Riley P et al. **PHARMACOLOGICAL INTERVENTIONS for preventing dry mouth and salivary gland dysfunction following radiotherapy**. The Cochrane Database of Systematic Reviews (Impact Factor: 6.103), 2017, doi: 10.1002/14651858.CD012744 [https://www.ncbi.nlm.nih.gov/pubmed/28759701]

BACKGROUND:
Salivary gland dysfunction is an 'umbrella' term for the presence of either xerostomia (subjective sensation of dryness), or salivary gland hypofunction (reduction in saliva production). It is a predictable side effect of radiotherapy to the head and neck region, and is associated with a significant impairment of quality of life. A wide range of pharmacological interventions, with varying mechanisms of action, have been used for the prevention of radiation-induced salivary gland dysfunction.
OBJECTIVES:
To assess the effects of pharmacological interventions for the prevention of radiation-induced salivary gland dysfunction.
SELECTION CRITERIA:
We included randomised controlled trials, irrespective of their language of publication or publication status. Trials included participants of all ages, ethnic origin and gender, scheduled to receive radiotherapy on its own or in addition to chemotherapy to the head and neck region. Participants could be outpatients or inpatients. We included trials comparing any pharmacological agent regimen, prescribed prophylactically for salivary gland dysfunction prior to or during radiotherapy, with placebo, no intervention or an alternative pharmacological intervention. Comparisons of radiation techniques were excluded.
MAIN RESULTS:
We included 39 studies that randomised 3520 participants; the number of participants analysed varied by outcome and time point. We found low-quality evidence to show that **amifostine**, when compared to a placebo or no treatment control, might reduce the risk of moderate to severe xerostomia at the end of radiotherapy, and up to three months after radiotherapy, but there is insufficient evidence that the effect is sustained up to 12 months after radiotherapy. We found very low-quality evidence that amifostine increased unstimulated salivary flow rate up to 12 months after radiotherapy, both in terms of mg of saliva per 5 minutes, and incidence of producing greater than 0.1 g of saliva over 5 minutes. However, there was insufficient evidence to show a difference when looking at stimulated salivary flow rates. There was insufficient (very low-quality) evidence to show that amifostine compromised the effects of cancer treatment when looking at survival measures. There was some very low-quality evidence of a small benefit for amifostine in terms of quality of life at 12 months after radiotherapy, but insufficient evidence at the end of and up to three months postradiotherapy. A further study showed no evidence of a difference at 6, 12, 18 and 24 months postradiotherapy.
We found insufficient evidence (that was of very low quality) to determine whether or not **pilocarpine** performed better or worse than a placebo or no treatment control for the outcomes: xerostomia, salivary flow rate, survival, and quality of life. There was some low-quality evidence that pilocarpine was associated with an increase in sweating.
We found insufficient evidence to determine whether or not **palifermin** performed better or worse than placebo for: xerostomia (low quality); survival (moderate quality); and any adverse effects.
There was also insufficient evidence to determine the effects of the following interventions: biperiden plus pilocarpine, Chinese medicines, bethanechol, artificial saliva, selenium, antiseptic mouthrinse, antimicrobial lozenge, polaprezinc, azulene rinse, and Venalot Depot (coumarin plus troxerutin).

AUTHORS' CONCLUSIONS:
There is some **low-quality evidence to suggest that amifostine prevents the feeling of dry mouth** in people receiving radiotherapy to the head and neck (with or without chemotherapy) in the short- (end of radiotherapy) to medium-term (three months postradiotherapy). However, it is less clear whether or not this effect is sustained to 12 months postradiotherapy. The benefits of amifostine should be weighed against its high cost and side effects. **There was insufficient evidence to show that any other intervention is beneficial.**

Apperley O et al. **A clinical trial of a novel emulsion for potential use as a SALIVA SUBSTITUTE in patients with radiation-induced xerostomia**. Journal of Oral Rehabilitation (Impact Factor: 2.098), 2017, 44(11):889-895 [https://www.ncbi.nlm.nih.gov/pubmed/28741683]

Researchers have recently developed a novel oily formulation for potential use as a saliva substitute for the treatment of dry mouth. The aim of this randomised, crossover study was to compare this new formulation to a currently available saliva substitute and a control of water on measures of mastication, subjective feeling of oral dryness and product acceptability.
Forty participants treated with radiotherapy to the head and neck and experiencing xerostomia were invited to participate in the trial. Each participant trialled all three products in a randomised order. The effect of each product was measured using the Test of Masticating and Swallowing Solids (TOMASS), the Shortened Xerostomia Inventory (SXI) and a questionnaire designed to test patient acceptability of each product. Outcome data were gathered in a single session after the first administration of each product to evaluate immediate effects and after 7 days of use to evaluate longer-term effects.
There was no evidence that application of the three formulations had an effect on any of the TOMASS measures, either immediately or after one week of use ($P > 0{\cdot}05$). There was a significant main effect of formulation on the SXI score ($P = 0{\cdot}02$). Application of the novel emulsion resulted in a clinically small but significant improvement in SXI score ($P < 0{\cdot}01$); however, application of methylcellulose ($P = 0{\cdot}21$) and water ($P = 0{\cdot}81$) resulted in no significant difference. There was no difference in participant acceptability between the three products ($P = 0{\cdot}32$).
The novel oily emulsion showed no clinically significant benefit over two existing products for relief of xerostomia. Indeed, **none of the three products demonstrated significant change in patient outcomes**.

Adamczak MI et al. **Polymer coated MUCOADHESIVE LIPOSOMES intended for the management of xerostomia**. International Journal of Pharmaceutics (Impact Factor: 3.649), 2017, 527(1-2):72-78 [https://www.ncbi.nlm.nih.gov/pubmed/28522426]

The aim of this work was to prepare and test different pharmaceutical formulations in respect of their potential in relieving dry mouth symptom. Since many of the products available on the market provide only temporary relief to the patients, there is need for new formulations able to retain on the oral mucosa. The prolonged moisture protection could be achieved by combining mucoadhesive materials, such as polymers containing hydrogen bonding groups, with vesicles capable of releasing hydration medium from the inner compartment.

In this study three different types of liposomes (positively, negatively and neutrally charged) were coated with five different types of polymers: low-methoxylated pectin (LM-pectin), high-methoxylated pectin (HM-pectin), alginate, chitosan and hydrophobically modified ethyl hydroxyethyl cellulose (HM-EHEC). The particle size and the zeta potential of the obtained carriers were tested by measuring dynamic light scattering (DLS) and electrophoretic mobility. Later on, selected positively charged liposomes were deposited on a negatively charged mica surface and depicted by atomic force microscopy (AFM). The water sorption properties of polymers, uncoated liposomes and polymer-coated liposomes were studied by the means of dynamic vapor sorption (DVS). The experiments were performed within the relative humidity range RH=95-0-95%, at 35°C.
It was found that **coating the liposomes with polymers significantly increased the water sorption capacity of the formulations, making them an attractive choice for hydration of the oral mucosa**.

Fidelix T et al. **LOW-LEVEL LASER therapy for xerostomia in primary Sjögren's syndrome: a randomized trial**. Clinical Rheumatology (Impact Factor 2.365), 2017, doi: 10.1007/s10067-017-3898-9
[https://www.ncbi.nlm.nih.gov/pubmed/29119483]

To evaluate the effectiveness of low-level laser therapy (LLLT) in the treatment of xerostomia in primary Sjögren's syndrome (SS), a randomized clinical trial of patients with dry mouth symptoms associated with primary SS receiving care at a university hospital was conducted.
Sixty-six patients were randomly assigned with a 1:1 allocation ratio to receive LLLT (laser group, n = 33) or placebo treatment (placebo group, n = 33). Patients in the laser group received LLLT twice a week for 6 weeks, for a total of 12 treatment sessions. Laser irradiation was performed with an aluminum-gallium-arsenide laser diode at a wavelength of 808 nm, 100-mW output power, and energy density of 4.0 J/cm2 per irradiation point per session. Placebo treatment was performed following the same protocol used for irradiated patients and using the same laser device to mimic a real irradiation, but with no active laser emission and the tip of the laser probe covered with aluminum foil. The outcomes of interest were xerostomia inventory scores, salivary flow rate, salivary beta-2 microglobulin levels, and salivary sodium and chlorine concentrations.
Patients in both groups showed no improvement in xerostomia. Likewise, there was no significant improvement in xerostomia inventory scores (p = 0.301) or salivary flow rate (p = 0.643) in either group. There was no difference in salivary beta-2 microglobulin levels, sodium concentration, and chlorine concentration before and after intervention or between the two groups.
The LLLT protocol used in this study effected no improvement in xerostomia or salivary flow rate in patients with primary SS.

Park B et al. **HERBAL MEDICINE for Xerostomia in Cancer Patients**: A Systematic Review of Randomized Controlled Trials. Integrative Cancer Therapies (Impact Factor 1.923), 2017, doi: 10.1177/1534735417728336
[https://www.ncbi.nlm.nih.gov/pubmed/28870110]

BACKGROUND:

Xerostomia (dry mouth) causes many clinical problems, including oral infections, speech difficulties, and impaired chewing and swallowing of food. Many cancer patients have complained of xerostomia induced by cancer therapy.
OBJECTIVE:
The aim of this systematic review is to assess the efficacy of herbal medicine for the treatment of xerostomia in cancer patients.
MATERIALS AND METHODS:
Randomized controlled trials investigating the use of herbal medicines to treat xerostomia in cancer patients were included.
RESULTS:
Twenty-five randomized controlled trials involving 1586 patients met the inclusion criteria. A total of 24 formulas were examined in the included trials. Most of the included trials were insufficiently reported in the methodology section. Five formulas were shown to significantly improve the salivary flow rate compared to comparators. Regarding the grade of xerostomia, all formulas with the exception of a Dark Plum gargle solution with normal saline were significantly effective in reducing the severity of dry mouth. Adverse events were reported in 4 trials, and adverse effects of herbal medicine were reported in 3 trials.
CONCLUSIONS:
We found **herbal medicines had potential benefits for improving salivary function and reducing the severity of dry mouth in cancer patients**. However, **methodological limitations and a relatively small sample size reduced the strength of the evidence**. More high-quality trials reporting sufficient methodological data are warranted to enforce the strength of evidence regarding the effectiveness of herbal medicines.