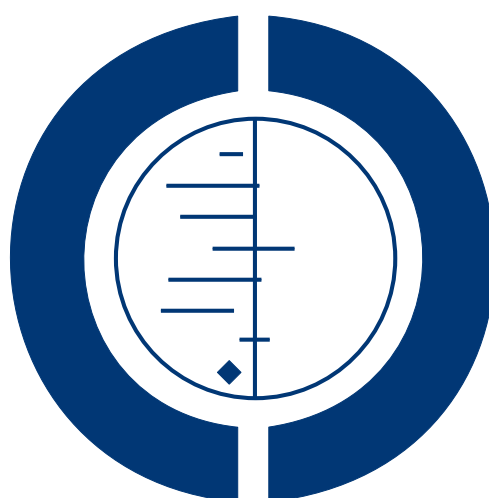


# **Surgery versus non-surgical treatment for bronchiectasis (Review)**

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[Intervention Review]

# Surgery versus non-surgical treatment for bronchiectasis

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(Editorial group: Cochrane Airways Group.)

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## ABSTRACT

### Background

Standard treatment for bronchiectasis comprises postural drainage and various regimes of antibiotic therapy. If the disease is confined to localised areas of lung, surgical resection of the affected segments is often performed.

### Objectives

To assess the benefit of surgical resection compared with standard (“conservative”) treatment.

### Search strategy

The Cochrane Airways Group Specialised Register of trials was searched up to April 2009.

### Selection criteria

Only randomised, controlled trials were considered

### Data collection and analysis

The titles, abstracts and citations were independently reviewed by the two reviewers to assess potential relevance for full review.

### Main results

No randomised or controlled clinical trials were found, other than case series or case-controlled studies. Subsequent update searches have failed to identify any trials.

### Authors' conclusions

Surgical treatment of bronchiectasis is widely used, but there appear to be no randomised controlled trials. It is not possible to provide an unbiased estimate of its benefit compared to conservative therapy .

## PLAIN LANGUAGE SUMMARY

### Surgery versus non-surgical treatment for bronchiectasis

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Surgery versus non-surgical treatment for bronchiectasis (Review)

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Removal of affected parts of the lung is often carried out in patients with bronchiectasis. A review was performed with the aim of identifying evidence for the benefit of surgery in bronchiectasis. No randomised controlled trials were identified so it is not possible to provide an unbiased estimate of the benefit of surgery for patients with bronchiectasis.

## BACKGROUND

Bronchiectasis is defined as the chronic dilatation of one or more bronchi. The first clinico-pathological description of the condition was given by Laennec in 1819. The disease is typically caused by a childhood pneumonia which irreparably damages the developing lung. Other causes include tuberculous infection, cystic fibrosis and immunoglobulin deficiencies. In the most severe cases the disease leads to recurrent infection, chronic bronchial sepsis and progressive lung damage culminating in ventilatory failure. Life-threatening complications including massive haemoptysis are occasionally seen. There is however considerable heterogeneity in the presentation and severity of the disease. The incidence of bronchiectasis in developed countries has fallen since the advent of effective anti-tuberculous chemotherapy, broad spectrum antibiotics and vaccination for childhood infections such as measles and whooping cough. Nevertheless a small but significant population of patients exist who encounter problems due to bronchiectasis. It has been a widely held view that if the area of the lung affected by bronchiectatic change is localised and the patient's symptoms are debilitating, surgical resection of the affected region may be of benefit. Non-randomised case-control studies and large series have been reported ([Annest 1982b](#), [Ashour 1996b](#), [Dogan 1989b](#), [George 1979b](#), [Sanderson 1974b](#)). The results are of uncertain value, however, mainly because patients in the surgically treated groups tended to have less severe disease. This review aims to identify randomised, controlled studies that compared surgical intervention with conventional non surgical ("conservative") treatment for chronic (non-cystic fibrosis) bronchiectasis.

## OBJECTIVES

The objective of the review was to determine whether surgical resection of areas of lung affected by bronchiectasis is a superior form of treatment to conventional conservative therapy (usually consisting of postural drainage and various regimes of antibiotic administration). We excluded bronchiectasis due to cystic fibrosis from this study.

## METHODS

### Criteria for considering studies for this review

### Types of studies

Only randomised parallel group studies were considered.

### Types of participants

Participants should be adults with a diagnosis of bronchiectasis based on clinical symptoms, imaging techniques (either high resolution CT scanning or bronchography) or histology of resected specimens.

### Types of interventions

Participants randomised to either surgical intervention (segmentectomy, lobectomy, pneumonectomy) or conventional treatment with postural drainage and antibiotic treatment.

### Types of outcome measures

All outcome measures of bronchiectasis severity were to be considered, but specifically:

1. Bronchiectasis symptom scores: cough, sputum, chest pain, wheeze, haemoptysis,
2. Clinic measurements of lung function, mainly FEV1, FVC, peak expiratory flow rate
3. Quality of life scores
4. Bronchiectasis exacerbation rates: hospitalisations, markers of systemic inflammation
5. Complications of surgery
6. Weight loss
7. Survival

### Search methods for identification of studies

Trials were identified using the Cochrane Airways Group Specialised Register of trials, which is derived from systematic searches of bibliographic databases including the Cochrane Central Register of Controlled Trials (CENTRAL), MEDLINE, EMBASE and CINAHL, and handsearching of respiratory journals and meeting abstracts (please see the [Airways Group Module](#) for further details). All records in the Specialised Register coded as 'bronchiectasis' were searched using the following terms:

surg\* OR resec\* OR lobect\* OR pneumonect\* OR segmentec\*

An additional search of CENTRAL was also completed using the same search strategy. The most recent searches were carried out in April 2009.

Bibliographies from included studies, reviews and texts were checked for further references to trials.

## Data collection and analysis

### Selection of studies

Initially the titles, abstracts and citations were reviewed independently by the two reviewers to assess potential relevance for full review. Subsequently from the full text, both reviewers independently assessed studies for inclusion based on the criteria for population, intervention, study design and outcomes. Agreement was measured by simple agreement and kappa statistics.

### Data extraction and management

Data were to have been extracted from published selected studies by both reviewers JAC and CJW and entered into the Cochrane Collaboration software programme. Included studies were to have been subjected to quality assessment using the Cochrane approach and the method of Jadad.

### Data synthesis

Where possible, all included trials were to be combined using the Review Manager. For continuous variables the results of individual studies were to be calculated as fixed effects weighted mean difference (WMD) or standardised mean difference (SMD), with 95% Confidence Intervals (CI). For similar studies the pooled WMD or SMD and 95%CI were to be calculated. For pooled effects a Breslow-Day test of heterogeneity was to have been carried out and a p value <0.05 would have been considered significant.

Planned subgroup comparisons were:

1. Concurrent use of corticosteroids (none, inhaled, oral)
2. Concurrent use of salmeterol (which may have effects on neutrophils)

Planned sensitivity analyses were:

1. Methodological quality - Cochrane criteria A versus B&C and Jadad score 3-5 versus <3
2. Random effects versus fixed effects modelling.

## RESULTS

### Description of studies

See: [Characteristics of excluded studies](#).

No randomised, controlled trials were identified from any of the searches.

### Risk of bias in included studies

No trials could be assessed.

### Effects of interventions

No data could be analysed. An update search carried out in April 2007 did not identify any further trials.

## DISCUSSION

Surgical intervention in patients with localised areas of bronchiectasis is a widespread practice. We have not identified any randomised controlled trials which address this issue. In mitigation this is a difficult area to study prospectively. There are case series and non-randomised case-controlled reports ([Annest 1982b](#), [Ashour 1996b](#), [Dogan 1989b](#), [George 1979b](#), [Sanderson 1974b](#)), but such studies were largely in patients with less severe disease. One large retrospective study in 166 participants with purulent sputum reported improvements in symptoms at long-term follow-up, and mortality and morbidity rates of 1.7 and 11% following surgery ([Kutlay 2002](#)). However, the absence of randomisation in all of these studies makes them liable to bias in selection.

This review should be regarded as concluding that, in the absence of randomised control trials, there is no unbiased evidence of the effect of surgery for bronchiectasis.

## AUTHORS' CONCLUSIONS

### Implications for practice

This review should be regarded as concluding that, in the absence of randomised control trials, there is no unbiased evidence of the effect of surgery for bronchiectasis. Equally, it does not provide evidence that surgery is of no benefit.

### Implications for research

Large randomised controlled trials assessing the effects of a surgical intervention in patients with confirmed bronchiectasis are required to establish any benefit of surgical intervention compared with standard conservative therapy in bronchiectasis. In addition to the impact of surgery on symptoms, adequate assessment should be made of the safety of surgery in these participants.

## ACKNOWLEDGEMENTS

We thank the editorial team of the Cochrane Airways Group for support in the production and publication of this review.

## REFERENCES

### References to studies excluded from this review

#### **Annest 1982a** {published data only}

Annest LS, Kratz JM, Crawford FA. Current results of treatment of bronchiectasis. *Journal of Thoracic and Cardiovascular Surgery* 1982; **83**:546–50.

#### **Ashour 1996a** {published data only}

Ashour M, Al-Kattan KM, Jain SK, Al-Majed S, Kassimi F, Mobaireek A, et al. Surgery for unilateral bronchiectasis: results and prognostic factors. *Tubercle and Lung Disease* 1996; **77**:168–72.

#### **Dogan 1989a** {published data only}

\* Dogan R, Alp M, Kaya S, Ayrancioglu K, Tastepe I, Unlu M, et al. Surgical treatment of bronchiectasis: a collective review of 487 cases. *Journal of Thoracic and Cardiovascular Surgery* 1989; **37**:183–6.

#### **George 1979a** {published data only}

George SA, Leonardi HK, Overholt RH. Bilateral pulmonary resection for bronchiectasis: a 40 year experience. *Annals of Thoracic Surgery* 1979; **28**:48–52.

#### **Kutlay 2002** {published data only}

\* Kutlay H, Cangir AK, Enon S, Sahin E, Akal M, Gungor A, et al. Surgical treatment in bronchiectasis: analysis of 166 patients. *European Journal of Cardio-Thoracic Surgery* 2002; **21**(4):634–7.

#### **Sanderson 1974a** {published data only}

Sanderson JM, Kennedy MC, Johnson MF, Manley DC. Bronchiectasis: results of surgical and conservative management. *Thorax* 1974; **29**:407–16.

### Additional references

#### **Annest 1982b**

Annest LS, Kratz JM, Crawford FA. Current results of treatment of bronchiectasis. *Journal of Thoracic and Cardiovascular Surgery* 1982; **83**:546–50.

#### **Ashour 1996b**

Ashour M, Al-Kattan KM, Jain SK, Al-Majed S, Kassimi F, Mobaireek A, et al. Surgery for unilateral bronchiectasis: results and prognostic factors. *Tubercle and Lung Disease* 1996; **77**:168–72.

#### **Dogan 1989b**

Dogan R, Alp M, Kaya S, Ayrancioglu K, Tastepe I, Unlu M, et al. Surgical treatment of bronchiectasis: a collective review of 487 cases. *Journal of Thoracic and Cardiovascular Surgery* 1989; **37**:183–6.

#### **George 1979b**

George SA, Leonardi HK, Overholt RH. Bilateral pulmonary resection for bronchiectasis: a 40 year experience. *Annals of Thoracic Surgery* 1979; **28**:48–52.

#### **Sanderson 1974b**

Sanderson JM, Kennedy MC, Johnson MF, Manley DC. Bronchiectasis: results of surgical and conservative management. *Thorax* 1974; **29**:407–16.

\* Indicates the major publication for the study

## CHARACTERISTICS OF STUDIES

### Characteristics of excluded studies *[ordered by study ID]*

Annest 1982a	Retrospective, non randomised audit
Ashour 1996a	Retrospective analysis of results of surgery in 40 patients with unilateral bronchiectasis
Dogan 1989a	Retrospective analysis of surgery on 487 patients
George 1979a	Retrospective analysis of 99 patients
Kutlay 2002	Retrospective study
Sanderson 1974a	Retrospective comparison of results of surgery versus conservative treatment in non-randomised, non-matched groups

## DATA AND ANALYSES

This review has no analyses.

## WHAT'S NEW

Last assessed as up-to-date: 20 April 2009.

8 April 2009	New search has been performed	Literature search re-run; no new studies found
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## HISTORY

Protocol first published: Issue 1, 1999

Review first published: Issue 2, 2001

1 September 2008	Amended	Converted to new review format.
7 July 2000	New citation required and conclusions have changed	Substantive amendment

## CONTRIBUTIONS OF AUTHORS

JC: Protocol initiation, study assessment, review development & write-up

CW: Protocol development, study assessment, write-up of review

## DECLARATIONS OF INTEREST

None known

## SOURCES OF SUPPORT

### Internal sources

- NHS Research and Development, UK.



**External sources**

- No sources of support supplied

**I N D E X T E R M S****Medical Subject Headings (MeSH)**

Bronchiectasis [surgery; \*therapy]; Case-Control Studies

**MeSH check words**

Adult; Humans