- Severe latent or delayed-onset complications have not been reported with BT, but the number of individuals with asthma included in long-term follow-up assessments is very small (fewer than 250 people at the time the systematic review report[3] on this topic was completed).
- **What clinicians should discuss with their patients about BT:**
  - This procedure may reduce severe asthma exacerbations compared with standard care after treatment. Although the benefits could last 5 years or more, only limited data demonstrate that this treatment improves long-term asthma outcomes.
  - The risks associated with BT include worsening of asthma, respiratory infections, hemoptysis, bronchiectasis, and pulmonary artery complications.[252-254] In addition, severe, delayed-onset complications could occur that have not yet been recognized because of the small numbers of individuals who have undergone the procedure.
  - Individuals ages 18 years and older with persistent asthma who place a low value on the harms (short-term worsening symptoms and unknown long-term side effects) and a high value on the potential benefits (improvement in asthma quality of life, small reduction in exacerbations) of BT might consider this treatment.

Summary of the Evidence

The Expert Panel specified three *critical* outcomes (exacerbations, asthma control, and quality of life) and one *important* outcome (use of rescue medication) for this question. The summary of evidence for Recommendation 19 can be found in Appendix B (evidence to decision Table XXVIII).

The conditional recommendation against the use of BT in individuals ages 18 years and older with poorly controlled asthma after medium-to-high-dose ICS treatment paired with a LABA (with or without oral corticosteroids) is based on three randomized controlled trials (RCTs).[247-249] All of these trials were funded by the company that markets the BT device.

Two of the studies compared BT with standard care.[248,249] The Research In Severe Asthma (RISA) study (N = 32)[249] enrolled individuals treated with a high-dose ICS (more than 750 mcg fluticasone or equivalent) and a LABA (100 mcg salmeterol equivalent) with or without daily oral corticosteroids (less than 30 mg/day prednisone equivalent). The Asthma Intervention Research (AIR)[248] study (N = 112) enrolled individuals taking an ICS (more than 200 mcg/day beclomethasone equivalent) and a LABA (100 mcg salmeterol or equivalent). These two studies found improvements in *critical* outcomes, including decreases in numbers of mild exacerbations not requiring oral or parenteral corticosteroids and in numbers of emergency department visits. The results also showed improved asthma control based on Asthma Control Questionnaire scores and less rescue medication use (an *important* outcome).[248,249]

A third study, AIR 2 (N = 288), compared BT with sham bronchoscopy plus standard care.[247] This study enrolled individuals treated with high-dose ICS (more than 1,000 mcg betamethasone or equivalent) plus a LABA. Participants could also continue using leukotriene modifiers and omalizumab if they had used these treatments for at least 1 year. This study found reductions in severe exacerbations requiring oral or parenteral corticosteroid treatment over 12 months in participants treated with BT. Other *critical* outcomes—such as asthma control, mean asthma quality of life scores (measured with the Asthma Quality of Life Questionnaire), and rescue medication use (an *important* outcome)—did not improve. The percentage of participants with Asthma Quality of Life Questionnaire scores of 0.5 or higher (minimally important difference) in the BT group (79 percent) was significantly different from the corresponding proportion (64 percent) in the control (sham bronchoscopy) group. The strength of evidence was low for all of these outcomes across the three studies. None of the studies found that BT reduced the number of hospitalizations for asthma over 12 months.[247-249]