Clinical Policy Bulletin: Nebulizers

Number: 0065

Policy

I. Small Volume Nebulizer

Aetna considers the use of a small volume nebulizer and related compressor medically necessary durable medical equipment (DME) for any of the following indications:

A. To administer antibiotics (gentamicin, amikacin, or tobramycin,*** to members with cystic fibrosis (CF) or bronchiectasis
B. To administer beta-adrenergics (albuterol, isoproterenol, isoetharine, levalbuterol, metaproterenol), anticholinergics (ipratropium), corticosteroids (budesonide), and cromolyn for the management of chronic obstructive pulmonary diseases (COPD) (e.g., chronic bronchitis, emphysema, asthma, etc.);* or
C. To administer dornase alfa (Pulmozyme)** to members with CF or primary ciliary dyskinesia (Note: the use of Pulmozyme for other non-CF indications (e.g., asthma, chronic bronchitis, Niemann-Pick type C, and post-lung transplantation [not an all-inclusive list]) is considered experimental and investigational); or
D. To administer epinephrine for the treatment of croup; or
E. To administer formoterol (Perforomist) or arformoterol (Brovana) for the management of COPD when medical necessity criteria in Pharmacy Clinical Policy Bulletin on "Long-Acting Beta Agonists" are met; or
F. To administer iloprost (Ventavis) via a controlled dose inhalation drug delivery system (i.e., the I-neb or the Prodose nebulizer) to members with pulmonary hypertension; or
G. To administer mucolytics (other than dornase alpha) (acetylcysteine) for persistent thick or tenacious pulmonary secretions; or
H. To administer pentamidine to members with HIV, pneumocystosis, or complications of organ transplants; or

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Note: The use of dornase alfa (Pulmozyme)** to members with CF or primary ciliary dyskinesia is considered experimental and investigational. Other non-CF indications (e.g., asthma, chronic bronchitis, Niemann-Pick type C, and post-lung transplantation [not an all-inclusive list]) are considered experimental and investigational.

* The use of beta-adrenergics (albuterol, isoproterenol, isoetharine, levalbuterol, metaproterenol), anticholinergics (ipratropium), corticosteroids (budesonide), and cromolyn for the management of chronic obstructive pulmonary diseases (COPD) (e.g., chronic bronchitis, emphysema, asthma, etc.) is considered medically necessary durable medical equipment (DME) for any of the following indications:

A. To administer antibiotics (gentamicin, amikacin, or tobramycin,*** to members with cystic fibrosis (CF) or bronchiectasis

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I. To administer colistin for multi-drug resistant P. aeruginosa pneumonia failing to improve on IV therapy
J. To administer aztreonam inhalation solution (Cayston) to persons with CF with *Pseudomonas aeruginosa*.

Aetna considers small volume nebulizers and related compressors experimental and investigational for all other indications because their effectiveness for indications other than the ones listed above has not been established.

* For criterion (B) to be met, the physician must have considered use of a metered dose inhaler (MDI) with and without a reservoir or spacer device and decided that, for medical reasons, it was not sufficient for the administration of needed inhalation drugs.

** More than 1 nebulizer may be considered medically necessary for members who are prescribed nebulized dornase alpha (Pulmozyme) plus other nebulized medications. The Food and Drug Administration (FDA)-approved product labeling of dornase alpha instructs that it should not be diluted or mixed with other drugs in the nebulizer. The labeling explains that mixing of dornase alpha with other drugs could lead to adverse physicochemical and/or functional changes in dornase alpha or the admixed compound.

*** Note on the Pari-C Plus Vented Jet Nebulizer: Aetna considers the Pari-C Plus breath-enhanced or vented jet nebulizer medically necessary for pulmonary administration of aerosolized tobramycin because there is some evidence from direct comparative studies with standard unvented jet nebulizers to suggest that the Pari-C Plus vented jet nebulizer is necessary to deliver adequate concentrations of tobramycin to the lung (e.g., Coates et al, 1998; Campbell and Saiman, 1999; Weber et al, 1994; Eisenberg et al, 1997; Ramsey et al, 1999). Consensus guidelines from the Cystic Fibrosis Foundation recommend use of the Pari-C Plus Jet Nebulizer for delivery of tobramycin to individuals with CF (Campbell and Saiman, 1999). The Kitabis Pak is a co-packaging of tobramycin Inhalation solution and Pari-LC Plus Reusable Nebulizer in a patient convenience kit. Aetna does not consider the Pari-LC Jet Plus brand of nebulizer medically necessary for nebulization of budesonide inhalation suspension (Pulmicort Respules). The Pari-LC Jet Plus Nebulizer was used in controlled clinical trials of nebulized budesonide for FDA approval. However, subsequent studies have demonstrated that brands of jet nebulizers other than Pari-LC Jet Plus are also capable of delivering a clinically effective dose of inhaled budesonide (Szeffler, 1999). By contrast, ultrasonic nebulizers have been found in clinical studies to be inefficient at delivering inhaled budesonide and are not recommended for this indication (Nikander, 1994; Nikander, 1999).

† Note on the Altera Nebulizer System: Aetna considers the Altera Nebulizer System medically necessary only to administer aztreonam inhalation solution (Cayston) to persons with CF with *Pseudomonas*
**aeruginosa.** The FDA-approved labeling for Cayston states that it should only be administered with the Altera Nebulizer System.

### II. Large Volume Nebulizer:

Aetna considers a large volume nebulizer, related compressor, and water or saline medically necessary DME to deliver humidity to a person with thick, tenacious secretions, with any of the following indications:

- Administration of pentamidine for members with HIV, pneumocystosis, and complications of organ transplants;
- Bronchiectasis;
- Cystic fibrosis;
- Tracheobronchial stent;
- Tracheostomy.

Aetna considers a large volume nebulizer and related compressor experimental and investigational for all other indications because their effectiveness for indications other than the ones listed above has not been established.

### III. Ultrasonic Nebulizers:

Aetna considers the use of ultrasonic nebulizers medically necessary DME for delivery of tobramycin (Tobi) for members with CF who meet the criteria for a standard nebulizer.

Because there is no proven medical benefit to nebulizing particles of other drugs to diameters smaller than achievable with a pneumatic model, ultrasonic nebulizers are considered medically necessary only when all of the following criteria are met:

- The member meets the criteria for a standard nebulizer; and
- The primary care physician and specialist indicate that the member has been compliant with other nebulizer and medication therapy; and
- The use of a standard nebulizer has failed to control the member's disease and prevent the member from utilizing the hospital or emergency room.

Aetna considers ultrasonic nebulizers experimental and investigational for all other indications because their effectiveness for indications other than the ones listed above has not been established.

### IV. Battery Powered Compressors:

A battery-powered compressor is rarely medically necessary. Accompanying documentation must be submitted justifying its medical necessity.

### V. Accessories:
A. Aetna considers disposable large volume nebulizers convenience items. A non-disposable unfilled nebulizer filled with water or saline by the member/caregiver is an acceptable alternative.

B. Note: Kits and concentrates for use in cleaning respiratory equipment are not covered. This is consistent with Medicare's policy.

VI. Replacement:

For members with DME benefits, Aetna considers replacement of nebulizers medically necessary on an individual basis if both of the following criteria are met:

A. The primary care physician and/or specialist confirm that the member has been compliant with the nebulizer and anticipate the need for continued use to prevent a hospital admission or emergency room visits; and

B. The warranty has expired.

The following table lists the usual maximum frequency of replacement for accessories that is considered medically necessary.

A. Administration set, small volume filtered pneumatic nebulizer: 1/month
B. Administration set, small volume non-filtered pneumatic nebulizer, disposable: 2/month
C. Administration set, small volume non-filtered pneumatic nebulizer, non-disposable: 1 per 6 months
D. Aerosol mask, used with DME nebulizer: 1/month
E. Corrugated tubing, disposable, used with large volume nebulizer: 100 feet/2 months
F. Corrugated tubing, non-disposable, used with large volume nebulizer: 10 feet/year
G. Dome and mouthpiece, used with small volume ultrasonic nebulizer: 2/year
H. Face tent: 1/month
I. Filter, disposable, used with aerosol compressor: 2/month
J. Filter, non-disposable, used with aerosol compressor or ultrasonic generator: 1 per 3 months
K. Immersion external heater for nebulizer: 1 per 3 years
L. Nebulizer, durable glass or autoclavable plastic, bottle type, not used with oxygen: 1 per 3 years
M. Small volume non-filtered pneumatic nebulizer, disposable: 2/month
N. Tracheostomy mask or collar: 1/month
O. Water collection device, used with large volume nebulizer: 2/month.

VII. Nebulized Opioids

Aetna considers the use of nebulized morphine or other opioids experimental and investigational for the relief of cancer-related dyspnea, or
dyspnea in persons with COPD because the effectiveness of this approach has not been established.

VIII. **Nebulized Corticosteroids for the Treatment of Nasal Polyps and Viral Wheezing**

Aetna considers the use of nebulized corticosteroids for the treatment of nasal polyps, including in the pre- and post-polypectomy periods, experimental and investigational because of insufficient evidence of the clinical value of nebulized corticosteroids over established forms of nasal corticosteroid administration (e.g., nasal spray, metered-dose nasal inhaler).

Aetna considers the use of nebulized corticosteroids for the prevention and treatment of viral wheezing experimental and investigational because the effectiveness of this approach has not been established.

IX. **Nebulized Lidocaine as Pain Relief for Nasogastric Tube Insertion in Children**

Aetna considers the use of nebulized lidocaine as pain relief for nasogastric tube insertion in children experimental and investigational because the effectiveness of this approach has not been established.

X. **Nebulized Lidocaine for the Treatment of Chronic Cough**

Aetna considers the use of nebulized lidocaine for the treatment of chronic cough experimental and investigational because the effectiveness of this approach has not been established.

See also CPB 0593 - Aerosolized or Irrigated Anti-infectives for Sinusitis.

**Background**

In this policy, the actual equipment (i.e., electrical devices) are referred to as either a compressor (when nebulization of liquid is achieved by means of air flow) or as a generator (when nebulization of liquid is achieved by means of ultrasonic vibrations). The term nebulizer is generally used for the actual chamber in which the nebulization of liquid occurs and is an accessory to the equipment. The nebulizer is attached to an aerosol compressor or an ultrasonic generator in order to achieve a functioning delivery system for aerosol therapy.

The plan of care must contain the specific condition of the patient justifying the medical necessity of each item. The order for any drug must clearly specify the type of solution to be dispensed to the patient and the administration instructions for that solution. The type of solution is described by a combination of (i) the name of the drug and the concentration of the drug in the dispensed solution and the volume of solution in each container, or (ii) the name of the drug and the number of milligrams/grams of drug in the dispensed solution and the volume of solution in that container.
A narrative diagnosis and/or an ICD-9 diagnosis code describing the condition must be present on each order. An ICD-9 code describing the condition that necessitates nebulizer therapy must be included on each claim for equipment, accessories, and/or drugs. The patient's medical record must contain information that supports the medical necessity for all equipment, accessories, drugs and other supplies that are ordered.

Chronic infection with *Pseudomonas aeruginosa* is associated with progressive deterioration in lung function in cystic fibrosis (CF) patients. Nebulized antibiotics/anti-infectives (e.g., colistin and tobramycin) have been used in the management of these patients.

In a prospective double-blind placebo-controlled study, Jensen et al (1987) assessed the effects of colistin inhalation in 40 patients with CF and chronic broncho-pulmonary *P. aeruginosa* infection. Active treatment consisted of inhalation of colistin 1 million units twice-daily for 3 months and was compared to placebo inhalations of isotonic saline. Significantly more patients in the colistin inhalation group completed the study as compared to the placebo group (18 versus 11). Colistin treatment was superior to placebo treatment in terms of a significantly better clinical symptom score, maintenance of pulmonary function and inflammatory parameters. The authors recommended colistin inhalation therapy for CF patients with chronic *P. aeruginosa* lung infection as a supplementary treatment to frequent courses of intravenous anti-pseudomonas chemotherapy.

Pai and Nahata (2001) noted that aerosolized tobramycin doses ranging from 80 mg 2 or 3 times daily to 600 mg 3 times daily have been used in various clinical trials. At an 80-mg dose, preservation of pulmonary function with little or no improvement over the baseline was reported. Tobramycin, nebulized at 600 mg 3 times daily, significantly improved clinical and pulmonary functions and reduced the density of *P. aeruginosa* in the sputum. No ototoxicity or nephrotoxicity was reported at either dose. An increased risk of emergence of resistant strains of *P. aeruginosa* was noted at all doses, after prolonged use.

Tobramycin solution for inhalation (TOBI) received U.S. Food and Drug Administration approval for the maintenance therapy of patients 6 years or older with CF who have between 25 % and 75 % of predicted forced expiratory volume in 1 second (FEV(1)), are colonized with *P. aeruginosa*, and are able to comply with the prescribed medical regimen. TOBI was not approved for the therapy of acute pulmonary exacerbations in patients with CF, nor was it approved for use in patients without CF (Prober et al, 2000).

In a randomized clinical trial, Hodson et al (2002) evaluated the safety and effectiveness of tobramycin nebulizer solution (TNS) and nebulized colistin in CF patients chronically infected with *P. aeruginosa*. A total of 115 patients, aged 6 yrs or older, were randomized to receive either TNS or colistin, twice-daily for 4 weeks. The primary end point was an evaluation of the relative change in lung function from baseline, as measured by FEV(1) % predicted. Secondary end points included changes in sputum *P. aeruginosa* density, tobramycin/colistin minimum inhibitory concentrations and safety assessments. TNS produced a mean 6.7 % improvement in lung function (p = 0.006), while there was no significant improvement in the colistin-treated patients (mean change 0.37 %).
Both nebulized antibiotic regimens produced a significant decrease in the sputum 
P. aeruginosa density, and there was no development of highly resistant strains 
over the course of the study. The safety profile for both nebulized antibiotics was 
good. Tobramycin nebulizer solution significantly improved lung function of 
patients with CF chronically infected with P. aeruginosa, but colistin did not, in this 
study of 1-month’s duration. Both treatments reduced the bacterial load.

In a review on the role of nebulized antibiotics for the treatment of respiratory 
infections, Klepser (2004) stated that data regarding this topic are scarce. At this 
time, data support the use of aerosolized tobramycin solution for inhalation in CF 
patients infected or colonized by P. aeruginosa. Apart from this situation, 
widespread aerosolized administration of other agents in CF and non-CF patient 
populations should not be advocated.

There is a lack of adequate evidence supporting the use of nebulized opioids for 
dyspnea. Foral et al (2004) performed a structured review of the evidence for the 
use of nebulized morphine for the relief of dyspnea in persons with chronic 
obstructive pulmonary disease. The investigators concluded that there is 
inadequate evidence from placebo-controlled studies to support the use of 
nebulized morphine for the relief of dyspnea in patients with chronic obstructive 
pulmonary disease (COPD). These investigators reported that published studies 
varied considerably in the dose, opioid used, administration schedule, and 
methodology. One study found improved exercise capacity in 11 patients not 
reproducible in a larger sample, and another study found benefit in 54 terminal 
patients. All other studies found no benefit. These investigators noted, 
Furthermore, that recently published Global Initiative for Lung Disease guidelines 
have specifically stated that opioids are contraindicated in COPD management 
due to the potential respiratory depression and worsening hypercapnia. The 
authors concluded that nebulized opioids should be discouraged in COPD, as 
current data do not support their use.

In a systematic review, Viola et al (2008) assessed the effectiveness of 4 drug 
classes (opioids, phenothiazines, benzodiazepines, and systemic corticosteroids) 
for relieving dyspnea experienced by advanced cancer patients. Search sources 
included Medline, Embase, HealthSTAR, CINAHL, and the Cochrane Library. 
Four reviewers selected evidence using pre-defined criteria: controlled trials not 
limited to cancer and involving the specified drug classes for dyspnea treatment. 
Three systematic reviews, 1 with meta-analysis, 2 practice guidelines, and 28 
controlled trials were identified. Most examined the effect of opioids, generally 
morphine, on dyspnea. Although the results of individual trials were mixed, the 
systematic review with meta-analysis detected a significant benefit for dyspnea 
with systemic opioids; 2 small placebo-controlled trials in cancer patients found 
systemic morphine reduced dyspnea, and dihydrocodeine also significantly 
reduced dyspnea in 4 placebo-controlled trials. Nebulized morphine was not 
effective in controlling dyspnea in any study or the meta-analysis. No controlled 
trials examined systemic corticosteroids in the treatment of cancer patients, and of 
the other non-opioid drugs examined, only oral promethazine, a phenothiazine, 
showed some benefit in the relief of dyspnea. Studies varied in methodological 
quality. The authors concluded that systemic opioids, administered orally or 
parenterally, can be used to manage dyspnea in cancer patients. Oral 
promethazine may also be used, as a 2nd-line agent if systemic opioids cannot be
used or in addition to systemic opioids. Nebulized morphine, prochlorperazine, and benzodiazepines are not recommended for the treatment of dyspnea, and promethazine must not be used parenterally.

There is insufficient evidence of the clinical value of nebulized corticosteroids for the treatment of nasal polyps, including in the pre- and post- polypectomy periods, over established forms of nasal corticosteroid administration (e.g., nasal spray, metered-dose nasal inhaler). Bikhazi (2004) stated that "no clinical studies have yet documented nebulized nasal steroid benefit".

There is inadequate evidence to support the use of nebulizers over spacers for delivery of beta-agonists in acute asthma. In a Cochrane review that compared holding chambers (spacers) versus nebulizers for beta-agonist treatment of acute asthma (Cates et al, 2006a), it was found that MDIs with spacer produced outcomes that were at least equivalent to nebulizer delivery. Spacers may have some advantages compared to nebulizers for children with acute asthma.

Evidence is limited to support the use of nebulizers over spacers for delivering inhaled corticosteroids in chronic asthma. In a Cochrane review that compared holding chambers versus nebulizers for inhaled steroids in chronic asthma (Cates et al, 2006b), it was concluded that budesonide in high dose delivered by the particular nebulizer used in the only double-blinded study that could be included in this review was more effective than budesonide 1,600 ug via a large volume spacer. However, it is unclear if this was an effect of nominal dose delivered or delivery system. Cost, compliance and patient preference are important determinants of clinical effectiveness that still require further assessment. Future studies are needed to ascertain the relative effectiveness of inhaled corticosteroids delivered by different combinations of nebulizer/compressor compared to holding chamber. Moreover, further studies evaluating these delivery methods are needed in infants and pre-school children, as these are groups that are likely to be considered for treatment with nebulized corticosteroids.

Nasogastric tube (NGT) insertion is a common procedure in children that is very painful and distressing. There is insufficient evidence to support the use of nebulized lidocaine for NGT insertion. In a randomized, double-blind, placebo-controlled trial, Babl et al (2009) examined if nebulized lidocaine reduce the pain and distress of NGT insertion in young children. Patients were eligible if they were aged from 1 to 5 yrs with no co-morbid disease and a clinical indication for a NGT. Nebulization occurred for 5 mins, 5 mins before NGT insertion. Video recordings before, during, and after the procedure were rated using the Face, Legs, Activity, Cry, and Consolability (FLACC) pain and distress assessment tool (primary outcome measure) and pain and distress visual analog scale scores (secondary outcome measures). Difficulty of insertion and adverse events were also assessed. A total of 18 subjects were nebulized with 2 % lidocaine and 18 subjects with normal saline. Nebulization was found to be highly distressing; FLACC scores during NGT insertion were very high in both groups. There was a trend in the post-NGT insertion period toward lower FLACC scores in the lidocaine group. Visual analog scale scores for this post-insertion period were significantly lower in the lidocaine arm for pain and distress. There were no significant differences between groups in terms of difficulty of insertion and the number of minor adverse events. The study was terminated early because of the distress
and treatment delay associated with nebulization. The authors concluded that NGT insertion results in very high FLACC scores irrespective of lidocaine use. They stated that nebulized lidocaine cannot be recommended as pain relief for NGT insertion in children. The delay and distress of nebulization likely outweigh a possible benefit in the post-insertion period.

Kuo et al (2010) performed a systematic review of current knowledge concerning the use of nebulized lidocaine to reduce the pain of NGT insertion in order to develop evidence-based guidelines. In addition, a meta-analysis of appropriate randomized controlled trials (RCTs) was performed. The databases included PubMed (1996 to 2009), ProQuest (1982 to 2009), CINAHL (1982 to 2009), and the Cochrane Central Register of Controlled Trials (2009), and reference lists of articles. Experts in this field also were contacted. Two investigators selected the research based on inclusion criteria and reviewed each study's quality according to the Jadad scale. Five RCTs with 212 subjects were identified. A total of 113 (58 %) subjects were women. The mean age of treatment and control groups was 59.6 and 55 years, respectively. The countries of studies were the United States, United Kingdom, Australia, Canada, and Thailand. In the treatment groups, the use of lidocaine concentration was 4 % and 10 %. The pooled effect size was 0.423 (95 % confidence interval: 0.204 to 0.880; Z = -2.301; p = 0.021), indicating that the use of nebulized lidocaine before NGT insertion can decrease pain by 57.7 %. The authors concluded that there is insufficient evidence to recommend the dosage, concentration, or delivery method. They stated that further research is needed to articulate a comprehensive clinical guideline.

Cayston (aztreonam for inhalation solution) has been approved by the FDA to improve respiratory symptoms in cystic fibrosis patients with *Pseudomonas aeruginosa*. The FDA approval of Cayston was based on a randomized, double-blind, placebo-controlled, multi-center trial in 164 subjects. Subjects received either Cayston (75 mg) or volume-matched placebo administered by inhalation 3 times a day for 28 days. Patients were required to have been off antibiotics for at least 28 days before treatment with study drug. The primary efficacy endpoint was improvement in respiratory symptoms on the last day of treatment with Cayston or placebo. Statistically significant improvements were seen in both adult and pediatric patients, but were substantially smaller in adult patients. The treatment difference at 28 days between Cayston-treated and placebo-treated patients for percent change in forced expiratory volume in 1 second (FEV1) was statistically significant at 10 %. Improvements in FEV1 were comparable between adult and pediatric patients. Two weeks after completion of drug treatment, the difference in FEV1 between Cayston and placebo groups had decreased to 6 %.

Cayston is supplied as a single-use vial of sterile, lyophilized aztreonam to be reconstituted with a 1-ml ampule of sterile diluent designed for administration via inhalation using an Altera Nebulizer System. The recommended dose of Cayston for both adults and pediatrics 7 yrs of age and older is 1 single-use vial (75 mg of aztreonam) reconstituted with 1 ml of sterile diluent administered 3 times a day for a 28-day course (followed by 28 days off Cayston therapy). Dosage is not based on weight or adjusted for age. Doses should be taken at least 4 hours apart.

An UpToDate review on "Primary ciliary dyskinesia (immotile-cilia syndrome (Bergstrom, 2012) states that "Daily chest physiotherapy is important in
compensating for diminished or absent mucociliary clearance. The effectiveness of DNase and other mucolytic agents, such as hypertonic saline and acetylcysteine, has not been fully assessed in PCD, but may be tried, particularly in patients with recurrent infections or ongoing respiratory symptoms”.

Lim and colleagues (2013) stated that the long-term safety of patient-administered nebulized lidocaine for control of chronic cough has not been established. These researchers performed a retrospective, case-series study of adults who received a prescription and nurse education for nebulized lidocaine for chronic cough between 2002 and 2007. A survey questionnaire inquiring about adverse events (AEs) and the effectiveness of nebulized lidocaine was developed and administered to these individuals after the nebulized lidocaine trial. They conducted 2 mailings and a post-mailing phone follow-up to non-responders. When AEs were reported in the questionnaire response, a structured phone interview was conducted to obtain additional details. Of 165 eligible patients, 99 (60 %) responded to the survey. Responders were a median age of 62 years (range of 29 to 87 years); 77 (79 %) were women, and 80 (82 %) were white. The median duration of cough was 5 years before treatment with nebulized lidocaine. Of the patients who used nebulized lidocaine (93 % of survey responders), 43 % reported an AE. However, none of these events required an emergency visit, hospitalization, or antibiotic therapy for aspiration pneumonia. The mean (SD) of the pre-treatment cough severity score was 8.4 (1.6) and post-treatment was 5.9 (3.4) (p < 0.001). Of the patients reporting improvement in cough symptoms (49 %), 80 % reported improvement within the first 2 weeks. The authors concluded that adults tolerated self-administration of nebulized lidocaine for difficult-to-control chronic cough. No serious AEs occurred while providing symptomatic control in 49 % of patients. The findings of this retrospective case-series study need to be validated by well-designed studies.

Truesdale and Jurdi (2013) noted that persistent cough can disrupt daily activities such as conversation, eating, breathing, and sleeping, and it can become extremely debilitating both physically and mentally. Pharmacological treatments include dextromethorphan, opioid cough suppressants, benzonatate, inhaled ipratropium, and guaifenesin. Successful cough suppression has also been demonstrated in several studies with the use of nebulized lidocaine. Nebulized lidocaine also appears to be well-tolerated by patients with minimal side effects including dysphonia, oropharyngeal numbness, and bitter taste. Moreover, the authors concluded that studies conducted thus far have been small, so larger RCTs comparing nebulized lidocaine to placebo need to be conducted in the future.

Furthermore, an UpToDate review on “Treatment of subacute and chronic cough in adults” (Weinberger and Silvestri, 2013) does not mention the use of nebulized lidocaine as a therapeutic option.

In a double-blind RCT, Doull et al (1997) determined the effect of regular prophylactic inhaled corticosteroids on wheezing episodes associated with viral infection in school age children. A total of 104 children aged 7 to 9 years who had had wheezing in association with symptoms of upper and lower respiratory tract infection in the preceding 12 months were included in this study. After a run-in period of 2 to 6 weeks, children were randomly allocated twice-daily inhaled
beclomethasone dipropionate 200 ug or placebo through a Diskhaler for 6 months with a wash-out period of 2 months. Children were assessed monthly. Main outcome measures were FEV1; bronchial responsiveness to methacholine (PD20); percentage of days with symptoms of upper and lower respiratory tract infection with frequency, severity, and duration of episodes of upper and lower respiratory symptoms and of reduced peak expiratory flow rate. During the treatment period there was a significant increase in mean FEV1 (1.63 versus 1.53 l; adjusted difference 0.09 l (95 % CI: 0.04 to 0.14); p = 0.001) and methacholine PD20 12.8 versus 7.2 mumol/L; adjusted ratio of means 1.7 (1.2 to 2.4); p = 0.007) in children receiving beclomethasone dipropionate compared with placebo. There were, however, no significant differences in the percentage of days with symptoms or in the frequency, severity, or duration of episodes of upper or lower respiratory symptoms or of reduced peak expiratory flow rate during the treatment period between the 2 groups. The authors concluded that although lung function is improved with regular beclomethasone dipropionate 400 ug/day, this treatment offered no clinically significant benefit in school age children with wheezing episodes associated with viral infection.

Guilbert and Bacharier (2011) noted that virus-induced wheezing in infants who have not experienced previous wheezing, termed bronchiolitis, leads to significant morbidity, and can be particularly difficult to treat. Despite a multitude of trials, no consistent benefits in clinical outcomes have been observed when inhaled bronchodilators, corticosteroids (systemic or inhaled), or montelukast have been studied during bronchiolitis episodes. However, a post-hoc analysis reported that while infants who wheezed with rhinovirus did not derive benefit from oral corticosteroid therapy during the acute severe rhinovirus-induced episode, they appeared less likely to develop recurrent wheezing over the following year. This finding, if confirmed, suggests a distinct pathogenesis and therapeutic approach for infants diagnosed with rhinovirus-induced wheezing illnesses. The authors concluded that the management of these wheezing episodes remains a distinct clinical challenge. While research over the last 2 decades had shed substantial light on this problem, clinicians remained uncertain as to the optimal management strategies in this heterogeneous population.

A review on “Bronchiolitis” by the Egton Medical Information Systems Limited (Knott, 2013) stated that “Corticosteroids -- trials have consistently failed to provide evidence of benefit. A large multicenter randomized controlled trial (RCT), comparing the use of a single dose of oral dexamethasone with placebo in children diagnosed with bronchiolitis in Emergency Departments, failed to show any significant differences in the rates of hospital admission, respiratory status after four hours or longer-term outcomes”.

Verma et al (2013) stated that bronchiolitis is one of the major causes for hospital admissions in infants. Managing bronchiolitis, both in the out-patient and in-patient settings remain a challenge to the treating pediatrician. The effectiveness of various interventions used for infants with bronchiolitis remains unclear. These researchers evaluated the evidence supporting the use of currently available treatment and preventive strategies for infants with bronchiolitis and provided practical guidelines to the practitioners managing children with bronchiolitis. They performed a search of articles published on bronchiolitis using PubMed. The areas of focus were diagnosis, treatment and prevention of bronchiolitis in
children. Relevant information was extracted from English language studies published over the last 20 years. In addition, the Cochrane Database of Systematic Reviews was searched. Supportive care, comprising of taking care of oxygenation and hydration, remains the corner-stone of therapy in bronchiolitis. Pulse oximetry helps in guiding the need for oxygen administration. Several recent evidence-based reviews have suggested that bronchodilators or corticosteroids lack efficacy in bronchiolitis and should not be routinely used. A number of other novel therapies (e.g., nebulized hypertonic saline, heliox, CPAP, montelukast, surfactant, and inhaled furosemide) have been evaluated in clinical trials, and although most of them did not show any beneficial results, some like hypertonic saline, surfactant, CPAP have shown promising results.

In a double-blind RCT, Clavenna et al (2014) evaluated the effectiveness of nebulized beclomethasone in preventing the recurrence of viral wheezing. Outpatient children aged 1 to 5 years with at least 1 episode of viral wheezing in the last 12 months, presenting to any of 40 Italian pediatricians for an upper respiratory tract infection, were randomly allocated to receive beclomethasone 400 μg or placebo twice-daily for 10 days. Medications were administered through a nebulizer. A clinical evaluation was performed by the pediatrician at the start and end of the treatment period. A subjective evaluation of symptoms and effectiveness of treatment was performed by the parents. The primary end-point was the incidence of viral wheezing diagnosed by the pediatricians during the 10-day treatment period. A total of 525 children were enrolled in the study, 521 of whom were visited at the end of the treatment period. Wheezing was diagnosed by the pediatricians in 47 children (9.0 % [95 % confidence interval [CI]: 6.7 to 11.3]), with no statistically significant differences between treatment groups (beclomethasone versus placebo relative risk: 0.61 [95 % CI: 0.35 to 1.08]). The treatment was considered helpful by 63 % of parents (64 % in the beclomethasone group versus 61 % in the placebo group). In all, 46 % of children still had infection symptoms at the end of the treatment period, with no differences between groups. The authors concluded that the findings from this study confirmed that inhaled steroids are not effective in preventing recurrence of viral wheezing. Moreover, no benefits were found in reducing symptoms of respiratory tract infections.

Furthermore, in an eMedicine review on “Bronchiolitis Treatment & Management”, DeNicola (2014) stated that “Steroid treatment has not been shown to decrease the long-term incidence of wheezing or asthma after RSV infection. Nebulized steroid treatment has not been proven efficacious”.

In a Cochrane review, Bjornson et al (2013) evaluated the safety (frequency and severity of side effects) and effectiveness (measured by croup scores, rate of intubation and health care utilization such as rate of hospitalization) of nebulized epinephrine versus placebo in children with croup, evaluated in an emergency department (ED) or hospital setting. These investigators searched CENTRAL 2013, Issue 6, MEDLINE (1966 to week 3 of June 2013), EMBASE (1980 to July 2013), Web of Science (1974 to July 2013), CINAHL (1982 to July 2013) and Scopus (1996 to July 2013). Randomized controlled trials or quasi-RCTs of children with croup evaluated in an ED or admitted to hospital were selected for analysis. Comparisons were: nebulized epinephrine versus placebo, racemic nebulized epinephrine versus L-epinephrine (an isomer) and nebulized epinephrine delivered by intermittent positive pressure breathing (IPPB) versus
nebulized epinephrine without IPPB. Primary outcome was change in croup score post-treatment. Secondary outcomes were rate and duration of intubation and hospitalization, croup return visit, parental anxiety and side effects. Two authors independently identified potentially relevant studies by title and abstract (when available) and examined relevant studies using a priori inclusion criteria, followed by methodological quality assessment. One author extracted data while the second checked accuracy. They used the standard methodological procedures expected by the Cochrane Collaboration. A total of 8 studies (225 participants) were included. In general, children included in the studies were young (average age less than two years in the majority of included studies). Severity of croup was described as moderate-to-severe in all included studies; 6 studies took place in the inpatient setting, 1 in the ED and one setting was not specified. Six of the 8 studies were deemed to have a low-risk of bias and the risk of bias was unclear in the remaining 2 studies. Nebulized epinephrine was associated with croup score improvement 30 minutes post-treatment (3 RCTs, standardized mean difference (SMD) -0.94; 95 % confidence interval [CI]: -1.37 to -0.51; I² statistic = 0 %). This effect was not significant 2 and 6 hours post-treatment. Nebulized epinephrine was associated with significantly shorter hospital stay than placebo (1 RCT, MD -32.0 hours; 95 % CI: -59.1 to -4.9). Comparing racemic and L-epinephrine, no difference in croup score was found after 30 minutes (SMD 0.33; 95 % CI: -0.42 to 1.08). After 2 hours, L-epinephrine showed significant reduction compared with racemic epinephrine (1 RCT, SMD 0.87; 95 % CI: 0.09 to 1.65).

There was no significant difference in croup score between administration of nebulized epinephrine via IPPB versus nebulization alone at 30 minutes (1 RCT, SMD -0.14; 95 % CI: -1.24 to 0.95) or 2 hours (SMD -0.72; 95 % CI: -1.86 to 0.42). None of the studies sought or reported data on adverse effects. The authors concluded that nebulized epinephrine is associated with clinically and statistically significant transient reduction of symptoms of croup 30 minutes post-treatment.

Evidence does not favor racemic epinephrine or L-epinephrine, or IPPB over simple nebulization. The authors noted that data and analyses were limited by the small number of relevant studies and total number of participants and thus most outcomes contained data from very few or even single studies.

An UpToDate review on “Croup: Approach to management” (Woods, 2104a) states that “Corticosteroids and nebulized epinephrine have become the cornerstones of therapy”. Furthermore, an UpToDate review on “Croup: Pharmacologic and supportive interventions” (Woods, 2014b) states that “The administration of nebulized epinephrine to patients with moderate to severe croup often results in rapid improvement of upper airway obstruction …. Racemic epinephrine, which is a 1:1 mixture of the D- and L-isomers, was initially thought to produce fewer systemic side effects, such as tachycardia and hypertension.

However, a randomized double-blind study comparing racemic epinephrine and L-epinephrine in children with croup found no difference between the two preparations in 30-minute croup score, heart rate, blood pressure, respiratory rate, fraction of inspired oxygen, or oxygen saturation. This finding is particularly important outside of the United States, where racemic epinephrine is not readily available. Either form of epinephrine is acceptable to use in the United States. Racemic epinephrine is administered as 0.05 ml/kg per dose (maximum of 0.5 ml) of a 2.25 percent solution diluted to 3 ml total volume with normal saline. It is given via nebulizer over 15 minutes. L-epinephrine is administered as 0.5 ml/kg
per dose (maximum of 5 ml) of a 1:1000 dilution. It is given via nebulizer over 15 minutes. Nebulized epinephrine treatments may be repeated every 15 to 20 minutes if warranted by the clinical course. Children who require repeated frequent dosing (e.g., three or more doses within two to three hours) to achieve stabilization of their respiratory function generally should be admitted to an intensive care unit or intermediate care setting (depending on the severity of persisting signs)“.

CPT Codes / HCPCS Codes / ICD-9 Codes

Small Volume Nebulizer:

CPT codes covered if selection criteria are met:

94640  Pressurized or nonpressurized inhalation treatment for acute airway obstruction or for sputum induction for diagnostic purposes (e.g., with an aerosol generator, nebulizer, metered dose inhaler or intermittent positive pressure breathing (IPPB) device)

94642  Aerosol inhalation of pentamidine for pneumocystis carinii pneumonia treatment or prophylaxis

94664  Demonstration and/or evaluation of patient utilization of an aerosol generator, nebulizer, metered dose inhaler or IPPB device

99601  Home infusion/specialty drug administration, per visit (up to 2 hours)

+ 99602  each additional hour (List separately in addition to code for primary procedure)

HCPCS codes covered if selection criteria are met:

A7003  Administration set, with small volume nonfiltered pneumatic nebulizer, disposable

A7004  Small volume nonfiltered pneumatic nebulizer, disposable

A7005  Administration set, with small volume nonfiltered pneumatic nebulizer, non-disposable

A7006  Administration set, with small volume filtered pneumatic nebulizer

E0565  Compressor, air power source for equipment which is not self-contained or cylinder driven

E0570  Nebulizer, with compressor
<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E0572</td>
<td>Aerosol compressor, adjustable pressure, light duty for intermittent use</td>
</tr>
<tr>
<td>J2545</td>
<td>Pentamidine isethionate, inhalation solution, FDA-approved final product, noncompounded, administered through DME, unit dose form, per 300 mg</td>
</tr>
<tr>
<td>J7604</td>
<td>Acetylcysteine, inhalation solution, compounded product, administered through DME, unit dose form, per g</td>
</tr>
<tr>
<td>J7605</td>
<td>Arformoterol, inhalation solution, FDA approved final product, noncompounded, administered through DME, unit dose form, 15 mcg</td>
</tr>
<tr>
<td>J7606</td>
<td>Formoterol fumarate, inhalation solution, FDA approved final product, noncompounded, administered through DME, unit dose form, 20 mcg</td>
</tr>
<tr>
<td>J7607</td>
<td>Levalbuterol, inhalation solution, compounded product, administered through DME, concentrated form, 0.5 mg</td>
</tr>
<tr>
<td>J7608</td>
<td>Acetylcysteine, inhalation solution, FDA-approved final product, noncompounded, administered through DME, unit dose form, per g</td>
</tr>
<tr>
<td>J7609</td>
<td>Albuterol, inhalation solution, compounded product, administered through DME, unit dose, 1 mg</td>
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<tr>
<td>J7610</td>
<td>Albuterol, inhalation solution, compounded product, administered through DME, concentrated form, 1 mg</td>
</tr>
<tr>
<td>J7615</td>
<td>Levalbuterol, inhalation solution, compounded product, administered through DME, unit dose, 0.5 mg</td>
</tr>
<tr>
<td>J7620</td>
<td>Albuterol, up to 2.5 mg and ipratropium bromide, up to 0.5 mg, FDA-approved final product, noncompounded, administered through DME</td>
</tr>
<tr>
<td>J7622</td>
<td>Beclomethasone, inhalation solution, compounded product, administered through DME, unit dose form, per mg</td>
</tr>
<tr>
<td>J7626</td>
<td>Budesonide, inhalation solution, FDA-approved final product, noncompounded, administered through DME, unit dose form, up to 0.5 mg</td>
</tr>
<tr>
<td>J7628</td>
<td>Bitolterol mesylate, inhalation solution, compounded product, administered through DME, concentrated form, per mg</td>
</tr>
<tr>
<td>J7629</td>
<td>Bitolterol mesylate, inhalation solution, compounded product, administered through DME, unit dose form, per mg</td>
</tr>
<tr>
<td>J7631</td>
<td>Cromolyn sodium, inhalation solution, FDA-approved final product, noncompounded, administered through DME, unit dose form, per 10 mg</td>
</tr>
<tr>
<td>J7632</td>
<td>Cromolyn sodium, inhalation solution, compounded product, administered through DME, unit dose form, per 10 mg</td>
</tr>
<tr>
<td>J7633</td>
<td>Budesonide, inhalation solution, FDA-approved final product, noncompounded, administered through DME, concentrated form, per 0.25 mg</td>
</tr>
<tr>
<td>J7634</td>
<td>Budesonide, inhalation solution, compounded product, administered through DME, concentrated form, per 0.25 mg</td>
</tr>
<tr>
<td>J7635</td>
<td>Atropine, inhalation solution, compounded product, administered through DME, concentrated form, per mg</td>
</tr>
<tr>
<td>J7636</td>
<td>Atropine, inhalation solution, compounded product, administered through DME, unit dose form, per mg</td>
</tr>
<tr>
<td>J7639</td>
<td>Dornase alfa, inhalation solution, FDA-approved final product, noncompounded, administered through DME, unit dose form, per mg [Pulmozyme] [not covered for asthma and chronic bronchitis]</td>
</tr>
<tr>
<td>J7640</td>
<td>Formoterol, inhalation solution, compounded product, administered through DME, unit dose form, 12 mcg</td>
</tr>
<tr>
<td>J7641</td>
<td>Flunisolide, inhalation solution, compounded product, administered through DME, unit dose, per mg</td>
</tr>
<tr>
<td>J7642</td>
<td>Glycopyrrolate, inhalation solution, compounded product, administered through DME, concentrated form, per mg</td>
</tr>
<tr>
<td>J7643</td>
<td>Glycopyrrolate, inhalation solution, compounded product, administered through DME, unit dose form, per mg</td>
</tr>
<tr>
<td>J7644</td>
<td>Ipatropium bromide, inhalation solution, FDA-approved final product, noncompounded, administered through DME, unit dose form, per mg</td>
</tr>
<tr>
<td>J7645</td>
<td>Ipatropium bromide, inhalation solution, compounded product, administered through DME, unit dose form, per mg</td>
</tr>
<tr>
<td>J7647</td>
<td>Isoetharine HCL, inhalation solution, compounded product, administered through DME, concentrated form, per mg</td>
</tr>
<tr>
<td>J7648</td>
<td>Isoetharine HCl, inhalation solution, FDA-approved final product, noncompounded, administered through DME, concentrated form, per mg</td>
</tr>
</tbody>
</table>
J7649  Isoetharine HCl, inhalation solution, FDA-approved final product, noncompounded, administered through DME, unit dose form, per mg

J7650  Isoetharine HCl, inhalation solution, compounded product, administered through DME, unit dose form, per mg

J7657  Isoproterenol HCl, inhalation solution, compounded product, administered through DME, concentrated form, per mg

J7658  Isoproterenol HCl, inhalation solution, FDA-approved final product, noncompounded, administered through DME, concentrated form, per mg

J7659  Isoproterenol HCl, inhalation solution, FDA-approved final product, noncompounded, administered through DME, unit dose form, per mg

J7660  Isoproterenol HCl, inhalation solution, compounded product, administered through DME, unit dose form, per mg

J7667  Metaproterenol sulfate, inhalation solution, compounded product, concentrated form, per 10 mg

J7668  Metaproterenol sulfate, inhalation solution, FDA-approved final product, noncompounded, administered through DME, concentrated form, per 10 mg

J7669  Metaproterenol sulfate, inhalation solution, FDA-approved final product, noncompounded, administered through DME, unit dose form, per 10 mg

J7670  Metaproterenol sulfate, inhalation solution, compounded product, administered through DME, unit dose form, per 10 mg

J7676  Pentamidine isethionate, inhalation solution, compounded product, administered through DME, unit dose form, per 300 mg

J7682  Tobramycin, inhalation solution, FDA-approved final product, noncompounded, unit dose form, administered through DME, per 300 milligrams

J7683  Triamcinolone, inhalation solution, compounded product, administered through DME, concentrated form, per mg

J7684  Triamcinolone, inhalation solution, compounded product, administered through DME, unit dose form, per mg

J7685  Tobramycin, inhalation solution, compounded product, administered through DME, unit dose form, per 300 mg
Q4074  Iloprost, inhalation solution, FDA-approved final product, non-compounded, administered through DME, unit dose form, up to 20 micrograms

S9061  Home administration of aerosolized drug therapy (e.g., Pentamidine); administrative services, professional pharmacy services, care coordination, all necessary supplies and equipment (drugs and nursing visits coded separately), per diem

ICD-9 codes covered if selection criteria are met:

041.7  Pseudomonas
042  Human immunodeficiency virus [HIV] disease
136.3  Pneumocystosis
277.00 - 277.09  Cystic fibrosis
416.0  Primary pulmonary hypertension
416.8  Other chronic pulmonary heart disease [secondary pulmonary hypertension]
482.1  Pneumonia due to pseudomonas
490 - 496  Chronic obstructive pulmonary disease and allied conditions [Pulmozyme] [not covered for asthma and chronic bronchitis]
519.00 - 519.09  Tracheostomy complications
748.61  Congenital bronchiectasis
786.4  Abnormal sputum
996.80 - 996.89  Complications of transplanted organ
V44.0  Tracheostomy status
V55.0  Attention to tracheostomy

ICD-9 codes not covered for indications listed in the CPB:

272.7  Niemann-Pick [type C] [not covered for Pulmozyme]
518.0  Pulmonary collapse
786.2  Cough (chronic) [not covered for nebulized lidocaine]
V42.6  Organ or tissue replaced by transplant (lung) [not covered for Pulmozyme]
**Large Volume Nebulizer:**

**CPT codes covered if selection criteria are met:**

- **94640**  
  Pressurized or non-pressurized inhalation treatment for acute airway obstruction or for sputum induction for diagnostic purposes (e.g., with an aerosol generator, nebulizer, metered dose inhaler or intermittent positive pressure breathing (IPPB) device)

- **94642**  
  Aerosol inhalation of pentamidine for pneumocystis carinii pneumonia treatment or prophylaxis

- **94664**  
  Demonstration and/or evaluation of patient utilization of an aerosol generator, nebulizer, metered dose inhaler or IPPB device

- **99601**  
  Home infusion/specialty drug administration, per visit (up to 2 hours)

- **+ 99602**  
  each additional hour (List separately in addition to code for primary procedure)

**HCPCS codes covered if selection criteria are met:**

- **A4619**  
  Face tent

- **A7009**  
  Reservoir bottle, non-disposable, used with large volume ultrasonic nebulizer

- **A7010**  
  Corrugated tubing, disposable, used with large volume nebulizer, 100 ft

- **A7011**  
  Corrugated tubing, non-disposable, used with large volume nebulizer, 10 ft

- **A7012**  
  Water collection device, used with large volume nebulizer

- **A7013**  
  Filter, disposable, used with aerosol compressor

- **A7015**  
  Aerosol mask, used with DME nebulizer

- **A7017**  
  Nebulizer, durable, glass or autoclavable plastic, bottle type, not used with oxygen

- **A7018**  
  Water, distilled, used with large volume nebulizer, 1000 ml

- **A7525**  
  Tracheostomy mask, each

- **A7526**  
  Tracheostomy tube collar/holder, each

- **E0565**  
  Compressor, air power source for equipment which is not self-contained or cylinder driven
E0572  Aerosol compressor, adjustable pressure, light duty for intermittent use
E0580  Nebulizer, durable, glass or autoclavable plastic, bottle type, for use with regulator or flowmeter
E0585  Nebulizer, with compressor and heater
E1372  Immersion external heater for nebulizer
J2545  Pentamidine isethionate, inhalation solution, FDA-approved final product, non-compounded, administered through DME, unit dose form, per 300 mg
S9061  Home administration of aerosolized drug therapy (e.g., Pentamidine); administrative services, professional pharmacy services, care coordination, all necessary supplies and equipment (drugs and nursing visits coded separately), per diem

**ICD-9 codes covered if selection criteria are met:**

042  Human immunodeficiency virus [HIV] disease
136.3  Pneumocystosis
277.00 - 277.09  Cystic fibrosis
494.0 -494.1  Bronchiectasis
519.00 - 519.09  Tracheostomy complications
748.61  Congenital bronchiectasis
786.4  Abnormal sputum
996.80 - 996.89  Complications of transplanted organ
V44.0  Tracheostomy status
V55.0  Attention to tracheostomy

**Ultrasonic Nebulizers:**

**HCPCS codes covered if selection criteria is met:**

A7014  Filter, non-disposable, used with aerosol compressor or ultrasonic generator
A7016  Dome and mouthpiece, used with small volume ultrasonic nebulizer
E0574  Ultrasonic/electronic aerosol generator with small volume nebulizer

J7682  Tobramycin, inhalation solution, FDA-approved final product, non-compounded, unit dose form, administered through DME, per 300 mg

J7685  Tobramycin, inhalation solution, compounded product, administered through DME, unit dose form, per 300 mg

**HCPCS codes not covered for indications listed in the CPB:**

J2001  Injection, lidocaine HCL for intravenous infusion, 10 mg

**ICD-9 codes covered if selection criteria are met:**

277.00 - 277.09  Cystic fibrosis

**Battery Powered Compressors:**

**HCPCS codes covered if selection criteria are met:**

E0571  Aerosol compressor, battery powered, for use with small volume nebulizer

**Accessories:**

**HCPCS codes not covered for indications listed in the CPB:**

A7007  Large volume nebulizer, disposable, unfilled, used with aerosol compressor

A7008  Large volume nebulizer, disposable, prefilled, used with aerosol compressor

**List of usual maximum frequency of replacement for accessories:**

**HCPCS codes covered if selection criteria are met:**

A4619  Face tent

A7003  Administration set, with small volume non-filtered pneumatic nebulizer, disposable

A7004  Small volume non-filtered pneumatic nebulizer, disposable

A7005  Administration set, with small volume non-filtered pneumatic nebulizer, non-disposable

A7006  Administration set, with small volume filtered pneumatic nebulizer

A7010  Corrugated tubing, disposable, used with large volume nebulizer, 100 ft.
A7011  Corrugated tubing, non-disposable, used with large volume nebulizer, 10 ft.

A7012  Water collection device, used with large volume nebulizer

A7013  Filter, disposable, used with aerosol compressor

A7015  Aerosol mask, used with DME nebulizer

A7016  Dome and mouthpiece, used with small volume ultrasonic nebulizer

A7017  Nebulizer, durable, glass or autoclavable plastic, bottle type, not used with oxygen

A7525  Tracheostomy mask, each

A7526  Tracheostomy tube collar/holder, each

E1372  Immersion external heater for nebulizer

**Nebulized Corticosteroids:**

**HCPCS codes not covered for indications listed in the CPB:**

- **J7622**  Beclomethasone, inhalation solution, compounded product, administered through DME, unit dose form, per mg
- **J7626**  Budesonide, inhalation solution, FDA-approved final product, non-compounded, administered through DME, unit dose form, up to 0.5 mg
- **J7627**  Budesonide, inhalation solution, compounded product, administered through DME, unit dose form, up to 0.5 mg
- **J7633**  Budesonide, inhalation solution, FDA-approved final product, non-compounded, administered through DME, concentrated form, per 0.25 mg
- **J7634**  Budesonide, inhalation solution, compounded product, administered through DME, concentrated form, per 0.25 mg
- **J7641**  Flunisolide, inhalation solution, compounded product, administered through DME, unit dose, per mg
- **J7683**  Triamcinolone, inhalation solution, compounded product, administered through DME, concentrated form, per mg
- **J7684**  Triamcinolone, inhalation solution, compounded product, administered through DME, unit dose form, per mg

**ICD-9 codes not covered for indications listed in the CPB:**

- 471.0 - 471.9  Nasal polyps
The above policy is based on the following references:


69. Bergstrom S-E. Primary ciliary dyskinesia (immotile-cilia syndrome). Last reviewed August 2012. UpToDate Inc. Waltham, MA.


74. Weinberger SE, Silvestri RC. Treatment of subacute and chronic cough in adults. Last reviewed October 2013. UpToDate Inc., Waltham, MA.


84. Woods CR. Croup: Pharmacologic and supportive interventions. UpToDate Inc., Waltham, MA. Last reviewed November 2014b.