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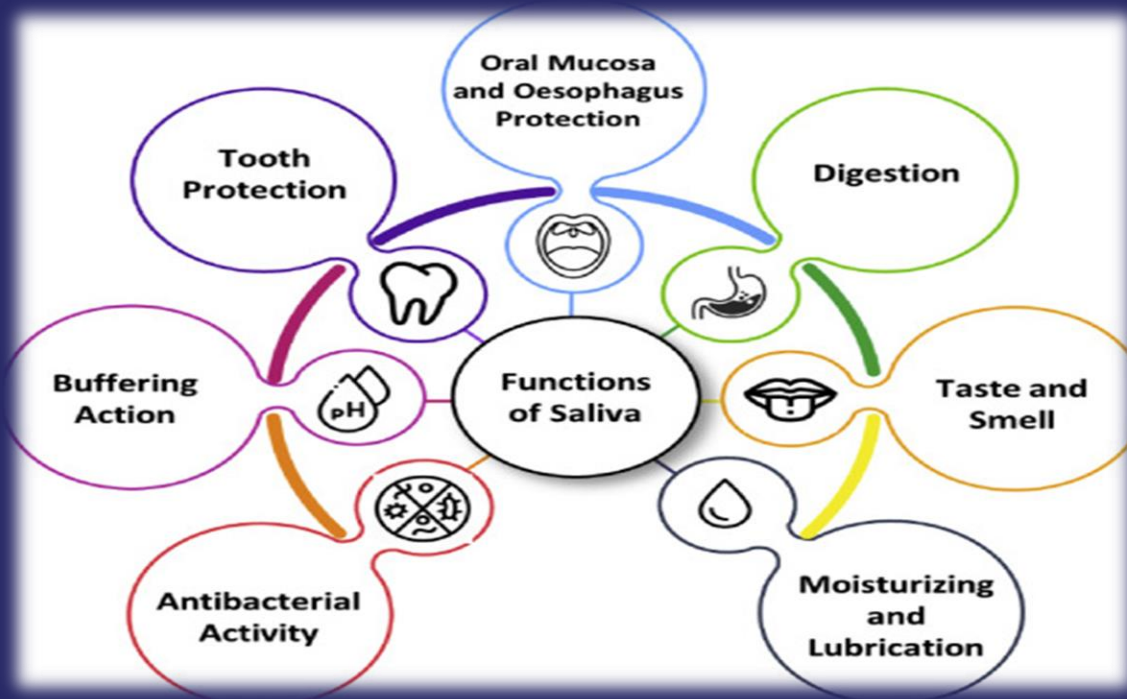
TRANSCUTANEOUS ELECTRICAL NERVE STIMULATION METHOD IN PATIENTS WITH XEROSTOMIA

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Introduction

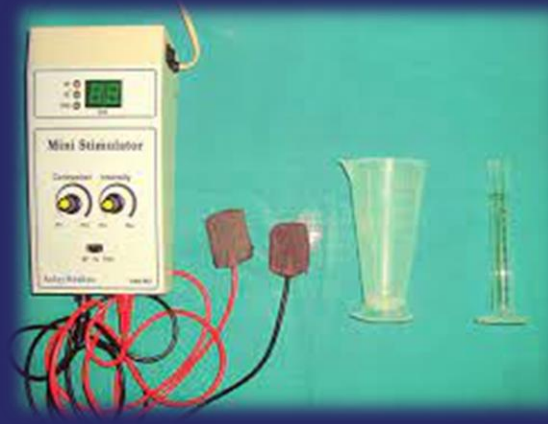


Xerostomia is the result of a decrease in the volume of saliva secreted because of salivary gland hypofunction



Patients with salivary gland hypofunction typically complain of dry mouth, difficulty chewing, swallowing and/or speaking; they hardly tolerate spicy, acidic, and crunchy food and often report taste changes or difficulty wearing dentures

□ Transcutaneous electrical nerve stimulation



□ Extraoral and intraoral devices



The first attempt to exploit neurostimulation to increase salivary secretion was made in the USA, through the design and commercialization of the Salitron device (Biosonics, Fort Washington, PA, USA)

Methods and materials

- totally 23 published studies in the last 10 years
- narrative review of published articles that were go into the related subject,
- evaluation of the impact of a transcutaneous electrical nerve stimulation (TENS) system on patients' dry mouth and salivary flow rates, written in English.
- NCBI (US National Library of Medicine), PubMed, Webmd and Google scholar
- The search included: systematic reviews, qualitative studies and clinical studies.

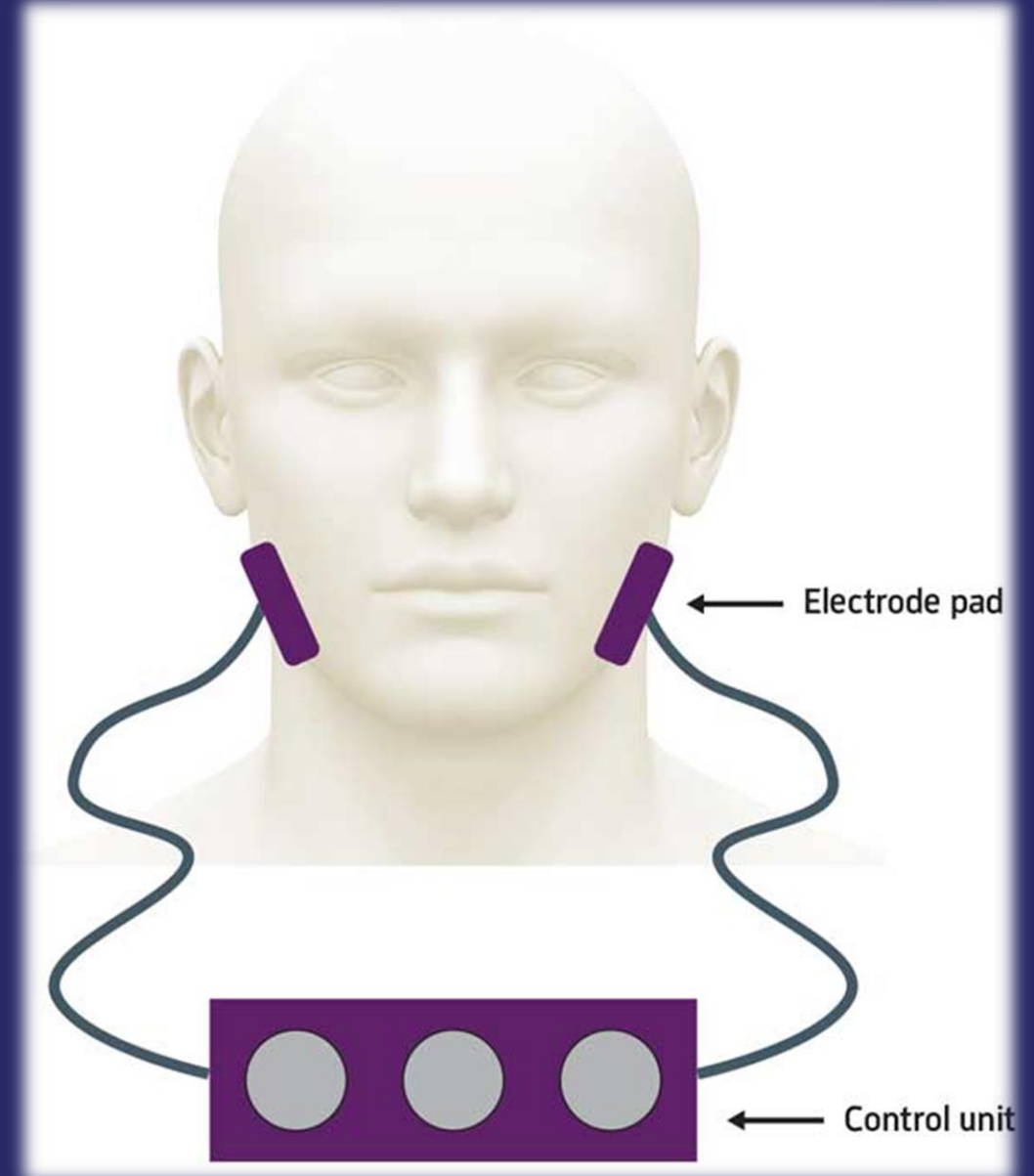
The screenshot shows the PubMed interface for a systematic review. At the top, the NIH logo and 'National Library of Medicine' are visible. The PubMed logo is on the left, and a search bar is on the right. Below the search bar, there are buttons for 'Save', 'Email', 'Send to', and 'Display options'. The article title is 'Trans-cutaneous electrical nerve stimulation to treat dry mouth (xerostomia) following radiotherapy for head and neck cancer. A systematic review'. The authors listed are Fatemeh Salimi, Francisco Saavedra, Brain Andrews, James FitzGerald, and Stuart C Winter. The article is marked as 'Free PMC article'. The abstract begins with 'Background: A dry mouth or xerostomia is one of the most common long-term complications following radiotherapy for head and neck cancer...'. On the right side, there are links for 'FULL TEXT LINKS' (Elsevier Open Access, Free Full text, PMC) and 'ACTIONS' (Cite, Favorites). There are also social media share icons and a 'PAGE NAVIGATION' section at the bottom right.

Results: Five studies were included in the systematic review which analysed a total of 280 patients with head and neck cancer. Methodological quality and outcomes were evaluated in every study included. The outcome measure was either subjectively assessed or objectively measured. Three studies used conventional TENS therapy to stimulate parotid glands which produced a significant increase in saliva production following therapy. Two studies used acupuncture TENS type to electrically stimulate acupuncture points scattered in the body and they reported improvement in saliva production at the same level as medical treatment. No reported adverse effect of TENS was identified.

Conclusions: This systematic review confirms the safety and feasibility of TENS in the treatment of xerostomia. It is established that commencing daily TENS therapy simultaneously with radiotherapy has the most efficacy. Given the nonspecific parameters used in the included studies, further evidence is needed in order to establish optimal settings and parameters of TENS for treatment of xerostomia.

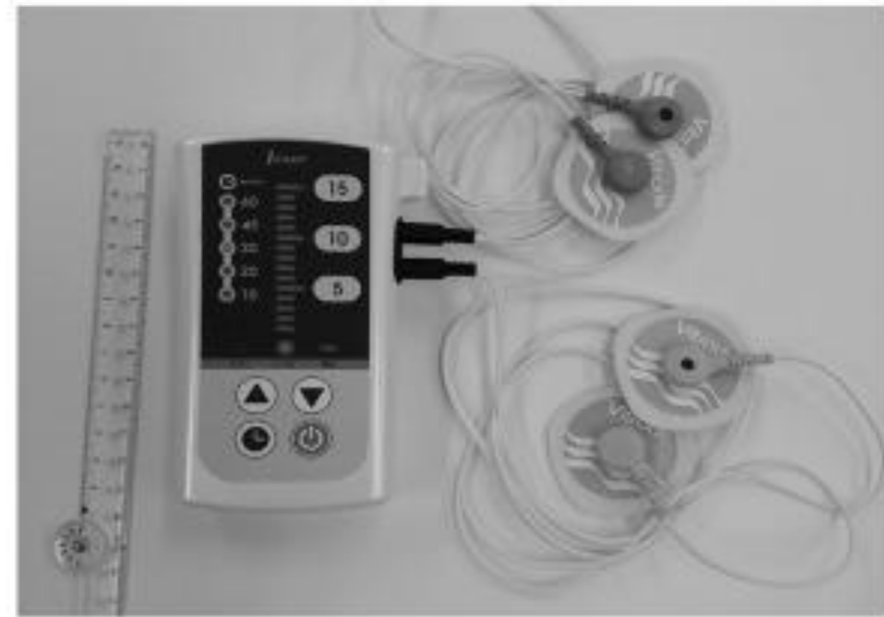
Evaluation and results

- dosage is determined by the frequency, intensity, mode, duration (minutes), and length of treatments (days/weeks)
- side effects of TENS therapy included twitching of the musculature and anesthesia of the skin (Hargitai et al.)
- studies provide a variety of application protocols for TENS in the management of different symptoms
- no study has examined if TENS could produce better outcomes on salivary flow rate for hemodialysis patients
- Wong et al. results showed that the participants demonstrated significantly increased salivary flow rates.

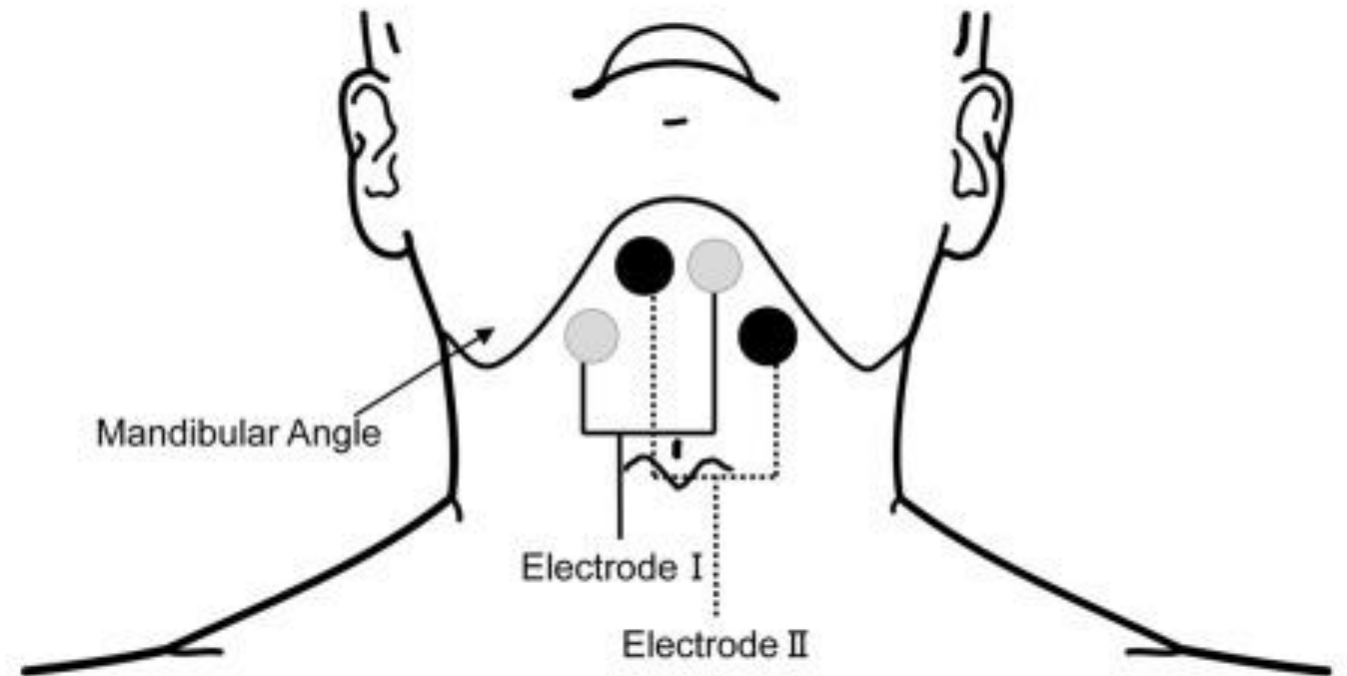


A) Device for TENS
B) Possible positions of placing electrodes

A



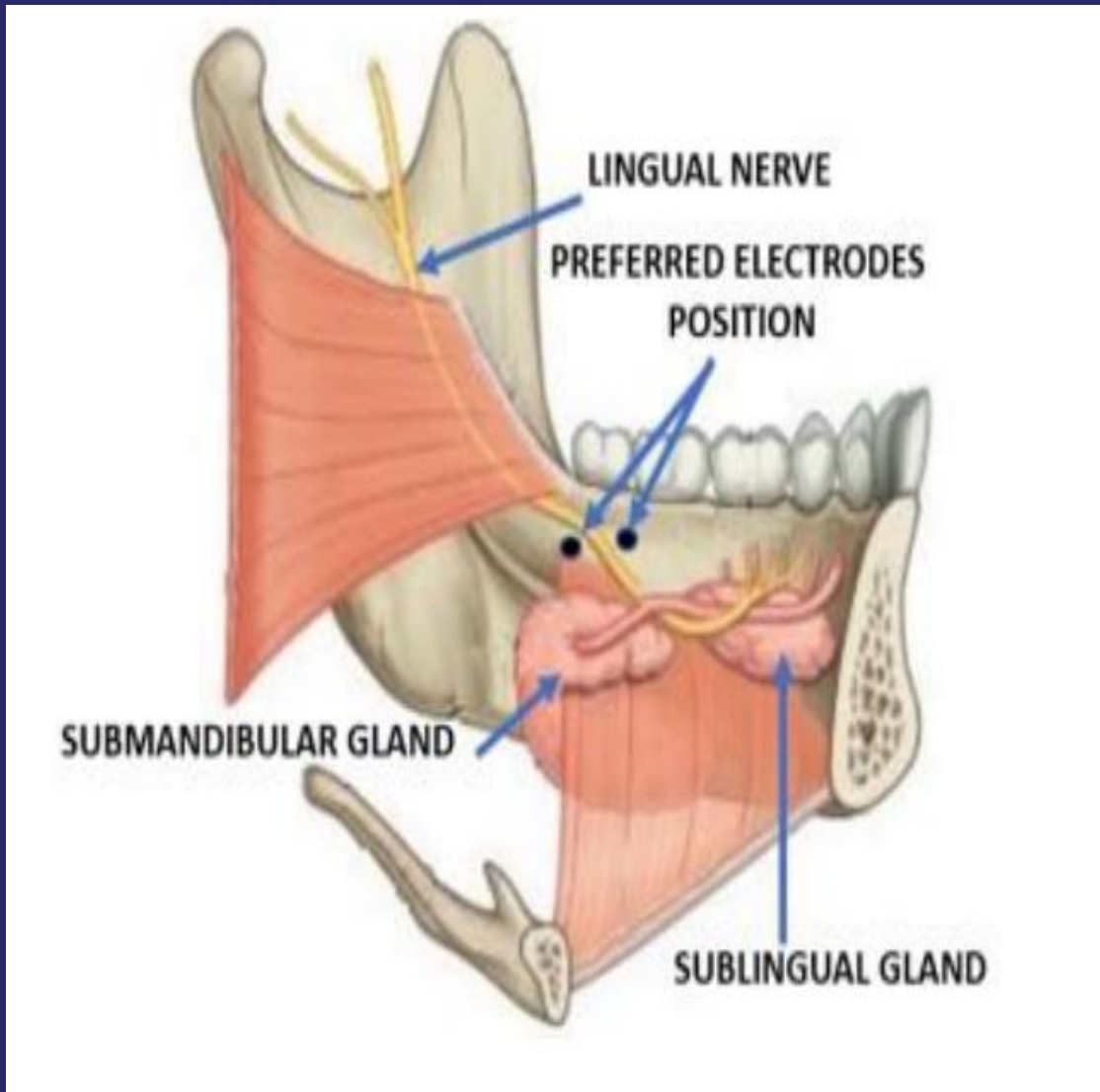
B



Електростимулирачки уред

SaliPen





Conclusion

- ❑ TENS has shown positive results in increasing salivary secretions and salivary values may diminish with age;
- ❑ TENS might be used in aged individuals as well as in diabetic patients to increase the quantity of saliva.
- ❑ From the result can be concluded that TENS was effective in increasing the salivary flow rate in hyposalivatory patients with residual saliva.
- ❑ TENS may be an ever-growing armamentarium in management of salivary gland hypofunction when other therapies have failed or are contraindicated

Thank you for your attention !



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