

# STEPS

## New Drug Reviews

# Glycopyrrolate (Lonhala Magnair) for Treatment of Chronic Obstructive Pulmonary Disease

Montgomery Douglas, MD, University of Connecticut School of Medicine, Farmington, Connecticut

Glycopyrrolate nebulizer solution (Lonhala Magnair) is labeled for long-term maintenance therapy of chronic obstructive pulmonary disease (COPD), including chronic bronchitis and emphysema. It is available with a portable nebulizer for self-administration by patients.

### Safety

Glycopyrrolate is an anticholinergic, which could theoretically induce narrow-angle glaucoma and worsen symptoms of urinary retention. Glycopyrrolate should not be used with other medications that have anticholinergic activity.<sup>1</sup> It should not be initiated in patients during an acute exacerbation of COPD. All patients started on glycopyrrolate should have a short-acting beta agonist for treatment of acute symptoms and paradoxical bronchospasm. Glycopyrrolate should be avoided in patients with unstable cardiac disease because studies have not evaluated safety. Glycopyrrolate is excreted in breast milk and should not be used in pregnant and lactating women unless the expected benefit outweighs the potential risk. It is not approved for use in children.

### Tolerability

Glycopyrrolate is well tolerated. In clinical trials, the pooled dropout rate due to adverse effects was 5%, compared with 9% for patients treated with placebo. Two 12-week randomized, placebo-controlled trials involved a total of 431 patients with moderate to severe COPD (average forced

Drug	Dosage	Dose form	Cost*
Glycopyrrolate (Lonhala Magnair)	One inhalation (25 mcg) twice daily	1-mL vial	\$1,170

\*—Estimated retail price of 30 days of treatment (60 vials) based on information obtained at <https://www.goodrx.com> (accessed February 7, 2019).

expiratory volume in one second [FEV<sub>1</sub>] of 52% of predicted). More than 2% of participants experienced adverse effects, including dyspnea (4.9% vs. 3% with placebo) and urinary tract infection (9% vs. 6% with placebo).<sup>1</sup> No adjustment in dosage is necessary in older patients or in patients with hepatic impairment or mild to moderate renal disease.

### Effectiveness

When added to treatment with a long-acting beta agonist, with or without an inhaled corticosteroid and ipratropium (Atrovent), glycopyrrolate will increase FEV<sub>1</sub> by 81 to 96 mL, which is similar to the increase achieved with tiotropium (Spiriva).<sup>1,2</sup> The effectiveness of glycopyrrolate was confirmed in a larger 48-week open-label study.<sup>3</sup> Quality of life is significantly improved in one additional patient for every nine patients treated with glycopyrrolate vs. placebo, but glycopyrrolate has not been studied as the sole long-acting therapy for COPD. ►

**STEPS new drug reviews** cover Safety, Tolerability, Effectiveness, Price, and Simplicity. Each independent review is provided by authors who have no financial association with the drug manufacturer.

**This series** is coordinated by Allen F. Shaughnessy, PharmD, MMedEd, Assistant Medical Editor.

**A collection** of STEPS published in *AFP* is available at <https://www.aafp.org/afp/steps>.

**Author disclosure:** No relevant financial affiliations.

## STEPS

Glycopyrrolate has not been evaluated in patients with mild COPD, and studies have not determined its effect on patient-oriented outcomes (e.g., risk of exacerbation, hospitalization).

### Price

A one-month supply of glycopyrrolate (60 vials) costs approximately \$1,170. This price includes the cost of the nebulizer for administration. In comparison, a one-month supply of tiotropium costs about \$445.

### Simplicity

The recommended dosage of glycopyrrolate is one 25-mcg inhalation twice daily. Patients should be instructed in the administration of glycopyrrolate as well as assembly and care of the nebulizer. Administration requires two to three minutes. No research has compared its ease of use with administration of a metered-dose inhaler.

### Bottom Line

Glycopyrrolate is a safe alternative to long-acting muscarinic antagonists delivered by metered-dose

inhaler for patients with moderate to severe COPD. However, it is significantly more expensive compared with other treatments. Its use should be limited to patients who cannot use a metered-dose inhaler.

**Address correspondence** to Montgomery Douglas, MD, at [mdouglas@uchc.edu](mailto:mdouglas@uchc.edu). Reprints are not available from the author.

### References

1. Daily Med. Drug label information. Lonhala Magnair-glycopyrrolate solution. <https://dailymed.nlm.nih.gov/dailymed/drugInfo.cfm?setid=78166def-5e2f-42a6-a1f1-0253e5765632>. Accessed January 7, 2019.
2. Kerwin E, Donohue JF, Goodin T, Tosiello R, Wheeler A, Ferguson GT. Efficacy and safety of glycopyrrolate/eFlow® CS (nebulized glycopyrrolate) in moderate-to-very-severe COPD: results from the Glycopyrrolate for Obstructive Lung Disease via Electronic Nebulizer (GOLDEN) 3 and 4 randomized controlled trials. *Respir Med*. 2017;132:238-250.
3. Ferguson GT, Goodin T, Tosiello R, Wheeler A, Kerwin E. Long-term safety of glycopyrrolate/eFlow® CS in moderate-to-very-severe COPD: results from the Glycopyrrolate for Obstructive Lung Disease via Electronic Nebulizer (GOLDEN) 5 randomized study. *Respir Med*. 2017;132:251-260. ■

**FMX** | **PHILADELPHIA**  
**FAMILY MEDICINE**  
**EXPERIENCE**  
Sept. 24-28, 2019  
[AAFP.ORG/FMX](http://AAFP.ORG/FMX)  
THE AAFP'S LARGEST ANNUAL FAMILY MEDICINE EVENT

REGISTER SOON TO SECURE YOUR SPOT  
AT THE LOWEST PRICE.