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**Automatic acoustic analysis of substitute speech characteristics by
speech recognition technique**

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Tracheo-esophageal (TE) substitute speech is often used after total laryngectomy as it resembles normal speech more than other substitute speech methods. However, TE speech still shows restrictions and is perceived as hoarse, rough, with strain, and usually monotone, e.g. due to augmented irregularity of the voice signal. Commonly used diagnostic tools to describe the acoustic properties of TE speech are mostly not applicable. Before, automatic speech recognition has been shown to serve as an appropriate acoustic tool for the quantification of TE speech intelligibility. We now applied an automatic speech recognition system with prosody module on speech data of 41 laryngectomees. The prosody module extracted 150 parameters. Factor analysis revealed five principal components. They show high correlation to perceptively described TE speech characteristics. Automatic prosody analysis by speech recognition technique allows to detect and quantify characteristics of highly disordered speech.