

Pharmacy Role in Emergency and Trauma Medicine

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Objectives

- Identify top priorities during inpatient management of adult emergency/trauma patients
- Recognize and describe some of the most commonly used pharmacological agents in this setting
- Understand pharmacy's role in these situations
- Appreciate the complex medical and emotional dynamic of emergent situations

Emergency vs Trauma

- Emergency – Defined by the *immediate* risk that it poses to life or health
- Trauma – Defined by the serious nature of the wound or emotional situation

Trauma Considerations

- Type of Trauma
 - Physical, Emotional, Both?
- Location of injury
 - Head/Brain/Spinal Cord
 - Internal
 - External
 - Limb vs Torso
- Severity of injury

Trauma Considerations Cont.

- Management of Shock
 - Airway, Breathing and Circulation
 - Hypotension → Decreased Oxygenation
 - Fluids and Blood Products

Inpatient Trauma Considerations

- Infection
 - Antibiotics are usually not necessary
 - GI/Chest wounds requiring surgery
 - Antibiotic prophylaxis is recommended pre- and post- surgery, and is dependent upon:
 - Type of wound
 - Clean, Contaminated, or Dirty
 - Location of wound

Infection

- **Cefazolin** (Ancef®)
 - First generation cephalosporin
 - Good gram pos, gram neg coverage
 - Most studied
 - Inexpensive
- **Cefuroxime** (Ceftin®)
 - As well as other 2nd generation cephalosporins have broader gram neg. coverage
- **Cefoxitin** (Mefoxin®) and **cefotetan** (Cefotan®)
 - Activity against anaerobic bacteria

Alternative Antibiotics

- **Clindamycin** is an option for patients who have had a severe penicillin allergy
- **Vancomycin**
 - Very few cases where this would be acceptable as a prophylactic
 - Usually in confirmed MRSA cases, and then used in combination with a cephalosporin or alternative if patient is allergic

Thromboprophylaxis

- Balance the risk of bleeding with the risk of clotting
 - DVT and Pulmonary emboli are major complications
- **Strategies**
 - Ted hose
 - Sequential Compression Devices (SCDs)
 - Chemical prophylaxis
 - Lovenox®
 - Heparin
 - Others

Heparin

- High alert medication
- IV vs Subcutaneous dosing
- Treatment vs prophylactic dosing
- Dosed according to units

Lovenox

- Low molecular weight heparin
- Fast acting
- Treatment vs prophylactic dosing
- Prefilled subcutaneous syringes

Review

- Type and Location of trauma
- Risk of infection?
- Antibiotics appropriate?
 - Appropriate antibiotic?
- Thromboprophylaxis
 - Clot vs Bleed
 - High alert

Emergency Situations

Cardiac Arrest

- Algorithms based on the type of emergency
 - Rhythm
 - VT/VF vs PEA/Asystole
 - Shockable?
 - CPR
 - Consider advanced airway
 - Maintain perfusion
 - Chemical Cardioversion

Core Interventions

- CPR
- Maintain Perfusion
- Rapid Sequence Intubation
- Cardioversion

Pharmacological Agents

Epinephrine and vasopressin

- Vasoconstriction
 - Maintain perfusion to brain and heart
- Cardiac stimulation
 - Mainly epinephrine

Dopamine

- Cardiac stimulation
- Dopamergic and adrenergic receptors
- Dopaminergic receptors lead to release of norepinephrine

Bicarb

- Acidosis
- Recommended after airway and ventilation has been established
- Corrects pH

Dobutamine

- Increased contractility and HR
- No activity at dopamine receptors
- Less prone to hypertension

Cardioversion

Restoration of normal sinus rhythm via electrical or chemical means

- Electrical
 - Defibrillator
- Chemical
 - Amiodorone
 - Magnesium
 - Lidocaine

Rapid Sequence Intubation

1. Sedation
2. Paralyzation
3. Intubation

Rapid Sequence Intubation

- Sedation or Induction
 - Rapid acting
 - Put the patient “under”
- Neruomuscular blocking agents or paralytics
 - Paralyze muscle activity
 - Ease the access to the airway

Sedatives

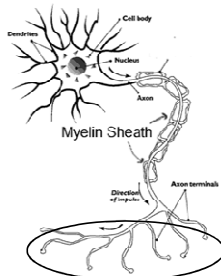
- **Etomidate**
 - Most often used sedative
 - Hemodynamic neutrality
- Midazolam
 - Rapid acting benzodiazepine
 - Good for patients who are seizing
 - Not to be used for continued sedation

Sedatives

- Ketamine
 - Similar in structure to PCP
 - Wide range of effects in the body
 - Hemodynamic stability – good for **hypotensive** patients
- Propofol
 - Useful in patients with severe bronchospasm

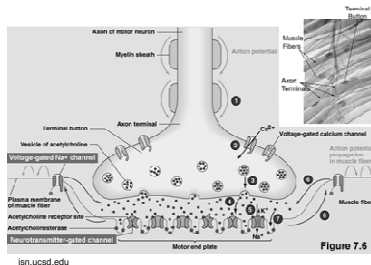
Rapid-fire Physiology Review

Neuron



Action Potentials and Muscle Contractions

The Neuromuscular Junction



Succinylcholine

- Structural analog of acetylcholine
- Depolarizing agent
- Targets postsynaptic ACh receptors, causing depolarization followed by paralysis

Rocuronium

- Nondepolarizing agent
- Inhibits post synaptic acetylcholine receptors
 - Inhibits all muscular function

Review

- CPR
- Maintain Perfusion
 - Epinephrine
- Cardioversion
 - Shock or chemical
- Advanced Airway
 1. Sedation
 2. Paralyzation
 3. Intubation

Emotional/Psychological Considerations

Emotional/Psychological Considerations

- Remain Calm
- Double check and ask for input
- Be aware of your surroundings
- Be aware of your colleagues
- Be aware of yourself

References

- UpToDate monographs:
 - Neuromuscular blocking agents (NMBA) for rapid sequence intubation in adults
 - Basic airway management in adults
 - Sedation or induction agents for rapid sequence intubation in adults
- Lexicomp monographs
 - Acetylcholine
 - Dobutamine
 - Dopamine
 - Epinephrine
 - Etomidate
 - Ketamine
 - Propofol
 - Rocuronium
 - Sodiumbicarbonate
 - Vasopressin
- Jeff, and Chris. "Home." *ACLS Algorithms.com* N.p., 2013. Web. 05 Sept. 2013
