Prior Authorization Review Panel
MCO Policy Submission

A separate copy of this form must accompany each policy submitted for review.
Policies submitted without this form will not be considered for review.

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| Plan: Keystone First | Submission Date: 2/1/2026 |
| Policy Number: CCP.1281 | Effective Date: 2/1/2017<br>Revision Date: 1/1/2026 |
| Policy Name: Room humidifiers | |

Type of Submission:

| | |
|---|---|
| ☐ New Policy | ☒ Prior Authorization Policy |
| ☒ Revised Policy* | ☐ Base Policy |
| ☐ Annual Review- no revisions | ☒ Experimental/Investigational Policy |
| | ☐ Statewide PDL |
| | ☐ Other: |

*All revisions to the policy must be highlighted using track changes throughout the document.

Please provide any clarifying information for the policy below:

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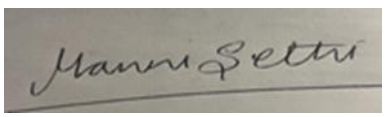
| Name of Authorized Individual (Please type or print):<br><br>Manni Sethi, MD, MBA, CHCQM | Signature of Authorized Individual:<br><br>  |

# Room humidifiers

Clinical Policy ID: CCP.1281

Recent review date: 1/2026

Next review date: 5/2027

Policy contains: Indoor air humidification; room/home humidifier.

*Keystone First- CHIP has developed clinical policies to assist with making coverage determinations. Keystone First- CHIP's clinical policies are based on guidelines from established industry sources, such as the Centers for Medicare & Medicaid Services (CMS), state regulatory agencies, the American Medical Association (AMA), medical specialty professional societies, and peer-reviewed professional literature. These clinical policies along with other sources, such as plan benefits and state and federal laws and regulatory requirements, including any state- or plan-specific definition of "medically necessary," and the specific facts of the particular situation are considered by Keystone First- CHIP, on a case by case basis, when making coverage determinations. In the event of conflict between this clinical policy and plan benefits and/or state or federal laws and/or regulatory requirements, the plan benefits and/or state and federal laws and/or regulatory requirements shall control. Keystone First- CHIP's clinical policies are for informational purposes only and not intended as medical advice or to direct treatment. Physicians and other health care providers are solely responsible for the treatment decisions for their patients. Keystone First- CHIP's clinical policies are reflective of evidence-based medicine at the time of review. As medical science evolves, Keystone First- CHIP will update its clinical policies as necessary. Keystone First- CHIP's clinical policies are not guarantees of payment.*

## Coverage policy

The use of room humidifiers (i.e., cool mist humidifiers) is investigational/not clinically proven and, therefore, not medically necessary. Consequently, room humidifiers do not qualify as durable medical equipment.

This policy does not address devices that provide warm mist humidification (i.e., vaporizers) of inspired gases for persons with artificial airways, receiving invasive or noninvasive ventilation, or on supplemental oxygen.

Limitations

All other uses of room humidifiers are not medically necessary.

Alternative covered services

No alternative covered services were identified during the writing of this policy.

## Background

Relative humidity affects air quality and the perception of comfort indoors. High humidity can create condensation on walls and trigger the growth of molds and dust mites. Maintaining indoor relative humidity below 60%, ideally between 30% and 50%, is recommended to reduce mold growth and minimize microbial proliferation. Conversely, humidity below this range can cause complaints related to dryness in many parts of the body, including dry skin, nose, throat, and lips. In the home, room humidifiers are used to increase the relative humidity of ambient air. Two general types are warm mist and cool mist (Consumer Reports, 2024).

Warm mist humidifiers, also called vaporizers, heat water to a boil and release the resulting steam. Evaporative, ultrasonic, and impeller types use either a fan to blow air over a wet wick, a vibrating nebulizer, or a rotating disk, respectively, to produce cool mist. Humidifiers have been shown to increase humidity within a room, versus an external environment, by approximately 7.5% when placed 1 to 2 meters from the room occupant (Guerra, 2021).

The United States Food and Drug Administration regulates humidifiers when the device adds water vapor to breathing gases and is intended for respiratory therapy or other medical purposes. The vapor must pervade the area surrounding the patient, who breathes the vapor during normal respiration (21 Code of Federal Regulations 868.5460). The United States Food and Drug Administration does not regulate most room humidifiers as medical devices when marketed only to improve room comfort; consumer product safety oversight may involve other regulatory authorities.

Ultrasonic humidifiers generate aerosols that can contain minerals and metals present in the fill water (Dietrich, 2022; Yao, 2020). When tap water or water with high total dissolved solids is used, the resulting aerosols can contain metals and minerals present in the source water (Yao, 2020; Yao, 2021). These particles are respirable and can be deposited in the respiratory tract, with modeling studies indicating higher deposition doses per body weight in infants compared to adults (Yao, 2020). Microbial contamination is another concern, as humidifiers can aerosolize microorganisms if the reservoir water is contaminated (Yang, 2022; Dietrich, 2022).

## Findings

The evidence regarding room humidifiers as a primary intervention for respiratory conditions remains limited and does not support clinical effectiveness for the prevention, treatment, or symptom management of common respiratory tract infections in either pediatric or adult populations. Systematic reviews have examined heated humidified air for the common cold and found no consistent improvement in clinical outcomes. The evidence base is characterized by heterogeneity in study designs, humidity delivery methods, outcome measures, and populations studied. Safety concerns have emerged regarding ultrasonic humidifiers, including risks from aerosolized minerals and microorganisms, as well as severe lung injuries associated with chemical disinfectant additives used in certain countries. The only clinical scenario with robust evidence supporting humidification is as an adjunct to positive airway pressure therapy for obstructive sleep apnea, where heated humidification reduces upper airway side effects. This policy does not address devices that provide warm mist humidification of inspired gases for persons with artificial airways, receiving invasive or noninvasive ventilation, or on supplemental oxygen.

Clinical guidelines

Clinical guidelines from major professional societies do not recommend room humidifiers as a primary disease-modifying intervention for respiratory tract conditions. The American Academy of Sleep Medicine clinical practice guideline recommends that clinicians generally use heated humidification with positive airway pressure devices to reduce side effects in adults with obstructive sleep apnea (Patil, 2019). However, this recommendation pertains specifically to humidification as an adjunct to positive airway pressure therapy for sleep apnea, not to the use of room humidifiers as a standalone or primary intervention for respiratory tract conditions (Patil, 2019). There is no evidence to support the use of humidifiers as a standalone intervention for sleep apnea; their role is strictly adjunctive to positive airway pressure therapy (Patil, 2019).

The American College of Chest Physicians guideline on management of children with chronic wet cough and protracted bacterial bronchitis does not address the use of home humidifiers as a primary intervention (Chang, 2017). The Healthy Children website of the American Academy of Pediatrics recommends using a humidifier when home air is dry to reduce airway dryness and keep mucus from drying, though this recommendation is based on expert opinion rather than high-quality clinical trial evidence (American Academy of Pediatrics, 2022; American Academy of Pediatrics, 2023).

Systematic reviews

The Cochrane systematic review by Singh and colleagues included six randomized controlled trials (n = 387) and found no consistent evidence of benefit with heated, humidified air for the common cold (Singh, 2017). The quality of evidence was graded as low, and the review concluded that current evidence does not support any clear benefit or harm from the use of heated, humidified air for the treatment of the common cold (Singh, 2017). The Cochrane review by Byber and colleagues examined humidification of indoor air in schools and workplaces and concluded that humidification may have little to no effect on dryness symptoms of the eyes, skin, or upper respiratory tract, and did not identify studies that directly assessed the impact of humidification on upper respiratory tract infections (Byber, 2021). Although this review focused on educational and workplace settings, its findings are consistent with the broader body of evidence showing no clinical benefit from humidification for respiratory symptom management (Byber, 2021).

The Cochrane systematic review by Kennedy and colleagues examined interventions to improve continuous positive airway pressure usage, with analyses of humidification studies showing that adding humidification devices reduced throat dryness and improved comfort outcomes for individuals with obstructive sleep apnea (Kennedy, 2019). These findings support humidification as an adjunct for symptom management in positive airway pressure therapy but do not support room humidifiers as a primary intervention for respiratory conditions (Kennedy, 2019).

A systematic review by Dietrich and colleagues found that fill water quality used in portable ultrasonic air humidifiers resulted in emission of particles that are inhaled, which can cause adverse respiratory health outcomes in adults and children (Dietrich, 2022). Ventilation was identified as a determinant of exposure intensity (Dietrich, 2022). A systematic review documented microbial contamination in reusable hospital humidifiers and suggested replacing reusable humidifiers with prefilled models to decrease contamination risk (de la Fuente-Sancho, 2019).

Several systematic reviews have examined the health effects associated with humidifier disinfectant use, documenting severe respiratory toxicity from inhalational exposure to certain disinfectant additives used with humidifiers (Song, 2022; Kim, 2024). Toxicological evidence integration has confirmed the biological plausibility of the association between humidifier disinfectant exposure and respiratory diseases (Kim, 2024). Epidemiological investigations confirmed a strong association between the use of these disinfectants and the outbreak of lung injury in South Korea (Kim, 2025; Cho, 2019). Importantly, this risk is specific to the use of chemical additives and not to the use of humidifiers per se (Park, 2017).

Meta-analyses

The meta-analysis by Hu and colleagues demonstrated that heated humidification improved several nasal and oral dryness symptoms in individuals with obstructive sleep apnea using positive airway pressure therapy, including dry nose, blocked nose, dry mouth, and dry throat (Hu, 2023). A separate meta-analysis by Zhu and colleagues examined whether heated humidification improved compliance with positive airway pressure therapy in obstructive sleep apnea syndrome (Zhu, 2018).

The systematic review and meta-analysis by Mansell and colleagues examined current treatment strategies for managing side effects associated with domiciliary positive airway pressure therapy and found that across interventions, including heated humidification, the evidence base for side-effect management was limited and heterogeneous (Mansell, 2023).

No meta-analyses were identified that support the use of room humidifiers as a primary intervention for the common cold, croup, bronchiolitis, rhinitis, sinusitis, or cough in home or community settings.

Other evidence

A randomized controlled trial by Bird and colleagues investigated nasal high-flow rhinothermy, delivering 100% humidified air at 41°C and 35 L/min for 2 hours daily, for the treatment of the common cold in adults (n = 170) (Bird, 2021). The results showed no difference between groups in symptom severity or duration, nor in time to resolution of symptoms (Bird, 2021). There were no serious adverse events related to the intervention (Bird, 2021). The authors concluded that rhinothermy with humidified air does not reduce common cold symptom severity or duration (Bird, 2021).

Epidemiological and modeling studies suggest that maintaining indoor relative humidity in the range of 40% to 60% may optimize airway health and reduce the viability and transmissibility of certain viruses, notably influenza (Wolkoff, 2024; Aganovic, 2022). However, these findings are largely theoretical and based on modeling or indirect measures, rather than direct clinical trials of humidifier use as a primary intervention for infection prevention or symptom management in home settings (Wolkoff, 2024; Aganovic, 2022). One modeling study found that the most effective intervention for reducing infection risk across all viruses was increasing ventilation rates, rather than humidification (Aganovic, 2022).

Safety data from multiple studies have documented risks associated with ultrasonic humidifier use. Research by Yao and colleagues demonstrated that use of tap water in ultrasonic humidifiers can result in respirable particle concentrations exceeding ambient air quality standards, with modeling indicating differential exposure patterns between infants and adults (Yao, 2020; Yao, 2021). Yang and colleagues found that portable ultrasonic humidifiers exacerbate indoor bioaerosol risks by raising bacterial concentrations and fueling potentially pathogenic genera including Pseudomonas, Brevundimonas, Acinetobacter, and Legionella (Yang, 2022). Lau and colleagues characterized particulate matter emitted from ultrasonic humidifiers and documented chemical compositions with implications for indoor air quality (Lau, 2021).

A unique and severe risk was identified in South Korea, where the use of chemical disinfectants as humidifier additives led to an epidemic of lung injuries, particularly among pregnant women and young children (Park, 2017;

Park, 2015; Lamichhane, 2019). These disinfectants, when aerosolized, caused a distinct form of interstitial lung disease (Park, 2017; Lamichhane, 2019). Longitudinal studies of children exposed to humidifier disinfectants have demonstrated persistent decrements in lung function, particularly in children exposed within the first year of life (Cho, 2019). The latency of respiratory disease onset following humidifier disinfectant exposure can be prolonged, with chronic conditions developing years after initial exposure (Kim, 2025).

In summary, humidification of indoor air may improve comfort, but the evidence supporting improvement in physiologic measures or clinical outcomes for respiratory tract conditions is inconclusive (Singh, 2017; Byber, 2021; Bird, 2021). From a respiratory therapy perspective, adequate humidification is important for preventing retained secretions in persons with certain chronic respiratory conditions, but the evidence of effectiveness of room humidifiers in a community or home setting needs further exploration (Patil, 2019; Hu, 2023). The clinical scenario with robust evidence supporting humidification is as an adjunct to positive airway pressure therapy for obstructive sleep apnea, where heated humidification reduces upper airway side effects (Hu, 2023; Mansell, 2023; Kennedy, 2019). At present, the evidence for benefit of room humidifiers as a primary intervention for respiratory conditions does not exceed the potential health risks associated with excessive humidification, aerosolized minerals from ultrasonic devices, microbial contamination, and poor infection control practices related to the equipment (Dietrich, 2022; Yang, 2022; Yao, 2020).

In 2026, we revised the findings section to add three meta-analyses (Hu, 2023; Zhu, 2018; Mansell, 2023), five systematic reviews (Dietrich, 2022; Byber, 2021; Song, 2022; Kim, 2024; de la Fuente-Sancho, 2019), one Cochrane review on positive airway pressure humidification (Kennedy, 2019), one randomized controlled trial (Bird, 2021), and additional evidence on ultrasonic humidifier emissions and humidifier disinfectant-associated lung injury (Yao, 2020; Yao, 2021; Yang, 2022; Lau, 2021; Park, 2017; Park, 2015; Lamichhane, 2019; Cho, 2019; Kim, 2025).

## References

On December 8, 2025, we searched PubMed and the databases of the Cochrane Library, the U.K. National Health Services Centre for Reviews and Dissemination, the Agency for Healthcare Research and Quality, and the Centers for Medicare & Medicaid Services. Search terms were “Durable Medical Equipment” (MeSH), “Humidifiers” (MeSH), “Humidity/therapeutic use” (MeSH), “Humidity/therapy” (MeSH), “Respiratory Therapy” (MeSH), “room humidifier,” “home humidifier,” and “humidity.” We included the best available evidence according to established evidence hierarchies (typically systematic reviews, meta-analyses, and full economic analyses, where available) and professional guidelines based on such evidence and clinical expertise.

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## Policy updates

11/2016: initial review date and clinical policy effective date: 2/2017

1/2018: Policy references updated.

1/2019: Policy references updated. Policy ID changed.

1/2020: Policy references updated.

1/2021: Policy references updated.

1/2022: Policy references updated.

1/2023: Policy references updated.


1/2024: Policy references updated.

1/2025: Policy references updated.

1/2026: Policy references updated.

## Related Codes

Below are the most commonly submitted codes for the service(s)/item(s) subject to this policy CCP.1281. This is not an exhaustive list of codes. Providers are expected to consult the appropriate coding manuals and bill accordingly.

| Code | Code Description |
|---|---|
| E0605 | Vaporizer, room type |
| E0550 | Humidifier, durable for extensive supplemental humidification during IPPB treatments or oxygen delivery |
| E0560 | Humidifier, durable for supplemental humidification during IPPB treatment or oxygen delivery |
| E0555 | Humidifier, durable, glass or autoclavable plastic bottle type, for use with regulator or flowmeter |
| E0561 | Humidifier, non-heated, used with positive airway pressure device |
| E0562 | Humidifier, heated, used with positive airway pressure device |