



PRIOR AUTHORIZATION POLICY

- POLICY:** Antibiotics (Inhaled) – Tobramycin Inhalation Solution Prior Authorization Policy
- Bethkis[®] (tobramycin inhalation solution – Chiesi)
 - Kitabis[®] (tobramycin inhalation solution – Pari, authorized generic)
 - TOBI[®] (tobramycin inhalation solution – Mylan, generic)

REVIEW DATE: 03/29/2023

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CIGNA NATIONAL FORMULARY COVERAGE:

OVERVIEW

TOBI, Kitabis, and Bethkis, tobramycin inhalation solutions, are aminoglycoside antibiotics indicated for the management of **cystic fibrosis (CF)** in patients with *Pseudomonas aeruginosa*.¹⁻³ TOBI and Kitabis are indicated for the management of CF in patients ≥ 6 years of age.^{1,2} Safety and efficacy have not been demonstrated in patients < 6 years of age, patients with forced expiratory volume in 1 second (FEV₁) $< 25\%$ or $> 75\%$ predicted, or patients colonized with *Burkholderia cepacia*. Bethkis is indicated for the management of CF patients with *P. aeruginosa*.³ Safety and efficacy have not been demonstrated in patients < 6 years of age, patients with FEV₁ $< 40\%$ or $> 80\%$ predicted, or patients colonized with *B. cepacia*.

Guidelines

The Cystic Fibrosis Foundation (CFF) Pulmonary Therapeutics Committee published recommendations for the use of chronic medications in the management of CF lung disease (2013).⁴ In patients ≥ 6 years of age with CF and moderate-to-severe lung disease with *P. aeruginosa* persistently present in cultures of the airways, chronic use of inhaled tobramycin is strongly recommended to improve lung function, quality of life and reduce exacerbations. For mild disease, the Committee recommends chronic

use of inhaled tobramycin for patients ≥ 6 years of age with CF and *P. aeruginosa* persistently present in cultures of the airways, to reduce exacerbations.

The CFF published a systematic review of the literature regarding eradication of initial *P. aeruginosa* infections to develop guidelines for effective prevention (2014).⁵ The recommendations pertaining to inhaled antibiotics are as follows: 1) Inhaled antibiotic therapy is recommended for the treatment of initial or new growth of *P. aeruginosa* (the favored antibiotic regimen is tobramycin [300 mg twice daily {BID}] for 28 days); and 2). Prophylactic antipseudomonal antibiotics to prevent the acquisition of *P. aeruginosa* are not recommended.

Other Uses with Supportive Evidence

A few trials support the efficacy of tobramycin inhalation solution (TIS) for the treatment of bronchiectasis with *P. aeruginosa* infection. A literature review concluded that in patients with non-CF bronchiectasis and chronic *P. aeruginosa* infection, TIS is effective in reducing the density of bacteria in sputum, which may be associated with additional clinical benefit.¹²

In a randomized, double-blind, placebo-controlled study, patients received either TIS 300 mg (n = 37) or placebo (n = 37) (BID for 4 weeks and were followed for an additional 2 weeks off treatment).⁶ At Week 4, the TIS group had a mean 4.54 log₁₀ decrease in *P. aeruginosa* colony-forming units (CFU)/g of sputum compared with no change in the placebo group (P < 0.01). At Week 6, complete eradication of *P. aeruginosa* occurred in 35% of the patients in the TIS group compared with none in the placebo group, and 62% of patients in the TIS group vs. 38% of patients in the placebo group had improvements in their general health (odds ratio 2.7; 95% confidence interval: 1.1, 6.9).

In a randomized, single-blind study, patients received TIS 300 mg (n = 16) or placebo (n = 19) BID for 3 months following a 14-day course of intravenous ceftazidime and tobramycin and were followed for an additional 12 months.⁷ At the end of the study, 54.5% of patients in the TIS group (n = 6/11) and 29.4% of patients in the placebo group (n = 5/17) were free of *P. aeruginosa* (P = 0.048). In addition, patients in the TIS group had significantly fewer exacerbations (1.27 vs. 2.5; P = 0.044), hospital admissions (0.06 vs. 0.47; P = 0.037), and hospital days (0.9 vs. 13.56; P = 0.034) than patients in the placebo group, respectively. No significant differences were found in pulmonary function tests.

A double-blind, placebo-controlled, crossover study randomized 30 patients to initial TIS 300 mg or placebo BID for 6 months, followed by a 1 month washout period and 6 months of therapy with the other treatment.⁸ During the first treatment period, TIS treatment resulted in a significant reduction in *P. aeruginosa* density compared with placebo (P = 0.038). During both treatment periods, patients treated with TIS had fewer hospital admissions (0.15 vs. 0.75; P = 0.038) and hospital days (2.05 vs. 12.65; P = 0.047) than patients treated with placebo, respectively. No significant changes in the number of exacerbations and/or pulmonary function tests were observed.

In an open-label trial, 41 patients received three cycles of TIS 300 mg BID for 14 days followed by 14 days off therapy.⁹ Patients were followed for an additional 40 weeks after the three cycles of treatment with TIS. At Week 10, there was a significant improvement from baseline (mean change 1.5 points; $P = 0.006$) in the composite pulmonary symptom score which included cough, shortness of breath, sputum production, fatigue, and wheezing. Quality of life, assessed using the St. George's Respiratory Questionnaire, was significantly improved at Week 10 (mean change 9.8; $P < 0.001$) compared with baseline. At Week 12, 22.2% of patients ($n = 6/27$) were considered to have *P. aeruginosa* eradicated from sputum cultures.

A Phase III, multicenter, double-blind, placebo-controlled trial randomized adults with symptomatic bronchiectasis with positive *P. aeruginosa* sputum culture to TIS 300 mg ($n = 167$) or placebo ($n = 172$) in addition to standard of care.¹³ Treatment was provided for two cycles, each consisting of 28 days on therapy and 28 days off therapy. At Week 16, there was a significant reduction in *P. aeruginosa* density with TIS vs. placebo (adjusted difference 1.74 \log_{10} CFU/g; $P < 0.001$) and a greater improvement in the quality of life bronchiectasis respiratory symptom score on Day 29 (adjusted mean difference 7.91; $P < 0.001$). Significantly more patients were culture negative for *P. aeruginosa* in the TIS group vs. placebo on Day 29 (29.3% vs. 10.6%, respectively).

The American Thoracic Society (ATS) published a clinical review (2013) of non-cystic fibrosis bronchiectasis.¹⁰ The review lists nebulized antibiotics (e.g., colistin, gentamicin, tobramycin) as treatment options for the eradication or suppression of *P. aeruginosa*. The European Respiratory Society (ERS) have published guidelines (2017) for the management of adult bronchiectasis and recommend patients with a new isolate of *P. aeruginosa* be offered eradication antibiotic treatment which includes nebulized antibiotics (e.g., colistin, gentamicin, tobramycin).¹¹ While both the ATS and ERS list nebulized colistin and gentamicin as treatment options for non-cystic fibrosis bronchiectasis, neither drug has a commercially available formulation for nebulization.

POLICY STATEMENT

Prior Authorization is recommended for prescription benefit coverage of tobramycin inhalation solution. All approvals are provided for the duration noted below. In cases where the approval is authorized in months, 1 month is equal to 30 days. Because of the specialized skills required for evaluation and diagnosis of patients treated with tobramycin inhalation solution as well as the monitoring required for adverse events and long-term efficacy, approval requires tobramycin inhalation solution to be prescribed by or in consultation with a physician who specializes in the condition being treated.

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is(are) covered as medically necessary when the following criteria is(are) met for fda-approved indication(s) or other uses with supportive evidence (if applicable):

FDA-Approved Indication

- 1. Cystic Fibrosis.** Approve for 1 year if the patient meets the following criteria (A and B):
 - A)** Patient has *Pseudomonas aeruginosa* in culture of the airway; AND
Note: Examples of culture of the airway include sputum culture, oropharyngeal culture, bronchoalveolar lavage culture.
 - B)** The medication is prescribed by or in consultation with a pulmonologist or a physician who specializes in the treatment of cystic fibrosis.

Other Uses with Supportive Evidence

- 2. Bronchiectasis, Non-Cystic Fibrosis.** Approve for 1 year if the patient meets the following criteria (A, B, and C):
 - A)** Patient is ≥ 18 years of age; AND
 - B)** Patient has *Pseudomonas aeruginosa* in culture of the airway; AND
Note: Examples of culture of the airway include sputum culture, oropharyngeal culture, bronchoalveolar lavage culture.
 - C)** The medication is prescribed by or in consultation with a pulmonologist.
- 3. Continuation of Tobramycin Inhalation Solution Therapy.** Approve for 1 month if the patient was started on tobramycin inhalation solution and is continuing a course of therapy.

CONDITIONS NOT COVERED

- **Bethkis® (tobramycin inhalation solution – Chiesi)**
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is(are) considered experimental, investigational or unproven for ANY other use(s) including the following (this list may not be all inclusive; criteria will be updated as new published data are available):

- 1. Nasal Rinse.** Tobramycin inhalation solution is not approvable for compounding of tobramycin nasal rinse.

REFERENCES

1. TOBI® inhalation solution [prescribing information]. Morgantown, WV: Mylan; February 2023.
2. Kitabis® inhalation solution [prescribing information]. Midlothian, VA: Pari; February 2023.
3. Bethkis® inhalation solution [prescribing information]. Woodstock, IL: Chiesi; February 2023.

4. Mogayzel PJ, Naureckas ET, Robinson KA, et al. Cystic Fibrosis Pulmonary Guidelines. Chronic Medications for Maintenance of Lung Health. *Am J Respir Crit Care Med.* 2013;187:680-689.
5. Mogayzel PJ, Naureckas ET, Robinson KA, et al; and the Cystic Fibrosis Foundation Pulmonary Clinical Practice Guidelines Committee. Pharmacologic approaches to prevention and eradication of initial *Pseudomonas aeruginosa* infection. *Ann Am Thorac Soc.* 2014;11(10):1640-1650.
6. Barker AF, Couch L, Fiel SB, et al. Tobramycin solution for inhalation reduces sputum *Pseudomonas aeruginosa* density in bronchiectasis. *Am J Respir Crit Care Med.* 2000;162:481-485.
7. Orriols R, Hernando R, Ferrer A, et al. Eradication therapy against *Pseudomonas aeruginosa* in non-cystic fibrosis bronchiectasis. *Respiration.* 2015;90:299-305.
8. Drobnic ME, Sune P, Montoro JB, et al. Inhaled tobramycin in non-cystic fibrosis patients with bronchiectasis and chronic bronchial infection with *Pseudomonas aeruginosa*. *Ann Pharmacother.* 2005;39:39-44.
9. Scheinberg P, Shore E. A pilot study of the safety and efficacy of tobramycin solution for inhalation in patients with severe bronchiectasis. *Chest.* 2005;127:1420-1426.
10. McShane PJ, Naureckas ET, Tino G, Strek ME. Non-cystic fibrosis bronchiectasis. *Am J Respir Crit Care Med.* 2013;188:647-656.
11. Polverino E, Goeminne PC, McDonnell, et al. European Respiratory Society guidelines for the management of adult bronchiectasis. *Eur Respir J.* 2017;50:1700629.
12. Elborn JS, BLasi F, Haworth CS, et al. Bronchiectasis and inhaled tobramycin: A literature review. *Respir Med.* [Epub ahead of print 2022 Jan 1].
13. Guan WJ, Xu JF, Luo H, et al. A double-blind randomized placebo-controlled Phase III trial of tobramycin inhalation solution in adults with bronchiectasis with *Pseudomonas aeruginosa* infection. *Chest.* 2023;163(1):64-76.

HISTORY

Type of Revision	Summary of Changes	Review Date
Annual Revision	Cystic fibrosis: Moved examples of culture of the airway to a Note. Bronchiectasis, Non-Cystic fibrosis: Moved examples of culture of the airway to a Note.	04/06/2022
Annual Revision	No criteria changes.	03/29/2023

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