# ELECTRONIC LARYNX

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Technology description

Tufts University investigators have developed an improved artificial larynx that enables patients undergoing laryngectomies or tracheostomies to communicate with a level of expression and intelligibility nearing that of the normal population. The invention provides an electric artificial larynx device that comprises, as shown below: (a) a sensor to be placed in the stoma or on the neck of the user, (b) a control element to obtain the signal from the sensor and translate it into speech, and (c) a speaker to amplify the speech. The control element can be configured to turn off this speaker when the user is not talking by detecting the user's breath thus eliminating the distraction of constant buzzing. The controller can also comprise memory and processing functions to perform articulatory pattern recognition of the user's jaw movements, to generate normal sounding speech enabling clear communication.

EXISTING SOLUTIONS

When a patient's larynx must be surgically removed, the patient loses the ability to speak in their usual manner. Electrolarynx (EL) devices shown on the left are often used by such patients to communicate. The devices produce the mechanical vibration necessary to excite the remaining vocal tract, and the patient articulates the sound waves generated by this vibration using his or her teeth, tongue, and lips. Audible speech is produced by this method, but EL speech is less intelligible than normal human speech.
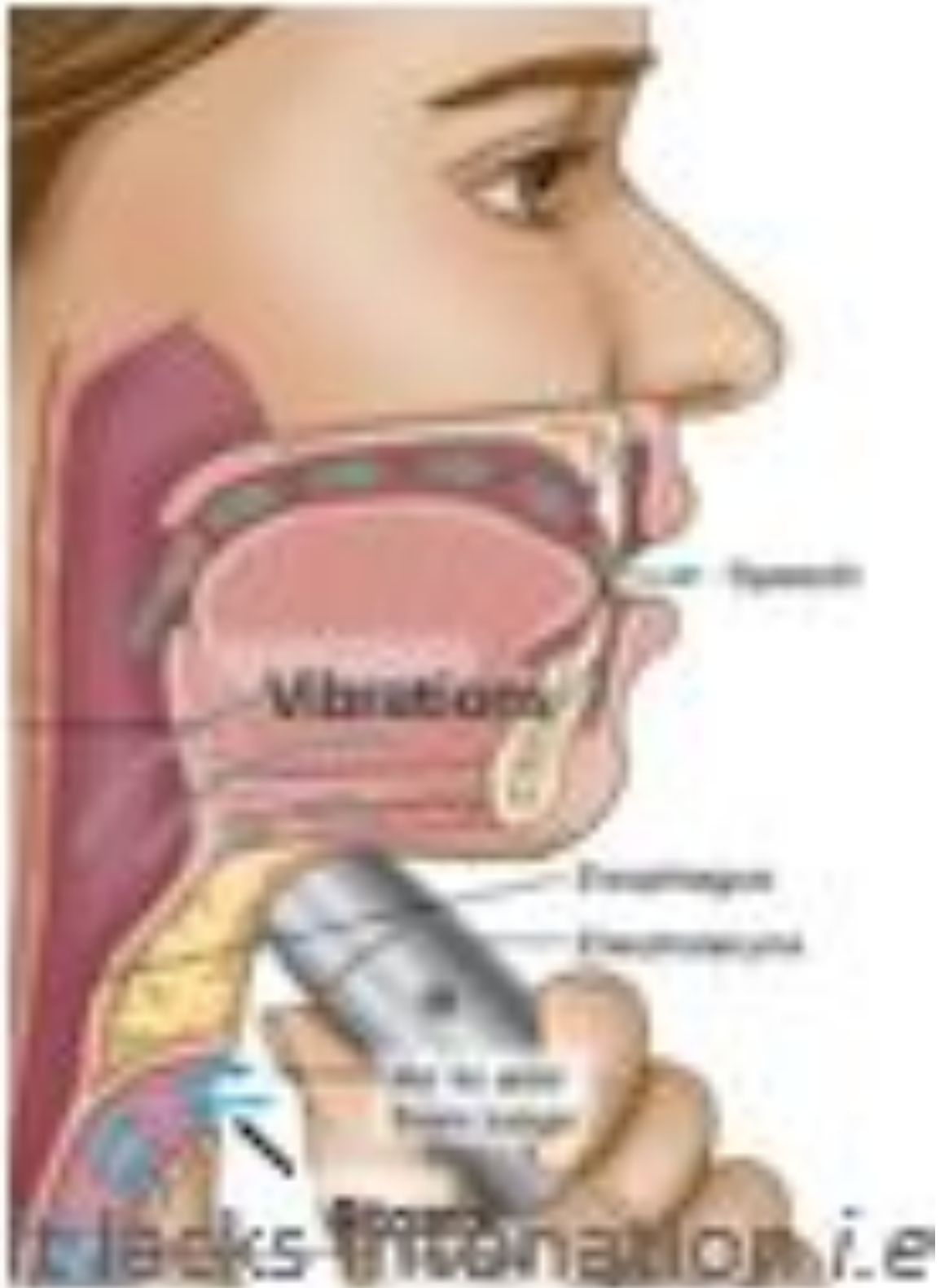
It lacks intonation i.e. the rise and fall of a voice's pitch which conveys a significant amount of information. As a result, patients using EL devices are unable to modulate pitch, volume and pauses between word. They sound monotonous and are hard to understand, especially when asking questions

or speaking highly tonal languages. To address these issues, current devices provide a capacitive slider or a pressure-sensitive knob requiring an unreasonable level of manual dexterity and consciousness on part of the patient but does not improve pitch control.

Application area

Patients with larynxes and Patients undergoing tracheostomies

Advantages

• Generates accurate information from the stoma and accurately forms the speech enabling changes in pitch while minimizing distortion and eliminating electronic buzz during pauses
• Adjusts real-time during speech;
• No drop-in frequency at end of phonation;
• No buzz during pauses;
• Hands free

Institution

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