

**Search outcome**

Altogether 200 papers were found of which four meta-analyses or systematic reviews provided the highest level of evidence (see table 3).

**Comment(s)**

A large number of papers have addressed this question in hospital and community settings. A well conducted meta-analysis by Saint *et al* found nine randomised controlled trials in this area and found a statistically significant mortality benefit in patients receiving antibiotics. In addition they showed a significant benefit in terms of peak expiratory flow rate. Several large groups have published guidelines. The American Colleges joint statement found an additional two papers to Saint *et al*, and concluded that antibiotics were of benefit and that the more severe the exacerbation the greater the benefit.

The British Thoracic Society Guidelines state that antibiotics should be used for anyone with two of: increased breathlessness, increased production of sputum, or purulent sputum.

NICE are currently in their second draft for producing new guidelines in this area. In addition to the 11 papers used above they have found three more studies of interest. They recommend that all patients with purulent sputum should have antibiotics and that there is greater benefit in patients with more severe underlying disease.

► **CLINICAL BOTTOM LINE**

Antibiotics improve outcome in acute exacerbations of COPD, especially when associated with purulent sputum, more severe exacerbations, or severe underlying disease.

**Saint S**, Bent S, Vittinghoff E, *et al*. Antibiotics in chronic obstructive pulmonary disease exacerbations. A meta-analysis. *JAMA* 1995;273:957-60.

**British Thoracic Society Nebulizer Project Group**. Nebulizer therapy. Guidelines. *Thorax* 1997;52:suppl 24.

**McCroory DC**, Brown C, Gelfand SE, *et al*. Management of acute exacerbations of COPD: a summary and appraisal of published evidence. *Chest* 2001;119:1190-209.

**National Institute of Clinical Excellence**. Chronic obstructive pulmonary disease: management of adults with chronic obstructive pulmonary disease in primary and secondary care, 2003. <http://www.nice.org.uk/article.asp?a=91784>

# Intravenous magnesium in chronic obstructive pulmonary disease

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A short cut review was carried out to establish whether the addition of intravenous magnesium to standard treatments improved outcome in patients with exacerbations of COPD. Altogether 465 papers were found using the reported search, of which one presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of this best paper are tabulated. A clinical bottom line is stated.

**Clinical scenario**

A 65 year old man presents to the emergency department with an exacerbation of COPD. You are aware that intravenous magnesium is used as a bronchodilator in acute severe asthma and wonder if it would benefit this patient.

**Three part question**

In [patients with an exacerbation of COPD] does [the addition of intravenous magnesium to conventional treatments] improve [PEFR or discharge rate or morbidity or mortality]?

**Search strategy**

Medline 1966-11/03 using the Ovid interface, including non-indexed citations and Medline in progress. [exp Magnesium or magnesium.mp] AND [exp Pulmonary Disease, Chronic Obstructive OR COPD.mp OR COAD.mp OR exp Lung Diseases] LIMIT to human AND English

**Search outcome**

Altogether 465 papers were found of which one was relevant (see table 4).

**Comment(s)**

There is only one small study addressing this question and it excludes patients with acute infection, which is one of the commonest causes of exacerbation of COPD. However, it does show a small significant improvement in PEFR with intravenous magnesium. The clinical significance of this change may be small but seems to show a non-significant trend towards a reduced rate of admission. A larger trial including patients with signs of acute infection would be helpful.

► **CLINICAL BOTTOM LINE**

Intravenous magnesium is worth considering in patients with an exacerbation of COPD.

**Skorodin MS**, Tenholder MF, Yetter B, *et al*. Magnesium sulfate in exacerbations of chronic obstructive pulmonary disease. *Arch Intern Med* 1995;155:496-501.

**Table 4**

Author, date and country	Patient group	Study type (level of evidence)	Outcome	Key results	Study weaknesses
Skorodin MS <i>et al</i> , 1995, USA	72 adults (70 male) presenting to ED with exacerbation COPD randomised to 1.2 g magnesium sulphate or placebo after receiving 2.5 mg nebulised salbutamol	Double blinded PRCT	Change in PEFR at 30 min and 45 min	25.1 l/min better for MgSO <sub>4</sub> at 30 min, 7.4 l/min better for MgSO <sub>4</sub> at 45 min (p=0.03)	Male bias
			Change in % PEFR at 30 min and 45 min	22.4% for MgSO <sub>4</sub> at 30 min, 6.1% at 45 min (p=0.01)	Patients with high temperature or radiological signs of infection excluded
			Need for hospitalisation	28.1% for MgSO <sub>4</sub> group v 41.9% for placebo (p=0.25)	Three patients received 3 g magnesium sulphate instead of 1.2 g