



Management Of Medical Emergencies



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Necessity Of Emergency Protocol



★ Aging patient population.

★ Medically compromised patients living longer than ever.



★ Undiagnosed underlying disease.

★ Invasive procedures.





How to minimize Unfavorable outcomes



★ Accurate Medical History.

★ Methodical and well planned approach In treatment.



★ Clear documentation of all underlying medical condition.

★ Good preparation.





How to formulate An Emergency Management Plan?



- ★ Prepare for the Worst.
- ★ Organize your team and equipment.
- ★ System by system approach.
- ★ Do not under estimate the possibilities.
- ★ Practice yourself and your staff through emergency drills.





Organ System Approach



★ Cardiovascular.

★ Respiratory.



★ Neuromuscular.

★ Immune.



★ Miscellaneous.



Cardiovascular Emergencies



★ Vasovagal Event.

★ Hypertension.

★ Angina.



★ MI.

★ Tachycardia.

★ Bradycardia.



★ Asystole.

★ VT/Vfib.



Vasovagal Event

- ★ Peripheral vasodilation.
- ★ Lower perfusion centrally.
- ★ Loss of consciousness.





Vasovagal event (Treatment)



- ★ Supplemental O₂.
- ★ Trendelenburg position.
- ★ Fluid as necessary.
- ★ Ammonia inhalers.
- ★ Support vitals.





Hypertension



★ Assess etiology and risk factors.

★ Mild= Systolic > 140mmHg, Diastolic > 90



★ Moderate= Systolic > 160mmHg, Diast. > 100

★ Severe= Systolic > 190mmHg, Diast. > 110



★ Assess patient's baseline.



Hypertension (treatment)



★ Treat non-cardiovascular causes (e.g. Pain, anxiety.)



★ Alpha antagonists (e.g. labetalol.)

★ Supplemental O₂.



★ Abort elective procedures in severe cases and direct to medical treatment.



Angina



★ Atherosclerotic heart disease.

★ Anxiety.



★ Other peripheral causes e.g. esophageal reflux.

★ May be an indication of MI.





Angina (Management)

- ★ Sublingual or transmucosal nitroglycerine.
- ★ Vasodilator.
- ★ Smooth muscle relaxant in both arterial and venous beds.
- ★ May cause severe hypotension and headache.





Angina (Nitroglycerine)

0.15mg,0.3mg,0.4mg,0.6mg (sublingual.)

1mg,2mg,3mg (buccal,controlled release.)

0.4mg (metered spray as lingual aerosol.)

Repeat three time, if no relief transport to hospital.

Use supplemental O2.





Myocardial Infarction



★ Atherosclerotic and ischemic heart disease.
★ Progressive over a number of years.



★ Risk factors Modifiable VS non-modifiable
★ Contributing factors e.g. stressful setting, overexertion.



★ Congenital heart disease with poor perfusion.



MI (management)

- ★ Supplemental O₂.
- ★ NTG.
- ★ Morphine IV/IM.
- ★ Aspirin (M*O*N*A).
- ★ Transport to hospital.





Sinus Tachycardia



★ Never treat the sinus tachycardia but the cause.



★ Anxiety/Pain.

★ Fever.

★ Hypovolemia.

★ Exercise.



★ Might be normal in children



Bradycardia



- ★ Understand the patient's baseline.

- ★ Sinus node disease.

- ★ Increased parasympathetic tone.

- ★ Drug effects.

- ★ May cause poor organ perfusion in little children.





Bradycardia (management)

- ★ Assess cause.
- ★ Atropine.
- ★ Parasympatholytic drug.
- ★ Enhances sinus node automaticity and atrioventricular conduction via direct vagolytic action.





Bradycardia (Atropine)

- ★ Dose 0.5-1.0 mg IV.
- ★ May be given via endotracheal tube at 2-2.5 times the IV dose and 0.9% NaCl flush.
- ★ When given in doses less than 0.5 mg can produce paradoxical bradycardia due to peripheral parasympathomimetic effects.
- ★ Glycopyrrolate is another option.





Pulseless VT/ Vfib.

- ★ Pulseless Ventricular tachycardia is treated the same as Ventricular fibrillation.
- ★ The definitive treatment is electrical shock treatment (i.e. defibrillation.)
- ★ Pharmacological agents act as adjuncts to defibrillation.





Defibrillation

- ★ Adults 200,300,360J
- ★ 25Lbs pressure.
- ★ Conductive Gel.
- ★ CPR.
- ★ Pediatric 2-4J/Kg





VT/VF (Epinephrine)



- ★ Natural Catecholamine.
- ★ Both Alpha&Beta adrenergic.
- ★ Increases vascular resistance.
- ★ Increases systolic and diastolic blood pressure.
- ★ Increases Electrical activity in the myocardium.
- ★ Increase coronary and cerebral blood flow.



VT/VF (epinephrine)

- ★ Increases strength of myocardial contraction.
- ★ Increases myocardial Oxygen requirement.
- ★ Increases automaticity.
- ★ Favorable redistribution of blood flow from peripheral to central circulation.
- ★ Adult dose 1mg IVP q3-5min.
- ★ Pediatric dose 0.01 mg/kg (1:10,000)





VT/VF (Lidocaine)

- ★ Suppresses ventricular arrhythmias by decreasing automaticity.
- ★ Suppresses ventricular ectopy after MI due to local anesthetic effects.
- ★ To achieve antifibrillatory effect, higher lidocaine plasma levels have to be achieved. At lower levels it may induce fibrillatory effects.
- ★ Dose 1.0-1.5 mg/kg q3-5 min. up to 3mg/kg





Vasopressin

- ★ Naturally occurring anti-diuretic hormone.
- ★ Powerful vasoconstrictor at higher doses.
- ★ Does not have the increased cardiac ischemia and irritability on the heart as epinephrine.
- ★ Single 1-time dose of 40 U I.V. in adults.





Amiodarone



- ★ Complex agent with multiple effects on the sodium, potassium and calcium channels.
- ★ Has both α and β -adrenergic blocking properties.
- ★ 300 mg diluted in 20-30 ml. of D5W.
- ★ If arrhythmia recurs, consider a second 150 mg dose. 5mg/kg in children.



VT/VF (Procainamide)



- ★ Suppresses ventricular ectopy.
- ★ Reduces phase 4 diastolic depolarization, thus reducing automaticity of all pacemakers.
- ★ Suppresses PVC's.
- ★ If given rapidly will exacerbate hypotension.
- ★ Dose 30mg/min. up to max.. 17 mg/kg



VT/VF (Magnesium)



- ★ Cofactor in numerous enzymatic reactions.
- ★ Essential for the function of the Na-K ATPase pump.
- ★ Mg deficiency is associated with cardiac arrhythmias.
- ★ May cause flushing, sweating, mild bradycardia and hypotension.



VT/VF (Magnesium)



- ★ Hypermagnesaemia may cause depressed reflexes, flaccid paralysis, circulatory collapse, respiratory paralysis and diarrhea.
- ★ Dose 1-2 gms. In adults.





Asystole

- ★ Consider possible causes.
- ★ Hypoxia, hyperkalemia, hypokalemia, preexisting acidosis, drug overdose, hypothermia.
- ★ Transcutaneous pacing.
- ★ Epinephrine 1mg IV repeat every 3-5 minutes.
- ★ Atropine 1mg repeat every 3-5 min. upto 0.03-0.04 mg/kg.





Respiratory Emergencies

- ★ Asthma.
- ★ Laryngospasm.
- ★ Aspiration.





Bronchospasm Laryngospasm



★ Muscle relaxant (-)
★ Positive pressure (-/+)

★ Beta 2 agonist (++)

★ Epinephrine (++++)

★ Theophylline (++)

★ Tracheotomy (-)



★ Muscle relaxant (++++)

★ Positive pressure (+)

★ Beta 2 agonist (-)

★ Epinephrine (-)

★ Theophylline (-)

★ Tracheotomy (++++)





Beta 2 Agonist



- ★ Selectively stimulates beta2 adrenergic receptors of the lungs, uterus and vascular smooth muscles.
- ★ Bronchodilation results from relaxation of bronchial smooth muscles.
- ★ 2 inhalations.
- ★ Oral dose for children 0.1mg/kg up to 2mg.



Allergic Reaction And Anaphylaxis



★ Diphenhydramine (benadryl)

★ Antihistamine, antiemetic, antitussive, sedative-hypnotic, topical anesthetic.



★ Adult dose 25-50mg PO, 10-15mg IV/IM

★ Children <9kg 6.25-12.5 mg PO 1.25mg /kg IM



★ >9kg 12.5-25mg PO 1.25 mg/kg IM



Allergic reaction and Anaphylaxis



★ Epinephrine, also indicated in severe asthma.



★ Adult dose 0.1-0.5 mg SC or IM.



★ Pediatric dose 0.01 mg/kg IM/SC



Seizure Disorder

- ★ Support airway.
- ★ Injury precaution.
- ★ If possible give IV/IM Benzodiazapine.





Narcotic Overdose

- ★ Support vital signs.
- ★ Reversal agent (Narcan)
- ★ 50-100 μcg IV as needed.
- ★ In children 10 $\mu\text{cg}/\text{kg}$.
- ★ Adverse effects.





Benzodiazepine Overdose



★ Romazicon.

★ 0.1-0.4 IV/IM.

★ Onset 2-4 min IV, 10-15 min IM.

★ Adverse effect.

★ Intranasal??





Miscellaneous

- ★ Sickle Cell crisis.
- ★ Hypoglycemia.
- ★ Hyperglycemia.
- ★ Dehydration.
- ★ Acute Cocaine use.
- ★ Malignant Hyperthermia.

