Anthem

Medical Policy

Subject: Intermittent Abdominal Pressure Ventilation Devices
Document #: DME.00046
Status: Reviewed

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Description/Scope

This document addresses the use of intermittent abdominal pressure ventilation devices.

Position Statement

Investigational and Not Medically Necessary:

Intermittent abdominal pressure ventilation devices are considered **investigational and not medically necessary** for all indications.

Rationale

Independent breathing may not be possible for those with severe thoracic restriction or paralysis. These individuals may require assisted breathing via external ventilators. Intermittent abdominal pressure ventilation (IAPV) uses abdominal compression to produce positive pressure ventilation. These “abdominal respirators” move the abdominal contents to increase the movement of the thoracic diaphragm during breathing.

A 1991 study by Bach and colleagues reported on 54 subjects who used the IAPV for long-term ventilatory support. Diagnoses included polio, spinal cord injury, myopathy, Duchenne muscular dystrophy, and other motor neuron diseases. None of the participants had tracheostomies. There were 48 participants who used the IAPV for daytime support for a mean of 12.9 ± 11.5 years. One participant used IAPV for nocturnal ventilatory support for 6 months, but switched to nocturnal nasal intermittent positive pressure ventilation (IPPV) in order to be able to lie supine. The other 5 participants used IAPV for ventilatory support 24 hours a day for a mean of 13.4 ± 11.2 years. There were 11 participants who died while using IAPV after a mean of 9.3 ± 4.4 years of use. Causes of death were lung cancer, myocardial infarction, sepsis from decubitus, motor vehicle accident, drug abuse, pneumonia, seizures, inadequate nocturnal ventilatory support while using a rocking bed, and two causes unknown. Of the 5 participants using the IAPV for 24 hours, 2 developed sacral decubiti with 1 death. After 12.3 ± 9.5 years, IAPV became ineffective for 12 participants and they switched to daytime mouth IPPV.

A 2021 study by Fiorentino and colleagues reported on 8 subjects with neuromuscular diseases who used IAPV. Diagnoses included congenital myopathy (n=1), Duchenne muscular dystrophy (n=3), and amyotrophic lateral sclerosis (n=4). Participants had previously rejected or had poor compliance with noninvasive mechanical ventilation due to claustrophobia or poor tolerance of the mask. All participants had a baseline functional respiratory assessment performed during spontaneous breathing and while using the IAPV. Baseline mean spontaneous tidal volume was 316.375 ± 146.80 mL and increased to 678 ± 334mL using the IAPV. Baseline peak expiratory flow was 29.5 ± 10.9 mL with an average of 54 ± 18.04 mL during IAPV. With 3 years of follow-up, all subjects continue to use IAPV with 3 subjects relying on IAPV as their sole method of respiratory support 24 hours/day. After 2 years, IAPV became ineffective as the sole means of ventilatory support and 2 subjects switched to daytime IAPV and nocturnal positive pressure ventilation with nasal mask.

A 2021 narrative review by Pierucci and colleagues reported on 10 studies in which IAPV was used for ventilatory support. Many of the studies were clinical series for which statistical analyses were not possible due to limited and heterogenous data. Most of the studies were published prior to 2017 as this technology has been used less frequently over the years due to the increasing use of tracheotomies. The authors propose that IAPV is becoming more prevalent with a paradigm shift back to non-invasive ventilatory (NIV) management and improvements in the portability and convenience NIV devices. The authors concluded “The paucity of long-term follow-up studies underlines the need for more clinical studies on larger patient populations with longer observation times.”

Many of the current peer-reviewed publications regarding IAPV include case series (Bach, 2019; Banfi, 2019; Puricelli, 2021). There are no current guidelines for IAPV in neuromuscular disease. There are also several body habitus issues which could be considered contraindications to IAPV including severe scoliosis, obesity or extremely lean individuals and inability to maintain a sitting position. It has also been noted IAPV can become less effective over time and regular follow-up is necessary.

Currently available published evidence does not permit reasonable conclusions concerning the effect of IAPV on health outcomes in relation to the effects of more standard assisted-breathing techniques.

Background/Overview

IAPV is a system of noninvasive respiratory care. Individuals wear a corset- or belt-type device placed on the body at the level of the thoracic diaphragm. Inside the corset is an inflatable sac or bladder which, when connected to a portable positive pressure ventilator, inflates the sac. This inflation compresses the abdomen which elevates the diaphragm causing forced exhalation. When the sac deflates, the diaphragm returns to the normal resting position and causes passive inhalation of air into the lungs. IAPV may be used as an alternative to noninvasive mechanical ventilation since there is no nasal or face mask involved, particularly during the day when a person is in an upright position.

Definitions

Ventilator: A mechanical device capable of providing pressurized air with or without supplemental oxygen and two or more of the following features: pressure support, rate support, volume support or various combinations of pressure, rate, and volume support.

Coding

The following codes for treatments and procedures applicable to this document are included below for informational purposes. Inclusion or exclusion of a procedure, diagnosis or device code(s) does not constitute or imply member coverage or provider

reimbursement policy. Please refer to the member's contract benefits in effect at the time of service to determine coverage or non-coverage of these services as it applies to an individual member.

When services are Investigational and Not Medically Necessary:
For the following procedure code, or when the code describes a procedure indicated in the Position Statement section as investigational and not medically necessary.

HCPCS	
A4468	Exsufflation belt, includes all supplies and accessories
ICD-10 Diagnosis	
	All diagnoses

References

Peer Reviewed Publications:

1. Bach JR, Alba AS. Intermittent abdominal pressure ventilator in a regimen of noninvasive ventilatory support. Chest. 1991; 99(3):630-636.
2. Bach JR, Radbourne M, Potpally N, Chiou M. A mechanical intermittent abdominal pressure ventilator. Am J Phys Med Rehabil. 2019; 98(12):e144-e146.
3. Banfi P, Volpato E, Bach JR. Efficacy of new intermittent abdominal pressure ventilator for post-ischemic cervical myelopathy ventilatory insufficiency. Multidiscip Respir Med. 2019; 14:4.
4. Fiorentino G, Annunziata A, Coppola A, et al. Intermittent Abdominal pressure ventilation: an alternative for respiratory support. Can Respir J. 2021; 2021:5554765.
5. Pierucci P, Di Lecce V, Carpagnano E, et al. The intermittent abdominal pressure ventilator as an alternative modality of noninvasive ventilatory support: a narrative review. Am J Phys Med Rehabil. 2021 May 28. Online ahead of print.
6. Puricelli C, Volpato E, Sciurello S, et al. Intermittent abdominal pressure ventilation: feasibility and efficacy in neuromuscular disease. A case report. Monaldi Arch Chest Dis. 2021 Aug 3. Online ahead of print.

Government Agency, Medical Society, and Other Authoritative Publications:

1. American Thoracic Society, ATS Consensus Statement, Respiratory Care of the Patient with Duchenne Muscular Dystrophy, 2004, https://www.atsjournals.org/doi/epdf/10.1164/rccm.200307-885ST?role=tab. Accessed on March 10, 2023.

Websites for Additional Information

1. International Ventilator Users Network, Home Mechanical Ventilation: The Basics, https://www.ventnews.org/m-hmv-the-basics. Accessed on March 10, 2023.

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PBAir™ corset
Pneumobelt
Luna belt

The use of specific product names is illustrative only. It is not intended to be a recommendation of one product over another, and is not intended to represent a complete listing of all products available.

Document History

Status	Date	Action
	12/28/2023	Updated Coding section with 01/01/2024 HCPCS changes, added A4468 replacing K1021 deleted as of 01/01/2024.
Reviewed	05/11/2023	Medical Policy & Technology Assessment Committee (MPTAC) review. Updated References section.
New	05/12/2022	MPTAC review. Initial document development.
