Oral care in cancer: helping patients with tooth, gum and mouth problems

Jocelyn Harding, Dental Hygienist, Confident Dental and Implant Clinic, Stroud (mouthcareforcancerpatients@gmail.com) describes the oral conditions that cancer patients can experience.

This article aims to provide an update on mouth care in cancer patients for the busy clinical nurse.

Cancer Research UK reported that there were 359,660 new cases of cancer in 2015 (Cancer Research UK, 2018). And it has been estimated that 15% to 80% of patients experience malnutrition when going through cancer treatment (Santarpia et al., 2011). One of the reasons for this poor nutritional intake is oral health problems. It has been estimated that only 50% of the population attend a dentist regularly (Evans, 2018), so many patients do not have good oral care before they start their cancer journey.

The mouth is often treated as if it is a separate entity, rather than as central to a person’s health and wellbeing. Many cancer patients do not see the importance of mouth care at the start of cancer treatment. However, the mouth becomes an important part of a cancer patient’s journey when oral mucositis, ulceration and xerostomia occur and hinder treatment. Unfortunately, cancer treatment may even have to be halted, and recovery can take longer, when these conditions cause the mouth to be sore and inflamed.

The nurse’s role

This article aims to show what is available to help with such problems and to explain how nurses can help prevent oral problems developing or worsening. Having a healthy mouth can help make cancer treatment more tolerable, so good oral care is vital. A preventative action the nurse can take is to suggest the patient attends a dental appointment before cancer treatment begins.

Conditions affecting the mouth

Immunosuppression during cancer treatment means dental problems can occur that the body would normally be able to fight. There are many bacteria in the mouth, some of which may cause decay, a multifactorial disease or, if Gram-negative anaerobic bacteria are present, can cause periodontal disease. The two most common harmful bacteria in the mouth are *Streptococcus mutans*, the main cause of tooth decay, and *Porphyromonas gingivalis*, linked to periodontitis, where the tissue supporting the teeth are attacked, eventually leading to tooth loss. These bacteria become even more of a problem when a patient has a dry mouth (xerostomia)—a common side effect of chemotherapy.

Common oral health problems are:
- Tooth decay or caries (see Figure 1)
- Gum disease (gingivitis and periodontal disease)
- Dry mouth (xerostomia)
- Oral mucositis.

Tooth decay

Tooth decay occurs when sugars are eaten or drunk on more than four occasions during the day. The nurse can explain this to patients by using the easily understandable Stephan curve (Higham et al., 2018). The Stephan curve demonstrates how, when at rest, the mouth environment is alkaline, but when sugars are consumed by bacteria and converted to acid, known as an ‘acid attack’, the pH of the mouth drops below the critical level of 5.5. This is when the enamel becomes softened or demineralized, leading to decay. After 30 to 45 minutes’ rest after this acid attack and drop in pH, saliva will help neutralise acidity, restore the mouth’s natural balance and slowly harden the tooth enamel. However, if the pH drops below 5.5 more than four times a day then because the tooth recovery process is slow, the tooth enamel will not have a chance to repair and decay will occur.

Tooth decay-causing bacteria do not differentiate between natural sugars or added sugars, they consume the sugar, metabolise the sugar and create acid. This then dissolves the enamel (hard outer shell of the tooth) and the more susceptible part of the tooth, the root surface. This is below the gingival margin and therefore exposed in patients with receding gums. With a lack of saliva, as a result of cancer treatments, cancer patients are at higher risk of tooth decay, especially if any root surfaces are exposed.

It is necessary for cancer patients to keep up their fluid intake, but having regular sugary drinks means they are at high risk of tooth decay. The best option, but not always possible, is if the patient is able to give their mouth a rest after consuming sugary foods and drinks. This gives the teeth time to remineralise and reharden the enamel. Ideally, water and milk are the best drink options between meals, or tea and coffee without sugar.

Cancer treatments can result in a sore and dry mouth and, traditionally, patients have been recommended pineapple chunks to eat as pineapple contains the anti-inflammatory enzyme bromelain; however, pineapple is acidic and therefore harmful to teeth. Ideally this practice should be only be recommended to patients without their own teeth, although it can be comforting for people at the end of life.

For most people, three meals a day plus a mid-morning snack may be a usual routine. If sugars are consumed on these four occasions then the saliva would normally be able to stabilise the pH and remineralise the teeth. Cancer patients may find it difficult to keep to such a routine, so nurses should recommend sugar-free snacks and drinks. The sweetener xylitol is a natural sugar alternative made from beech and birch trees. It does not break down in the same way as sugar and can help keep a neutral pH level in the mouth. Xylitol can now be found in mints, pastilles, mouthwashes, sprays, gum and toothpastes. It is also safe for people with diabetes.

Gum disease

Gingivitis is a common problem. It is caused by bacteria and causes inflamed, red, swollen and bleeding gums. It should be prevented by...
Brushing twice a day for 2 minutes and using interdental aids: If the mouth is not cleaned effectively, gingivitis may occur and may then progress to periodontal disease.

The patient’s dentist or the hospital dental team can help the patient use the correct brushing technique. Most dentists will recommend an electric toothbrush and interdental aids. Selection of which dental aids will depend on the size of the gaps between the patient’s teeth.

**Dry mouth (xerostomia)**

A dry mouth can affect chewing, speech, and swallowing. Saliva also contains enzymes that help to balance the pH of the mouth and break down fats, which is the start of the digestion process. There are products to help the mouth with lubrication, some available on prescription and others over the counter. The dental team or pharmacist will be able to advise on which products are appropriate to recommend and can check ingredients for potential allergies or contraindications.

**Oral mucositis**

Oral mucositis is defined as inflammation of the mucosal membrane, characterised by ulceration, which may result in pain, dysphagia, and impairment of the ability to talk. Mucosal injury provides an opportunity for infection to flourish, placing the immunocompromised patient at risk of sepsis and septicemia. It is common in patients undergoing cancer treatment (UK Oral Mucositis in Cancer Group, 2015).

**Osteoradionecrosis**

For some head and neck cancer patients who receive radiation therapy, osteoradionecrosis may occur as a severe side effect of treatment. Regular dental visits are recommended for checking oral health and helping to prevent infections and decay. This group of cancer patients must continue using a high fluoride toothpaste and aim for their oral hygiene to be as high a standard as possible.

### Helping with mouth care

**Fluoride toothpaste**

Public Health England (PHE) recommends using toothpastes containing high levels of fluoride (PHE, 2017). Duraphat 5000 toothpaste for patients over 16, and Duraphat 2800 toothpaste for patients over 10 years old are high-fluoride prescription-only toothpastes.

A pea-size amount on the toothbrush should be used twice a day. The dental team may recommend custom-made dental trays to help keep the high fluoride toothpastes in contact with the teeth overnight. Many other brands of toothpaste contain beneficial ingredients and help with reducing the risk of decay.

**Fluoride varnish treatment**

For high-risk patients, PHE (2017) recommends that a high-fluoride varnish be applied to the teeth and any exposed root surfaces by a professional at intervals of at least six months.

**Toothbrushes**

An electric toothbrush is ideal, but if a cancer patient’s mouth is too tender, a soft manual toothbrush may be preferable. Nurses must alert patients who cannot perform their own mouth care and assist them when necessary and encourage relatives to help with mouth care if they are willing.

**Intertidal cleaning**

Controlling bacteria in these inaccessible areas is difficult but should be attempted. Intertidal brushes, floss, toothpicks and waterjets are available. The dental team can advise which is best for the individual patient.

**Mouth rinses**

If the patient is not able to tolerate a toothbrush or toothpaste, another option is an alcohol-free fluoride mouth rinse. PHE recommend using a fluoride mouthwash (0.05%) at a different time to brushing as rinsing straight after brushing reduces the beneficial effect of the toothpaste (PHE, 2017).

**Dry mouth products**

Some patients develop a very dry mouth and require mouthwash and gel for lubrication. Many companies have developed products to help and patients may need to try a few until they find one that suits. Some contain enzymes, vitamin oils, xylitol and fluoride. This range of products is expanding, with more options becoming available.

**Chewing gum and sweets**

Saliva production can be stimulated by chewing gum and/or encouraging the use of sugar-free gum and mints—ideally versions that contain xylitol—can help with lubricating and reducing decay.

### Conclusion

The mouth is a "window" to the body, providing clues to the patient’s overall health. Oral problems can be a major source of discomfort and distress in cancer patients, and nurses must think holistically and work collaboratively.

Some patients suffer with a dry mouth long after they have completed their cancer treatment. These patients are at high risk of oral problems. Long-term, the nurse should advise the use of a high-fluoride toothpaste and regular visits to the dentist after cancer treatment has finished.

The dental team is always available to help if nurses have any questions or concerns about the oral care of their patients.