



EVIDENCE SEARCH RESULTS

Question/subject of request:	Expiratory muscle strength training in patients after total laryngectomy
Date requested:	03/04/2025
Date completed:	20/05/2025
Compiled by:	Veronica Price

CITING THIS SEARCH

If you reference this search in any paper, publication or presentation, please let us know.

The citation format is:

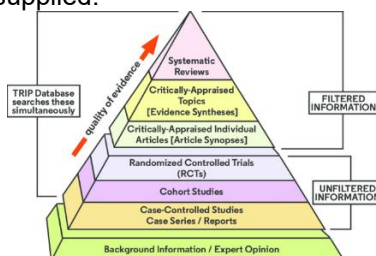
- Price, V., (2025). *Evidence summary: Expiratory muscle strength training in patients after total laryngectomy*. Taunton, UK: Somerset Foundation Trust Knowledge and Library Services.

CONTACT DETAILS

Knowledge & Library Services:	<p>Email: library@somersetft.nhs.uk Telephone: MPH (01823) 342433 or YDH (01935) 384495 / 4697 Website: https://somersetft-nhs.libguides.com/home BlueSky: @somersetft-cls.bsky.social</p>
Quality Improvement Team:	<p>Email: jessica.pawley@somersetFT.nhs.uk Website: Somerset Collaboration Hub - Home</p>
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The results are presented according to the hierarchy of evidence which is used to rank the relative strength of results obtained from scientific research.

The design of the study and the endpoints measured affect the strength of the evidence.

Evidence hierarchies are often applied in evidence-based practices and are integral to evidence-based medicine.



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Summary of search results:

Despite an extensive search of the medical databases, The Cochrane Library for clinical trials, FutureNHS, Google Scholar, Google advanced and the AI tools Consensus and SciSpace, I have found only 2 published studies, 1 conference abstract and 1 Master’s thesis, of EMST on cancer patients after laryngectomy. Numbers of participants are low, and the most recent publication by van Sluis et al. 2020 concludes that: “EMST appears to be feasible and safe after total laryngectomy. MEP improved over time but no improvement in the clinically relevant outcome measures were seen in this sample of relatively fit participants. Further investigation of the training in a larger group of participants who report specifically pulmonary complaints is recommended to investigate if the increase in MEP results in clinical benefits.)

After completing the searches, I used the quick summary tool in SciSpace which produced this table:

Table: Summary of Key Findings on EMST After Laryngectomy

Aspect	Findings	Citation
Feasibility	EMST is well-tolerated and feasible for post-laryngectomy patients.	(Sluis et al., 2020) (Palmer et al., 2019)
Clinical Benefits	Improves expiratory pressure and pulmonary function.	(Sluis et al., 2020) (Palmer et al., 2019)
Patient Satisfaction	Patients report improved voice-related quality of life and communication.	(Sluis et al., 2020) (Palmer et al., 2019)
Limitations	Limited by small sample sizes and lack of long-term follow-up data.	(Sluis et al., 2020) (Palmer et al., 2019)

I hope this is helpful. Please do let us know if you need any further information.



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These results of this search will only be shared in the repository if you have given your permission to do so (we ask this in the evidence search request form).

Thank you.





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[Expiratory Muscle Strength Training in patients After Total Laryngectomy; A Feasibility Pilot Study.](#)

Authors: van Sluis, Klaske E.;Kornman, Anne F.;Groen, Wim G.;van den Brekel, Michiel W. M.;van der Molen, Lisette, et al

Publication Date: Dec ,2020

Journal: Annals of Otolaryngology, Rhinology & Laryngology 129(12), pp. 1186–1194

Abstract: **OBJECTIVES:** Expiratory muscle strength training (EMST) is a threshold based device-driven treatment for improving expiratory pressure. EMST proved to be effective in different patient groups to improve cough function. To date, EMST has not been tested in the total laryngectomy population (TL). **METHODS:** This prospective, randomized case-series study examined feasibility, safety, and compliance of EMST in a group of TL participants and its effects on pulmonary function, physical exertion, fatigue, and vocal functioning. Ten TL participants were included in the study to perform a 4 till 8 weeks of EMST. Objective and subjective outcome measures included manometry, spirometry, cardio pulmonary exercise testing (CPET), voice recordings, and patient reported outcome measures. Group means were reported and estimates of the effect are shown with a 95% confidence interval, using single sample t-tests. **RESULTS:** Nine participants completed the full study protocol. Compliance to the training program was high. All were able to perform the training, although it requires adjustments of the device and skills of the participants. Maximum expiratory pressure (MEP) and vocal functioning in loudness improved over time. After EMST no changes were seen in other objective and subjective outcomes. **CONCLUSIONS:** EMST appears to be feasible and safe after total laryngectomy. MEP improved over time but no improvement in the clinically relevant outcome measures were seen in this sample of relatively fit participants. Further investigation of the training in a larger group of participants who report specifically pulmonary complaints is recommended to investigate if the increase in MEP results in clinical benefits. **LEVEL OF EVIDENCE:** 4.

The Safety and Efficacy of Expiratory Muscle Strength Training for Rehabilitation After Supracricoid Partial Laryngectomy: A Pilot Investigation.

[requires an ILL request]

DOI: <https://libkey.io/10.1177/0003489418812901>



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Authors: Palmer, Andrew D.;Bolognone, Rachel K.;Thomsen, Skipp;Britton, Deanna;Schindler, Joshua, et al

Publication Date: Mar ,2019

Journal: Annals of Otolaryngology, Rhinology & Laryngology 128(3), pp. 169–176

Abstract: **OBJECTIVES:** Expiratory muscle strength training (EMST) is a safe, effective intervention that can be performed at home and may be beneficial for individuals with voice and swallowing disorders. To date there have been few studies of EMST in the head and neck cancer population, and there are no previous reports of its use after supracricoid partial laryngectomy (SCPL). The current prospective clinical pilot study was undertaken to determine the safety and efficacy of a 4-week treatment program. **METHODS:** Six participants were recruited who had previously undergone SCPL, were medically stable, and had no contraindications for use of the device. At baseline, objective respiratory measurements were collected, dietary status was recorded, and participants were asked to complete a series of validated self-report instruments relating to voice, swallowing, breathing, and cough. Following the completion of treatment, baseline measures were repeated, and participant feedback was solicited. **RESULTS:** The majority of individuals found the device easy to use (83%) and beneficial (83%). The side effects of treatment were relatively minor and included dizziness, muscle inflammation, and vocal fatigue. There were improvements in 2 measures from before to after treatment, namely, an average 21% increase in peak cough flow (from 371.67 to 451.33 L/min) and a 38% decrease on the Dyspnea Index (from 6.17 to 3.83). Other measures showed inconsistent changes. **CONCLUSIONS:** EMST appeared to improve cough strength and reduce dyspnea symptoms after SCPL. Further study of the relative efficacy of EMST compared to other rehabilitation protocols after SCPL is needed.

Master's Thesis

The effectiveness of device-driven Expiratory Muscle Strength Training (EMST) in total laryngectomy patients; A pilot study

[Can be downloaded from Utrecht University Student Thesis Repository [here](#)

Authors: NL-OMON45719

Publication Date: 2017

Journal: <https://Trialsearch.Who.Int/Trial2.aspx?TrialID=NL-OMON45719>

Abstract: **INTERVENTION:** Group 1 (n=6) Four weeks of EMST-training, four weeks no training. Group 2 (n=6) Four weeks of EMST-training, four weeks continued training on maintenance dose. Both groups perform the first four weeks five training sessions a week, five sets per training session containing five forced exhalations. The maintenance dose contains two training sessions a week, five sets per training session containing five forced exhalations. **CONDITION:** 10046304 Stemproblemen ; Pulmonary functioning ; reduced cough strength **PRIMARY OUTCOME:** Maximum Expiratory Pressure en Peak Expiratory Flow.; **SECONDARY OUTCOME:** Spirometry which reveals Vital capacity (VC), forced expiratory volume in the ; first second (FEV1) and, mean expiratory flow (MEF). Cardio Pulmonary Exercise ; Test (CPET) which includes measurements of breath-by-breath



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minute ventilation ; (VE), oxygen uptake (VO₂), carbon dioxide production (VCO₂), and RER ; (VCO₂/VO₂). ; Voice recordings to obtain maximum phonation time (sec) and range in Hz (high - ; low) and dB (soft - loud). ; Borg Ratings of Perceived Exertion ; Modified Borg Dyspnoea Scale ; Short Fatigue questionnaire ; Linear Analogue Self Assessments ; Clinical COPD Questionnaire ; Voice Handicap Inde X10 item version ; Study specific questions ;
INCLUSION CRITERIA: 18 years or older Male Undergone TL At least 6 months post TL At least 6 months post-operative (chemo)radiotherapy Signed informed consent

Conference Abstract

[The safety and efficacy of Expiratory Muscle Strength Training \(EMST\) for rehabilitation after supracricoid partial laryngectomy: A pilot investigation](#)

Item Type: Conference Proceeding

Authors: Bolognone R.K., Palmer A.D., Thomsen S., Britton D., Schindler J. and Graville, D.

Publication Date: 2019

Publication Details: Dysphagia. Conference: 27th Annual Meeting of the Dysphagia Research Society. San Diego, CA United States. 34(6) (pp 951); Springer,

Abstract: Purpose: Expiratory Muscle Strength Training (EMST) is a safe, effective intervention that can be performed at home and may be beneficial for individuals with voice and swallowing disorders. To date there have been few studies of EMST in the head and neck cancer population and there are no previous reports of its use after supracricoid partial laryngectomy (SCPL). This prospective clinical pilot study was undertaken to determine the safety and efficacy of a 4-week treatment program. Method(s): Six participants were recruited who had undergone SCPL, were medically stable, and had no contraindications for EMST. At baseline objective respiratory measurements were collected, dietary status was recorded, and participants completed a series of validated self-report instruments relating to voice, swallowing, breathing, and cough. Following the completion of treatment, baseline measures were repeated and participant feedback was solicited. Result(s): The majority of individuals found EMST easy to use (83%) and beneficial (83%). The side-effects of treatment were relatively minor and included dizziness, muscle inflammation, and vocal fatigue. There were improvements in two measures from pre-to posttreatment, namely an average 21% increase in Peak Cough Flow (371.67 L/min to 451.33 L/min) and a 38% decrease on the Dyspnea Index (6.17 to 3.83). Other measures showed inconsistent changes. Conclusions (Including Clinical Relevance): EMST appeared to improve cough strength and reduce dyspnea symptoms and may be a useful rehabilitation tool after SCPL. Further study of the relative efficacy of EMST compared to other rehabilitation protocols after SCPL is needed.

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DATABASES AND INFORMATION SOURCES USED				
	Pubmed		HMIC	BMJ Best Practice
✓	Medline		Social Policy and Practice	✓ Cochrane Library
✓	Emcare	✓	CINAHL	✓ TRIP
✓	Embase		PsycINFO	Grey Literature
	AMED		UpToDate	✓ Other – Google scholar, Google Advanced search, FutureNHS, SWAG cancer alliance, Consensus AI, SciSpace AI

PURPOSE OF SEARCH			
	Patient info/health & well being	✓	Clinical decision making (inc. patient care)
	Executive Team support	✓	Research/Education/Professional development
	Quality Improvement		Primary Care & Neighbourhoods Directorate support
	KM/Management decision making		Other

USER CATEGORY OF REQUESTOR			
	Medical students		Patients/public
	Nursing/midwifery students		Physician Associates
	Doctor/Psychiatrist		Public Health (Somerset CC)
	Nurses/Midwives		Other
✓	Allied Health professionals		

HAS PERMISSION TO SHARE THE RESULTS BEEN OBTAINED FROM THE REQUESTOR?			
✓	YES - share		NO – do not share





KEY WORDS/SEARCH STRATEGY INCLUDING MESH HEADINGS	LIMITS USED
<p>Ovid MEDLINE(R) ALL <1946 to May 16, 2025></p> <p>1 *Laryngectomy/ 6342</p> <p>2 Laryngeal Neoplasms/ 29858</p> <p>3 exp "Head and Neck Neoplasms"/ 373197</p> <p>4 laryngectomy.tw. 8272</p> <p>5 ((head or neck) adj3 (cancer or carcinoma or neoplasm*)).tw. 55606</p> <p>6 *Speech, Alaryngeal/ 1083</p> <p>7 bronchoesophagology.tw. 71</p> <p>8 "tracheoesophageal voice".tw. 170</p> <p>9 *Breathing Exercises/ 2608</p> <p>10 ("expiratory muscle strength training" or EMST or EMST150).tw. 143</p> <p>11 "expiratory muscle training".tw. 87</p> <p>12 9 or 10 or 11 2779</p> <p>13 or/1-8 392761</p> <p>14 12 and 13 19</p>	English language

