

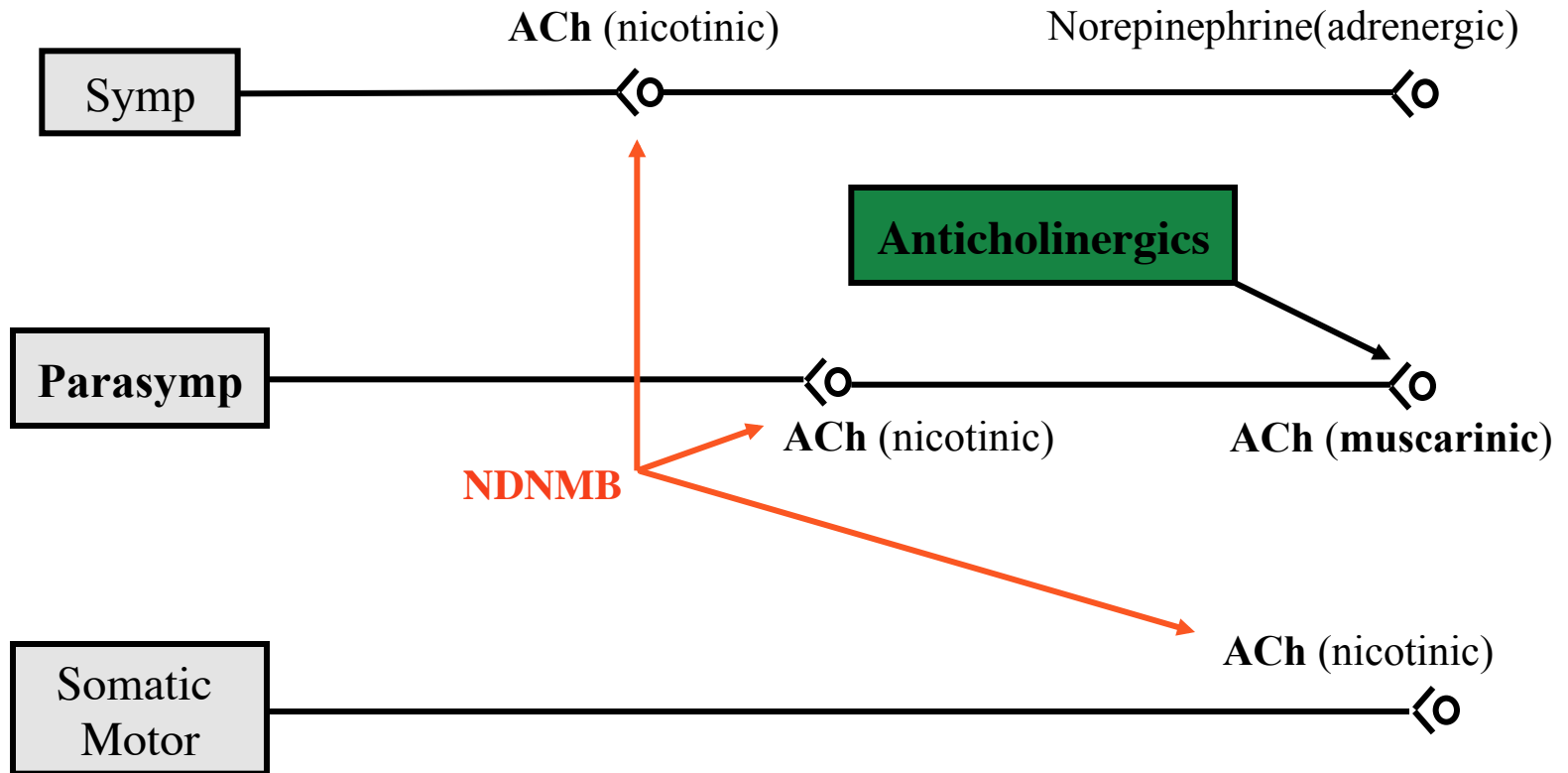
Anticholinergics.



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Mechanism of Action.



Clinical Pharmacology.

- 5 distinct muscarinic cholinergic receptor sub-types present in the **heart, salivary glands, and smooth muscle** of the GI tract & GU tract.
- Extent of effect depends on pre-existing **baseline vagal tone** – will **generally get a greater effect in young adults**, in whom vagal tone is greatest, than in infants or the elderly.

Cardiovascular Effects (M_2 subtype)

1. **Tachycardia** ← blockade of muscarinic rec.s in the SA node
2. Facilitates **conduction through AV node** → ↓ PR interval and often ↓ heart block from vagal activity.
3. Little effect on ventricular function or peripheral vasculature.

Respiratory Effects (M_2 M_3 subtypes)

- 1. Inhibit secretions** of respiratory tract mucosa.
- 2. Relax** bronchial smooth musculature

CNS Effects (M_1 M_3 M_4 M_5 sub-types)

1. Depending on drug & dose :
 - Stimulation** (e.g. restlessness, hallucinations)
 - Depression** (e.g. sedation, amnesia)
 - always consider as a possible explanation for delayed awakening from anesthesia or agitation in the early postop period.
 - **Physostigmine** (anti-cholinesterase that crosses bbb) can reverse these actions.
2. Inhibit n&v - ↓ excitability of labyrinth receptors.

GI Effects (M_1 sub-type)

1. ↓ salivary secretions
↓ gastric secretions.
2. ↓ intestinal **motility** and peristalsis →
longer gastric emptying times.
3. ↓ LOS tone (*? clinical significance*)

Ophthalmic Effects.

1. Mydriasis (pupillary **dilation**)
2. Cycloplegia (unable to accommodate to near vision)

Genitourinary

- ↓ ureter & bladder tone (smooth m. relaxation)

Thermoregulation (M₃ sub-type)

- Inhibition of sweat glands may
→ ↑ body temp (*esp children*)

Dose - Response



Increasing Dose

Salivary / bronchial secretion inhibition

Cardiac / ophthalmic effects

GI tract / GU tract tone / motility

Gastric H⁺ secretion

Comparisons.

	Atropine	Scopolamine	Glycopyrrolate
Tachycardia	+++	+	++
Bronchodilation	++	+	++
Sedation	+	+++	0
Antisialagogue	++	+++	+++
Other effects	Weak analgesia	Prevent motion sickness ↓ incidence PONV	
Cautions	Narrow-angle glaucoma BPH Bladder-neck obstruction	Closed-angle glaucoma ? alter fetal heart rate	↑ metabolic O ₂ consumption

Preop Clinical Uses.

- Historically, *im* atropine to protect heart from vagal reflexes & prevent excessive secretions. Current anesthetic drugs not predictably associated with these effects.
- Nowadays, preop therapeutic goals are :
 - 1. sedation**
 - 2. antisialagogue effect.**

Preop Clinical Uses.

- Anticholinergic drugs in traditional doses used for preop medication in adults do **not** alter gastric fluid pH or volume.

Intraop Clinical Uses.

- **Tx of reflex-mediated bradycardia.**
- **Protection against muscarinic effects of anticholinesterase drugs as used to antagonize NDNMBs.**

Less Frequent Clinical Uses.

1. Bronchodilation.
2. Biliary & ureteral smooth muscle relaxation.
- 3. Production of mydriasis & cycloplegia.**
4. Antagonism of gastric H⁺ secretion.
- 5. Prevention of motion-induced nausea.**
6. Constituents in nonprescription cold remedies.