Home spirometry

Clinical Policy ID: CCP.1494

Recent review date: 8/2025

Next review date: 12/2026

Policy contains: Home; portable; spirometry.

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Coverage policy

Home spirometry for monitoring of pulmonary disease is investigational/not clinically proven and, therefore, not medically necessary.

Limitations

No limitations were identified during the writing of this policy.

Alternative covered services

Facility-based spirometry.

Background

Spirometry is a test that measures air volume and speed that can be exhaled over time following maximal inhalation. It is a key diagnostic test for many obstructive and restrictive pulmonary diseases. Spirometry can evaluate and monitor patient condition; assess disease severity, effects, and prognosis; and screen for pulmonary diseases (Lamb, 2021).

During the procedure, a mouthpiece is placed between the patient's teeth, after deep inhalation. Exhalation usually lasts at least six seconds, or as long as possible. The procedure is repeated in one-minute intervals until similar results are obtained. Spirometry can measure different variables, most often forced vital capacity and forced expiratory volume in one second (de Jong, 2020).

Spirometry can be performed in inpatient facilities, physician offices, emergency rooms, and specialty labs. Regular access to accurate, reliable pulmonary function data is essential to managing many chronic lung conditions. During the pandemic, alternatives to comprehensive pulmonary function testing, such as home-based electronic spirometry, became available to continue to diagnose and manage patients with lung conditions while minimizing infectious disease transmission. Technological advances allow for electronic data transmission to caregivers (Kouri, 2020).

The U.S. Food and Drug Administration (2025) has approved or cleared several spirometers for home use, including the GoSpiro® Home Spirometer (Monitored Therapeutics Inc., Dublin, Ohio) and the Air Next wireless spirometer (NuvoAir®, Stockholm, Sweden).

Findings

Guidelines

A technical statement from the American Thoracic Society and European Respiratory Society on spirometry notes that updated standards are required for unattended home spirometry (Graham, 2019). The Global Initiative for Chronic Obstructive Lung Disease notes that "good quality spirometry is possible in any healthcare setting," with no mention of home use of the technology (Global Initiative for Chronic Obstructive Lung Disease, 2025).

The American Thoracic Society issued a research statement outlining the PANACEA (test ***p***erformance, disease m***ana***gement, ***c***ost, ***e***xperiences, ***a***ccess) framework for standardizing evaluation of home-based monitoring of individuals with chronic lung diseases. The items in the PANACEA checklist represent the information required to determine if a home-based monitoring technology, such as spirometry or pulse oximetry, is ready for clinical implementation. The statement identified several areas requiring additional research ranging from test performance to domains of disease management, costs, patient experiences, and equitable access provision (Khor, 2025).

Evidence review

There is increasing interest in home spirometry for its convenience and potential for early detection of exacerbations and improved self-management, infection control, and outcomes in patients with chronic lung conditions. However, the published evidence raises concerns about quality control, clinical effectiveness, and clinical utility. Education and training may increase the feasibility of unattended home monitoring, but underlying etiologies, patient compliance, and differences in spirometry equipment appear to influence testing quality (Bell, 2022; Bindler, 2023; Fettes, 2022; Paynter, 2022; Wang, 2023; Williams, 2023).

A review of 16 commercially available portable electronic spirometers, including four approved for use by the U.S. Food and Drug Administration, found 63% provided graphical representations of lung function results, and 44% gave immediate feedback on the quality of the breathing maneuver. Authors describe the proportion of devices that provided information on data security (63%), measurement accuracy (50%), and association with patient outcomes (0%) to be "commonly limited" (Carpenter, 2018).

Home spirometry was often a component of a multicomponent intervention, limiting the ability to evaluate home spirometry in isolation. Some studies enrolling participants with cystic fibrosis predated the availability of cystic fibrosis transmembrane conductance regulator therapies that represent the current standard of care (Khor, 2025).

Many individual studies have small sample sizes or do not compare home spirometry to clinic spirometry, which is considered the standard of care. Where a comparison was conducted, the best available evidence suggests inconsistent agreement between clinic and unattended home spirometry measurement, indicating that clinic and home spirometry results may not be interchangeable (Anand, 2023; Oppenheimer, 2023; Svedberg, 2025). Lower-quality cohort studies reported mixed results for correlating home spirometry with clinic spirometry and detecting differences in health care utilization (Nichols, 2022; Noth, 2021).

The Early Intervention in Cystic Fibrosis Exacerbation trial (ClinicalTrials.gov identifier NCT01104402), a randomized controlled trial of 267 participants older than age 14 with cystic fibrosis, compared pulmonary function outcomes using home spirometry to usual care. Home spirometry was measured twice weekly with automated notification if pulmonary exacerbation criteria were met. Participants in the usual care arm were seen every three months and asked to contact the site about any worsening pulmonary symptoms. No significant difference between groups occurred in the 52-week mean change in forced expiratory volume in one minute slope (P = .99). The early intervention group had more frequently detected exacerbations (P = .01). Adverse events were not significantly different (Lechtzin, 2017). Home spirometry lacked the precision of forced expired volume in one second measurement and the ability to detect subtle changes, particularly in patients who were on modulator therapy. There were no significant differences in outpatient utilization or overall health care costs (Franz, 2022; Paynter, 2022).

A prospective study randomized 60 Turkish children with cystic fibrosis between six and 18 years of age to receive four quarterly visits with or without twice-weekly home spirometry measurement using the SpiroHome device with mobile application. Participants were followed for one year. From baseline to the 12th month, there were no statistically significant differences between groups in the absolute (primary outcome) or relative (secondary outcome) change in forced expired volume in one second as percentage of predicted value, or in the number of pulmonary exacerbations detected or change in lung clearance index. Among 22 children who completed 70% of the measurements over 12 months, there was a significant difference in the primary outcome, favoring the home spirometry group (mean 5.56%, interquartile range − 3.33 to 13.50 versus mean 2.46%, − 7.57 to 4.24; P = .01). The authors suggested high adherence with home spirometry use may improve lung function. Among participants younger than 14 years of age, there was a significant increase in the social domain of the health-related quality of life questionnaire for patients with cystic fibrosis (from 59.1 to 76.2, P = .01) (Yanaz, 2024).

A prospective, multicenter, observational study in Sweden enrolled 110 participants with cystic fibrosis aged five years or older to compare home and hospital longitudinal trends in lung function and treatment patterns. The investigators used the NuvoAir home spirometer. Over a 12-month period, the mean forced expired volume in one second and mean rate of forced expired volume in one second decline were relatively comparable between home and hospital spirometry assessments (Svedberg, 2025).

In 2023, we updated the Global Initiative for Chronic Obstructive Lung Disease annual report with no policy changes warranted.

In 2024, we updated the references and added several new studies with no policy changes warranted.

In 2025, we updated the references with no policy changes warranted.

References

On June 17, 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 “spirometry (MeSH),” “vital capacity (MeSH),” “telemedicine (MeSH),” and “home spirometry.” 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

8/2021: initial review date and clinical policy effective date: 9/2021

8/2022: Policy references updated.

8/2023: Policy references updated.

8/2024: Policy references updated.

8/2025: Policy references updated.