

CIRCULATION / SHOCK PROTOCOLS

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CIRCULATION / SHOCK

SHOCK GUIDELINES

TYPES OF SHOCK	SIGNS AND SYMPTOMS
ANAPHYLACTIC SHOCK	<ul style="list-style-type: none"> • Warm Burning Feeling • Itching • Rhinorrhea • Hoarseness / Stridor • Wheezing • Shock • Severe Respiratory Distress • Altered LOC / Coma • Cyanosis • Pulmonary Edema • Facial / Airway Edema • Urticaria / Hives • Dyspnea
CARDIOGENIC SHOCK	<ul style="list-style-type: none"> • Cool, Clammy Skin – Mottled • Altered Mental Status • Anxiety / Restlessness • Weakness • Difficulty Breathing • Hypotension • JVD • Decreased Urine Output
HYPOVOLEMIC SHOCK	<ul style="list-style-type: none"> • Tachycardia • Weak, Thready Pulse • Hypotension with Narrow Pulse Pressure • Hypotension or Falling Systolic B/P • Pale Skin • Clammy or Dry Skin • Dyspnea • Altered LOC/ Coma • Decreased Urine Output • Restlessness • Irritability
NEUROGENIC SHOCK	<ul style="list-style-type: none"> • Evidence of Trauma (lacerations, bruising, swelling, deformity) • Normal or Bradycardic HR • Hypotension with a Narrow Pulse Pressure • Compromise in Neurological Function • Normal or Flush Skin Color • Warm, Dry Extremities • Peripheral Vasodilation
SEPTIC SHOCK	<ul style="list-style-type: none"> • Tachycardia • Hypovolemia • Hypotension with a Narrow Pulse Pressure • Dehydration • Altered LOC / Coma • Dyspnea • Febrile • Signs of Infection • Hx of Infection (UTI, Pneumonia, etc.)

CIRCULATION / SHOCK

SHOCK / KEY POINTS

HISTORY	SIGNS AND SYMPTOMS	DIFFERENTIAL DIAGNOSIS
<ul style="list-style-type: none"> Blood loss - vaginal or gastrointestinal bleeding, AAA, Trauma Fluid loss - vomiting, diarrhea, fever Infection Cardiac ischemia (MI, CHF) Medications Allergic reaction Pregnancy 	<ul style="list-style-type: none"> Restlessness, confusion Weakness, dizziness Weak, rapid pulse Pale, cool, clammy skin Delayed capillary refill Hypotension Coffee-ground emesis Tarry stools 	<ul style="list-style-type: none"> Shock <ul style="list-style-type: none"> Hypovolemic Cardiogenic Septic Neurogenic Anaphylactic Ectopic pregnancy /AAA Dysrhythmia Pulmonary embolus Tension pneumothorax Medication effect /overdose Vasovagal Physiologic (pregnancy)

KEY POINTS

- Exam: Mental Status, Skin, Heart, Lungs, Abdomen, Back, Extremities, Neuro
- Hypotension can be defined as a systolic blood pressure of less than 90.
- Consider performing orthostatic vital signs on patients in nontrauma situations if suspected blood or fluid loss.
- Consider all possible causes of shock and treat per appropriate protocol.

Anaphylactic Shock

- Sudden, severe allergic reaction characterized by sharp drop in B/P, urticaria and breathing difficulty caused by exposure to a foreign substance.
- Routine assessment and supportive care of the patient's respiratory and cardiovascular systems is required.
- Do not confuse epinephrine 1:1000 and 1:10000
- Treat patients with a history of anaphylaxis aggressively.
- Contact Medical Control when using epinephrine for patients over forty years of age.
- Use caution when using epinephrine for patients with a heart rate greater than 120 bpm.
- If bee sting, remove stinger (scrape, don't squeeze it).

Cardiogenic Shock

- Circulatory failure is due to inadequate cardiac function.
- Be aware of patients with congenital defects.
- Cardiogenic shock exists in the prehospital setting when an MI is suspected and there is no specific indication of volume related shock.
- Pulmonary Edema, CHF, AMI, PE may cause cardiogenic shock.
- Marked, symptomatic tachycardia and bradycardia can also cause cardiogenic shock.

Hypovolemic Shock

- Shock caused by decreased blood volume
- Patients suffering from hemorrhagic shock secondary to trauma, should be treated under the Trauma Criteria and should be rapidly transported to the nearest appropriate facility.
- Initiate a second large bore IV for all patients in hypovolemic shock.

Neurogenic Shock

- Caused by sudden loss of the sympathetic nervous system signals to smooth muscle in vessel walls leading to a decrease in peripheral vascular resistance and decreased B/P
- To be considered in spinal cord and head trauma.
- Cushing's Reflex is a sign of increased ICP. Cushing's Reflex is a hypertension, bradycardia, and irregular respirations.

Septic Shock

- Be alert for septic shock in the elderly.
- Caused by overwhelming infection

CIRCULATION / SHOCK

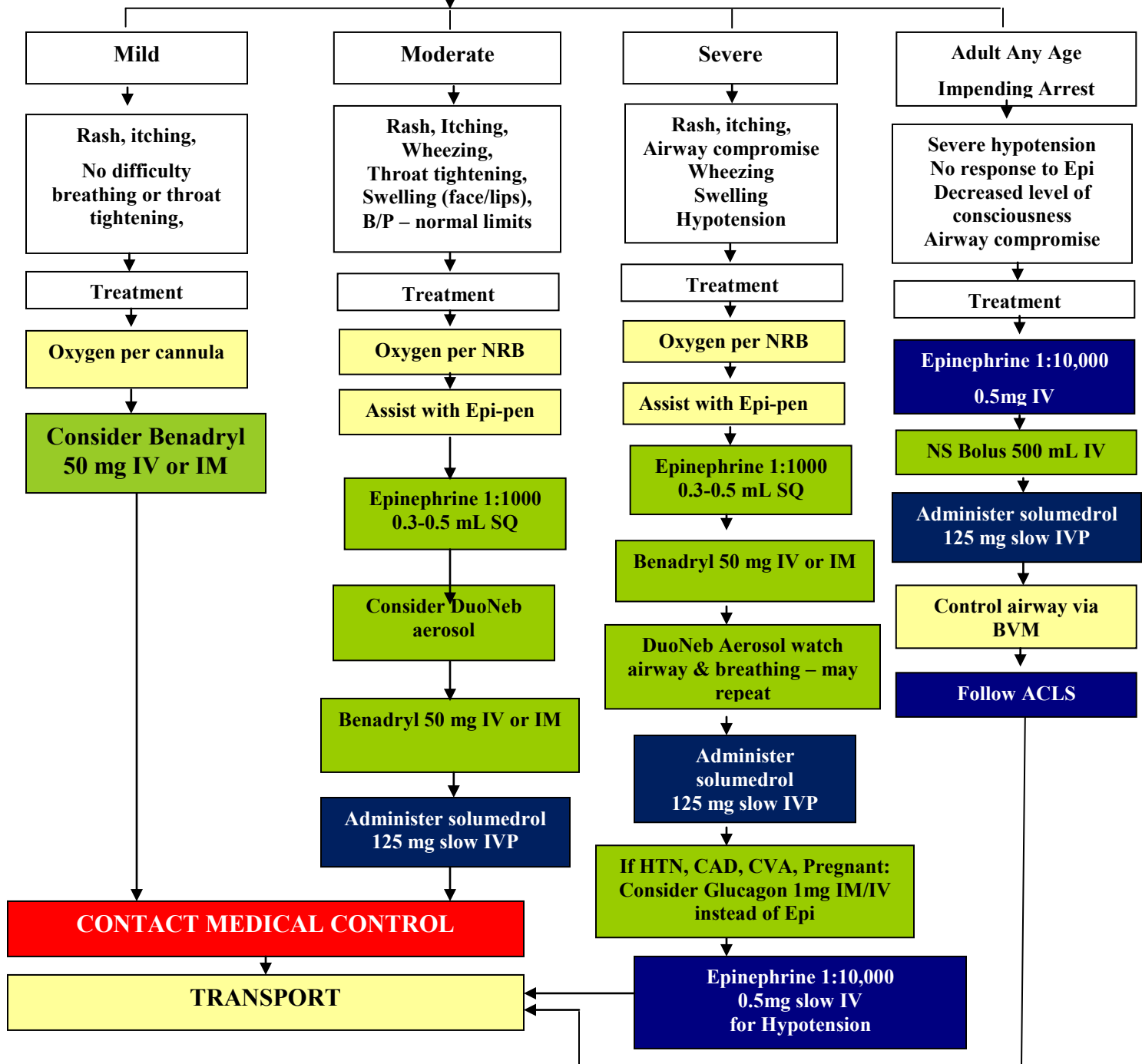
ANAPHYLACTIC SHOCK

UNIVERSAL PATIENT CARE PROTOCOL

Apply Cardiac Monitor and Assess Vitals

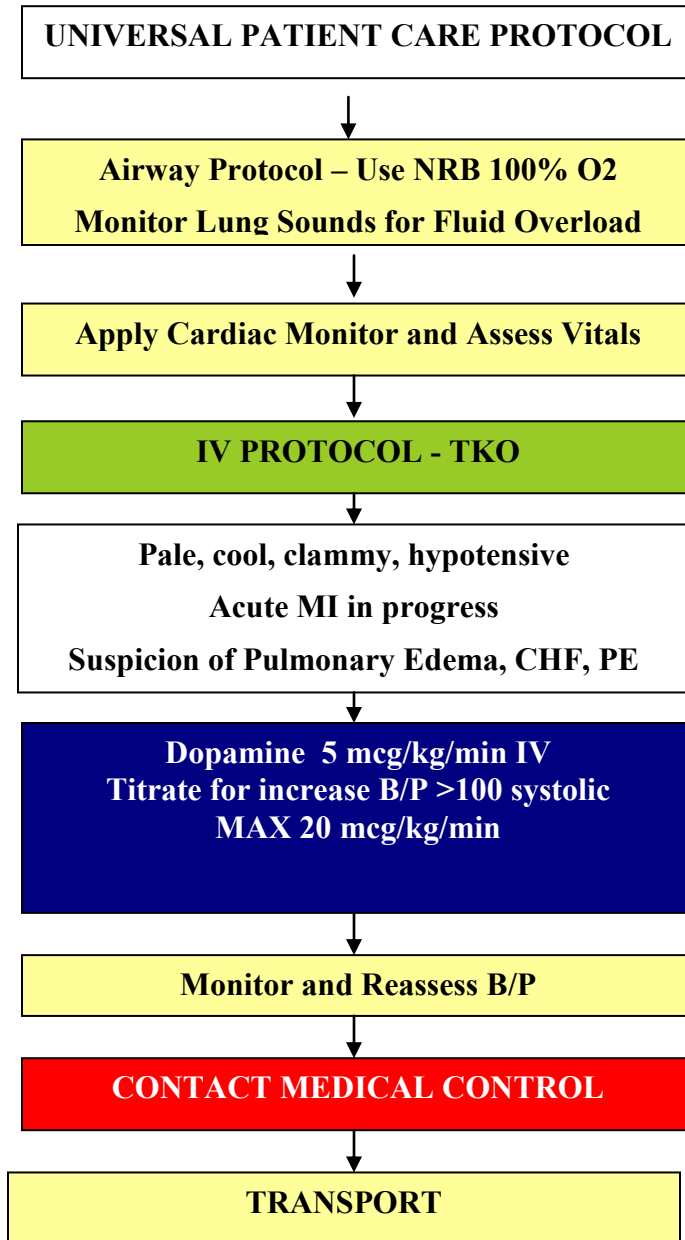
IV PROTOCOL

B	EMT – B	B
I	EMT – I	I
P	EMT – P	P
M	MED CONTROL	M



CIRCULATION / SHOCK

CARDIOGENIC SHOCK



B	EMT – B	B
I	EMT – I	I
P	EMT – P	P
M	MED CONTROL	M

Dopamine Simple calculation for approx 5 mcg/kg/min (must be 1600 mcg/ml concentration)
 *Take the Patients weight in lbs and remove the last digit (175lbs = 17)
 * Subtract 2 from that figure (17-2=15)
 *This gives you the number of drops per min using a 60gtts set. (titrate to desired effect)
 Example: 175lbs patient. 175 remove the 5 is 17
 17 – 2 = **15 drops per min** (approx 5 mcg/kg/min)

CIRCULATION / SHOCK

NON-TRAUMATIC HYPOVOLEMIC AND NEUROGENIC

UNIVERSAL PATIENT CARE PROTOCOL

Airway Protocol
Monitor Lung Sounds for Fluid Overload

Apply Cardiac Monitor and Assess Vitals
Apply Oxygen via NRB or use ResQGard

IV PROTOCOL

B	EMT – B	B
I	EMT – I	I
P	EMT – P	P
M	MED CONTROL	M

Non - traumatic
Hypovolemic Shock

Neurogenic Shock

If hypotensive and breathing adequately
Apply the ResQGard

Consider Spinal
Immobilization procedure if

NORM
SALINE BOLUS
500 mL IV
(If B/P < 100
Systolic)

NORM
SALINE BOLUS
500 mL IV
(If B/P < 100
Systolic)

If hypotensive and breathing adequately
Apply the ResQGard

Check Glucose
Level

Check Glucose Level

Monitor and
Reassess B/P

B/P < 100 Systolic

NORM
SALINE BOLUS
500 mL IV
(If B/P < 100
Systolic)

Treatment per
Trauma Protocol if
Appropriate

Monitor and Reassess B/P

CONTACT MEDICAL CONTROL

TRANSPORT

CIRCULATION / SHOCK

SEPTIC SHOCK

B	EMT - B	B
I	EMT - I	I
P	EMT - P	P
M	MED CONTROL	M

UNIVERSAL PATIENT CARE PROTOCOL

Airway Protocol
Monitor Lung Sounds for Fluid Overload

Apply Cardiac Monitor and Assess Vitals
Apply Oxygen via NRB or use ResQGard if Hypotensive

IV PROTOCOL

Identify if the patient has SIRS (**)

****SIRS – Systemic Inflammatory Response System**

Patient has 2 or more of the following:

- Temp >38 C (100.4 F) or <36 C (96.8 F)
- Heart Rate >90
- Respiratory Rate >20 BPM or PaCO₂ <32mmHg

If Yes:

Does Patient have a prior history of any of the following: Pneumonia, Urinary Tract Infection, Cellulitis, Septic Arthritis, Diarrhea, ABD pain, Wound Infection, Decubitus ulcer, Meningitis, Indwelling Device, Fever

If Yes, Patient has Sepsis
DOES THE PATIENT HAVE SEVERE SEPSIS ?

Are any of the following present and new to the patient?

- BP ≤ 90
- Oxygen Sat ≤ 90
- No urine output in the last 8 hours
- Prolong Bleeding from the gums
- Lactate levels ≥ 4

If Yes - Patient has Severe Sepsis
Begin Resuscitation

APPLY ResQGard for hypotension
if not already done

IV/IO FLUID RESUSCITATION
1 liter to start or 20 cc/kg

Still Hypotensive ?? Dopamine 5 mcg/kg/min IV
Titrate for increase B/P >100 systolic
MAX 20 mcg/kg/min

CONTACT MEDICAL CONTROL

Advise that you have a patient with severe sepsis

No Organ Dysfunction
Sepsis is likely, but severe sepsis is unlikely
Continue Current Treatment

CONTACT MEDICAL CONTROL

TRANSPORT

MEDICATIONS

DIPHENHYDRAMINE HCL (*Benadryl*)

I	EMT – I	I
P	EMT – P	P

<i>ACTIONS</i>	Antihistamine Sedative Inhibits motion sickness (antiemetic)
INDICATIONS	Anaphylactic shock and severe allergic reaction Acute dystonia Nausea/vomiting (contact Medical Control) Extrapyramidal reaction (Parkinson-like movement disorders)
CONTRAINDICATIONS	Known hypersensitivity / Allergy Pregnancy or lactating
PRECAUTIONS	Avoid the use of Diphenhydramine in nursing mothers May induce vomiting Carefully monitor patient while awaiting for medication to take effect (effect of medication begins 15 minutes after administration)
SIDE EFFECTS	Drowsiness, confusion Blurring of vision Dry mouth Wheezing; thickening of bronchial secretions Hypotension
ADULT DOSAGE	<u>Allergic Reaction or Anaphylaxis</u> 25-50 mg IV/IO/IM
PEDIATRIC DOSAGE	<u>Allergic Reaction or Anaphylaxis</u> 1 mg/kg (without hypotension) IV/IO/IM

MEDICATIONS
DOPAMINE (Intropine)

P	EMT – P	P
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ACTIONS	Alpha and beta adrenergic receptor stimulator Dopaminergic receptor stimulator Dilates renal and mesenteric blood vessels Vasoconstriction Arterial resistance Increases cardiac output Increases preload
INDICATIONS	Cardiogenic shock Distributive Shock Cyanide poisoning (contact Medical Control)
CONTRAINDICATIONS	Known hypersensitivity /Allergy Hypovolemic hypotension VF or VT
PRECAUTIONS	Do not mix with bicarbonate, dopamine may be inactivated by alkaline solutions Extravasation may cause tissue necrosis
SIDE EFFECTS	Ectopic beats, palpitations Tachycardia, angina Nausea/vomiting VF or VT Dyspnea Headache
ADULT DOSAGE	2 -20mcg/kg/min IV drip. Start 5 micrograms/kg/minute IV/IO infusion, titrate to effect

Simple calculation for approx 5 mcg/kg/min (must be 1600 mcg/ml concentration)
 *Take the Patients weight in lbs and remove the last digit (175lbs = 17)
 * Subtract 2 from that figure (17-2=15)
 *This gives you the number of drops per min using a 60gtts set. (titrate to desired effect)

Example: 175lbs patient.
 175 remove the 5 is 17
 17 – 2 =**15 drops per min** (approx 5 mcg/kg/min)

MEDICATIONS
DuoNeb

I	EMT – I	I
P	EMT – P	P

ACTIONS	<p>(Albuterol) Parasympatholytic bronchodilator Dries respiratory tract secretions</p> <p>(Ipratropium – Atrovent) B₂ selective bronchodilator Increases HR</p>
INDICATIONS	<p>Asthma exacerbation COPD exacerbation Patients that have used their prescribed inhaler more than once Pulmonary edema with wheezing</p>
CONTRAINDICATIONS	<p>Known hypersensitivity /Allergy Allergy to peanuts Acute myocardial infarction Arrhythmias</p>
PRECAUTIONS	<p>Cardiovascular disease Hypertension history CHF</p>
SIDE EFFECTS	<p>Palpitations Anxiety Nausea Dizziness</p>
ADULT DOSAGE	Unit dose inhaled via nebulizer. May repeat as needed

MEDICATIONS							
EPINEPHRINE (Adrenaline)							
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I	EMT – I	I					
P	EMT – P	P					
ACTIONS	Alpha and Beta adrenergic agonist Bronchodilation Increases heart rate and automaticity Increases cardiac contractility Increases myocardial electrical activity Increases systemic vascular resistance Increases blood pressure						
INDICATIONS	Cardiac arrest Allergic reaction/Anaphylaxis Respiratory distress Acute Asthma Pediatric Bradycardia						
CONTRAINDICATIONS	Hypersensitivity Tachycardia Hypertension Hypothyroidism Angina / Chest pain Coronary artery disease						
PRECAUTIONS	Pregnancy Blood pressure, pulse, and EKG must be routinely monitored						
SIDE EFFECTS	Palpitations, ectopic beats, tachycardia Anxiety / Tremors Hypertension VF / VT Angina						
ADULT DOSAGE	<p><u>Asthma and Anaphylaxis</u> Mild Reaction (1-1,000) 0.3-0.5mg SQ Consider 1:1000 2mg mixed with 1ml NS in nebulizer for Asthma</p> <p><u>Severe Anaphylaxis</u> (1:10,000) 0.5 mg slow IV/IO over 5 minutes - EMT-P Only</p> <p><u>Cardiac Arrest</u> 1:10,000 1 mg IV/IO every 3-5 minutes – EMT-P Only</p>						
PEDIATRIC DOSAGE	<p><u>Asthma and Anaphylaxis</u> Mild Reaction Ages 10-16 yrs (1:1,000) 0.03 mg/kg SQ Under 10 yrs (1:1,000) 0.01mg/kg SQ May use 1:1000 2mg mixed with 1ml NS in nebulizer aerosolized</p> <p><u>Severe Anaphylaxis Pending Arrest</u> Ages 10-16 yrs (1:10,000) 0.01mg/kg IV/IO over 5 minutes – EMT-P Only</p> <p><u>Cardiac Arrest</u> 1:10,000 0.01 mg/kg IV/IO push 0.1ml/kg – EMT-P Only or 0.1 mg/kg 1:1000 ETT 0.1ml/kg – EMT-P Only</p>						
KEY POINTS	<p>Administer SQ dose prior to contacting Medical Direction. IV dose in non-cardiac patient consult Medical Direction</p>						

MEDICATIONS**GLUCAGON**

I	EMT - I	I
P	EMT - P	P

ACTIONS	Accelerates the breakdown of glycogen to glucose in the liver, causing an increase in blood glucose level Relaxes smooth muscle of GI tract
INDICATIONS	Hypoglycemia when IV/IO is not able to be established and oral glucose is contraindicated Esophageal obstruction Beta Blocker overdose
CONTRAINDICATIONS	Known hypersensitivity Pheochromocytoma
PRECAUTIONS	Glucagon is only effective in patients with sufficient stores of glycogen Use caution in patients with renal or cardiovascular disease Glucagon can be administered on scene, but do not wait for it to take effect
SIDE EFFECTS	Nausea/Vomiting
ADULT DOSAGE	1mg IM for Hypoglycemia 2mg IV/IO/IM in esophageal foreign body obstruction 2 – 4mg IV/IO for hypotension / bradycardia in Betablocker overdose and Calcium Channel overdose
PEDIATRIC DOSAGE	<20kg give 0.5mg/kg IM >20kg give 1mg IM
KEY POINTS	Response is usually noticed in 5-20 minutes Glucagon is NOT a substitute for D25, or D12.5. IV must be attempted prior to administering Glucagon

MEDICATIONS**METHYPREDNISOLONE (Solumedrol)****P** **EMT – P** **P**

ACTIONS	Anti-inflammatory steroid
INDICATIONS	Anaphylaxis Asthma COPD
CONTRAINDICATIONS	NONE in emergency setting
SIDE EFFECTS	GI bleeding Prolonged wound healing Suppression of natural steroids
ADULT DOSAGE	125 mg IVP
PEDIATRIC DOSAGE	1-2 mg/kg IVP
KEY POINTS	