The importance of mouth care in preventing infection


Summary

Most patients can benefit from nurses taking an active interest in their oral hygiene. Gladys Xavier describes how effective mouth care can improve a patient's quality of life and prevent serious infections.

Aims and intended learning outcomes

The aims of this article are to:

- Provide nurses with a logical and informed approach to oral care in the prevention of infection.
- Outline and emphasise the objectives of oral care in the prevention of the most commonly implicated nosocomial infections.
- Identify specific infections of the mouth.
- Encourage nurses to think of the importance of assessment of the mouth and frequency of mouth care in preventing infections of the mouth.
- Identify the health promotion role of nurses in oral care regimes.

Background

The number of adults retaining some natural teeth in later life is increasing. It is estimated that currently approximately 50 per cent of those aged 65 years and over are dentate. This figure is expected to increase to 65 per cent by 2008, 77 per cent by 2018 and reach 85 per cent by 2038 (Todd and Lader 1991).

In the 1988 UK adult dental survey (Todd and Lader 1988), it was found that only 50 per cent of the dentate adults interviewed had regular check ups at the dentist, and only 5 per cent of adults are completely free from clinical signs of inflammation (Moore and Moore 1994). About 500 different bacterial species colonise the mouth, of which over 400 live beneath the gum, and 69 per cent of all adults have periodontal disease. These figures suggest that many patients will have less than healthy teeth (Jones 1998). These figures also help to highlight the importance of mouth care for patients.

Oral disease and hygiene

It is generally accepted that oral diseases are the most common in the world. They affect the hard tissues (teeth), the supporting structures (the periodontium) and the soft tissues (cheeks, tongue, palate and floor of the mouth). The structure of the oral cavity is shown in Figure 1.

Care of the mouth is considered one of the most essential nursing procedures and should be regarded as an integral part of the general hygiene routine of a patient. Oral hygiene is defined as 'scientific care of teeth and mouth' (Thomas 1997). Oral hygiene should be part of an assessment of the mouth on admission and should be reviewed at regular intervals. Assessing a patient’s mouth and delivering appropriate oral care can prevent potential infections, distress and discomfort to a patient, as well as reducing the risk of both dental and systemic disease.

Nurses have an important role in providing effective oral care and a health promotion role in teaching patients about the importance of oral assessment and oral care. Regular oral care includes such things as mouthwashes, which can help maintain moisture, remove debris, prevent plaque and reduce the risk of infection (Holmes 1996).

Planned oral care, which should try and promote independence where possible, should take into account the patient’s level of dependency.

Assessing and planning oral care

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Several tools have been devised and are being used in the assessment of the mouth. Research has indicated that the oral examination guide by Dudjak, with...
A systematic approach in assessing the mouth must be followed otherwise infections of the mouth might be overlooked. Therefore, examination of the oral cavity should be included routinely in the initial holistic physical assessment of the patient and on occasions when the clinical condition of patient is unstable. The examination should include the lips, mucous membrane, gums, teeth, hard and soft palates, floor of the mouth and tongue.

### Examination and assessment

Before carrying out an examination, the nurse should ask the patient about his or her usual routine of oral hygiene and this should also include frequency and method of tooth or denture cleaning. Regularity of dental check-ups and any current or past oral health problems should also be noted. The state of the throat, palate, floor of the mouth, cheeks, tongue, gums and teeth should be examined. Any lesions or ulceration should be noted, together with the general state of the mucosa. The teeth and gums should be examined for plaque, caries and periodontal disease. Bleeding gums can indicate gingivitis or another underlying condition and, again, this should be noted, if present.

For any oral assessment, nurses should wear gloves to prevent cross-infection.

### Bacteria and mouth problems

A painful or sore mouth caused by dental decay, a dental abscess, or ulceration of the oral mucosa, can result in problems with eating and speaking, which can cause further discomfort to an already debilitated patient. The psychosocial importance of poor oral health may also be far reaching because the mouth plays such a major role in communication through both speech and physical expression. Patients with dry mouths, for example, may find it very difficult to express themselves adequately.

The two major dental diseases, dental caries (decay) and periodontal disease are both bacterial in origin and are largely preventable. Dental caries occurs when bacteria in the sticky layer of plaque on the tooth surface produce acid as a result of their metabolism of refined carbohydrates or sugars, especially sucrose. The acid initially causes demineralisation of the enamel and at this stage the process may be reversible due to elements in the saliva. If there are frequent acid attacks, however, caries and the breakdown of the tooth results, leading to cavity formation. If left untreated, the nerve might become involved and an abscess can form. The frequent consumption of

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**Table 1. Oral assessment guide**

<table>
<thead>
<tr>
<th>PHYSICAL FEATURE</th>
<th>ASSESSMENT TOOL</th>
<th>OBSERVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mucous membrane</td>
<td>Visual observation</td>
<td>Observe for unusual coating or bleeding, dryness of mouth</td>
</tr>
<tr>
<td>Lips</td>
<td>Visual observation and palpation. Ask patient to open mouth</td>
<td>Observe for cracks, bleeding and feel tissue for oedema. Also observe colour of lips</td>
</tr>
<tr>
<td>Tongue</td>
<td>Visual observation and palpation. Use of disposable tongue depressor</td>
<td>Observe for any coating, blisters, dryness, areas of redness and feel tissue texture</td>
</tr>
<tr>
<td>Gums</td>
<td>Observation and disposable tongue depressor</td>
<td>Check to see if gums are sore or bleeding. Check for redness and oedema</td>
</tr>
<tr>
<td>Teeth</td>
<td>Visual observation</td>
<td>Observe for plaque or debris</td>
</tr>
<tr>
<td>Dentures</td>
<td>Visual observation Disposable tongue depressor</td>
<td>Remove dentures and check gums for any redness, bleeding and oedema.</td>
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</tbody>
</table>

(adapted from Beck and Yasko 1993, Dudjak 1987)
sugary snacks such as sweets, biscuits, cakes and sweetened drinks is particularly implicated in the formation of tooth decay.

To prevent dental caries occurring, it is important to limit the frequency with which drinks and foods containing sugar are consumed by patients, and it is particularly important to ensure that only water is drunk through the night. In addition, the teeth should be brushed at least twice a day, including last thing at night, with a toothpaste containing fluoride.

Gingivitis is inflammation at the tooth/gum margin and presents as redness, swelling and bleeding of the gums on brushing. If the disease is not controlled at this stage, it may progress to chronic periodontitis, which involves the fibres supporting the teeth and the underlying bone. As the disease progresses, recession of the gums may occur and periodontal pockets can form between the gums and teeth. Because these pockets are difficult to clean, further destruction may occur and eventually the teeth can become mobile and might be lost. As periodontal diseases are caused by plaque, the most important way to prevent, or control, them is by removing plaque from the teeth, particularly from around the gum margins, on a daily basis. This is carried out most effectively by good toothbrushing, but for those patients where it is difficult to brush, a chlorhexidine mouthwash can be a useful adjunct to care.

There are numerous diseases and conditions that involve the oral mucosa; some examples are given in Table 2.

### Table 2. Diseases of the oral mucosa

<table>
<thead>
<tr>
<th>Bacterial</th>
<th>Mycotic (fungal)</th>
<th>Viral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streptococcal stomatitis</td>
<td>Moniliasis</td>
<td>Herpetic gingivostomatitis</td>
</tr>
<tr>
<td>Ulcerative gingivostomatitis</td>
<td>Histoplasmosis</td>
<td></td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>Blastomycosis</td>
<td></td>
</tr>
<tr>
<td>Syphilis</td>
<td>Candidiasis or thrush</td>
<td></td>
</tr>
</tbody>
</table>

(Campbell 1980)

A patient’s mouth is one of the best indices of patient care and she believed it contributed to the patient’s comfort. Oral care for patients who are unconscious and for those who require assistance with activities of daily living are provided by nurses. According to Howarth (1977), it is not nil-by-mouth patients who are at greatest risk but those who are reluctant to eat or drink.

When patients are unable or reluctant to eat or are taking nil by mouth, the mouth becomes dry. These patients need appropriate and adequate oral care to keep the mouth clean and reduce the risk of infection.

Scannapieco et al (1992) found that the bacterial species most commonly implicated in nosocomial pneumonia – methicillin-resistant *Staphylococcus aureus* (MRSA), *Pseudomonas aeruginosa*, and *Klebsiella pneumoniae* – were also the pathogens found within the dental plaque and buccal mucosa of critically ill patients who were unable to take fluids orally. It can then be hypothesised that a more rigorous oral care for these patients might have reduced oropharyngeal colonisation.

When appropriate oral care is planned and implemented for these patients, it should also include a lip lubricant. Intact lips provide a natural barrier for any potential infection. When lips are dry they can become cracked and harbour potential pathogens from the oral cavity if adequate oral care is not carried out.

**Poor nutritional status** The impact of nutritional status and the ability of the patient to fight infection are well documented. Disorders of the mouth can significantly impair the quality of life of ill patients. For patients requiring nutritional support, especially those who are not able to take food orally, effective oral care is important in preventing any potential infections.

This also includes patients receiving parenteral feeding, as bacterial plaque will consolidate in the mouth of these patients as the result of inactivity of the oral structures (Jones 1998).

### TIME OUT 5

Select a patient who is nil-by-mouth and discuss the oral care regime planned and implemented for this patient.

**Relationship between insufficient saliva and dry mouth in the risk of oral infection** Saliva plays an essential role in lubrication and protection of the oral
Mucous membrane. It binds food in the mouth, enabling it to be formed into a bolus to be swallowed (Lennie 1989). Saliva also contains many enzymes that are very important in the initial phase of digestion. In addition, saliva also has a bactericidal action designed to keep bacteria under control. Where saliva is deficient in the mouth, oral infections are common (Carl and Bersani 1983). Figure 2 shows the salivary glands of the mouth and their secretions.

Xerostomia, the name given when the mouth is dry due to a failure of salivary gland secretion, is one of the most common side effects of debilitating illness. These patients can be highly susceptible to dental caries, especially if they suck sweets or take frequent sips of sugary drinks to alleviate the symptoms. In the aetiology of temporary xerostomia, anxiety and depression are well-recognised causes of reduced basal flow of saliva (Bates and Adams 1968).

Eating, drinking, speaking and denture wearing become difficult and painful for these patients. In addition, the natural cleansing mechanism of saliva is lost. In the long term, the reduction in saliva flow can result in inflammation and infection, stomatitis, glossitis, mucosal ulcers, dental caries and candidiasis. Sores or ulcers can occur in dry, inactive mouths when food debris or tablets become attached to the delicate oral mucous membrane. The tissue beneath the debris becomes inflamed and breaks down. Prevention involves regular gentle swabbing to remove the debris before substances become dried onto the oral mucous membrane.

Sometimes, the use of an antibacterial gel to aid healing and a topical analgesic will reduce the pain. Major interventions altering oral status and their role in potential risk of infection. For patients with head/neck cancer who are already compromised by the side effects of surgery or chemotherapy, effective oral care is essential in the prevention of infection. Stomatitis and oral complications are potential risks for these immuno-compromised patients.

There are several reasons why patients with cancer experience inflammation of the oral mucosa (stomatitis or oral mucositis): they may be exposed to physical injury (including irradiation of head and neck areas or surgery), chemical injury (chemotherapeutic cytotoxic agents) and microbial attackers (infectious agents), which an defective immune system is less able to fight.

Infections of the oral mucosa are caused by a wide variety of organisms. Staphylococcal infections can be treated with broad-spectrum antibiotics. However, resistant bacteria will not be affected and fungal infections can be exacerbated by these antibiotics.

Chronic oral thrush can sometimes present with dry, red buccal mucosa, sometimes with patches and a swollen red, shiny, dry cracked tongue. It should be treated promptly to prevent haematogenous and oesophageal spread. Herpetic stomatitis presents in a yellowish brown membrane that is easily wiped away. This can cause severe pain to the patient. Herpes simplex vesicles may also extend over the lips. Nurses should also be aware of the increased prevalence of Herpes simplex virus infection and a greater susceptibility to Herpes zoster found in patients receiving chemotherapy and radiation therapy. Patients with lymphoma are also more susceptible to viral infections, due to deficiencies in cell-mediated immunity.

Although oral care is an obvious nursing responsibility, oral care in the prevention of infection for patients who have had major a intervention, altering their oral status, should have multidisciplinary team approach including medical, dietetic and dental teams.

Data from the US in hospital infection control show that frequent oral care and suctioning of secretions decreases the incidence of nosocomial pulmonary infections in a surgical intensive care unit (Arnovitch 1997).
Dentures and oral infections

A denture is described as a moveable prosthesis for natural teeth and their associated tissues. Dentures are frequently forgotten; if they remain in the mouth during mouth care they negate the benefit of the procedure, particularly if the patient has an infection, as sores and organisms become trapped in the gums. Dentures may be worn for many years. During this time, the gums continue to shrink. However, the person wearing them would have skillfully adapted to control the dentures and might not have any major problems. However, a sudden debilitating illness can change this and denture control can be lost. This can cause upper dentures to drop down unexpectedly and eating may become difficult.

Dentures accumulate food debris, mucin from saliva and microbial plaque (or proliferation of oral bacteria). Therefore, denture plaque should be removed daily, as its long-term accumulation is harmful to tissues in contact with the dentures. Denture stomatitis can occur as a result of an inflammation of the denture-bearing areas, particularly the palate.

The basic care of dentures in the prevention of infection consists of scrubbing with soap and water, and soaking in clean water or a proprietary cleaner when not worn. Dentures should always be stored in a marked container with clean water. To prevent the potential for cross-infection it is useful to mark the patients’ dentures.

TIME OUT 8

Having read the section on dentures, look critically at your own practices on the ward for patients with dentures. If you have a hospital dental service, discuss your concerns with the dental team.

Conclusion

Standard oral care regimes do not provide for the needs of patients because of their inflexibility. Care plans should be devised for individual patients based on the initial oral assessment. Providing appropriate and individual oral care requires an effective and thorough oral assessment.

Although a number of assessment guides have been developed, none is available to assess the risk of oral infection. It is essential for nurses to continue the assessment regularly and implement effective oral care (Holmes 1996). In providing oral care, nurses should also be aware of what constitutes a healthy mouth (Fig. 3).

Patient education and counselling to achieve independence in oral care before discharge from hospital is also useful. With the introduction of clinical governance, nurses should be encouraged to assess the state of the mouth as an outcome measure of the quality of oral care given while in hospital.

Therefore, the main aims of mouthcare are:

- Oral comfort, this will enhance the quality of life.
- To keep the natural teeth free from plaque and debris.
- To maintain dental hygiene and prevent denture induced disease.
- To maintain the mouth in a state of normal function.

This will reduce the risk of infections of the mouth. If the patient is immuno-compromised these local infections can rapidly become systemic and life threatening.

The best management of potential oral infections relies on prevention, regular dental inspection, a high index of suspicion and good nursing care.

Fig. 3. What constitutes a healthy mouth

Healthy mouth

- Ability to masticate food
- Absence of plaque and debris
- Adequate salivation
- Regular cleansing by mechanical means

REFERENCES


Howarth H (1977) Mouth care procedures for the very ill. Nursing Times. 73, 354-355.


