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Mastering Alaryngeal Communication Using an Artificial Larynx

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Disclosures

The following individual has financial relationship or relationship affiliations to disclose:

She is employed part-time by the Educational Division of Atos Medical. There are no other nonfinancial relationships to disclose.

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Learning Objectives

After this course, participants will be able to:

- Describe how an artificial larynx works.
- Describe goals and selection factors for alaryngeal communication as well as the role of the SLP in this process.
- Describe the IPATPAL method.

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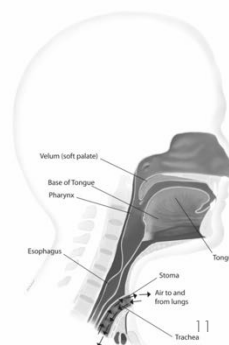
Primary Goals for Laryngeal Cancer Patients

- **Cancer Free**
- Functional communication
- Able to safely swallow a normal diet
- Acceptance of new means of communication and breathing
- Functioning at the same level or higher than pre-op function
- Independent

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Pre-Operative Education / The Role of the SLP

- Establish rapport
- General overview of impact of total laryngectomy on function
- Provide overview of rehabilitation process
 - communication, pulmonary, swallowing
- Initiate a functional communication alternative
- Important that Surgeon and SLP are on the same page



Communication Options

- Must involve the patient regarding various choices for communication
- Not limited to just one option
- Educate patient on all forms of alaryngeal voice restoration
 - artificial larynx (AL)
 - esophageal speech
 - tracheoesophageal speech (TEP)

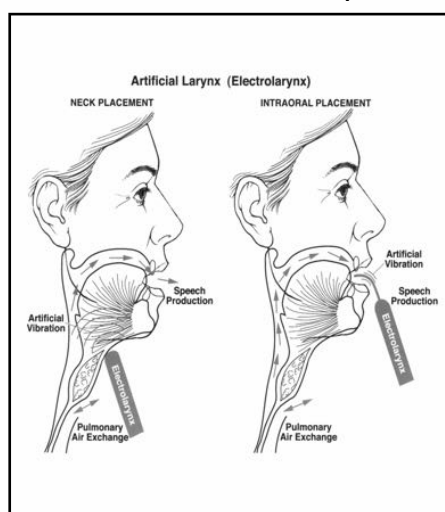
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Artificial Larynx

- Electrolarynx: A battery powered electromechanical device that moves a plastic or metal head, which generates a sound or tone
- When the head of the device is held against the tissues of the neck or cheek, this tone is transmitted into the oropharynx, where sound is shaped into meaningful speech by movements of the lips, teeth, tongue and jaw
- Tone can also be transmitted via an intra-oral adapter into the oral cavity

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Introduction of Sound Via Neck and Via Intra-oral Adapter



Video

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Speaking with an Artificial Larynx

Video

<https://www.youtube.com/watch?v=riHLUOXt1Aw>

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Artificial Larynx Selection: Factors to Consider

- Sound quality & intelligibility
- Ease of use (weight, preference, manual dexterity, etc.)
- Neck contour & density
- Hearing acuity
- Cost
- Warranty
- Battery life / type
- Durability
- Language spoken

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Different Styles/Types of ALs



Servox

SolaTone



TruTone

**Cooper
Rand**

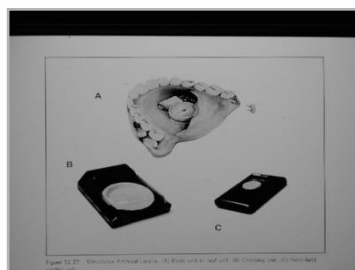


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NuVois

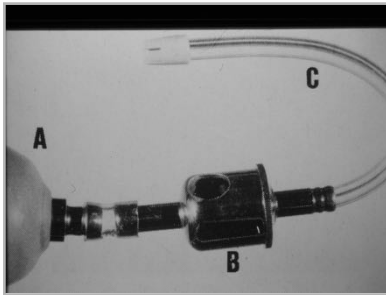
UltraVoice



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Pneumonic Device: Uses pulmonary air to mouth via tube to produce speech

Tokyo Artificial Larynx



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Example of Pneumonic Device

- Tokyo Artificial Larynx

Video

<https://www.youtube.com/watch?v=27jlVVn4SLw>

- Tokyo Artificial Larynx□ has a cup that goes over the stoma
- When you breathe out, the air is transferred through the device which causes a rubber diaphragm to vibrate
- The sound that is produced then travels through a tube that is placed between the cheek and teeth
- Pt. mouths the words as he/she breathes out and makes words just like before the larynx was removed

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Artificial Larynx Training

- Rationale
- Finding the right device for the patient
- How does it work?
- Placement
- Articulation
- Pitch and loudness
- Eliminate distracting behaviors
- The key to success is minimizing frustration!

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Instructional Method for Teaching Use of an Artificial Larynx: IPATPAL METHOD

(S. J. Salmon, Ph.D., 1983)

I = Information

- The patient is informed on benefits of artificial larynges and selection of the proper device
- Influential factors:
 - purchase price
 - upkeep
 - availability
 - possible modifications
 - expediency
 - post-operative complications
 - patient preferences

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Instructional Method for Teaching Use of an Artificial Larynx: IPATPAL METHOD

P = Placement

- Optimal placement of the device to achieve the best clarity of sound and resonance
 - With intra-oral devices, appropriate placement of the intra-oral tubing to achieve the best clarity of sound and resonance
 - For the neck, find the “sweet” spot

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Intra-oral adapter



**Neck placement
with arm down**

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Instructional Method for Teaching Use of an Artificial Larynx: IPATPAL METHOD

A = Articulation

- Shaping sounds into speech using the tongue, teeth, lips and palate for precise sound production
 - Over-articulation or exaggerated movements of the articulators is often recommended to improve overall intelligibility
 - Placement of the artificial larynx should not result in obstruction of mouth as some lip reading may be used by listener

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Instructional Method for Teaching Use of an Artificial Larynx: IPATPAL METHOD

T=Timing

- Effective use of on/off button to coincide with appropriate phrasing
- Biggest challenge is the learning curve of when to turn the AL on and off
- Encourage them to turn device on when speaking is initiated and turn off at the end of the final word in a phrase
- Use 7-10 syllable phrases to train on/off timing

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Instructional Method for Teaching Use of an Artificial Larynx: IPATPAL METHOD

PAL = Pitch and Loudness

- SLP sets the pitch of the AL during the initial AL treatment session
 - Adjust to an appropriate level for patient's age and gender
- Loudness/Volume should be set so that the patient can hear him or herself clearly
 - Instruction on basic volume adjustments specific to individual's device should be offered within the first few treatment sessions
 - Teach to modulate pitch for more natural intonation patterns by manipulating the pitch buttons on the external device

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Distracting Behaviors

- Distracting behaviors refer to any behavior that draws attention to patient in a negative way
 - stoma blast
 - head tilted back
 - grimaces
 - atypical arm postures
 - excessive use of on/off button
- These behaviors should be addressed during each session

Video

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Electrolarynx Comparisons: “Hello, how are you?”

- **TruTone**

Video

[Trutone & Solatone](#)

- **NuVois** (*Audio*)

Video

[Servox Digital Speech Aid](#)

- **Servox**

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Liberty Electrolarynx

- Value-priced
- Small and lightweight
- External volume and pitch
- AA battery operation
- 3-Year manufacturer warranty



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SolaTone Electrolarynx

- Small and lightweight
- Use of 9v batteries, rechargeable and standard
- Available in 2 versions – with integrated USB charging technology or as standard kit
- 3-Year “Drop and Soak” manufacturer warranty



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TruTone Electrolarynx

- Small and lightweight
- Single pressure-sensitive button for natural expression
- Wide frequency range allows for masculine or feminine voice
- Use of 9v batteries, rechargeable and standard
- Available in 2 versions – with integrated USB charging technology or as standard kit
- 5-Year “Drop and Soak” warranty



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Servox Electrolarynx

- Two types: Digital and Inton
- Buttons can be set for various volumes and pitches enabling individual setting
- Rocker switch for individual volume adjustment
- Titanium housing
- NiMH Battery
- 2-Year warranty



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Electrolarynx Reimbursement

- The Medicare Act only pays for items or services that are 'reasonable and necessary for the treatment of illness or injury or to improve the functioning of a malformed body member.' 42 U.S.C. § 1395y(a)(1)
- Artificial larynx considered Durable Medical Equipment (DME)
- Atos Medical takes Assignment
- Private insurance depends on their contract for DME
- Medicaid, often out of pocket, although some states offer assistance

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State Assistance Program

- The International Association of Laryngectomees (IAL) website has a listing of Telephone Equipment Distribution Programs and contact information
- http://theial.com/ial/index.php?option=com_content&view=article&id=249&Itemid=172
- <http://www.tedpa.org>

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Replacement Electrolarynx

- Medicare will pay for a replacement electrolarynx at anytime if:
 - MD provides a statement that you have had a change in your medical condition
 - The original AL is no longer useable and the repairs would cost more than 60 percent of the price of the replacement AL
 - You must have the repair attempt documented by both a physician and an official repair facility

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Thank You

Video

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References

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