

## GLYCOPYRROLATE

### Alternatives

- Preoperative inhibition of salivation and excessive respiratory tract excretions
  1. Assess need for premedication on an individual patient basis. Routine use not recommended.
  2. **Atropine sulfate parenteral:**
    - Adult: 0.4 mg (range: 0.2–1 mg) SC, IM, IV 30 - 60 min prior to anesthesia
    - Pediatric: 0.1 mg for children weighing 3 kg, 0.2 mg for 7 to 9 kg, 0.3 mg for 12 to 16 kg and 0.4 mg for those weighing more than 20 kg
  3. **Scopolamine hydrobromide parenteral :**
    - 0.3 mg to 0.6 mg SC, IM, IV 45 to 60 minutes prior to anesthesia
  4. **Scopolamine 1.5 mg transdermal patch**
    - Apply 12 hours before surgery
  5. **Atropine (Other routes)**
    - Oral solution (ophthalmic drops, compound)
      - Pediatric dose: 0.02 mg/kg to 0/03 mg/kg. **Note:** Significantly less effective than IV atropine.
    - Rectal solution (compound)
      - Pediatric dose: 0.05 mg/kg (Max 1.5 mg)
- Intraoperative and postoperative use to counteract excessive vagal stimulation to the heart and the adverse muscarinic effects (bradycardia and excessive secretions) of neostigmine or pyridostigmine.
  1. **Atropine sulfate IV:**
    - Adult: 0.4 mg (range: 0.2–1 mg) OR 0.6–1.2 mg for each 0.5–2.5 mg of neostigmine methylsulfate or 10–20 mg of pyridostigmine bromide
    - Pediatric: 0.02 mg/kg
  2. **Scopolamine hydrobromide IV:**
    - Adult: 0.3 to 0.6 mg
    - Note:** may not be effective in blocking muscarinic effects of neostigmine or pyridostigmine)
- Management of gastrointestinal disorders
  1. **Hyoscine butylbromide (Buscopan) 20 mg/ml**
    - Adult: 10 mg to 20 mg IM, SC or IV at an injection rate of 1 mL/min.
  2. **Atropine sulfate** - 0.4 to 0.6 mg SC, IM, or IV every 4 to 6 hours
  3. **Scopolamine hydrobromide**
    - Adult: 0.3–0.65 mg IM, IV, SC; may be repeated 3 or 4 times if necessary
    - Pediatric: 0.006 mg/kg (6 mcg/kg) or 0.2 mg/m<sup>2</sup> IM, IV, SC

Rationale:

***Routine use of premedication with an antimuscarinic agent is not recommended.***

- General anesthetics such as halothane, pentothal and similar agents don't stimulate salivation and excess tracheobronchial secretions (with the exception of ketamine).<sup>1</sup>
- Premedication does not reduce the frequency or severity of acid-aspiration pneumonitis<sup>2</sup>
- Anticholinergic premedication is not necessary and may even be harmful during flexible bronchoscopy.<sup>3</sup>

1. AHFS electronic database – glycopyrrolate

2. Micromedex electronic database - atropine

3. Malik J, Gupta D et al. Anticholinergic premedication for flexible bronchoscopy: A randomized, double-blind, placebo-controlled study of atropine and glycopyrrolate. Chest 2009;136:347-354.

***Atropine, scopolamine and glycopyrrolate have all been used effectively as preoperative medications.***<sup>1,2,3,4,5</sup>

Drug	Reduces secretions	Increases heart rate	Blocks AE's of a'cholinesterases	Comments
Glycopyrrolate	++	+	+++	No CNS effects
Atropine	+	++	++	Shorter duration of effect
Scopolamine	+++	+	?	Strong sedative effects

1. AHFS electronic database – atropine, glycopyrrolate, scopolamine

2. Micromedex electronic database – atropine, glycopyrrolate, scopolamine

3. Preanesthetic evaluation and preparation. In Eds: Barash PG, Cullen, BF et al. Clinical anesthesia. Online textbook. Available at AccessMedicine. Accessed 02March 2012

4. Open Anesthesia – Premedication. Available at [http://www.openanesthesia.org/index.php?title=Premedication\\_\(Anesthesia\\_Text\)#Anticholinergics](http://www.openanesthesia.org/index.php?title=Premedication_(Anesthesia_Text)#Anticholinergics). Accessed 01Mar 2012.

5. Preoperative Medication: Sedative Hypnotics and Other Agents and Issues. Available at <http://www.cybermedicine2000.com/pharmacology2000/Central/sedhyp/shobj4.htm>. Accessed 30Mar2012.

### ***Transdermal scopolamine for preoperative medication***

One study observed that transdermal scopolamine applied 12 hours before surgery was more effective than placebo and IM scopolamine as an antisialogogue, sedative and post-operative antiemetic.<sup>1</sup>

1. AHFS electronic database – scopolamine monograph.

### **Oral atropine vs. parenteral anticholinergics**

Studies are all from pediatric populations; effect of oral atropine for premedication has not been investigated in adults. Oral atropine was less effective than parenteral atropine and glycopyrrolate in reducing pharyngeal secretions, increasing heart rate and preventing cardiac arrhythmias.<sup>1,2</sup>

1. Warran P, Radford P, & Manford MLM: Glycopyrrolate in children. Br J Anaesth 1981; 53:1273-1276.
2. Gervais H, ElGindi M et al. Plasma concentrations following oral and intramuscular atropine in children and their clinical effects.

### **Rectal atropine**

In one study atropine 0.05mg/kg and midazolam diluted to 6 ml with normal saline provided equivalent inhibition of salivary secretion and sedation as IM atropine and midazolam.<sup>1</sup>

1. De Jong PC & Verburg MP: Comparison of rectal to intramuscular administration of midazolam and atropine for premedication of children. Acta Anesthesiol Scand 1988; 32:485-489.