MRAD 202 – Patient Care 2

*** IMPORTANT: Table of Common Medications

Purpose: a) *Identify the trade and generic names for commonly used drugs.*

b) Differentiate the types and effects of common medications used in the diagnostic imaging department.

Category	Effect	Example	Reference
Adrenergics (vasoconstrictors)	Stimulate the sympathetic nervous system causing bronchodilation, vasoconstriction and cardiac stimulation.	• epinephrine (Adrenalin)	Jensen & Peppers, 2006, pp.157–164; Ehrlich & Coakes, 2016, p. 232
Analgesics/Anesthetics	Relieve pain, promote loss of feeling or sensation.	• acetaminophen (Tylenol) • acetylsalicylic acid (Aspirin) • ibuprofen (Advil) • meperidine (Demerol) • fentanyl (Sublimaze) • oxycodone(Percocet) • morphine • codeine • lidocaine (Xylocaine) • dimenhydrinate (Gravol)	Jensen & Peppers, 2006, pp. 56–57; Ehrlich & Coakes, 2016, p. 232
Antianxiety	Act by blocking stimulation in the limbic and cortical systems of the brain.	• lorazepam (Ativan) • midazolam (Versed) • diazepam (Valium)	Jensen & Peppers, 2006, pp. 59–60, 149
Anticoagulants	Inhibit the clotting mechanism of blood; used to keep IV lines and arterial catheters open during diagnostic procedures and to prevent blood clots following heart attack or stroke.	• heparin • warfarin (Coumadin) • clopidogrel bisulfate (Plavix) • acetylsalicylic acid (Aspirin) • atorvastatin (Lipitor)	Jensen & Peppers, 2006, p. 56; Ehrlich & Coakes, 2016, p. 232
Antidepressants	Used to relieve or prevent depression.	• fluoxetine (Prozac) • duloxetine hydrochloride(Cymbalta)	Jensen & Peppers, 2006, p. 59; Ehrlich & Coakes, 2016, p. 233
Antidiabetics	Required for patients who have difficulty maintaining proper blood sugar balance.	• insulin • metformin (Glucophage)	Jensen & Peppers, 2006, p. 58; Ehrlich & Coakes, 2016, p. 232-234
Antihistamine	Relieves the symptoms of allergic reactions	• diphenhydramine (Benadryl) • loratadine (Claritin)	
Anticholinergics (Antispasmodics)	Depress the parasympathetic nervous system to reduce spasms of smooth	• hyoscine butylbromide (Buscopan) • atropine sulfate	Ehrlich & Coakes, 2016, p. 232

Category	Effect	Example	Reference
	muscle tissue and decrease contractions, saliva, bronchial mucus and digestive secretions. Used in preparation for surgery and endoscopy to suppress secretions.		
Antiperistaltic	Slow peristalsis of the G.I. tract, reduce diarrhea.	• loperamide (Imodium)	Ehrlich & Coakes, 2016, p. 233
Bronchodilators	Dilate smooth muscle, used to treat asthma attacks and some allergic reactions.	• albuterol (Ventolin AND Proventil)	Ehrlich & Coakes, 2016, p. 233
Cathartics	Stimulate peristalsis, promote defecation.	• bisacodyl (Dulcolax) • Castor oil • magnesium citrate	Ehrlich & Coakes, 2016, pp. 234, 307–310
Contrast Agents	Used to enhance the presentation of a structure, organ, etc. during diagnostic imaging.	• Omnipaque • Optiray • Visipaque • Conray • Hypaque • Gastrografin • Telebrix	Ehrlich & Coakes, 2016, pp. 354–355
Diuretics	Stimulate the flow of urine.	• furosemide (Lasix) • chlorothiazide (Diuril)	Ehrlich & Coakes, 2016, p. 234
Fluids and Electrolytes	Provide balance of body fluids, electrolytes and nutrients; used to treat and prevent dehydration.	• normal saline (NaCl) • 5% Dextrose in water • Ringer's solution • Electrolytes: Sodium, Magnesium, Chloride, Bicarbonate	
Glucocorticoids/NSAIDs (nonsteroidal anti-inflammatory drugs)	Used to treat pain associated with inflammation such as arthritis, vasculitis, broken bones and surgical incisions.	• Ibuprofen (Advil) • naproxen • Aspirin (*technically in a class of its own but has actions similar to NSAIDs.)	Jensen & Peppers, 2006, p. 57; Ehrlich & Coakes, 2016, p. 236
Hypoglycemics	Used to control the level of glucose in the blood, primarily as a treatment for diabetes mellitus (Type 2).	• metformin (Glucophage)	Ehrlich & Coakes, 2016, p. 236
Narcotics/Opioids	Stimulate central nervous system receptors known as opioid receptors, causing a decrease in the perception of pain.	• codeine • fentanyl (Sublimaze) • meperidine (Demerol) • morphine	Jensen & Peppers, 2006, p. 152; Ehrlich & Coakes, 2016, pp. 234–235

Category	Effect	Example	Reference
Sedatives	Depress and relax the CNS and reduce mental activity. There are multiple classes within the sedative category.	• barbiturates (Phenobarbital Methohexital) • benzodiazepines (antianxiety agents - see above) • opiate analgesics (see above)	Jensen & Peppers, 2006, pp.149–150; Ehrlich & Coakes, 2016, p. 234, 236
Tranquilizers	Reduce anxiety. See Antianxiety above.	• diazepam (Valium) • lorazepam (Ativan) • midazolam (Versed)	Ehrlich & Coakes, 2016, p. 234, 236
Vasodilators	Relax the walls of blood vessels, permitting a greater flow of blood.	• nitroglycerin hydralazine (Apresoline) • dopamine (Intropin)	Ehrlich & Coakes, 2016, p. 234

Note: The chart aligns with CAMRT's Appendix 6 of the CAMRT Exam blueprint

IMPORTANT NOTE: The drug **Naloxone** is administered if sedation causes respiratory depression or arrest, whether due to drug reactions or illicit drug use/overdose. Naloxone will **reverse** the respiratory depressant effects of opiates (Jensen & Peppers, 2006, p. 149).

*Important information about **glucagon compared to Glucophage/metformin:**

1. "**glucagon**" is a generic name. No brand/trade name will be provided.
   -it's a hyperglycemic agent so it's used to **treat** hypoglycemia (low blood sugar).

   However, it's used as a diagnostic aid in radiologic examinations of the stomach, duodenum, small bowel and colon where *diminished motility would be advantageous.*

2. **metformin** is a generic name and Glucophage is a Brand/Trade name.
   -metformin is an oral medication that lowers blood glucose (sugars) in influencing the body's sensitivity to insulin and is used to treat people with Type 2 diabetes.

Emergency Medications for Cardiorespiratory Arrest Summary pg. 54-61 and 149-171

This is an example of medications found on the crash cart/drug box. However, variations occur depending on site/dept. Knowledge and experience allows the technologist to predict accurately which drug will most likely be needed and thus rapidly acquire it for the emergency team. This assists in swift and efficient handling of an emergency situation.

The technologist should check the emergency medication box/cart:

- At least monthly to ensure that all drugs are present, are in adequate supply, and have not expired.
- Restock after each emergency use.
- Be familiar with the contents, drug names, know the location of drugs within the box, their proper uses, and pharmacology.

Medications used in the radiology department for conscious sedation consist primarily of the *barbiturate, benzodiazepine* (antianxiety agents) and *opiate analgesic* classes of drugs (pg.149)

a. Barbiturates decrease cortical brain activity. They are capable of producing all levels of anesthesia, from conscious sedation to compete anesthesia.
b. Benzodiazepines have the propensity to be used for conscious sedation because they cause selective CNS depression, muscle relaxation, antianxiety, anticonvulsant and sedative-hypnotic activates.
c. Opiate analgesic medications stimulate the CNS opioid receptors to decrease pain perception.

1. **Epinephrine (Adrenaline)** pg.157-160
    - A lifesaving therapeutic agent available to cardiac arrest victims.
    - This drug is the pharmaceutical equivalent of adrenaline, produced by the adrenal gland.
    - In cardiac arrest, epinephrine is primarily given in doses sufficient to stimulate the alpha-1 receptors so that arterioles (small blood vessels) can constrict which results in an increase in blood pressure.
    - When combined with chest compressions, epinephrine is used to cause a return of spontaneous circulation.

Indications:

- Epinephrine is indicated as first-line treatment for cardiorespiratory arrest and is used as such in ventricular fibrillation.
- Other uses include treatment of anaphylactic reactions and acute bronchospasm.

2. **Dopamine (Intropin)** pg. 162-163
    - Leads to arteriolar vasodilation with increased blood flow to the respective organs.
    - At moderate doses, dopamine will cause an increase in contractility and force contraction which effectively increases cardiac output in patients in shock or with congestive heart failure.

Indications:

- Dopamine is indicated for treating hypotension secondary to congestive heart failure, myocardial infarction and trauma.
- Used to increase urine output in patients with renal failure.

3. **Atropine** pg.163-165
    - Is an anti-muscarinic agent frequently used in patients experiencing cardiac arrest.
    - It's used in the setting of cardiac arrest when a patient exhibits bradycardia (slow heart rate)
    - When the heart rate falls to 40 beats/min or less, the emergency medical team will use atropine to block the muscarinic receptors in the myocardium.

Indications:

- Atropine is used with significant bradycardia and first degree atrioventricular block and ventricular asystole (flat line)

4. **Lidocaine** (Xylocaine) pg.165-167
    - This medication is one of the most frequently used antidysrhythmic (antiarrhythmic) drugs for patients experiencing cardiac arrest.

Indications:

- For treating ventricular dysrhythmias in heart attack or during a cardiac arrest.
- *After* cardiac arrest, it is primarily used to treat ventricular tachycardia and can be used to treat ventricular fibrillation when direct-current electrical shock (i.e. Defibrillation) has failed.

5. Sodium Bicarbonate pg.168-170
    - Strong alkalinizing agent. Its use for treating cardiac arrest has been carefully scrutinized, but it is still frequently used in select patients.

    Indications:
    - Used for treating severe metabolic or respiratory acidosis.
6. Acetaminophen-brand name is Tylenol pg. 57
    - It relieves headaches and lowers fever but it is NOT an anti-inflammatory so it won't help with sprains or arthritis.

7. Aspirin (acetylsalicylic acid) -brand name is Bayer/Bufferin pg.57
    - Was developed over 100 years ago.
    - Used to treat heart disease by being an anticoagulant. Therefore, individuals on blood thinners should not take aspirin.
    - Known to cause upper G.I. problems

8. Opiate Analgesics pg. 56
    - Stimulate the CNS opioid receptors to decrease pain perception.
    - When used in combination with antianxiety medications, the opiates allow for decreased pain and anxiety (Jensen & Peppers, 2006, p. 152)

9. Narcotics pg.57
    - The narcotics class of analgesic is generally highly controlled by the local and federal enforcement agencies to prevent misappropriation into the community.
    - These medications have addictive characteristics (pg.149)

10. Agents used for Conscious Sedation pg.149-152
    - Conscious sedation is frequently required to decrease patient anxiety and pain associated with medical procedures.
    - The administration of these medicinal agents improves the outcome of the procedure.
    - All patients should be monitored closely with a heart monitor and pulse oximetry, and the machines used for the procedure will need to be compatible for such monitoring.

References

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