Molina Clinical Policy
Noninvasive Positive Pressure Ventilation
Policy No. 275

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OVERVIEW

Non-invasive positive pressure ventilation (NIPPV) refers to the delivery of mechanical positive pressure ventilatory support via a non-invasive interface (nasal mask, partial- or full-face mask, or nasal pillows), as opposed to an invasive interface (endotracheal tube or tracheostomy tube). The use of NIPPV has increased in the acute care hospital setting, the long-term care hospital, and the home for the management of patients with both acute respiratory failure and chronic respiratory failure requiring prolonged mechanical ventilation. Home NIPPV has been investigated for use in patients with obstructive lung disease, neuromuscular disease, obesity hypoventilation syndrome (OHS), and restrictive chest wall disease (Bach 2025; Gay 2025; Hill & Kramer 2024, 2025; Martin 2025).

Both bilevel positive airway pressure (BPAP) devices and non-invasive ventilators can deliver NIPPV; however, their technical features may vary considerably. Key areas of variability include the mode of ventilation (pressure-targeted versus volume-targeted), monitoring capabilities, safety and alarm systems, and the presence of a flow sensor. Many home ventilators are capable of providing multiple modes of invasive or noninvasive ventilation, including continuous positive airway pressure (CPAP), pressure control, volume control, assist/control, synchronized intermittent mandatory ventilation, or BPAP (Hyzy & Jia 2025).

Newer modes of NIPPV available on certain models of non-invasive ventilators include average volume-assured pressure support (AVAPS), average volume-assured pressure support auto-titrating expiratory positive airway pressure (AVAPS-AE), and intelligent volume-assured pressure support (iVAPS). AVAPS is trademarked to Philips Respironics and targets average tidal volume to maintain a consistent breath size and support adequate minute ventilation while reducing hypoventilation (Yarrarapu et al. 2023). iVAPS is trademarked to ResMed and targets alveolar ventilation to stabilize blood gases and maintain effective ventilation despite changes in breathing (ResMed 2016). Both AVAPS and iVAPS allow a set target tidal volume, minimum and maximum inspiratory positive airway pressure, a backup respiratory rate, and an expiratory positive airway pressure. Each device has a specific algorithm that monitors the average achieved ventilation parameter, usually over the last rolling minute, and adjusts the inspiratory pressure in small increments to achieve the target. AVAPS-AE functions similar to AVAPS and iVAPS with the addition of allowing a set minimum and maximum expiratory pressure, which will increase or decrease based on the device-specific algorithm and patient-specific needs (Yarrarapu et al. 2023).

Considering the user's needs when selecting an appropriate positive pressure ventilation assist device is essential. For situations in which there is a risk of acute respiratory failure, hypoventilation, or apnea, the non-invasive ventilator will sound an alarm where the standard BPAP unit may not. Additionally, non-invasive ventilators have the capability of delivering ventilation based on volume and more precise levels of oxygen needed by complex patients (Hyzy & Jia 2025; Yarrarapu et al. 2023).

Regulatory Status

Multiple ventilators are available for NIPPV use within a facility (acute care hospital or long-term care facility) or the home setting. Certain ventilators have FDA-clearance for use within both settings. Ventilators approved for continuous use within a facility may be found in the FDA 510(k) database by searching product code CBK. Ventilators approved for home use may be found by using the product code NOU.

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COVERAGE POLICY

This policy does not address the use of other respiratory assist devices including bilevel positive airway pressure (BPAP) or continuous positive airway pressure (CPAP) devices. Please see Milliman MCG for criteria for BPAP and CPAP devices. These devices are considered first line treatment for many conditions and should be tried before following the criteria outlined below whenever appropriate.

A non-invasive positive pressure ventilation (NIPPV) device approved or cleared by the FDA for home use may be **considered medically necessary** when ALL the following criteria are met:

1. A simple/standard bilevel positive airway pressure (BPAP) or continuous positive airway pressure (CPAP) device is not appropriate**,** as evidence by ANY of the following:
   a. Chronic respiratory insufficiency, hypercapnia, or oxygen saturation fails to improve with a standard BPAP/CPAP device
   b. Settings or functionality required by Member is not available with a simple/standard PAP device, as indicated by at least ONE of the following:
      i. Alarms required by Member are not available on device
      ii. Daytime ventilation using mouthpiece required
      iii. The pressure range delivered by the device (e.g., expiratory or inspiratory pressure) is not appropriate for the patient
      iv. Volume-assured pressure support (e.g., AVAPS or iVAPS) or volume control mode is required
      v. Pediatric Member who weighs < 30 kg
   c. Ventilated Member requires cough assistance via volume ventilator's breath stacking capability
   d. Ventilation is required 24 hours a day

2. NIPPV therapy is indicated for at least ONE of the following:
   a. **Diagnosis of chronic respiratory failure due to progressive neuromuscular disease** (e.g., muscular dystrophies, poliomyelitis, multiple sclerosis, spinal cord injuries, spinal muscular atrophy, diaphragmatic paralysis, myasthenia gravis, amyotrophic lateral sclerosis) or severe chest wall disorder (e.g., kyphoscoliosis, asphyxiating thoracic dystrophy)
   b. **Mechanical ventilation required due to respiratory insufficiency** with at least ONE of the following:
      i. Arterial oxygen (O_2) saturation < 88% for 5 consecutive minutes during nocturnal oximetry
      ii. Arterial partial pressure of carbon dioxide ($PaCO_2$) ≥ 45 mm Hg (6.0 kPa)
      iii. Maximal inspiratory pressures < 60 cm/H2O
      iv. Forced vital capacity < 50% predicted
   c. **Diagnosis of chronic obstructive pulmonary disease (COPD)** and at least ONE of the following:
      i. Palliative care in Member with end-stage disease and advance directive stating no desire for intubation
      ii. Chronic hypercapnia (e.g., $PaCO_2$ ≥ 50 mm Hg [6.7 kPa]) necessitating continuous ventilatory support
   d. **Diagnosis of obesity hypoventilation syndrome (OHS)** and ALL the following:
      i. Body mass index ≥ to 30 kg/m^2
      ii. Daytime hypercapnia with $PaCO_2$ > 45 mmHg (6.0 kPa) without other etiology (e.g., kyphoscoliosis, lung parenchymal disease, myopathy, severe hypothyroidism)
      iii. Sleep-disordered breathing or hypoventilation on polysomnography, as indicated by at least ONE of the following:
         1) Apnea-hypopnea index of ≥ 5
         2) Increase in $PaCO_2$ during sleep by more than 10 mm Hg (1.3 kPa) above value while awake
         3) Significant oxygen desaturation (e.g., O2 < 90%) not explained by obstructive apneas or hypopneas
         4) TSH level does not demonstrate hypothyroidism
      iv. Failure to improve arterial oxygen saturations and/or hypercapnia on CPAP or BPAP devices
      v. Diagnosis and prescription for the device must be made by a pulmonologist or other relevant specialty physician

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vi. The NIPPV device is FDA-cleared or approved for the clinical indication(s)
vii. None of the following contraindications are present:
1) Alteration in level of consciousness (i.e., alert and oriented)
2) Anatomic abnormality that precludes mask fitting (facial or neurological surgery, trauma, or deformity)
3) High risk for aspiration (excessive secretions, impaired cough, or inability of mechanically assisted cough to clear secretions)
4) Swallowing disorder
5) Inability to cooperate/protect airway
6) Upper airway obstruction

e. **Residual pediatric obstructive sleep apnea (OSA)**, and ALL the following:
i. First-line therapy (e.g., adenotonsillectomy) fails to eliminate OSA
ii. Diagnosis of symptomatic, persistent OSA, as evidenced by polysomnogram
iii. Site-specific upper airway modification is contraindicated or ineffective (e.g., supraglottoplasty, lingual tonsillectomy, orthodontic or dentofacial orthopedic treatment)
iv. Member is < 18 years old

Continuation of Therapy
For establishment of **continued medical necessity** beyond 3 months, ALL the following documentation must be supplied:

1. Member continues to meet indications for a home NIPPV device as stipulated above

2. Compliance reported every three months including documentation of compliant use of the ventilatory device for at least an average of 4 or more hours per 24 hours
a. Initial rental authorization of the device is for 90 days. Compliance is confirmed using a smartcard or other similar report. This verification should be completed within the first 90 days of therapy to assist with long-term rental authorizations. (Note: Smartcards are an integral part of NIPPV management and are not separately reimbursable)

3. Requesting provider statement affirming continued Member benefit of use

4. A specialist referral to a pulmonologist for follow up and management

5. Documented symptomatic improvement with the use of a ventilator

6. Pulmonary function tests and/or arterial blood gases, if treatment is for severe COPD or OHS

Limitations and Exclusions
A home NIPPV device is **not medically necessary** for the treatment of ANY of the following conditions or scenarios:

1. OSA in adults, as the clinical outcomes have not been shown to be superior to other standard treatments (e.g., CPAP, BPAP)

2. Any other condition or disease not stipulated above (e.g., central sleep apnea, cystic fibrosis, heart failure, chronic stable COPD without hypercapnia) due to insufficient evidence in the peer reviewed medical literature

3. Acute respiratory distress syndrome

4. Due to limited evidence-based support, contraindications for NIPPV include, but are not limited to:
a. Altered mental status or confusion, lethargy, or loss of consciousness
b. Excessive mucus production or respiratory secretion
c. Facial trauma or other abnormalities
d. Hemodynamic instability
e. Nausea and/or vomiting
f. Respiratory arrest

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DOCUMENTATION REQUIREMENTS. Molina Healthcare reserves the right to require that additional documentation be made available as part of its coverage determination; quality improvement; and fraud; waste and abuse prevention processes. Documentation required may include, but is not limited to, patient records, test results and credentials of the provider ordering or performing a drug or service. Molina Healthcare may deny reimbursement or take additional appropriate action if the documentation provided does not support the initial determination that the drugs or services were medically necessary, not investigational, or experimental, and otherwise within the scope of benefits afforded to the member, and/or the documentation demonstrates a pattern of billing or other practice that is inappropriate or excessive.

SUMMARY OF MEDICAL EVIDENCE

Neuromuscular or Chest Wall Disorders

Systematic Reviews and Meta-Analyses

Delorme et al. (2023) completed a systematic review and meta-analysis to determine if the intensity of home non-invasive ventilator settings affected outcomes in patients with neuromuscular or chest-wall disorders. Non-invasive ventilator intensity was defined as "the product of pressure support (or tidal volume) and backup rate." The primary outcome was diurnal partial pressure of arterial oxygen ($PaCO_2$) levels with secondary outcomes being daily non-invasive ventilator usage, interface type, nocturnal oxygenation, and sleep quality. A total of seven studies with 192 participants (n=113 neuromuscular, n=63 chest wall disorder) were included in the analysis. Results for diurnal $PaCO_2$ levels showed that the intensity of non-invasive ventilator settings was not associated with significant differences in $PaCO_2$ levels. However, a greater amount of daily usage was associated with lower $PaCO_2$ levels as was lower baseline $PaCO_2$ values. Regarding oxygenation, higher PaO_2 levels were associated with higher baseline PaO_2 values and higher daily usage. Disease category (neuromuscular vs. chest wall disorders) was associated with whether non-invasive ventilator setting intensity impacted PaO_2 levels. Researchers noted greater reductions in $PaCO_2$ values in higher baseline $PaCO_2$ values and higher non-invasive ventilator setting intensity in patients with chest wall disorders. The PaO_2 levels of patients with neuromuscular disorders were negatively impacted by more intense non-invasive ventilator settings while patients with chest wall disorders typically experienced an improvement in PaO_2 levels. There was no significant association noted between non-invasive ventilator setting intensity and interface type or daily non-invasive ventilator usage.

Cystic Fibrosis

Non-Randomized Studies, Retrospective Reviews, and Other Evidence

Milross et al. (2019) completed a prospective, randomized, parallel group study to evaluate if non-invasive positive pressure ventilation (NIPPV) with supplemental oxygen reduced the development of hypercapnia or criteria for failure of therapy over 12 months compared to low-flow oxygen therapy alone in patients with cystic fibrosis and oxygen desaturation. A total of 29 patients were included in the study with 14 being randomized to NIPPV with supplemental oxygen and 15 being randomized to low-flow oxygen therapy. Patients received follow-up at 3, 6, and 12 months. The primary outcome was event free survival, defined as failure of therapy ($PaCO_2$ > 60 mmHg, increase in $PaCO_2$ > 10mmHg from baseline, or an increase in $TcCO_2$ > 10 mmHg from awake to sleep or sleep rises in $TcCO_2$ > 10mmHg), lung transplantation, or death. NIPPV with supplemental oxygen was associated with a significantly higher likelihood of event-free survival (33% at 3 months, 26% at 6 months, and 46% at 12 months) and a lower likelihood of failure of therapy. The number of transplants at each follow-up was cumulative (it included the number of transplants from the previous follow-up) and for each follow-up period (3, 6, and 12 months respectively) was 0, 2, and 2 for the NIPPV with supplemental oxygen group and 4, 4, and 5 for the low-flow oxygen therapy group. The number of patients meeting failure of therapy criteria was also cumulative and for each follow-up period (3, 6, and 12 months respectively) was 1, 2, and 4 for the low-flow oxygen therapy group while no patients in the NIPPV with supplemental oxygen group met criteria for failure of therapy. There were no differences noted between either group in terms of arterial blood gases, pulmonary function tests, and hospitalizations. Researchers noted that the small sample size of this study did not allow for demonstration of clinically relevant differences in $PaCO_2$. Researchers also noted certain subgroups of patients with cystic fibrosis may benefit from NIPPV. However, additional high-quality studies with larger sample sizes are needed to verify the results of this study and to determine which subgroups would have the most benefit.

Archangelidi et al. (2019) completed a retrospective review of the UK Cystic Fibrosis Registry to determine the patterns of NIPPV usage, the changes in forced expiratory volume in one second associated with NIPPV use, and the survival of patients following initiation of NIPPV therapy. A total of 1,107 patients in the registry had at least one record with documented NIPPV usage. Adults (age > 16 years) with significantly worse lung function (forced expiratory volume in one second < 40% of predicted) at baseline were noted to have a greater increase in forced expiratory volume in one second following initiation of NIPPV therapy. However, the risk of death and transplant was not impacted by the

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initiation of NIPPV and was noted to be worse compared to the overall cohort with "approximately 36% of those with at least one non-invasive ventilation record [dying] by the end of follow-up [and] 40% accepted for lung transplant." Researchers noted a potential bias by indication despite bias mitigation using statistical methods as patients with advanced cystic fibrosis were likely to have exhausted treatment options prior to the initiation of NIPPV.

Obesity Hypoventilation Syndrome (OHS)

Randomized Controlled Trials

Masa et al. (2019) conducted an open label, randomized controlled trial to assess the effectiveness of continuous positive airway pressure (CPAP) versus NIPPV in patients with obesity hypoventilation syndrome (OHS). Participants were eligible if they were 15-80 years old, had untreated OHS, and an apnea-hypopnea index of 30 or more events per hour. The analysis included 97 patients in the NIPPV group and 107 in the CPAP group. The primary outcome was the number of hospitalization days per year. At a median follow-up of 5.44 years, the CPAP group had an average of 1.63 hospitalization days per patient-year, while the NIPPV group had 1.44 days. Reported adverse events were similar between the groups. The authors concluded that in stable patients with OHS and severe obstructive sleep apnea, both NIPPV and CPAP are similarly effective over the long term. However, due to its lower complexity and cost, CPAP may be the preferred initial treatment until further studies are conducted.

Chronic Obstructive Pulmonary Disease (COPD)

Systematic Review and Meta-Analysis

Raveling et al. (2021) conducted an updated systematic review to assess the effects of chronic NIPPV at home in people with COPD. The authors included RCTs comparing chronic nocturnal NIPPV in addition to standard care versus standard care alone. Studies investigating people initiated on NIPPV in a stable phase and studies investigating NIPPV commenced after a severe COPD exacerbation were reported and analyzed separately. The primary outcomes evaluated were arterial blood gases, health-related quality of life, exercise capacity (stable COPD), and admission-free survival (post-exacerbation COPD). Secondary outcomes for both populations included lung function, COPD exacerbations and admissions, and all-cause mortality. A total of 21 studies (including 778 people with stable COPD and 364 people with post-exacerbation COPD) met inclusion criteria. Results showed that in all people with COPD who had hypercapnia, chronic NIPPV for 3- and 12- months improved blood gases. In stable COPD, chronic NIPPV also might have improved quality of life, and survival seemed to be better compared to people who were treated with standard care only. There was no relevant benefit of NIPPV on exercise capacity. People using chronic NIPPV after a COPD admission experienced less benefit; carbon dioxide levels decreased, the time to the next hospital admission might have been longer when treated with NIPPV but quality of life and survival were not affected by chronic NIPPV. Confidence in the certainty was good in relation to blood gases. For other outcomes, certainty of the evidence is moderate to very low due to participants and researchers not being blinded.

[1]Wilson et al. (2020) completed a meta-analysis and systematic review to "evaluate the association of home NIPPV via BPAP devices and non-invasive home mechanical ventilator devices with clinical outcomes and adverse events in patients with COPD and hypercapnia." The analysis included a total of 51,085 patients with COPD and hypercapnia. The analysis found that BPAP compared to no device was associated with significantly lower mortality risk (22.31% compared to 28.57%). The need for intubation was also significantly lower (5.34% vs 14.71%) as was all-cause hospital admissions (39.74% vs 75.00%). The use of home BPAP was also associated with fewer emergency department visits, ICU admissions, less dyspnea, and a longer distance on the shuttle walk test. Only two observational studies compared non-invasive home mechanical ventilator use to no device. Analysis showed that non-invasive home mechanical ventilator use was also associated with significantly fewer all-cause hospital admissions but no statistically significant difference in mortality (21.84% vs 34.09%). A total of 23 studies compared NIPPV usage (BPAP and non-invasive home mechanical ventilator devices combined) to no device. NIPPV usage was also associated with significantly lower risk of mortality (22.26% vs 29.20%), lower all-cause hospital admissions (39.74% vs 75.00%), and lower need for intubation (5.34% vs 14.71%). One included RCT (n=40 participants) compared BPAP volume assured pressure support to standard BPAP in terms of mortality and found BPAP volume assured pressure support to be associated with lower mortality (5.00% vs 10.00%), although the overall strength of evidence was determined to be insufficient. One RCT (n=49 participants) compared BPAP to CPAP and found BPAP was associated with fewer exacerbations (30.43% vs 53.85%). Non-invasive home mechanical ventilator usage was compared to CPAP in one RCT (n=39,700 participants) and found that non-invasive home mechanical ventilator usage was associated with significantly less all-cause hospital admissions ($p<0.001$) and hospital admissions due to respiratory causes ($p=0.01$). However, the quality of evidence was determined to be low.

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Pediatric Obstructive Sleep Apnea (OSA)

Non-Randomized Studies, Retrospective Reviews, and Other Evidence

Tanner et al. (2023) performed a single-center, retrospective observational study to examine the management of residual obstructive sleep apnea (OSA) in children with Down syndrome (DS) following adenotonsillectomy, adenoidectomy, or tonsillectomy. The study included 100 children with DS who underwent a polysomnogram after upper airway surgery for OSA, with an average age of 7.6 years old. Of the cohort, 77% had adenotonsillectomy, 19% had adenoidectomy, and 4% had tonsillectomy, and common comorbidities included congenital heart disease (52%) and hypothyroidism (19%). Following surgery, 21% children underwent further surgical intervention whereas 41% were recommended for CPAP therapy. The mean starting age for CPAP therapy was approximately 9 years old (range of 0.2-17.1 years), and the mean CPAP pressure was 8.24cmH20. Of those recommended for CPAP, 82.9% of children successfully established and sustained therapy > 12 months, and 31.7% discontinued use after approximately 15-18 months, due to improvements in OSA severity, poor tolerance, or a combination of the two. The study reported no adverse events related to CPAP or surgical interventions for OSA. The authors also noted that while data is limited, available literature suggests that in children with DS who are recommended CPAP, just over 50% are adherent to therapy. Whereas this study demonstrates that 82.9% of children were able to establish and sustain CPAP therapy long-term, suggesting that with the involvement of skilled staff to provide support and education, CPAP therapy can be successful. The authors also acknowledge the study limitations, including the retrospective design, incomplete medical records, and missing CPAP adherence data. Additionally, because the single center favored nonsurgical management for persistent OSA, the effectiveness of subsequent surgical options could not be fully evaluated. The authors concluded that residual or recurrent OSA is highly prevalent in children with DS and that CPAP therapy can be successfully established and maintained in most patients when supported by a clinical team.

National and Specialty Organizations

The **Global Initiative for Chronic Obstructive Lung Disease (GOLD)** published its 2025 report with the following recommendations for the use of long-term NIPPV in patients with COPD (GOLD 2024):

- Long-term NIPPV may decrease mortality and prevent re-hospitalization for patients with severe chronic hypercapnia and a history of respiratory failure-related hospitalization(s).
- The need for NIPPV support should be considered individually and an action plan for treatment should be developed and updated as needed.
- The use of NIPPV with home oxygen may significantly prolong the time to hospital readmission or death.
- NIPPV should be prescribed and monitored by clinicians that are familiar with the devices utilized.

An **American Thoracic Society (ATS)** Clinical Practice Guideline on Long-Term Non-invasive Ventilation in Chronic Stable Hypercapnic COPD provides the following five evidence-based recommendations (Macrea et al. 2020):

- "We suggest the use of nocturnal NIPPV in addition to usual care for patients with chronic stable hypercapnic COPD (conditional recommendation, moderate certainty).
- We suggest that patients with chronic stable hypercapnic COPD undergo screening for obstructive sleep apnea before initiation of long-term NIPPV (conditional recommendation, very low certainty).
- We suggest not initiating long-term NIPPV during an admission for acute-on-chronic hypercapnic respiratory failure, favoring instead reassessment for NIPPV at 2–4 weeks after resolution (conditional recommendation, low certainty); 4) we suggest not using an in-laboratory overnight polysomnogram to titrate NIPPV in patients with chronic stable hypercapnic COPD who are initiating NIPPV (conditional recommendation, very low certainty).
- We suggest NIPPV with targeted normalization of $PaCO_2$ in patients with hypercapnic COPD on long-term NIPPV (conditional recommendation, low certainty)."

The **ATS** published *Clinical Practice Guideline for the Evaluation and Management of Obesity Hypoventilation Syndrome.* The guideline provides the following recommendations (Mokhlesi et al. 2019):

- "We suggest clinicians use a serum bicarbonate level <27 mmol/L to exclude the diagnosis of OHS in obese patients with sleep-disordered breathing when suspicion for OHS is not very high (<20%) but to measure arterial blood gases in patients strongly suspected of having OHS.
- We suggest stable ambulatory patients with OHS receive positive airway pressure.
- We suggest CPAP rather than non-invasive ventilation be offered as the first-line treatment to stable ambulatory patients with OHS and coexistent severe obstructive sleep apnea.

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- We suggest patients hospitalized with respiratory failure and suspected of having OHS be discharged with non-invasive ventilation until they undergo outpatient diagnostic procedures and positive airway pressure titration in the sleep laboratory (ideally within 2–3 months).
- We suggest nocturnal home therapy with NIPPV be offered if CPAP/BPAP fail to correct hypoventilation.
- We suggest patients with OHS use weight-loss interventions that produce sustained weight loss of 25% to 30% of body weight to achieve resolution of OHS (which is more likely to be obtained with bariatric surgery)."

The **National Institute for Health and Clinical Excellence (NICE)** (2019), guideline NG115, on COPD diagnosis and management, states the following: "Refer people who are adequately treated but have chronic hypercapnic respiratory failure and have needed assisted ventilation (whether invasive or non-invasive) during an exacerbation, or who are hypercapnic or acidotic on long-term oxygen therapy, to a specialist center for consideration of long-term non-invasive ventilation."

A technology assessment prepared for the **Agency for Healthcare Research and Quality (AHRQ)** by the Mayo Clinic Evidence-based Practice Center evaluated the use of NIPPV in adult patients with chronic respiratory failure due to a variety of primary causes including COPD, thoracic restrictive disorders, neuromuscular disease, and OHS. Randomized and comparative nonrandomized studies that enrolled adults with chronic respiratory failure who used NIPPV for ≥ 1 month at home using a home mechanical ventilator, BPAP device, or CPAP device were selected for inclusion, resulting in a total of 68 studies evaluating 53,733 patients. Study limitations include the inability to fully account for the type of device used, equipment settings, and other respiratory services provided. The following conclusions were made ([2]Wilson et al. 2020):

- In patients with COPD, home BPAP (compared to no device) was associated with lower mortality, decreased need for intubations, fewer patients with hospital admissions but no difference in the total number of hospital admissions or quality of life.
- In patients with stable COPD, NIPPV compared with no device was associated with no difference in the total number of hospital admissions.
- In patients with COPD and recent exacerbation, NIPPV compared with no device was associated with no difference in mortality (OR=0.66, 95% CI: 0.41 to 1.06), but was associated with fewer hospital admissions
- In patients with thoracic restrictive diseases, home mechanical ventilators (compared to no device) were associated with lower mortality.
- In patients with neuromuscular diseases, home BPAP (compared to no device) was associated with lower mortality and better quality of life.
- In patients with OHS, home mechanical ventilators or BPAP (compared to no device) was associated with lower mortality.

The assessment also proposes that future research should look to determine which patient populations would benefit from a home mechanical ventilator versus BPAP device, when to optimally initiate treatment, comparative effectiveness of invasive versus non-invasive 24-hour ventilation, and the consequence of various features and device types on outcomes. The authors note that although RCTs may offer the highest level of evidence, enrolling patients requiring this type of treatment may not be ethical. Thus, other study designs, such as single arm interventional studies, may be the best available option ([2]Wilson et al. 2020).

The **European Respiratory Society** published a 2019 guideline titled *Long-Term Home Non-Invasive Ventilation for Management of COPD.* The following evidence-based recommendations were made regarding the clinical application of non-invasive ventilation in chronic hypercapnic COPD patients (Ergan et al. 2019):

- Use of non-invasive ventilation in stable hypercapnic COPD.
- Use of non-invasive ventilation in COPD patients following a COPD exacerbation requiring acute non-invasive ventilation.
- Use of non-invasive ventilation settings targeting a reduction in carbon dioxide.
- Using fixed pressure support as first choice ventilator mode.

The **ATS** published a *clinical practice guideline on the management of persistent, post-adenotonsillectomy obstructive sleep apnea (OSA) in children*. The authors note that while adenotonsillectomy is the first-line treatment for pediatric OSA, up to 40% of children may have persistent OSA. While some guidelines, such as those from the American Academy of Pediatrics and Pediatric Society of New Zealand recommend CPAP for persistent OSA in children, some

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studies suggest that long-term use of CPAP in children can negatively impact midface growth and dental anatomy. As there are currently no RCTs that have evaluated the use of CPAP versus no CPAP for children with persistent OSA, the panel's confidence in the accuracy of the estimated effects of CPAP on this population is very low. Therefore, ATS recommendations are, in general, based on limited pediatric data and extrapolation from adult data, and all recommendations are conditional with very low certainty in the estimates of the effects (Ehsan et al. 2024):

- "We suggest that children with persistent OSA who do not qualify for site-specific upper airway treatment may be considered candidates for treatment with continuous positive airway pressure (CPAP)
- We suggest that children with persistent OSA with specific craniofacial features may be considered candidates for orthodontic and dentofacial orthopedic treatment
- We suggest that children with persistent OSA who are overweight or obese undergo weight loss intervention
- We suggest that children with persistent OSA with lingual tonsillar hypertrophy may be considered candidates for lingual tonsillectomy
- We suggest that children with persistent OSA and sleep dependent laryngomalacia be considered candidates for supraglottoplasty
- We suggest that children with persistent OSA who are on intranasal steroids be, may be treated with montelukast"

The **American Academy of Otolaryngology-Head and Neck Surgery Foundation (AAO-HNSF)**, in collaboration with the American Academy of Sleep Medicine (AASM), the Society of Otorhinolaryngology and Head-Neck Nurses (SOHN), and the Internation Surgical Sleep Society (ISSS), published an expert consensus statement on the *management of pediatric persistent OSA after adenotonsillectomy*. The authors note that adenotonsillectomy is first-line therapy for pediatric OSA, but that persistent OSA following surgery occurs in over 25% of children. Management of persistent OSA remains to be a challenge, and factors such as obesity, co-morbidities, other sites of airway obstruction, and medical and surgical treatments should be considered prior to establishing a comprehensive treatment plan. Recommendations are also challenging due to the lack of published studies investigating the long-term outcomes of persistent OSA treatment in children. The following statements, among others, reached consensus (Ishman et al. 2024):

- "Children with persistent OSA after adenotonsillectomy benefit from multidisciplinary treatment with specific practitioners determined by the medical needs of the child. These providers can include primary care physicians, sleep medicine clinicians, dentists, otolaryngologists, and pulmonologists, among others.
- Symptoms suggesting persistent OSA include snoring, mouth breathing, secondary enuresis, difficulty with attention, fatigue, behavioral problems, underweight/overweight, restless sleep, and hyperactivity.
- PSG is useful after medical or surgical treatment of severe persistent OSA or mild or moderate persistent OSA with symptoms.
- In children with persistent OSA and surgically modifiable sites of obstruction, surgery or a trial of CPAP are both reasonable options."

SUPPLEMENTAL INFORMATION

Chronic hypercapnia defined as PaCO2 ≥ 50 mm Hg (6.7 kPa).

Non-invasive positive pressure ventilation may be abbreviated as either NIPPV or NPPV. In addition, non-invasive ventilation, or NIV, may also refer to non-invasive positive pressure ventilation. However, NIV may also refer to non-invasive negative pressure ventilation. The type of ventilation (negative or positive) used typically depends on the disease process. In addition, some studies refer to NIPPV as simply non-invasive ventilation or NIV. NIPPV was used throughout this policy to provide clarity and prevent confusion.

Bilevel positive airway pressure is often abbreviated as BiPAP. However, it is important to note that BiPAP is the trademarked name of a specific device. BPAP and BiPAP refer to the same therapy and BPAP was used throughout this policy to prevent reference to a specific device.

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CODING & BILLING INFORMATION

HCPCS (Healthcare Common Procedure Coding System)

Code	Description
E0466	Home ventilator, any type, used with noninvasive interface (e.g., mask, chest shell)
E0467	Home ventilator, multi-function respiratory device, also performs any or all of the additional functions of oxygen concentration, drug nebulization, aspiration, and cough stimulation, includes all accessories, components and supplies for all functions
E0468	Home ventilator, dual-function respiratory device, also performs additional function of cough stimulation, includes all accessories, components and supplies for all functions

CODING DISCLAIMER. Codes listed in this policy are for reference purposes only and may not be all-inclusive. Deleted codes and codes which are not effective at the time the service is rendered may not be eligible for reimbursement. Listing of a service or device code in this policy does not guarantee coverage. Coverage is determined by the benefit document. Molina adheres to Current Procedural Terminology (CPT®), a registered trademark of the American Medical Association (AMA). All CPT codes and descriptions are copyrighted by the AMA; this information is included for informational purposes only. Providers and facilities are expected to utilize industry standard coding practices for all submissions. When improper billing and coding is not followed, Molina has the right to reject/deny the claim and recover claim payment(s). Due to changing industry practices, Molina reserves the right to revise this policy as needed.

APPROVAL HISTORY

12/10/2025	Policy revised. Changed criteria hierarchy so that the inappropriateness of a standard BPAP/CPAP device is a requirement for all Members. Removed documented BPAP failure and pulmonologist prescription requirement for COPD Members with chronic hypercapnia. Added new indication for residual pediatric OSA where a standard FDA-cleared BPAP/CPAP unit is not available (Members < 30 kg). Removed continuous, 24-hour ventilation from limitations and exclusions. IRO peer reviewed on November 20, 2025, by a practicing physician board certified in pulmonary, internal, and critical care medicine.
12/11/2024	Policy reviewed. No changes to coverage criteria. Updated Summary of Medical Evidence and References.
12/13/2023	Policy reviewed, no changes to criteria. Updated Overview, Summary of Medical Evidence, Supplemental Information, and References.
12/14/2022	Policy reviewed, updated Coverage Policy – included criteria for patients with COPD and for those when BPAP/CPAP is not indicated; added Continuation of Therapy section. IRO Peer Review on October 11, 2022, by a practicing, board-certified physician with specialties in the areas of Pulmonary Disease and Critical Care. IRO Peer review on December 12, 2022, by a practicing, board-certified physician with specialties in the area of Pulmonary Disease.
02/09/2022	Policy reviewed; updated Coverage Policy, Summary of Evidence, and Reference section.
02/08/2021	Policy reviewed, updated references.
04/23/2020	Policy reviewed, updated references.
09/18/2019	Policy reviewed, Summary of Evidence and Reference section updated.
07/16/2018	Policy reviewed; updated Coverage Policy, Summary of Evidence, and Reference section. Added medically necessary criteria for the diagnosis of COPD and chronic restrictive hypoventilation syndrome related to obesity.
12/13/2017	Policy reviewed, no changes to criteria, updated references.
05/23/2016	New policy.

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