

# **A PNEUMATIC BIONIC VOICE PROSTHESIS FOR THE DUMB**

## **ABSTRACT:**

There has been notable progress in many fields of bionics, but still a functional bionic voice prosthesis or any other rehabilitation solution for laryngectomy patients or for congenital dumbness has not been achieved yet, leading to a lifetime vocal disability in patients. This study introduces a novel framework of pneumatic, bionic voice prostheses that acts as an artificial larynx for patients with speech related disabilities. The device designed so is a rehabilitative device that works by stimulating excitation to vocal tract as a substitute to a dysfunctional or removed larynx. The speech generated by electrolarynx, which is an external vibrator held against the neck tissue, is the existing and predominant method used for voice restoration in the case of laryngectomy. These methods are inconvenient and most of the time is unintelligible because of the improper shape of the excitation pulses and presence of a background noise caused by sound leakage from the vibrator. The proposed device here is reported for the first time to be a complete pneumatic bionic voice prosthesis with reduction of background noise and also self leakage in electrolarynx speech using harmonic pulse noise model (HNM).

Keywords: Electrolarynx, Bionic Voice, laryngectomy, Harmonic Pulse Noise Model.