Improving the assessment and treatment of voice disorders: Emerging technologies.
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Our research group is currently developing a number of new methods for assessing and treating laryngeal voice disorders. The overall thrust of this work has been the incorporation of previously unexploited technologies into new approaches for improving the clinical management of voice disorders. A brief overview shows that ongoing projects are utilizing Advanced Audio Coding (AAC) technology, as well creating new imaging and physiological/biomechanical instrumentation, to better quantify vocal function for improved clinical voice assessment. In addition, biomedical technologies are being utilized to develop innovative methods for treating patients with damaged (scarred vocal folds) and/or non-functional (laryngectomy) phonatory mechanisms. Current progress in two projects is described in greater detail: (1) Ambulatory Phonation Monitor (APM) is a wearable monitoring and feedback system for evaluating and treating voice disorders that can reliably and unobtrusively provide long-term, continuous tracking of important parameters of vocal function, and provide feedback to the user when voice parameters exceed 'safe' limits and/or target phonatory behaviors are not maintained. (2) Improved Electrolarynx (EL) with Neural Interface is designed to more closely approximate normal voice and speech production than current poor-quality EL devices. This is being accomplished in laryngectomy patients by developing a neural interface to provide hands-free control of an improved EL sound source, i.e., a voice neural prosthesis. Work supported by grants from NIH/NIDCD, W.M. Keck Foundation, Department of Veterans Affairs, Community Foundation for the National Capital Region, and Eugene B. Casey Foundation.