

Electrolarynx-Holder to Support Independent Single Switch Operation

Introduction and Background

An electrolarynx is an assistive speech device used by patients who cannot speak due to surgical removal of their larynx. The most common reason for total laryngectomy is throat cancer and this surgery is performed around 3000 times annually within the United States.

The electrolarynx is a vibratory device placed against the neck which allows patients to mouth syllables and produces a monotone, robotic voice. The optimal placement position is known as the “sweet spot” and varies from patient to patient. The electrolarynx is typically used as a handheld device and presents a clinical problem to recent post-operative patients who may not be physically able to hold and operate the device.

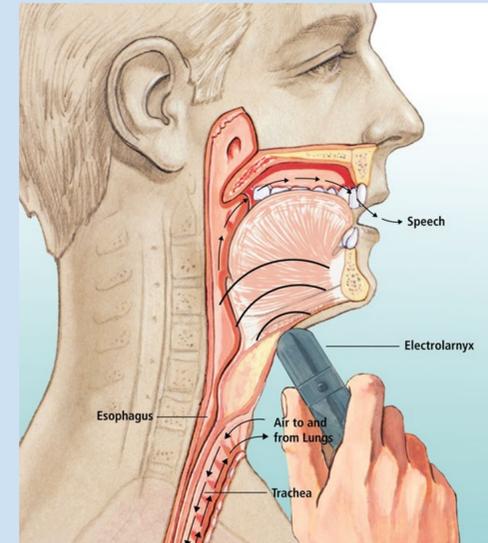


Figure 1. Typical electrolarynx method of use.
Courtesy of Blom-Singer and InHealth Technologies

Design

The design of an adjustable electrolarynx holder with three degrees of freedom for adjustment is presented here. This design fits a commercially available electrolarynx and does not require physical modification of the device's internals.

The bracket assembly is 3D printed as three separate components using PLA (polylactic acid), secured via bolt fasteners, and is attached to the patient using a Velcro-lined strap.

The electrolarynx is remotely activated by a wired switch and uses a battery interrupter circuit to selectively power the device.

Together, these components constitute a highly adjustable design that will suit the needs of an underserved patient population.

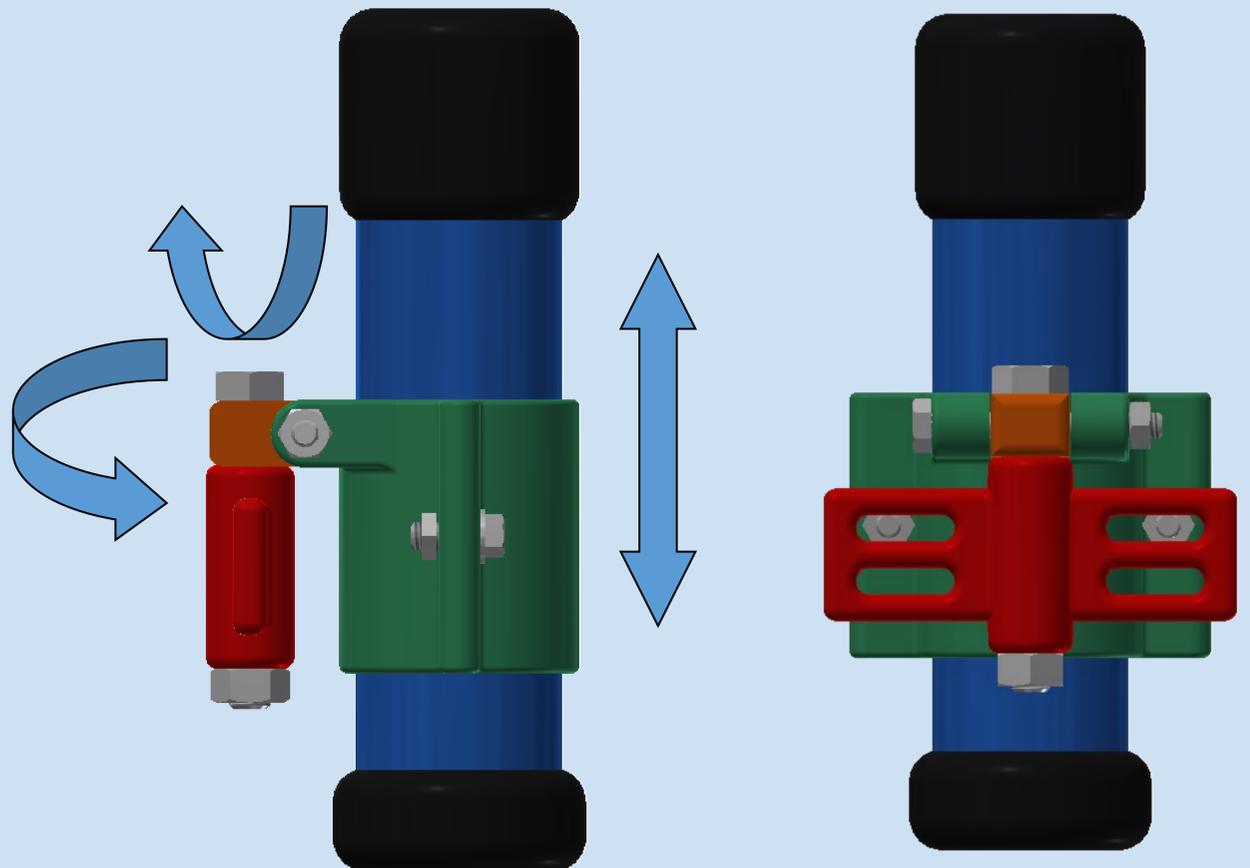


Figure 2. Electrolarynx bracket design with three degrees of freedom for adjustability.

Figure 3. Rear view demonstrating slits to hold a Velcro-lined strap to secure the device to the patient.

Conclusion

This electrolarynx holder serves as a practical, conceptual design for future academic and industry development of electrolarynx devices. There is only one commercially available electrolarynx holder on the market. This holder is proprietary, fits a single electrolarynx, and must be positioned at the neck's midline and is not a good candidate for patients with an active stoma site. Furthermore, no electrolarynx device has a radiofrequency or bluetooth receiver to allow wireless activation. It is our hope that this project inspires research towards new electrolarynx use patterns to address the needs of patients.

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