

DRUG BOX REVIEW FORMAT

GENERIC NAME
(Common Trade Name)

Class:

The category (or categories) of drugs in which this drug is classified.

Action:

The specific effects of the drug on tissues, organs or organ systems.

Onset: *time to onset of drug action*/**Peak:** *time to peak drug concentration in serum*/**Duration:** *length of drug action*

Indications:

The indications for drug use.
Also: Other indications for use, including non-prehospital.

Contraindications:

The conditions for which the drug is not indicated.
May also include *relative contraindications*.

Side Effects:

Common side effects are underlined.

Notes:

Additional information on techniques of administration, drug interactions, assessment post administration, end points of administration, etc.

Route:

The means by which the medication may be administered safely. (approved routes in Central California EMS Agency are underlined)

Dosage/Route:

Approved dosages and routes of administration.

ET Dose (includes Combitube):

As indicated in the *Central California EMS Treatment Protocols* for adults and pediatrics.

Standing Order or Base Contact

Strengths/Size	Unit of Issue	Quantity
Concentration/volume of the prehospital packaging of this drug	Type of package	Number on each ALS Unit

ACETYLSALICYLIC ACID
(Aspirin)

Class:

Analgesic
Antipyretic
Anti-inflammatory
Anti-platelet agent

Action:

Reduces the loss of myocardium in MI.
Inhibits prostaglandin synthesis for anti-inflammatory effect.
Aspirin blocks the formation of Thromboxane A₂, which causes platelets to aggregate.
Aspirin blocks pain impulses in the CNS.

Onset: 5-30 minutes

Peak: 15-20 minutes

Duration: 1-4 hours

Indications:

Chest pain, suggestive of an MI.

Also: Prevention of MI or reinfarction.
Prevention of TIA/CVA

Contraindications:

GI bleeding, ulcer, children with flu-like symptoms.
Hypersensitivity to this drug or non-steroidal anti-inflammatory.

Side Effects:

EENT: Tinnitus – (only in overdoses)
GI: Stomach irritation, nausea, vomiting – (with chronic use)
INTEG: Petechiae (with chronic use)

Notes:

Used to reduce the loss of myocardium in myocardial infarction. Studies show that aspirin prevents progression of MI due to progression of the thrombus. The sooner aspirin therapy is started on a patient with an acute MI, the less damage the patient has from the infarction.
Irreversible platelet aggregation inhibitor, takes 5-7 days after metabolism for body to resume aggregation. Use with caution with those on oral antidiabetic agents. May increase hypoglycemia.

Route:

Oral

Dosage/Route:

Adult Dose: 162 mg or two 81 mg tablets PO (one time dose)
Pediatric Dose: *No local application*

Standing Orders

Strengths/Size	Unit of Issue	Quantity
81 mg Tablet	Bottle	1 Bottle

ACTIVATED CHARCOAL

(Actidose, Aqua, Liqui-Char)

Class:

Chemical/adsorbent

Action:

Blocks toxic substances ingested by forming an effective barrier between any remaining particulate material and the gastrointestinal mucosa, thus inhibiting the gastrointestinal absorption. Also adsorbs an unspecified number of toxins by chemical binding.

Onset: Immediate

Peak/Duration: Not absorbed (excreted in feces)

Indications:

Suspected overdose or ingestion of drugs
Oral poisonings

Contraindications:

GI bleeding
Active seizures or postictal state
Patient that cannot follow commands, cannot sit and sip water with an altered mental status.
No gag reflex
Hydrocarbon ingestion
Caustic ingestion

Side Effects:

GI: Vomiting, nausea, constipation, black stools

Notes:

Ipecac is inactivated if given after charcoal administration.

Ingestions which are likely to cause a rapid decrease in mental status (e.g., tricyclics, inhalants) require Base Hospital contact.

Shake vigorously prior to administration. May need to dilute contents that have settled to the bottom.

If Ipecac has been administered first, allow vomiting to stop before charcoal is given.

Does not absorb cyanide, ethanol, methanol, ferrous sulfate, caustic alkali or mineral acids.

“Gut dialysis” for theophylline, aspirin and phenobarbital.

Activated charcoal is an inert, nontoxic wood material.

Charcoal has not been shown to alter patient survival after ingestion.

Route:

Oral, Nasogastric

Dosage/Route:

Adult Dose: 50 grams PO
Pediatric Dose: Ages 1-12 years – 1 gram/kg PO.
Age under one year: Contact Base Hospital Physician

Standing Orders

Strengths/Size	Unit of Issue	Quantity
50 gm/8 oz	Pre-mixed bottle	2

ADENOSINE

(Adenocard)

Class:

Antiarrhythmic
Edogenous Nucleoside

Action:

Adenosine slows electrical conduction time through the AV node, and can interrupt reentry pathways through AV node.
Stops PSVT by blocking the AV node and usually does not cause negative inotropic effects. Also acts on SA node.
Used in the emergency treatment of PSVT (paroxysmal supraventricular tachycardia).
Adenosine is a “purine nucleoside,” a naturally occurring body nucleic acid. Adenosine usually does not cause change in blood pressure. Adenosine is primarily formed from the breakdown of adenosine triphosphate (ATP).

Onset: Immediate

Peak: Immediate

Duration: Seconds

Indications:

Conversion of PSVT to sinus rhythm, including PSVT in Wolfe-Parkinson-White syndrome.

Contraindications:

Bradycardia, second degree and third degree heart block, or sick-sinus syndrome.
Caution in patients taking digitalis, tegretol or dipyridamole.
Caution in asthmatic patients – potential bronchoconstriction.
Adenosine *is not effective* in converting other rhythms such as atrial fibrillation, atrial flutter, or ventricular tachycardia

Side Effects:

Metallic taste may be noticed by patient.

Affects are usually mild and short lasting.

CNS: Light-headedness, headache.

CV: Conduction delay (asystole) for several seconds, chest pain. Transient arrhythmias (V-tach, V-fib, torsade de pointes) or, facial flushing (18%), palpitations, diaphoresis

RESP: Dyspnea (12%)

GI: Nausea

Notes:

Adenosine should be administered after vagal attempts.

Adenosine is antagonized by methylxanthines (theophylline, caffeine) and may need increased doses or may not respond because of the competition for receptor sites. Converts PSVT to sinus rhythm in approximately 90% of cases. PSVT may recur in up to 25% of patients initially converted by adenosine.

Adenosine may be used in patients with mild chest pain or hypotension (90-100mm Hg).

In unstable patients (i.e., acutely altered mental status, systolic blood pressure 80 mm Hg, congestive heart failure, severe chest pain or shortness of breath, heart rate greater than 250 BPM for ages less than 2 y/o or heart rate greater than 180 BPM in ages greater than 2 y/o) with *PSVT*, synchronized cardioversion is indicated.

Adenosine has a very short half-life, possibly 5-10 seconds, primarily by uptake from erythrocytes and vascular endothelial cells.

Route: Intravenous, Intraosseous

(Continued)

ADENOSINE
(Adenocard)

Dosage/Route:

Adenosine should be given in the IV line port closest to the patient and as proximal to the heart as possible. It should be given as a vigorous rapid IV push over 1 second with a *rapid IV flush of normal saline (20 cc)*. Adenosine may be given in radio failure if ETA to hospital is greater than 15 minutes.

Adult Dose: 6 mg rapid IV push over 1 second with IV line wide open to flush. If patient does not convert in 2 minutes, repeat adenosine with 12 mg rapid IV push over 1 second. If the patient does not convert, a third administration of 12 mg may be administered in 1 minute. **Flush all doses with 20 cc NS.**

Pediatric Dose: 0.1 mg/kg rapid IV. Maximum first dose 6 mg. If no change, repeat in 2 minutes. at 0.2 mg/kg rapid IV push. Maximum single dose 12 mg. **Flush all doses with 10 cc NS.**

Base Contact Required unless in Radio Failure

Strengths/Size	Unit of Issue	Quantity
6 mg/2ml	Single Dose Vial	5

ALBUTEROL SULFATE
(Ventolin, Proventil)

Class:

Bronchodilator/Beta₂ Agonist
Sympathomimetic/Sympathetic Agonist

Action:

Albuterol works by causing relaxation of the bronchial smooth muscle in the bronchial tree and stimulates adrenergic receptors of the sympathetic nervous system. Beta₂ selective.
Prevents exercise-induced bronchospasm.

Onset: 5-15 minutes

Peak: 1-1½ hours

Duration: 3-4 hours

Indications:

Relief of bronchospasm in patients with reversible obstructive airway disease or acute attacks of bronchospasm (i.e., chronic obstructive pulmonary disease, asthma and allergic reactions).
Exercise-related bronchospasm.

Contraindications:

Contraindicated in patients actively seizing or complaint of cardiac chest pain.
Caution in patients with a history of coronary heart disease or arrhythmias.
Caution in patients receiving other sympathomimetic medications (i.e., epinephrine) or a history of using sympathomimetic drugs (i.e., cocaine, amphetamines) within the last 24 hours.

Side Effects:

CV: Tachycardia, hypertension, palpitations
CNS: Tremulousness, anxiety, headache, restlessness
RESP: Albuterol may cause worsening of bronchospasm or coughing

Notes:

Optimal nebulized albuterol delivery to the airways is given by having the patient take long slow deep breaths. Supplemental continuous oxygen should be given in all patients receiving albuterol. Cardiovascular side effects may be worsened in patients taking monamine oxidase inhibitors (MAO) or tricyclic antidepressants.
Tachycardia is not a contraindication to albuterol administration.

Route:

Inhaled/Nebulized

Dosage/Route:

Adult/Pediatric Dose: 2.5 mg/3 cc nebulized albuterol sulfate with standard acorn-type jet nebulizer using pressurized oxygen at a flow rate of 6 L/min. May repeat in 20 minutes.

Standing Orders

Strengths/Size	Unit of Issue	Quantity
2.5 ml/3 cc	Unit Dose	6

AMIODARONE
(Cordarone)

Class:

Class III antiarrhythmic properties, Class I, II, IV effects.

Action:

Prolongs cardiac repolarization. Also has sodium channel blockade, beta adrenergic blockade, and calcium channel blockade effects.

Onset: Immediate

Peak:

Duration: 10-20 minutes

Indications:

Cardiac arrest due to V-fib or V-tach
Patient has been shocked by AICD
Patient has ROSC after AED shock.
Ventricular Dysrhythmias (V-Fib, V-Tach)
A-fib with RVR

Contraindications:

Heart rate less than 80 in patients with a pulse (i.e. ROSC)
2nd and 3rd degree heart block

Side Effects:

CNS: Hypotension, rhythm disturbances, bradycardia, CHF, cardiac arrest, shock, heart block, SIADH
RESP: Respiratory depression, pulmonary toxicity
GI: Vomiting, hepatotoxicity
SKIN: Rash
INTEG: Anaphylaxis
M/S: Rhabdomyolysis
RENAL: Acute renal failure

Notes:

Hold for heart rate less than 80 as Amiodarone may worsen/induce bradycardia.

Route:

Intravenous, Intraosseous, PO

Dosage/Route:

Adult Dose:	<u>Cardiac Arrest (V-fib):</u>	IV/IO: 300 mg (50 mg/ml) IV push.
	<u>ROSC:</u>	IV/IO: 150 mg IV push over 10 minutes, repeat in 5 minutes to a total of 300mg.
	<u>Ventricular Tachcardia with Pulses:</u>	IV/IO: 150 mg IV push over 10 minutes, repeat in 5 minutes to a total of 300mg.

(Continued)

AMIODARONE
(Cordarone)

Pediatric Dose:

1 mo-14 yrs: Cardiac Arrest (V-fib): IV/IO: 5 mg/kg IV push (max dose 300 mg).
 ROSC: IV/IO: 5 mg/kg IV push over 10 minutes, repeat in 5 minutes to a total of 300mg.

 Ventricular
 Tachcardia
 with Pulses: IV/IO: 5 mg/kg IV push over 10 minutes.

<1 month: Not Used

Standing Orders

Strengths/Size	Unit of Issue	Quantity
150 mg, 3 ml (50 mg/ml)	Vial	300 mg minimum

ATROPINE SULFATE

Class:

Anticholinergic (Parasympatholytic)
Antiarrhythmic

Action:

Blocks acetylcholine receptors thereby inhibiting parasympathetic (vagal) stimulation of the SA node, which causes an increase in heart rate and conduction. Enhances conduction through AV node.

- ↑ Heart rate (however, no inotropic effect)
- ↑ Cardiac Output
- ↓ P-R interval

Reduces smooth muscle contractions in stomach, intestinal tract, ureters and bladder.

Antisecretory action causes ↓ sweating, salivation, lacrimation, bronchial mucus and gastric secretions.

Onset: IV immediate

Peak: 2-4 minutes

Duration: 4 hours

Indications:

Hemodynamically significant bradycardias
Asystole
PEA
Organophosphate poisoning or nerve gas poisoning

Contraindications:

Unstable CV status in acute hemorrhage
Tachycardia, hypersensitivity, narrow-angle glaucoma

Side Effects:

CV: Palpitations, tachycardia, hypertension, paradoxical bradycardia following low doses (less than .5 mg), CNS:

Headache, nervousness, weakness, dizziness

GI: Dry mouth with thirst and dysphagia, constipation, heartburn

INTEG: Flushed, dry skin

EENT: Blurred vision, photophobia

GU: Urinary retention

Notes:

Check pupils prior to administration.

Doses less than 0.5 mg can cause paradoxical bradycardia in adults and children.

Do not exceed 3 mg total dosage, except in organophosphate poisoning.

Remove clothing immediately from organophosphate contaminated patients to prevent continued absorption. Use extreme caution to prevent self-exposure. Irrigate patient's body to dilute the chemical.

Enhanced anticholinergic effects may occur with tricyclic antidepressants, Haldol, Procainamide, Quinidine, Antihistamines and Meperidine.

May precipitate V-fib in cardiac patients who are tachycardiac.

Route: Intravenous, Intraosseous, Endotracheal, Intramuscular

Dosage/Route:

ET Dose:

2 mg ET 1/1000 multidose vial (3 dosages = 6 mg max dosage).

Adult Dose: Asystole:

1 mg IVP. Repeat if no change q 3-5 minutes to max 3 mg

PEA:

1.0 mg IVP. Repeat if no change q 3-5 minutes to max 3 mg

Bradycardia (*symptomatic*): 0.5 mg IVP q 3-5 minutes until 3 mg total or improvement.

Pediatric Dose: Bradycardia:

0.02 mg/kg IV/IO – 0.04 mg/kg ET – Minimum 0.1 mg/Maximum 3 mg.

Organophosphate Poisoning:

2 mg IVP every 5 minutes. May increase to 5 mg increments. May try test dose of 0.5mg IV Push. Titrate to bronchial secretions.

Pediatric Dose:

0.05 mg/kg every 20 minutes.

Standing Orders or Base Contact Required unless in Radio Failure, is Call Dependent

Strengths/Size	Unit of Issue	Quantity
1 mg/10 ml	Preload Syringe	4
8 mg/20 ml	Vial	1

BRETYLIUM TOSYLATE
(Bretylol)

Note: Not used in the Central California Protocols

Class:

Antiarrhythmic (Class III)

Action: (Complex – not well understood)

Direct action on the myocardial membrane:

Initial release of norepinephrine causing ↑ BP, ↑ P followed by subsequent block of the release of norepinephrine from peripheral sympathetic nerves.

Spontaneous antifibrillatory effects (“chemical defibrillator”).

Positive inotropic and chronotropic effects.

Bretylium acts to prolong the action potential in normal tissue, tending to prevent reentry from ischemic or infarcted tissue, which tends to normalize electrical transmission between normal/injured myocardium. This may result in a suppression of the reentry phenomenon.

Increase in impulse formation and spontaneous firing rate of pacemaker tissue.

Prolongs repolarization and refractory period, therefore producing an increase in V-fib threshold.

Onset: Immediate with delayed ventricular response to 20 min. **Peak:** 6-9 hours **Duration:** 6-24 hours

Indications:

Ventricular Fibrillation
Refractory to Lidocaine
Ventricular Tachycardia
Refractory to Lidocaine

Contraindications:

None for field use

Also: Ventricular dysrhythmia, post cardioversion.
Ventricular tachycardia with pulse after no response to other therapy.

Side Effects:

CV: Severe hypotension, bradycardia, dizziness, angina, PVCs, transient arrhythmias, transient hypertension
CNS: Headache, involuntary movement, confusion, psychosis, anxiety
GI: Nausea, vomiting (with rapid IV push), diarrhea, pain, anorexia
SKIN: Rash
MS: Weakness, pain in extremities

Notes:

Bretylium is incompatible with all medications.
Keep patient in the supine position to avoid postural hypotension, occurs in 50% of patients.
Effects may increase or decrease when used with quinidine, procainamide or propranolol.
Effects may increase when used with sympathomimetics.

Route: Intravenous, Intraosseous

Dosage/Route:

Adult Dose: V-Fib 500 mg (5 mg/kg) rapid IV push. Repeat 1000 mg (10 mg/kg) q 5-10 min. Additional doses require maximum dosage not to exceed 30 mg/kg.
V-Tach with pulse 500 mg slow IVP (over 8-10 min.).
Pediatric Dose: 5 mg/kg for V-fib.

Strengths/Size	Unit of Issue	Quantity
500 mg/10 ml	Ampules	Not Used in Central California Protocols

CALCIUM CHLORIDE

Class:

Electrolyte

Action:

Replenishes a necessary element (Ca⁺⁺) which is necessary for nerve and muscle function, as well as cardiac function and blood clotting. Increases contractile force (inotrope), prolongs systole, and increases myocardial automaticity.

Onset/Peak: Immediate **Duration:** ½ to 2 hours

Indications:

Hyperkalemia (except when associated with digitalis toxicity)
Calcium Channel blocker toxicity

Also: May be given prior to Verapamil to reduce chances of Hypotension.

 Magnesium intoxication.

 Dialysis patients or history of renal failure (only with hyperkalemia or cardiac arrest).

Hypocalcemia

Suspected hyperkalemia or Ca Channel blocker toxicity with Ventricular Fibrillation, Ventricular Tachycardia with no pulse, or Ventricular Tachycardia.

Contraindications:

Digitalis toxicity
Respiratory failure
Hypercalcemia
Renal or cardiac disease

Side Effects:

CV: Hypotension, bradycardia arrhythmias, cardiac arrest, venous thrombosis

CNS: Headache, confusion, psychosis, brain cell injury

GI: Nausea, vomiting, anorexia

MS: Joint pain

GU: Polyuria

Notes:

Do not mistake for calcium gluconate.

IV line must be flushed between CaCl and NaHCO₃ – to avoid precipitation.

Observe IV site closely. Extravasation may result in tissue necrosis. Slow IV push

Use of Calcium for cardiac arrest has become controversial based upon recent studies on its effects on the CNS.

V-Tach less than 120: Strongly consider diagnosis of hyperkalemia and therefore use of Calcium should be considered.

Do not administer through scalp veins on pediatrics.

Route:

Intravenous, Intraosseous

Dosage/Route:

Adult Dose: 500-1000 mg (10%) IV push. Consider Calcium 250 mg IV prior to Verapamil.

Pediatric Dose: 0.25 ml/kg IVP. Refer to Broselow Tape.

Base Contact Required unless in Radio Failure, is Call Dependant

Strengths/Size	Unit of Issue	Quantity
1 gm/ml (10%)	Preload Syringe	2

Class:

Carbohydrate, Hypertonic Solution

Action:

Six-carbon sugar molecule, which is the principal form of carbohydrate utilized by the body.
Elevates blood glucose level rapidly.
Causes hyperosmolar diuresis → ↓ cerebral edema.

Onset/Peak: Within one minute

Duration: Variable

Indications:

Hypoglycemia
Also: *when associated with hypoglycemia*
- Coma, altered mental status
- Seizures of unknown etiology
- Ingestion/poisoning if coma or altered consciousness and unclear etiology

Contraindications:

Intracranial hemorrhage
Increased ICP
CVA in absence of hypoglycemia

Side Effects:

SKIN: Thrombophlebitis at injection site, tissue sloughing, necrosis with extravasation
ENDO: Hyperglycemia

Notes:

To be given only if altered mental status more severe than disorientation to time or date and blood glucose less than 80 or after evaluating baseline blood sugar.
Utilize large vein for administration to avoid local venous irritation.
Effects may be delayed in elderly patients with poor circulation, those who have had prolonged hypoglycemia.

Route:

Intravenous, Intraosseous

Dosage/Route:

Adult Dose: 25 gram (Dextrose 50%) 50 ml IVP; administer 10 ml/min. (May repeat in 5 minutes if altered mental status persists and blood glucose with repeat fingerstick is less than 80.)
Pediatric Dose: 1 ml/kg IVP (maximum 50 ml)
If less than 2 years old, dilute 50% solution (1 part D50: 1 part NS) ratio 1:1 = D25%.
Note: Diluted solution will double volume.
Example: 10 kg 1 year old = 10 ml/D50 diluted (1:1) with 10ml NS = 20 ml/D25 IVP.
Refer to Broselow Tape.

Standing Orders

Strengths/Size	Unit of Issue	Quantity
25 mg/50 ml	Preload syringe	2

DIAZEPAM
(Valium)

Note: Diazepam is in the EMT-P Basic Scope of Practice.
Not used in the Central California Protocols

Class:

Benzodiazepine/Sedative/Hypnotic/Anticonvulsant

Action:

Diazepam acts on the limbic, thalamic, and hypothalamic regions of the CNS to potentiate the effects of inhibitory neurotransmitters, raising the seizure threshold in the motor cortex. Used during cardioversion and Transcutaneous Pacing to induce amnesia and sedation. Depresses reticular activating system in the brain leading to depression in level of consciousness. Also a sedative and a muscle relaxant.

Onset: Immediate

Peak: Immediate

Duration: 15 minutes – 1 hour

Indications:

Seizures lasting greater than 10 minutes or if in status.
Precardioversion sedation should be considered for all patients unless unconscious.
Also: Alcohol withdrawal, as a muscle relaxant, behavioral emergency.
Ischemic chest discomfort if associated with sympathomimetic abuse (cocaine, crack, crank).

Contraindications:

Hypersensitivity
Shock
CNS depression as a result of head injury
Respiratory depression

Side Effects:

CV: Hypotension, brady/tachycardia (rare), cardiac arrest
CNS: Confusion, drowsiness, lethargy, ataxia, psychomotor impairment
RESP: Respiratory depression
GI: Dry mouth, anorexia
INTEG: Rash
EENT: Blurred vision

Notes:

Smoking increases metabolism of benzodiazepine, monitor the patient for any changes.
Administer Diazepam only while patient is actively seizing.
Assess and monitor respirations, BP, pulse and mental status closely.
Do not mix with other drugs – may precipitate.
Check IV site closely – may cause local venous irritation.
Because of a relatively short duration of action, seizure activity may recur and additional doses may be necessary.
When administered with a narcotic, decrease the dosage.
Cimetidine, ETOH, and CNS depressants enhance sedation.

Route: Intravenous, Intraosseous, Rectal, Endotracheal

Dosage/Route:

ET Dose: If no IV access: 0.1 mg/kg via ET tube (10 mg maximum). If volume less than 1.5 ml, flush with 2 ml NS.
Adult Dose: 0.1 mg/kg slow IVP, not to exceed 10 mg per dose.
5 mg IVP if ischemic chest discomfort is associated with sympathomimetic abuse (cocaine, crank, amphetamines).
Pediatric Dose: 0.1 mg/kg slow IVP not to exceed 10 mg per dose.
If no IV in patient less than 12 years old: 0.5 mg/kg rectally (20 mg maximum) via syringe without needle.
Refer to Broselow Tape.

Strengths/Size	Unit of Issue	Quantity
10mg/2ml	Vial	Not Used in Central California Protocols

DIPHENHYDRAMINE HCL
(Benadryl)

Class:

Antihistamine

Action:

Diphenhydramine is an antihistamine with anticholinergic (drying) and sedative side effects. Suppresses an allergic reaction by blocking histamine H₁ and H₂ receptor sites. Indicated for conditions of excess histamine. Does not reverse histamine-mediated responses. Also slight sedative, antiemetic, antitussive and antispasmodic effects.

Onset: Immediate IV/Unknown IM **Peak:** 1-4 hours **Duration:** 6-12 hours

Indications:

Anaphylaxis
Also: Phenothiazine (dystonic) reactions, mild allergic reaction, motion sickness

Contraindications:

Active bronchospasm
Use with caution in COPD

Side Effects:

CV: Palpitations, tachycardia, hypotension or hypertension
CNS: Drowsiness, headache, restlessness, disturbs coordination (convulsions in OD situations)
RESP: Dries and thickens bronchial secretions, wheezing
GI: Dry mouth, nausea, vomiting
EENT: Blurred vision, tinnitus

Notes:

Assess for dizziness and drowsiness.
Additive CNS depressant effects may occur with alcohol, sedatives, hypnotics, tranquilizers and narcotics.
Monitor airway for thickening bronchial secretions (asthmatics).

Route:

Intravenous, Intramuscular

Dosage/Route:

Adult Dose: 50 mg IVP (over 1 minute) or IM if unable to establish IV
Pediatric Dose: 1 mg/kg slow IVP or IM (50 mg maximum dose)

Standing Orders

Strengths/Size	Unit of Issue	Quantity
50 mg/1 ml	Preload Syringe/Ampule	2

DOPAMINE (Intropin)

Note: Dopamine is in the EMT-P Basic Scope of Practice.
Not used in the Central California Protocols

Class:

Natural Catecholamine
Sympathomimetic

Action:

Varying actions dependent on the dose. Acts primarily on alpha₁ and beta₁ adrenergic receptors.
Common vasopressor which increases systolic BP and pulse pressure while maintaining renal and mesenteric blood flow in therapeutic dosages (less than 20 mcg/kg/min.).

Dopamine is commonly used in the treatment of hypotension associated with cardiogenic shock.

Dopaminergic:

2-5 mcg/kg/min.
Selectively dilates blood vessels to brain, kidneys, heart, and GI tract

Beta:

5-10 mcg/kg/min.
↑ CO by ↑ myocardial contractility and SV and rate (inotropic and chronotropic)

Alpha:

Greater than 10-20 mcg/kg/min.
Peripheral vasoconstriction (also maintains its beta effects).

Onset: Immediate

Peak: Unknown

Duration: 10 minutes

Indications:

Shock non-traumatic (with pulmonary edema)

Also: Septic shock, neurogenic shock (after fluid bolus)

Contraindications:

Hypovolemic shock without adequate volume replacement
V-fib, or ventricular irritability
Tumor of adrenal gland

Side Effects:

CV: Tachycardia, hypertension, ↓ cardiac output, ventricular tachyarrhythmias, palpitations, anginal pain, ↑ O₂ demand

CNS: Headache

GI: Nausea, vomiting

INTEG: Necrosis at injection site with extravasations

Notes:

Dopamine can be deactivated by alkaline solutions such as sodium bicarbonate.

MAO inhibitors and bretylium may potentiate the effect of dopamine.

Dopamine is a potent drug. Monitor BP and P continuously. Observe for decrease in pulse pressure.

Monitor infusion rate closely (utilize mini-drip).

Incompatible with Furosemide.

Observe IV site closely for extravasation and tissue sloughing.

Should not be administered in the presence of severe tachydysrhythmias or ventricular tachycardias.

Dopamine is inactivated by Sodium Bicarbonate, and acidosis decreases effectiveness.

10% increase in heart rate may risk myocardial ischemia. Lidocaine may be helpful in suppression of ectopy.

Route: Intravenous piggyback only

Dosage/Route:

Adult Dose: (Continuous IV drip)

Add 400 mg to 250 ml NS with pediatric tubing (concentration 1600 mcg/ml).

Start at 5 mcg/kg/min. and increase dose every 5 min. until systolic BP = 90 or a maximum of 30 mcg/kg/min.

Pediatric Dose: Refer to Protocol or Broselow Tape

Base Contact Required unless in Radio Failure

Strengths/Size	Unit of Issue	Quantity
400 mg/5 ml	Ampule/Vial Preload Syringe	Not Used in Central California Protocols

EPINEPHRINE

(Adrenalin)

Class:

Natural Catecholamine/Sympathomimetic

Action:

Potent catecholamine with Alpha and Beta effects; Rapid onset (90 sec.) but brief (less than 5 min.) duration if given IV; Effects steady (onset 6-15 min.) and prolonged (15 min.) if given SQ.

Epinephrine causes vasoconstriction in the arterioles of the skin, mucosa, and splanchnic areas, and antagonizes the effects of histamine.

Alpha Effects:

↑ Resp. tidal volume and vital capacity by vasoconstriction of arterioles in lungs (↓ edema)
Vasoconstriction in skin, kidneys, stomach, intestines, liver and pancreas

Beta Effects:

↑ heart rate
↑ force of contraction
↑ AV-node conduction
↑ spontaneous contraction
↑ cardiac output
↑ tidal volume

Beta Effects (Continued):

↑ coronary blood flow
↑ O₂ consumption
↑ myocardial irritability
Bronchodilation
Vasodilation of circulation to heart and skeletal muscle

Onset: SQ 6-15 min./IV immediately

Peak: SQ 30 min./IV 5 min.

Duration: SQ 1-4 hr./IV 5 min.-1 hr.

Indications:

IV:

PEA
Ventricular fibrillation/ventricular tachycardia without a pulse
Asystole
Profound symptomatic bradycardia
Severe Anaphylactic Shock

SQ:

Shortness of breath with bronchospasm (asthma, COPD, patients that are less than 70 years)
Acute allergic reaction (anaphylaxis)
Anaphylactic shock

Contraindications (for patients with pulse, under the following conditions):

Cardiac ventricular dysrhythmias
Pregnancy
Severe hypertension
Coronary artery disease
Tachydysrhythmias
Hypovolemic shock
Chest pain of cardiac origin

Side Effects:

CV: Tachycardia, palpitations, chest pain, hypertension, V-tach, V-fib

CNS: Headache, tremors, anxiety, dizziness, restlessness, convulsions

GI: Nausea, vomiting, anorexia, cramps

INTEG: Pallor, flushing, sweating, painful blanching at SQ injection site

Notes:

Never give Epinephrine IM.

Do not give with Sodium Bicarbonate (inactivated by alkaline solutions, including furosemide).

Use with caution with patient greater than 70 years, or with hypertension.

Monitor Blood Pressure, Pulse and EKG closely.

Be extremely cautious with dosage calculations and administration. (Check type of solution, concentration, dosage and route.)

No epinephrine given for mild allergic reactions.

Route:

Intravenous, IVPB infusion, Intraosseous, Endotracheal, Subcutaneous, Nebulized

EPINEPHRINE
(Adrenalin)

Dosage/Route:

- Adult ET Dose:** 2 mg (1:1000) q 3-5 minutes in code situations.
- Pediatric ET Dose:** 0.1 mg/kg (1:1000) flush with 2 ml NS if less than 1.5 cc of medication
- VF/VT without Pulse: 1:10,000 1 mg (10 ml) IVP. Repeat every 3-5 minutes.
- Asystole: 1:10,000 1 mg (10 ml) IVP. Repeat every 3-5 minutes.
- PEA: 1:10,000 1 mg (10 ml) IVP. Repeat every 3-5 minutes.
- Asthma: 0.01 mg/kg 1:1000 SQ (maximum dose 0.4 mg). May repeat in 15 minutes with Base Hospital Contact.
- Anaphylaxis: Adult Dose: 0.4 mg SQ (1:1000).
Pediatric Dose: 0.01 mg/kg (1:1000) SQ – Maximum single dose 0.4 ml SQ. May repeat in 15 minutes if symptoms persist.
- Anaphylactic shock (severe): Adult Dose: 0.1 mg IV (1:10,000)
Pediatric Dose: 0.025 mg/kg (1:10,000) IV maximum of 1.0 ml. Repeat q 5 min. if symptoms persist.
Adult or Ped max of 4 total IV doses = 0.4 mg (ml).
- Profound shock persists: 1 mg 1:10,000 in **250cc NS** and titrate drip to BP of 100 (30-90 gtts/min.) (0.5-1.5 ml/min.).
- Pediatric Bradycardia: 0.01 mg 1:10,000 IV/IO, 0.1 mg 1/1000 ET
- Refer to Broselow Pediatric Tape

Standing Orders or Base Contact Required, Call Dependent

Strengths/Size	Unit of Issue	Quantity
1:1000 1 mg/1ml	Ampule	4
1:10,000 1 mg/10 ml	Preload Syringe	6
1:1000 mg/ml – 30 ml	Multi-Dose Vial	1

FENTANYL
(Sublimaze)

Class:

Narcotic analgesic/synthetic opioid agonist

Action:

Analgesic with short duration of action.

Minimal histamine release with minimal hemodynamic compromise and minimal nausea/vomiting.

Onset: Immediate IV/IO
7-8 min. IM
1-2min. IN

Peak: IV/IO/IN: 5 min. / IM: 10-12 min.

Duration: 0.5 – 1 hour (all routes)

Indications:

See individual protocols.
Analgesia after ALS airway (see ETT / King Tube procedures.)

Contraindications:

Altered mental status
Shock/hypotension
Allergy to Fentanyl

Side Effects:

CNS: Bradycardia, sedation hypotension. Hypertension and rigid chest syndrome are rare.

RESP: Respiratory depression

GI: Nausea and vomiting

Notes:

Monitor blood pressure, respirations, and mental status carefully.

Be prepared for respiratory depressions. Have equipment to assist respirations, and Naloxone (Narcan) prepared for drug reversal if necessary.

Hypotension after Fentanyl should be treated with fluids.

Use with Caution:

Multi-system trauma

Patients in whom respiratory depression should be avoided (asthma/COPD) SOB

Patients in whom CNS (mental status) depression should be avoided (head injury)

Elderly patients generally require smaller doses and are more susceptible to hypotension.

Side effects are increased by alcohol or drugs that are CNS depressants and other narcotics.

Route:

Intravenous, Intramuscular, Intranasal, PO

Dosage/Route:

Adult Dose: If severe pain, Systolic BP greater 100, and normal mental status.

IV/IM/IN: 25-100 mcg. Repeat every 5 minutes as needed to a total of 100 mcg.

Pediatric: IV/IM/IN: 1 mcg/kg. Repeat every 5 minutes as needed to a total of 100 mcg.

Standing Order or Base Contact Required in Radio Failure, is Call Dependent.

Strengths/Size	Unit of Issue	Quantity
250 mcg in 5 ml	Ampule	100 ug minimum

Class:

Antihypoglycemic Agent/Insulin Antagonist
Pancreatic Hormone

Action:

Glucagon is a protein secreted by the alpha cells of the pancreas.
Causes an increase in blood glucose concentration by converting liver glycogen to glucose (glycogenolysis).
Glucagon inhibits glycogen synthesis. Glucagon exerts positive inotropic action on the heart and decreases renal vascular resistance.
Smooth muscle relaxant of bronchi, esophagus, stomach, duodenum, small bowel, and colon.

Onset of action: 5-20 minutes

Peak: 30 minutes

Duration: 60-90 minutes

Indications:

Hypoglycemia
Altered mental status (known diabetic, only if IV cannot be established and accucheck/chemstrip less than 80)
Status epilepticus (known diabetic only if IV cannot be established and accucheck/chemstrip less than 80)

Contraindications:

Hypersensitivity (allergy to pork or beef protein)

Also: Consider with beta-blocker or calcium channel O.D. with hemodynamic compromise.

Side Effects:

CV: Tachycardia, hypotension
CNS: Headache
GI: Nausea, vomiting
INTEG: Urticaria

Notes:

Exogenous glucagon stimulates release of catecholamines.
To be given if altered mental status and blood glucose with accucheck or chemstrip less than 80.
Use with caution in patients with renal or cardiovascular disease.
Only effective if there are sufficient stores of glycogen in the liver, i.e. will probably not work in severe alcoholic, malnourished patient, or infants.
Diabetic patient usually responds in 15 minutes when given IV, IM.

Route:

Intravenous, Intramuscular

Dosage/Route:

Adult Dose: 1 mg IM. Mix with diluent provided only. No substitution.
Pediatric Dose: Rarely used.

Standing Orders

Strengths/Size	Unit of Issue	Quantity
1 unit of powder plus 1 ml solution (must be reconstituted until clear of precipitate)	Ampule	2

Note: Not used in the Central California Protocols

Class:

Emetic/GI decontaminant

Action:

Induces vomiting in overdoses and poisonings of non-caustic substances.

Action by irritation of stomach mucosa and centrally by stimulating the chemoreceptor trigger zone in the medulla.

Contains cephaeline which produces or causes the emesis.

Onset: 10-30 minutes in most patients

Peak: Unknown

Duration: 20-25 minutes after onset

Indications:

Poison ingestion/Toxic overdose

Pediatric (greater than one year of age) – Oral ingestion in the conscious patient

Significant Iron ingestion and long transport time.

Contraindications:

Coma, shock, seizures

Patients unable to sit upright

Antiemetic poisoning

Petroleum distillate, hydrocarbons, strong acid or base poisoning, caustics

OD that may cause a rapid decrease in mental status (Tricyclic anti-depressant)

Do not Ipecac anyone who has absent gag or if unable to sit unassisted.

Do not Ipecac anyone who is deteriorating rapidly and is unlikely to be awake in 30 minutes (i.e., as mixed Valium and ETOH or phenothiazines).

Do not Ipecac hydrocarbon or caustic ingestions or anyone who is seizing or postictal.

Patients with Nissin fundoplication or Gastric Bypass

Side Effects:

CV: Hypertension, hypotension, arrhythmias, bradycardia

CNS: Headache, convulsions

GI: Diarrhea, stomach cramps

INTEG: Sweating

Notes:

Derived from a Brazilian dried root *cephaelis ipecacuanha*.

Save emesis for inspection and evaluation.

Administer only if within one hour of time of ingestion.

Monitor and assure a patent airway. Do not Ipecac anyone who has absent gag or if unable to sit unassisted.

Do not use Ipecac if less than one year of age.

Do not administer with activated charcoal.

Ipecac is commonly used by bulemics.

Route: Oral

Dosage/Route:

Adult Dose: 30 ml followed by 200-250cc (8oz) water. May repeat in 30 minutes if no response.

Pediatric Dose: 15 ml followed by 200-250cc (8oz) water. May repeat in 30 minutes if no response.

Do not administer if less than 1 year of age!

Base Hospital Order Only

Strengths/Size	Unit of Issue	Quantity
30 ml	Bottles	Not Used in Central California Protocols

ISOPROTERENOL HCL
(Isuprel)

Note: *Not used in the Central California Protocols*

Class:

Synthetic Catecholamine
Beta Adrenergic Agonist
Sympathomimetic (pure beta)

Action:

Acts directly on cardiovascular system (↑ cardiac output) and respiratory stimulation of beta receptors:

Positive chronotrope
Positive inotrope
↑ automaticity
↑ myocardial oxygen consumption with poor coronary perfusion
Vasodilation (↓ PVR) with ↑ preload
Hypertension
Bronchodilation
Relaxation of the GI tract

Onset: Immediate

Peak: Unknown

Duration: 1-2 hours

Indications:

Symptomatic bradycardia (refractory to Atropine)

Also: Bronchial asthma, asystole

Contraindications:

Tachycardia
Hypertension
Cardiogenic Shock
Digitalis toxicity

Side Effects:

CV: Palpitations, tachycardias, hypertension, anginal pain, flushing

CNS: Headache, restlessness, anxiety

GI: Nausea, vomiting, anorexia

GU: Polyuria, dysuria

Notes:

Watch for widening pulse pressure.

Monitor heart rate, ECG (ventricular irritability) and BP continuously.

Incompatible with lidocaine, calcium preparations and sodium bicarbonate.

Use with extreme caution in recent MI (significantly increases myocardial oxygen demand).

IVP: Dilute 1 ml (0.2 mg) to 10 ml with NS – Give 0.02 mg-0.06 mg

SIVP: 1 ml-3 ml over 2 minutes with free flowing IV

IVPB: 1 mg in 250 cc D₅W 2-20 mcg/minute

NOTE: Lidocaine is in the EMT-P Basic Scope of Practice.
Not used in the Central California Protocols

LIDOCAINE
(Xylocaine)

Class:

Antiarrhythmic (Class I-B)
Local Anesthetic

Action:

Decrease ventricular depolarization. Delays ventricular automaticity at the His-Purkinje system. Lidocaine reduces ventricular excitability and raises the ventricular fibrillation threshold.

Direct action on the heart to suppress ventricular arrhythmias without ↓ force of contractions. However, lidocaine does depress the conduction velocity through ischemic tissue and depresses the increased automaticity seen in ischemic tissue. A therapeutic blood level of a 100 mg (*based on a 70 kg patient*) bolus of lidocaine is maintained for approximately 20 minutes.

Onset: 1-2 minutes

Peak: 2-4 minutes

Duration: 10-20 minutes IV

Indications:

Ventricular fibrillation
Ventricular tachycardia
PVCs with frequent couplets or repeated non-sustained V-Tach (three or more PVCs in a row)
Wide-complex tachycardia of uncertain origin
Also: Post-defibrillation or cardioversion

Contraindications:

Hypersensitivity to this drug
Severe AV blocks
Atrial arrhythmias
Heart rate less than 60

Side Effects:

CV: Hypotension, Bradycardia
CNS: Confusion, dizziness, drowsiness, numbness, headache, convulsions in high doses
RESP: Respiratory depression
GI: Vomiting
INTEG: Rash, urticaria
EENT: Tinnitus, blurred vision

Notes:

Suppress cough and gag reflexes.
Beta-blockers decrease metabolism of lidocaine by the liver. Watch for toxicity.
Lidocaine drips are discouraged in the field (except with long transports – greater than 30 minutes) due to difficulty in maintaining a specific drip rate.
If patients are greater than 70 years old, in shock, CHF, liver failure or currently taking tocainide (Tonocard), cut all doses by one-half, after conversion (half dose = 50 mg). Patient weights less than 50 kg receives 1 mg/kg.
Administration requires cardiac monitoring.
Standard dosage for lidocaine is 1-1.5 mg/kg IV.

Route: Intravenous, IVPB Infusion, Intraosseous, Endotracheal, Intramuscular, Subcutaneous

Dosage/Route:

ET Dose: 2% Lidocaine 3.0 mg/Kg preload. This will result in therapeutic levels that last for one hour.
Adult Dose: 100 mg IV/IO push 50 mg/minute, q 5 minutes, max of 300mg
Lidocaine Drip: Pre-mixed bag 1 gm Lidocaine/250 ml D5 at 2 mg/min. (= 30 microdrops/minute)
(Half dose = 1 mg/min. = 15 microdrops/minute)
Converted Dysrhythmia: If converted, 100 mg IV/IO over 2 minutes
Pediatric Dose: 1 mg/kg IVP maximum 50 mg. Refer to Broselow Tape.

Standing Orders or Base Contact Required unless in Radio Failure, is Call Dependent

Strengths/Size	Unit of Issue	Quantity
2% 100 mg/5 ml 1 gm Lidocaine/250 ml D5	Preload Syringe Pre-mixed Bag	Not Used in Central California Protocols

MAGNESIUM SULFATE 50%

Class:

Anticonvulsant
Electrolyte Replacement

Action:

CNS depressant
Acts by raising the blood level of magnesium, thereby decreasing CNS irritability, depressing the irritability of striated skeletal muscle and increasing the seizure threshold.
Anticonvulsant properties produced by decreasing the amount of acetylcholine liberated from motor nerve terminals
→ peripheral neuromuscular blockade.
In excessive dosages, produces vasodilation by ganglionic blockade and direct action on blood vessels.
In excessive dosages, produces respiratory depression by neuromuscular blockade.

Onset: Immediate

Peak: Immediate

Duration: 3-4 hours

Indications:

Eclampsia (seizures). If late pregnancy with hypertension, Midazolam to stop the seizure prior to magnesium.

Also: Refractory V-fib and V-tach
May be used for hypercalcemia with hemodynamic compromise or severe arrhythmia.
May consider for Torsades de Pointes.

Contraindications:

Hypersensitivity
Heart block
Severe renal disease
Caution in digitalized patients

Side Effects:

CV: Hypotension, circulatory collapse, reduced heart rate
CNS: Depression, flushing, drowsiness, hypothermia
RESP: Depression, failure
GI: Thirst, diarrhea
INTEG: Feeling of warmth, sweating

Notes:

Magnesium Sulfate is an optional drug approved by the EMS Authority to use in the expanded EMT-P Scope of Practice.
CNS depressant effects may be increased when used with barbiturates, narcotics and hypnotics.
Observe closely for overdose symptoms: hypotension, heart block, and respiratory paralysis.
Do not leave patient unsupervised – monitor respirations (rate and depth), pulse, EKG and BP.
Calcium chloride should be readily available as an antidote if respiratory depression ensues.
Used mostly as a drug in an interfacility transfer.

Route: Intravenous, Intraosseous, IVPB infusion.

Dosage/Route:

Adult Dose: Eclampsia (seizures): 5 grams in 250 cc NS IV infusion over 20 minutes
Torsades de Pointes: 2 gm IVP over 1-2 minutes

Pediatric Dose: Not indicated locally

Standing Orders

Strengths/Size	Unit of Issue	Quantity
5 gm/10 ml	Preload Syringe	2

MIDAZOLAM HYDROCHLORIDE

(Versed)

Class:

Short-acting benzodiazepine/CNS agent
Sedative-Hypnotic
Anticonvulsant

Action:

Midazolam HCL is a water-soluble benzodiazepine that may be administered for conscious sedation to relieve apprehension or impair memory prior to tracheal intubation or cardioversion.

Midazolam is a CNS depressant with muscle relaxant, anticonvulsant, and anterograde amnesic effects. Intensifies activity of gamma-aminobenzoic acid (GABA), a major inhibitory neurotransmitter of the brain, by interfering with its reuptake and promoting its accumulation at neuronal synapses. This calms the patient, relaxes skeletal muscles, and in high doses produces sleep.

Also provides some retrograde amnesic effects making it useful after cardioversion.

Onset: 3-5 minutes (IV) dose dependent **Peak:** 20-60 minutes **Duration:** 2-6 hours; dose dependent

Indications:

Seizures
Premedication for tracheal intubation or cardioversion

Contraindications:

Hypersensitivity to midazolam
Shock, coma, glaucoma
Chronic renal failure
Concomitant use of barbiturates

Side Effects:

CV: Fluctuations in vital signs, hypotension
CNS: Oversedation, headache, retrograde amnesia, euphoria, drowsiness, coma
RESP: Respiratory depression, respiratory arrest, cough, laryngospasm
GI: Nausea, vomiting, hiccough (diaphragmatic spasm producing a cough/noise)
INTEG: Pain at injection site
EENT: Blurred vision, diplopia (seeing two objects), nystagmus, pinpoint pupils

Notes:

Versed is noted to be 3-4 times as potent per milligram as diazepam.
Most seizures do **not** require treatment with benzodiazepines.

Route:

Intravenous, Intramuscular, Endotracheal, Rectal, Intraosseous

Dosage/Route:

Adult: 0.1 mg/kg, Slow IVP, over 2 min (4 mg max per dose) may repeat once in 10 minutes
0.2 mg/kg, IM if no IV access (8mg max per dose). **May not repeat without Base Contact**
Pediatric: Same as the adult dose.
Elderly: 0.5 mg slow IVP (max 1.5 mg in a 2 min period); Elderly patients age 65 or greater.

Standing Orders

Strengths/Size	Unit of Issue	Quantity
10mg/2ml	Vial	2

NOTE: Morphine Sulfate is in the EMT-P Basic Scope of Practice.
Not used in the Central California Protocols

MORPHINE SULFATE
(Astramorph)

Class:

Narcotic Analgesic
Opioid Analgesic

Action:

Binds with opiate receptors of the CNS. Opioid alkaloid that has a primary effect of analgesia.
Decreases sensitivity to pain (potent opiate derivative).
Causes peripheral vasodilation and ↓ venous return (chemical phlebotomy), ↓ systemic vascular resistance and ↑ sedative effects → ↓ O₂ demands on the heart.
Alters both perception of pain and the emotional response to pain.

Onset: Immediate IV/10-30 min. IM/SQ **Peak:** 20 min. IV/30-60 min. IM/50-90 min. SQ **Duration:** 2-7 hours

Indications:

Chest pain associated with myocardial infarction
Pulmonary edema
Dissecting aneurysm (if hypertensive with chest pain)
Thermal and chemical burns without hemodynamic compromise
Severe isolated extremity trauma without hemodynamic compromise

Contraindications:

Respiratory depression
Asthma/COPD
CNS injury or depression/Increased ICP
Hypersensitivity to this drug
Volume depletion
Undiagnosed abdominal pain
Multisystem trauma

Side Effects:

CV: Hypotension, flushing, tachycardia, bradycardia, shock
CNS: Light-headedness, dizziness, sedation, hallucinations, tremor, seizure, euphoria
RESP: Respiratory depression, apnea, respiratory arrest, bronchospasm
GI: Nausea, vomiting, anorexia, dry mouth
GU: Urinary retention
INTEG: Local histamine release at injection site

Notes:

Effects may be increased when used with alcohol, other CNS depressants, tricyclics or MAO inhibitors.
Administer only if BP greater than 100 systolic. Repeat BP after each dose.
The CNS effects are promptly reversed by Naloxone, but the CV effects (↓ BP) are not reversed – hypotension should be treated with volume replacement.
Monitor VS (P, R and BP) closely – have Naloxone on hand and be prepared to assist ventilations.

Route:

Intravenous, Intraosseous, Intramuscular, Subcutaneous

Dosage/Route:

Adult Dose: 2-5 mg very slow IV every 5 minutes if necessary to a total of 10 mg. May be given IM or SQ.
Pediatric Dose: 0.1 mg/kg trauma or burns with Base Hospital contact.

Standing Orders or Base Hospital Contact Required unless in Radio Failure, is Call Dependent

Strengths/Size	Unit of Issue	Quantity
10 mg/1 ml	Vial	Not Used in Central California Protocols

NALOXONE
(Narcan)

Class:

Opioid Antagonist

Action:

Acts by competing for opiate receptor sites in the brain → antidote for respiratory effects of narcotic-like drugs.

Onset: 1 min. IV, 5 min. IM/SC

Peak: Unknown

Duration: 1-4 hours, dependent on dose/route

Indications:

Ingestion/poisoning – only if suspected narcotic intoxication with altered mental status and respiratory depression
Coma of unknown origin

Contraindications:

Known hypersensitivity
Use with caution in narcotic-dependent patient

Side Effects:

GI: Nausea, vomiting
CV: Hypertension, tachycardia
CNS: Tremor, N/V, diaphoresis, withdrawal (opiate)

Notes:

Naloxone may potentiate some effects of Cocaine.

Naloxone will completely or partially reverse CNS depression caused by the following agents (natural and synthetic):

Morphine	Percodan	Paregoric	Nubain	Darvon (Propoxyphene)
Heroin	Methadone	Codeine	Stadol	Lomotil
Dilaudid	Demerol	Fentanyl	Talwin	Hydromorphone

Will not reverse hemodynamic conditions.

Shorter duration of action than many narcotics – repeated doses may be necessary. Monitor patient closely on long transports. Precipitates withdrawal in addicts (nausea, vomiting, sweating, tachycardia, increased BP, tremulousness) but not a concern if patient is hypoventilating with decreased mental status secondary to narcotic overdose.

Reverses respiratory depression of opiates – not other drug induced or pathological respiratory depression.

Route:

Intravenous, Intramuscular, Intraosseous, Endotracheal, Subcutaneous

Dosage/Route:

Adult Dose: Give 1 mg SQ (prior to IV, if narcotic OD) then (if no improvement) 1 mg IVP (after IV established). Routes include IM, and SQ.

Darvon Overdose:
(Propoxyphene) 2.0 – 4.0 mg IVP.

Pediatric Dose: 0.1 mg/kg (0.025 ml/kg) IVP. Refer to Broselow Tape.

Standing Orders

Strengths/Size	Unit of Issue	Quantity
2.0 mg	Ampule/Preload	3

NITROPASTE
(Nitro-Bid Ointment)

Class:

Vasodilator

Action:

Nitropaste contains a 2 % solution of nitroglycerin in an absorbent paste. Relaxation of vascular smooth muscle and consequent dilation of peripheral arteries and veins. The dilation promotes peripheral pooling thereby decreasing venous return to the heart, reducing left ventricular end-diastolic pressure and pulmonary capillary wedge pressure (preload). Arteriolar relaxation reduces arterial pressure (afterload). Dilation of coronary arteries also occurs.

Onset: 15-60 min.

Peak: Same as onset

Duration: 2-12 hours

Indications:

Angina pectoris
Chest pain associated with AMI
CHF w/ pulmonary edema

Contraindications:

Hypersensitivity
Hypotension
Head injury
Cerebral hemorrhage

Side Effects:

CV: Postural syncope, Reflex tachycardia, Hypotension
CNS: Transient headache
GI: Nausea and vomiting
INTEG: Allergic reaction

Notes:

Other vasodilators may have additive hypotensive effects.

Nitropaste should be spread over 2-4 inch area on skin that is free of hair (chest), and cover with transparent wrap and secure with tape.

The frequency and severity of side effects of nitropaste is usually considerably less than with the preparations because of the slower absorption and less erratic serum levels.

Do not cardiovert/defibrillate on or near nitropaste on the patients chest, paddles may cause arcing.

Route: Transdermal

Dosage/Route:

ET Dose: N/A

Adult dose:

Chest pain: 1 inch (B/P greater than 100)

SOB w/ PE: 1 inch (B/P greater than 100-120), 2 inches (B/P greater than 120)

Pediatric: Not recommended

Standing Orders

Strengths/Size	Unit of Issue	Quantity
Nitropaste 1-3 grams	Single patient Unit Dose	2

ONDANSETRON
(Zofran)

Class:

Antiemetic

Action:

Selective serotonin (5-HT₃) receptor antagonist
Treats and prevents nausea and vomiting

Onset: IV/IM/ODT – 2-5 min.

Peak:

Duration: IV/IM/ODT: 5-6 hours.

Indications:

Nausea/vomiting

Contraindications:

Hypersensitivity to ondansetron
Prolonged QT interval

Side Effects:

GEN: Fever
CNS: Headache, sedation
GI: Diarrhea, dry mouth, constipation
CARD: QT prolongation

Notes:

Monitor cardiovascular status. Rare cases of tachycardia, angina, and transient blindness have been reported.

Route:

Intravenous, Intramuscular, Oral Dissolving Tablet, PO

Dosage/Route:

Adult Dose: IV/IM: 4 mg IV over 2-5 minutes, repeat in 15 minutes
PO: 4 mg, repeat in 15 minutes

Pediatric Dose:

Greater than 1 month,
less than 4 years: IV/IM: 0.15 mg/kg (max 4 mg)

Greater than 4 years PO: 4mg PO

Standing Order or Base Contact Required in Radio Failure, is Call Dependent.

Strengths/Size	Unit of Issue	Quantity
2 ml: 2 mg/ml, total 4mg 4mg	2ml vial Tablet/ODT	4 mg minimum

OXYTOCIN
(Pitocin)

Note: *Not used in the Central California Protocols.*

Class:

Oxytocic Hormone (Synthetic)

Action:

Acts on myofibrils in smooth muscle to induce uterine contractions characteristic of normal delivery. Stimulation of uterine contractions, tamponade exposed postpartum vessels.

Onset: Within 1 minute

Peak: Unknown

Duration: Up to 30 min. after infusion

Indications:

Childbirth; for control of postpartum hemorrhage

Contraindications:

Hypersensitivity
Labor (1st stage)
Fetal distress or presence of second fetus
Toxemia
Placenta previa

Side Effects:

CV: Cardiac arrhythmia, fetal bradycardia, hypotension, hypertension

CNS: Convulsions, coma

GI: Nausea, vomiting, abdominal pain

INTEG: Anaphylaxis

GU: Uterine tetany or rupture

Notes:

Oxytocin stimulates the mammary glands to increase lactation.

Metabolized by the kidney and the liver.

It is essential to assure that the placenta has been delivered and that there is not another fetus present before administering oxytocin.

Utilize fundal massage and baby to breast first as a means of controlling vaginal bleeding.

Monitor maternal VS every 15 minutes. (Watch for dysrhythmias, hypertension, transient usually related to inductions.)

Incompatible with all drugs in IV solution.

Overdosage can cause uterine rupture.

When given rapidly in large amounts, may cause ↓ PVR and hypotension.

Route:

Intravenous, Intramuscular, IVPB Infusion

Dosage/Route:

Adult Dose: 20 units added to 1000 ml LR run at a rate not to exceed 250 cc/hr.

Consider 10-20 units IM if unable to start IV.

Strengths/Size	Unit of Issue	Quantity
10 units/1 ml	Ampule	Not Used in Central California Protocols

POTASSIUM CHLORIDE
(KCL)

Note: EMT-Ps may monitor IV solutions containing KCL not greater than 20 meq/L. Not carried in drug box.

Class:

Electrolyte Supplement

Action:

Maintains electrolyte balance.
Regulates nerve conduction and muscle contraction (especially cardiac).
Participates in carbohydrate utilization and protein synthesis.
Maintains acid-base balance.

Onset: Immediate

Peak: Immediate

Duration: Unknown

Indications:

Treatment of potassium deficiency.
Potassium (K⁺) maintenance in NPO patients

Contraindications:

Renal failure
Hyperkalemia

Side Effects:

CV: Dysrhythmias, cardiac arrest, respiratory depression
CNS: Muscular paralysis, paresthesias of extremities
GI: Nausea, vomiting, diarrhea, abdominal pain
Other: Hyperkalemia, venous thrombosis, post infusion phlebitis

Notes:

Infusions containing KCL may only be monitored.
EMT-Ps are not allowed to start or add KCL to IV solutions.
Monitor EKG for cardiac dysrhythmias.
May induce cardiac arrest if given as IV bolus.

Dosage/Route:

Adult Dose: Usual dose 10-40 meq added to main IV solution.

NOTE: Paramedics can only monitor IV solutions containing KCL not greater 20 meq/L.

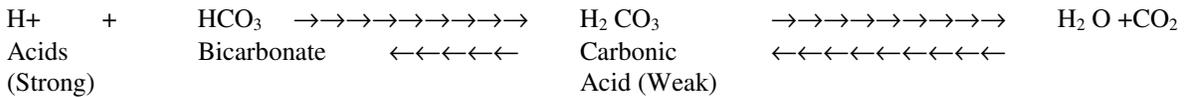
SODIUM BICARBONATE

Class:

Alkalotic Agent
Electrolyte

Action:

Sodium bicarbonate reacts with hydrogen ions (H+) to form water and carbon dioxide and acts by buffering metabolic acids. Buffers the acids present in the body during and after severe hypoxia and/or inadequate tissue perfusion.



Onset: Immediate **Peak:** Immediate **Duration:** Unknown

Indications:

Severe hyperkalemia with dysrhythmia producing hemodynamic compromise.

Prolonged cardiac arrest (medical or trauma)
Tricyclic ingestion with life-threatening dysrhythmia
DKA

Consider: Metabolic acidosis associated with vascular collapse, salicylate poisoning after volume challenge, severe ASA poisoning

Contraindications:

None for field use.

Side Effects:

- CNS: Dizziness, headache, irritability, twitching, weakness, brain cell injury, seizures
- RESP: Pulmonary edema, hypoventilation
- GI: Gastric distention, anorexia, cramps, nausea, vomiting
- GU: Renal calculi, impaired renal function, dehydration
- MS: Muscle cramps, pain, tetany
- INTEG: Tissue sloughing at injection site with extravasation

Notes:

Correct dosage is essential to avoid overcompensation of pH abnormalities.
Monitor ABCs during administration.
Flush IV line before and after administration (catecholamines will be inactivated, precipitate will form with Ca⁺⁺).
When administered, must be accompanied by adequate ventilation and oxygenation.
Do not administer to resuscitated patients in the field who have a pulse, even though respiratory arrest persists.
May worsen CHF.

Dosage/Route:

Adult Dose: In arrested patients: Consider in patients with hyperkalemia, tricyclic ingestions – 1 mEq/kg IV.
Pediatric Dose: 1 meq/kg (Dilute 1:1 to age 6 months; Maximum 2 amps – IV push. Refer to Broselow Tape.)
Not indicated in paramedic protocols.

Base Contact Required unless in Radio Failure, is Call Dependant

Strengths/Size	Unit of Issue	Quantity
44.6-50 meq/50 ml	Preload Syringe	3

TERBUTALINE SULFATE
(Brethine, Bricanyl, Brethaire Inhaler)

Note: Terbutaline is in the EMT-P Basic Scope of Practice.
Not used in the Central California Protocols.

Class:

Bronchodilator
Synthetic Sympathomimetic
Tocolytic

Action:

Decreases uterine contractions in preterm labor.
Synthetic adrenergic stimulant with selective B₂ and some alpha effects. Exerts preferential effect on bronchial smooth muscle to relax the smooth muscle and relieve bronchospasm. Effects similar to epinephrine with less cardiac effects and longer duration of action.
Relaxes smooth muscle of vascular supply to skeletal muscles and uterus, thus increasing blood supply to those areas.

Onset: 5 min. SQ

Peak: 30-60 min. SQ

Duration: 90 min. – 4 hrs. SQ

Indications:

Acute Asthma
COPD/Bronchitis
Preterm labor

Contraindications:

Hypersensitivity to sympathomimetic amines
Severe hypertension
Cardiac arrhythmias
Cardiac chest pain

Side Effects:

GI: Nausea, vomiting
CV: Palpitations, tachycardia, hypertension
CNS: Tremors, anxiety, muscle cramps, drowsiness, headache
RESP: Rash, dry bronchospastic cough (rarely)

Notes:

Beta blockers antagonize terbutaline.
Use with caution in patients with hypertension, coronary artery disease, cardiac arrhythmias, CHF, diabetes and seizures.
Protect from light. Do not use if discolored.
Tolerance may develop with prolonged use.
Monitor EKG.
Tachycardia is not a contraindication to using Terbutaline.
Used to reduce pre-term contractions in pregnancy.

Route:

Adult Dose: 0.25 mg SQ. May repeat one time in 20 minutes.
Inhaler – 1 puff. May repeat one time in 60 seconds.

VERAPAMIL HCL
(Isoptin, Calan)

Class:

Calcium Channel Blocker

Action:

Acts by inhibition of Ca⁺⁺ ions influx in cardiac and smooth muscle cells during contraction which decreases myocardial contractility. Inhibits reentry during PSVT. Verapamil decreases atrial automaticity, reduces AV conduction velocity, and prolongs AV nodal refractory period.
Decreases the rate of ventricular response.
Decreases myocardial oxygen demand.
Peripheral vasodilation (↓ afterload).
Coronary artery and arteriole dilation.

Onset: 1-3 minutes

Peak: 1 – 3 minutes

Duration: 1-6 hours

Indications:

Supraventricular tachycardia (PSVT)
Atrial fibrillation with rapid ventricular response.

Also: Atrial flutter with rapid ventricular response, angina (prinzmetal's, crescendo, preinfarction and exertional)

Contraindications:

AV Block
Sick sinus syndrome
L ventricular dysfunction
Severe Hypotension/Cardiogenic Shock
Severe CHF/pulmonary failure
Atrial Fibrillation with Wolfe-Parkinson-White Syndrome

Side Effects:

CV: Hypotension, bradycardia, peripheral edema, dizziness, tachycardia, CHF, 3rd degree heart block, asystole
CNS: Dizziness, headache
GI: Nausea, constipation, vomiting

Notes:

Verapamil is an optional drug approved by the EMS Authority to use on the expanded EMT-P Scope of Practice.
Antihypertensives may enhance hypotension.
May cause heart failure in patients on beta blockers.
Do not mix with any drugs in any manner.
Monitor EKG continuously for arrhythmias, ventricular rate, increasing PR interval or dropped beats and bradycardia.
Monitor BP closely.
Use extreme caution on patients receiving beta blockers (propranolol, nadolol, timolol, etc.).
Vagal maneuvers after administration may convert SVT.
Ca⁺⁺ may blunt hypotensive effects of verapamil.

Route:

Intravenous

Dosage/Route:

Adult Dose: 5 mg IV over 2 minutes. (If patient greater than 50 years, give over 3 minutes). Repeat dose in 5 minutes if pulse rate and symptoms do not improve. Consider Calcium Chloride 250 mg IV prior to Verapamil.
Pediatric Dose: Not recommended in prehospital.

Base Contact Required

Strengths/Size	Unit of Issue	Quantity
5 mg/2 ml	Ampule/Preload Syringe	2