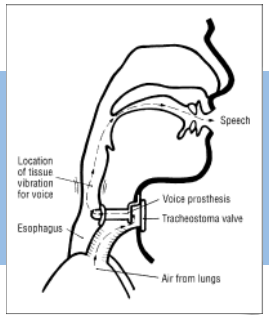

Clinical Insights

Fall, 1998 Eric D. Blom, Ph.D., Editor • Indianapolis, Indiana

Tracheostoma Valve Attachment

Patients vary in their interest and degree of successful use of a tracheostoma valve. Published data suggest that approximately 35 - 65% become effective daily users, which concurs with our own unpublished clinical experience. It should be noted that rarely is it the valve itself that contributes to failure, but rather the inability to maintain an airtight adhesive attachment at the tracheostoma with confidence for the desired 12 -15 hours per day.

The most widely used method of tracheostoma valve attachment is with an adhesive-backed, flexible polyvinylchloride housing applied to the peristomal skin. The patient is taught to thoroughly cleanse the skin gently with an alcohol wipe prior to applying a brush-on liquid adhesive to the skin area where the tracheostoma valve housing will be positioned. While the adhesive is drying, a circular disk of double-faced tape is applied to the posterior surface of the tracheostoma housing. Once the liquid adhesive on the skin has dried, the housing is accurately positioned and thoroughly laminated to the skin by rubbing firmly over its entire surface.

Pressure from within the trachea during speech is one of the primary factors contributing to the premature seal breakdown. Excessive intratracheal pressure is a direct expression of resistance to airflow through a valved voice prosthesis, a tracheoesophageal vocal tract, or a combination of both. This back pressure pushes the tracheostoma housing adhesive seal loose from within, causing an air leak that can be durably repaired only by replacing the seal. Before initiation of therapy to teach a patient to use a tracheostoma valve, a pressure measurement should be undertaken. This can be done using a manometer attached with tubing to the adapter from a disposable Blom-Singer® Insufflation Test Set (InHealth Technologies, Carpinteria California, Figure 1). With the adapter inserted into the tracheostoma housing, the patient takes a breath, occludes the adapter and counts to 15 at a conversational loudness level. A manometric reading of 25 - 40 cm H_2O is acceptable, with higher levels contributing to proportionally shorter tracheostoma valve seal duration. For some patients, simply monitoring the meter as they vary their loudness from softest (usually registering 10 - 20 cm H_2O) to loudest (often measuring 90 cm H_2O or more) teaches the importance of controlling their voice. The majority of tracheoesophageal speakers attempt to speak too loudly resulting in deteriorating voice quality, shortened tracheostoma valve seal duration, and fatigue.

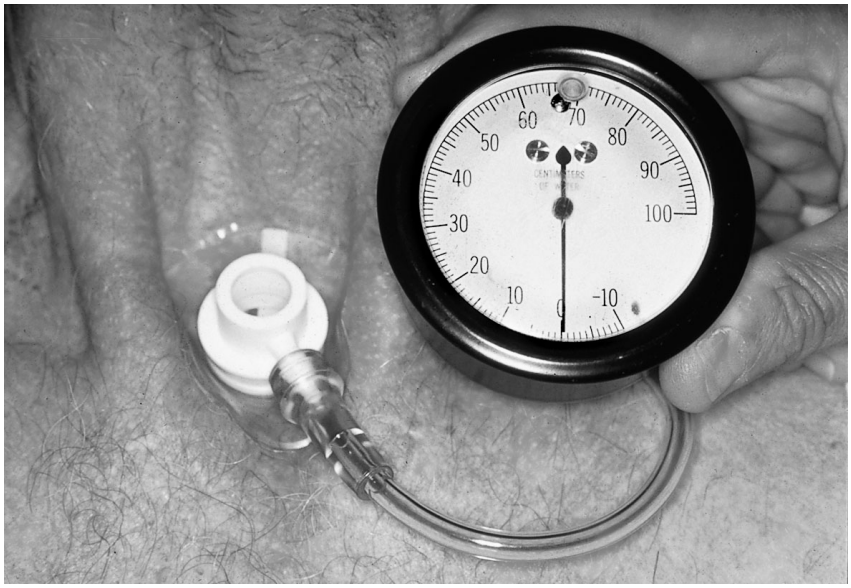

Figure 1

Excessive back pressure can also be caused by prosthetic variables. Pressure measurements taken during use of the low-pressure voice prosthesis versus a duckbill style may show substantially improved resistance values. Likewise, for some patients, using a 20-Fr.

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diameter prosthesis versus a 16-Fr can significantly reduce speech airflow resistance. The easiest way to predict the effect of a 20-Fr diameter prosthesis is to remove the 16-Fr diameter prosthesis and measure resistance during open-tract voice production. Often, formal manometric measurement is unnecessary. If this is effective, the patient can immediately tell that open-tract speech, which simulates a larger diameter airflow pathway because of the absence of a prosthesis, is significantly less effortful.

Another cause of effortful, excessively resistive speech is pharyngeal constrictor muscle hypertonicity. Muscle contraction elicited by esophageal distention resists the free forward flow of air through the pharynx. Measured back pressure is equivalent with the prosthesis in place and open tract. An accurately injected lidocain block can transiently demonstrate the effect on phonatory effort and manometrically measured pressure values resulting from pharyngeal constrictor muscle relaxation.

Excerpted from Blom ED: Tracheostoma Valve Fitting and Instruction in Blom ED, Singer MI, and Hamaker RC (Eds.) Tracheoesophageal Voice Restoration Following Total Laryngectomy, Singular Publishing, San Diego. pp. 101 - 106, 1998. (With Permission)

Voice Prosthesis Length Designations

In recent months, size designations for all Blom-Singer® Tracheoesophageal Voice Prostheses have been re-designated to express length in millimeters (mm). The conversion chart below describes this re-designation.

Size Conversion Chart

New	Former
6mm	1.4
8mm *	1.6
10mm	1.8
12mm *	2.0
14mm	2.2
18mm	2.6
22mm	3.0
25mm	3.3
28mm	3.6

*Indicates New Indwelling Sizes introduced in January 1999.

Botulinum Neurotoxin for Tracheoesophageal Voice Failure

Insufficient relaxation of the pharyngeal constrictor muscles, i.e. spasm or hypertonicity of the laryngectomized pharynx has been frequently verified as the cause of tracheoesophageal voice failure. Traditionally, this problem has been treated surgically with pharyngeal constrictor muscle myotomy. This procedure is both difficult and risky, particularly in radiated tissue. Recently, unilateral chemical denervation of the pharyngeal constrictor muscles with Botulinum Neurotoxin type A has been successfully used in place of surgery to eliminate excessive muscle tonicity that prevents tracheoesophageal voice acquisition. The following references describe this important development.

Blitzer A, Komisar A, Baredes S, Brin JF, & Stewart C: Voice failure after tracheoesophageal puncture: Management with Botulinum Toxin. Otolaryngology ñ Head and Neck Surgery, 113: pp. 668-670, 1995.

Clevens RA, Esclamado RM, Hartshorn DO, & Lewin JS: Voice Rehabilitation after total laryngectomy and tracheoesophageal puncture using nonmuscle closure. Annals of Otology, Rhinology and Laryngology, 102: pp. 792-796, 1993.

Crary MA and Glowasky AL: Using Botulinum Toxin A to Improve Speech and Swallowing Function Following Total Laryngectomy. Archives of Otolaryngology Head and Neck Surgery, 122: pp. 760-763, 1996.

Hoffman HT, and McCulloch TM: Botulinum Neurotoxin for Tracheoesophageal Voice Failure in Blom ED, Singer MI, and Hamaker RC (Eds.) Tracheoesophageal Voice Restoration Following Total Laryngectomy, Singular Publishing, San Diego. pp. 81-85, 1998.

Hoffman HT, Fisher H, VanDemark D, Peterson KL, McCulloch TM, Karnell LH, & Funk GF: Botulinum Neurotoxin Injection after Total Laryngectomy. Head and Neck, 19: pp.92-97, 1997.