facility for that complaint without manipulating the device.
5. The patient's travel bag (backup controller, spare batteries) must accompany them at all times. Bring the power module, cable, and display module to the hospital when feasible.

RESPIRATORY PROTOCOLS

The following protocols address respiratory emergencies in adult and pediatric patients. Each protocol is self-contained with inline dosing.

AIRWAY MANAGEMENT

PATIENT CARE GOALS

6. Provide effective oxygenation and ventilation.
7. Recognize and alleviate respiratory distress promptly.
8. Provide necessary interventions quickly and safely.
9. Identify a potentially difficult airway early.

PATIENT PRESENTATION

Children and adults with signs of respiratory distress or respiratory failure, or with evidence of hypoxemia or hypoventilation.

NOTE This protocol does NOT apply to neonate/newborn patients. For newly born infants, follow the Neonate Resuscitation Protocol.

TREATMENT AND INTERVENTIONS — LEAST TO MOST INVASIVE

Progress through the following sequence based on patient response. Use the least invasive effective intervention.

Non-Invasive Airway Management:

- Optimize body positioning — upright or semi-recumbent when appropriate.
- Manual maneuvers: head-tilt/chin-lift or jaw thrust. Suction upper airway as needed.
- Apply supplemental oxygen — target SpO2 94–98% unless otherwise specified by protocol.
- Insert oral airway (OPA) and/or nasal airway (NPA) to improve patency and BVM effectiveness, especially in altered mental status.
- CPAP/BiLevel — for spontaneously breathing patients with adequate drive and mental status.
- Two-person BVM ventilation — more effective than single-operator technique; use whenever an additional provider is available.
- Mechanical ventilation (supervisor unit) as indicated.

Invasive Airway Interventions — only when non-invasive measures have failed:

- Supraglottic airway (SGA) insertion — preferred escalation from BVM failure, especially in children.
- Oral endotracheal intubation — limit to ONE attempt, then immediately place SGA or return to BVM.
- Direct laryngoscopy with Magill's forceps — for suspected foreign body airway obstruction in unresponsive patient.
- Surgical cricothyrotomy — only when oxygenation/ventilation by all less invasive means has failed AND risk of death outweighs procedural risk.

MONITORING REQUIREMENTS

CAUTION Continuous pulse oximetry, ETCO2 waveform capnography, and EKG monitoring are REQUIRED for any patient in respiratory distress and/or with an advanced airway in place. Secure all advanced airways with a commercial securing device or tape.

Ventilation rates for apneic patients:

1. Adult: 10–12 breaths/min (guided by ETCO2)
2. Child: 20 breaths/min (guided by ETCO2)
3. Infant: 30 breaths/min (guided by ETCO2)
4. Neonate/Newborn: 40–60 breaths/min — see Neonate Resuscitation Protocol

ETCO2 target: 35–45 mmHg (ideally 40 mmHg).

1. Exception — signs of impending herniation (unilateral blown pupil and/or posturing): target ETCO2 30–35 mmHg with modest controlled hyperventilation.

ADVANCED AIRWAY CONFIRMATION — REQUIRED FOR SGA, ET TUBE, SURGICAL CRICOTHYROTOMY

- Continuous ETCO2 waveform capnography. Colorimetric device acceptable for initial SGA confirmation in BLS agencies.
- Bilateral breath sounds present with chest rise on auscultation.
- Absent gastric sounds on epigastric auscultation.

SEDATION FOR INVASIVE AIRWAY COMPLIANCE

Consider midazolam and/or fentanyl for patient agitation or non-compliance with CPAP, SGA, or endotracheal tube placement:

Midazolam	Adult: 2–5 mg IV/IO/IM, or 2 mg IN per nostril Pediatric: 0.1 mg/kg IV/IO (max 5 mg); 0.2 mg/kg IM/IN (max 5 mg) *Titrate to effect. Monitor respiratory status closely.*
Fentanyl	Adult: 25–100 mcg IV/IO slow push; 2 mcg/kg IN Pediatric: 1 mcg/kg IV/IO slow push; 2 mcg/kg IN (max 100 mcg) *Peak IV effect at 10 min. Avoid repeat dosing too quickly.*

FOREIGN BODY AIRWAY OBSTRUCTION (FBAO)

- Conscious patient able to cough — encourage continued forceful coughing. Do not intervene.
- Conscious patient unable to cough effectively — BLS procedures: abdominal thrusts for adults/children; back blows and chest thrusts for infants. Continue until obstruction clears or patient loses consciousness.
- Unconscious patient/cardiac arrest with suspected FBAO — direct laryngoscopy with Magill's forceps. Paramedic only.

CPAP / BILEVEL CONTRAINDICATIONS

CPAP is contraindicated in any of the following (all require clinical judgment):

1. Hypotension or hemodynamic instability
2. Severely impaired or obtunded mental status
3. Inability to tolerate the device / maintain a seal
4. Excessive secretions inhibiting proper mask seal
5. Pneumothorax
6. Recent GI, airway, or facial surgery

KEY CONSIDERATIONS

KEY POINT

Do NOT routinely apply supplemental oxygen to patients who appear to be hyperventilating. Investigate the underlying cause — consider DKA, sepsis, PE, pneumothorax, or shock. Coach the patient to slow their breathing. Do NOT use a rebreather bag.

1. Two-person, two-thumbs-up BVM technique is significantly more effective than single-operator BVM and should be used whenever a second provider is available.
2. Pre-oxygenation and apneic oxygenation (high-flow oxygen via nasal cannula at 10–15 LPM during laryngoscopy) prolong the safe apnea period and should be used before intubation attempts.
3. Prompt suctioning of soiled airways before SGA or intubation improves first-pass success rate.
4. Use SGA if BVM ventilation is failing, especially in children — pediatric intubation is infrequently practiced and has not been shown to improve outcomes in EMS.
5. In cardiac arrest: deliver ventilations during the upstroke of a compression, between chest compressions, to minimize interruptions.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION

Signs of a difficult airway — recognize early and prepare accordingly: inability to bite lower lip with upper incisors, limited jaw opening or jaw thrust, small thyromental space, large tongue, obesity, large neck, craniofacial trauma, excessive facial hair, history of obstructive sleep apnea, blood or vomitus in airway, infants/newborns, or performing the procedure on the ground.

1. Avoid excessive pressure or volume during BVM ventilation. Only ventilate to visible minimal chest rise. Squeeze BVM with one hand only to prevent over-ventilation.
2. Correct reversible causes such as opioid overdose or hypoglycemia before escalating to invasive airway management.
3. Consider early intubation in airway burns or anaphylaxis if clinical judgment deems necessary — SGA remains an acceptable alternative.
4. Cricothyrotomy is a last resort. Only consider when all other methods have failed and the patient faces death without a definitive airway.
5. EMS providers are significantly more likely to malposition ET tubes in children. Complication rates (malposition, aspiration) can be nearly three times higher in pediatric patients than adults. Prefer SGA in children whenever feasible.

BRONCHOSPASM

Also known as: *Asthma, COPD, Reactive Airway Disease, Wheezing*

PATIENT CARE GOALS

6. Alleviate respiratory distress caused by bronchospasm.
7. Maintain adequate oxygenation and ventilation.
8. Identify patients requiring escalation of therapy promptly.
9. Differentiate bronchospasm from other causes of respiratory distress.

PATIENT PRESENTATION

Respiratory distress with wheezing or decreased air entry, presumed to be due to bronchospasm from reactive airway disease, asthma, COPD, acute bronchitis, or inhalation injury.

Signs and symptoms may include:

1. Wheezing — inspiratory and/or expiratory. Note: in severe bronchoconstriction, air movement may be too poor to generate audible wheezing.
2. Signs of respiratory infection (fever, congestion, cough, sore throat)
3. Acute onset after inhaling an irritant

NOTE This protocol does NOT apply to: bronchiolitis (wheezing in children < 2 years), croup, epiglottitis, foreign body aspiration, submersion/drowning, congestive heart failure, or respiratory distress from trauma.

TREATMENT AND INTERVENTIONS

Airway and Monitoring — apply immediately:

1. Position patient upright or in position of comfort.
2. Administer oxygen. Escalate from nasal cannula to non-rebreather mask as needed. Target SpO2 > 90–94%.
3. Suction nose and/or mouth if excessive secretions are present.
4. Apply pulse oximetry and ETCO2 monitoring for all patients with respiratory distress.
5. Initiate EKG monitoring. Obtain 12-lead as indicated.
6. Establish vascular access as indicated.

Pharmacologic Treatment — administer in the following order:

Albuterol	Adult: 2.5 mg/3 mL NS via nebulizer — repeat continuously for ongoing distress (no dose limit) Pediatric: 2.5 mg/3 mL NS via nebulizer — repeat continuously for ongoing distress MDI alternative: 8–10 puffs (adult) or 4 puffs (pediatric) — repeat as needed

	First-line bronchodilator. Repeat with unlimited frequency for active bronchospasm.
Ipratropium	Adult: 0.5 mg/3 mL NS via nebulizer — one time dose, combined with albuterol Pediatric: 0.25 mg/3 mL NS via nebulizer — one time dose, combined with albuterol *Administer with albuterol when available. Provides additive bronchodilation.*
Epinephrine IM	Adult: 0.3 mg of 1:1,000 IM to lateral thigh Pediatric: 0.01 mg/kg of 1:1,000 IM (max 0.3 mg) *For impending respiratory failure or failure to improve with inhaled medications. Administer as adjunct — do not delay other treatments.*
Methylprednisolone	Adult: 125 mg IV/IO/IM Pediatric: 1–2 mg/kg IV/IO/IM (max 125 mg) *Reduces airway inflammation. Clinical benefit is delayed but administration is warranted early.*

Escalation if no improvement with pharmacologic therapy:

- CPAP — if patient mental status and respiratory drive are adequate to tolerate and benefit from non-invasive positive pressure.
- BVM ventilation — for patients in respiratory failure who cannot maintain oxygenation with other means.
- Supraglottic airway (SGA) — only if BVM ventilation fails.
- Endotracheal intubation — last resort, only if SGA fails.

1. Consider midazolam (2–5 mg IV/IO/IM, or 0.1 mg/kg pediatric) to facilitate compliance with advanced airway management.
2. Consider needle decompression in any patient with severe respiratory distress when tension pneumothorax is suspected.

KEY CONSIDERATIONS

KEY POINT In asthma: pharmacologic bronchodilation takes priority over CPAP. Initiate inhaled medications first. If CPAP or advanced airway becomes necessary, continue inhaled medications simultaneously.

1. Normoxia is the goal — do not apply oxygen indiscriminately. COPD patients not in distress should receive oxygen titrated to SpO2 > 90%.
2. Known asthmatics with chest tightness or dyspnea should be treated empirically even if wheezing is absent — silent chest in a known asthmatic is an emergency.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION Positive pressure ventilation (BVM, SGA, or intubation) in the setting of severe bronchoconstriction significantly increases the risk of air trapping, which can cause tension pneumothorax and

cardiovascular collapse. Reserve these interventions for respiratory failure only. Allow adequate exhalation time between breaths to minimize breath stacking and barotrauma.

1. CPAP should only be applied if the patient's mental status allows them to tolerate it and they have sufficient spontaneous respiratory drive.
2. Nebulizer droplets can carry infectious particles. Consider placing a surgical mask over the nebulizer to limit droplet spread and ensure providers wear appropriate PPE when in close proximity.

PULMONARY EDEMA

Also known as: *Congestive Heart Failure (CHF), Acute Respiratory Distress Syndrome (ARDS)*

PATIENT CARE GOALS

3. Decrease respiratory distress and work of breathing.
4. Maintain adequate oxygenation, ventilation, and perfusion.
5. Identify patients who will benefit from CPAP and/or nitrates.

PATIENT PRESENTATION

Respiratory distress with crackles/rales on auscultation (cardiac wheezing may be present in some patients). Clinical impression consistent with congestive heart failure or pulmonary edema.

NOTE This protocol does NOT apply to patients with clinical signs of infection (fever, pneumonia), or respiratory distress consistent with asthma/COPD exacerbation — treat those conditions with the Bronchospasm Protocol.

TREATMENT AND INTERVENTIONS

1. Position patient upright — sitting up reduces venous return and work of breathing.
2. Administer supplemental oxygen. Target SpO2 94–98%. Do not apply oxygen if SpO2 is adequate without it.
3. Apply pulse oximetry and ETCO2 monitoring continuously.
4. Initiate EKG monitoring and obtain 12-lead EKG.
5. Establish IV access as indicated.

Consider the following therapies in order of clinical priority:

Nitroglycerin SL	Adult: 0.4 mg SL — repeat every 3–5 minutes as needed Titrate to blood pressure response. Monitor BP before each dose. Pediatric: Not routinely indicated. Contact Direct Medical Oversight. *Reduces preload and afterload. May markedly reduce intubation rates in CHF. Frequent dosing may be required for severely elevated BP.*
	Initiate at 5 cmH2O. Titrate to 10–15 cmH2O as tolerated. Requires adequate mental status and spontaneous respiratory drive. *Benefits: improves oxygenation, recruits atelectatic alveoli, reduces preload/afterload, decreases work of breathing, and enhances inhaled medication delivery.*

Albuterol + Ipratropium	Albuterol 2.5 mg/3 mL NS nebulized if wheezing is present Ipratropium 0.5 mg nebulized once, combined with albuterol *Indicated when cardiac wheezing is present. Not a first-line agent for pulmonary edema without bronchospasm.*
Midazolam (for CPAP compliance)	Adult: 1–2 mg IV/IO/IM to facilitate CPAP tolerance Pediatric: 0.05–0.1 mg/kg IV/IO (max 2 mg) *Use cautiously. Monitor respiratory status closely — midazolam can precipitate respiratory failure in a fatigued patient.*

1. If patient fails to improve with non-invasive support or develops respiratory failure: escalate to BVM, SGA, or endotracheal intubation in that order.

KEY CONSIDERATIONS

Consider the following alternative causes of CHF/pulmonary edema — treatment may differ:

1. Acute Coronary Syndrome (ACS)
2. Dysrhythmia — tachycardia or bradycardia driving forward failure
3. Medication toxicity or non-compliance
4. Renal failure with volume overload
5. Toxic gas inhalation
6. Myocardial contusion
7. Pericardial tamponade
8. Sepsis

KEY POINT

Nitrates provide both subjective and objective improvement in pulmonary edema and may significantly decrease intubation rates. Because many CHF patients present with markedly elevated arterial and venous pressures, repeated doses may be required. Monitor blood pressure before each dose.

CPAP CONTRAINDICATIONS

1. Altered or severely diminished level of consciousness
2. Unable to protect or maintain airway
3. Active vomiting or aspiration risk
4. Pneumothorax
5. Facial or head trauma
6. Hemodynamic instability or shock
7. Recent oral, tracheal, neck, or facial surgery

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION Nitroglycerin is CONTRAINDICATED if the patient has used a PDE5 inhibitor within the past 48 hours: sildenafil (Viagra, Revatio), vardenafil (Levitra, Staxyn), tadalafil (Cialis, Adcirca), or any agent used for erectile dysfunction or pulmonary hypertension. Also avoid with IV epoprostenol (Flolan) or treprostinil (Remodulin).

CAUTION Administer nitroglycerin with EXTREME CAUTION — or avoid entirely — in patients with suspected inferior STEMI or right ventricular infarction. These patients depend on adequate RV preload and may deteriorate rapidly with nitrate-induced venodilation.

1. Hypotension from nitroglycerin is typically short-lived given its brief half-life. Place patient supine and consider a small IV fluid challenge.
2. Monitor blood pressure and EKG continuously during nitrate therapy — some patients are highly sensitive to even standard doses.

PEDIATRIC SPECIFIC PROTOCOLS

The following protocols address presentations specific to the pediatric patient. Adult airway, cardiac, and medical protocols apply to pediatric patients unless a pediatric-specific protocol exists.

BRONCHIOLITIS

Also known as: *Pediatric Wheezing, RSV, Viral Lower Respiratory Infection*

PATIENT CARE GOALS

3. Alleviate respiratory distress in infants with bronchiolitis.
4. Maintain adequate oxygenation and ventilation.
5. Identify respiratory failure early and escalate appropriately.
6. Avoid unnecessary pharmacologic interventions not supported by evidence.

PATIENT PRESENTATION

Child less than 2 years of age presenting with diffuse rhonchi, crackles, and/or wheezing — or an undifferentiated lower respiratory illness characterized by rhinorrhea, cough, fever, tachypnea, and/or increased work of breathing.

NOTE This protocol does NOT apply to: anaphylaxis, croup, epiglottitis, foreign body aspiration, submersion/drowning, or asthma (use the Bronchospasm Protocol for asthma in children over 2 years).

TREATMENT AND INTERVENTIONS

1. Manage airway. Position infant in a position of comfort — upright or caregiver-held when possible to reduce agitation.
2. Administer supplemental oxygen as needed to maintain SpO2 > 90%. Escalate from blow-by to nasal cannula to non-rebreather mask as required.
3. Suction nose and/or mouth (bulb, Yankauer, or suction catheter) if excessive secretions are present. Suctioning alone is often highly effective in infants who are obligate nose breathers.
4. Apply pulse oximetry and ETCO2 monitoring for all patients in respiratory distress.
5. Initiate EKG monitoring if no improvement after treating respiratory distress.

NOTE IV access should only be established in children with respiratory distress if there is concern for poor perfusion or a need to administer IV medications. Do not place IV access routinely.

Pharmacologic considerations:

CAUTION Inhaled medications are generally unnecessary and should NOT be routinely administered for bronchiolitis. If the infant remains in severe respiratory distress despite suctioning and oxygen, a one-time trial of one of the following may be considered — not both:

Racemic Epinephrine (nebulized)	0.5 mL of 2.25% solution in 2.5 mL NS via nebulizer One-time dose only. Transport all patients who receive this treatment. *Consider for severe distress unresponsive to suctioning and oxygen.*

Albuterol (nebulized)	2.5 mg/3 mL NS via nebulizer One-time trial only if racemic epinephrine not chosen. *Evidence for benefit in bronchiolitis is limited. Use only in severe distress.*

1. BVM ventilation should be used in children with respiratory failure.
2. SGA and intubation should only be used if less invasive airway and ventilation maneuvers fail.

KEY CONSIDERATIONS

KEY POINT Suctioning is the most reliably effective prehospital intervention for bronchiolitis. Infants are obligate nose breathers — clearing nasal secretions often produces immediate improvement.

1. Current evidence does NOT support routine use of albuterol for bronchiolitis.
2. Ipratropium and other anticholinergic agents should NOT be administered to infants with bronchiolitis in the prehospital setting.

BRUE — BRIEF RESOLVED UNEXPLAINED EVENT

Also known as: *Apparent Life-Threatening Event (ALTE)*

PATIENT CARE GOALS

3. Recognize patient characteristics and symptoms consistent with a BRUE.
4. Identify and intervene for patients requiring escalation of care.
5. Select the appropriate transport destination.

PATIENT PRESENTATION

A BRUE is an event in an infant less than 1 year of age, reported by a bystander as sudden, brief (less than 1 minute), and completely resolved by the time of EMS arrival, characterized by one or more of the following:

1. Absent, decreased, or irregular breathing
2. Color change — central cyanosis or pallor
3. Marked change in muscle tone — hypertonia or hypotonia
4. Altered level of responsiveness

NOTE This protocol does NOT apply when any of the following are present: abnormal vital signs for age (including fever), vomiting, noisy breathing, history or exam concerning for abuse/neglect, or color change that involved only facial redness or isolated perioral/acral cyanosis.

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated. Position infant appropriately.
2. Administer supplemental oxygen for any signs of respiratory distress or hypoxia. Escalate from blow-by to nasal cannula to non-rebreather mask as needed.
3. Apply pulse oximetry monitoring.
4. Obtain blood glucose level. If < 60 mg/dL with symptoms: administer oral glucose if conscious and able to swallow, or dextrose 10% IV/IO (2 mL/kg) if unable.
5. Initiate EKG monitoring.
6. Do NOT place routine IV access unless signs of poor perfusion or IV medications are required.
7. Treat any identified underlying condition per applicable protocol.
8. Transport all BRUE patients to an appropriate emergency department.

DESTINATION CONSIDERATIONS

Consider transport to a facility with pediatric critical care capability when any of the following high-risk criteria are present:

1. Infant less than 2 months of age
2. History of prematurity (≤ 32 weeks gestation or corrected gestational age ≤ 45 weeks)
3. More than one BRUE — during this event or in prior history

KEY CONSIDERATIONS

KEY POINT

BRUE is a group of symptoms, not a diagnosis. All BRUE patients must be transported to an ED for evaluation regardless of current appearance. Contact Direct Medical Oversight if a parent or guardian refuses transport, especially when high-risk criteria are present.

Identifiable causes to consider during history and assessment:

1. Gastroesophageal reflux / spitting up
2. Swallowing dysfunction
3. Nasal congestion causing apnea in an obligate nose breather
4. Breath-holding spell
5. Change in tone associated with choking, gagging, coughing, crying, or feeding
6. Seizure — assess for eye deviation, nystagmus, tonic-clonic activity, or clonus

CROUP

Also known as: *Laryngotracheobronchitis, Barky Cough, Stridor*

PATIENT CARE GOALS

7. Alleviate respiratory distress from upper airway inflammation.
8. Maintain adequate oxygenation and ventilation.
9. Identify impending respiratory failure and escalate appropriately.
10. Differentiate croup from other causes of pediatric respiratory distress.

PATIENT PRESENTATION

Child with suspected croup: history of barky, seal-like cough and/or stridor. Typically caused by viral upper respiratory infection causing subglottic edema.

NOTE This protocol does NOT apply to: anaphylaxis, asthma, bronchiolitis (< 2 years), foreign body aspiration, submersion/drowning, or epiglottitis. Epiglottitis presents similarly but with a toxic, drooling child who refuses to lie flat — do not agitate or examine the oropharynx.

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated. Keep child calm — agitation worsens stridor significantly.
2. Allow child to assume position of comfort. Do not force supine positioning.
3. Administer supplemental oxygen as needed to maintain SpO2 > 90%. Use blow-by oxygen first to avoid agitating child. Escalate to nasal cannula or non-rebreather mask as needed.
4. Suction nose/mouth for excessive secretions — avoid agitating the child.
5. Apply pulse oximetry and ETCO2 monitoring. Minimize procedures that upset the child.
6. Consider EKG monitoring if no clinical improvement after initial treatment.

Racemic Epinephrine — for stridor AT REST only:

Racemic Epinephrine (nebulized)	0.5 mL of 2.25% solution in 2.5 mL NS via nebulizer ONE-TIME dose only. Do not repeat. Indication: stridor present at rest, not only with crying or agitation. *Transport ALL patients who receive racemic epinephrine — rebound edema can occur.*

CAUTION Racemic epinephrine is indicated for stridor AT REST only. Children with stridor only while crying or agitated — but who are quiet and comfortable at rest — should NOT receive racemic epinephrine.

1. IV access: establish only if there are concerns for poor perfusion or IV medications are needed. Do not place routinely.

2. BVM ventilation for children in respiratory failure.
3. SGA and intubation only if less invasive measures fail.

SIGNS OF IMPENDING RESPIRATORY FAILURE

CAUTION

The following indicate deterioration — escalate immediately: change in mental status (fatigue, listlessness), pallor, dusky appearance, decreased retractions with decreased breath sounds, decreasing stridor with worsening clinical appearance (silent obstruction).

KEY CONSIDERATIONS

1. Upper airway obstruction can produce inspiratory, expiratory, or biphasic stridor.
2. Foreign body aspiration can mimic croup exactly. Always ask about a possible choking event.
3. Clinical judgment is required when the child remains agitated — factor in work of breathing, general appearance, and mental status.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

1. Perioral pallor or duskiness following racemic epinephrine is a normal vasoconstriction effect — typically limited to the area around the mouth, nose, and chin. Do not mistake this for deterioration.
2. All patients receiving racemic epinephrine must be transported to an ED for monitoring. Rebound edema can occur after the medication wears off.

NEONATE RESUSCITATION

Also known as: *Newly Born Infant Resuscitation*

PATIENT CARE GOALS

3. Rapidly identify newly born infants requiring resuscitative efforts.
4. Provide appropriate, evidence-based interventions to minimize distress.
5. Prevent hypothermia — a primary driver of poor neonatal outcomes.

PATIENT PRESENTATION

Newly born infants — from the moment of delivery. Approximately 10% of all newborns will require some degree of assistance to begin breathing.

INITIAL ASSESSMENT AND TREATMENT — ALL NEWBORNS

KEY POINT Heart rate is the primary indicator of effective resuscitation. Reassess HR every 30 seconds throughout resuscitation.

Cord Management:

1. If IMMEDIATE resuscitation is required: clamp cord at least 6 inches from neonatal umbilicus in two places and cut between clamps without delay.
2. If no immediate resuscitation needed: delay cord clamping for 1–3 minutes or until cord stops pulsating.

Immediately for all newborns:

- Warm, dry, and stimulate — dry the infant thoroughly and cover the head. Hypothermia is common and worsens all complications.
- Wrap infant in dry towel or thermal blanket. Keep head covered.

IF STRONG CRY, REGULAR RESPIRATIONS, GOOD TONE, TERM GESTATION

1. Place infant skin-to-skin with mother ("kangaroo care") and cover with dry linen.
2. Monitor for central cyanosis — provide blow-by oxygen as needed.
3. Monitor SpO2 if prolonged. Target at 10 minutes: 85–95%. Right wrist or medial palm is preferred probe placement.

IF WEAK CRY, RESPIRATORY DISTRESS, POOR TONE, OR PRETERM

- Position airway in sniffing position.
- Clear airway — suction mouth then nose ONLY if thick meconium is present AND respiratory distress is observed. Routine suctioning is not indicated.

If HR ≥ 100 bpm:

1. Monitor for central cyanosis — provide blow-by oxygen.
2. If apneic or significant respiratory distress: initiate BVM ventilation with room air at 40–60 breaths/min.
3. Consider SGA ONLY if BVM is ineffective.
4. Consider ET intubation ONLY if SGA fails — limit to one attempt.

If HR 60–99 bpm:

- Initiate BVM ventilation with room air at 40–60 breaths/min.
- Use minimum rate and volume needed to achieve chest rise and heart rate improvement — squeeze BVM with one finger/thumb only.
- If no improvement after 90 seconds: switch to high-flow oxygen until HR normalizes.
- Consider SGA only if BVM is ineffective.
- Consider ET intubation only if SGA fails — one attempt only.

If HR < 60 bpm:

- Ensure effective BVM ventilation with high-flow oxygen and adequate chest rise.
- If no improvement after 30 seconds: initiate chest compressions using two-thumb encircling hands technique — preferred over two-finger technique.
- Compression-to-ventilation ratio: 3:1 — target 90 compressions and 30 breaths per minute.
- Consider SGA only if BVM fails.
- Consider ET intubation only if SGA fails — one attempt.

Epinephrine IV/IO	0.01–0.03 mg/kg of 1:10,000 IV/IO For persistent HR < 60 despite effective ventilation and compressions *Prepare IO early if HR remains < 60 after 30 seconds of effective compressions.*
Normal Saline	10 mL/kg IV/IO bolus For signs of shock — pallor, weak pulses, poor perfusion *Administer over 5–10 minutes.*
Dextrose 10%	2 mL/kg IV/IO Obtain blood glucose for ongoing resuscitation, maternal diabetes, ill-appearing infant, or poor feeding *Hypoglycemia is common with preterm birth and prolonged resuscitation.*
Naloxone	0.1 mg/kg IV/IO/IM/IN Consider ONLY if respiratory depression and suspected maternal opioid use *Do not administer to infants of mothers on chronic opioid therapy — may precipitate acute withdrawal.*

KEY CONSIDERATIONS

KEY POINT

Acrocyanosis — blue discoloration limited to the distal extremities — is a normal finding in the transitioning newborn and requires NO treatment. It must be distinguished from central cyanosis (blue lips, tongue, trunk) which demands immediate intervention.

1. SpO2 will not normalize until approximately 10 minutes after birth — do not use early SpO2 readings to guide aggressive oxygen therapy. Target 85–95% at 10 minutes.
2. Both hypoxia AND excess oxygen can harm the newborn brain. Titrate oxygen to target range.
3. If gestational age is uncertain: initiate resuscitation. Viability is difficult to determine in the field.
4. Multiple gestation delivery may require additional personnel — call for resources early when delivery is imminent.
5. Low birth weight infants are at exceptionally high risk for hypothermia — aggressive warming must be a simultaneous priority throughout resuscitation.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION

Hypothermia is the most common preventable cause of poor neonatal outcomes. Dry the infant thoroughly, cover the head immediately, wrap in dry blankets, and use kangaroo care when resuscitation allows. Heat loss occurs rapidly in the prehospital environment.

1. During transport: neonate must be secured in an appropriate restraint device.
2. Mother must be secured to the cot during transport.
3. If a larger-than-ideal BVM mask is used due to unavailability: avoid pressure over the eyes, which can cause vagally-mediated bradycardia.

ENVIRONMENTAL AND TOXICOLOGY PROTOCOLS

The following protocols address environmental emergencies and toxic exposures. Each protocol is self-contained with inline dosing. Contact Kansas Poison Control (1-800-222-1222) for agent-specific guidance on any call.

UNIVERSAL TOXINS GUIDELINES

PATIENT CARE GOALS

4. Activate appropriate HazMat resources early when indicated.
5. Remove patient from the hazardous environment.
6. Decontaminate to eliminate continued absorption, ingestion, or inhalation.
7. Identify the intoxicating agent by toxidrome or environmental testing.
8. Identify and treat life-threatening complications including dysrhythmias and arrest.

PATIENT PRESENTATION

Presentation varies by agent, concentration, and duration of exposure. Routes of exposure may include absorption, ingestion, inhalation, and/or injection.

TREATMENT AND INTERVENTIONS

CAUTION Scene safety first. Do not enter a potentially hazardous environment without appropriate PPE and HazMat resources. Remove patient from the environment before initiating care.

1. Don appropriate PPE before patient contact.
2. Remove patient's clothing and wash skin with soap and water as appropriate.
3. Manage airway. Position, suction, and apply oxygen targeting SpO2 94–98%. Assist ventilations as needed.
4. Expose patient for assessment, then cover to prevent heat loss.
5. Establish vascular access as indicated. Administer normal saline 500 mL IV/IO bolus for signs of shock — repeat as needed for hemodynamic response.
6. Initiate EKG monitoring and obtain 12-lead EKG.
7. Obtain blood glucose. If < 60 mg/dL with symptoms, treat per hypoglycemia protocol.
8. Treat seizures with midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg).
9. Contact Kansas Poison Control: 1-800-222-1222.

ACETYLCHOLINESTERASE INHIBITOR EXPOSURE

Also known as: *Organophosphate, Carbamate, Nerve Agent, Pesticide, Insecticide*

PATIENT CARE GOALS

10. Rapidly recognize signs and symptoms of AChEI exposure.
11. Administer atropine — the primary antidote — early and repeatedly.
12. Manage airway and respiratory secretions aggressively.

PATIENT PRESENTATION

Use the DUMBELS mnemonic to recognize the cholinergic toxidrome:

D	Diarrhea
U	Urination
M	Miosis / Muscle weakness
B	Bronchospasm / Bronchorrhea / Bradycardia
E	Emesis
L	Lacrimation
S	Salivation / Sweating

TREATMENT AND INTERVENTIONS

CAUTION Don appropriate PPE before approaching patient. AChEI agents can be absorbed through skin and mucous membranes — provider exposure is a real risk.

1. Remove clothing and flush skin with soap and water.
2. Manage airway aggressively. Suction copious secretions. Assist ventilations as needed.
3. Administer oxygen targeting SpO2 94–98%.
4. Establish vascular access immediately.
5. Initiate EKG monitoring and treat dysrhythmias as indicated.
6. Treat seizures with midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg).

Atropine IV/IO/IM	Adult: 2 mg IV/IO/IM — repeat every 5 minutes until respiratory secretions dry and bronchoconstriction resolves. No maximum dose. Pediatric: 0.02 mg/kg IV/IO/IM — repeat every 5 minutes as needed. No maximum dose. *Primary antidote. Titrate to drying of secretions, not to heart rate. Bradycardia alone is not the endpoint.*

KEY CONSIDERATIONS

KEY POINT

Atropine dosing endpoint is drying of secretions and resolution of bronchoconstriction — NOT heart rate or pupil size. Large doses may be required. Do not withhold atropine because the patient is already tachycardic.

BETA BLOCKER OVERDOSE

Also known as: *Anti-hypertensive Medication Toxicity*

PATIENT CARE GOALS

7. Assure adequate ventilation, oxygenation, and correction of hypoperfusion.
8. Recognize and treat bradycardia and cardiovascular collapse.
9. Transport urgently — deterioration can be rapid.

PATIENT PRESENTATION

Patients who have ingested excessive beta-blocker may present with any combination of: bradycardia, hypotension, altered mental status, weakness, shortness of breath, seizures, or hypoglycemia.

TREATMENT AND INTERVENTIONS

1. Manage airway. Suction, position, apply oxygen. Assist ventilations as needed.
2. Obtain blood glucose. Treat hypoglycemia: dextrose 10% 25 g (250 mL) IV/IO slow push for adults; 2 mL/kg for pediatric.
3. Establish vascular access.
4. Initiate EKG monitoring and obtain 12-lead EKG.
5. Administer normal saline 500 mL IV/IO bolus for hypotension — repeat as hemodynamically indicated.
6. Treat seizures with midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg).

Atropine IV/IO	Adult: 0.5 mg IV/IO fast push — repeat every 3–5 min (max 3 mg) Pediatric: 0.02 mg/kg IV/IO (min 0.1 mg; max single dose 0.5 mg) *For symptomatic bradycardia. Note: atropine may have limited effect in moderate-to-severe beta blocker OD.*
Norepinephrine infusion	Adult: 0.1–0.2 mcg/kg/min IV/IO — titrate to MAP > 65 mmHg Pediatric: 0.1 mcg/kg/min IV/IO — titrate to effect *For hypotension refractory to fluids. Preferred vasopressor.*
Calcium Chloride IV/IO (DMO required)	Adult: 1 g IV/IO over 5 minutes Pediatric: 20 mg/kg IV/IO over 5 minutes (max 1 g) *For severe overdose only. Contact Direct Medical Oversight before administration.*
Sodium Bicarbonate IV/IO (DMO required)	Adult: 1 mEq/kg IV/IO bolus Pediatric: 1 mEq/kg IV/IO bolus *Consider if QRS > 120 ms. Contact Direct Medical Oversight.*

1. Consider transcutaneous pacing (TCP) if refractory to pharmacologic interventions.

KEY CONSIDERATIONS

CAUTION A single pill can be lethal to a toddler. Assess the scene thoroughly for all medications the child may have accessed and bring all suspect bottles to the ED.

1. Hypotension and bradycardia may be independent — correcting heart rate may not improve blood pressure. Address both simultaneously.
2. Propranolol crosses the blood-brain barrier and can cause AMS, seizures, and widened QRS mimicking TCA toxicity.
3. TCP may not capture, and even when it does, blood pressure may not improve. Maintain vasopressor support.
4. Identify the specific agent (immediate-release vs. sustained-release), time of ingestion, and quantity.

CALCIUM CHANNEL BLOCKER OVERDOSE

Also known as: *Anti-hypertensive Medication Toxicity, CCB Toxicity*

PATIENT CARE GOALS

5. Assure adequate ventilation, oxygenation, and correction of hypoperfusion.
6. Recognize and treat bradycardia, AV block, and cardiovascular collapse.
7. Transport urgently — deterioration can be profound and rapid.

PATIENT PRESENTATION

May present with: bradycardia, hypotension, altered mental status, nausea/vomiting, decreased AV nodal conduction, cardiogenic shock, hyperglycemia, weakness, respiratory distress, or flushing.

KEY POINT Hyperglycemia in the setting of bradycardia and hypotension is a distinguishing feature of CCB toxicity vs. beta blocker toxicity — CCBs block L-type calcium channels in the pancreas, inhibiting insulin secretion.

TREATMENT AND INTERVENTIONS

1. Manage airway. Suction, position, apply oxygen. Assist ventilations as needed.
2. Obtain blood glucose and treat as indicated.
3. Establish vascular access.
4. Initiate EKG monitoring and obtain 12-lead EKG.
5. Administer normal saline 500 mL IV/IO bolus for hypotension.

Atropine IV/IO	Adult: 0.5 mg IV/IO fast push — repeat every 3–5 min (max 3 mg) Pediatric: 0.02 mg/kg IV/IO (min 0.1 mg; max 0.5 mg per dose) *For symptomatic bradycardia. May have limited effect in severe overdose.*
Norepinephrine infusion	Adult: 0.1–0.2 mcg/kg/min IV/IO — titrate to MAP > 65 mmHg Pediatric: 0.1 mcg/kg/min — titrate to effect *For hypotension refractory to fluids.*
Calcium Chloride IV/IO (DMO required)	Adult: 1 g IV/IO over 5 minutes Pediatric: 20 mg/kg IV/IO over 5 minutes (max 1 g) *Contact Direct Medical Oversight before administration.*
Sodium Bicarbonate IV/IO (DMO required)	1 mEq/kg IV/IO bolus *If widened QRS > 120 ms. Contact Direct Medical Oversight.*

1. Consider TCP if refractory to pharmacologic interventions.
2. Treat seizures with midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg).

KEY CONSIDERATIONS

1. Dihydropyridine CCBs (nifedipine, amlodipine) may cause reflex tachycardia early — then transition to bradycardia as toxicity worsens.
2. CCBs can produce any rhythm from sinus bradycardia to complete heart block.
3. A single pill is potentially lethal in a toddler — bring all medications to the ED.
4. Serial reassessment is essential. These patients can deteriorate suddenly and catastrophically.

CARBON MONOXIDE POISONING

PATIENT CARE GOALS

5. Remove patient from toxic environment immediately.
6. Administer high-flow 100% oxygen.
7. Identify candidates for hyperbaric oxygen therapy.

PATIENT PRESENTATION

Symptoms reflect the degree of carboxyhemoglobin saturation. May include: headache, nausea, fatigue, vertigo/dizziness, altered mental status, tachypnea, tachycardia, seizures, or cardiac arrest.

CAUTION Pulse oximetry is UNRELIABLE in CO poisoning. CO binds hemoglobin with high affinity and is read as oxyhemoglobin by standard pulse oximeters — patients may display normal SpO2 while profoundly hypoxic. Do not use SpO2 to guide oxygen therapy.

TREATMENT AND INTERVENTIONS

CAUTION Remove the patient AND all response personnel from the environment immediately. Do not enter without appropriate air-supplied PPE. Instruct family/bystanders not to re-enter until the source is identified and eliminated.

1. Apply 100% oxygen via non-rebreather mask at 15 LPM. If respiratory failure: BVM or advanced airway with 100% O2.
2. Obtain blood glucose and treat as indicated.
3. Establish vascular access.
4. Initiate EKG monitoring and obtain 12-lead EKG.
5. Administer normal saline as indicated for shock.
6. Treat seizures with midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg).
7. Consider direct transport to a facility with hyperbaric oxygen capability for severe cases — if it does not conflict with trauma or burn center criteria.

KEY CONSIDERATIONS

1. CO is a colorless, odorless gas produced by any form of combustion. Sources include generators, propane heaters, charcoal grills, motor vehicles, and home heating systems.
2. Do NOT look for cherry-red skin as a diagnostic sign — this is an unreliable and uncommon finding.
3. Pregnant patients: maternal CO levels do not accurately reflect fetal levels. Fetal hemoglobin has higher CO affinity. Hyperbaric therapy should be considered more aggressively in pregnancy.
4. CO is also a direct cellular toxin — neurologic sequelae (cognitive changes, personality changes) can be delayed or persistent even after apparent recovery.
5. If patient is hemodynamically unstable after removal from fire/smoke exposure, consider concurrent cyanide toxicity.

CONDUCTED ELECTRICAL WEAPON INJURY

Also known as: *TASER Injury*

PATIENT CARE GOALS

6. Manage the condition that triggered CEW deployment.
7. Ensure appropriate patient restraint in coordination with law enforcement.
8. Perform comprehensive trauma and medical assessment.

PATIENT PRESENTATION

Patient who has received direct-contact or dart-discharge from a conducted electrical weapon. May have prior or concurrent physical struggle, toxic substance use, or excited delirium.

TREATMENT AND INTERVENTIONS

1. Coordinate with law enforcement to ensure patient is appropriately secured or restrained before close provider contact.
2. Evaluate for excited delirium: paranoia, hyper-aggression, AMS, diaphoresis, hyperthermia, abnormal strength. If present — initiate pharmacologic management with midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric) and EKG monitoring.
3. Initiate EKG monitoring. Obtain 12-lead as clinically indicated.
4. Treat medical and traumatic injuries per applicable protocol.
5. Obtain blood glucose and treat as indicated.
6. Remove dart probes — except when located in sensitive areas: head, ears, eyes, neck, hands, feet, genitalia, nipple, umbilicus, or embedded in bone.

KEY CONSIDERATIONS

1. CEW may be discharged by: direct contact (stun), one or two darts plus contact, or from distance up to 35 feet using two darts. Ascertain all discharge methods used — including by multiple officers.
2. Device delivers 19 pulses/second at ~2.1 mA average current — in combination with stimulant use, underlying disease, physical exertion, or struggle, may precipitate arrhythmias.
3. Patient may be under the influence of stimulants or other substances, or may have an underlying psychiatric disorder — maintain high index of suspicion for other contributing conditions.
4. Drive Stun mode (direct two-point contact) is designed to cause pain, not incapacitate — patient may still be fully mobile and combative.

CYANIDE EXPOSURE

Also known as: *Hydrogen Cyanide, CN*

PATIENT CARE GOALS

5. Remove patient from toxic environment.
6. Administer 100% oxygen immediately.
7. Administer hydroxocobalamin without delay for symptomatic patients.

PATIENT PRESENTATION

Suspect cyanide exposure in: occupational or structural fire/smoke exposure, industrial accidents, natural disasters, and any mass casualty event with unclear etiology. Also consider in suicide attempts.

Signs and symptoms may include: anxiety, weakness, vertigo, headache, tachypnea, nausea, dyspnea, vomiting, tachycardia, hypotension, altered mental status, seizures, respiratory arrest, cardiac dysrhythmias, or sudden cardiovascular collapse.

TREATMENT AND INTERVENTIONS

CAUTION Remove patient and response personnel from the toxic environment with appropriate air-supplied PPE. In mass casualty events: maintain your own safety — do not become a casualty.

1. Apply 100% oxygen via non-rebreather mask at 15 LPM or via BVM/advanced airway.
2. Establish vascular access.
3. Initiate EKG monitoring and obtain 12-lead EKG.
4. Obtain blood glucose and treat as indicated.
5. Treat seizures with midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg).

Hydroxocobalamin IV/IO	Adult: 5 g IV/IO over 15 minutes Pediatric: 70 mg/kg IV/IO over 15 minutes (max 5 g) *Administer for symptomatic smoke inhalation with suspected cyanide, or cardiac arrest from suspected cyanide. Do not delay for diagnostic certainty — treatment decisions are based on clinical history and toxidrome.*

KEY CONSIDERATIONS

CAUTION Pulse oximetry is UNRELIABLE in cyanide exposure — it reflects serum O2 levels but not tissue O2 utilization. After hydroxocobalamin is administered, pulse oximetry is no longer reliable at all.

1. Cyanide blocks cytochrome oxidase at the cellular level, preventing mitochondrial oxygen use — cells die of hypoxia despite normal blood oxygen. Classic presentation: high venous O2 saturation (cells cannot extract oxygen).

2. Cyanide may have a bitter almond odor, but only ~40% of the population can detect it. Do not rule out exposure based on absence of smell.
3. Onset of collapse can be dramatic and nearly instantaneous with high-concentration inhalation.
4. In a fire with hemodynamically unstable patient: treat for BOTH carbon monoxide AND cyanide.
5. If patient vomits after cyanide ingestion: maximize ventilation in closed spaces — gastric contents may off-gas hydrogen cyanide.

DROWNING

Also known as: *Near-Drowning, Submersion, Immersion*

PATIENT CARE GOALS

6. Rescue patient from water environment safely.
7. Rapidly restore oxygenation and ventilation — this is the primary intervention.
8. Transport all drowning patients for hospital evaluation regardless of apparent recovery.

PATIENT PRESENTATION

Any patient who has experienced respiratory impairment from submersion or immersion in liquid. Applies regardless of whether the patient appears symptomatic at the time of EMS evaluation.

TREATMENT AND INTERVENTIONS

CAUTION Scene safety for rescuers is paramount. Ensure water rescue resources are available before entering an aquatic environment. In-water chest compressions are not effective. Remove patient from water as quickly as possible.

1. Remove patient from water as soon as possible.
2. PRIMARY APPROACH IS ABC — unlike standard cardiac arrest (CAB), drowning victims require immediate airway management and ventilatory support. Respiratory arrest often precedes cardiac arrest in drowning.
3. Open airway and assess breathing. If apneic or inadequate respirations: begin BVM ventilation with high-flow oxygen immediately.
4. If cardiac arrest: follow cardiac arrest protocol — prioritize airway and ventilation.
5. If concern for cervical spine injury (diving, watercraft, water skiing, surfing): apply spinal motion restriction.
6. Initiate EKG monitoring as soon as feasible.
7. Establish vascular access as indicated.
8. Treat hypothermia: remove wet clothing, dry patient, apply warm blankets, increase ambulance heat.
9. Do NOT attempt to expel water from the airway via abdominal thrusts — this delays resuscitation and increases aspiration risk.

COLD WATER SUBMERSION — RESUSCITATION GUIDANCE

Water Temperature	Submersion < Threshold	Submersion > Threshold
< 43°F (< 6°C)	< 90 min: initiate resuscitation	> 90 min: may withhold resuscitation
> 43°F (> 6°C)	< 30 min: initiate resuscitation	> 30 min: may withhold resuscitation

1. Routine C-spine precautions for all drowning patients are NOT indicated unless mechanism (diving, watercraft) or physical exam suggests spinal injury.
2. Patients may develop subacute respiratory deterioration hours after apparent recovery — all drowning patients must be transported.

ELECTRICAL INJURIES

Also known as: *Electrocution, Electrical Burns*

PATIENT CARE GOALS

3. Ensure scene safety — electrical source must be disabled before patient contact.
4. Prevent additional harm to the patient.
5. Identify and treat dysrhythmias and cardiac arrest.
6. Communicate electrical source characteristics to the receiving facility.

PATIENT PRESENTATION

Patient who has been exposed to electrical current (AC or DC). External injury severity often underestimates deep tissue destruction — internal injuries may be far more extensive than visible burns.

TREATMENT AND INTERVENTIONS

CAUTION SCENE SAFETY: Do not approach the patient until the electrical source has been confirmed disabled by qualified personnel. Do not attempt to move a downed power line.

1. Assess primary survey with specific focus on dysrhythmias and cardiac arrest.
2. Initiate EKG monitoring and obtain 12-lead EKG.
3. If altered mental status — assume associated trauma and apply spinal motion restriction.
4. Establish vascular access. Avoid access through burned skin when possible.
5. Administer normal saline as indicated for shock.
6. Apply clean dry dressings to wounds. Remove constricting clothing and jewelry.
7. Provide analgesia: ketorolac 15–30 mg IV/IO or 30 mg IM (adults); or fentanyl 1 mcg/kg IV/IO (adults or peds) for pain management.
8. Transport preferentially to a Burn Center. Trauma Center is acceptable if significant associated traumatic injuries.

KEY CONSIDERATIONS

Electrical current causes injury through three mechanisms:

- Direct tissue damage — alters cell membrane potential, causes tetany in skeletal and cardiac muscle.
- Thermal injury — conversion of electrical energy to heat causes massive tissue destruction and coagulative necrosis.
- Mechanical trauma — violent muscle contraction or patient being thrown causes blunt injury. Anticipate associated spinal, long bone, and thoracic injuries.

1. AC current is more likely to cause ventricular fibrillation and repeated muscle contractions preventing release. DC current is more likely to cause asystole and deep tissue burns.
2. Current amount impacts mortality more than voltage.

3. Identify voltage, amperage, and current type (AC vs. DC) if possible — communicate to receiving facility.

HYPERTHERMIA

Also known as: *Heat Cramps, Heat Exhaustion, Heat Syncope, Heat Stroke*

PATIENT CARE GOALS

4. Initiate aggressive cooling in heat stroke.
5. Rehydrate as indicated.
6. Reduce risk of cardiovascular and neurologic decompensation.

PATIENT PRESENTATION

Condition	Characteristics
Heat Cramps	Minor muscle cramps, usually legs/abdomen. Normal temperature. Normal mental status.
Heat Exhaustion	Gradual onset. Tachycardia, hypotension, elevated temperature. Headache, nausea. Mental status NORMAL. Can progress to heat stroke.
Heat Syncope	Transient LOC from heat exposure. Normal mental status on recovery.
Heat Stroke	Core temp ≥ 104°F (40°C). ALTERED MENTAL STATUS distinguishes from heat exhaustion. High mortality if cooling delayed.
Heat Edema	Dependent extremity swelling from interstitial fluid pooling. Benign.

TREATMENT AND INTERVENTIONS

1. Move patient to a cool shaded area immediately. Remove as much clothing as practical.
2. Manage airway and oxygen as needed.
3. Obtain blood glucose for any patient with AMS.
4. Measure core temperature rectally (in warm environment only).

CAUTION HEAT STROKE: Core temp > 104°F (40°C) WITH altered mental status = EMERGENCY. Begin aggressive cooling BEFORE transport when possible. "Cool first, transport second."

Cooling priority order:

- Cold water/ice bath immersion with continuous rectal temperature monitoring — PREFERRED. Continue until temp < 102.2°F (39°C) and mental status improves (typically 10–20 min).
- Patient wrapped in tarp/sheet covered with large amounts of ice — replace as it melts.
- Continuous cold water dousing from hose.
- Continuously misting exposed skin with cool water while fanning and maximizing AC.
- Ice packs to neck, axillae, and groin — LEAST preferred option.

1. If temperature monitoring unavailable: cool for 10 minutes OR until shivering begins, then expedite transport.
2. Establish vascular access. Administer normal saline for shock or dehydration.
3. Initiate EKG monitoring.
4. Treat seizures with midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg).
5. Consider midazolam 2 mg IV/IO/IM to control shivering during active cooling — shivering generates heat and impedes cooling.

KEY CONSIDERATIONS

1. Altered mental status is the key distinguishing feature of heat stroke vs. heat exhaustion — when in doubt, treat as heat stroke.
2. Heat stroke is associated with cardiac arrhythmias and cerebral edema independent of drug ingestion.
3. Risk factors: extremes of age, psychiatric medications, diuretics, anticholinergics, stimulants, alcohol, exertion in heat + humidity > 90°F/60%.
4. Children in vehicles: any child with AMS and elevated temperature after being in a vehicle should be presumed to have heat stroke.
5. If AMS + normal glucose + normal temp: consider exercise-associated hyponatremia — particularly in endurance athletes.

HYPOTHERMIA

Also known as: *Cold Exposure, Frostbite, Cold-Induced Injury*

PATIENT CARE GOALS

6. Prevent further heat loss.
7. Rewarm safely.
8. Manage hypothermic cardiac arrest appropriately.
9. Prevent frostbite-associated limb loss.

PATIENT PRESENTATION

Severity	Core Temperature / Clinical Features
Mild	95°F–89.8°F (35°C–31.1°C) — Normal mental status, shivering, possible normal vitals
Moderate	89.7°F–82.5°F (32°C–28°C) — AMS, loss of shivering, progressive bradycardia and hypotension
Severe	82.4°F–75.2°F (28°C–24°C) — Obtunded to unresponsive, VF risk
Profound	< 75.2°F (< 24°C) — Extreme bradycardia, high VF risk, may appear dead

TREATMENT AND INTERVENTIONS — SYSTEMIC HYPOTHERMIA

1. Ensure rescuer and patient safety — remove from cold environment.
2. Remove wet clothing (cut off if needed — do not manipulate extremities). Dry skin. Insulate from ground. Shelter from wind and wet.
3. Move to warm environment as soon as feasible.
4. Manage airway as indicated.
5. Obtain blood glucose for AMS patients.
6. Measure core temperature rectally once in a warm environment.
7. Initiate EKG monitoring and obtain 12-lead.
8. Establish vascular access.
9. Administer warmed IV fluids if available.
10. Treat shock with normal saline as indicated.
11. Apply chemical heat packs or electric heat blankets to the anterior chest/thorax — always wrap heat packs in a barrier to prevent skin burns. Check contact areas regularly in unresponsive patients.
12. Keep patient horizontal — minimize extremity movement to reduce return of cold peripheral blood to the heart.

TREATMENT — FROSTBITE

1. If evacuation or ambulation is required: do NOT rewarm frostbitten extremities until definitive care is available and refreezing is absolutely preventable. Refreeze after rewarming causes additive tissue destruction.
2. Rewarm by contact with non-affected body surfaces only. Do not rub or cause mechanical trauma.
3. After rewarming: cover with loose, clean dressings. Do not de-roof or drain blisters.
4. Provide analgesia: ketorolac 15–30 mg IV/IO or fentanyl 1 mcg/kg IV/IO for moderate-to-severe pain.

HYPOTHERMIC CARDIAC ARREST

KEY POINT

Patients with severe hypothermia should NOT be considered dead until warm and dead. Fixed/dilated pupils, apparent rigor mortis, and dependent lividity are NOT reliable indicators of death in the profoundly hypothermic patient.

Contraindications to initiating resuscitation:

a. Obvious lethal injuries
b. Ice formation in the airway
c. Chest wall rigidity making compressions impossible
d. Immediate danger to rescuers

1. Provide CPR at standard rates. If shockable rhythm (VF/VT): defibrillate — success likelihood increases with temperature.
2. If defibrillation unsuccessful and core temp > 86°F (30°C): follow normothermic arrest guidelines.
3. Asystole: CPR is the primary therapy.
4. Organized rhythm without palpable pulse: do NOT start CPR — this may represent effective perfusion given low metabolic need. Monitor for deterioration to asystole, then initiate CPR.
5. Medications: withhold until core temp > 86°F (30°C). Above 86°F: double medication intervals until 95°F (35°C), then normal intervals.
6. Do not hyperventilate — hypocarbia lowers the VF threshold in cold patients.
7. If clearly established that cardiac arrest preceded cooling (not cooling then arrest): resuscitation has low benefit. Use clinical judgment.

LIGHTNING STRIKE INJURY

PATIENT CARE GOALS

8. Identify lightning strike victim and move to safety.
9. Initiate immediate resuscitation — apply reverse triage in mass casualty.
10. Treat associated traumatic injuries.
11. Monitor cardiac rhythm continuously during transport.

PATIENT PRESENTATION

Patients of all ages who have sustained lightning strike. May present with cardiac arrest, respiratory arrest alone, neurologic deficits, blast injury, or burns.

KEY POINT Lightning strike cardiac arrest has a significantly higher survival rate than typical cardiac arrest if resuscitation is initiated promptly. These patients should be treated aggressively.

TREATMENT AND INTERVENTIONS

CAUTION SCENE SAFETY: Repeated lightning strikes to the same area are possible. Victims do not carry or discharge electricity — it is safe to touch them. Move patient and rescuers to safety immediately.

1. Move patient to safety immediately.
2. If cardiac arrest: initiate CPR. Lightning causes combined cardiac and respiratory arrest — airway management and ventilation are equally critical to compressions.
3. Assess for associated trauma — if AMS, assume trauma occurred and apply spinal motion restriction.
4. Establish vascular access. Avoid burned skin when possible.
5. Initiate EKG monitoring and obtain 12-lead EKG.
6. Treat shock with normal saline as indicated.
7. Apply clean dry dressings to burn wounds. Remove constricting clothing and jewelry.
8. Provide analgesia for burn pain: fentanyl 1 mcg/kg IV/IO or ketorolac 15–30 mg IV/IO (adults).
9. Transport to Burn Center preferred. Trauma Center acceptable for significant associated trauma.

KEY CONSIDERATIONS

1. Lightning is high-voltage, very short-duration DC current.
2. Fixed/dilated pupils after lightning strike may reflect neurologic insult — do NOT use as sole criterion for ceasing resuscitation.
3. Stroke-like findings, blast injury, and secondary missile injuries (objects propelled by overpressure) may be present.
4. REVERSE TRIAGE in multiple-victim events: lightning arrest victims whose events were witnessed or thought recent should be treated FIRST. Unlike standard triage, these patients have high resuscitation potential and should receive priority.

OPIOID OVERDOSE

Also known as: *Narcotic Overdose, Fentanyl OD, Heroin OD, Carfentanil*

PATIENT CARE GOALS

5. Rapidly recognize and reverse opioid-induced respiratory depression.
6. Prevent respiratory and cardiac arrest through airway management and naloxone.
7. Use lowest effective naloxone dose to avoid precipitating withdrawal.

PATIENT PRESENTATION

Classic opioid toxidrome: miosis (pinpoint pupils), decreased mental status, and respiratory depression. Known or suspected opioid use in any age group.

KEY POINT The essential feature requiring EMS intervention is RESPIRATORY DEPRESSION or APNEA — not loss of consciousness alone. Airway management and ventilatory support precede and accompany naloxone.

TREATMENT AND INTERVENTIONS

1. Manage airway immediately. Position, suction, apply jaw thrust or NPA/OPA. Apply high-flow oxygen via NRB mask.
2. If apneic or inadequate respirations: initiate BVM ventilation. If unresponsive to BVM: consider SGA or ET intubation.
3. Obtain blood glucose and treat as indicated.
4. Establish vascular access as indicated.
5. Initiate EKG monitoring. Obtain 12-lead EKG as indicated.

Naloxone IV/IO/IM/IN	Adult: 0.4–2 mg IV/IO/IM — titrate to adequate respirations. May repeat every 2–3 min. For high-potency opioids (fentanyl, carfentanil): up to 4 mg per dose may be required. Adult IN: 2 mg per nostril (4 mg total). May repeat. Pediatric: 0.01 mg/kg IV/IO/IM (max 0.4 mg) — repeat as needed. IN: 0.1 mg/kg per nostril (max 2 mg). *Use lowest effective dose. Goal: restore adequate respirations — NOT full reversal of sedation. Precipitating acute withdrawal increases risk of combative behavior and patient harm.*

1. If opioid patch found on skin: remove immediately. Patches continue to absorb after death.
2. Obtain information on substance used (specific opioid, formulation, time/amount) and any pre-EMS naloxone given.

KEY CONSIDERATIONS

CAUTION Naloxone duration of effect (30–90 min) is shorter than most opioids (4+ hours). Monitor continuously for return of respiratory depression after apparent reversal. All patients who receive naloxone should be transported.

1. Fentanyl and fentanyl analogs can cause rapid chest wall rigidity — requiring PEEP and higher/repeated naloxone doses for adequate ventilation.
2. Methadone can cause QT prolongation. Obtain 12-lead EKG.
3. Tramadol can cause seizures — treat with midazolam 5 mg IV/IO/IM.
4. Patients may become combative after naloxone — take advance measures to maintain scene safety.
5. Neonates born to mothers with chronic opioid use: naloxone may precipitate seizures — use with caution and contact DMO.
6. Unsecured needles may be on scene — high risk of needle stick. Exercise PPE precautions throughout.

STIMULANT POISONING / OVERDOSE

Also known as: *Cocaine, Methamphetamine, Bath Salts, Synthetic Cathinones, PCP, K2, Ecstasy*

PATIENT CARE GOALS

7. Identify the intoxicating agent when possible.
8. Recognize and treat excited delirium and hyperthermia — primary drivers of death.
9. Initiate resuscitation when indicated.

PATIENT PRESENTATION

Any patient suspected of stimulant intoxication presenting with: tachycardia, dysrhythmias, hypertension, diaphoresis, delusions/paranoia, seizures, hyperthermia, mydriasis (dilated pupils), or agitation.

TREATMENT AND INTERVENTIONS

1. Manage airway and apply oxygen as indicated.
2. Establish vascular access.
3. Obtain blood glucose and treat as indicated.
4. Obtain temperature. If hyperthermia (> 104°F with AMS): initiate cooling per Hyperthermia Protocol — this is a life-threatening priority.
5. Administer normal saline as indicated.
6. Initiate EKG monitoring and obtain 12-lead EKG.
7. For agitation/excited delirium: midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg). Maintain continuous monitoring after administration.
8. Treat seizures with midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg).
9. Physical restraints as needed in coordination with law enforcement — follow Patient Restraint Protocol.

Sodium Bicarbonate IV/IO (DMO required)	Adult: 1 mEq/kg IV/IO bolus Pediatric: 1 mEq/kg IV/IO bolus *If QRS > 120 ms (cocaine sodium channel blockade). Contact Direct Medical Oversight.*

If EKG is consistent with STEMI in the setting of stimulant use: treat as ACS. Vasospasm is the primary mechanism.

KEY CONSIDERATIONS

KEY POINT

Hyperthermia is the leading cause of death in stimulant toxicity. Recognition and aggressive cooling — combined with benzodiazepines to reduce heat-generating muscular activity — are the most critical interventions.

1. Cocaine has sodium channel blocking effects — widened QRS (> 100 ms) indicates cardiac conduction toxicity, treated similarly to TCA overdose with sodium bicarbonate.
2. Assess patient for weapons and additional drugs — these pose risk to both the patient and the EMS crew.
3. Use the minimum physical restraint necessary to ensure safety. Chemical sedation is strongly preferred.

TRICYCLIC ANTIDEPRESSANT OVERDOSE

Also known as: *TCA Poisoning, TCA Toxicity*

PATIENT CARE GOALS

4. Recognize EKG findings consistent with TCA toxicity.
5. Administer sodium bicarbonate promptly for widened QRS.
6. Manage cardiovascular complications and seizures.

PATIENT PRESENTATION

Patients may present with any combination of: palpitations, chest pain, hypotension, seizures, altered mental status, respiratory depression, dry mouth, dry skin, blurred vision, urinary retention, widened QRS, tachycardia, mydriasis, or fever.

KEY EKG FINDINGS IN TCA TOXICITY

1. Wide complex QRS > 100 ms (non-specific intraventricular conduction delay)
2. Right axis deviation
3. R/S ratio > 0.7 in lead aVR
4. Terminal R wave > 3 mm in lead aVR

TREATMENT AND INTERVENTIONS

1. Manage airway. Suction, position, apply oxygen. Assist ventilations as needed.
2. Initiate EKG monitoring and obtain 12-lead EKG immediately.
3. Establish vascular access.
4. Obtain blood glucose and treat as indicated.
5. Treat seizures with midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg).
6. Treat shock with normal saline 500 mL IV/IO bolus.

Sodium Bicarbonate IV/IO (DMO required)	Adult: 1–2 mEq/kg IV/IO bolus — reassess QRS width after each dose Pediatric: 1 mEq/kg IV/IO bolus *Administer for widened QRS > 100 ms. Multiple boluses may be required — involve Direct Medical Oversight for redosing. Endpoint: QRS narrowing.*

KEY CONSIDERATIONS

1. TCAs block sodium channels — the same mechanism as cocaine. Widened QRS indicates cardiotoxicity requiring sodium bicarbonate.
2. TCAs also cause anticholinergic syndrome: dry skin and mouth, urinary retention, ileus, hyperthermia, tachycardia, and mydriasis.

3. Sodium bicarbonate works by increasing sodium channel availability and raising serum pH — alkalinization directly reduces cardiotoxicity.
4. Multiple boluses may be required. Contact DMO for redosing guidance.

TOPICAL CHEMICAL BURNS

Also known as: *Chemical Exposure, Acid/Alkali Burn*

PATIENT CARE GOALS

5. Rapidly recognize chemical burn exposure.
6. Remove contaminating agent through decontamination.
7. Initiate transport to an appropriate burn center.

PATIENT PRESENTATION

Patients exposed to chemicals capable of causing topical burns — including alkalis, acids, mustard agent, and lewisite. Presentation may be immediate or delayed depending on agent, concentration, and duration of exposure.

TREATMENT AND INTERVENTIONS

CAUTION Don appropriate PPE before patient contact. Protect rescuers and bystanders from secondary contamination. Activate HazMat resources as needed.

1. Remove patient's clothing immediately.
2. If DRY chemical contamination: carefully brush off solid chemical BEFORE flushing. Contact with water may activate an exothermic chemical reaction if solid material remains.
3. If WET chemical contamination: flush affected skin (and eyes if involved) with copious amounts of water or normal saline. Continuous irrigation is the priority.
4. For eye exposure: continuous irrigation with IV normal saline is the treatment. Do not attempt to neutralize.
5. Manage airway. Plan early for potential oropharyngeal burns causing progressive airway compromise — consider early SGA or ET intubation if burn involves airway.
6. Take measures to prevent hypothermia during decontamination.
7. Establish vascular access as indicated.
8. Provide analgesia: fentanyl 1 mcg/kg IV/IO or ketorolac 15–30 mg IV/IO (adults) for significant burn pain.
9. Gather MSDS (material safety data sheet) and all chemical information available on scene. Communicate directly to the receiving facility.
10. Expedite transport to a burn center for significant TBSA involvement or burns to eyes, face, hands, feet, or genitalia.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION Do NOT attempt to neutralize an acid with an alkali or vice versa. The resulting exothermic reaction will cause additional thermal burns and may make the injury significantly worse.

1. Ensure ongoing decontamination does not contaminate the ambulance or other personnel.

2. Gather chemical information while on scene — do not delay patient treatment, but document all available data for the receiving facility.

OBSTETRICS

The following protocols address obstetric emergencies, field delivery, and hypertensive complications of pregnancy.

OBSTETRIC AND GYNECOLOGICAL EMERGENCIES

PATIENT CARE GOALS

3. Recognize serious hemorrhagic conditions in pregnancy even when hemorrhage or pregnancy is not apparent.
4. Recognize and treat shock.
5. Transport to the closest appropriate receiving facility without delay.

PATIENT PRESENTATION

Any female patient with vaginal bleeding in any trimester, pelvic pain, or possible ectopic pregnancy. Maternal age may range from 10 to 60 years.

HEMORRHAGIC CONDITIONS OF PREGNANCY — KEY RECOGNITION

Condition	Key Features
Abruptio Placentae	3rd trimester. Placenta prematurely separates. Presents with lower abdominal pain, contractions, uterine rigidity. Shock may occur with minimal external bleeding.
Placenta Previa	Late 2nd or 3rd trimester. Placenta covers cervical opening. Painless vaginal bleeding unless in active labor.
Ectopic Pregnancy	1st trimester. Abdominal/pelvic pain with or without minimal bleeding. Consider in any female 10–60 years with unexplained shock and abdominal pain. Syncope may be presenting sign.
Spontaneous Abortion	Usually 1st trimester. Intermittent pelvic pain (uterine contractions) with vaginal bleeding.

TREATMENT AND INTERVENTIONS — IF SIGNS OF SHOCK

1. Place patient supine. If hypotensive in 2nd/3rd trimester: left lateral recumbent position OR manually displace uterus to the left while supine.
2. Apply oxygen targeting SpO2 94–98%.
3. Establish vascular access. Administer normal saline 500 mL IV/IO bolus — repeat for hemodynamic response.
4. Initiate EKG monitoring.
5. Treat nausea/vomiting: ondansetron 4 mg IV/IO/IM or 4 mg ODT SL.
6. Transport to closest appropriate receiving facility without delay.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

CAUTION Do NOT place hand or fingers into the vagina of a bleeding patient except in cases of prolapsed cord or breech birth that is not progressing.

CHILDBIRTH — FIELD DELIVERY

PATIENT CARE GOALS

7. Recognize imminent delivery and prepare appropriately.
8. Assist with controlled delivery to minimize maternal and fetal injury.
9. Recognize and manage delivery complications.

SIGNS OF IMMINENT DELIVERY

1. Contractions — repetitive, short intervals, painful
2. Crowning — presenting part visible at vaginal opening
3. Urge to push or urge to move bowels
4. Membrane rupture

NOTE If patient is in labor but NO signs of imminent delivery: transport promptly to the appropriate receiving facility. Do not deliver on scene if time allows safe transport.

NORMAL DELIVERY — STEP-BY-STEP

- Apply PPE — gloves, gown, eye protection.
- Position mother supine. Allow legs and buttocks to be at edge of cot if possible.
- Apply high-flow oxygen to mother.
- Control the delivery — allow slow, controlled delivery. Support the infant's head as it emerges. Do NOT pull.
- Check for nuchal cord immediately after head delivers:
  a. Slip cord over infant's head if possible.
  b. If unable to reduce cord: double clamp and cut between clamps immediately.
- Do NOT routinely suction the infant's airway during delivery (bulb syringe or otherwise).
- Gently guide head DOWN to deliver anterior shoulder. Gently guide head UP to deliver posterior shoulder. Slowly deliver remainder of infant.
- After 1–3 minutes (or when cord stops pulsating), clamp cord ~6 inches from umbilicus with 2 clamps and cut between them. If resuscitation is needed: clamp and cut immediately.
- After delivery: suction ONLY if obvious airway obstruction or positive pressure ventilation is required.
- Dry and warm infant. Place skin-to-skin on maternal chest unless resuscitation is required.
- Record APGAR scores at 1 and 5 minutes.
- Placenta will deliver spontaneously within 5–15 minutes. Do NOT pull on the cord. Place all tissue in a plastic bag and transport.
- Consider uterine fundal massage after placental delivery to control hemorrhage. Allow infant to nurse if possible — promotes uterine contraction.
- Secure infant in appropriate restraint device for transport.

DELIVERY COMPLICATIONS

Shoulder Dystocia — delivery fails to progress after head delivers:

1. Hyperflex mother's hips to supine knee-chest position (McRoberts maneuver).
2. Apply firm suprapubic pressure to dislodge the impacted shoulder. Do NOT apply fundal pressure.
3. Apply high-flow oxygen to mother.
4. Transport immediately. Contact receiving facility to mobilize OB resources.

Prolapsed Umbilical Cord:

1. Insert gloved hand into vagina and gently lift the presenting part off the cord. Do not remove your hand until relieved by hospital staff.
2. Assess for pulsations in the cord.
3. Apply high-flow oxygen to mother.
4. Consider prone knee-chest position during transport — use clinical judgment regarding transport safety.
5. Transport immediately. Contact receiving facility.

Breech Presentation:

1. Allow legs, buttocks, and trunk to deliver spontaneously. Support the body.
2. If head fails to deliver: insert gloved hand into vagina with fingers between infant's face and vaginal wall to create a patent airway.
3. Arm or leg presenting through vagina alone: transport immediately — do not attempt delivery.
4. Apply high-flow oxygen to mother. Transport immediately. Contact receiving facility.

Post-Partum Hemorrhage:

1. Assess blood loss — 3 or more heavily soaked pads is significant.
2. Firm uterine fundal massage after placental delivery.
3. Examine perineum for large lacerations — apply direct pressure. Consider hemostatic dressing if available.
4. Normal saline 500 mL IV/IO bolus for signs of shock.
5. Transport promptly.

Maternal Cardiac Arrest:

CAUTION The best chance for fetal survival is maternal survival. Perform full ALS resuscitation with one modification: manually displace the uterus to the LEFT throughout resuscitation to relieve aortocaval compression.

1. Apply manual left uterine displacement continuously during compressions — a second rescuer maintains this throughout.
2. If uterus is at or above the umbilicus (approximately > 20 weeks): transport immediately for possible perimortem C-section. Best outcomes if performed within 5 minutes of maternal arrest.
3. Compressions placed slightly higher on sternum than standard (gravid uterus elevates diaphragm).
4. Defibrillate as in non-pregnant patients without modification.
5. Contact receiving facility to mobilize OB resources and surgical team.

KEY CONSIDERATIONS

CAUTION Newborns are extremely slippery. Grip firmly. Take care not to drop the infant.

1. Some bleeding is normal with any delivery. Large quantities of free bleeding are abnormal.
2. If expecting twins: transport between deliveries when possible.
3. Supine hypotension: hypotensive mother in late pregnancy should be in left lateral recumbent position or have uterus manually displaced left if supine is required.

PRE-ECLAMPSIA AND ECLAMPSIA

Also known as: *Toxemia of Pregnancy, Pregnancy-Induced Hypertension*

PATIENT CARE GOALS

4. Recognize serious hypertensive conditions associated with pregnancy.
5. Treat eclamptic seizures promptly.
6. Transport to the closest appropriate receiving facility without delay.

PATIENT PRESENTATION

Female patient more than 20 weeks gestation presenting with hypertension and evidence of end-organ dysfunction. May occur up to 4 weeks post-partum (rare after 48 hours post-delivery).

Condition	Defining Features
Pre-Eclampsia (Severe)	SBP > 160 or DBP > 110, PLUS any of: headache, visual changes, RUQ/epigastric pain, mental confusion, pulmonary edema, or signs of renal, hepatic, or hematologic dysfunction.
Eclampsia	Pre-eclampsia features PLUS new-onset seizures. Seizures may occur without warning.

NOTE This protocol does NOT apply to pregnant patients with chronic hypertension without end-organ signs, or patients < 20 weeks gestation.

TREATMENT AND INTERVENTIONS

1. Manage airway as indicated. Suction, position, apply oxygen targeting SpO2 94–98%.
2. For actively seizing patient: midazolam 5 mg IV/IO or 10 mg IM. Repeat once in 5 minutes if seizure continues.
3. Initiate EKG monitoring.
4. Establish IV access.
5. Obtain blood glucose and treat as indicated.
6. Treat shock: normal saline 500 mL IV/IO bolus if hypotensive.
7. Transport to closest appropriate receiving facility. Use patient's Obstetrician preference when feasible and safe.
8. 2nd/3rd trimester patients: transport on left side or manually displace uterus left if hypotensive.

KEY CONSIDERATIONS

KEY POINT Delivery of the placenta is the ONLY definitive treatment for pre-eclampsia and eclampsia. The role of EMS is stabilization, seizure management, and rapid transport.

MAGNESIUM TOXICITY — IF PATIENT HAS PRE-HOSPITAL MAGNESIUM INFUSION RUNNING

Magnesium toxicity progresses in this order — recognize early:

- Hypotension
- Loss of deep tendon reflexes
- Somnolence and slurred speech
- Respiratory paralysis
- Cardiac arrest

Treatment of magnesium toxicity:

1. Stop the magnesium infusion immediately.

Calcium Chloride IV/IO (DMO required)	Adult: 1 g IV/IO over 5 minutes for pending respiratory arrest *Contact Direct Medical Oversight before administration.*

1. Manage airway and respiratory distress — BVM or advanced airway as required.

CARDIAC ARREST

The following protocols address recognition, resuscitation, post-ROSC care, and field termination for cardiac arrest.

CARDIAC ARREST AND RESUSCITATION

PATIENT CARE GOALS

2. High-quality CPR with minimal interruption from recognition to ROSC or field termination.
3. Early defibrillation of shockable rhythms.
4. Rapid identification and correction of reversible causes.
5. Return of spontaneous circulation and preservation of neurologic function.

PATIENT PRESENTATION

Non-traumatic cardiac arrest in adult or pediatric patients. This protocol also applies to hypothermic cardiac arrest (see additional guidance in Hypothermia Protocol) and drowning cardiac arrest (airway and ventilation take equal priority with compressions).

NOTE Patients with a valid DNR/TPOPP order: do not initiate resuscitation. See Determination of Death Protocol. If resuscitation was begun before discovery of the directive, it may be discontinued without Direct Medical Oversight.

CORE RESUSCITATION PRINCIPLES

KEY POINT The two most important therapies in cardiac arrest are EFFECTIVE CHEST COMPRESSIONS and EARLY DEFIBRILLATION. All other interventions are secondary.

Effective compression standards:

1. Rate: 100–120 compressions per minute — use metronome.
2. Adult/child depth: at least 2 inches (5 cm), no more than 2.4 inches (6 cm). Infant depth: at least 1.5 inches (4 cm).
3. Allow complete chest recoil after each compression — avoid leaning.
4. Minimize all interruptions. Pre-charge defibrillator during compressions. Resume compressions within 5 seconds of shock delivery.
5. Rotate compressors every 2 minutes to prevent fatigue.
6. Monitor compression quality with quantitative ETCO2 — target > 10 mmHg. If < 10 mmHg: improve compression technique.

TREATMENT SEQUENCE

- Begin chest compressions immediately upon confirming pulselessness.
- Apply monitor/defibrillator while compressions continue. Defibrillate shockable rhythms (VF/pVT) at maximum energy without delay.
- Resume compressions immediately after shock — no pulse check for 2-minute cycle.
- Establish vascular access. IV preferred; IO is acceptable and should be established without delay if IV is not immediately available. Begin using IV route once established.

Epinephrine IV/IO	Adult: 1 mg IV/IO every 3–5 minutes Pediatric: 0.01 mg/kg IV/IO (max 1 mg) every 3–5 minutes *Administer as soon as vascular access is obtained. Do not delay compressions to establish access.*

- Airway management — simultaneous with compressions when sufficient providers are present:
  a. Adult preferred: SGA immediately with BVM at 10 breaths/min (1 breath every 10 compressions, delivered on upstroke between compressions).
  b. If SGA unavailable: 2-person BVM with oral airway at same rate, without interrupting compressions.
  c. Pediatric preferred: 2-person BVM. Multi-rescuer compression:ventilation ratio — 15:2 adults, 30:2 single rescuer.
  d. ET intubation: ONLY if BVM and SGA have both failed. Do NOT pause compressions to place ET tube. Once placed, ventilate at 10 breaths/min adults / 12–20 breaths/min pediatric.

- Continue 2-minute cycles of compressions — rhythm check — defibrillation of shockable rhythms.
- Antiarrhythmic for recurrent/refractory VF or pVT unresponsive to CPR, defibrillation, and epinephrine:

Amiodarone IV/IO	Adult: 300 mg IV/IO — repeat once at 150 mg in 5 minutes if needed Pediatric: 5 mg/kg IV/IO — repeat once at same dose if needed *Amiodarone and lidocaine are equivalent in efficacy — use one. Once maximum dose of one agent reached, may switch to the other.*
Lidocaine IV/IO	Adult: 1–1.5 mg/kg IV/IO — repeat at 0.5–0.75 mg/kg every 5–10 min (max 3 mg/kg) Pediatric: 1 mg/kg IV/IO *Alternative to amiodarone for refractory VF/pVT.*

- Consider and treat reversible causes throughout resuscitation (H's and T's):

REVERSIBLE CAUSES — INLINE TREATMENT

Cause	Prehospital Treatment
Hypoxia	Optimize airway and ventilation. Apply 100% oxygen. Ensure proper ET/SGA placement.
Hypovolemia	Normal saline 500 mL IV/IO bolus — repeat for clinical response.
Hypothermia	Active rewarming. Withhold medications until core temp > 86°F (30°C). See Hypothermia Protocol.
Hyperkalemia / Dialysis Patient	Calcium chloride 1 g IV/IO push. Flush line thoroughly with NS before administering sodium bicarbonate 1 mEq/kg IV/IO — do not push through the same line without flushing. Administer early.
Hypoglycemia	Dextrose 10%: 25 g (250 mL) IV/IO push for adults; 2 mL/kg for pediatric.
TCA Overdose	Sodium bicarbonate 1–2 mEq/kg IV/IO for widened QRS.

Tension Pneumothorax	Needle decompression: 2nd intercostal space, midclavicular line (or 4th ICS, anterior axillary line).
Tamponade	Rapid transport. No prehospital field intervention available.
Thrombosis (Pulmonary)	Rapid transport. Consider in sudden arrest with recent immobility or risk factors.
Thrombosis (Coronary)	Treat as ACS/STEMI. Rapid transport for cath lab activation post-ROSC.
Toxins	Identify agent and treat per applicable toxicology protocol.

SPECIAL CIRCUMSTANCES

Pregnancy:

1. Manually displace uterus LEFT throughout resuscitation — assigned second rescuer maintains this continuously.
2. Standard defibrillation doses and medication doses apply.
3. Transport immediately for possible perimortem C-section — best outcomes within 5 minutes of arrest.

Pediatric:

1. Most pediatric arrests are respiratory in origin — early airway management and ventilation are critical.
2. CAB sequence still recommended per AHA to ensure compressions are initiated promptly.
3. Conventional CPR (with ventilations) is superior to compression-only CPR in children.

KEY CONSIDERATIONS

KEY POINT

Resuscitate on scene in most cases. CPR in a moving vehicle is significantly less effective, poses provider injury risk, and endangers the public. Move only when scene is unsafe or operationally untenable.

1. Mechanical CPR device may be placed after 20 minutes of resuscitation (or sooner per Medical Director authorization).
2. If ROSC is achieved at any point: transition to Post-ROSC Care Protocol.
3. If resuscitation remains ineffective: apply Termination of Resuscitation criteria.

POST-ROSC CARE

Also known as: *Return of Spontaneous Circulation, Post-Cardiac Arrest Care*

PATIENT CARE GOALS

4. Optimize oxygenation, ventilation, and perfusion to protect neurologic function.
5. Identify and treat post-arrest STEMI.
6. Transport to the most appropriate facility.

TREATMENT AND INTERVENTIONS

1. Assign one provider to continuously monitor femoral pulse — especially critical during any patient movement or transfer.

CAUTION NORMOXIA AND NORMOCARBIA are the targets post-ROSC. Both hyperoxia and hyperventilation independently worsen neurologic outcomes. SpO2 target: 94–98%. ETCO2 target: 35–45 mmHg.

1. Administer oxygen to maintain SpO2 94–98%. Do NOT target 100% — hyperoxia causes reperfusion injury.
2. Ventilate to ETCO2 35–45 mmHg. Do NOT hyperventilate — hyperventilation-induced hypocapnia causes cerebral vasoconstriction and is a leading cause of post-ROSC re-arrest.
3. Obtain 12-lead EKG immediately. If STEMI is identified: activate STEMI alert and notify receiving facility.
4. Obtain blood glucose. Treat hypoglycemia: dextrose 10% 25 g (250 mL) IV/IO adults; 2 mL/kg pediatric.
5. Treat seizures: midazolam 5 mg IV/IO/IM (0.1 mg/kg pediatric, max 5 mg).
6. Ensure adequate vascular access for ongoing management.

Hypotension management post-ROSC:

1. Adult SBP threshold: < 90 mmHg.
2. Pediatric thresholds: < 1 year < 60 mmHg; 1–10 years < 70 + (age × 2) mmHg; > 10 years < 90 mmHg.

Norepinephrine infusion	Adult: 0.1–0.2 mcg/kg/min IV/IO — titrate to MAP > 65 mmHg Pediatric: 0.1 mcg/kg/min IV/IO — titrate to age-appropriate BP *Preferred vasopressor for post-arrest hypotension. Begin after fluid challenge.*

1. Normal saline 500 mL IV/IO bolus for initial hypotension — then vasopressor if not responding.

KEY CONSIDERATIONS

1. Most post-ROSC patients require ventilatory support immediately. Spontaneous breathing is often inadequate.
2. Post-ROSC patients are highly unstable — a significant percentage will re-arrest. Continuous monitoring is mandatory.
3. Common causes of post-ROSC hypotension: hyperventilation, hypovolemia, pneumothorax.

4. A significant proportion of post-ROSC patients will have EKG evidence of STEMI — perform 12-lead on every ROSC patient.
5. Do NOT use lights and sirens routinely for post-ROSC transport.
6. Consider mechanical CPR device placement before transport in case of re-arrest.

DETERMINATION OF DEATH — WITHHOLDING RESUSCITATION

PATIENT CARE GOALS

7. Ensure resuscitation is initiated for all clinically dead patients unless a valid exception applies.
8. Apply clear criteria for withholding resuscitation to prevent futile interventions.

RESUSCITATION MAY BE WITHHELD — WITHOUT DMO — IF ANY OF THE FOLLOWING ARE PRESENT

NOTE These criteria apply to cardiac arrest from any cause EXCEPT lightning strike/electrocution, drowning, and hypothermia — those patients should receive resuscitation regardless of apparent signs.

- Decapitation — severing of head from body.
- Decomposition or putrefaction — bloated or ruptured skin, soft tissue sloughing.
- Transection of torso — body completely severed below shoulders and above hips.
- Incineration — > 90% BSA full-thickness burns, charred skin, complete absence of body hair.
- Injuries clearly incompatible with life — massive crush, complete exsanguination, severe displacement of brain matter.
- Blunt or penetrating trauma: patient is apneic, pulseless, and without any signs of life (spontaneous movement, EKG activity, pupillary response) upon EMS arrival.
- Non-traumatic arrest with obvious signs of dependent lividity or rigor mortis.
- Valid DNR order (form, card, bracelet, medallion) or actionable medical order (TPOPP) is present.

DNR / TPOPP WITH SIGNS OF LIFE

1. If a valid DNR/TPOPP is present and the patient HAS a pulse and respirations: provide standard appropriate treatment under existing protocols.
2. Do Not Intubate (DNI) or other partial directive: full treatment per protocol except the specific prohibited intervention.
3. If any prohibited intervention is being considered: contact Direct Medical Oversight.
4. To withhold any treatment beyond the scope of the directive for any reason: contact Direct Medical Oversight.

KEY CONSIDERATIONS

1. If patient status is unclear and withholding resuscitation is questioned: initiate CPR immediately and contact Direct Medical Oversight.
2. At a likely crime scene: disturb as little potential evidence as possible. Document scene findings.
3. Photocopies, faxes, and electronic formats of advanced directives are honored. Document and file with EMS report.
4. Once arrest is terminated: Law Enforcement has jurisdiction of the scene; Medical Examiner has jurisdiction of the body. All devices (SGA, ET tube, IV/IO catheters, EKG electrodes) should be left in place. Medical trash should be collected and properly disposed of.

TERMINATION OF RESUSCITATION

PATIENT CARE GOALS

5. Provide clear criteria for ceasing futile prehospital resuscitation.
6. Protect providers and the public from risks of resuscitation during transport.
7. Appropriately redirect attention to family support after termination.

NON-TRAUMATIC CARDIAC ARREST — CRITERIA FOR FIELD TOR

All of the following criteria must be met to terminate resuscitation without Direct Medical Oversight:

1. High-quality chest compressions performed throughout resuscitation.
2. Appropriate oxygenation and ventilation techniques applied.
3. Vascular access achieved.
4. Defibrillation performed and rhythm-appropriate medications administered per protocol.
5. Minimum 25 minutes of EMS resuscitation for UNWITNESSED arrest.
6. Minimum 40 minutes of EMS resuscitation for WITNESSED arrest.
7. At least 5 minutes have elapsed since the last epinephrine dose.
8. No ROSC at any point during resuscitation.
9. No refractory or recurrent VF/VT.
10. No neurological activity: no eye opening, no pupillary response, no agonal breathing, no motor responses.
11. Persistent asystole, agonal rhythm, or slow wide-complex PEA.
12. Reversible causes identified and managed when possible.
13. If patient is a minor: parent or guardian agrees to discontinuing efforts.
14. All EMS providers on scene agree that TOR is appropriate.

TRAUMATIC CARDIAC ARREST

Blunt traumatic arrest — TOR may be applied if all of the following are present:

a. Apneic
b. Pulseless
c. Asystole or PEA with HR < 40 on cardiac monitor

Penetrating traumatic arrest — TOR may be applied if all of the following are present:

d. Apneic
e. Pulseless
f. Asystole or PEA with HR < 40 on cardiac monitor
g. Absence of any signs of life: no pupillary reflexes, no spontaneous movement, no response to pain

NOTE If resuscitation is not terminated in traumatic arrest: expeditious transport is indicated. Consider Direct Medical Oversight for field TOR if transport time exceeds 15 minutes.

KEY CONSIDERATIONS

KEY POINT Quantitative ETCO2 < 10 mmHg, or falling > 25% despite ongoing resuscitation, is a poor prognostic indicator and additional supporting evidence for TOR — but should not be used in isolation.

1. All patients with VF should in general have full resuscitation continued on scene — VF is a shockable rhythm with meaningful survival potential.
2. After termination: family becomes the primary focus. Explain what occurred and the rationale for ceasing efforts. Offer to contact family, clergy, or chaplain support.
3. Scene safety: if family or bystanders are threatening violence, EMS may elect to continue resuscitation to avoid escalation.
4. Law Enforcement takes jurisdiction of scene. Medical Examiner takes jurisdiction of body. Leave all devices in place. Clean and properly dispose of medical waste.

TRAUMA PROTOCOLS

The following protocols address traumatic emergencies. All protocols are self-contained with inline dosing. For patients with multi-system trauma, Universal Trauma Management applies as the primary framework with condition-specific protocols supplementing as needed.

UNIVERSAL TRAUMA MANAGEMENT

PATIENT CARE GOALS

5. Rapid assessment and management of life-threatening injuries.
6. Safe movement of patient on-scene and during transport.
7. Rapid transport to the appropriate receiving facility.

PATIENT PRESENTATION

All patients of any age who have sustained blunt injury, penetrating injury, or burns.

PRIMARY SURVEY — XABCDE

CAUTION Scene time goal: under 10 minutes for unstable patients or those likely to need surgical intervention. Life-threatening injuries identified on primary survey drive immediate transport — secondary survey is performed en route.

X — Exsanguinating Hemorrhage Control (first priority):

1. Identify and stop severe external hemorrhage immediately before all other interventions.
2. Apply direct pressure. If ineffective or impractical for extremity wounds: apply commercial tourniquet 2–3 inches proximal to wound, not over a joint. Tighten until bleeding stops and distal pulse is eliminated. Mark time prominently.
3. For junctional wounds (groin, axilla) not amenable to tourniquet: pack tightly with hemostatic gauze and apply direct pressure.
4. If bleeding continues after tourniquet: apply second tourniquet proximal to the first.

A — Airway:

1. Assess patency — ask patient to speak. Listen and look.
2. Identify threats: unstable facial fractures, expanding neck hematoma, blood or vomitus in airway, facial burns, inhalation injury.
3. Assess mental status — GCS ≤ 8 increases likelihood of needing airway assistance. Decision to escalate is based on clinical findings, not GCS alone.
4. If impending obstruction or inability to protect airway: manage per airway sequence (positioning, OPA/NPA, BVM, SGA, intubation).
5. NPA should NOT be used with significant facial injury or suspected basilar skull fracture — unless it is the only available means of airway protection.
6. Apply cervical spine precautions when indicated.

B — Breathing:

1. Assess rate, pattern, and symmetry of chest wall movement.
2. Auscultate bilaterally on lateral chest wall.
3. Apply oxygen. Target SpO2 94–98% (normoxia). Do not hyperoxygenate.

4. If absent or diminished breath sounds with hypotension: treat as tension pneumothorax — perform needle decompression (2nd ICS, midclavicular line, or 4th ICS, anterior axillary line).
5. Open chest wound: apply semi-occlusive chest seal immediately.

C — Circulation:

1. Assess perfusion: blood pressure, heart rate, capillary refill, skin color and temperature.
2. Establish vascular access — do NOT delay transport in unstable patients for IV access.

Patient	Fluid Resuscitation Threshold
Adult	SBP < 90 mmHg. Normal mental status with lower BP may be tolerated without fluids.
Isolated head injury	Target SBP ≥ 110–120 mmHg. Avoid hypotension to maintain cerebral perfusion.
Head injury + penetrating trauma	Contact Direct Medical Oversight for guidance on fluid strategy.
Pediatric	< 1 year: SBP < 60 mmHg. 1–10 years: < 70 + (age × 2) mmHg. > 10 years: < 90 mmHg. Tachycardia with poor perfusion also warrants fluid.

Normal Saline	Adult: 500 mL IV/IO bolus — reassess and repeat for clinical response Pediatric: 20 mL/kg IV/IO bolus — reassess after each bolus *Administer for shock thresholds above. Avoid over-resuscitation — permissive hypotension is acceptable in penetrating trauma without head injury.*

D — Disability:

1. Rapid neurologic status assessment — AVPU or GCS.
2. Assess gross motor movement of all extremities.
3. Evaluate for signs of traumatic brain injury with herniation: unequal pupils, posturing, Cushing's response (bradycardia + hypertension).

E — Exposure:

1. Rapid evaluation of entire body — roll and examine the back.
2. Identify all sites of penetrating wounds or blunt injury.
3. Remove wet clothing. Cover patient to prevent hypothermia. Maintain modesty.

ADDITIONAL TREATMENT

1. Splint obvious extremity fractures as time and clinical situation allow.
2. Maintain spinal motion restriction as clinically indicated.
3. Analgesia: fentanyl 1 mcg/kg IV/IO/IM (max 100 mcg adults) or ketamine 0.1–0.3 mg/kg IV/IO for pain. Ketorolac 15–30 mg IV/IO (adults) for musculoskeletal pain when hemodynamically stable.

KEY CONSIDERATIONS

KEY POINT Signs of hemorrhagic shock: tachycardia, hypotension, pale and cool clammy skin, capillary refill > 2 seconds. Compensated shock may present without hypotension until severe blood loss has occurred.

1. If ventilation becomes difficult during transport: reassess breath sounds immediately for tension pneumothorax.
2. If tourniquet or pressure dressing applied: reassess frequently for continued or recurrent hemorrhage.
3. If mental status declines: reassess XABCDE and repeat neurologic assessment.
4. Patients with TBI may deteriorate as intracranial swelling and hemorrhage expand — reassess continuously.
5. Transport decision: follow CDC Field Triage Guidelines for Injured Patients (Appendix A).

TRAUMATIC ARREST — WITHHOLDING RESUSCITATION

Resuscitative efforts should be withheld for trauma patients with any of the following:

1. Decapitation or near decapitation
2. Hemicorporectomy
3. Signs of rigor mortis or dependent lividity
4. Blunt trauma: apneic, pulseless, asystole or PEA with HR < 40
5. Penetrating trauma: apneic, pulseless, asystole or PEA with HR < 40, AND absence of any signs of life (pupillary reflexes, spontaneous movement, response to pain)

BLAST INJURIES

PATIENT CARE GOALS

6. Identify multi-system injuries from explosive force including possible toxic contamination.
7. Prioritize treatment of life-threatening injuries.
8. Transport to the appropriate trauma or burn center.

PATIENT PRESENTATION

Patients exposed to explosive force. May sustain any combination of: blunt trauma, penetrating trauma (shrapnel), burns, barotrauma, and toxic chemical contamination.

TREATMENT AND INTERVENTIONS

CAUTION SCENE SAFETY: Ensure scene is clear of secondary explosive devices before patient contact. In a possible terrorist event, assume secondary devices until confirmed safe.

Hemorrhage Control:

1. Control all external hemorrhage — direct pressure, tourniquet, wound packing as indicated.

Airway:

1. Secure airway as indicated. If thermal or chemical airway burn is suspected: consider early advanced airway management. SGA is acceptable if difficult intubation is anticipated.

Breathing:

1. Administer oxygen — target SpO2 94–98%.
2. Assist respirations as needed.
3. Cover open chest wounds with semi-occlusive chest seal.
4. If tension pneumothorax suspected: needle decompression immediately.

Circulation:

1. Establish vascular access.
2. Normal saline for shock per Universal Trauma fluid thresholds.
3. Minimize IV fluids in patients without signs of shock.

Disability:

1. If head injury signs present: treat per Head Injury Protocol (inline below).
2. Apply spinal motion restriction if indicated.
3. Monitor GCS continuously during transport.

Exposure:

1. Keep patient warm. Blast victims are at high risk for hypothermia.

KEY CONSIDERATIONS

1. Barotrauma injuries to consider: tension pneumothorax, tympanic membrane perforation (may cause deafness that complicates mental status assessment and ability to follow commands).
2. Airway burns from blast require early management — progressive edema can cause complete obstruction within minutes.
3. Transport to trauma center and/or burn center as appropriate for dominant injury pattern.

BURNS — THERMAL

PATIENT CARE GOALS

4. Stop the burning process.
5. Manage airway burns aggressively and early.
6. Provide pain management.
7. Transport to appropriate burn center.

PATIENT PRESENTATION

Patients with thermal injury presenting with any of the following: stridor or hoarse voice (airway involvement), mouth/nares involvement (redness, blisters, soot, singed hairs), rapid or shallow breathing with wheeze or crackles, skin burns of varying depth, or associated trauma.

TREATMENT AND INTERVENTIONS

1. Stop the burning process — remove from heat source, remove burning clothing.
2. Remove all clothing and constricting bands (watches, jewelry, rings) — these retain heat and cause circumferential constriction as edema develops.
3. Apply high-flow 100% oxygen for ALL patients rescued from an enclosed space or with any concern for carbon monoxide exposure.
4. Manage airway. For burns involving face, airway, or voice change: consider early advanced airway — progressive edema can cause complete obstruction.
5. Apply pulse oximetry and ETCO2 monitoring. Note: pulse oximetry is unreliable in CO poisoning.
6. Initiate EKG monitoring.
7. Establish vascular access — avoid placement through burned skin whenever possible.

CAUTION Suspect cyanide toxicity in any enclosed-space fire patient with: altered mental status, respiratory distress, shock, or seizures. Administer hydroxocobalamin when in doubt.

Hydroxocobalamin IV/IO	Adult: 5 g IV/IO over 15 minutes Pediatric: 70 mg/kg IV/IO over 15 minutes (max 5 g) *For enclosed-space fire with AMS, respiratory distress, shock, or seizures.*

Fluid management:

1. If patient IS in shock: administer normal saline per Universal Trauma guidelines.
2. If patient is NOT in shock: do NOT administer IV fluids. Short transport times and inability to accurately calculate TBSA and control drip rates in the EMS environment offer no benefit and risk over-hydration.

KEY POINT If the patient is in shock within one hour of burn, the burn is almost certainly NOT the cause. Evaluate aggressively for associated trauma and cyanide toxicity.

1. Prevent hypothermia — keep patient warm.
2. Cover burns with dry, clean dressings or a clean sheet. Do NOT apply gels, ointments, or ice.
3. Analgesia: fentanyl 1 mcg/kg IV/IO (adults and peds) or ketamine 0.1–0.3 mg/kg IV/IO. ETCO2 monitoring is especially important when administering significant pain medication doses.
4. Transport to burn center preferred. Trauma center is acceptable if airway compromise requires clinical judgment about transport timing.

KEY CONSIDERATIONS — BURNS

TBSA Estimation — Rule of Nines (adults):

Body Region	% TBSA
Head and neck	**9%**
Each arm (entire)	**9%**
Anterior trunk	**18%**
Posterior trunk	**18%**
Each leg (entire)	**18%**
Perineum/genitalia	**1%**

1. TBSA calculation includes only 2nd degree (partial thickness) and 3rd degree (full thickness) burns. First degree (superficial) burns are NOT included.
2. Burn center transport criteria: partial or full thickness burns > 10% TBSA, or any burns involving hands, feet, genitalia, face, circumferential burns, airway/inhalation burns, or electrical burns.
3. Evaluate distal circulation in circumferentially burned extremities — circumferential burns can cause vascular compromise.
4. Cardiac monitor is critical for electrical burns and chemical inhalation burns.

CRUSH INJURY

Also known as: *Crush Syndrome, Traumatic Rhabdomyolysis*

PATIENT CARE GOALS

5. Recognize crush mechanism and anticipate systemic complications.
6. Minimize effects of crush syndrome — hyperkalemia, renal failure, dysrhythmias.
7. Coordinate with Direct Medical Oversight before extrication when possible.

PATIENT PRESENTATION

Patient with traumatic crush mechanism. May initially appear with minimal signs and symptoms — maintain a high index of suspicion for any patient with a compressive mechanism of injury.

TREATMENT AND INTERVENTIONS

1. Control severe hemorrhage if present per Extremity Trauma protocol.
2. Manage airway as indicated.
3. Initiate EKG monitoring and obtain 12-lead EKG immediately. Monitor continuously for dysrhythmias before, immediately after, and during transport following release of pressure.
4. Establish IV access.
5. Begin normal saline resuscitation prior to extrication if possible — pre-extrication fluids help dilute the systemic release of myoglobin and potassium.
6. Provide analgesia: fentanyl 1 mcg/kg IV/IO or ketamine 0.1–0.3 mg/kg IV/IO.

CAUTION Contact Direct Medical Oversight early for any suspected crush or prolonged entrapment patient BEFORE extrication release for guidance on ongoing fluid management.

Post-extrication — if EKG findings consistent with hyperkalemia (peaked T-waves, widened QRS > 120 ms, loss of P waves):

Calcium Chloride IV/IO	Adult: 1 g IV/IO over 5 minutes Pediatric: 20 mg/kg IV/IO over 5 minutes (max 1 g) *Membrane stabilization for cardiac effects of hyperkalemia. Administer first.*
Albuterol (nebulized)	Adult: 2.5 mg/3 mL NS via nebulizer — repeat continuously Pediatric: 2.5 mg/3 mL NS via nebulizer — repeat continuously *Shifts potassium intracellularly.*
Sodium Bicarbonate IV/IO (DMO required)	Adult: 1 mEq/kg IV/IO bolus Pediatric: 1 mEq/kg IV/IO bolus *Alkalinizes urine, reduces myoglobin nephrotoxicity, treats acidosis. Contact DMO.*

1. Continue fluid resuscitation through extrication and during transport.
2. Transport to a trauma center.

KEY CONSIDERATIONS

KEY POINT

Fatal complication of crush syndrome is hyperkalemia-induced cardiac arrest. EKG changes are the earliest warning: peaked T-waves, widening QRS, loss of P waves, bradycardia. Do not wait for blood results.

1. Crush syndrome is of little concern if entrapment duration is under a few hours — but clinical judgment should still guide monitoring.
2. Sudden release of compressed tissue floods the circulation with potassium, myoglobin, and lactic acid — the transition from entrapment to release is the highest-risk period.

EXTREMITY TRAUMA AND EXTERNAL HEMORRHAGE CONTROL

PATIENT CARE GOALS

3. Minimize blood loss from extremity hemorrhage.
4. Prevent hemorrhagic shock.
5. Minimize pain and further injury from fractures and dislocations.

PATIENT PRESENTATION

Traumatic external hemorrhage, potential extremity fractures, and/or dislocations.

HEMORRHAGE CONTROL — PRIORITY SEQUENCE

- Apply direct pressure to bleeding site. Follow immediately with a pressure dressing.
- If direct pressure is ineffective or impractical for extremity wound: apply commercial tourniquet.
  a. Place 2–3 inches (2–3 fingerbreadths) proximal to wound, not over a joint.
  b. Tighten until bleeding stops AND distal pulse is eliminated.
  c. If bleeding continues: apply second tourniquet proximal to the first.
  d. Mark time of tourniquet placement prominently on patient (forehead or limb).
  e. Do not cover tourniquet with clothing or dressings.
- For junctional wounds (groin, axilla) not amenable to tourniquet: pack tightly with hemostatic gauze and maintain direct pressure.

CAUTION Tourniquet should NOT be removed in: amputation or near-amputation, unstable multi-trauma patient, or unstable clinical situation. If replaced with pressure dressing, leave the loose tourniquet in place so it can be retightened if bleeding resumes.

FRACTURE AND DISLOCATION MANAGEMENT

1. Provide analgesia before moving or manipulating fractures when patient is stable: fentanyl 1 mcg/kg IV/IO or ketamine 0.1–0.3 mg/kg IV/IO. Tourniquet pain in alert patients will require medication.
2. If angulated fracture with compromised distal vascular function: gently attempt to restore normal anatomic position. Do NOT force.
3. Assess and document neurovascular status distal to injury BEFORE and AFTER any manipulation or splinting.
4. Splint to limit movement. Elevate extremity above heart level when possible to limit swelling.
5. Apply ice or cool packs to limit swelling — do not apply directly to skin.

KEY CONSIDERATIONS

1. Tourniquet may be placed initially to control obvious severe hemorrhage, then converted to pressure dressing after ABCs are stabilized and patient is packaged.

2. Commercial and properly tested tourniquets are strongly preferred over improvised devices.
3. If hemostatic gauze is unavailable, plain gauze packed tightly is effective.
4. Arterial pressure points are NOT effective for hemorrhage control.
5. Amputated parts: place in a plastic bag — keep cool and dry, do not allow direct contact with ice. KU Medical Center is the only Kansas regional center performing peripheral amputation replantation — consider transport there for isolated stable patients with peripheral amputations.

FACIAL AND DENTAL TRAUMA

PATIENT CARE GOALS

6. Maintain a patent airway — highest priority.
7. Preserve vision.
8. Protect dentition.

PATIENT PRESENTATION

Patients with isolated facial injury including trauma to eyes, nose, ears, midface, mandible, or dentition.

TREATMENT AND INTERVENTIONS

Airway — highest priority:

1. Assess airway continuously. Facial trauma may cause progressive bleeding, expanding hematoma, or edema that compromises the airway.
2. Consider transport sitting up for patients with difficulty bleeding, swallowing, or managing secretions — after cervical spine assessment.
3. Remove cervical collar if it impedes airway management.
4. Have suction immediately available throughout transport.

Avulsed tooth (permanent teeth only):

1. Handle only at the crown — do not touch or wipe the root.
2. If dirty: rinse with water for 10 seconds only.
3. Storage medium: milk or normal saline preferred. Alert cooperative patient may hold tooth in their own saliva.
4. Permanent teeth may be successfully re-implanted if done within 15 minutes of avulsion — provider must be comfortable with the procedure and tooth must be intact, patient cooperative, with no airway concerns.

Eye trauma:

1. Place eye shield for any significant eye trauma.
2. Avulsed globe: do NOT attempt to replace in socket. Cover with moist saline dressing, then place a cup or shield over it.
3. Tetracaine topical ophthalmic drops for eye pain — do not apply to avulsed globe.
4. Treat nausea and vomiting: ondansetron 4 mg IV/IO/IM — increased vagal tone with eye injury can cause severe nausea.

Mandible fracture (unstable):

1. Patient cannot spit or swallow effectively — have suction continuously available.
2. Transport sitting up when spinal injury is not suspected.

Traumatic epistaxis:

1. Apply sustained direct pressure — squeeze nose continuously for 10–15 minutes.
2. Do NOT have patient blow nose forcefully.
3. Consider oxymetazoline topical if available.
4. Posterior bleeds may not be visible externally — blood drains down the posterior pharynx. Monitor airway carefully.

Nose or ear avulsion:

1. Recover tissue if it does not cause scene delay.
2. Wrap in dry sterile gauze in a plastic bag placed on ice.
3. Cover severe ear and nose lacerations with moist sterile dressings.

KEY CONSIDERATIONS

1. Airway may be compromised by fractures, hematoma, or progressive bleeding — reassess continuously.
2. After nasal fractures, epistaxis may be posterior and not visible at the nares while silently compromising the airway.

HEAD INJURY

Also known as: *Traumatic Brain Injury, TBI, Intracranial Injury*

PATIENT CARE GOALS

3. Limit disability and mortality by promoting adequate oxygenation and cerebral perfusion.
4. Prevent secondary brain injury from hypoxia, hypotension, and hyperventilation.
5. Recognize signs of herniation and respond immediately.

PATIENT PRESENTATION

Patient with blunt or penetrating head injury. Secondary brain injury from hypoxia and hypotension is preventable and is a major driver of morbidity and mortality.

TREATMENT AND INTERVENTIONS

Airway and ventilation:

1. Manage airway as indicated. Maintain cervical stabilization if indicated.
2. Provide oxygen to maintain SpO2 94–98% (normoxia). Hypoxia is directly injurious to the traumatized brain.

CAUTION Do NOT hyperventilate unless signs of impending herniation are present. Routine hyperventilation causes cerebral vasoconstriction and secondary ischemia — it is harmful and must be avoided.

Clinical Situation	ETCO2 Target
Moderate or severe head injury — unable to maintain airway	35–45 mmHg (normocapnia)
Signs of impending herniation: blown pupil, posturing, Cushing's response	30–35 mmHg — controlled hyperventilation only until definitive care

Circulation — blood pressure targets:

1. Avoid hypotension. Hypotension is directly associated with secondary brain injury and worsened outcomes.

Patient Age	Minimum SBP Target
Adult	≥ 110 mmHg
< 1 month old	> 60 mmHg
1–12 months	> 70 mmHg
1–10 years	> 70 + (age × 2) mmHg

1. Administer normal saline 500 mL IV/IO bolus if SBP falls below target thresholds.

2. Control scalp and facial bleeding with direct pressure — scalp wounds bleed profusely.
3. Obtain blood glucose — hypoglycemia can mimic or worsen TBI. Treat if < 60 mg/dL.
4. Initiate EKG monitoring.
5. Transport with head of bed elevated 30 degrees for severe head injury — clinical judgment required.

SIGNS OF DETERIORATION AND HERNIATION

Early deterioration signs — increasing concern:

1. Confusion or new agitation
2. Drowsiness or somnolence
3. Vomiting
4. Severe headache

Signs of herniation — immediate controlled hyperventilation and transport:

1. Decreasing or rapidly deteriorating mental status
2. Abnormal respiratory pattern
3. Asymmetric or unreactive pupils
4. Decorticate or decerebrate posturing
5. Cushing's response: bradycardia with hypertension

PATIENT / PROVIDER SAFETY CONSIDERATIONS

1. Maintain high suspicion for cervical spine injury in all moderate-to-severe head injury patients.
2. Elderly patients with ankylosing spondylitis or severe kyphosis may not tolerate a cervical collar — pad and immobilize in position of comfort.
3. Never allow cervical collar to compromise airway management — remove anterior portion if needed.
4. Do not delay transport to initiate IV access in unstable TBI patients.

SPINAL CARE — SPINAL MOTION RESTRICTION

PATIENT CARE GOALS

5. Select patients who will benefit from spinal motion restriction (SMR).
6. Minimize patient morbidity from unnecessary immobilization.
7. Apply SMR as a clinical decision, not a reflex response to mechanism.

PATIENT PRESENTATION

Patients with traumatic mechanism of injury or concern for possible traumatic mechanism.

CAUTION This protocol does NOT apply to isolated penetrating trauma to head, face, neck, or torso. SMR in penetrating neck trauma is associated with increased mortality and should not be applied.

ASSESSMENT — IS SMR INDICATED?

Mechanism alone does NOT determine need for SMR. High-risk mechanisms associated with spinal injury include:

1. Motor vehicle crashes (auto, ATV, snowmobile)
2. Axial loading injuries to the spine
3. Falls greater than 10 feet

Apply SMR (cervical collar + cot restraints) if ANY of the following are present:

1. Midline neck or spine pain or tenderness on palpation
2. Altered mental status with concerning mechanism
3. Focal neurologic deficit
4. Evidence of alcohol or drug intoxication with concerning mechanism
5. Severe or painful distracting injury (particularly torso)
6. Torticollis in children (if collar cannot be placed without force — avoid forcing)
7. Communication barrier preventing accurate assessment with concerning mechanism

NOTE If NONE of the above apply: patient may be managed without a cervical collar. Ambulatory patients do not require a spine board — gurney with collar and straps is appropriate.

TREATMENT AND INTERVENTIONS

Extrication:

1. From a vehicle: after collar placement (if indicated), adults and children in booster seats should be allowed to self-extricate with a non-focal neuro exam. Infants and toddlers in harness car seats: extricate in the car seat.
2. Other extrication: scoop stretcher or long spine board acceptable for extrication — remove from board once on cot unless logistics prevent timely removal.

3. Helmet removal: manually immobilize neck throughout. Remove shoulder pads before transport when possible. Use on-site athletic training staff when available.

Transport:

1. Do NOT transport patients on rigid long boards routinely. Remove from board as soon as practical.
2. Exception: unstable patient where board removal delays transport or other treatment priorities.
3. Pregnant patients: allow left lateral position if more comfortable. Manually displace uterus left when supine is required.
4. Preferred position: flat and supine. Head of bed may be raised to 30 degrees for: respiratory distress, suspected isolated severe TBI with elevated ICP, or to promote patient compliance.

KEY CONSIDERATIONS

KEY POINT

Do not manually stabilize the cervical spine of alert, spontaneously moving patients. Patients with pain will self-limit movement — forced immobilization increases anxiety and discomfort without clinical benefit.

1. SMR is a medical decision requiring risk/benefit judgment — it is not automatically indicated by mechanism.
2. Age alone should not determine SMR decision-making, but communication barriers at age extremes (infants, elderly with dementia) must be factored into assessment reliability.
3. Musculoskeletal instability conditions (rheumatoid arthritis, Down syndrome, etc.) may predispose to spinal injury — but evidence does not support treating these patients differently than others. Use standard criteria.

PATIENT / PROVIDER SAFETY CONSIDERATIONS

1. Penetrating neck injury: NO cervical collar, NO SMR — regardless of neurologic symptoms. Collar can delay identification of vascular injury and compromise the airway.
2. Monitor for airway compromise or aspiration in immobilized patients with nausea, vomiting, or facial/oral bleeding.
3. Anterior portion of cervical collar should be opened or removed if it impedes airway, oxygenation, or ventilation.
4. Excessively tight straps restrict chest excursion and cause hypoventilation. Check straps after application.
5. Prolonged spine board immobilization causes ischemic pressure injuries and significant patient discomfort — remove as soon as clinically possible.
6. Children are abdominal breathers — immobilization straps should cross the chest and pelvis, not the abdomen.

MEDICATION FORMULARY

This formulary provides complete drug reference information for all medications authorized under AMR Linn County Medical Protocols. Medications are listed alphabetically. Extended formulary agents are listed separately at the end — these are not required for permanent vehicle stock but may be carried per Medical Director authorization.

NEW 2025

Ketorolac (Toradol) has been added to the formulary effective 2025. It is authorized as a first-line non-opioid analgesic option for eligible patients. Review contraindications carefully before use — it is not appropriate for hemodynamically compromised patients.

ACETAMINOPHEN

Class	Analgesic, Antipyretic
Action	Elevates the pain threshold and readjusts the hypothalamic temperature regulatory center.
Indications	Mild-to-moderate pain. Consider IV for moderate/severe pain when oral route is not feasible. Opioid-sparing strategy.
Scope	PO: EMT, AEMT, PM | IV: PM
Dosing	Adult (PO): 1,000 mg PO Adult (IV): 1,000 mg IV infused over 15 minutes Pediatric (PO): 15 mg/kg PO (max 1,000 mg) — see Broselow chart Pediatric (IV): 15 mg/kg IV over 15 minutes (max 1,000 mg)
Contraindications	Known hypersensitivity Known or suspected chronic liver disease Therapeutic acetaminophen dose within past 6 hours, or > 3 g in past 24 hours
⚠ Warning	Determine prior acetaminophen intake before administration. Chronic supratherapeutic ingestion can cause hepatotoxicity. Single toxic dose in 70 kg adult is > 7 g; in children > 150 mg/kg.
Side Effects	IV: headache, nausea, vomiting. Hypersensitivity reactions are rare.
Pregnancy / BF	Generally considered safe.
Onset / Duration	Onset: PO: 20–30 minutes. IV: within 5 minutes. Duration: Peak: 1 hour. Duration: 4 hours.

ADENOSINE

Class	Antidysrhythmic
Action	Slows conduction through the AV node and interrupts AV reentry pathways to restore normal sinus rhythm.
Indications	Conversion of regular narrow complex tachycardia (SVT) refractory to vagal maneuvers, or when vagal maneuvers are impractical.
Scope	PM
Dosing	Adult: 6 mg IV/IO fast push. May repeat at 12 mg IV/IO fast push x1 if ineffective. Pediatric: 0.1 mg/kg IV/IO fast push (max 6 mg). May repeat at 0.2 mg/kg IV/IO (max 12 mg) x1.
Contraindications	Hypersensitivity, 2nd or 3rd degree AV block (except pacemaker patients), sick sinus syndrome, confirmed atrial flutter or fibrillation.

⚠ Warning	Reduce dose by 50% for heart transplant patients or when given through central line. Expect transient asystole — warn patient.
Side Effects	Transient flushing, dyspnea, chest pain, metallic taste, transient asystole, heart block, PVCs, bronchospasm, VF, hypotension.
Pregnancy / BF	Risk cannot be ruled out. Give only when benefits justify risk.
Onset / Duration	Onset: Rapid, within 30 seconds. Duration: Very brief, < 30 seconds.

ALBUTEROL

Class	Short-acting beta-2 agonist (SABA)
Action	Beta-2 receptor agonist with mild beta-1 activity. Relaxes bronchial smooth muscle; shifts potassium intracellularly.
Indications	Bronchospastic lung disease, wheezing, respiratory distress from bronchospasm, suspected hyperkalemia.
Scope	EMT (patient's own MDI), AEMT, PM
Dosing	Bronchospasm — Adult: 2.5 mg/3 mL NS via nebulizer, repeat as needed; or 8–10 puffs MDI. Bronchospasm — Pediatric: 2.5 mg/3 mL NS via nebulizer, repeat as needed; or 4 puffs MDI. Hyperkalemia — Adult: 2.5 mg/3 mL NS continuously (max 8 doses / 20 mg). Hyperkalemia — Pediatric: 2.5 mg/3 mL NS continuously (max 4 doses / 10 mg).
Contraindications	Hypersensitivity.
⚠ Warning	Use caution with known hypokalemia, tachycardia, CAD, hypertension, arrhythmia, or chest pain.
Side Effects	Palpitations, tremors, chest pain, hypertension, dizziness, nervousness, tachycardia, cough, headache, nausea/vomiting.
Pregnancy / BF	Generally considered safe with favorable risk/benefit profile.
Onset / Duration	Onset: < 5 minutes. Duration: 3–6 hours.

AMIODARONE

Class	Class III antidysrhythmic
Action	Inhibits adrenergic stimulation; affects sodium, potassium, and calcium channels; prolongs action potential and repolarization; decreases AV conduction and sinus node function.

Indications	Ventricular fibrillation (VF) and pulseless VT refractory to defibrillation and epinephrine.
Scope	PM (cardiac arrest), AEMT (cardiac arrest)
Dosing	Adult: 300 mg IV/IO. Repeat once at 150 mg in 5 minutes if needed. Pediatric: 5 mg/kg IV/IO. Repeat once at 5 mg/kg if needed.
Contraindications	Hypersensitivity.
Side Effects	Hypotension, heart block, bradycardia, CHF, arrhythmias.
Pregnancy / BF	Only for life-threatening arrhythmias.
Onset / Duration	Onset: Unknown. Duration: Half-life measured in days to weeks.
Notes	Amiodarone and lidocaine are equivalent in efficacy for refractory VF/VT. Use one agent — do not combine.

ASPIRIN

Class	Antiplatelet agent, NSAID
Action	Inhibits prostaglandin synthesis via cyclooxygenase; irreversibly inhibits platelet aggregation; has antipyretic and analgesic activity.
Indications	Antiplatelet agent for suspected acute coronary syndrome (ACS).
Scope	EMT, AEMT, PM
Dosing	Adult: 324 mg PO (chewed). Pediatric: Not indicated.
Contraindications	Hypersensitivity to aspirin or NSAIDs (including aspirin-intolerant asthma), active GI bleeding, thrombocytopenia, hemophilia, intracranial hemorrhage.
Side Effects	Minimal with single dose.
Pregnancy / BF	Administer only for STEMI. Breast-feeding: interrupt until cleared by physician.
Onset / Duration	Onset: Within 20 minutes (non-enteric coated, chewed). Duration: Antiplatelet effect: permanent for life of platelet (7–10 days).

ATROPINE

Class	Anticholinergic, parasympatholytic
Action	Competitively inhibits acetylcholinesterase; positive chronotrope; increases AV node conduction and SA node automaticity.

Indications	Symptomatic bradycardia, organophosphate/carbamate/nerve agent toxicity, cholinergic toxicity.
Scope	PM
Dosing	Adult — Bradycardia: 0.5 mg IV/IO fast push, repeat every 3–5 min (max 3 mg). Adult — OP/Nerve agent: 2 mg IV/IO/IM, repeat every 5 min until secretions dry (no max dose). Peds — Bradycardia: 0.02 mg/kg IV/IO (min 0.1 mg; max 0.5 mg), repeat once in 3–5 min (max 3 mg total). Peds — OP/Nerve agent IV/IO: 0.02 mg/kg, repeat every 3–5 min (no max). Peds — OP/Nerve agent IM (no IV/IO): < 2 yr: 0.05 mg/kg; 2–10 yr: 1 mg; > 10 yr: 2 mg — all every 5–10 min (no max).
Contraindications	No absolute contraindications. Relative: narrow-angle glaucoma, GI obstruction, severe ulcerative colitis, bladder outlet obstruction, myasthenia gravis, thyrotoxicosis.
⚠ Warning	Ineffective in hypothermic bradycardia. For organophosphate toxicity, titrate to drying of secretions — NOT heart rate.
Side Effects	Dry mouth, blurred vision, urinary retention, tachycardia.
Pregnancy / BF	Administer for life-threatening emergencies.
Onset / Duration	Onset: IV: immediate. IM: 15–30 min (HR), 30 min (secretions). Duration: IV: 3–5 min. IM: < 4 hours (secretions).

CALCIUM CHLORIDE

Class	Antidote, calcium salt
Action	Essential for neurotransmission, muscle contraction, and cardiac function. Membrane-stabilizing agent in hyperkalemia.
Indications	Suspected hyperkalemia with wide-complex QRS or cardiac arrest, crush syndrome, beta-blocker OD, calcium channel blocker OD, magnesium toxicity.
Scope	PM (DMO required for repeat dosing or non-arrest)
Dosing	Adult — Cardiac arrest (suspected hyperkalemia): 1 g IV/IO push. (DMO for repeat.) Adult — With pulse (toxicity, crush, hyperkalemia): 1 g IV/IO over 5 minutes. (Requires DMO.) Pediatric — Cardiac arrest: 20 mg/kg IV/IO push (max 1 g). (DMO for repeat.) Pediatric — With pulse: 20 mg/kg IV/IO over 5 minutes (max 1 g). (Requires DMO.)
Contraindications	Hypercalcemia, documented hypersensitivity.
⚠ Warning	Risk of severe tissue necrosis with extravasation. Confirm widely patent IV with saline flush BEFORE administration. Do NOT push sodium bicarbonate through the same line without flushing between doses — precipitation will occur.

Side Effects	Vasodilation, hypotension, bradycardia, arrhythmias, flushing, dizziness, nausea.
Pregnancy / BF	Administer for life-threatening emergencies.
Onset / Duration	Onset: Rapid. Duration: Depends on underlying physiology and albumin levels.

DEXTROSE 10% (D10)

Class	Glucose-elevating agent, carbohydrate
Action	Increases blood glucose levels.
Indications	Symptomatic hypoglycemia in patients who cannot protect their airway or take oral glucose.
Scope	AEMT, PM
Dosing	Adult: Up to 25 g (250 mL) IV/IO slow push/infusion, titrated to effect. Max total dose 50 g (500 mL). Pediatric (≥ 1 month): Up to 0.5 g/kg (5 mL/kg) IV/IO slow push (max single dose 25 g). Repeat to max 10 mL/kg or 500 mL (whichever is less).
Contraindications	Hyperglycemia.
⚠ Warning	Use a large, patent vein to reduce irritation and extravasation risk. Consult DMO before administering to a pediatric patient with chronic seizures on a ketogenic diet.
Side Effects	Hyperglycemia if over-administered. Local irritation or tissue injury with extravasation.
Pregnancy / BF	Safe.
Onset / Duration	Onset: Rapid. Duration: Depends on metabolism and underlying physiology.

DIPHENHYDRAMINE

Class	Antihistamine — first generation (H1 antagonist)
Action	H1-receptor antagonist with anticholinergic properties. Blocks histamine effects in respiratory tract, blood vessels, and GI smooth muscle.
Indications	Urticaria and pruritus from allergic reaction. Anaphylaxis (adjunct ONLY — after epinephrine). Acute dystonic reactions.
Scope	AEMT, PM
Dosing	Adult: 50 mg IV/IO/IM — one dose only. Pediatric: 1 mg/kg IV/IO/IM (max 50 mg) — one dose only.
Contraindications	Documented hypersensitivity. Premature infants and neonates.

⚠ Warning	Do NOT administer diphenhydramine before epinephrine in anaphylaxis. Epinephrine is always first-line.
Side Effects	Sedation, drowsiness, dizziness, confusion, tachycardia, dry mouth, nausea, vomiting, drying of airway secretions, paradoxical CNS excitement, urinary retention.
Pregnancy / BF	Use caution in active labor — may cause respiratory depression in newborn.
Onset / Duration	Onset: Rapid IV. Duration: 4–18 hours depending on age/liver function.

EPINEPHRINE

Class	Alpha/beta adrenergic agonist
Action	Strong alpha-adrenergic effects causing systemic vasoconstriction. Beta-1 effects increase cardiac output and heart rate. Moderate beta-2 effects cause bronchial smooth muscle relaxation.
Indications	Cardiac arrest, anaphylaxis, symptomatic bradycardia (pediatric), refractory bronchospasm/asthma, cardiogenic/neurogenic/septic shock (pediatric).
Scope	Cardiac arrest: PM, AEMT | Anaphylaxis: PM, AEMT, EMT | Refractory asthma: PM
Dosing	Adult — Cardiac arrest: 1 mg (1:10,000) IV/IO, repeat every 3–5 min. Adult — Anaphylaxis / Refractory asthma: 0.3 mg (1:1,000) IM (lateral thigh), repeat every 5–15 min. Adult — Epi auto-injector: 0.3 mg IM, repeat as available every 5 min. Peds — Cardiac arrest: 0.01 mg/kg (1:10,000) IV/IO (max 1 mg), repeat every 3–5 min. Peds — Anaphylaxis: 0.01 mg/kg (1:1,000) IM (max 0.3 mg), repeat every 5 min. Peds — Bradycardia/Shock: 0.01 mg/kg (1:10,000) IV/IO.
Contraindications	None absolute in life-threatening emergencies.
⚠ Warning	Monitor closely in patients with a pulse who are elderly or have CAD, CVA, or uncontrolled hypertension. NEVER give IV/IO route for anaphylaxis — use IM. Never administer after ROSC for hemodynamic support without vasopressor drip context.
Side Effects	Nervousness, anxiety, tremors, pallor, nausea, vomiting, headache, dizziness, diaphoresis, tachycardia, palpitations, arrhythmias.
Pregnancy / BF	Safe in pregnancy and breastfeeding.
Onset / Duration	Onset: IV: rapid. IM: 5–10 minutes. Duration: 5 minutes.

FENTANYL

Class	Synthetic opioid analgesic

Action	Opioid agonist; inhibits ascending pain pathways, alters response to pain, increases pain threshold; produces analgesia, respiratory depression, and sedation.
Indications	Management of acute moderate-to-severe pain.
Scope	AEMT, PM
Dosing	Adult: 25–100 mcg IV/IO/IM/IN, repeat every 5–10 min (max total 200 mcg). Pediatric: 1 mcg/kg IV/IO/IM (max 100 mcg per dose), repeat every 5–10 min (max total 200 mcg). Pediatric IN: 2 mcg/kg IN (max 100 mcg per dose), repeat every 10 min (max total 200 mcg).
Contraindications	Hypersensitivity to fentanyl.
⚠ Warning	IV fentanyl has immediate onset but PEAK EFFECT at 10 minutes. Avoid repeat dosing too quickly — dose stacking causes respiratory depression. Consider lower doses for patients ≥ 65, debilitated, critically ill, or receiving other CNS depressants. Respiratory depressant effect may outlast analgesic effect.
Side Effects	Dizziness, euphoria, confusion, hypotension, respiratory depression, nausea, vomiting.
Pregnancy / BF	Analgesia should not be withheld solely due to pregnancy. Use caution during labor/delivery — may depress newborn.
Onset / Duration	Onset: IV: immediate. IM: 7–8 min. IN: 5–10 min. Duration: IV: 30–60 min. IM: 1–2 hours.

HYDROMORPHONE (DILAUDID)

Class	Opioid analgesic agonist
Action	Depresses pain impulse transmission at the spinal cord level via opioid receptor interaction. Approximately 5–10× more potent than morphine by weight.
Indications	Moderate-to-severe pain. Alternative when fentanyl is contraindicated or unavailable.
Scope	PM
Dosing	Adult: 0.5–2 mg IV/IO titrated for effect, every 10 minutes (max 4 mg total). May also be given IM. Pediatric: Contact Direct Medical Oversight for dosing order.
Contraindications	Hypersensitivity, status asthmaticus, opioid addiction (relative).
⚠ Warning	Increased ICP, hypothyroidism, hepatic or renal disease, seizure disorders, pregnancy. Potentiated by alcohol, antihistamines, CNS depressants, phenothiazines. MAOIs can cause serious reactions — reduce dose.
Side Effects	Dizziness, drowsiness, sedation, confusion, euphoria, hypotension, bradycardia, miosis, nausea, vomiting, respiratory depression, urinary retention.

Pregnancy / BF	Use caution. Avoid during labor — may cause neonatal respiratory depression.
Onset / Duration	Onset: 10–15 minutes IV. Duration: 2–3 hours.

INSTAGLUCOSE / ORAL GLUCOSE

Class	Glucose-elevating agent, carbohydrate
Action	Increases blood glucose levels when absorbed orally.
Indications	Symptomatic hypoglycemia in conscious patients who can protect their airway and take oral medications.
Scope	EMT, AEMT, PM
Dosing	Adult: One tube of Instaglucose, cake frosting, or equivalent (candy, table sugar, honey, non-diet soda). Repeat as needed. Pediatric: Same — one tube or equivalent, repeat as needed.
Contraindications	Hyperglycemia. Patient unable to swallow or protect airway.
⚠ Warning	Consult DMO before administration in pediatric patients with chronic seizures on a ketogenic diet.
Pregnancy / BF	Safe in pregnancy and breastfeeding.
Onset / Duration	Onset: 10 minutes oral. Duration: Peak at 40 minutes. Depends on metabolism and dose.

IPRATROPIUM

Class	Anticholinergic (parasympatholytic)
Action	Inhibits vagally mediated reflexes by antagonizing acetylcholine on muscarinic receptors in bronchial smooth muscle, causing bronchodilation.
Indications	Bronchospastic lung disease — co-administered with albuterol for additive bronchodilation.
Scope	PM, AEMT
Dosing	Adult: 0.5 mg/2.5 mL unit-dose via nebulizer, combined with albuterol. Repeat as needed. Pediatric: 0.5 mg/2.5 mL unit-dose via nebulizer, combined with albuterol. NOTE: For children < 2 years with bronchiolitis — ipratropium should NOT be administered.
Contraindications	Hypersensitivity to ipratropium, atropine, or derivatives.

Side Effects	Cough, nervousness, dry mouth, dizziness, headache, oral irritation, nausea. May worsen angle-closure glaucoma.
Pregnancy / BF	Safe in pregnancy.
Onset / Duration	Onset: Within 15 minutes. Duration: 2–8 hours.

ISOPROPYL ALCOHOL (INHALED)

Class	Secondary alcohol — antiemetic (inhaled)
Action	Inhalation of isopropyl alcohol vapor produces antiemetic effect via olfactory stimulation.
Indications	Nausea and vomiting.
Scope	EMT, AEMT, PM
Dosing	Hold isopropyl alcohol prep pad 1–2 cm below nares. Have patient inhale deeply as frequently as needed. Patient must be able to understand and self-administer.
Contraindications	Patient unable to understand and self-administer. Avoid in pregnancy.
Pregnancy / BF	Unknown safety via vapor inhalation — generally avoid in pregnancy.
Onset / Duration	Onset: Presumed rapid via inhalation. Duration: Unknown.

KETAMINE

Class	Dissociative anesthetic, non-opioid analgesic
Action	Blocks NMDA receptors. Produces analgesia at low doses; dissociative anesthesia at high doses. Maintains airway reflexes and cardiovascular tone. Does not cause respiratory depression at analgesic doses.
Indications	Pain refractory to fentanyl or with contraindication to fentanyl. Pain management in hemodynamic compromise or shock. Alternative for patients who refuse opioids. Sedation for medication-assisted intubation.
Scope	PM
Dosing	Analgesia — Adult: 20 mg in 100 mL NS IV/IO over 5–10 minutes. May repeat x1 ten minutes after completion (max total 40 mg). MAI Sedation — Adult: 1–1.5 mg/kg IV/IO over 1 minute.
Contraindications	Hypersensitivity to ketamine, ACS, CVA, active psychosis.

⚠ Warning	Use caution with severe hypertension. Avoid routinely in 3rd trimester pregnancy (fentanyl preferred). May cause increased secretions — have suction available.
Side Effects	Respiratory depression (rare at analgesic doses), laryngospasm, hypertension, hypotension, bradycardia, tachycardia, delirium, hallucinations, flushing, nausea, vomiting, nystagmus, twitching.
Pregnancy / BF	Generally prefer fentanyl. May consider on case-by-case basis with DMO.
Onset / Duration	Onset: Rapid IV. Duration: 5–15 minutes from completion of infusion.

KETOROLAC (TORADOL) ★ NEW 2025

Class	Non-steroidal anti-inflammatory drug (NSAID), analgesic
Action	Inhibits prostaglandin synthesis via cyclooxygenase (COX-1 and COX-2) inhibition. Produces anti-inflammatory, analgesic, and antipyretic effects.
Indications	Moderate-to-severe pain — particularly effective for musculoskeletal pain and renal colic. Opioid-sparing analgesic option. First-line non-opioid analgesic for eligible patients.
Scope	AEMT, PM
Dosing	Adult IV/IO: 15–30 mg IV/IO slow push over 1–2 minutes. Adult IM: 30 mg IM to lateral thigh. Pediatric (≥ 2 years): 0.5 mg/kg IV/IO or IM (max single dose 15 mg). Pediatric (< 2 years): Not for routine use — contact DMO. Maximum single dose: adults 30 mg IV/IO, 30 mg IM. Peds 15 mg. Single prehospital dose only — do not redose.
Contraindications	Active GI bleeding or history of GI ulceration. Known hypersensitivity to NSAIDs or aspirin (including aspirin-intolerant asthma). Coagulopathy or anticoagulant therapy. Significant renal impairment. Hypotension, shock, or hemodynamic instability. Pregnancy (especially 3rd trimester — risk of premature closure of ductus arteriosus). Dehydration (relative contraindication).
⚠ Warning	Do NOT use as a substitute for surgical hemorrhage control. Contraindicated in patients with active or suspected hemorrhagic shock. Use single prehospital dose only. Do not combine with other NSAIDs.
Side Effects	GI discomfort, nausea, dizziness, headache. Rare: GI bleeding, renal dysfunction, hypersensitivity.
Pregnancy / BF	CONTRAINDICATED — especially 3rd trimester.
Onset / Duration	Onset: IV: 30 minutes. IM: 30–60 minutes.

	Duration: 4–6 hours.
Notes	Ketorolac is particularly effective for musculoskeletal pain, fracture pain, and renal colic. It is not appropriate for patients in hemodynamic compromise.

LIDOCAINE

Class	Class Ib antidysrhythmic, sodium channel blocker
Action	Combines with fast sodium channels and inhibits recovery after repolarization, decreasing myocardial excitability and conduction velocity.
Indications	VF and pulseless VT refractory to defibrillation and epinephrine. Sustained VT with a pulse. IO site analgesia prior to fluid administration.
Scope	Cardiac arrest: PM, AEMT | Sustained VT: PM | IO analgesia: PM, AEMT
Dosing	Adult — Cardiac arrest / Sustained VT: 1–1.5 mg/kg IV/IO; repeat x1 in 5 min. Adult — IO analgesia: 40 mg IO slow push, then 10 mL NS fast push, then 20 mg IO slow push. Peds — Cardiac arrest: 1–1.5 mg/kg IV/IO; repeat x1 in 5 min. Peds — Sustained VT: 1–1.5 mg/kg IV/IO (requires DMO). Peds — IO analgesia: 0.5 mg/kg IO (max 40 mg) slow push; then 5 mL NS fast push; then 0.25 mg/kg IO slow push.
Contraindications	Hypersensitivity to lidocaine or amide local anesthetics, Adams-Stokes syndrome, SA/AV/intraventricular block without pacemaker, WPW syndrome.
⚠ Warning	Use caution with hypotension, hypovolemia, shock, CHF, elderly patients.
Side Effects	Toxicity signs: seizures, drowsiness, AMS, agitation, slurred speech, tinnitus, paresthesias, hallucinations, visual disturbances, muscle twitching. Cardiac: heart block, hypotension, bradycardia.
Notes	Lidocaine and amiodarone are equivalent in efficacy for refractory VF/VT. Use one — do not combine.

METHYLPREDNISOLONE

Class	Glucocorticoid, corticosteroid
Action	Decreases inflammatory and immune responses by stabilizing cell membranes in white blood cells.
Indications	Allergic reaction (adjunct to epinephrine), respiratory distress from bronchospasm.
Scope	AEMT, PM
Dosing	Adult: 125 mg IV (preferred) or IM. Pediatric: 1–2 mg/kg IV or IM (max 125 mg).

Contraindications	Hypersensitivity to any component. Systemic fungal infections. Premature infants.
⚠ Warning	Clinical benefit is delayed — administer early. Not a substitute for epinephrine in anaphylaxis.
Side Effects	Acute (EMS-relevant): euphoria, behavioral changes, hypertension, hyperglycemia.

MIDAZOLAM

Class	Benzodiazepine — anticonvulsant, anxiolytic, sedative
Action	Binds GABA receptor complex, enhancing inhibitory chloride ion effects, causing hyperpolarization and stabilization of neuronal membranes.
Indications	Active seizures, sedation for electrical therapy (pacing/cardioversion), compliance with advanced airway management (CPAP, SGA, ETT), agitated/violent patients, nerve agent poisoning, active cooling shivering, eclampsia-related seizures, end-of-life anxiety.
Scope	Active seizure: PM, AEMT | All other: PM
Dosing	Adult — Active seizure (no IV): 10 mg IM; repeat at 5 mg every 5 min (max 20 mg total). Adult — Active seizure (IV/IO): 5 mg IV/IO; repeat at 5 mg every 5 min (max 20 mg total). Adult — Sedation/Procedure: 2.5–5 mg IV/IO/IM/IN; repeat every 5 min (max 10 mg). Adult — Agitation/Behavioral: 5–10 mg IV/IO/IM/IN; repeat every 5 min (max 20 mg). Adult — MAI: 2.5–5 mg IV/IO every 10–30 min as needed. Adult — End-of-life anxiety: 2.5 mg IV/IM/IN once (DMO for repeat). Peds — Active seizure (no IV, 13–40 kg): 5 mg IM; repeat at 2.5 mg every 5 min IM/IN (max 10 mg). Peds — Active seizure (IV, 13–40 kg): 2.5 mg IV/IO; repeat every 5 min (max 10 mg). Peds — Active seizure (< 13 kg): 0.1 mg/kg IV/IO/IM or 0.2 mg/kg IN; repeat every 5 min (max 10 mg). Peds — Sedation/Procedure: 0.1 mg/kg IV/IO/IM or 0.2 mg/kg IN; repeat every 5 min (max 10 mg).
Contraindications	Documented hypersensitivity.
⚠ Warning	May cause respiratory depression, arrest, or apnea. Use lower doses for patients ≥ 65, debilitated, or critically ill. IN dosing may take 10 minutes for full effect. Avoid in hypotensive patients when possible — prefer agents without hypotensive effects. Avoid repeat dosing too quickly.
Side Effects	Drowsiness, fatigue, dizziness, confusion, vomiting, respiratory depression, hypoventilation, hypotension, paradoxical hyperactivity.
Pregnancy / BF	Avoid unless seizing or risk/benefit favors administration. Consult DMO for non-seizure use.

NALOXONE	
Class	Opioid reversal agent (competitive antagonist)
Action	Competitive opioid antagonist — blocks opioid receptors and reverses respiratory depression, sedation, and hypotension.
Indications	Reversal of acute opioid toxicity causing hypoventilation, apnea, or symptomatic hypotension.
Scope	EMT (auto-injector/nasal spray), AEMT, PM
Dosing	Adult — Titrated dose: 0.4–2 mg IV/IO/IM/IN; repeat every 3–5 min (max 4 mg). Use lowest dose to restore respirations — avoid precipitating withdrawal. Adult — Auto-injector/nasal spray: per commercial device; repeat every 5 min. Pediatric: Same weight-based — 0.01 mg/kg IV/IO/IM/IN (max 0.4 mg); repeat every 3–5 min. Auto-injector or commercial nasal spray also acceptable. High-potency opioids (fentanyl analogs): may require doses up to 4 mg per administration with frequent redosing.
Contraindications	Hypersensitivity.
⚠ Warning	Duration of naloxone (30–90 min) is SHORTER than most opioids (4+ hours). Re-sedation and re-arrest are real risks. All patients receiving naloxone must be transported. Sudden reversal can precipitate opioid withdrawal — agitation, tachycardia, pulmonary edema, arrhythmias, vomiting. Neonates of opioid-dependent mothers may develop seizures with naloxone.
Side Effects	Nausea, vomiting, opioid withdrawal symptoms, agitation, tremors, diaphoresis, hypertension, dyspnea.
Pregnancy / BF	Administer for life-threatening emergencies.
Onset / Duration	Onset: IV: 2 min. IM: 2–5 min. IN: 8–13 min. Duration: 30–120 min depending on route (IV shortest).

NITROGLYCERIN	
Class	Nitrate, anti-anginal
Action	Causes systemic venodilation via nitric oxide, decreasing preload and afterload. Also improves coronary collateral circulation.
Indications	Chest pain of suspected cardiac origin (ACS). Pulmonary edema/CHF with elevated blood pressure. Hypertensive emergency.
Scope	PM, AEMT
Dosing	Adult: 0.4 mg SL; repeat every 5 minutes as needed. Pediatric: Not routinely indicated. Contact DMO.

Contraindications	Hypersensitivity to nitrates. PDE5 inhibitor use within 48 hours (sildenafil, vardenafil, tadalafil, or any erectile dysfunction/pulmonary hypertension agent). IV epoprostenol (Flolan) or treprostinil (Remodulin) use. SBP < 100 mmHg or ≥ 30 mmHg below baseline. Extreme bradycardia (< 50 bpm). Tachycardia > 100 bpm without heart failure.
⚠ Warning	NEVER administer after ROSC. Use EXTREME CAUTION with inferior STEMI or suspected right ventricular infarction — these patients depend on adequate RV preload.
Side Effects	Hypotension, tachycardia, syncope, headache, dizziness, nausea, vomiting.
Pregnancy / BF	Can be used for pulmonary edema with uncontrolled hypertension.
Onset / Duration	Onset: SL: 1–3 minutes. Duration: 25 minutes.

NOREPINEPHRINE

Class	Alpha/beta adrenergic agonist — vasopressor
Action	Stimulates alpha and beta-1 adrenergic receptors, producing inotropic and vasopressor effects.
Indications	Vasopressor for cardiogenic, neurogenic, and septic shock refractory to or as alternative to fluid resuscitation.
Scope	PM
Dosing	Adult: Begin at 0.1–0.2 mcg/kg/min IV/IO; titrate to SBP > 90 mmHg or MAP > 65 mmHg. Standard admixture: 4 mg in 500 mL NS (concentration: 8 mcg/mL). Starting rate for 80 kg adult: approximately 75 mL/hr (10 mcg/min). Pediatric: 0.1 mcg/kg/min; titrate to age-appropriate BP.
Contraindications	Hypersensitivity. Hypotension due to uncorrected volume deficit. Peripheral vascular thrombosis (except life-saving situations).
⚠ Warning	Norepinephrine is a VESICANT. Severe tissue necrosis occurs with extravasation. Use the largest, most proximal vein available. Confirm patency with aspiration and flush before starting. Monitor infusion site continuously.
Side Effects	Dysrhythmias, hypertension, bradycardia reflex, anxiety, headache, dyspnea, injection site injury.
Pregnancy / BF	Administer for life-threatening emergencies.
Onset / Duration	Onset: Rapid. Duration: 1–2 minutes.

NORMAL SALINE (0.9% NACL)

Class	Crystalloid IV fluid
Action	Isotonic fluid — expands intravascular volume without causing significant osmotic shifts.
Indications	IV access maintenance and medication flushing. Volume expansion and fluid replacement in shock. Medication dilution. Crush syndrome fluid resuscitation.
Scope	IV: AEMT, PM | IO: AEMT, PM | Flush: EMT (per IV protocol)
Dosing	Adult — Bolus: 250–500 mL IV/IO; repeat as clinically indicated. Adult — Crush syndrome: 500–1,000 mL/hr (requires DMO). Adult — Medication flush: 5–10 mL after each medication. Pediatric (≥ 1 month) — Bolus: 20 mL/kg IV/IO; repeat as needed. Pediatric (< 1 month) — Bolus: 10 mL/kg IV/IO; repeat as needed. Pediatric — Crush syndrome: 10 mL/kg/hr (requires DMO). Pediatric — Medication flush: 5 mL after each medication.
Contraindications	None.
Pregnancy / BF	Safe.

ONDANSETRON

Class	Antiemetic — selective 5-HT3 antagonist
Action	Selectively blocks 5-HT3 receptors in the GI tract and CNS, reducing nausea and vomiting. No dopamine receptor effect — does not cause extrapyramidal symptoms.
Indications	Nausea and vomiting.
Scope	PM, AEMT
Dosing	Adult: 4 mg IV/IO/IM or 4 mg ODT (orally disintegrating tablet) — one dose only. Pediatric (> 2 years): 0.1 mg/kg IV/IO/IM slow push (max 4 mg) — one dose only. OR 4 mg ODT for patients measuring "white" or greater on Broselow tape. Not indicated in children < 2 years.
Contraindications	Hypersensitivity. Age < 2 years.
⚠ Warning	May cause dose-dependent QT prolongation. Avoid in patients with congenital long QT syndrome. Obtain EKG in patients with electrolyte abnormalities, CHF, bradyarrhythmias, or who are taking other QT-prolonging medications.
Side Effects	Generally well tolerated. Rare: QT prolongation, headache, constipation, dizziness.
Pregnancy / BF	First trimester: possible small increased risk of cleft palate (conflicting data). Discuss risk/benefit with patient. Generally considered acceptable for hyperemesis gravidarum.

Onset / Duration	Onset: 20–30 minutes. Duration: 3–6 hours.

SODIUM BICARBONATE

Class	Alkalinizing agent, antidote
Action	Releases bicarbonate ion to neutralize hydrogen ion concentration, correcting metabolic acidosis. Enhances protein binding of TCAs, reducing cardiotoxicity. Promotes renal excretion of certain toxins.
Indications	Cardiac arrest with suspected hyperkalemia or TCA overdose. QRS prolongation (> 100 ms) in TCA or beta-blocker OD. Wide-complex QRS in cocaine/stimulant toxicity. Suspected hyperkalemia with wide QRS (dialysis, crush syndrome).
Scope	PM (DMO required for non-arrest or repeat dosing)
Dosing	Adult — Cardiac arrest: 1 mEq/kg IV/IO push (DMO for repeat). Adult — With pulse: 1 mEq/kg IV/IO over 5 minutes (requires DMO). Pediatric — Same weight-based dosing as adult.
Contraindications	Documented hypersensitivity. Severe pulmonary edema. Known alkalosis. Hypernatremia, hypocalcemia, hypokalemia.
⚠ Warning	Do NOT mix with other drugs in the same line — flush before and after. May need to increase ventilation (monitor ETCO2) as bicarbonate generates CO2, which can worsen intracellular acidosis. Large sodium load may cause hypervolemia.
Side Effects	Metabolic alkalosis, hypernatremia, paradoxical intracellular acidosis if CO2 not cleared.
Pregnancy / BF	Generally not recommended.
Onset / Duration	Onset: Rapid IV. Duration: 8–10 minutes IV.

VECURONIUM

Class	Non-depolarizing neuromuscular blocking agent (NMBA)
Action	Inhibits nerve impulse transmission by binding cholinergic receptor sites, antagonizing acetylcholine. Has NO analgesic properties — patient may be fully conscious but unable to communicate.
Indications	Paralytic agent for medication-assisted intubation (paramedic only). Post-intubation maintenance of paralysis.
Scope	PM only
Dosing	Adult and Pediatric (> 16 years): 0.1 mg/kg IV slow administration over 30–60 seconds (typically 5–7 mg for average adult).

Contraindications	Hypersensitivity.
⚠ Warning	CAUSES COMPLETE RESPIRATORY PARALYSIS. Continuous airway control under direct observation is mandatory at all times. Administer sedation/analgesia before NMBA — the patient is awake and aware without it. Myasthenia gravis and other neuromuscular diseases increase drug sensitivity.
Side Effects	Hypersensitivity reactions possible. Prolonged paralysis with certain drug interactions (aminoglycosides).
Onset / Duration	Onset: 30–60 seconds. Duration: 30–60 minutes.

EXTENDED FORMULARY — NOT REQUIRED FOR PERMANENT STOCK

The following agents may be stocked and used per Medical Director authorization. They are not required to be maintained as permanent vehicle inventory.

MAGNESIUM SULFATE

Class	Electrolyte, CNS depressant, anticonvulsant
Action	Prevents/controls convulsions by blocking neuromuscular transmission. Decreases acetylcholine at motor nerve end plates. Peripheral vasodilation.
Indications	Eclampsia and severe pre-eclampsia — seizure prevention/control. Torsades de pointes. Refractory ventricular fibrillation. Severe asthma refractory to standard treatment.
Scope	PM
Dosing	Eclamptic seizures: 4 g rapid infusion (mix 4 g in 50 mL D5W, macro drip at 2 gtts/sec). May repeat once at 2 g. Torsades de pointes / Refractory VF: 1–2 g IV rapid infusion (mix in 50 mL D5W, wide open). Maintenance: 1 g in 250 mL NS at 30–60 gtts/min. Asthma — Adult: 2 g in 50–100 mL NS or D5W over 10–20 min. Asthma — Pediatric: 20–50 mg/kg in 50–100 mL NS or D5W over 10–20 min.
Contraindications	Renal impairment (use with caution). Do not administer within 2 hours of delivery in eclampsia.
⚠ Warning	Signs of hypermagnesemia: flushing, sweating, hypotension, loss of deep tendon reflexes, flaccid paralysis, hypothermia, circulatory collapse, cardiac depression. CALCIUM CHLORIDE must be immediately available as antidote. Must dilute 50% solution to 20% or less before IV infusion.
Side Effects	Flushing, sweating, hypotension, reflex loss, paralysis, hypothermia, cardiovascular depression — all related to hypermagnesemia.

MORPHINE

Class	Opioid analgesic — Schedule II narcotic
Action	Depresses CNS sensitivity to pain; increases venous capacitance; decreases venous return and produces peripheral vasodilation; decreases myocardial oxygen demand.
Indications	Pain management.
Scope	PM
Dosing	Adult: 2–10 mg IV slowly; repeat with small increments every 5 minutes (max 20 mg for pain; max 30 mg over 20 min for burns). May also be given IM or subcutaneous.
Contraindications	Volume depletion or hypotension. Head trauma. Acute asthma. Known hypersensitivity.
⚠ Warning	Use CAUTION in ACS — co-administration with P2Y12 inhibitors (given in-hospital) may reduce their efficacy. Potentiated by alcohol, antihistamines, barbiturates, sedatives, beta-blockers.
Side Effects	Euphoria, drowsiness, miosis, respiratory arrest, bradycardia, hypotension, bronchoconstriction, nausea, vomiting, urinary retention.

ROCURONIUM

Class	Non-depolarizing neuromuscular blocking agent (NMBA)
Action	Inhibits nerve impulse transmission by binding cholinergic receptor sites, antagonizing acetylcholine. No analgesic properties.
Indications	Medication-assisted intubation. Skeletal muscle relaxation during mechanical ventilation.
Scope	PM only
Dosing	Adult and Pediatric: 0.5–1 mg/kg IV.
Contraindications	Hypersensitivity.
⚠ Warning	CAUSES COMPLETE RESPIRATORY PARALYSIS. Administer sedation/analgesia before NMBA. Rocuronium should be refrigerated but may be stored at room temperature for up to 60 days. Reversed by sugammadex (not a prehospital agent).
Side Effects	Prolonged apnea, respiratory arrest, skeletal muscle paralysis. Interactions: aminoglycosides increase paralysis intensity and duration.
Onset / Duration	Onset: 30–60 seconds. Duration: 20–75 minutes.

OPERATIONAL GUIDELINES

The following guidelines address operational and systems-level functions including air transport, crew rehabilitation, mass casualty triage, and hospital destination capability.

AIR MEDICAL TRANSPORT

Indications for Air Medical Transport:

1. Critical patients requiring emergent surgical intervention or in-hospital treatment when air transport is faster than ground transport.
2. Areas where terrain, traffic, or road conditions make ground transport impractical.
3. Patients requiring a specific specialty facility when air is more expedient.
4. Seasonal conditions that significantly increase ground transport times (flooding, snowdrifts, etc.).
5. Mass casualty incidents to augment ground ambulance resources.

Activation and Preparation

1. Request helicopter response through the Communications Center. Service selection is based on scene location and availability.
2. Continue treating the patient per protocol prior to helicopter arrival.
3. Establish communication with appropriate receiving facilities.
4. Determine which patients will be evacuated by air and package them before the helicopter arrives to minimize scene time.
5. Assist in establishing the helicopter landing zone (LZ) as needed. Law enforcement and fire will handle most LZ operations.

Transition of Care to Flight Crew

1. Provide the flight crew with a complete report: time of injury/onset, suspected injuries, patient condition, treatments given, and receiving destination.
2. Assist with patient movement to the helicopter.
3. Upon transfer of care, the flight crew operates under their own protocols.

EMS RESPONSE TO EVENTS REQUIRING REHABILITATION

EMS providers assigned to rehabilitation are responsible for medical monitoring, hydration oversight, temperature management, and recovery support for all Fire/EMS personnel at the incident.

Rehab Procedures

1. All Fire/EMS personnel entering rehab must be logged in and out of the Rehabilitation Log.
2. Obtain and document an initial assessment on the Rehabilitation Assessment Form on every entrant. Repeat in 15 minutes.
3. Personnel who meet release criteria on initial entry: document observation and hydration only — no second vital set required.
4. Personnel who do NOT meet release criteria: rest for 20 minutes (30 minutes on high-impact days), then reassess. If still not meeting criteria after 30 minutes (40 minutes high-impact): remove from active duty and notify IC/Safety Officer.
5. Personnel with vital signs or complaints that meet "patient" criteria below: move immediately to the Treatment Group — do not assess or treat in rehab. Complete a PCR.

Vital	Release Criteria (20/30 min)	Becomes a Patient
Pulse	< 120 bpm	> 150 bpm after full rest period
Blood Pressure	SBP 90–160 / DBP < 100	SBP < 80 or > 220, DBP > 120
Respirations	Normal effort, no distress	Increased work of breathing or any distress
Mental Status	Normal behavior, clear conversation, steady gait	Any alteration from baseline (confusion, syncope, agitation)
Complaints	None beyond minor musculoskeletal/skin issues	Any complaint beyond minor musculoskeletal/skin
Hydration	Able to consume fluids without nausea/vomiting	Unable to tolerate any fluids

MULTI-CASUALTY INCIDENT — TRIAGE

START Triage Categories:

Color	Category	Definition
GREEN	**Minimal**	Minor injury or illness not likely to deteriorate to life-threatening. May wait.
YELLOW	**Delayed**	Not immediately life-threatening but at risk of deterioration without timely care.
RED	**Immediate**	Life-threatening shock or hypoxia present or imminent. Requires immediate treatment.
BLACK	**Expectant/Dead**	Dead, obviously mortal wound, or requires resources beyond those available.

CLINICAL PROCEDURES

The following reference procedures outline technique, indications, and contraindications for authorized clinical skills.

12-LEAD AND 15-LEAD EKG

Indications:

1. All cardiac patients — dysrhythmias, chest pain, CHF, syncope, altered mental status, respiratory distress.
2. Suspected TCA overdose. Electrical injuries. Any other indication at paramedic discretion.
3. 15-Lead: consider when right-sided AMI is suspected (inferior/posterior injury on 12-lead), or with chest pain and a normal 12-lead.

Lead Placement:

Lead	Placement
RA	Right arm
LA	Left arm
RL	Right leg
LL	Left leg
V1	4th intercostal space, right sternal border
V2	4th intercostal space, left sternal border
V3	Directly between V2 and V4
V4	5th intercostal space, midclavicular line
V5	Level with V4, left anterior axillary line
V6	Level with V5, midaxillary line
V4R (15-lead)	5th intercostal space, midclavicular line — RIGHT side
V8 (15-lead)	5th intercostal space, mid-scapular line
V9 (15-lead)	Level with V8, between V8 and spinal column

Procedure:

- Enter patient information into the device. Expose chest; respect patient modesty throughout.
- Apply limb leads and precordial leads per placement table above.
- Instruct patient to remain still.
- Acquire 12-lead. If signal noise is detected, address motion or electrode contact before reacquiring.
- Transmit EKG to receiving hospital. Notify hospital of transmission and provide patient report.
- Obtain serial 12-leads as clinically indicated (minimum two for ACS workup).
- Import all 12-lead copies into the Patient Care Report.

NOTE If the patient is unstable, prioritize definitive treatment. Do not delay critical interventions to acquire a 12-lead.

MEDICATION-ASSISTED INTUBATION (MAI)

Also known as: Drug-Assisted Intubation, Facilitated Airway Management, RSI (Rapid Sequence Intubation)

SCOPE OF PRACTICE

Paramedic only. MAI agents (sedatives and neuromuscular blockers) may only be administered by a credentialed Paramedic.

PURPOSE

MAI refers to the administration of a sedative agent followed by a neuromuscular blocking agent (NMBA) to facilitate safe, controlled orotracheal intubation in patients who require a definitive airway but cannot be intubated without pharmacologic assistance.

INDICATIONS FOR MAI

- Apnea or impending apnea.
- Upper airway obstruction not manageable by less invasive means.
- Head injury with GCS ≤ 8 and inability to protect airway.
- Respiratory insufficiency from any cause where less invasive measures have failed.
- Hemodynamic instability requiring airway protection.
- Status epilepticus refractory to benzodiazepines with inability to maintain SpO2 ≥ 94%.
- Combative patient where airway, spinal cord stability, or transport safety is threatened and less invasive measures have failed.

CAUTION MAI should NOT be performed when surgical cricothyrotomy would be difficult or impossible, or when bag-mask ventilation after paralysis would be expected to fail — such as severe maxillofacial trauma, known or suspected fixed airway obstruction, epiglottitis, or significant subglottic pathology.

CONTRAINDICATIONS

- Known or suspected altered airway anatomy where BVM ventilation would be ineffective after paralysis.
- Inability to confirm ventilation can be maintained if intubation fails.
- Epiglottitis — partial obstruction may convert to complete obstruction after paralysis.
- Severe maxillofacial trauma where BVM seal cannot be maintained.

NOTE If NMBAs are contraindicated: attempt intubation with sedation only (ketamine or midazolam). Do not administer an NMBA without confidence you can ventilate the patient by BVM if intubation fails.

PRE-PROCEDURE AIRWAY ASSESSMENT

Before initiating MAI, assess for difficult airway predictors. Difficult intubation is more likely when ANY of the following are present:

- Inability to bite upper lip with lower incisors (poor jaw mobility).
- Limited mouth opening (< 3 cm / 2 finger widths).
- Short or receding jaw, small thyromental space.
- Large tongue, large tonsils, or redundant pharyngeal tissue.
- Obesity, large neck, or short neck.
- Craniofacial abnormalities or significant facial trauma.
- Excessive facial hair, history of obstructive sleep apnea.
- Blood, vomitus, or edema in the airway.
- Infants and neonates (anatomically different airway proportions).

CAUTION Prepare for failed intubation before every MAI attempt: have SGA immediately accessible, BVM ready, and cricothyrotomy kit within reach. Once NMBA is given, you are committed to the airway.

EQUIPMENT — PREPARE BEFORE DRUG ADMINISTRATION

- Laryngoscope with functioning light (curved and straight blades available).
- ETT in appropriate size plus one size smaller: Adults typically 7.5–8.0; Pediatric use Broselow tape.
- Stylet lubricated and bent to 35-degree hockey-stick angle.
- 10 mL syringe for cuff inflation.
- Suction — powered, functional, and at bedside.
- BVM with PEEP valve and high-flow oxygen.
- ETCO2 waveform capnography connected and ready.
- Commercial ETT securing device or tape.
- SGA (King Airway or equivalent) as rescue airway.
- Nasal cannula at 15 LPM for apneic oxygenation during laryngoscopy.
- Cardiac monitor, pulse oximeter, NIBP — all applied and running.

DRUG ADMINISTRATION SEQUENCE

Step 1 — Pre-oxygenation (minimum 3 minutes before drug administration):

- Apply non-rebreather mask at 15 LPM.
- Encourage deep breathing in conscious patients.
- Apply nasal cannula at 10–15 LPM under the NRB mask (apneic oxygenation — maintain throughout laryngoscopy).
- Avoid BVM ventilation unless SpO2 is falling — mask ventilation causes gastric distension and aspiration risk.

Step 2 — Sedation (administer first, allow 1 minute to take effect):

NOTE Ketamine: Adult 1–2 mg/kg IV/IO over 1 minute (typical dose 100–200 mg). Pediatric: 1–2 mg/kg IV/IO. Preferred agent — maintains airway reflexes, cardiovascular tone, and bronchodilates. Avoid in ACS, CVA, or active psychosis. Midazolam: Adult 0.1–0.3 mg/kg IV/IO (max 10 mg). Pediatric: 0.1 mg/kg IV/IO (max 5 mg). Alternative sedative — use with caution in hypotensive patients.

Step 3 — Neuromuscular Blockade (administer immediately after sedation takes effect, ~60 seconds post-sedation):

NOTE Vecuronium (non-depolarizing): 0.1 mg/kg IV/IO slow push over 30–60 seconds. Onset: 60–90 seconds. Duration: 30–60 minutes. Paramedic only. Rocuronium (non-depolarizing, Extended Formulary): 0.6–1.2 mg/kg IV/IO. Onset: 60 seconds. Duration: 30–60 minutes. Paramedic only.

CAUTION NMBA causes COMPLETE RESPIRATORY PARALYSIS. The patient is fully conscious until sedation takes effect. NEVER administer NMBA without prior sedation. Once administered you must ventilate the patient — there is no reversal agent available in the prehospital setting for vecuronium.

Step 4 — Intubation Attempt:

1. Wait for full fasciculations to cease (succinylcholine) or full relaxation (vecuronium/rocuronium) before laryngoscopy — typically 60–90 seconds after NMBA.
2. Suction oropharynx immediately before blade insertion.
3. Perform laryngoscopy. Pass ETT under direct visualization through the vocal cords. Cuff should be 1–2 cm below the cords.
4. Inflate cuff with 10–12 mL of air. Remove stylet.
5. Confirm placement with MINIMUM THREE methods — one MUST be continuous ETCO2 waveform capnography.
6. Confirm bilateral breath sounds and absent gastric sounds. Note ETT depth at teeth.
7. Secure ETT with commercial device or tape. Document depth.
8. LIMIT TO ONE ATTEMPT. If unsuccessful within 20 seconds: stop, ventilate with BVM, then decide whether to retry or place SGA.

REQUIRED CONFIRMATION METHODS — ADVANCED AIRWAY

1. Continuous ETCO2 waveform capnography — required for all advanced airways. Colorimetric device acceptable for initial SGA confirmation in BLS agencies.
2. Bilateral breath sounds on auscultation — with visible, symmetric chest rise.
3. Absent gastric sounds on epigastric auscultation.

If ETCO2 is absent or gastric sounds are present: REMOVE TUBE IMMEDIATELY. Ventilate with BVM and re-attempt or place SGA.

POST-INTUBATION MANAGEMENT

- Ventilate at 10–12 breaths/min for adults guided by ETCO2 (target 35–45 mmHg).
- Titrate FiO2 to maintain SpO2 94–98% — avoid hyperoxia post-ROSC.
- Administer additional sedation for any signs of patient awareness or agitation: midazolam 2–5 mg IV/IO every 10–30 minutes as needed.
- Monitor ETCO2 continuously — any disruption in waveform requires immediate reassessment of tube position.
- Re-confirm tube placement after every patient movement.
- Document drug names, doses, routes, and times for all MAI agents.

FAILED AIRWAY ALGORITHM

CAUTION

If intubation fails after ONE attempt — do not attempt again immediately. Follow this sequence: (1) BVM ventilate to restore SpO2 > 94%. (2) Place SGA (King Airway or equivalent). (3) If SGA ventilation fails: perform surgical cricothyrotomy. This must be performed immediately — do not delay.

KEY CONSIDERATIONS

- Pre-oxygenation is the most important pre-intubation step. Every 1 minute of high-flow pre-oxygenation extends safe apnea time.
- Apneic oxygenation (nasal cannula at 10–15 LPM maintained throughout laryngoscopy) significantly prolongs the safe apnea window.
- ETCO2 must be monitored continuously. A fall in ETCO2 during chest compressions is a sign of ineffective CPR. ETCO2 > 10 mmHg during CPR predicts ROSC potential.
- Head-injured patients: maintain normocapnia (ETCO2 35–45 mmHg) unless signs of herniation are present — then target 30–35 mmHg.
- Hypoxia and hypotension immediately before and after intubation are the leading preventable causes of secondary brain injury in head trauma. Correct both before proceeding when time permits.
- EMS providers experience significant skill decay with infrequent intubation — the SGA is a clinically equivalent and often safer airway choice in the prehospital environment.

TRANSCUTANEOUS PACING (TCP)

Indications:

1. Hemodynamically unstable symptomatic bradycardia.

Contraindications:

1. Severe hypothermia with core temperature < 86°F (30°C).

Pacing Reference Settings:

1. Rate: Adults 70 bpm | Children 100 bpm | Newborns/Infants 120 bpm
2. Starting current: 45 mA (or manufacturer default).
3. Increase current by 10 mA increments until electrical capture is achieved.
4. Upon mechanical capture: increase by 10% above capture threshold.

Procedure:

- Ensure monitoring and electrical therapy cables are properly connected.
- Press PACER — confirm LED illuminates.
- Observe ECG rhythm — confirm sense markers appear at each QRS.
- Administer pre-medication for sedation/analgesia as indicated (midazolam 2.5–5 mg IV/IO; fentanyl 25–100 mcg IV/IO).
- Set desired pacing rate.
- Increase current until electrical capture is achieved. Palpate pulse or check BP to confirm mechanical capture.
- Adjust rate or current as needed during pacing.
- Monitor continuously throughout transport.

SYNCHRONIZED CARDIOVERSION

Indications:

1. Unstable VT with pulse. Unstable SVT. Unstable A-fib/flutter with rapid ventricular response.

Contraindications:

1. Non-sustained VT or self-terminating tachycardias. Torsades de pointes — treat as VF and defibrillate.

Procedure:

- Ensure monitoring and electrical therapy cables are connected.
- Select the lead with the greatest QRS amplitude.
- Press SYNC — confirm LED blinks with each detected QRS.
- Administer pre-medication: midazolam 2.5–5 mg IV/IO and/or fentanyl 25–100 mcg IV/IO for patient comfort.
- Select appropriate energy setting per Dysrhythmia Protocol.
- Press CHARGE.
- Ensure all personnel stand clear.
- Press and HOLD SHOCK until discharge occurs on the next detected QRS. Then release.
- Reassess patient and rhythm.
- If rhythm deteriorates to VF/pulseless VT: switch immediately to asynchronous mode and defibrillate.

NEEDLE CHEST DECOMPRESSION

Indications:

1. Signs and symptoms of life-threatening tension pneumothorax.
2. PEA cardiac arrest in the presence of blunt chest trauma.

Contraindications:

1. No evidence of tension pneumothorax. Simple pneumothorax without tension physiology. Hemothorax.

Classic Signs of Tension Pneumothorax:

1. Progressive dyspnea with absent or decreased breath sounds on affected side.
2. Tracheal deviation away from affected side (late finding).
3. Distended neck veins, hypotension, cyanosis, subcutaneous emphysema.

Equipment:

1. Adult: 10-gauge, 3¼ inch IV catheter.
2. Pediatric: 18–20 gauge, 1¾ inch IV catheter.

Procedure — Primary Site (2nd ICS, Midclavicular Line):

- Do not delay decompression to apply ancillary equipment when urgently needed.
- Identify the angle of Louis (sternomanubrial junction). Move fingers laterally to the 2nd intercostal space.
- Palpate the upper edge of the 3rd rib at the midclavicular line — this is the point of entry.
- Insert needle at the top margin of the 3rd rib (avoids neurovascular bundle running beneath each rib), pointing posteriorly and slightly upward.
- A rush of air or barrel displacement of the syringe confirms decompression.
- Pull back needle slightly into catheter before threading catheter into chest wall to prevent lung laceration.
- Advance catheter hub to skin; remove needle. Ensure one-way valve is positioned for air escape.
- Tape catheter securely. Auscultate and reassess.
- Monitor flutter valve throughout transport — may become occluded. Replace as needed.

NOTE Alternative site: 4th or 5th intercostal space, anterior axillary line — associated with higher success rates in obese patients and may be preferred when 2nd ICS access is difficult.

EZ-IO INTRAOSSEOUS ACCESS

Indications:

1. Vascular access is critical but traditional IV techniques are not possible or require excessive time.

Contraindications:

1. Fracture at the selected site. Recent orthopedic procedures (e.g., joint replacement). Pre-existing medical condition compromising the extremity (tumor, peripheral vascular disease). Infection over insertion site. Unable to identify anatomical landmarks. Excessive tissue over insertion site preventing cortical penetration.

Needle Selection:

Needle Set	Indication
15 mm — Pink	3–39 kg (pediatric)
25 mm — Blue	> 39 kg (standard adult)
45 mm — Yellow	> 39 kg with excessive tissue over insertion site

Insertion Site Landmarks:

1. Proximal tibia — adult: 2 fingerbreadths below patella, 1 fingerbreadth medial to tibial tuberosity.
2. Proximal tibia — pediatric: 1–2 fingerbreadths below tibial tuberosity, medial along flat surface of tibia.
3. Distal tibia (medial malleolus) — adult: 2 fingerbreadths proximal to medial malleolus, midline tibia.
4. Distal tibia — pediatric: 1–2 fingerbreadths proximal to medial malleolus.
5. Humeral head: adduct arm against body; identify humeral head at anterior-superior aspect of shoulder; insert at greater tubercle.

Procedure:

- Obtain informed consent from conscious patients.
- Apply BSI; use aseptic technique; clean site with iodine and/or alcohol.
- Select appropriate needle set.
- Position driver at 90-degree angle to bone surface.
- Power needle through skin until tip contacts bone. Verify 5 mm marking is visible — if not, needle is too short; abandon and switch to longer set.
- Continue driving through cortex with gentle pressure. Stop when flange contacts skin or sudden decrease in resistance is felt.
- Remove driver, then remove stylette (counterclockwise). Discard in biohazard container immediately.
- Confirm placement: catheter stands perpendicular, blood at stylette tip, free flow of flush without extravasation.
- Attach EZ-Connect or luer lock extension. FLUSH WITH 10 mL NORMAL SALINE before any medication or fluid administration.
- Apply wristband and dressing. Initiate infusion — pressure bag required for adequate flow rates.

NOTE IO insertion in conscious patients causes mild-to-moderate discomfort. Administer lidocaine for IO analgesia in conscious patients: Adult: 40 mg IO slow push, then 10 mL NS fast push, then 20 mg IO slow push. Pediatric: 0.5 mg/kg IO (max 40 mg), then 5 mL NS, then 0.25 mg/kg IO.

CAUTION Do not remove the EZ-IO catheter in the field without physician order. EZ-IO should be removed within 24 hours. If hub-catheter separation occurs, use a hemostat to grasp and gently remove while rotating.

SUPRAGLOTTIC AIRWAY — KING AIRWAY

Indications:

1. Apneic or unresponsive patient without a gag reflex requiring airway management.

Contraindications:

1. Known esophageal disease or ingestion of caustic substances. Patient outside printed weight range for selected device size.

Procedure — Placement:

- Ensure adequate BLS airway; pre-oxygenate with 100% oxygen.
- Select appropriate device size. Test cuff with recommended air volume; fully deflate prior to insertion.
- Apply water-based lubricant to distal tip and posterior aspect. Avoid ventilatory openings.
- Position head in sniffing position (neutral for suspected c-spine injury).
- Hold mouth open; apply chin lift (jaw thrust for c-spine concern).
- Insert tube rotated 45–90 degrees with blue stripe touching corner of mouth. Advance behind base of tongue without force.
- Once tube passes under tongue, rotate to midline with blue stripe up toward chin.
- Advance until base connector aligns with teeth or gums.
- Inflate cuff per device specifications.
- Ventilate — confirm placement by chest rise and bilateral breath sounds. Secure tube and document depth.
- Monitor placement continuously throughout transport.

Removal:

1. Place patient on side. Carefully unsecure and remove; suction as needed. Insert OPA/NPA as needed and continue BVM ventilations.

CPAP

Indications:

1. Moderate to severe respiratory distress or impending respiratory failure unresponsive to conventional oxygen therapy.
2. Acute pulmonary edema, CHF, ARDS, COPD exacerbation, or severe asthma (as adjunct to pharmacologic therapy).
3. Dyspnea with hypoxia, accessory muscle use, decreased tidal volume, crackles/rales, inability to speak in full sentences.

Contraindications:

1. Cardiac or respiratory arrest. GCS < 12 or inability to protect airway. Active vomiting. Penetrating head/chest trauma. Pneumothorax. Significant facial injuries. Suspected intracranial hemorrhage.

Procedure:

- Seat patient upright.
- Apply ETCO2 nasal cannula before mask.
- Apply CPAP mask; set initial flow to achieve 7.5 cmH2O pressure. Secure mask.
- Monitor and reassess continuously.

NOTE If no improvement: troubleshoot equipment, consider medication-assisted intubation, assess for pneumothorax, and assess for hypotension from reduced cardiac preload.

TOURNIQUET APPLICATION

Indications:

1. Significant extremity hemorrhage not controlled by direct pressure. GSW, partial/full amputation, major lacerations. Trapped limb prior to extrication.

Procedure:

- Determine tourniquet is indicated. Assess pulse, movement, and sensation distal to injury.
- Route band around limb. No more than 3 fingers should fit under the tightened band.
- Secure band with Velcro once tightened.
- Twist rod until bleeding stops AND distal pulse is eliminated. Lock rod in securing clip.
- RECORD TIME of tourniquet application on the tourniquet AND in the PCR.
- If bleeding continues: apply second tourniquet proximal to the first.
- Reassess continuously. Do not cover tourniquet — keep it visible.

CAUTION DO NOT REMOVE A TOURNIQUET ONCE APPLIED — except per Extremity Trauma protocol guidance under EMS provider judgment. INFORM the receiving physician of tourniquet location, indication, and time of application.

OROTRACHEAL INTUBATION

Indications:

1. Inadequate ventilation or oxygenation. Airway protection with depressed or absent gag reflex. Cardiopulmonary arrest with BVM and SGA failure.

Contraindications:

1. No absolute contraindications in the presence of hypoxia, unresponsiveness, or cardiopulmonary arrest.

Procedure:

- Pre-oxygenate for at least 1 minute with 100% oxygen. Attach pulse oximeter.
- Position head in sniffing position. NECK EXTENSION IS CONTRAINDICATED in suspected cervical spine injury.
- Curved blade: advance into vallecula to indirectly lift epiglottis. Straight blade: lift epiglottis directly with blade tip.
- Visualize glottis and pass ETT through cords until cuff is just beyond the cords.
- Remove stylette. Begin ventilations with 100% O2.
- Confirm placement with minimum 3 methods — one MUST be continuous ETCO2 waveform capnography.
- Also auscultate: bilateral breath sounds (no gastric sounds). If gastric sounds heard: remove tube and hyperventilate.
- Inflate balloon cuff with 10–12 mL of air. Secure tube with commercial device or tape. Document depth.

NOTE Pediatric intubation: straight blade preferred. Advance tube only 5–10 mm past cords. Auscultate over mid-axillary regions — avoid false sounds transmitted across small chest. Limit to ONE attempt, then SGA or BVM.

CLINICAL POLICIES

The following policies address the legal, ethical, and operational frameworks governing EMS practice in Linn County. All providers are expected to be familiar with and comply with these policies.

CONSENT

Adults

An adult in Kansas is any person 16 years of age or older (KSA 38-123b), or an unmarried pregnant minor (KSA 38-123). Every adult is presumed capable of making medical decisions, including decisions the provider believes are not in their best interest.

Types of consent:

1. Express consent: patient verbally or through action agrees to treatment.
2. Implied consent: unconscious adult is presumed to consent to treatment for life-threatening conditions.
3. Involuntary consent: court-ordered guardianship, prisoners in custody, persons under mental health hold.

NOTE A patient has decision-making capacity if they understand the nature of their illness/injury, the possible consequences of refusing treatment, and voluntarily make their decision. When in doubt, contact Direct Medical Oversight.

Minors

1. A parent or legal guardian may consent to or refuse treatment in non-life-threatening situations.
2. If parent is not present and the minor has a life-threatening condition: treat and transport per protocol.
3. If parent refuses treatment and imminent danger exists: treat to the extent allowable and contact law enforcement.
4. Religious refusal is not grounds to withhold care when imminent danger, life threat, or serious disability risk is present.
5. Minors 16 and older who are emancipated may consent without parental involvement.

CPR DIRECTIVES AND ADVANCED DIRECTIVES

CPR Directive (KSA 65-4941):

1. Patient must be 18 or older with decision-making capacity. Must be signed by patient or authorized agent AND attending physician.
2. Forms accepted: original or legible copy of CPR directive form, DNR necklace/bracelet, or valid physician order (signed, dated within 1 year).
3. CPR may be withheld if a valid directive is present AND the patient is in cardiac/pulmonary arrest.
4. Verify with cardiac monitor in at least 3 leads that patient is in cardiac arrest.
5. If any doubt or inability to verify: initiate full resuscitation and contact Direct Medical Oversight.

TPOPP (Transportable Physician Orders for Patient Preferences):

1. Signed by patient or representative AND primary physician. Sections A, B, and E apply to EMS providers.
2. If "Do Not Attempt Resuscitation" is marked AND accompanied by a valid DNR identifier: treat as a valid DNR.
3. Comfort Measures Only: oxygen, oral suction, position of comfort, wound care, hemorrhage control.
4. Limited Additional Interventions: comfort measures plus IV fluids and cardiac monitoring. No intubation, no electrical therapy.

CAUTION Verbal DNR orders are NOT accepted. Resuscitation may only be ceased on verbal order from the Direct Medical Oversight physician.

Special Circumstances:

1. Patient with valid DNR expires in the ambulance during transport: stop safely, notify dispatch/supervisor/medical control/coroner. Contact applicable hospital if family was en route.
2. Patient may revoke CPR directive at any time by oral expression or by destruction of the form, bracelet, or necklace.

PATIENT REFUSALS

A competent adult may refuse any or all aspects of EMS care including IVs, oxygen, medications, and transport. The provider's obligation is to:

- Ensure the patient has decision-making capacity.
- Inform the patient of their condition and potential consequences of refusal in plain language.
- Offer treatment again after explaining consequences.
- Contact Direct Medical Oversight when appropriate.
- Document the refusal thoroughly, including the patient's stated reason and understanding.

CAUTION If a patient lacks decision-making capacity and their life or health is in danger, proceed with treatment and transport under implied consent.

COMMUNICATION SYSTEM FAILURE

If an ambulance cannot contact Direct Medical Oversight due to mass casualty incident, radio/telephone failure, or failure of medical control to respond within 2 minutes: ALL PROTOCOLS BECOME STANDING ORDERS.

1. An emergency department nurse may relay physician orders when it is impractical for the physician to reach the radio/telephone.
2. Providers do not need to contact medical control for treatment modalities that are already standing orders, unless a question about planned treatment arises.
3. When communication is restored, the record is pulled for review by CES and/or the on-duty supervisor. The Medical Director signs for retroactive approval.

BLOOD DRAWS — LAW ENFORCEMENT

Per KSA 08-1001, EMS workers are compelled to perform blood draws upon request of a law enforcement officer. Only AEMTs and Paramedics authorized to perform venous procedures may conduct legal blood draws.

Procedure:

1. Ensure all law enforcement procedures (arrest, consent documentation) are completed BEFORE the draw.
2. Use the blood draw kit provided by law enforcement.
3. Follow kit instructions for chain of custody and documentation.
4. Complete a PCR for each subject — even in DUI saturation patrol scenarios requiring multiple draws.

NOTE Providers MAY REFUSE a blood draw request ONLY if it will delay lifesaving care and the patient's condition is critical and requires immediate advanced intervention.

CONFIDENTIALITY AND HIPAA

AMR is committed to ensuring the privacy and security of patient health information. Providers should disclose only the minimum amount of protected health information (PHI) necessary for the specific care or disclosure purpose, as required under 45 C.F.R. §164.502(b) and applicable federal, state, and local laws.

1. Additional HIPAA and PHI policies are maintained by the AMR Compliance Department and are available upon request.

CRIME SCENES

1. Do not respond if not assigned to the call. Over-response causes confusion and destroys evidence.
2. Meet with the investigating officer prior to entering the scene. Obtain patient condition and scene information. Make a joint decision on whether resuscitative measures are indicated. If in doubt — resuscitate.
3. Prepare monitor before entering the scene to minimize equipment dropped in the scene.
4. Minimize contact with the patient's body and surroundings. Have the officer assist with any necessary object movement.
5. If conclusive signs of death are present: exit scene with escort. In all cases of unattended death outside a medical facility: contact the coroner immediately.
6. ALS providers: document asystole for 20 seconds in at least 3 leads before withholding or terminating resuscitation. Exception: patients with decapitation, decomposition, or dependent lividity/rigor.

RESTRAINTS — PHYSICAL

Physical restraints should be used only when necessary to ensure the safety of the patient, EMS providers, and bystanders. See also the Patient Restraint and Behavioral Emergency Protocols.

CAUTION

PROHIBITED TECHNIQUES — the following are NEVER permitted: prone positioning with or without hobbling/hog-tying, "sandwiching" between backboards, techniques that constrict the neck or airway, any technique that restricts chest excursion or ability to breathe adequately, improvised restraint devices (except approved supplemental straps/sheets).

1. Continuous monitoring of restrained patients is mandatory: airway patency, respiratory status (SpO2 and ETCO2), circulatory status, mental status trends, and extremity perfusion by capillary refill.
2. Patients should be restrained in lateral or supine position. Upright positioning on the stretcher reduces aspiration risk when safe to do so.
3. For patients with key-locking devices applied by law enforcement: replace with non-key-locking restraint, administer pharmacologic management then replace, transport with law enforcement officer holding the key, or transport in law enforcement vehicle if appropriate per Direct Medical Oversight.