Medical Policy
Surgical Tongue Base Suspension

Effective Date: August 10, 2016;
Revised [8/10; 8/12; 8/14; 8/16]

Subject: Surgical Tongue Base Suspension for the treatment of Obstructive Sleep Apnea

Overview: The AIRvance System, formerly the Repose™ Tongue and Hyoid Suspension System, uses screws and sutures to advance and stabilize the tongue to help prevent it from falling back and occluding the airway during sleep.

Policy and Coverage Criteria:

The AIRvance System for tongue base suspension is NOT covered. It is considered experimental/investigational and unproven in the treatment of obstructive sleep apnea.

Exclusions: N/A

Supporting Information:

1. Technology Assessment: The device and procedure can be used for tongue suspension alone or for an adjunct hyoid suspension. The objective of the tongue suspension procedure is to advance and stabilize the genioglossus muscle to help prevent it from falling back and occluding the airway when the patient is supine and asleep. A small titanium screw with attached sutures is implanted in the lower mandible, and then the sutures are looped through the tongue to form a hammock that suspends it.

2. Literature Review: There is a limited amount of peer-reviewed literature evaluating the use of the AIRvance/Repose™ System and comparing its safety and efficacy with other established surgical OSA treatments. Studies with larger patient populations and longer follow-up are needed. A 2011 report from the European Respiratory Society evaluated non-CPAP therapies for OSA. The researchers noted “procedures such as laser midline glossectomy and tongue suspension (Repose®) have a small role as a single treatment option for obese patients with moderate to severe OSA and cannot be recommended. There are at present no data about their role in patients with mild disease.”

A 2015 systematic review (Bostanci and Turhan) evaluated existing research into the effectiveness and safety of two tongue base suspension (TBS) techniques (Repose and modified TBS) with or without uvulopalatopharyngoplasty (UPPP) in OSA. Seven studies including 113 patients who received TBS as a stand-alone procedure and ten studies including 300 patients who received TBS combined with UPPP were included in the review. Four studies that used TBS as stand-alone (62 patients) used the Repose system and three studies (51 patients) used the modified TBS. Success rates were higher in studies using modified TBS (74.5%) compared with studies using the Repose system (25.8%). Within the studies that used TBS combined with UPPP, seven of the ten studies (176 patients) used the Repose system and three studies (124 patients) used the modified TBS. There was a similar success rate between these two groups. When aggregate data of all patients were compared, modified TBS had significantly higher success rates compared to Repose.

A 2013 study (Berg et al.) discussed results of a retrospective multicenter chart review of all patients who had undergone surgical management of OSA with pharyngeal suspension sutures from January 1, 2001, through December 31, 2008. The analysis found the procedure had good outcomes. However, the authors note further evaluation is needed and future studies should include larger patient populations and focus on long-term efficacy.

Fernandez-Julian et al. (2009) published results of a randomized study comparing the effectiveness and morbidity of tongue base radiofrequency ablation and tongue base suspension techniques combined with UPPP for
moderate to severe OSA. 29 patients underwent tongue base RF reduction and 28 underwent tongue base suspension. AHI, lowest oxygen saturation, Epworth score, and side effects were assessed. Results found success rates for the two procedures were 57.1% and 51.7%, respectively. However, the success rates were 12.5% and 10% in obese patients. Tongue base suspension demonstrated higher morbidity. Researchers found the effectiveness of the two procedures was similar, but tongue base suspension had significantly higher morbidity. Miller et al. (2002) conducted a retrospective analysis of the Repose System for the treatment of OSA to describe preliminary experience using the system in conjunction with UPPP in the multilevel surgical approach. The authors evaluated 19 consecutive patients undergoing UPPP and the Repose System tongue base suspension for the management of OSA during a one-year period (1998 through 1999). Fifteen patients had complete preoperative and postoperative PSG data. A 46% reduction in RDI was demonstrated at a mean of 3.8 months after surgery. The apnea index demonstrated a 39% reduction. The authors concluded that the Repose System in conjunction with UPPP has been shown to produce significant reductions in the RDI and apnea index, as well as a significant increase in oxygen saturation. Despite the improvement in these objective parameters, the overall surgical cure rate was only 20% (three of 15 patients) in this retrospective series. Further research is warranted to define the role of the Repose System in the management of obstructive sleep apnea patients.

Kuhnel et al. (2005) conducted a prospective nonrandomized study (n=28) to demonstrate the efficacy of tongue base suspension with the Repose System in the treatment of OSA. PSG was performed before as well as three and 12 months after surgery. Lateral cephalometric radiography and videoendoscopy of the pharynx were performed preoperatively and postoperatively to identify morphological changes in the posterior airway space. A suspension suture anchored intraorally at the mandible was passed submucosally in the body of the tongue, with suture tightness adjusted individually. The posterior airway space was widened by at least 2 mm in 60% of cases. Daytime sleepiness improved subjectively in 67% of patients, and the RDI improved postoperatively in 55% of patients. The correlation between posterior airway space widening and the improvements in daytime sleepiness and respiratory disturbance index was not significant. The authors concluded that surgical intervention in obstructive sleep apnea syndrome with the Repose System does not result in permanent anatomical change in the posterior airway space.

Yin et al. (2007) evaluated 18 patients that underwent GAHM along with UPPP. There was a reduction in AHI following the procedures. Researchers found that GAHM plus UPPP may benefit patients with severe OSA hypopnea syndrome and the success was best predicted by low BMI and younger age.

3. Governmental/Regulatory Agencies:

FDA: The Repose Bone Screw System (Influence, Inc., San Francisco, CA) received FDA 510(k) approval on August 27, 1999. As of August 2011, the Repose brand has been marketed as AIRvance.

CMS: No NCD

Codes:
CPT: 41512 – Tongue base suspension, permanent suture technique

References:
10. Bostanci, A., Turhan, M. A systematic review of tongue base suspension techniques as an isolated procedure or combined with uvulopalatopharyngoplasty in obstructive sleep apnea. Eur Arch Otorhinolaryngol. 2015; [Epub ahead of print].