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Laryngectomy Basics for Healthcare Providers

Bridget Guenther, M.S., CCC-SLP, BCS-S

Moderated by:
Amy Hansen, MA, CCC-SLP, Managing Editor, SpeechPathology.com

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How to earn CEUs

- Must be logged in for full time requirement
- Log in to your account and go to Pending Courses
- Must pass 10-question multiple-choice exam with a score of 80% or higher
  - Within 7 days for live webinar; within 30 days of registration for recorded/text/podcast formats
- Two opportunities to pass the exam

Laryngectomy Basics for Healthcare Providers

Bridget Guenther, M.S., CCC-SLP, BCS-S
Senior Clinical Educator, Atos Medical Inc
Disclosures

Bridget Guenther, M.S., CCC-SLP, BCS-S is a Senior Clinical Educator in the Education Division at Atos Medical.

Financial relationship disclosure: She is employed by Atos Medical.

Relevant nonfinancial relationships: None

Learning Outcomes

As a result of this course, participants will be able to:

Describe anatomical and physiologic changes to the voice, respiratory, and swallowing systems following total laryngectomy.

Identify types of communication options available to patient following total laryngectomy.

List goals for pulmonary rehabilitation for total laryngectomees.
Introduction to Laryngeal Cancer and Laryngectomy

Laryngeal Cancer Rates

- Larynx Cancer in 2018:
  - 13,150 New Cases (estimated)
  - 3,710 Deaths
- As of 2018, nearly 100,000 people living in U.S. with laryngeal cancer
- In comparison (estimated 2018 numbers):
  - Breast Cancer: 266,120
  - Lung Cancer: 234,030
  - Prostate: 164,690

Laryngeal Cancer Treatment

- Larynx Cancer is treated via:
  - Chemotherapy
  - Radiation Therapy
  - Surgery
  - A combination of any/all of these

Laryngectomy Surgery Trends

- Declining number of surgeries
  - 1997-2008
    - New Larynx Cancers and Total Laryngectomy surgeries
- Typically treated in high volume centers
- Resulting in:
  - More complex patients + increased complications = Longer length of stay
  - Need for higher level of care at d/c
  - Need for education and familiarity across care settings

End Goals for Every Patient

- Cancer Free
- Independent
- Able to safely swallow a normal diet
- Able to functionally communicate in way that they are most comfortable
- Acceptance of their new anatomy and communication
- Functioning at the same level or higher than prior to surgery

Anatomy changes
Before Laryngectomy  
Larynx Intact  
Breathing through nose and mouth

After Laryngectomy  
Larynx Removed  
Breathes only through stoma

Laryngectomy vs. Tracheostomy
<table>
<thead>
<tr>
<th>Laryngectomy</th>
<th>Tracheostomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larynx removed during surgery</td>
<td>Larynx intact</td>
</tr>
<tr>
<td>Breathes through stoma (permanent)</td>
<td>Breathes through tracheostomy (temporary or permanent)</td>
</tr>
<tr>
<td>May wear a LaryTube, a tracheostomy tube, or no tube</td>
<td>Wears a tracheostomy tube</td>
</tr>
<tr>
<td>Cannot use a one-way valve</td>
<td>May use a one-way valve</td>
</tr>
<tr>
<td>May use a Voice Prosthesis</td>
<td>Cannot use Voice Prosthesis</td>
</tr>
</tbody>
</table>

**Functional Changes After Laryngectomy**
Before Laryngectomy

1. Breathing via nose and mouth
2. Any dust or particles get trapped in your nose and coughed/sneezed out
3. Nose and mouth moisten, filter and heat air before it enters lungs
4. Nose and mouth are connected to both esophagus and trachea
5. Hyolaryngeal complex protects airway while swallowing
6. Cough results in mucus/saliva coming up into throat/mouth to subsequently swallow
7. Sound generated by vocal folds then moves to mouth to be shaped into speech with articulators.

After Laryngectomy

1. Larynx removed;
2. No longer breathe through nose & mouth;
3. Bypass breathing through upper airway and breathe through stoma;
4. Stoma is a permanent opening in neck;
5. Air is no longer filtered, heated or moisturized;
6. Aerodigestive trach separated and unable to aspirate;
7. Mucus expelled through stoma
8. Breath hold only possible with stomal occlusion;
9. Alternative sound source for speaking (AL, TEP, Esophageal Speech)
Alaryngeal Communication

Communication Options

- Discussion between the patient, caregivers, and healthcare provider (HCP)
- Educate re: all forms of alaryngeal voice restoration (i.e., artificial larynx, tracheoesophageal prosthesis (TEP), esophageal speech).
- Not limited to just one option
- Not all options are right for everyone
Additional Communication Options

- Gestures
- Augmentative communication
- Writing (Boogie boards, dry erase boards)
- Smartphone applications
Esophageal Speech

- Vibratory Source = Pharyngoesophageal (PE) segment
- Movement of air from oral cavity
- Advantages
- Disadvantages

Electrolarynx Speech

- Vibratory Source = Device
- Neck / Oral / Cheek placement
- Advantages
- Disadvantages

https://www.youtube.com/watch?v=AYydnhu6NbU
Neck Placement  Intraoral Adapter

Example of Artificial Larynx Devices

[Images of artificial larynx devices]

Hello Trutone.wav  Hello Servox.wav
Artificial Larynx Training

• Rationale
• Finding the right device for the patient
• Education – how does the device work?
• Placement – finding optimal placement
• Articulation / Pitch / Timing – to maximize intelligibility
• The key to success is minimizing frustration!


Tracheoesophageal Speech

• Vibratory Source = PE segment as sound source
• Pulmonary air
• One-way valve
• Tracheoesophageal prosthesis
• Advantages
• Disadvantages

Used with permission from Ms. Ellen Frohardt and the Pikes Peak Library District
https://www.youtube.com/watch?v=x9AhLnlsxrc
TE Speech Success Factors

- Candidate selection is CRITICAL
- Patient education / anatomy / ability
- Knowledge, skill and experience level of the head & neck surgeon and SLP

Types of Voice Prostheses

- Indwelling: Placed by a professional
- Non-indwelling: Patient and/or professionally managed
Voice Prosthesis Sizing

- Diameter:
  - 16 Fr = 4.8 mm
  - 17 Fr = 5.1 mm
  - 20 Fr = 6.0 mm
  - 22.5 Fr = 6.75 mm

- Standard industry length options:
  - 4-28 mm

Voice prosthesis placement
- Placement Video
- Check out videos here on the Atos Medical YouTube Channel

Voice prosthesis leak check
- Checking for leak Video
- Leaking prosthesis Video
- Instruction and patient handout found here:
  - https://www.atosmedical.us/resources/caretip-information-sheets/
  - Provox® Voice Prosthesis - Is Your VP Leaking Chart
Pulmonary Rehabilitation

- Pt. independence with stoma care
- Use of the moist air/suction
- Some of the lost function of upper airway
- Tracheal climate and pulmonary function
- Pt. independence with stoma care
- Replace
- Improve
- Reduce
- Enable
Long Term Goals for Pulmonary Rehabilitation:

- Decrease hypersecretion of mucus associated quality of life issues
- Improve overall stoma cleanliness
- Improve social acceptance
- Improve patient’s overall self acceptance
- Provide patient with options for speech

Normal Respiratory Physiology

- Trachea, bronchi, nose
  - Lined with cilia that transport mucus
- Mucus – NOT abnormal, it’s protective
- Mucus Viscosity – dependent on hydration, humidification, warming, infection, environment
- Mucus Production - 14ml/day (Widdecombe & Widdecombe, 1995) to 100ml/day (Pride, 1997)
Respiratory Changes Following Total Laryngectomy

Pre-Surgery
- At The Nose
  - Air Temp = 72°F
  - RH = 45%
  - Ambient / Dirty

Post Surgery
- At The Bronchioles
  - Air Temp = 98.6°F
  - RH = 99%
  - Ejected / Pristine

- At The Trachea
  - Air Temp = 72°F
  - RH = 45%
  - Ambient / Dirty

Consequences
- Loss of heat
- Loss of moisture
- No filtration

Ciliary Action

1000-1500 beats/min
Moving mucus at approximately 10-20mm/min

Function is:
- Dependent on temperature and relative (RH) humidity
- Impaired when RH falls below 70%
- Halted when RH <50% at 37°C

References:
- Ackerstaff, Souren, van Zandwijk, Balm, Hilgers. Laryngoscope 1996;103:1391-4
To watch an animation of cilia in action:

https://www.youtube.com/watch?v=Q-tETbEkNZ4

The New “Nose”… the Heat Moisture Exchanger

- **HME** stands for **Heat Moisture Exchanger**
- HME captures the natural heat and moisture from the airway upon exhalation
- Heat and moisturizes the air upon inhalation
- Heat and humidity consistently maintained
- Logical barrier to gross airborne matter
- Covers the stoma, more hygienic
- Helps adapt to having a stoma
- Standard of care to place HME immediately post-op
HME Basics

- Do not rinse out and reuse
- Replace every 24 hours
- Choose based on tolerance, environment, and situation

- Provox® XtraFlow™ / XtraMoist™ HME
- Provox® Micron™ HME
- Provox® FreeHands™ HME
- Provox® Luna®
- Blom-Singer® EasyFlow™ HME
- Blom-Singer® ClassicFlow™ HME

HME Attachments

Intraluminal
  - Provox® LaryTube™
  - Provox® LaryButton™

Peristomal Adhesives
  - Baseplates
  - Housings
Basics of Care and Supplies

OVERALL = Maintain patent airway and reduce risk of mucus plugs

Patient goals may include:
- Self care (stoma cleaning)
- Cleaning LaryTube or LaryButton (if wearing)
- Apply Peristomal Attachment (if wearing)
- Replacing HME daily
- Able to communicate effectively via chosen method
LaryTube Insertion and Care

- Clean as needed per instructions
- Schedule for wear is patient dependent
- Instruction and patient handout found here:
  - https://www.atosmedical.us/resources/caretip-information-sheets/
  - LaryTube - When and How to Use

Adhesive Baseplate Application

- Baseplate Application video
- Skin care is critical
- Many adhesives to choose from
- Can be worn with BlueRing LaryTube
- Instruction and patient handout found here:
  - https://www.atosmedical.us/resources/caretip-information-sheets/
  - Provox Adhesives
Voice Prosthesis Brush

- Daily Cleaning to maintain life of TE prosthesis
- Gentle and slow
- Instruction and patient handout found here:
  - https://www.atosmedical.us/resources/caretip-information-sheets/
  - Provox Daily Care of Your Voice Prosthesis – Provox® Brush and Flush

Voice Prosthesis Brush Cleaning video

Dilator use

- Dilator Insertion video

- Reasons for Use:
  - Upsizing of punctures
  - Maintaining puncture size during placement
  - Orient to tract direction
  - Keeps puncture open in event prosthesis becomes dislodged
  
  Critical in the event prosthesis comes out; puncture can close in a matter of minutes or hours
Final Outcomes

https://www.youtube.com/watch?v=ojakN5B9gb4  Tony

https://www.youtube.com/watch?v=HEai281cWVk  Alan

Videos used with permission from Mr. Tony Talmich, Mr. David Morin, and Mr. Alan Pummell

Questions?
Thank you for your attention

Additional Resources
Emergency Alerts / Resources

Rescue breathing [https://youtu.be/VGVF84RpiX4](https://youtu.be/VGVF84RpiX4)
Emergency breathing card
Medic alert bracelet
Notify local EMS
The Laryngectomee Guide (Dr. Itzhak Brook)
[http://dribrook.blogspot.com/](http://dribrook.blogspot.com/)

CareTip Information Sheets

Information sheets designed to assist in the care and maintenance involved post-laryngectomy

Examples of topics:

- Artificial Larynx (AL) Basic Training
- How to Help Your Loved One Before/After a Laryngectomy
- Things to Prepare for Traveling
- Getting a Good Seal
- What to Do if Your VP Falls Out
- Provox® Xtra-HME – Let’s Get Started

[http://www.atosmedical.us/professional-main/caretip-information-sheets/](http://www.atosmedical.us/professional-main/caretip-information-sheets/)
Atos Medical YouTube Channel:  
https://www.youtube.com/user/AtosMedical

Atos Medical Website:  
https://www.atosmedical.us/  
(Be sure to check out the PROFESSIONAL Section)

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