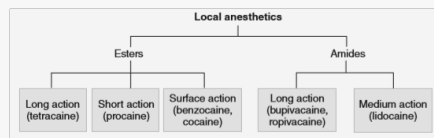


Local Anaesthesia:

- Loss of sensation in a limited region of the body
- Localized analgesia
- Drug delivered to target
- aka "regional anesthesia"

Local anaesthetic agents **provide complete loss of sensory modalities.**

Classification:



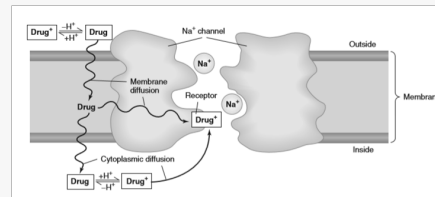
Henderson- Hasselbach Equation:

- > Uncharged form is more lipid soluble
- > Lower the pKa, the greater the percentage of uncharged weak base at a given pH
- > **Basic drugs: more will be lipid soluble form at alkaline pH**

Pharmacokinetics of Local Agents:

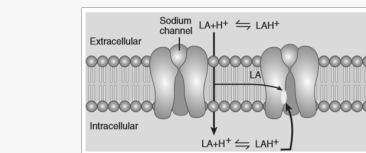
- > Exists as weak bases
- > pKa of most LA agents ranges 7.5 to 9.0
 - mainly exist in cationic form at physiologic pH
- > Benzocaine (pKa 3.5) exists mainly in non-ionized form at physiological pH
- > Cationic form is most active at receptor site
 - receptor site at the inner vestibule of the sodium channel

Mechanism of Action:

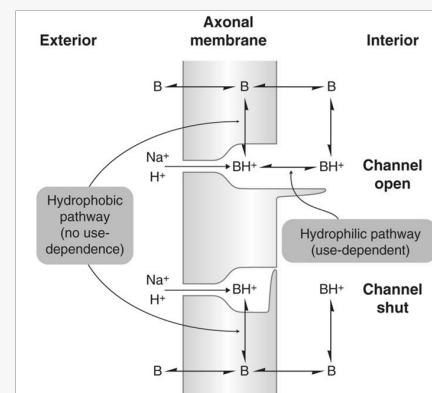


- > Block voltage-gated sodium channels
- > During excitation, sodium channels are opened=
- Sodium influx
- Opening of sodium channels result in depolarization

Path to receptor site:



Interaction with Sodium Channels:



Adverse Effects:

- CNS** sedation, light headedness, visual and auditory disturbances
 - tongue numbness and metallic taste
 - tonic-clonic convulsions (at higher dose)
- Cardio** Profound effects on conduction and function
 - tox-icity:** Heart Block
 - > Pre-medication with **Benzodiazepines** can prevent CNS side effects

Clinical Uses:

- Surface anesthesia:** lidocaine, benzocaine, tetracaine
- Infiltration anesthesia:** most agents, minor surgeries
- Nerve block:** most agents, for surgery, dentistry and analgesia.
- Spinal anesthesia:** mainly lidocaine

Local anesthetic agents used with a **vasoconstrictor:**

- > localised neuronal uptake
- > adrenaline can potentiate neurotoxicity of LA