



## Section 13: Appendix 1: Medications

### SECTION 13: PHARMACOLOGY REVIEW

#### I. ACTIONS OF MEDICATIONS

1. Local effects
2. Systemic effects

#### II. EFFECTS DEPENDS UPON

1. Age of patient
2. Condition of patient
3. Dosage
4. Route of administration

#### III. ROUTE OF ADMINISTRATION

1. Intravenous (IV)
  - Most rapidly effective
  - Most dangerous
  - Give SLOWLY through an established IV line (FOR MOST MEDICATIONS)
2. Intramuscular (IM)
  - Takes longer to act
  - Longer duration of action (Oil vs. water based medications duration varies)
  - Deltoid or gluteus maximus site
  - Absorption VERY dependent on blood flow
3. Subcutaneous (SQ)
  - Slower and more prolonged absorption
  - Under skin of upper arms, thigh, abdomen
4. Inhalation
  - Bronchodilators
  - Steroids (Patients may be prescribed)
5. Endotracheal (Only administer through ET as a last resort with no better options)
  - Epinephrine (Adrenaline), Atropine, Lidocaine (Xylocaine), Naloxone (Narcan)
  - Medication dose must be twice the IV dose
6. Sublingual (SL)
  - Rapid absorption
  - Patient must be well hydrated for good absorption
7. Oral
  - Slow rate of absorption
8. Rectal (PR)
  - Rapid but unpredictable absorption
9. Intranasal (IN)
  - Must use specific device to aerosolize medication
  - Used with specific medications only (Midazolam (Versed), Naloxone (Narcan), or Glucagon (Glucagen))
10. Intraosseous (IO)
  - IO is only to be used only if IV is unobtainable in an unconscious patient
  - Nearly as fast as IV route



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### SECTION 13: PHARMACOLOGY REVIEW-Cont.

#### IV. RATES OF ABSORPTION

1. "Directly related to route of administration"

- IV (Fastest)
- IO (Intraosseous)
- Inhalation
- ET (Endotracheal)
- IM (Intramuscular)
- SL (Sublingual)
- IN (intranasal)
- PR (Rectal)
- SQ (Subcutaneous)
- Oral (Slowest)

#### V. ELIMINATION

1. Many methods
2. Usually metabolized by the liver
3. Eliminated by the kidneys, lungs, skin

#### VI. TERMS

1. Indications – Conditions medications are used for
2. Contraindications – Conditions which make medication use improper
3. Depressants - Lessens / decreases activity
4. Stimulants - Increases activity
5. Physiologic action - Action from therapeutic concentrations of a medication
6. Therapeutic action - Beneficial action expected from a desired concentration of a medication
7. Untoward reaction - Unwanted side effect
8. Irritation - Damage to tissue
9. Antagonism - Opposition between physiologic action
10. Cumulative action - Increased action after repeated administration of medications
11. Tolerance - Decreased effects after repeated doses
12. Synergism - Combined effects greater than sum of individual effects
13. Potentiation - Enhancement of one medication by another
14. Habituation – Becoming abnormally tolerant to and dependent on something that is habit-forming
15. Idiosyncrasy - Abnormal response to a medication
16. Hypersensitivity - Exaggerated response or allergy to a specific agent

#### VII. AUTONOMIC NERVOUS SYSTEM

1. Parasympathetic - Controls vegetative functions "rest and digest"
2. Sympathetic - "flight or fight"

#### VIII. PARASYMPATHETIC NERVOUS SYSTEM

1. Mainly mediated by vagus nerve
2. Acetylcholine is transmitter (cholinergic)
3. Atropine is an acetylcholine blocker

#### IX. SYMPATHETIC NERVOUS SYSTEM

1. Mediated by Nerves from Sympathetic Chain
2. Norepinephrine and Epinephrine are the transmitters

#### X. SYMPATHETIC RECEPTORS

- Alpha (a)
- Beta (b)



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### **SECTION 13: PHARMACOLOGY REVIEW-Cont.**

#### **XI. COMMON SYMPATHETIC AGENTS**

Isoproterenol (Isuprel) - pure BETA  
Epinephrine (Adrenalin) – ALPHA and BETA  
Dobutamine (Dobutrex) - predominately BETA  
Norepinephrine (Levophed) - predominately ALPHA  
Dopamine (Intropin) - BETA at low dose range, ALPHA at high dose range  
Phenylephrine (Neo-Synephrine) - pure ALPHA

#### **XII. SYMPATHETIC BLOCKERS**

Propranolol (Inderal) - BETA blocker

#### **XIII. MEDICATION ADMINISTRATION**

Appropriate:

1. Medication selection based on protocol
2. Visually examine medication for particulates or discoloration and that the medication has not expired
3. Contraindications are reviewed prior to administration
4. Route is determined by protocol
5. Dose selection based on protocol
6. Dilution is per protocol
7. Rate is per protocol