

GENERIC EFFECTS OF DRUGS/MEDICATIONS (handout) (Learn 2nd)

A drug or medication is likely to produce its effects by one or more of the following:

1. MIMICS A NT OR HORMONE... they bind to the same receptor sites yielding the same effect.

The drug NICOTINE mimics the neurotransmitter ACh in the brain.

The drug VALIUM produces a sedating effect by mimicking a naturally sedating NT called GABA.

The drug PITOCIN mimics the natural hormone OXYTOCIN thereby inducing labor contractions associated with childbirth.

The drugs MORPHINE, DEMEROL, and HEROIN all relieve pain by mimicking your own naturally occurring pain blocking NTs called ENDORPHINS and ENKEPHALINS.

The drug DOPAMINE, in the PNS, mimics the NT NOREPINEPHRINE (NE) causing vasoconstriction thereby ↑ BP.

2. BLOCKS RECEPTOR SITES... they bind to the receptor sites of an NT but do NOT produce the same effect thus preventing the NT from having its effect.

The drug BENADRYL (an antihistamine) blocks H₁ and H₂ receptor sites for histamine.

The drug PROCARDIA, a “calcium channel blocker,” inhibits smooth muscle contraction resulting in dilation of coronary and peripheral arteries thereby ↓ BP.

The drug INDERAL, a “BETA BLOCKER,” blocks beta receptors for NE at the heart thereby ↓HR and ↓ strength of contraction thereby ↓ high BP.

Curare blocks ACh receptor sites causing temporary paralysis.

The drug VERAPAMIL, a “calcium channel blocker,” helps suppress certain cardiac dysrhythmias.

3. ↑ or ↓ THE AMOUNT OF NT RELEASED

COCAINE and AMPHETAMINES increase the release and block the reuptake of both NE & dopamine. The surplus of these “feel good” NTs in the CNS is what provides the “rush” users become addicted to.

Botulinus toxin (botulism) prevents release of ACh at neuromuscular junctions.

4. ↑ or ↓ THE RATE OF REMOVAL OF A NT FROM THE CLEFT... thereby lessening or prolonging the effect of the NT

The popular antidepressants Prozac & Paxil both inhibit the reuptake of the NT SEROTONIN which is a “feel good” NT of the CNS. The “feel good” effects of your own serotonin are thereby prolonged.

5. ↑ or ↓ MEMBRANE PERMEABILITY to Na⁺, K⁺, Ca⁺⁺, or Cl⁻ thereby shifting the RMPs of neuronal membranes either closer to or farther from threshold. Neurons are thereby made either more likely or less likely to “fire.”

The pain medication LIDOCAINE ↓ mem. perm. to sodium by preventing the opening of voltage-gated sodium channels. Therefore, no nerve impulse travels to brain.