How to handle xerostomia and hyposalivation.

1 BACKGROUND.

The function of salivary glands is frequently impaired by a variety of pathological conditions, the most prominent being autoimmune diseases; head and neck radiotherapy and the adverse effect of numerous medications are also involved.

Apart from the discomfort factor, patients with salivary gland dysfunction are more prone to a number of problems including dental decay and Candida infections.

The management of hyposalivation and xerostomia is a challenge. There is no consensus about the most efficient treatment. Although the use of some systemic drugs may be a possibility in some cases, a difficulty can be that the patient’s health is often compromised by existing disease and medication intake.

Summary: There is no agreement as to the optimal treatment for hyposalivation and xerostomia. The use of systemic drugs can have severe limitations. As a result, treatments are essentially directed towards lessening the sensation of oral dryness and preventing dental decay.

2 FLUORIDE TREATMENTS.

Use of fluoride in trays.

Anecdotal evidence has shown that the use of a high concentration fluoride gel in upper and lower bleaching trays at least once each day can keep dental caries at bay in patients with xerostomia.

It should only be used with motivated patients with no impairments to carrying out the necessary procedures meticulously.

Technique:

- Prepare bleaching trays for the upper and lower arches.
- Supply patient with a fluoride gel containing 2% neutral sodium fluoride (example product: All Solutions Topical Fluoride - Dentsply).
  (Note: A neutral sodium fluoride gel is preferable to one containing acidulated phosphate fluoride as it does not etch feldspathic ceramics nor affect the surface of glass-ionomer cement restorations).
- Give instructions on using trays, with a small amount of gel in each tray, for 5 minutes each day. This should be done after tooth cleaning. Ensure that the patient knows how to remove excess gel by use of tissues and by spitting out.
How to handle xerostomia and hyposalivation. (cont)

**FLUORIDE TREATMENTS. (CONT)**

**Clinical example of fluoride gel use on a daily basis.**

1. Appearance of teeth before patient started radiotherapy to head and neck area. It was anticipated that the radiotherapy would dramatically reduce the patient’s salivary flow.
2. Before the patient underwent treatment a custom tray was constructed. Use of a fluoride gel started at the beginning of treatment and continued on a daily basis thereafter.
3. After 18 months, despite the impaired salivary flow, the teeth remained sound.

Example where a patient had radiotherapy to the head and neck area and there was no daily fluoride regimen. The results are evident.

Photographs courtesy Dr Chris Daly. Reproduced from December 2002 issue of Dental Outlook.

**Use of a high fluoride toothpaste.**

An anecdotal evidence has also shown that the once or twice daily use of a high concentration fluoride toothpaste is an effective item for patients with hyposalivation and xerostomia.

**Technique:**
- Patient uses a 5,000 ppm fluoride toothpaste for tooth cleaning.
- Whilst the toothpaste slurry is still in the mouth the brush is used to clean the surface of the tongue.
- The patient spits out but does not rinse after each brushing.

An example 5,000 ppm fluoride toothpaste is Colgate NeutraFlour 5000 (Colgate). It is marketed in some countries as Colgate Duraphat 5,000 ppm fluoride toothpaste and in others as Colgate PreviDent 5000.

3M Espe also have a 5,000 ppm fluoride toothpaste (ClinPro 5000) which is not available in all markets at present.
How to handle xerostomia and hyposalivation. (cont)

2 Fluoride Treatments. (cont)

Summary: Regular fluoride exposure is the backbone of any program for preventing caries development in patients with hyposalivation and xerostomia.

3 Products Designed to Act as Saliva Substitutes.

Saliva substitutes are formulated to lubricate the mouth and mimic natural saliva. The ingredients commonly used in saliva substitutes are:

- Carboxymethylcellulose.
- Hydroxyethylcellulose.
- Polyglycerylmethacrylate.
- Hydroxypropylmethylcellulose.
- Glycerol.
- Various oils such as canola oil and olive oil.
- Various gums such as xanthan gum.

Although products containing these ingredients can be of value in that they relieve symptoms from dry mouth they do not cure the condition or increase the output of saliva.

<table>
<thead>
<tr>
<th>Example products</th>
<th>Ingredients</th>
</tr>
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<tbody>
<tr>
<td>Biotène</td>
<td>Ingredients may include glucose oxidase, lactoferrin, lactoperoxidase, lysozyme and water.</td>
</tr>
<tr>
<td>Colgate Dry Mouth Relief</td>
<td>Ingredients include 0.02% sodium fluoride, xanthan and cellulose gums, a suspending agent, glycerin, propylene glycol and water.</td>
</tr>
<tr>
<td>Hamilton AQUAE</td>
<td>Ingredients include water, inorganic salts, flavouring and citric acid. Available as a gel and a spray.</td>
</tr>
<tr>
<td>GC Dry Mouth Gel</td>
<td>Ingredients include diglycerol (a clear viscous liquid very similar to glycerol), sodium carboxymethylcellulose and water.</td>
</tr>
</tbody>
</table>

Source: www.dentaloutlook.com.au
How to handle xerostomia and hyposalivation. (cont)

1. Pilocarpine. 1

Pilocarpine has been shown to be of benefit in clinical trials. It acts on receptors on the acinar cell surface in the salivary glands. The increased secretion leads to greater moisture of the oral mucosa and the reduction of dry mouth symptoms.

However, for pilocarpine to be effective some remaining functional salivary tissue must be present.

Dosage: Oral doses of 5-7.5 mg given three to four times a day have been shown to be effective.

Side effects: Frequent side effects have been reported. Most were mild and included sweating, warmth or flushing (especially on face and neck), chills, fever, increased urgency or frequency of urination, eye and nasal secretion, joint pain, muscle aches and pains, unusual tiredness or weakness, mild gastrointestinal tract distress, diarrhoea, cramps and nausea.

Contraindications: Asthma, acute iritis, glaucoma, chronic bronchitis or other type of obstructive pulmonary disease, kidney stones, gallstones, gallbladder, heart or liver disease.

Availability: Pilocarpine has been approved for increasing salivary flow by regulatory agencies in a number of countries.

In Australia pilocarpine is only available as eye drops in 1% (10 mg/ml), 2% (20 mg/ml) and 4% (40 mg/ml) concentrations from Alcon Laboratories, Frenchs Forest, NSW.*

* Tel: 1800 025 032

2. Cevimeline. 1

Cevimeline (Evoxac) is a parasympathomimetic and muscarinic agonist, with particular effect on M3 receptors. It is used in the treatment of dry mouth associated with Sjögren’s syndrome.

Dosage: Clinical trials have shown that 30 mg taken 3 times a day can provide relief from dry mouth.

Side effects: Known side effects include nausea, vomiting, diarrhoea, excessive sweating, rash, headache, runny nose, cough, drowsiness, hot flushes, blurred vision, and difficulty sleeping.

Contraindications: Contraindications include uncontrolled asthma and narrow angle glaucoma. Because it has the potential to alter the heart rate or conduction it should be used with caution in patients

Other approaches:

Other systemic drugs: There are a number of agents that require further evaluation to determine whether they may be useful in helping dry mouth. These include anetholetrithione, bethanechol and nizatidine. 1

Acupuncture: Acupuncture has been attempted to improve the symptoms associated with dry mouth available. However, to date, there is insufficient evidence to recommend it.

It is possible that any positive results may have been due to placebo effects modulated by discussion, listening and encouragement during treatment sessions. 1,2

Electrostimulation: The application of an electrical current on the skin covering the parotid gland area and on the oral mucosa has been shown to stimulate saliva production. 3-7

An electrostimulation device called the Saliwell GenNarino (Saliwell)* uses a custom-made mouthguard containing an electronic circuit and a battery. It applies an electrical current adjacent to the lingual nerve and is worn for a few minutes when a patient feels oral dryness.

The dentist takes an impression and the manufacturer constructs a mouthguard containing the necessary circuitry.

Initial trials have reported an increase in oral moisture from use of the device.

* Aust. distributor: Golden Medical Pty Ltd. 02 9943 5042

Source: www.dentaloutlook.com.au
How to handle xerostomia and hyposalivation. (cont)

PRESCRIPTION MEDICINES TO INCREASE SALIVARY FLOW. (cont)

with cardiovascular disease, asthma, bronchitis, chronic obstructive pulmonary disease, Parkinson’s disease, urinary or bladder obstruction, gall bladder disease, gastro-intestinal ulcers and lactation. The drug may also decrease visual acuity, especially at night and impair depth perception.

Availability: Cevimeline has been approved for increasing salivary flow by regulatory agencies in some countries. Not found on the Australian Register of Therapeutic Goods.

summary - a practical approach

Daily routine:

**Morning:**
- On waking rinse mouth with a simple sodium bicarbonate solution. It is made by dissolving half a teaspoon of sodium bicarbonate in a glass of water.
- Use 2% sodium fluoride gel in bleaching trays for a 5-minute application (employ at night time if more convenient).
- After breakfast clean teeth with *Colgate Neutraflour 5000*. Spit out but don’t rinse. Clean the tongue whilst the toothpaste slurry is still in the mouth.

**During the day:**
- Between meals take sips of water. However, excessive sipping of water can actually reduce the mucous film lining on the oral mucosa. If it is more comfortable, supplement with a proprietary saliva substitute.
- Limit snacks throughout the day, especially sweets and sugary snacks.
- Avoid or decrease the intake of caffeine-containing drinks. Caffeine is a mild diuretic which promotes fluid loss and may increase mouth dryness. It is also suggested that the intake of alcohol be reduced.
- Protect dry lips with a suitable product. Preparations containing vitamin E are useful.

**During meals:**
- Use fluids while eating. A practical approach is to take a drink of water to wet the mouth, take a bite of food and then wash it down with another sip.
- It may be necessary to restrict the intake of items like bread, pasta and biscuits which tend to cling around the mouth.

**Before retiring:**
- Clean teeth with *Colgate Neutraflour 5000* using the same technique as employed in the morning.

**During the night:**
- Use a humidifier. The dry ambient air in some homes can contribute to a sense of dryness. The use of a humidifier can help alleviate this problem.
- Take sips of water during the night if required.
How to handle xerostomia and hyposalivation. (cont)

PRESCRIPTION MEDICINES TO INCREASE SALIVARY FLOW. (CONT)

Summary: For systemic drugs to be effective some functional salivary gland tissue must still be present. The use of these drugs has to be weighed against the list of undesirable side effects.

REFERENCES.


A note about a ‘dry mouth’ feeling in some patients.

Some patients may complain of having a dry mouth whilst, in fact, their salivary flow is still quite good. The sensation of dryness usually comes from the minor salivary glands and these only account for 10 percent of the total saliva output. Smoking, evaporation of saliva during exercise and mouth breathing can all produce these symptoms. Because there is little relationship between the feeling of dryness and actual salivary flow, it may be necessary to carry out a saliva flow rate test to reassure a patient on this point.

also......

Source: www.dentaloutlook.com.au
## drugs with saliva-reducing side effects

### example products

<table>
<thead>
<tr>
<th>antidepressants</th>
<th>antihypertensive</th>
<th>antihistamines</th>
<th>anti-inflammatory</th>
<th>analgesic</th>
<th>anticholinergic</th>
<th>anxiolytic</th>
<th>diuretic</th>
<th>muscle relaxants</th>
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<td>Ceflexa</td>
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<td>Antivert</td>
<td>Advil</td>
<td>Codeine</td>
<td>Atrohist</td>
<td>Dalmane</td>
<td>Diuril</td>
<td>Flexeril</td>
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<td>Effexor</td>
<td>Catapres</td>
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<td>Darvon</td>
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<td>Cogentin</td>
<td>Valium</td>
<td>HydroDiuril</td>
<td>Zanaflex</td>
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<td>Restoril</td>
<td>Lasix</td>
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<td>Norpramin</td>
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<td>Feldene</td>
<td>Talwain</td>
<td>Donnatal</td>
<td>Xanax</td>
<td>Tenuate</td>
<td>Tegretol</td>
<td>Nicorette</td>
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Source: Reference 9 previous page.