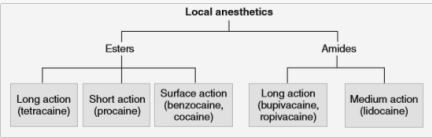
Local Anaesthesia:

- 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 unchanged weak base at a given pH

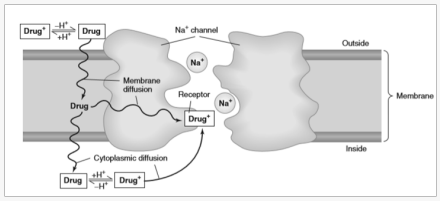
> Basic drugs: more will be lipid soluble form at alkaline pH

Pharmacokinetics of Local Agents:

> Exists as weak bases

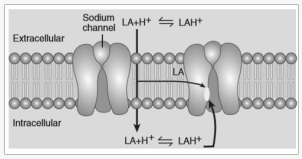
> pKa of most LA agents ranges 7.5 to 9.0	mainly exist in cationic form at physiologic pH
> Benzocaine (pKa 3.5)	exists mainly in non-ionized form at physiological pH
> Cationic form is most active at receptor site	receptor site at the inner vestibule of the sodium channel

Mechanism of Action:

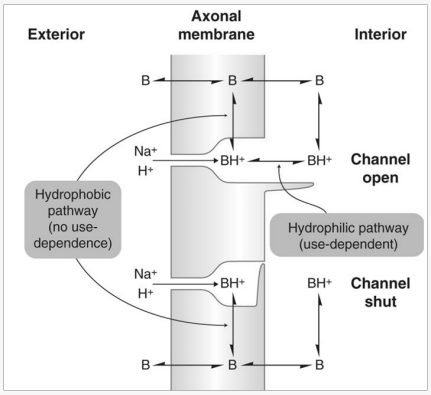


> Block voltage-gated sodium channels
> During excitation, sodium channels are opened=
- Sodium influx
- Opening of sodium channels result in depolarization

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 tox-icity:	Profound effects on conduction and function
	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

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