

Using high-speed nasopharyngoscopy to study velum dynamics during normal speech

Authors:

Liran Oren, PhD, Department of Otolaryngology, University of Cincinnati

Hedieh Hashemi Hosseinabad, MS, Department of Communication Sciences and Disorders,
University of Cincinnati

Ann W. Kummer, PhD, CCC-SLP, ASHA-F, Senior Director, Division of Speech-Language
Pathology, Cincinnati Children's Hospital Medical Center

Paul Willging, MD, Department of Pediatric Otolaryngology – HNS, Cincinnati Children's
Hospital Medical Center

Suzanne Boyce PhD, CCC-SLP, Department of Communication Sciences and Disorders,
University of Cincinnati

Abstract

The normal patterns of velar movement speed and elevation patterns during different speech sounds has not been well-studied for clinical purposes. High-speed nasopharyngoscopy taken simultaneously with audio recording is used as an alternative technique to track the motion of the velum, its temporal and spatial characteristics, and reaction times in healthy adult speakers. Results show that transvelar vibrations occur for voiced sounds at the fundamental frequency (i.e., pitch) of the subject. The elevation of the velum is higher for high vowels and its response time varied based on speech sounds. Incomplete closure of the velum was observed for nasal /consonant-a/ sounds.