Pharmacology

- Acetaminophen (APAP)
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- Methylprednisolone
- Midazolam
- Morphine Sulfate
- Naloxone Hydrochloride
- Nitroglycerin
- Ondansetron
- Sodium Bicarbonate
- Terbutaline

- Tranexamic Acid (TXA)

Acetaminophen (APAP)

GENERIC NAME

Acetaminophen (APAP)

TRADE NAME

Tylenol

DESCRIPTION

Non-opioid analgesic and antipyretic.

HOW SUPPLIED

Oral Suspension: 160 mg / 5 mL strength

INDICATIONS

- Pain management – mild pain levels
- Fever

CONTRAINDICATIONS

- Active and severe liver disease
- Severe liver impairment
- Allergy or hypersensitivity to acetaminophen
- Do not dose if acetaminophen has been taken within the last 4 hours

PRECAUTIONS

1. Monitor for signs of liver toxicity, especially in patients with existing liver conditions.
2. Be cautious with dosing in patients who are also taking other medications containing acetaminophen.
3. Ensure proper dosage based on weight, particularly in pediatric patients.

MECHANISM OF ACTION

Inhibits specific parts of the cyclooxygenase (COX) pathway in the central nervous system, likely inhibiting the synthesis of prostaglandins involved in pain sensation. Affects the hypothalamus to reduce body temperature.

SIDE EFFECTS

- Skin rash
- Kidney toxicity
- Liver failure in large doses

AUTHORIZATION

EMT: Standing Order

EMT-I: Standing Order

Paramedic: Standing Order

DOSAGE

- **Adult:** 20 mL of PO liquid medication
- **Pediatric:**
  - **Under 2 years:** Not recommended
  - **2-3 years (24-35 lbs):** 5 mL
  - **4-5 years (36-47 lbs):** 7.5 mL
  - **6-8 years (48-59 lbs):** 10 mL
  - **9-10 years (60-71 lbs):** 12.5 mL
  - **11 years (72-95 lbs):** 15 mL
  - **12 years and above (96 lbs and above):** 20 mL

Acetylsalicylic Acid

GENERIC NAME

Aspirin

TRADE NAME

Acetylsalicylic Acid

DESCRIPTION

Aspirin works by inhibiting platelet aggregation, which reduces the formation of blood clots. It makes platelets less sticky, helping to prevent clots that can lead to myocardial infarction (MI) or cardiac ischemia.

HOW SUPPLIED

Tablets: 81 mg

INDICATIONS

- Chest pain or discomfort suggestive of myocardial infarction (MI) or cardiac ischemia.

CONTRAINDICATIONS

- Hypersensitivity or allergy to aspirin.

PRECAUTIONS

1. Emergency Medical Dispatch (EMD) protocol allows patients to self-administer aspirin. Verify the amount taken before administering additional doses.
2. Aspirin may be taken in conjunction with anticoagulants like Coumadin.
3. Do not administer if there is evidence of active bleeding.

MECHANISM OF ACTION

Aspirin decreases platelet aggregation and reduces inflammation, which helps prevent blood clot formation in the cardiovascular system.

SIDE EFFECTS

- Gastritis
- Nausea and vomiting

AUTHORIZATION

EMT: Standing Order

AEMT: Standing Order

Paramedic: Standing Order

DOSAGE

- **Adult:** 324 mg, chewed and swallowed (use baby aspirin if available).
- **Pediatric:** Not authorized

Adenosine

GENERIC NAME

Adenosine

TRADE NAME

Adenocard

DESCRIPTION

Adenosine is a naturally occurring substance present in all cells that slows conduction through the AV node of the heart. Due to its rapid onset of action and short half-life, the administration of Adenosine is sometimes referred to as "chemical cardioversion."

HOW SUPPLIED

Vial and pre-filled syringe: 6 mg/2 mL

INDICATIONS

- Paroxysmal Supraventricular Tachycardia (PSVT) refractory to common vagal maneuvers
- Wide Complex Tachycardia with a pulse

CONTRAINDICATIONS

- Hypersensitivity or allergy to adenosine
- Second- or third-degree heart block
- Sick sinus syndrome

MECHANISM OF ACTION

Adenosine decreases conduction of the electrical impulse through the AV node, which can terminate rapid supraventricular arrhythmias such as PSVT. The half-life of Adenosine is approximately 5 seconds.

SPECIAL CONSIDERATIONS

The preferred IV site is the antecubital fossa with an 18 gauge or larger catheter. Administer via the port closest to the IV catheter for rapid delivery.

SIDE EFFECTS

- Facial flushing
- Headache
- Shortness of breath
- Chest pain or tightness
- Dizziness
- Nausea
- Other transient symptoms due to the brief half-life of adenosine

AUTHORIZATION

EMT: Not Authorized

AEMT: Not Authorized

Paramedic: Standing Order and Medical Control

DOSAGE

- **Adult:**
  - 1st dose: **6 mg** Rapid IV/IO push, followed immediately by a 10 – 20 mL saline bolus
  - 2nd dose: **12 mg** Rapid IV/IO push, followed immediately by a 10 – 20 mL saline bolus
  - 3rd dose: **12 mg** Rapid IV/IO push, followed immediately by a 10 – 20 mL saline bolus
- **Pediatric:**
  - 1st dose: **0.1 mg/kg (max 6 mg)** Rapid IV/IO push, followed immediately by a 10 mL saline bolus
  - 2nd dose: **0.2 mg/kg (max 12 mg)** Rapid IV/IO push, followed immediately by a 10 mL saline bolus
  - 3rd dose: **0.2 mg/kg (max 12 mg)** Rapid IV/IO push, followed immediately by a 10 mL saline bolus

Albuterol

GENERIC NAME

Albuterol

TRADE NAME

Proventil, Ventolin

CLASS

Sympathetic Agonist

HOW SUPPLIED

Pre-mixed vial: 2.5 mg in 3 mL saline

INDICATIONS

- Based on patient condition, paramedics may consider any of the dosing regimens listed below.
- Wheezing or diminished breath sounds due to acute bronchospasm (Asthma, COPD)
- Bronchospasm associated with chronic bronchitis, emphysema, allergic reaction, or toxic inhalation

CONTRAINDICATIONS

- Hypersensitivity or allergy to Albuterol

MECHANISM OF ACTION

Albuterol causes bronchodilation with minimal side effects. The duration of action is approximately 5 hours.

SIDE EFFECTS

- Palpitations
- Anxiety

- Dizziness
- Headache
- Nervousness
- Tremor
- Hypertension
- Arrhythmias
- Chest pain
- Nausea and vomiting

AUTHORIZATION

EMT: Standing Order

AEMT: Standing Order

Paramedic: Standing Order

DOSAGE

- **All Patients:**
  - **1st Dose:** Albuterol 2.5 mg via nebulizer
  - **2nd Dose:** Albuterol 2.5 mg and Atrovent 500 mcg via nebulizer
  - **3rd Dose:** Albuterol 7.5 mg and Atrovent 500 mcg via nebulizer or BVM with in-line nebulizer

Amiodarone

GENERIC NAME

Amiodarone

TRADE NAME

Cordarone

DESCRIPTION

An antiarrhythmic medication indicated for the treatment of documented, recurrent, life-threatening ventricular arrhythmias.

HOW SUPPLIED

150 mg/3 mL pre-filled syringe

INDICATIONS

- Ventricular Fibrillation (VF)
- Ventricular Tachycardia (VT)
- Supraventricular Tachycardia (SVT) with aberrancy
- Indicated only for patients with life-threatening arrhythmias

CONTRAINDICATIONS

- Hypersensitivity or allergy to Amiodarone
- Iodine allergy
- Cardiogenic shock
- Pregnancy, except in life-threatening situations

MECHANISM OF ACTION

Amiodarone prolongs the duration of the action potential of all cardiac fibers, which helps reduce arrhythmias.

SIDE EFFECTS

- Heart blocks
- Cardiac arrest

AUTHORIZATION

EMT: Not Authorized

AEMT: Not Authorized

Paramedic: Standing Order

DOSAGE

- **Cardiac Arrest (VT/VF):**
  - **Adult:** 300 mg IV/IO push during the third set of 200 compressions. Repeat once with 150 mg IV/IO (maximum dose: 450 mg).
  - **Pediatric:** 5 mg/kg IV/IO push
- **Tachycardia (Wide Complex with Pulse):**
  - **Adult:** 150 mg drip over 10 minutes (mix 150 mg in 100 mL D5W; run wide open with 60 gtts tubing)
  - **Pediatric:** Not given

Atropine Sulfate

GENERIC NAME

Atropine Sulfate

TRADE NAME

None

DESCRIPTION

Atropine is used to increase slow heart rates and to treat organophosphate and nerve agent poisoning.

HOW SUPPLIED

- Prefilled syringe: 1.0 mg / 10 mL
- DuoDote: One auto-injector containing both 600 mg Pralidoxime chloride and 2.1 mg Atropine
- Mark I Kit: One auto-injector containing 600 mg Pralidoxime chloride and one auto-injector containing 2 mg Atropine

INDICATIONS

- Hemodynamically significant bradycardia
- Organophosphate poisoning
- WMD Nerve Agent poisoning

CONTRAINDICATIONS

- Hypersensitivity or allergy to Atropine

MECHANISM OF ACTION

Atropine sulfate increases heart rate by blocking the parasympathetic nervous system and its inhibitory effects on heart rate. It is used when a slow heart rate is accompanied by hypotension, shortness of breath, chest pain, altered mental status, congestive heart failure, or shock. It also reverses the effects of parasympathetic overstimulation seen in organophosphate poisoning.

SIDE EFFECTS

- Blurred vision
- Dilated pupils
- Dry mouth
- Palpitations
- Tachycardia
- Drowsiness
- Confusion
- Paradoxical bradycardia if less than 0.5 mg is given to adults

AUTHORIZATION

EMT: Standing order when DuoDote or Mark I Kit is necessary for WMD Nerve Agents; all other usages not authorized

AEMT: Standing order when DuoDote or Mark I Kit is necessary for WMD Nerve Agents; all other usages not authorized

Paramedic: Standing Order

DOSAGE

- **Bradycardia:**
  - **Adult:** 0.5 mg IV/IO every 3–5 minutes, with a maximum total dose of 3 mg
  - **Infant & Child:** 0.02 mg/kg IV/IO every 3–5 minutes, with a maximum total dose of 3 mg (single dose minimum 0.1 mg; maximum 0.5 mg)
- **Overdose / Poisoning (Organophosphate Poisoning) / WMD:**
  - **Adult:** 2–4 mg IV/IO every 5 minutes until secretions dry (No total maximum dose)
  - **Pediatric:** 0.05 mg/kg IV/IO every 5 minutes until secretions dry (single dose minimum 0.1 mg; maximum 0.5 mg; No total maximum dose)

Calcium Chloride

GENERIC NAME

Calcium Chloride

TRADE NAME

None

DESCRIPTION

Calcium chloride provides elemental calcium in the form of the cation (Ca++). Calcium is essential for many physiological activities, including muscle contraction and neurotransmitter release.

HOW SUPPLIED

Prefilled syringe: 1 gm/10 ml

INDICATIONS

- Calcium channel blocker toxicity (e.g., overdose of drugs such as Nifedipine, Verapamil).
- Hyperkalemia

CONTRAINDICATIONS

- Hypersensitivity or allergy

PRECAUTIONS

1. Calcium chloride can cause severe local necrosis if IV infiltration occurs.
2. Calcium chloride can precipitate when mixed with certain drugs, notably Sodium bicarbonate. Always flush the IV line with 10–20 ml of IV fluid after administering Calcium chloride and before administering any other medication.

MECHANISM OF ACTION

1. Increases myocardial contractility significantly and may enhance ventricular automaticity.
2. Mitigates the hypotensive effects of calcium channel blocker drugs.
3. Pediatric patients require a higher dose due to faster calcium metabolism.

SIDE EFFECTS

- Bradycardia
- Arrhythmias

AUTHORIZATION

EMT: Not authorized

AEMT: Not authorized

Paramedic: Standing order

DOSAGE

- **Adult:** 10 mg/kg (0.1 ml/kg) IV/IO push
- **Pediatric:** 20 mg/kg (0.2 ml/kg) IV/IO push

Dextrose

GENERIC NAME

Dextrose

TRADE NAME

Dextrose 10

DESCRIPTION

Dextrose is a simple sugar that is rapidly metabolized by the body, providing quick restoration of blood glucose levels.

HOW SUPPLIED

Prefilled bag: 25 grams/250 ml (10% solution)

INDICATIONS

- Hypoglycemia

CONTRAINDICATIONS

- No major contraindications for IV administration of Dextrose.
- Known or suspected CVA (stroke) in the absence of hypoglycemia.

MECHANISM OF ACTION

Rapidly restores blood glucose levels in cases of hypoglycemia.

SIDE EFFECTS

- Local venous irritation and potential tissue necrosis if IV infiltration occurs.

AUTHORIZATION

EMT: Not authorized

AEMT: Standing order

Paramedic: Standing order

DOSAGE

- **Adult:** 250 ml IV/IO wide open, may repeat once if blood glucose remains < 60 mg/dL.
- **Pediatric:** 5 ml/kg (0.5 g/kg) IV/IO, may repeat once if blood glucose remains < 60 mg/dL.

ADMINISTRATION NOTES

- If desired dose is ≤ 100 ml, draw the required amount of D10 into a syringe and administer via slow IV/IO push using the port closest to the patient.
- If the desired dose is > 100 ml, administer by running wide open as a piggy-back to Normal Saline.

Diphenhydramine

GENERIC NAME

Diphenhydramine

TRADE NAME

Benadryl

DESCRIPTION

Diphenhydramine is a potent antihistamine with both antihistamine and mild sedative properties.

HOW SUPPLIED

Ampule and pre-filled syringe: 50 mg/mL

INDICATIONS

- Anaphylaxis
- Allergic reactions

CONTRAINDICATIONS

- Allergy or hypersensitivity to diphenhydramine

MECHANISM OF ACTION

1. Blocks the effects of histamine, preventing bronchoconstriction and vasodilation.
2. Produces mild sedative effects.

SIDE EFFECTS

- Hypotension
- Headache
- Palpitations
- Tachycardia
- Sedation and drowsiness
- Disturbed coordination

AUTHORIZATION

EMT: Not authorized

AEMT: Standing order (IM only)

Paramedic: Standing order

DOSAGE

- **Adult:**
  - 25 mg, slow IV/IO push or IM for mild allergic reaction
  - 50 mg, slow IV/IO push or IM for severe allergic reaction
- **Pediatric:**
  - 1 mg/kg, slow IV/IO push or IM (max dose 25 mg) for mild or moderate reaction
  - 1 mg/kg, slow IV/IO push or IM (max dose 50 mg) for severe reaction

Droperidol

GENERIC NAME

Droperidol

TRADE NAME

Inapsine

DESCRIPTION

Droperidol (Inapsine) is a potent antiemetic and antipsychotic medication used for nausea, vomiting, and chemical restraint in agitated or violent patients.

HOW SUPPLIED

Intramuscular injection solution: 2.5 mg/1 mL

INDICATIONS

- Nausea and vomiting
- Sedation of acutely agitated and/or violent patients (chemical restraint)

CONTRAINDICATIONS

- Known hypersensitivity to Droperidol

MECHANISM OF ACTION

Droperidol is a butyrophenone neuroleptic (antipsychotic) that acts by antagonizing dopamine receptors in the central nervous system, similar to haloperidol.

SIDE EFFECTS

- Sinus tachycardia
- Hypotension
- Dystonic reactions
- Hallucinations
- Drowsiness

- Dizziness
- Chills
- Anxiety

AUTHORIZATION

EMT: Not authorized

EMT-I: Not authorized

Paramedic: Standing order

DOSAGE

- **Adult:**
  - **Active vomiting:** 1.25 mg IV; may repeat once after 10 minutes with Medical Control approval (max dose 2.5 mg).
  - **Agitated/Psychosis (RASS Score +2):** 5 mg IM.
  - **Violent Patient (RASS Score ≥ +3):** 10 mg IM; may repeat once after 20 minutes with Medical Control approval.
- **Pediatric:** Not given

Epinephrine

GENERIC NAME

Epinephrine 1:1,000 and Epinephrine 1:10,000

TRADE NAME

None

DESCRIPTION

Epinephrine is a naturally occurring potent stimulant with rapid onset of action. Its effects usually occur within seconds and are typically of short duration.

HOW SUPPLIED

- 1:1,000 - Ampule: 1 mg/ml
- 1:10,000 - Prefilled syringe: 1 mg/10 ml

INDICATIONS

- Cardiac arrest
- Severe anaphylaxis
- Severe bronchospasm
- Severe symptoms of croup (e.g., sternal retractions, agitation, fatigue)
- Hypotension post-resuscitation

CONTRAINDICATIONS

- Allergy or hypersensitivity to Epinephrine

PRECAUTIONS

1. Consider risk/benefit in patients with allergic reactions and history of coronary artery disease, as Epinephrine may precipitate acute myocardial infarction (MI).
2. Use caution in patients with tachycardia, especially if heart rate > 200/min.
3. Use with caution in patients with diabetes mellitus.
4. Use with caution in patients with hyperthyroidism.

MECHANISM OF ACTION

1. Increases heart rate and contractile force.
2. Increases electrical activity in the myocardium.
3. Increases systemic vascular resistance and blood pressure.
4. Induces bronchodilation.

SIDE EFFECTS

- Tachycardia
- Hypertension
- Palpitations
- Anxiety
- Tremors
- Headache
- Dizziness
- Nausea and vomiting
- Increased myocardial oxygen demand

AUTHORIZATION

EMT: Not authorized

AEMT: Standing order for patients in cardiac arrest (all doses except push dose and nebulized); standing order for 1st dose in non-cardiac arrest situations

Paramedic: Standing order for all doses, including push dose and nebulized

DOSAGE

Allergic Reaction / Anaphylaxis

- **Adult:**
  - 1st dose: 1:1,000 - 0.3 mg SQ/IM
  - Additional doses: 1:10,000 - 0.3 mg IV/IO push
- **Pediatric:**
  - 1st dose: 1:1,000 - 0.01 mg/kg SQ/IM (max 0.3 mg)
  - Additional doses: 1:10,000 - 0.01 mg/kg IV/IO push (max 0.3 mg)

Bradycardia

- **Child:** 1:10,000 - 0.01 mg/kg IV/IO push every 3–5 minutes (Paramedic only)
- **Infant:** 1:10,000 - 0.01 mg/kg IV/IO push every 3–5 minutes (Paramedic only)

Cardiac Arrest

- **Adult:**
  - 1st dose: 1:10,000 - 1 mg IV/IO push
  - Additional doses: 1:10,000 - 1 mg IV/IO push every 3–5 minutes (max of 3 doses)
- **Pediatric:**
  - 1st dose: 1:10,000 - 0.01 mg/kg IV/IO (max 1 mg)
  - Additional doses: 1:10,000 - 0.01 mg/kg IV/IO every 3–5 minutes (max of 3 doses)

Newborn Care and Resuscitation

- **Newborn:** 1:10,000 - 0.01 mg/kg IV/IO push (max of 3 doses)

Push Dose Epinephrine

- **Using 1:10,000:** Waste 1 ml of a 10 ml Normal Saline flush and draw up 1 ml of Epinephrine 1:10,000. Dose is 0.5–2 ml (5–20 mcg) IV/IO push.
- **Using 1:1,000:** Inject 1 mg/1 ml of Epinephrine 1:1,000 into a 100 ml Normal Saline bag. Dose is 0.5–2 ml (5–20 mcg) IV/IO push.

Croup

- **Adult/Pediatric:** 0.3 mg (1:10,000) mixed with 3 ml Normal Saline, nebulized; may repeat once as needed.

Fentanyl Citrate

GENERIC NAME

Fentanyl Citrate

TRADE NAME

Fentanyl

DESCRIPTION

Fentanyl is a potent narcotic analgesic used for pain management. It acts quickly and has a short duration of action, making it suitable for trauma patients experiencing pain.

HOW SUPPLIED

Prefilled Syringe: 100 mcg/2 ml

INDICATIONS

- All trauma patients with pain

CONTRAINDICATIONS

- Allergy or hypersensitivity to Fentanyl
- Acute respiratory compromise or bradycardia

MECHANISM OF ACTION

Fentanyl Citrate binds with opiate receptors in the central nervous system, altering the perception of and emotional response to pain.

SIDE EFFECTS

- Nausea
- Vomiting
- Abdominal cramps
- Headache
- Anxiety

- Respiratory depression

AUTHORIZATION

EMT: Not authorized

AEMT: Not authorized

Paramedic: Standing order

DOSAGE

- **Adult:**
  - IV/IO/IM: 100 mcg, may repeat once after 10 minutes (max 200 mcg total)
  - IN: 200 mcg (administer half in each nostril), may repeat once after 10 minutes (max 400 mcg total)
  - For patients ≥ 65 years: 25 mcg per dose, titrate to effect
- **Pediatric:**
  - IV/IO/IM: 1 mcg/kg, may repeat once after 10 minutes (max 72 mcg total)
  - IN: 2 mcg/kg (administer half in each nostril), may repeat once after 10 minutes (max 144 mcg total)

Glucagon Hydrochloride

GENERIC NAME

Glucagon Hydrochloride

TRADE NAME

None

DESCRIPTION

Glucagon is used to increase blood glucose levels, particularly in cases where an IV line cannot be immediately established. Intramuscular (IM) administration results in a quicker onset than subcutaneous (SQ) and is therefore the preferred route.

HOW SUPPLIED

Vial: 1 mg powder (activated by injection of 1 cc sterile water)

INDICATIONS

- Hypoglycemia

CONTRAINDICATIONS

- Allergy or hypersensitivity to Glucagon

MECHANISM OF ACTION

Glucagon increases circulating blood glucose levels by promoting the breakdown of stored glycogen to glucose. Return to consciousness typically occurs within 5–20 minutes after administration. However, Glucagon may lose its effectiveness if given within the previous 48 hours.

SIDE EFFECTS

- Hypotension
- Dizziness
- Headache
- Nausea and vomiting

ADDITIONAL INFORMATION

After administration of Glucagon, the patient should eat a carbohydrate-rich meal as soon as possible to prevent recurrent hypoglycemia.

AUTHORIZATION

EMT: Not authorized

AEMT: Not authorized

Paramedic: Standing order

DOSAGE

- **Adult:** 1 mg IM/SQ
- **Pediatric < 20 kg:** Refer to specific dosages listed in the 402 – Drug Dosage Chart – Pediatric
- **Pediatric > 20 kg:** 1 mg IM/SQ

Glucose

GENERIC NAME

Glucose

TRADE NAME

Glutose, Insta-Glucose

DESCRIPTION

Oral glucose is used to provide supplemental glucose in cases of hypoglycemia. It is administered when the patient is conscious and able to swallow.

HOW SUPPLIED

Tube: 15 gm

INDICATIONS

- Hypoglycemia

CONTRAINDICATIONS

- Allergy or hypersensitivity to glucose
- Patient is not awake or unable to swallow

MECHANISM OF ACTION

Oral glucose restores blood sugar levels in patients experiencing hypoglycemia.

SIDE EFFECTS

- None

AUTHORIZATION

EMT: Standing order

AEMT: Standing order

Paramedic: Standing order

DOSAGE

- **Adult:** 15 gm (1 tube) orally
- **Pediatric:** 15 gm (1 tube) orally

Hydroxycobalamin (Cyanokit)

GENERIC NAME

Hydroxycobalamin

TRADE NAME

Cyanokit

DESCRIPTION

Cyanokit is an antidote for cyanide poisoning.

HOW SUPPLIED

5 gram single-dose vial of dark red crystalline powder

PREPARATION

Without removing the vial from the box, transfer 200 ml of Normal Saline from an IV bag to the 5 gram Cyanokit vial using the transfer spike, filling to the line on the vial. Rock or invert the vial repeatedly (do not shake) for at least 60 seconds. Verify that no particulate matter is present and the solution is dark red. Attach the included IV tubing to the Cyanokit vial. For adults, administer the entire vial by running the IV wide open. For pediatric patients, use the dosing chart below and administer over 15 minutes.

INDICATIONS

- Patients with known or suspected exposure to both carbon monoxide and cyanide, with moderate or severe symptoms (e.g., confusion, altered mental status, coma, hypotension, cardiac dysrhythmias, respiratory or cardiac arrest).
- Patients at high risk include victims of closed-space fires with smoke inhalation.

CONTRAINDICATIONS

- No contraindications in emergency situations for patients exposed to both carbon monoxide and cyanide.
- Patients exposed only to cyanide should not be treated with Cyanokit; they should receive the traditional cyanide antidote kit at a hospital.

MECHANISM OF ACTION

Hydroxycobalamin has a higher affinity for cyanide than hemoglobin, preventing cyanide from binding to hemoglobin. When cyanide binds to hydroxycobalamin, it is converted into a form of Vitamin B12, which is then excreted harmlessly in the urine.

SPECIAL CONSIDERATIONS

None in prehospital emergencies.

SIDE EFFECTS

- Substantial increase in blood pressure may occur during administration, but it typically resolves quickly after the infusion is completed.
- May change the pigmentation of blood, which can interfere with the RAD-57 oximeter reading and may complicate dialysis in patients with renal disease.
- There are multiple other side effects, but none should prevent the administration of the full dose.

AUTHORIZATION

EMT: Not authorized

AEMT: Standing order and Medical Control

Paramedic: Standing order and Medical Control

DOSAGE

- **Adult:** 5 grams, run IV wide open
- **Pediatric:** Total volume according to weight, administer as an IV drip over 15 minutes

PEDIATRIC DOSING CHART

Patient Weight (kg)	Total Volume (ml) over 15 min	Drops per Min (with tubing supplied in Cyanokit)
4	16	16
5	20	20
6	24	24

7	28	28
8	32	32
9	36	36
10	40	40
11	44	44
12	48	48
13	52	52
14	56	56
15	60	60
16	64	64
17	68	68
18	72	72
19	76	76
20	80	80
21	84	84
22	88	88
23	92	92
24	96	96
25	100	100
26	104	104
27	108	108
28	112	112
29	116	116
30	120	120
31	124	124
32	128	128
33	132	132
34	136	136
35	140	140
36	144	144
37	148	148
38	152	152

39	156	156

Ipratropium

GENERIC NAME

Ipratropium

TRADE NAME

Atrovent

DESCRIPTION

Ipratropium is an anticholinergic bronchodilator chemically related to Atropine. It is a parasympatholytic agent used in the treatment of respiratory emergencies. Ipratropium causes bronchodilation and helps to dry respiratory secretions.

HOW SUPPLIED

Vial: 500 mcg in 2.5 mL saline

INDICATIONS

- Dyspnea with wheezing that is unresponsive to Albuterol

CONTRAINDICATIONS

- Allergy or hypersensitivity to Ipratropium

MECHANISM OF ACTION

Ipratropium blocks acetylcholine receptors, inhibiting parasympathetic stimulation, leading to bronchodilation and reduced mucus production.

SIDE EFFECTS

- Palpitations
- Anxiety
- Dizziness
- Headache
- Nervousness

- Nausea
- Vomiting

AUTHORIZATION

EMT: Standing order

AEMT: Standing order

Paramedic: Standing order

DOSAGE

- **Adult:** 500 mcg Ipratropium combined with 2.5 mg Albuterol, nebulized
- **Pediatric:** 500 mcg Ipratropium combined with 2.5 mg Albuterol, nebulized

Labetalol

GENERIC NAME

Labetalol

TRADE NAME

Trandate

DESCRIPTION

Labetalol is a selective Alpha and Beta-Blocker used to manage hypertensive emergencies. It lowers blood pressure by decreasing systemic vascular resistance without significantly affecting stroke volume, heart rate, or cardiac output.

HOW SUPPLIED

Vial: 5 mg/ml (100 mg/20 ml)

INDICATIONS

- Hypertensive emergencies with acute neurological symptoms and signs of end-organ damage

CONTRAINDICATIONS

- Hypersensitivity to Labetalol
- Pulmonary edema/crackles or overt cardiac failure
- Cardiogenic shock
- Second or third-degree AV blocks
- Heart rate less than 70 bpm

MECHANISM OF ACTION

Labetalol blocks both Alpha- and Beta-adrenergic receptors. It reduces blood pressure by decreasing systemic vascular resistance, with minimal effect on stroke volume, heart rate, and cardiac output. Onset of action is typically within 5 minutes.

SIDE EFFECTS

- Nausea
- Vomiting
- Dizziness
- Bradycardia
- Hypotension

AUTHORIZATION

EMT: Not authorized

EMT-I: Not authorized

Paramedic: Standing order

DOSAGE

- **Adult:** 10 mg IV/IO over 2 minutes. May repeat dose after 10 minutes with Medical Control approval, up to a maximum of 30 mg. *(Do not reduce the initial blood pressure by more than 25% in the first hour.)*
- **Pediatric:** Contact Medical Control

Lidocaine

GENERIC NAME

Lidocaine

TRADE NAME

Xylocaine

DESCRIPTION

Lidocaine is an antiarrhythmic and local anesthetic that also helps reduce intracranial and intraocular pressures. It is commonly used for its effects on the heart's electrical conduction system and for pain management during certain medical procedures.

HOW SUPPLIED

Prefilled syringe: 100 mg/5 ml

INDICATIONS

- Ventricular fibrillation (VF)
- Head injury
- Pain prevention during intraosseous (IO) infusion
- Intubation of patients with penetrating eye injury

CONTRAINDICATIONS

- Allergy or hypersensitivity to Lidocaine
- Usually contraindicated in second-degree Mobitz II and third-degree heart blocks

MECHANISM OF ACTION

1. Suppresses ectopic ventricular activity by decreasing the excitability of the heart and its electrical conduction system, preventing premature ventricular contractions from inducing ventricular fibrillation.
2. Suppresses ventricular tachycardia (VT) and ventricular fibrillation (VF).
3. Decreases intracranial pressure during intubation.

SIDE EFFECTS

- Drowsiness
- Seizures
- Confusion
- Hypotension
- Bradycardia
- Heart blocks
- Nausea
- Vomiting
- Respiratory and cardiac arrest

AUTHORIZATION

EMT: Not authorized

AEMT: Not authorized

Paramedic: Standing order

DOSAGE

IO Insertion (for pain control prior to infusion)

- **Adult:** 50 mg
- **Pediatric:** 0.5 mg/kg

Cardiac Arrest (with VF/VT)

- **Adult:** 1.5 mg/kg IV/IO for the first dose. Subsequent doses: 0.5 mg/kg IV/IO every 3–5 minutes, up to a maximum of 3 mg/kg.
- **Pediatric:** 1 mg/kg IV/IO every 5 minutes, up to a maximum of 3 mg/kg.

Head/Spinal Cord Injury (head-injured patients requiring intubation)

- **All patients:** 1 mg/kg IV/IO push prior to intubation, if available

Tachycardia: Wide Complex - No Pulse

- **Adult:** 1 mg/kg IV/IO push every 5 minutes, up to a maximum of 3 mg/kg.

Tachycardia: Wide Complex with Pulse

- **Adult:** 1 mg/kg IV/IO push every 5 minutes, up to a maximum of 3 mg/kg.

Magnesium Sulfate

GENERIC NAME

Magnesium Sulfate

TRADE NAME

None

DESCRIPTION

Magnesium Sulfate is used to decrease seizure activity in eclampsia and to terminate certain ventricular arrhythmias, including Torsades de Pointes.

HOW SUPPLIED

Vial: 50% solution in 10 mL (5 grams in 10 mL)

PREPARATION

- **For Torsades de Pointes:** Draw up in syringe for IV/IO administration.
- **For Eclampsia:** Mix 4 grams in 100 ml Normal Saline (NS) and drip over 15 minutes.

INDICATIONS

- Pre-Eclampsia / Eclampsia (seizures during pregnancy)
- Torsades de Pointes
- Dyspnea – Respiratory Distress

CONTRAINDICATIONS

- Allergy or hypersensitivity to Magnesium Sulfate

MECHANISM OF ACTION

Magnesium Sulfate acts as a central nervous system depressant, primarily used to manage convulsions associated with pregnancy and to correct severe magnesium deficiency linked to certain cardiac arrhythmias.

SIDE EFFECTS

- Vomiting
- Flushing
- Sweating
- Bradycardia
- Drowsiness
- Respiratory depression
- Arrhythmias
- Hypotension

AUTHORIZATION

EMT: Not authorized

AEMT: Not authorized

Paramedic: Standing order and Medical Control

DOSAGE

Cardiac Arrest – Suspected Torsades de Pointes

- **Adult:** Standing order: 2 grams IV/IO, push over 4 minutes
- **Pediatric:** Standing order: 50 mg/kg IV/IO, push over 4 minutes, max dose 2 grams

Eclampsia (Seizures During Pregnancy)

- **Adult:** Standing order: 4 grams IV/IO, drip over 15 minutes
- **Additional Doses:** Contact Medical Control for further administration of Magnesium Sulfate

Pre-Eclampsia

- **Adult:** Contact Medical Control for possible administration of Magnesium Sulfate, max dose 2 grams over 15 minutes in 100 ml NS

Dyspnea – Respiratory Distress

- **Adult:** Standing order: Magnesium Sulfate 2 grams in 100 ml Normal Saline, infused over 20 minutes IV/IO

Methylprednisolone

GENERIC NAME

Methylprednisolone

TRADE NAME

Solu-Medrol

DESCRIPTION

Methylprednisolone is an anti-inflammatory agent used to manage severe bronchoconstriction and other inflammatory conditions. It suppresses the immune response, particularly in allergic reactions.

HOW SUPPLIED

Unmixed vial: 125 mg

INDICATIONS

- Severe bronchoconstriction and/or impending respiratory failure due to anaphylaxis, asthma, or exacerbation of COPD

CONTRAINDICATIONS

- Allergy or hypersensitivity to Methylprednisolone

MECHANISM OF ACTION

Methylprednisolone acts as an anti-inflammatory agent, suppressing the immune response and reducing inflammation, particularly in allergic and respiratory conditions.

SIDE EFFECTS

- No significant side effects of any frequency

AUTHORIZATION

EMT: Not authorized

AEMT: Not authorized

Paramedic: Standing order

DOSAGE

- **Adult:** 125 mg IV/IO/IM
- **Pediatric:** 2 mg/kg IV/IO/IM, max dose 125 mg

Midazolam

GENERIC NAME

Midazolam

TRADE NAME

Versed

DESCRIPTION

Midazolam is a short-acting, water-soluble benzodiazepine that depresses the central nervous system (CNS), producing sedation and decreased responsiveness to commands.

HOW SUPPLIED

1 mg/ml (5 ml vial)

INDICATIONS

- Active seizures
- Sedation prior to cardioversion
- Sedation for administering CPAP
- Violent patients with extreme agitation
- Post resuscitation – sedation for agitation after intubation

CONTRAINDICATIONS

- Allergy or hypersensitivity to Midazolam

PRECAUTIONS

- Respiratory depression
- Hypotension

MECHANISM OF ACTION

Midazolam produces CNS depression, causing drowsiness and decreased responsiveness to commands.

SIDE EFFECTS

- Respiratory depression
- Hypotension

HOW ADMINISTERED

- **IV/IO:** Administer no faster than 5 mg over 2 minutes. For seizures, give in 2 mg increments, titrating to effect. Allow at least 10 minutes between doses.
- **IM:** Allow at least 10 minutes between doses. Total dosage may require two injections if volume exceeds the maximum single IM volume.
- **IN:** Deliver half of each dose per nostril. Allow at least 10 minutes between doses. Use the intranasal route only if IV/IO access is unavailable.

AUTHORIZATION

EMT: Not authorized

AEMT: Not authorized

Paramedic: Standing order and Medical Control

DOSAGE

Indication	Route	Adult Dosage	Pediatric Dosage
Seizure / Agitation / Violent Patient	IV/IO/IM	2–5 mg, may repeat every 5 min, max 10 mg total	≥ 13 years: 2–5 mg, may repeat every 5 min, max 10 mg total < 13 years: 0.1 mg/kg, max 10 mg total
Seizure / Agitation / Violent Patient	IN	5 mg (½ dose per nostril), may repeat every 5 min, max 10 mg total	≥ 13 years: 5 mg (½ dose per nostril), may repeat every 5 min, max 10 mg total < 13 years: 0.2 mg/kg, max 10 mg total
Bradycardia (prior to pacing) / Tachycardia (prior to cardioversion)	IV/IO	2–5 mg, do not repeat	0.1 mg/kg, max 5 mg
CPAP Sedation (Respiratory Distress)	IV/IO/IM	0.5 mg, may repeat every 5 min, max 2 mg total	No pediatric protocol
Post Resuscitation (Sedation for agitation after intubation)	IV/IO/IM /IN	2–5 mg, may repeat up to a total of 10 mg	1 mg IV/IO, may repeat up to a total of 5 mg

Notes:

- For all IV/IO administrations, administer no faster than 5 mg over 2 minutes.

- For IM administrations, total volume may require two injections if exceeding the maximum single IM volume.
- For IN administrations, deliver half of each dose per nostril. Use this route only if IV/IO access is not established.

Morphine Sulfate

GENERIC NAME

Morphine Sulfate

TRADE NAME

Morphine

DESCRIPTION

Morphine Sulfate is an opioid pain reliever used to manage moderate to severe pain. It acts as a central nervous system depressant, providing both analgesia and sedation.

HOW SUPPLIED

Ampule and multi-dose vial: 10 mg/1 ml

INDICATIONS

- Patients with pain of non-traumatic origin
- Burn patients with pain
- Analgesia prior to cardioversion

CONTRAINDICATIONS

- Allergy or hypersensitivity to Morphine
- Should not be used in trauma patients (other than burn injuries)
- Undiagnosed head injury or sudden onset of altered mental status

MECHANISM OF ACTION

Morphine Sulfate acts as a central nervous system depressant, providing pain relief and sedation by binding to opioid receptors in the brain and spinal cord.

SIDE EFFECTS

- Nausea
- Vomiting

- Abdominal cramps
- Blurred vision
- Constricted pupils
- Altered mental status
- Headache
- Respiratory depression

AUTHORIZATION

EMT: Not authorized

AEMT: Not authorized

Paramedic: Standing order and Medical Control

DOSAGE

Patient Type	Route	Standard Dosage	Maximum Dosage
Adult (Non-burn pain)	IV/IO/IM	2–5 mg slow push	10 mg total
Adult (Burn patients)	IV/IO/IM	2–5 mg slow push	20 mg total
Pediatric (Non-burn pain)	IV/IO/IM	0.1 mg/kg slow push	5 mg total
Pediatric (Burn patients)	IV/IO/IM	0.1 mg/kg slow push	10 mg total

Administration Notes:

- Administer Morphine slowly over several minutes to avoid rapid onset of side effects, particularly respiratory depression.
- Monitor respiratory status closely, especially in patients with underlying respiratory conditions.
- For burn patients, higher maximum dosages are permitted due to the severity of pain.

Naloxone Hydrochloride

GENERIC NAME

Naloxone Hydrochloride

TRADE NAME

Narcan

DESCRIPTION

Naloxone is used to reverse the effects of narcotic overdose, including respiratory depression caused by both natural and synthetic narcotic analgesics.

HOW SUPPLIED

Prefilled syringe: 2 mg / 2 mL

INDICATIONS

- Complete or partial reversal of central nervous system depression, especially in cases of respiratory depression caused by narcotics and synthetic narcotic analgesics

CONTRAINDICATIONS

- Allergy or hypersensitivity to Naloxone
- Patients who have been intubated

MECHANISM OF ACTION

Naloxone reverses the effects of natural and synthetic narcotic agents, including respiratory depression, by competitively binding to opioid receptors in the central nervous system.

SIDE EFFECTS

- Flushing
- Nausea
- Vomiting

- Can induce rapid withdrawal symptoms in patients dependent on narcotics (use cautiously and only when respiratory depression is present)
- IM administration has a longer onset of action compared to IV administration

AUTHORIZATION

EMT: Standing order (first dose only, IM/IN only)

AEMT: Standing order (first dose only, IM/IN only)

Paramedic: Standing order

DOSAGE

Patient Type	Route	Dosage
Adult	IV/IO/IM/IN	0.5 mg increments, titrate to respiratory sufficiency
Pediatric	IV/IO/IM/IN	0.1 mg/kg, max 2 mg per dose; may repeat every 2 minutes, up to a total of 4 doses

Administration Notes:

- Titrate doses to achieve adequate respiratory effort, rather than complete reversal of sedation.
- Use cautiously in patients who are opioid-dependent, as it may precipitate acute withdrawal symptoms.
- If given via the IM route, the onset of action may be delayed compared to IV administration.

Nitroglycerin

GENERIC NAME

Nitroglycerin

TRADE NAME

Nitrostat

DESCRIPTION

Nitroglycerin is a potent smooth muscle relaxant used primarily in the treatment of angina pectoris. It causes vasodilation, reducing cardiac workload and increasing coronary blood flow.

HOW SUPPLIED

Tablet or spray: 0.4 mg per tablet or spray

INDICATIONS

- Chest pain indicative of acute coronary syndrome (ACS)

CONTRAINDICATIONS

- Allergy or hypersensitivity to Nitroglycerin
- Systolic blood pressure less than 120 mmHg if no 12-lead ECG has been obtained
- Systolic blood pressure less than 90 mmHg with a 12-lead ECG, and no signs of inferior MI
- Inferior MI indicated on 12-lead ECG (no nitrates should be given)
- Patient has taken erectile dysfunction medication (Sildenafil/Viagra, Tadalafil/Cialis, Vardenafil/Levitra) within the past 48 hours

MECHANISM OF ACTION

Nitroglycerin relaxes smooth muscle, causing vasodilation. This results in decreased preload and reduced cardiac workload, as well as increased coronary blood flow and perfusion of the heart. Pain relief typically occurs within 1–2 minutes, and therapeutic effects last up to 30 minutes.

SIDE EFFECTS

- Headache
- Dizziness
- Weakness
- Tachycardia
- Hypotension

AUTHORIZATION

EMT: Not authorized

AEMT: Standing order (1 dose only)

Paramedic: Standing order

DOSAGE

Patient Type	Route	Dosage	Frequency	Maximum Doses
Adult	Sublingual (SL)	0.4 mg	Every 3–5 minutes	Up to 3 doses, or until pain is relieved or contraindication occurs
Pediatric	Not given	N/A		

Administration Notes:

- Ensure blood pressure is monitored closely before and after each dose due to the risk of hypotension.
- If patient experiences significant hypotension, dizziness, or syncope, discontinue administration and reassess.
- Use with caution in patients who may have taken erectile dysfunction medications within the past 48 hours due to potential severe hypotension.

Ondansetron

GENERIC NAME

Ondansetron

TRADE NAME

Zofran

DESCRIPTION

Ondansetron (Zofran) is primarily used to treat nausea and vomiting. It is a serotonin receptor antagonist that effectively blocks the vomiting reflex. The duration of action is approximately 8 hours.

HOW SUPPLIED

- Ampule: 4 mg / 2 ml
- Orally Disintegrating Tablet (ODT): 4 mg tablet (scored)

INDICATIONS

- Nausea
- Vomiting

CONTRAINDICATIONS

- Hypersensitivity or allergy to Ondansetron
- Do not administer to children under 1 year of age
- Do not administer to pregnant patients in their first trimester

MECHANISM OF ACTION

Ondansetron blocks serotonin receptors in the central nervous system, preventing the vomiting reflex and reducing nausea.

SIDE EFFECTS

- Headache

AUTHORIZATION

EMT: Adult: IM injection or ODT PO; Pediatric: ODT PO

AEMT: Standing order

Paramedic: Standing order

DOSAGE

Patient Type	Route	Dosage	Maximum Dosage
Adult	IV/IO/IM/PO (ODT)	4 mg	4 mg per dose
Pediatric ≥ 1 year	IV/IO/IM	0.15 mg/kg	Max 4 mg per dose
Pediatric (Weight 8–15 kg)	PO (ODT)	2 mg (split 4 mg tablet on score line)	2 mg
Pediatric (Weight 16–36 kg)	PO (ODT)	4 mg	4 mg
Pediatric < 1 year	Not authorized	N/A	

Administration Notes:

- For IV/IO administration, give over 2–5 minutes to prevent rapid onset side effects.
- ODT (Orally Disintegrating Tablet) should be placed on the tongue and allowed to dissolve without chewing or swallowing whole.
- Monitor for signs of headache, which is the most common side effect.
- Use caution in pediatric patients and adjust dosage based on weight.

Sodium Bicarbonate

GENERIC NAME

Sodium Bicarbonate

TRADE NAME

None

DESCRIPTION

Sodium bicarbonate is a salt that provides bicarbonate ions to buffer metabolic acidosis. It is used in several emergency situations, such as cardiac arrest, hyperkalemia, and tricyclic antidepressant overdose, to help restore acid-base balance.

HOW SUPPLIED

Prefilled syringe: 1 mEq/ml

INDICATIONS

- Tricyclic antidepressant overdose
- Suspected hyperkalemia
- Dialysis-related cardiac arrest
- Crush injury (Medical Control required)
- Cardiac arrest lasting longer than 10 minutes

CONTRAINDICATIONS

- Allergy or hypersensitivity to sodium bicarbonate

PRECAUTIONS

1. Sodium bicarbonate precipitates with Calcium Chloride. Flush the IV line with 10 ml of Normal Saline between administering these two medications.

MECHANISM OF ACTION

Sodium bicarbonate increases the alkalinity of the urine to enhance the excretion of tricyclic antidepressants. It also acts as a buffer, helping to reduce acidosis in emergency situations.

SIDE EFFECTS

- Few side effects when used appropriately in emergency settings

AUTHORIZATION

EMT: Not authorized

AEMT: Not authorized except for crush injury (Medical Control required)

Paramedic: Standing order

DOSAGE

Patient Type	Route	Dosage	Maximum Dosage
All patients (except crush injury)	IV/IO push	1 mEq/kg	Determined by patient response and clinical condition
Crush injury (Adult)	IV infusion	1,000 ml of ½ Normal Saline with 100 mEq of Sodium Bicarbonate, infused over 1 hour	Medical Control required
Crush injury (Pediatric)	IV infusion	Consult Medical Control for dosing	Medical Control required

Administration Notes:

- To prepare the infusion for crush injury, remove 100 ml from a 1,000 ml bag of Normal Saline, then inject 100 mEq of Sodium Bicarbonate and mix well.
- Monitor the patient’s electrolyte levels and acid-base status closely during administration.
- Adjust the dosage based on the patient’s clinical condition and response.

Terbutaline

GENERIC NAME

Terbutaline

TRADE NAME

Brethine

DESCRIPTION

Terbutaline (Brethine) is a short-acting, selective beta-2 agonist that is used for the treatment and prevention of bronchospasm in both adult and pediatric patients. It is effective for managing bronchospasm due to asthma and is also used in cases of COPD-related bronchospasm in adults. It has a shorter duration of action compared to albuterol.

HOW SUPPLIED

Subcutaneous injection solution: 1 mg/mL

INDICATIONS

- Treatment of bronchospasm associated with COPD
- Treatment of bronchospasm due to asthma exacerbation

CONTRAINDICATIONS

- Known hypersensitivity to terbutaline or its components

MECHANISM OF ACTION

Terbutaline is a selective beta-2 adrenergic agonist with minimal effects on beta-1 receptors and no significant alpha receptor activity. It targets beta-2 receptors located on the bronchiolar smooth muscle, leading to bronchodilation. This action helps relax the bronchial smooth muscle and improves airflow in the lungs.

SIDE EFFECTS

- Injection site reaction

- Nausea
- Insomnia
- Anxiety
- Rash
- Headache
- Vomiting
- Dizziness
- Drowsiness
- Tremor

AUTHORIZATION

EMT: Not authorized

EMT-I: Not authorized

Paramedic: Standing order

DOSAGE

Patient Type	Route	Dosage	Maximum Dosage
Adult	Subcutaneous (SQ)	0.25 mg; may repeat once after 15 minutes if no significant improvement	0.5 mg total within a 4-hour period
Pediatric	Subcutaneous (SQ)	0.01 mg/kg (maximum single dose of 0.25 mg); may repeat once after 15 minutes if no significant improvement	0.25 mg maximum per single dose

Administration Notes:

- Administer subcutaneously in the upper arm, thigh, or abdomen.
- Monitor the patient for potential side effects, particularly tremors, dizziness, and increased heart rate.
- Do not exceed the maximum dosage limits to avoid increased risk of side effects.
- Reassess the patient after administration and consider additional interventions if symptoms persist.

Tranexamic Acid (TXA)

GENERIC NAME

Tranexamic Acid (TXA)

TRADE NAME

Cyclokapron, Lysteda

DESCRIPTION

Tranexamic Acid (TXA) is an antifibrinolytic agent that helps promote clot formation by preventing the breakdown of fibrin clots. It is used in cases of massive hemorrhage, particularly in trauma and postpartum hemorrhage, to reduce bleeding and improve patient outcomes.

HOW SUPPLIED

1 gram in 10 ml vial

PREPARATION

Mix 1 gram of TXA in 100 ml of Normal Saline (NS).

INDICATIONS

- Hemorrhagic shock or cardiac arrest due to trauma less than three hours old
- Suspected need for massive blood transfusion due to significant internal or external bleeding, indicated by sustained heart rate ≥ 110/min and SBP < 90 mmHg
- Blood loss greater than 500 ml with continued bleeding in a postpartum situation

CONTRAINDICATIONS

- Non-hemorrhagic shock
- Non-traumatic hemorrhagic shock
- Hemorrhagic shock stabilized with other hemostatic agents or measures
- Isolated traumatic brain injury

MECHANISM OF ACTION

Tranexamic Acid inhibits the activation of plasminogen to plasmin, preventing the breakdown of fibrin clots (antifibrinolytic action). This helps stabilize formed clots and reduce ongoing bleeding.

SPECIAL CONSIDERATIONS

- Obtain two blood pressure and heart rate measurements to confirm sustained HR ≥ 110/min and SBP < 90 mmHg before administering TXA to patients likely to respond to fluid bolus(es). Do not delay TXA administration for patients with obvious signs of hemorrhagic shock.
- Prepare the solution just prior to administration. Discard if not used immediately.
- Although there is a theoretical concern, current evidence does not show a significant increase in deep venous thrombosis, pulmonary embolism, myocardial infarction, or stroke with TXA use in published trials.

SIDE EFFECTS

- None known at this time

AUTHORIZATION

EMT: Not authorized

AEMT: Not authorized

Paramedic: Standing order and Medical Control

DOSAGE

Patient Type	Route	Dosage	Maximum Dosage
Adult (≥ 12 years)	IV infusion	1 gram IV over 10 minutes; mix 1 gram in 100 ml NS	1 gram total dose
Pediatric	IV/IO infusion	15 mg/kg IV/IO over 10 minutes; mix 15 mg/kg in 100 ml NS	Consult Medical Control for specific maximum dose

Administration Notes:

- Infuse TXA over 10 minutes. For adult administration, use a 60 gtts tubing for a straight IV stream or a 10 gtts tubing at 100 drops/minute.
- Monitor the patient’s vital signs and hemodynamic status closely during and after infusion.
- Do not delay administration in patients with clear signs of hemorrhagic shock, as early administration improves outcomes.