

INTERNATIONAL
IV NUTRITIONAL THERAPY
GLOBAL PHYSICIAN EDUCATION

EMERGENCY

Conditions/diseases that can and do occur during IV therapy treatment

Incident and Emergency Protocol

The following procedures are steps that the staff at your clinic will be trained in.

In the event that a situation occurs in the clinic requiring immediate attention by a staff doctor.

All personnel will become familiar with the location of the emergency equipment within the clinic.

1. Emergency equipment box:
Tackle/tool Box located in the IV room.
2. Oxygen tank in the IV room.
3. IV pole

Call to the Incident

1. Primary caretaker of the patient will remain with the patient during the incident.
2. Dr. (Name) will be called to all incidents.
3. All incidents will be attended by two staff doctors.
4. RN/Medical Assistants will attend all incidents.
 - a. Obtain emergency box & O2 if needed.
 - b. Record incident on incident report form.
 - c. Oversee all other patients in clinic.

5. Receptionists

- a. Ensure doctors are aware of incident
- b. Perform medical assistant duties 1-3 if they are not in the clinic
- c. Remain in contact with the doctor to call 911 if needed
- d. Meet the ambulance
- e. Reassure clinic patients

6. Medical Students

- a. Attend all incidents
- b. Record incident
- c. Oversee all other clinic patients until doctors return
7. All incidents will be reviewed within 24 hours with all staff involved.
A review of the incident will take place at monthly staff meetings.
8. A copy of all incident reports will be kept in the patient's file and the Incident File.

Inspection of Emergency Kit:

- The emergency kit will be inspected once a month. Each staff doctor will be assigned to inspect the kit on a rotating basis. This will ensure that all staff doctors are familiar with the kit contents.
- A label will be placed on the outside of the gray tackle box. The label will contain the inspection date, expiration dates of supplies and the inspector's initials.
- The O2 tank will be checked every month and refilled as needed.

CONT

Procedure for use of oxygen:

Procedure for turning on tank:

- Turn valve on top of tank counter-clockwise to open tank.
- Turn green knob on side of tank to "on" position (indicated by arrows) to regulate.
- Flow should be greater than or equal to 5 liters/min. Caution with emphysema
- Face mask or nasal cannula hose is attached to tank

To turn tank off:

- Turn valve on top of tank clockwise until it stops.
- Turn green knob off.

CONT

**WARNING: NO SMOKING
IN AREA WHERE
OXYGEN IS STORED OR
USED**

Management of oxygen in your clinic:

- Monthly inspection of oxygen equipment should take place.
 - Volume of O2 in tank
 - Clean unused mask and nasal cannula are available
 - Documentation of assessment
 - Assign a staff person to this duty

CONT

INCIDENT/ ACCIDENT REPORT

1. Check all that apply: incident____ accident____ injury____ illness____ theft____
Property destruction____ death____ other____

2. Date of occurrence: _____ time of occurrence: _____

3. Events/ Activities prior to incident: _____

4. What happened during the incident? _____

5. List any staff, faculty, patients, or others involved in or witnessing the incident: _____

6. What response was made to the incident? _____

7. Additional comments: _____

8. Author signature: _____ Position: _____ Date: _____

9. Supervising doctor signature: _____ Date: _____

Please return this form to Dr. (Name)

CONT

EMERGENCY MEDICAL EQUIPMENT LIST

- Oxygen tank and flow meter
- Mask, cannula, and tubing
- Airways/ laryngoscope with blades or combi tube
- BP cuff
- Stethoscope
- Additional IV fluids, tubing and needles
- Syringes and needles to draw medications
- Back board
- Glucose tabs
- Canned or bottled juice, crackers
- Gloves, gauze bandages, tape

CONT

EMERGENCY MEDICAL EQUIPMENT LIST

Medicines

- Epinephrine 1:1000
- Dextrose, 50%
- Ammonia salts (smelling salts)
- Calcium gluconate
- Homeopathic remedies
- Benadryl: Adults: 25-50 mg q 4-8 hrs
- Do NOT exceed 400mg/24hrs.
- Children: 5mg/kg q 6-8hrs in 24hrs
- Rescue Remedy

- Designated Place for Emergency box
- Use tackle/tool box to store equipment
- Have a sheet made up with emergency equipment listed
- Have a document for recording steps taken to treat incidents

Vasovagal Reactions vs. Anaphylactic Reactions

Vasovagal Reactions

- Vasovagal syncope is usually precipitated by unpleasant physical or emotional stimuli such as pain, fright, sight of blood, and usually occurs in the upright position.
- It is often preceded by vagally-mediated warning symptoms: Nausea, weakness, yawning, visual blurring, sweating

Vasovagal Reactions vs. Anaphylactic Reactions

- The syncopal patient becomes unresponsive and loses postural tone. Faintness, dizziness or lightheadedness may indicate an impending loss of consciousness and more often progresses to syncope when the patient is upright.
- Vaso-relaxing nutrients, such as Magnesium, may contribute to precipitating a vasovagal episode by lowering blood pressure.

Treatment:

- With the first onset of symptoms lay the patient supine and raise their feet. If this is done quickly, loss of consciousness may be avoided. Stop the I.V. infusion or set the drip rate just high enough to keep the line open.
- If syncope occurs, the majority of patients will regain consciousness immediately on being placed supine. All patients will be confused and perhaps anxious. Reassure them and make them comfortable. Take their blood pressure.
- Occasional patients will have mild self-limited clonic-tonic convulsions as they regain consciousness. Insure they do not injure themselves. This is a normal variant so neither the patient or the practitioner should be unduly concerned. The patient is usually diaphoretic and weak on recovery.
- Keep the patient supine until they feel well enough to sit up and do not sit them up too soon. Oxygen may hasten recovery. The treatment may be continued if the patient recovers sufficiently.

Anaphylactic Reactions

- Generalized anaphylaxis is an acute systemic reaction that occurs in a previously sensitized patient who again receives the sensitizing antigen.

- Typically, in 1-15 minutes

- the patient will feel uneasy, become agitated and flushed, and complains of palpitations, paresthesias, pruritus, throbbing in the ears, coughing, sneezing, urticaria-angioedema, and difficulty breathing due to laryngeal edema or bronchospasm.

- Nausea, vomiting, abdominal pain and diarrhea are less common.

The manifestations of shock may develop within another 1-2 minutes

The patient can become incontinent, convulse, become unresponsive and die.

Cardiovascular collapse can occur without respiratory symptoms

TREATMENT OF ANAPHYLACTIC REACTIONS

• Signs and Symptoms

- Apprehension
- Urticaria
- Edema
- Throat sensation

• Severe cases:

- Hypotension
- LOC
- Mydriasis
- Incontinence
- Convulsion
- Sudden Death

- Place Pt in Trendelenburg position

• STOP ADMINISTRATION OF ANY MEDICATION IMMEDIATELY

- if administering IV- **Do Not Remove**- and start saline drip

• ASSESS PATIENT AND TREAT AS FOLLOWS:

RAPID ONSET

multiple symptoms within minutes.

1. Administer epinephrine HCL 1:1000, 0.3-1.0 cc subcutaneously or IM. Dosage may be repeated every 15-30 minutes if needed. Monitor for symptoms of epinephrine toxicity such as hypertension.
 2. Maintain open airway by having patient assume "sniffing position" (head & chin slightly forward). Insert oral airway if necessary.
 3. Administer Benadryl 50 mg IM, usually after EPI has been given
 4. Check vitals if BP is dropping or Pt is in severe respiratory distress start IV line. Adjust IV
 5. flow rate to maintain systolic BP at 90 mm Hg. In severe respiratory distress insert airway.
 6. Initiate CPR if necessary
- Call 911 if steps 1-3 do not halt attack.

SLOW ONSET

a few symptoms over a longer period 15-30 min to hours

- Administer epinephrine HCL 1:1000, 0.3-1.0 cc subcutaneously or IM. Dosage may be repeated every 15-30 minutes if needed. Monitor for symptoms of epinephrine toxicity such as hypertension.
- Maintain open airway by having patient assume "sniffing position" (head & chin slightly forward)
- Insert oral airway if necessary.
- Administer Benadryl 50 mg IM

More treatments to consider

Steroids – Stabilize cytokine storm:

- Dexamethasone @ 10-20 mg (2.5 to 5 cc)
- Solu-Cortef (Hydrocortisone) @ 100 – 500 mg
- Solu-Medrol (Prednisone) @ 30-60 mg

Albuterol / Aminophylline:

- Limited help / if available

- In both cases continue to monitor patient for several hours.
- Do not allow patient to leave clinic until all symptoms have subsided and stabilized.
- Know that symptoms can recur as epinephrine or Benadryl begin to wear off.
- Follow up the next day.
- For all but the most minor cases the patient should be hospitalized and monitored for 24-48 hours

EMERGENCY PROTOCOLS FOR IV THERAPY

OBJECTIVE:

- to recognize the most common emergencies that may occur when administering IV therapy

PREVENTION:

- Know your patient well. How they react to new situations, allergies, and medical conditions.
- Have appropriate medical equipment available: oxygen tank and mask/cannula, airways, epinephrine, smelling salts, glucose, homeopathic remedies
- Always take vital signs before during and after the treatment. This allows you to be aware of changes
- Never take the IV out if the patient has had a reaction until you are sure they are stable. 'Heparin' lock the site.

- Be current with CPR/ACLS

- Start with the basics:
 - Survey the scene what has occurred
 - Primary survey
 - Airway
 - Breathing- look, listen and feel
 - Circulation carotid artery check 5-10 seconds
 - Radial pulse = AT LEAST 80 Systolic
 - Femoral pulse = AT LEAST 70 Systolic
 - Carotid pulse = AT LEAST 60 Systolic

AED



CPR RsQ



CALL EMERGENCY MEDICAL SYSTEM

(EMS) 911

DIFFERENTIAL DIAGNOSIS IN EMERGENCIES:

Cardiac Emergencies

Respiratory Emergencies

CHF: indicated by fluid overload. A chronic condition that may be aggravated by IV therapy. Infuse 250 ml maximum IV at 1-2 ml/minute

Symptoms:

- Anxious
- Diaphoretic, cold & clammy
- Agitation
- Cyanosis
- Air hunger
- Dizziness
- Rapid respiratory rate (tachypnea)
- Distended neck veins.

Treatment:

- Digitalis
- Diuretics (herbal if time)
- Oxygen 10-12 l/min
- **REFER FOR MONITORING AT THE NEAREST HOSPITAL**

ANGINA: Secondary to vasospasm of coronary arteries.

Cause:

- Electrolyte imbalance
- Cardiac disease
- Anxiety

Symptoms

- Chest pain

Treatment:

- Nitroglycerin (NTG)
- Reestablishing fluid and electrolyte imbalance
- Addressing the stress issue
- Homeopathics and botanicals

Asthma a disease of pulmonary obstruction

Causes:

- Inflammation and edema due to allergens or viruses
- Exposure to cold
- Anxiety

Symptoms:

- Decreased breath, sounds, or wheezing.
- Anxiety makes it worse.

Treatment:

- IV magnesium
- Hydrotherapy, diet changes, botanical, homeopathics

Anaphylaxis

Uncommon with nutritional IV therapy using substances normal to the body, e.g. vitamins, minerals, amino acids. Exception is parenteral thiamine (rare).

Cause:

- A type 1 immune reaction that occurs within 1-10 minutes of exposure to antigen

Symptoms:

- Cough
- Dyspnea
- Restlessness
- Airway obstruction
- Urticaria,
- Vascular collapse.

Treatment:

- Immediately administer Epinephrine
- 1:1000, SQ, give 0.3 to 1.0 cc. May repeat in 15-20 minutes if required.
- Benadryl.
- Assess airway
- Vital signs
- Oxygen
- Don't send home until after several hours of observation.
- If not responding transfer
- **CALL 911**

Angioedema:

- Causes:**
- Respiratory arrest
 - Shock
 - Cardiovascular collapse

- Treatment:**
- Call 911.
 - Monitor vital signs
 - Oxygen

Cardiac arrest

Absent or inadequate ventricular contraction that immediately results in systemic circulatory failure

- | | |
|--|---|
| <p>Causes:</p> <ul style="list-style-type: none"> • Electrical dysfunction • Mechanical failure • Circulatory shock • Abnormalities in ventilation <p>Symptoms:</p> <ul style="list-style-type: none"> • Loss of consciousness • Rapid, shallow breathing leading rapidly to apnea • Profound arterial hypotension • Nonpalpable pulses • Absent heart sounds | <p>Treatment:</p> <ul style="list-style-type: none"> • Call 911 • External electronic defibrillator is treatment for ventricular fibrillation • CPR |
|--|---|

Respiratory arrest

Absence of spontaneous ventilatory movement in an unconscious person

- | | |
|---|--|
| <p>Causes:</p> <ul style="list-style-type: none"> • Airway obstruction: emboli, foreign body, tumor etc. <ul style="list-style-type: none"> • Pulmonary hemorrhage or edema • Pulmonary bronchospasm throughout (severe) • Spasm or edema of the vocal cords • Laryngeal and pharyngeal inflammation • Respiratory weakness • Fluid and electrolyte imbalance/pH • Secondary to cardiac arrest <p>Symptoms:</p> <ul style="list-style-type: none"> • Decreased sensorium, weak, feeble • Irregular or gasping respirations • Tachycardia • Diaphoresis | <p>Treatment:</p> <ul style="list-style-type: none"> • Airway obstruction foreign material – Heimlich maneuver • Lung auscultation • If no airway obstruction-correct as below • Lower airway obstruction-give epinephrine for bronchodilation • Dose of epinephrine 1:1000 dilution. Administer 0.5-0.7 cc SQ • Oxygen by mask or cannula • Caution with oxygen administration in COPD. More than 2L/min for prolonged periods will cause respiratory acidosis and respiratory arrest |
|---|--|

Pulmonary embolism

sudden blockage of pulmonary artery or one of its branches

- | | |
|--|---|
| <p>Cause:</p> <ul style="list-style-type: none"> • Blood clot or fatty clot <p>Symptoms:</p> <ul style="list-style-type: none"> • Sudden onset of severe unexplained dyspnea • Chest pain • Tachycardia • Hypotension <p>• Check all tubing connections and tape if needed</p> <p>• Use of Luer lock connections</p> <p>• Use of 22 micron air eliminating filter</p> | <p>Treatment:</p> <ul style="list-style-type: none"> • Call 911 • Keep patient sitting up right • Give oxygen by mask • Maintain IV access • Transport to hospital. |
|--|---|

Nutrient Reactions

- Cause:**
- Mainly magnesium overdose resulting in respiratory arrest
 - Potassium may lead to arrhythmias.

- Treatment:**
- Antidote for magnesium use calcium (gluconate or chloride)
 - For Potassium monitor serum levels

Air Embolism:

- Air introduced into the vascular system via IV equipment.
- Embolus is carried to the right ventricle where it lodges against the pulmonary valve and blocks the flow of blood from the ventricles into the pulmonary arteries.
 - Worse with R-L shunt
- This requires at least 50-80 cc of air.

Cause:

- Allowing IV bag to run dry with a pump continuing to infuse
- Infusing air from tubing into patient usually requires some mechanism greater than gravity to push it in
- Loose tubing connection to catheter into patient, allowing air to enter
- **Symptoms/Signs:**
- Palpitations, lightheadedness, weakness
- Dyspnea, cyanosis, expiratory wheeze, tachypnea, pulmonary edema
- Weak thready pulse, tachycardia, hypotension, substernal chest pain, jugular vein distention
- Confusion, anxiety, seizure, coma

Treatment:

- Place patient in left lateral decubitus position (Trendelenburg position) with head down
- Oxygen
- Vital signs
- Transfer to hospital contact ER doc (doc to doc)
- Prevention:
- Clear air from tubing, avoid letting the tubing run dry

Catheter Embolus

Cause:

- In an over the needle system that has a part of the cannula nicked and sheared off

Symptoms:

- Sudden sharp pain at IV site
- Cyanosis
- Hypotension
- Weak rapid pulse

Treatment:

- Stop infusion
- Apply tourniquet above IV site
- Start a new IV in other arm
- Arrange for an x-ray

Prevention:

- **Never** re-insert a stylet (needle) in a catheter after it has been removed
- Always use radiopaque catheter so that the catheter can be detected by x-ray
- Withdraw needle and catheter together if unsuccessful venipuncture

Circulatory Overload

Excess fluid in the patient's circulatory system

Cause:

- Excess infusion volume
- Wrong type of solution (excess sodium)
- Too rapid infusion
- Symptoms/Signs:
- Rapid respiratory rate (SOB)
- Anxiety or restlessness
- Distended neck veins
- Hypertension
- Rise in central venous pressure
- Late signs: weight gain, edema, puffy eye lids

Treatment:

- Decrease IV rate
- Raise head and chest area
- Vital signs hourly
- Oxygen
- Keep patient warm – increases peripheral circulation
- Consider diuretic – if needed
- Prevention:
- Monitor infusion rate closely
- Know your patients health history
- Monitor I&O – Amount of fluids in vs. amount of fluids out
- Do not "catch up" IV if infusion is hours behind

Speed Shock:

Occurs when a foreign substance is rapidly introduced into the system (usually medication)

Causes:

- Too rapid an IV push
- Medication not properly diluted
- Symptoms. /Signs:
- Bradycardia
- Dizziness
- Headache
- Tightness in chest
- Hypotension
- Irregular pulse
- Progression of shock

Treatment:

- Give antidote or resuscitation medications prn
- emergency equipment available

Prevention:

- Reduce the size of drops of medication by using a micro drip set, which allows better regulation of slow drip rates (2 ml/min or less)
- Monitor piggyback solutions closely
- Following manufacturer's advice on how to administer medication
- **Know what you are giving – and know it well**

Syncope

Cause:

- Impaired circulation,
- Decreased cardiac output/Perfusion
- Vasovagal episode
- Orthostatic hypotension
- Hypoglycemia
- Hyperventilation.

Treatment:

- Lie horizontal
- Raise legs
- Break ammonia capsule under nose (smelling salts), if awake give rescue remedy
- Reorient patient
- Be patient and reassuring
- Note: can occur rapidly

• SHOCK

BP



Pulse



• Vasovagal

BP



Pulse



• Anxiety States

BP



Pulse



Hyperventilation Syndrome

Causes:

- Anxiety states
- Carpopedal spasms- a classic symptom

Symptoms:

- Good clear breath sounds
- Rapid breathing
- No cyanosis

Treatment:

- Breathe into brown paper bag
- Oxygen may help

civntp

Vaso-vagal Episodes

onset from fright, pain or trauma (reflex inhibition of sympathetic activity)

Causes:

- Increased thoracic pressure
- Sensitive carotid sinus mechanism
- Petit mal or grand mal seizures
- Hypoglycemia
- Other concurrent drug therapy (anti-hypertensives)
- Hyperventilation

Symptoms

- Patient may state that they feel they are going to pass out
- Pale face with diaphoresis
- Classic drop in BOTH blood pressure and pulse.

Treatment: according to cause

- Trendelenburg position (feet higher than heart)
- Oxygen 1-2 L
- Rescue Remedy
- Appropriate homeopathic (see handout)

civntp

Psychogenic States

Cause:

- General anxiety states with apprehension and aversion to needles
- Breath holding or shallow breathing (often fear based)

Symptoms:

- Lightheadedness
- Visual changes

civntp

Shock

Symptoms/signs:

Dizziness

HA

Tightness of chest

Hypotension

Irregular pulse

Progression of shock

Treatment:

Cause:

- Loss of fluids with a result in cardiovascular collapse and hypoxia
- Hemorrhage internal or external
- Vomiting and/or diarrhea
- Pump failure- CHF, heart block, reduced perfusion
- Psychogenic fear/trauma
- Angioedema with third spacing of fluid

- Give antidote or resuscitation medications as needed

- Have emergency equipment available

- CALL 911

civntp

Hypoglycemia

Cause:

- Dysglycemia
- Insulin overdose
- Fasting
- Glucose shifts secondary to IV treatment

Symptoms:

- Often pale
- Diaphoretic
- Syncope
- May see personality changes
- Unsteady gait when standing
- Diplopia
- Reminder: anxiety can heighten a hypoglycemic state.

Treatment:

- Fruit juices
- IV dextrose – see emergency treatment protocols
- Prevent by having patient eat before coming to clinic and snack during long IV treatments

civntp

EMERGENCY DRUGS

EPINEPHRINE HYDROCHLORIDE (ADRENALIN)

- 1:1000 solution 1mg/ml (adult)
 - IM, SQ or intratracheal **ONLY**
- 1:10,000 solution 1mg/10ml **IV form**
 - IV administer 3 ml and wait. May give all 10 ml.
- **DOSAGE:**
- Anaphylaxis:
 - Adult: 0.3-1.0 ml 1:1000 s.c. q10-15min prn
 - Child: 0.01 ml/kg 1:1000 s.c. q10-15min prn
 - Patient must be observed until stable, up to 24 hours
- Cardiac arrest: Requires Advanced Cardiac Life Support training and ability to monitor and treat

Epinephrine



1:1000

- For anaphylaxis
- Safe for **IM ONLY** unless you dilute.
- Give 0.3 ml at a time



1:10000

- For anaphylaxis
- Safe for **IV infusion**
- Give 3 ml at a time

EPI PEN



IM only have 1 use, some 2.

WARNING/ CAUTIONS:

- Use with caution in the elderly, patients with diabetes mellitus, cardiovascular disease, thyroid disease, or cerebral arteriosclerosis.

CONTRAINDICATIONS: glaucoma, cardiac arrhythmia

ADVERSE REACTIONS:

- Tachycardia, nervousness, restlessness, dizziness, chest pain, arrhythmia HA, hypertension, sweating, nausea, insomnia, increased O2 demand of myocardium, urinary retention.

DIPHENHYDRAMINE CHLORIDE (BENADRYL)

- 50mg/ml 25-50MG CAPSULES
- **DOSAGE:**
- **ADULT-** oral/PO 25-50 mg every 4-6 hours
- IM-IV 10-50 mg in a single dose every 2-4 hours

Not to exceed 400mg /day



Diphenhydramine

- For anaphylaxis (25-50 mg q4-8 hours,
 - Don't exceed 400 mg/24 hours
 - Children: 5 mg/kg q6-8hrs in 24 hours
- Works well for nausea. Start with 25 mg.

<p>• USE:</p> <ul style="list-style-type: none"> Symptom relief of allergies caused by histamine release. <p>• CONTRAINDICATIONS:</p> <ul style="list-style-type: none"> Hypersensitivities to benadryl. Acute asthma attack <p>• CAUTIONS:</p> <ul style="list-style-type: none"> Glaucoma, peptic ulcer, hyperthyroid, urinary obstruction. Some preparations contains sodium bisulfate. 	<p>• ADVERSE REACTION:</p> <ul style="list-style-type: none"> Drowsiness, thickening of bronchial secretions, HA, fatigue, dry mouth, angio edema, bronchospasm, urinary retention. <p>• DRUG INTERACTIONS:</p> <ul style="list-style-type: none"> CNS depressants, anticholinergics, metronidazole & chlorpropamide due to disulfiram reaction secondary to alcohol content of some preparations.
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CALCIUM GLUCONATE

<p>• USES:</p> <ul style="list-style-type: none"> Antidote to magnesium overdose To reverse hypocalcemia DOSE: IV injection 10- 20 ml of a 10 % solution = 1-2 grams or 5-10 mEq 2 min X3 then 1G in 500 ml NS 	<p>• STORAGE:</p> <ul style="list-style-type: none"> Calcium products are at risk for crystallization at lower temperatures. All calcium products should be stored at temperature ranges of 15-30 Celsius or 59-86 Fahrenheit.
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Calcium Chloride 10%

HOMEOPATHIC CHART	
Rescue Remedy	anxiety; orally (30-60gts) and/or apply topically Cream 1/8 tsp. or liquid 3-4gts
Aconitum Nap	6c sudden violent onset, fear & anxiety, restlessness, may have increased HR. < cold, motion and touch
Alumina	6c fear of blood, fear of knives, marked slowing and confusion of neural impulses
Apis Mell	6c acute sudden, dry, hot allergic reaction, stinging pain, insect bite, diuretic, edema stinging pain, swelling, < heat, > cold
Arsenicum	6c anxiety, spasms/tremors veins, hemorrhaging, small sips liquid
Arnica Montana	6c shock from injury, blows, falls, vascular lesion, hemorrhage, wounds, contusions, bruises < cold, motion, touch, > lying
Carbo Veg	6c stagnation or sluggishness of blood flow, cold or bluish skin, wants cold water during chills, burning pain internally while cold externally, desires being fanned, < loss fluid, > cool air
Gelsemium	6c confusion, drowsiness, drooping eyelids, extreme weakness, following fear or anxiety, thirst less
Hypericum Perforatum	6c excessively painful, sharp shooting pain, injuries to nerves & spine, crushing injuries, lacerations of finger tips, coccyx, punctures, < cold, touch
Ipecac	6c bronchodilator
Ledum Pal	6c ill effects of puncture wounds, cuts, ecchymosis, & bruises, wounds become cold, stinging pain, pain travels upwards, chronic rheumatism, follows Arnica well, < warm, night, > ice cold water
Nux Moschata	6c confusion, overwhelming drowsiness, following infection, allergy, shock, Etc., giddiness, forgetful, dry eyes, mouth, tongue
Nux Vomica	6c fear of own blood
Op	6c insensibility, painlessness, drowsy, stupor, sluggishness of function, Face sweaty, weak pulse, irregular respiration, thirsty, < heat, fright, Cold air, caffeine, walking
Silica	6c fear of needles
Veratrum alb	6c sudden violent onset, collapse, extreme coldness bluing of parts, cold sweats on forehead, delirium, < cold drinks, motions, > warmth
Calendula Succus	1 oz tincture, or Calendula gel

Rescue Remedy



For anaphylaxis.
For longer term allergy stabilization.
Can get away without this if close to emergency room.



Nasal Cannula



Ambu Bag/Mask



Rebreather Mask



Oxygen Delivery Systems

Nasal Cannula

- Easiest to wear, on demand or continuous
- Lowest flow rates-up to 6 lpm=20-40% O₂

• Simple Mask

- 6-10 lpm gives approximately 40-60% O₂

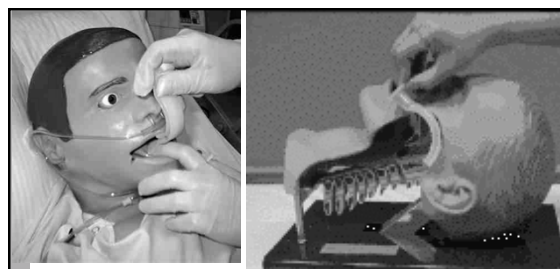
• Partial/Non Rebreather Mask

- Partial has air release valves, NRB-one way valve only
- For liter flows 60-100% O₂
- Usually used in Acute Emergency situations

• Ambu Bag/Mask

- For Emergency situations requiring manual ventilation of pt

Air Way



NEED EXTRA TRAINING
Laryngoscope



Table 1. Parenteral Antihypertensive Agents Used in Hypertensive Emergencies ^{10,11,12}

Agent	Mechanism of Action	Dose	Onset	Duration	Adverse Effects	Contraindications/Cautions
Vasodilators						
Sodium nitroprusside (SNP)	Nitric oxide donor; vasodilates arterial and venous smooth muscle	0.5 ug/kg/min; increase to maximum of 8-10 ug/kg/min; for doses > 4 ug/kg/min, start thiocyanate infusion to decrease risk of toxicity	Immediate	1-2min	Thiocyanate and cyanide toxicity, nausea/vomiting, headache, muscle spasm	• Contraindicated in high output cardiac failure and pregnancy • Caution use with renal disease, anemia, liver disease, myocardial ischemia and increased intracranial pressure
Nicardipine	2nd generation dihydropyridine calcium channel blocker; arterial vasodilator	5 mg/hr; increase of 2.5 mg/hr increments to maximum of 15 mg/hr	5-15 min	2-6 hours	Tachycardia, flushing, headache, nausea, local phlebitis	• Contraindicated in aortic stenosis • Caution with cardiac ischemia and acute heart failure
Clevidipine	3rd generation dihydropyridine calcium channel blocker; arterial vasodilator	1-2 mg/hr; with rapid titration to maximum of 16 mg/hr	1-2 min	5-15 min	Nausea	• Contraindicated in patients with allergies to soy or egg products and defective lipid metabolism
Fenoldopam	Peripheral Dopamine 1 agonist	0.1 ug/kg/min; increase by 0.1 ug/kg/min increments to max of 1.5 ug/kg/min	< 5 min	30 min	Nausea, headache, flushing, tachycardia, dose-related increase in intracranial pressure	• Contraindicated in patients with glaucoma and those with allergy to sulfates • Caution in patients with increased intracranial pressure
Nitroglycerin	Nitric oxide donor; veno-dilator	5 ug/min; increase by 5 ug/min every 5 min to maximum of 200 ug/min	2-5 min	5-10 min	Headache, vomiting, methemoglobinemia, tolerance with prolonged use	• Contraindicated in angle closure glaucoma and increased intracranial pressure • Caution when cerebral or renal perfusion compromised
Adrenergic Inhibitors						
Labetalol	Alpha-1 and nonselective beta adrenergic antagonist; alpha to beta blocking ratio is 1:7	20 mg initial bolus, with incremental doses of 20-80 mg every 10 min; CRI infusion 0.5-2 mg/min	5-10 min	2-6 hours	Bradycardia, bronchospasm, nausea/vomiting, heart block	• Avoid in patients with severe reactive airway disease or COPD, acute systolic heart failure, bradycardia, heart block or hepatic dysfunction
Esmolol	Cardioselective beta 1-adrenergic antagonist	500 ug/kg loading dose followed by 50 ug/kg/min infusion titrated to maximum of 300 ug/kg/min	1-2 min	10-30 min	Bradycardia, nausea, bronchospasm, heart block	• Dose limited; clearance not dependent on renal or hepatic function
Phentolamine	Peripheral A1 and A2 antagonist	5-15 mg IV boluses	1-2 min	10-30 min	Tachycardia, flushing, headache	• Caution in patients with coronary artery disease

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Treatment of hypertensive emergencies and urgencies with oral clonidine loading and titration. A review.
Houston MC.
Abstract
Oral clonidine hydrochloride rapid titration or loading is a safe, effective method to control severe elevations of blood pressure in hypertensive crisis in many clinical situations. An initial oral dose of 0.1 to 0.2 mg of clonidine hydrochloride followed by hourly doses of 0.05 or 0.1 mg until goal blood pressure is attained that does not reduce perfusion to critical organs, or a total of 0.7 mg is given, will achieve a significant reduction in blood pressure in 93% of patients. A smooth, rapid, predictable reduction in blood pressure, patient comfort, lower overall cost, reduced requirement for close observation, intravenous lines, and hospitalization, and a small incidence of clinically significant side effects make oral clonidine rapid titration an attractive oral antihypertensive agent for patients with hypertensive urgencies and in some carefully selected patients with hypertensive emergencies. Immediate outpatient follow-up within 24 hours is mandatory in all patients who are not hospitalized to adjust the dose of antihypertensive medications.

