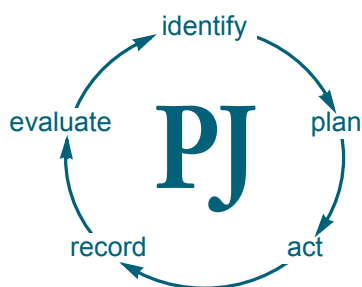


ORAL CARE

(4) ORAL HYGIENE

By Derrick Garwood, BDS

This last article on oral care provides some basic guidelines to help people select suitable dental products and establish a sound routine for maintaining good oral health



identify gaps in your knowledge

1. Can the teeth be cleaned effectively using just a toothbrush and toothpaste?
2. When should a fluoride toothpaste not be used?
3. Can you describe the correct way to care for dentures?

This article relates to the Royal Pharmaceutical Society's core competencies of "appropriate advice" and "health education and promotion" (see "Medicines, ethics and practice — a guide for pharmacists", number 26, July 2002, pp105–6). You should consider how it will be of value to your practice.

Nearly all dental disease is preventable, and by far the most important factor in prevention is an effective daily oral hygiene regimen. The pharmacist is in a prime position to improve oral health, by providing sound advice on good daily practices and recommended oral hygiene products.

GENERAL ORAL CARE

Today's consumer is faced with an array of toothbrushes, toothpastes, mouthwashes and other aids to dental health, and the importance of providing clear advice in this area cannot be over-estimated.

Toothbrushes Teeth should be brushed twice daily. Once should be before going to bed because salivary flow decreases during sleep and its natural cleansing action is correspondingly reduced, but the precise timing of the second brushing is not so important. It is, however, better not to brush within 20 minutes of consuming acidic food or drink (eg, fruit juice or wine), when the enamel is particularly susceptible to wear.

Today, choosing a toothbrush can be a protracted task — which of the many types available is the most suitable? Electric models are not necessarily superior to manual toothbrushes but they do remove plaque more quickly, which means they often produce better results in children, who generally enjoy using them. They can also make life easier for people with arthritic hands or other conditions that adversely affect manual dexterity. There is conflicting evidence about the benefits of the new ultrasonic toothbrushes; some studies demonstrated greater plaque removal using less pressure, but others found no performance gain over conventional toothbrushes, and claims that ultrasonic brushes could remove plaque 4mm to 6mm beyond the bristle tip were not substantiated. Patients are generally more enthusiastic about using these brushes, however, and this could bring about improvements in oral hygiene.

The best design for a manual toothbrush is a highly contentious (and unresolved) issue within the profession, but Panel 1 lists some widely accepted principles. Toothbrushes should be changed as soon as the bristles start to splay outwards — for most people this happens after about 10 weeks

There are almost as many toothbrushing methods as models of toothbrush, and most dental practitioners have their own particular favourite. For this reason, it is probably best to suggest that customers consult their dentist or hygienist, to avoid giving conflicting advice. Whichever method is employed, it must ensure that every accessible surface of every tooth is cleaned without damaging the teeth or soft tissues.

Toothpaste Toothpaste accounted for 69 per cent of the sales of oral hygiene products in 2001. The enormous reduction in caries seen over the past 20 to 30 years results largely from the introduction of toothpaste containing fluoride (usually in the form of sodium monofluorophosphate, with or without sodium fluoride), which converts the calcium hydroxyapatite in enamel to calcium fluoroapatite.

PANEL 1: PRINCIPLES FOR CHOOSING A MANUAL TOOTHBRUSH

- Nylon bristles are better than natural bristles, which soften when wet and readily harbour bacteria
- Medium texture bristles are appropriate for most people; soft bristles are less effective at removing plaque, while hard ones may not only damage the gums but also abrade the teeth if used too enthusiastically
- A straight rather than an angled handle is easier to manipulate
- The brush head should be suitably proportioned — small enough to reach awkward areas of the mouth, but large enough to avoid prolonged brushing being required
- Round-ended bristles cause less damage to gums than angular-ended ones

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ate and reduces susceptibility to decay. As a general rule, people should always use a fluoride toothpaste unless they live in one of the few areas in the United Kingdom with fluoridated water, or are taking fluoride supplements. Some patients with exposed dentine may have been advised by their dentist to use a desensitising toothpaste, and again they should choose a brand containing fluoride. Anyone purchasing this type of product in an unsanctioned attempt at pain relief should be referred to a dental practice, to establish the specific cause of the problem.

Dental floss Toothbrush bristles are unable to remove plaque from areas directly between the teeth (assuming the contact points are normal) and even the most effective techniques cover only 70 per cent of the tooth surface. These inaccessible areas should be cleaned once a day using dental floss. Patients can check with their dentist about areas of the mouth that need particular attention.

Of the two types of dental floss available, waxed and unwaxed, it is a matter of personal choice which one is used; unwaxed floss splays out, so may be slightly more efficient at removing plaque, but the loose threads this creates are easily torn and may lodge between the teeth.

Correct technique is vitally important here. On no account should an in and out movement be employed because this can damage the periodontal ligament and severely traumatise the gums. A taut length of floss should be gently introduced into the space between two teeth and moved up to the gumline. Here it is curved into a C-shape around one tooth and slid up between gum and tooth until resistance is felt, then held tightly against the tooth and moved vertically up and down several times to remove plaque. The process is repeated for the adjacent tooth and then for the interstices between the other teeth. Providing an adequate length of floss is taken (about 30 cm), it is easy to change the section used for cleaning once it becomes soiled. On completion, the mouth should be vigorously rinsed with water or mouthwash. It is common for people who are new to flossing to experience bleeding gums afterwards, but this should stop if a good technique is developed. Frequent bleeding is a sign of inflamed gums and professional advice should be sought. For people who find flossing difficult, floss in a special holding device can be purchased.

Mouthwashes Mouthwashes contain antiplaque agents such as chlorhexidine gluconate, triclosan, cetylpyridinium chloride and peroxide. Chlorine dioxide is an ingredient claimed to reduce bad breath by eliminating sulphur compounds. Many mouthwashes also contain fluoride.

Disclosing agents Plaque *in situ* is normally invisible unless present in gross quantities. Disclosing agents are vegetable dyes in the form of liquids or tablets that stain the plaque and thus provide a useful measure of the effectiveness of an oral hygiene regimen. They can be used before brushing and flossing, to show the user the areas on which to concentrate, or afterwards, to check that all the plaque has been removed. It might be prudent to warn people that these products stain clothing if accidentally dribbled, and that their lips may be stained for some time afterwards.

Fluoride tablets Fluoride is proved to prevent dental caries, and there are several theories about its mechanism of action. It has been suggested that fluoride is important in the remineralisation of enamel and that it inhibits bacterial enzymes that convert sugars to acids. Fluoride is effective both topically and systemically. In a few parts of the UK, drinking water contains measurable concentrations of fluoride, because either the water has a naturally high fluoride content or it is artificially fluoridated.



Sugar-free products should be recommended over their sugar-containing equivalents where possible

Dentists may recommend oral fluoride supplements to children living in areas where the concentration of fluoride in water is less than 0.7 parts per million, but too much can lead to dental fluorosis, which causes mottling and discoloration of the teeth. Fluoride tablets should be taken in the evening and sucked or dissolved in the mouth. Fluoride mouthwashes and gels are also available, but caution is needed, especially with children, to avoid swallowing any excess. Topical fluoride varnishes can be applied by the dentist.

The quality of public water supplies is regulated by the Drinking Water Inspectorate (www.dwi.gov.uk/). A map compiled by the DWI, showing the concentration of fluoride in public water supplies across the UK in August 2002, can be found at www.defra.gov.uk/enviro

[nment/statistics/des/inlwater/iwfg06.htm](http://www.defra.gov.uk/enviro).

However, boundaries of the area receiving a particular supply can change and fluoridation at some works can be suspended (eg, when equipment is renovated or replaced), so up-to-date information should be obtained from the water company. Pharmacists are encouraged to familiarise themselves with the British Dental Association's recommendations for fluoride supplementation and find out the fluoride content of water in their area.

Diet Most people know that a significant determining factor in caries development is the amount of sugar in the diet. Sugar consumption also affects oral health by increasing the thickness and rate of formation of plaque, the primary factor in the development of periodontal disease. Plaque on teeth is composed mainly of bacteria, which ferment the sugar in food to produce lactic acid, which in turn demineralises tooth tissue. This allows the bacteria to invade the tooth and progressively destroy it, creating a carious cavity. Sugar intake should therefore be moderated and food labels carefully checked — a few surprises are likely to be encountered here (eg, on average, a tablespoon of tomato ketchup contains a teaspoon of sugar).

Even more important is the frequency with which sugar is eaten, because teeth are exposed to lactic acid for approximately 20 minutes on each occasion, and considerably longer if the food containing it is sticky. It is therefore preferable for a child with a packet of sweets to eat them all at once rather than gradually throughout the day.

The greatest benefits are obtained by observing the following guidelines, bearing in mind that refined sugar and unrefined sugar, such as honey, are equally damaging:

- Overall sugar consumption should be reduced as much as possible
- The frequency of sugar consumption should be minimised
- Sticky, sweet foods should be avoided because they adhere to teeth and prolong exposure to bacterial acids
- Snacks should be savoury
- Fruit and vegetables should be eaten in preference to cakes, biscuits and confectionery
- Where sweetening is unavoidable, non-cariogenic sugar substitutes such as sorbitol and mannitol should be used
- Any necessary medication should be sugar-free

Pharmacists could try to raise awareness of the sugar content of over-the-counter and prescription-only products. For example, they could recommend the purchase of sugar-free liquid medicines (eg, Calpol sugar-free, sugar-free simple linctus, Pavaodol D) and throat lozenges (eg, Strepsils sugar-free and Bradosol) rather than their sugar-containing equivalents. Pharmacists might also check that prescribers are aware of sugar-free alternatives to prescription-only medicines.

The consumption of acidic soft drinks such as fruit juices and carbonated beverages has greatly increased over the past few years,

especially among young people. One direct consequence has been a corresponding rise in the incidence of tooth erosion, ie, the irreversible loss of tooth tissue caused by a chemical process not involving bacteria. Lesions start as concave enamel defects with a highly polished appearance and progress into the dentine, so that a major loss of tooth structure can result.

Tooth erosion is now a major concern for the dental profession. The key to halting the erosive process is reducing exposure to acidic drinks. Pharmacists can explain the benefits of reducing overall consumption, limiting consumption to meal times, chilling drinks (to slow the rate of reaction between acid and tooth tissue) and using a straw. People affected should use a soft or medium toothbrush and a low abrasive toothpaste, and always avoid brushing within 20 minutes of eating or drinking. Once erosion has stopped, any badly affected teeth can be restored with fillings, veneers or crowns.

Regular check ups Although the single most important measure to prevent dental disease is home oral hygiene, regular dental check-ups are necessary in order to identify and treat problems as soon as possible. In the early stages, both caries and periodontal disease are reversible, but the treatment of caries becomes more complex and extensive the longer tooth destruction is allowed to continue. Check-up appointments also provide the opportunity to plan and carry out treatment, such as applying fissure sealant or straightening crooked teeth, at the optimum time.

Mouthguards The number of recreational injuries to the teeth each year is high. Anyone taking part in a contact sport should wear a mouthguard covering the upper teeth and jaw, not only to protect the dentition but also to help prevent more serious injuries such as concussion and jaw fractures.

Cheap plastic mouthguards are available from sports shops, but are relatively ineffective and lack retention, so have to be held in place by biting the teeth together — not ideal when playing a strenuous game. A better alternative is the thermoplastic mouthguard, which is softened by immersion in boiling water and moulded in the player's mouth using finger, tongue and biting pressure. However, these are often ill-fitting and bulky, and it is difficult to achieve an adequate thickness of material over the teeth. The best approach is to have an individual mouthguard constructed by a dentist; not only will this provide the best comfort and stability without affecting speech or breathing, but the design can take into account the sport being played, any previous dental injuries and the need to allow for orthodontic treatment or erupting teeth.

Once acquired, the mouthguard should not be left in the sports bag to grow mildew, but should be washed thoroughly after use in warm soapy water and then soaked in mouthwash, before being stored in a well-ventilated plastic box away from any sources of heat.

CARE OF DENTURES

Denture fitting was covered in the second article of this series (*P7*, 19 April, p551–3). Dentures are almost certainly the most widely abused medical device. Some of the following guidance may appear to be common sense, but the examples cited are all based on clinical experience.

When not being worn, dentures should be kept in cold water to avoid distortion and loss of fit. Hot water should not be used because it can cause warping. Merely soaking in effervescent cleansers is not sufficient to maintain dentures in a hygienic condition, and prolonged use of these products can lead to the development of minute cracks over the highly-polished plastic surface ("crazing") which adversely affects their natural appearance.

It is essential to brush dentures thoroughly once or twice a day. Soap and water is perfectly adequate for this, but denture toothpaste tastes better. Most practitioners have encountered dentures where both gum and tooth have been reduced to a uniform grey/cream colour by repeated immersion in sodium hypochlorite, a common ingredient of harsh domestic cleansers, disinfectants and bleach. On no account should ordinary toothpaste be used, because it is too abrasive and will damage the denture surface. Hard brushes should also be avoided and either a soft toothbrush or a denture brush used. Brushing should be carried out over a bowl of water or other soft

action : practice points

1. Recommend the purchase of sugar free liquid medicines and throat lozenges, rather than their sugar-containing equivalents, and speak to prescribers to make sure they are aware of sugar-free alternatives to prescription-only medicines.
2. Read the British Dental Association fact file on toothbrushes and tooth brushing at www.bda-dentistry.org.uk/pdfs/toothbrush.pdf
3. Use a disclosing agent to evaluate the effectiveness of your own oral hygiene regime.

evaluate

How could your learning have been more effective?
What will you do now and how will this be achieved?

surface in case the dentures are accidentally dropped, this being a major cause of breakages. Ultrasonic cleaners are available, but they are no substitute for daily brushing. Even if people take good care of their dentures, it is a good idea to brush their gums, tongue and palate with a soft brush, especially before putting their dentures in each morning.

The mouth changes with age (eg, gums shrink) and dentures may become loose as a result. This can cause soreness and ulceration, so loose dentures need to be replaced. Dentures also suffer from normal wear and may need repair or relining. There is a tendency for patients to use anything at hand that is vaguely sticky to effect repairs themselves; personal experience extends to fish glue, carpet adhesive and epoxy resin. People who have broken their dentures should be strongly advised not to attempt repair themselves but should be referred to a dental laboratory. Aligning the broken fragments correctly is often impossible without a plaster cast because they tend to move while the repair is setting. Consequently, the denture becomes unwearable and a new one has to be constructed.

ORAL HYGIENE FOR CHILDREN

The age at which teeth erupt is variable but, in general, deciduous teeth begin to erupt at six months of age, with the first molars erupting at 12 months and the canines at 24 months. However, eruption dates are variable and if parents are concerned that their child's teeth appear six or nine months later than those of their contemporaries, tell them not to worry.

Between the ages of six and 12, the primary teeth are lost and replaced by adult teeth. If a primary tooth is retained for more than 18 months after it would normally have been shed, the dentist will take an x-ray to see if the permanent successor is absent. If so, every effort will usually be made to conserve the deciduous tooth. If the successor is present, it may be necessary to extract the tooth to allow the permanent tooth to erupt.

It is a good idea to begin cleaning children's teeth as soon as they appear. Young infants may object to having their teeth brushed and rubbing with a toothpaste-impregnated flannel may be more acceptable. Promoting dental health to young children will help instil good oral hygiene routines for life. They should start visiting the dentist as soon as possible, to familiarise them with the experience long before any treatment is required. In addition, tooth brushing should be made into a fun habit rather than a chore by allowing them to choose their own toothbrush or by using disclosing agents.

Most children cannot brush their own teeth satisfactorily until they are about six years old, unless they are using an electric toothbrush. Even in older children the effectiveness of their routine should be checked occasionally using a disclosing agent. Parents must also ensure that the amount of toothpaste used is no more than the size of a small pea, because up to 70 per cent of it may be swallowed, increasing the risk of fluorosis and consequent mottling of enamel.