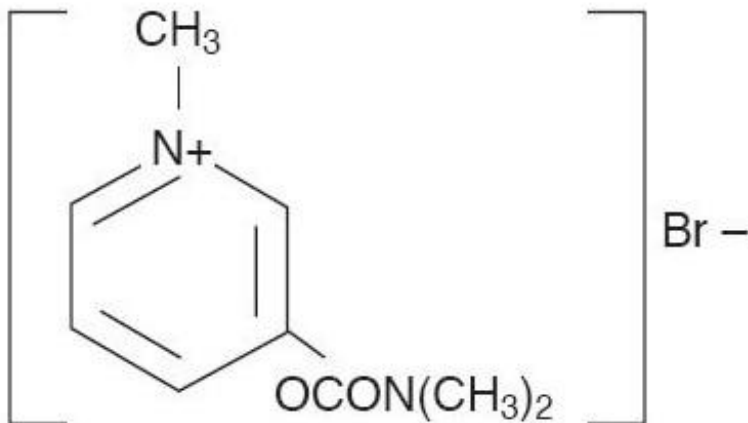


**PRYIDOSTIGMINE BROMIDE- pyridostigmine bromide solution**  
**Athem LLC**

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**Pyridostigmine Bromide Oral Solution USP**

**Description**

Pyridostigmine bromide oral solution USP is an orally active cholinesterase inhibitor. Chemically, pyridostigmine bromide is 3-hydroxy-1-methylpyridinium bromide dimethylcarbamate. Its structural formula is:



Pyridostigmine bromide syrup is available in the following form: Oral solution containing 60 mg pyridostigmine bromide per teaspoonful in a vehicle containing 5% alcohol, glycerin, lactic acid, sodium benzoate, sorbitol, sucrose, FD&C Red No. 40, FD&C Blue No. 1, raspberry flavor and water.

**CLINICAL PHARMACOLOGY**

Pyridostigmine bromide oral solution inhibits the destruction of acetylcholine by cholinesterase and thereby permits freer transmission of nerve impulses across the neuromuscular junction. Pyridostigmine is an analog of neostigmine (Prostigmin®), but differs from it in certain clinically significant respects; for example, pyridostigmine is characterized by a longer duration of action and fewer gastrointestinal side effects.

**INDICATION**

Pyridostigmine bromide oral solution USP is useful in the treatment of myasthenia gravis.

**Contraindications**

Pyridostigmine bromide oral solution is contraindicated in mechanical intestinal or urinary obstruction, and particular caution should be used in its administration to patients with bronchial asthma. Care should be observed in the use of atropine for counteracting side

effects, as discussed below.

## **Warnings**

Although failure of patients to show clinical improvement may reflect underdosage, it can also be indicative of overdosage. As is true of all cholinergic drugs, overdosage of pyridostigmine bromide oral solution may result in cholinergic crisis, a state characterized by increasing muscle weakness which, through involvement of the muscles of respiration, may lead to death. Myasthenic crisis due to an increase in the severity of the disease is also accompanied by extreme muscle weakness, and thus may be difficult to distinguish from cholinergic crisis on a symptomatic basis. Such differentiation is extremely important, since increases in doses of pyridostigmine bromide oral solution or other drugs of this class in the presence of cholinergic crisis or of a refractory or "insensitive" state could have grave consequences. Osserman and Genkins <sup>1</sup> indicate that the differential diagnosis of the two types of crisis may require the use of Tensilon® (edrophonium chloride) as well as clinical judgment. The treatment of the two conditions obviously differs radically. Whereas the presence of myasthenic crisis suggests the need for more intensive anticholinesterase therapy, the diagnosis of cholinergic crisis, according to Osserman and Genkins, <sup>1</sup> calls for the prompt withdrawal of all drugs of this type. The immediate use of atropine in cholinergic crisis is also recommended.

Atropine may also be used to abolish or obtund gastrointestinal side effects or other muscarinic reactions; but such use, by masking signs of overdosage, can lead to inadvertent induction of cholinergic crisis.

For detailed information on the management of patients with myasthenia gravis, the physician is referred to one of the excellent reviews such as those by Osserman and Genkins, <sup>2</sup> Grob <sup>3</sup> or Schwab. <sup>4,5</sup>

## **Usage in Pregnancy**

The safety of pyridostigmine bromide oral solution during pregnancy or lactation in humans has not been established. Therefore, use of pyridostigmine bromide oral solution in women who may become pregnant requires weighing the drug's potential benefits against its possible hazards to mother and child.

## **Precautions**

Pyridostigmine is mainly excreted unchanged by the kidney. <sup>6,7,8</sup> Therefore, lower doses may be required in patients with renal disease, and treatment should be based on titration of drug dosage to effect. <sup>6,7</sup>

## **Pediatric Use**

Safety and effectiveness in pediatric patients have not been established.

## **Adverse Reactions**

The side effects of pyridostigmine bromide oral solution are most commonly related to overdosage and generally are of two varieties, muscarinic and nicotinic. Among those in

the former group are nausea, vomiting, diarrhea, abdominal cramps, increased peristalsis, increased salivation, increased bronchial secretions, miosis and diaphoresis. Nicotinic side effects are comprised chiefly of muscle cramps, fasciculation and weakness. Muscarinic side effects can usually be counteracted by atropine, but for reasons shown in the preceding section the expedient is not without danger. As with any compound containing the bromide radical, a skin rash may be seen in an occasional patient. Such reactions usually subside promptly upon discontinuance of the medication.

To report SUSPECTED ADVERSE REACTIONS, contact Athem LLC at 844-369-4671 or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch).

## **Dosage and Administration**

Pyridostigmine bromide oral solution is available in the following dosage form:

### **Oral Solution**

raspberry-flavored, containing 60 mg pyridostigmine bromide per teaspoonful (5 mL). This form permits accurate dosage adjustment for children and "brittle" myasthenic patients who require fractions of 60 mg doses. It is more easily swallowed, especially in the morning, by patients with bulbar involvement.

### **Dosage**

The size and frequency of the dosage must be adjusted to the needs of the individual patient.

### **Oral Solution**

The average dose is ten 5 mL teaspoonfuls daily, spaced to provide maximum relief when maximum strength is needed. In severe cases, as many as 25 teaspoonfuls a day may be required, while in mild cases one to six teaspoonfuls a day may suffice.

Note: For information on a diagnostic test for myasthenia gravis, and for the evaluation and stabilization of therapy, please see product literature on Tensilon® (edrophonium chloride).

## **How Supplied**

Oral Solution, 60 mg pyridostigmine bromide per teaspoonful (5 mL) and 5% alcohol — bottles of 16 fluid ounces (1 pint) NDC: 73152-028-16

Store pyridostigmine bromide oral solution USP at 25°C (77°F); excursions permitted to 15°C-30°C (59°F-86°F).

Brands mentioned are trademarks of their respective owners.

## **References**

### REFERENCES

1. Osserman KE, Genkins G. Studies in myasthenia gravis: Reduction in mortality rate after crisis. JAMA. Jan 1963; 183:97-101.
2. Osserman KE, Genkins G. Studies in myasthenia gravis. NY State J Med. June 1961; 61:2076-2085.
3. Grob D. Myasthenia gravis. A review of patho-genesis and treatment. Arch Intern

Med. Oct 1961; 108:615-638.

4. Schwab RS. Management of myasthenia gravis. New Eng J Med. Mar 1963; 268:596-597.

5. Schwab RS. Management of myasthenia gravis. New Eng J Med. Mar 1963; 268:717-719.

6. Cronnelly R, Stanski DR, Miller RD, Sheiner LB. Pyridostigmine kinetics with and without renal function. Clin Pharmacol Ther. 1980; 28:No. 1, 78-81.

7. Miller RD. Pharmacodynamics and pharmacokinetics of anticholinesterase. In: Ruegheimer E, Zindler M, ed. Anaesthesiology. (Hamburg, Germany: Congress; Sep 14-21, 1980; 222-223.) (Int Congr. No. 538), Amsterdam, Netherlands: Excerpta Medica; 1981.

8. Breyer-Pfaff U, Maier U, Brinkmann AM, Schumm F. Pyridostigmine kinetics in healthy subjects and patients with myasthenia gravis. Clin Pharmacol Ther. 1985;5:495-501.

Manufactured for:

Athem, LLC

East Brunswick, NJ 08816

Made in USA

Rev. 10/2020

## Pyridostigmine Bromide Syrup 60mg/5mL Bottle

5 ml (1 teaspoonful) contains 60 mg pyridostigmine bromide.

**Usual Dosage:** The size and frequency of the dosage must be adjusted to the needs of the individual. The average is ten 60 mg (5 ml) doses per day, spaced to provide maximum relief when maximum strength is needed. In severe cases, as many as 25 or more teaspoonfuls a day maybe required, while in mild cases one to six teaspoonfuls a day may suffice.

**IMPORTANT:** For additional dosage information and other important prescribing information, read accompanying insert.

Store at 25°C (77°F); excursions permitted to 15°C to 30°C (59°F to 86°F).

Dispense in tight, light-resistant containers as defined by USP/NF.

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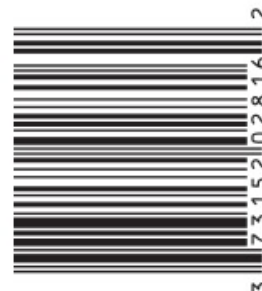
NDC: 73152-028-16

**Pyridostigmine  
Bromide  
Oral Solution,  
USP**

**5 ml = 60 mg  
1 Pint (473 ml)**

**Alcohol 5%**

**Rx only**



**1.75" x 2.0"**

**NO VARNISH**

**PRYIDOSTIGMINE BROMIDE**

pyridostigmine bromide solution

### Product Information

<b>Product Type</b>	HUMAN PRESCRIPTION DRUG	<b>Item Code (Source)</b>	NDC:73152-028
<b>Route of Administration</b>	ORAL		

### Active Ingredient/Active Moiety

Ingredient Name	Basis of Strength	Strength
<b>PYRIDOSTIGMINE BROMIDE</b> (UNII: KVI301NA53) (PYRIDOSTIGMINE - UNII:19QM69HH21)	PYRIDOSTIGMINE BROMIDE	60 mg in 5 mL

### Inactive Ingredients

Ingredient Name	Strength
<b>ALCOHOL</b> (UNII: 3K9958V90M)	
<b>SODIUM BENZOATE</b> (UNII: OJ245FE5EU)	
<b>SUCROSE</b> (UNII: C151H8M554)	
<b>GLYCERIN</b> (UNII: PDC6A3C0OX)	
<b>LACTIC ACID</b> (UNII: 33X04XA5AT)	
<b>SORBITOL</b> (UNII: 506T60A25R)	
<b>FD&amp;C RED NO. 40</b> (UNII: WZB9127XOA)	
<b>FD&amp;C BLUE NO. 1</b> (UNII: H3R47K3TBD)	
<b>RASPBERRY</b> (UNII: 4N14V5R27W)	
<b>WATER</b> (UNII: 059QF0KO0R)	

### Product Characteristics

<b>Color</b>	orange	<b>Score</b>	
<b>Shape</b>		<b>Size</b>	
<b>Flavor</b>	RASPBERRY	<b>Imprint Code</b>	
<b>Contains</b>			

### Packaging

#	Item Code	Package Description	Marketing Start Date	Marketing End Date
1	NDC:73152-028-16	473 mL in 1 BOTTLE, PLASTIC; Type 0: Not a Combination Product	02/25/2021	

### Marketing Information

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
ANDA	ANDA208797	02/25/2021	

**Labeler** - Athem LLC (117077124)**Establishment**

<b>Name</b>	<b>Address</b>	<b>ID/FEI</b>	<b>Business Operations</b>
InvaTech Pharma Solutions LLC		078602180	manufacture(73152-028) , analysis(73152-028) , pack(73152-028) , label(73152-028)

Revised: 3/2023

Athem LLC