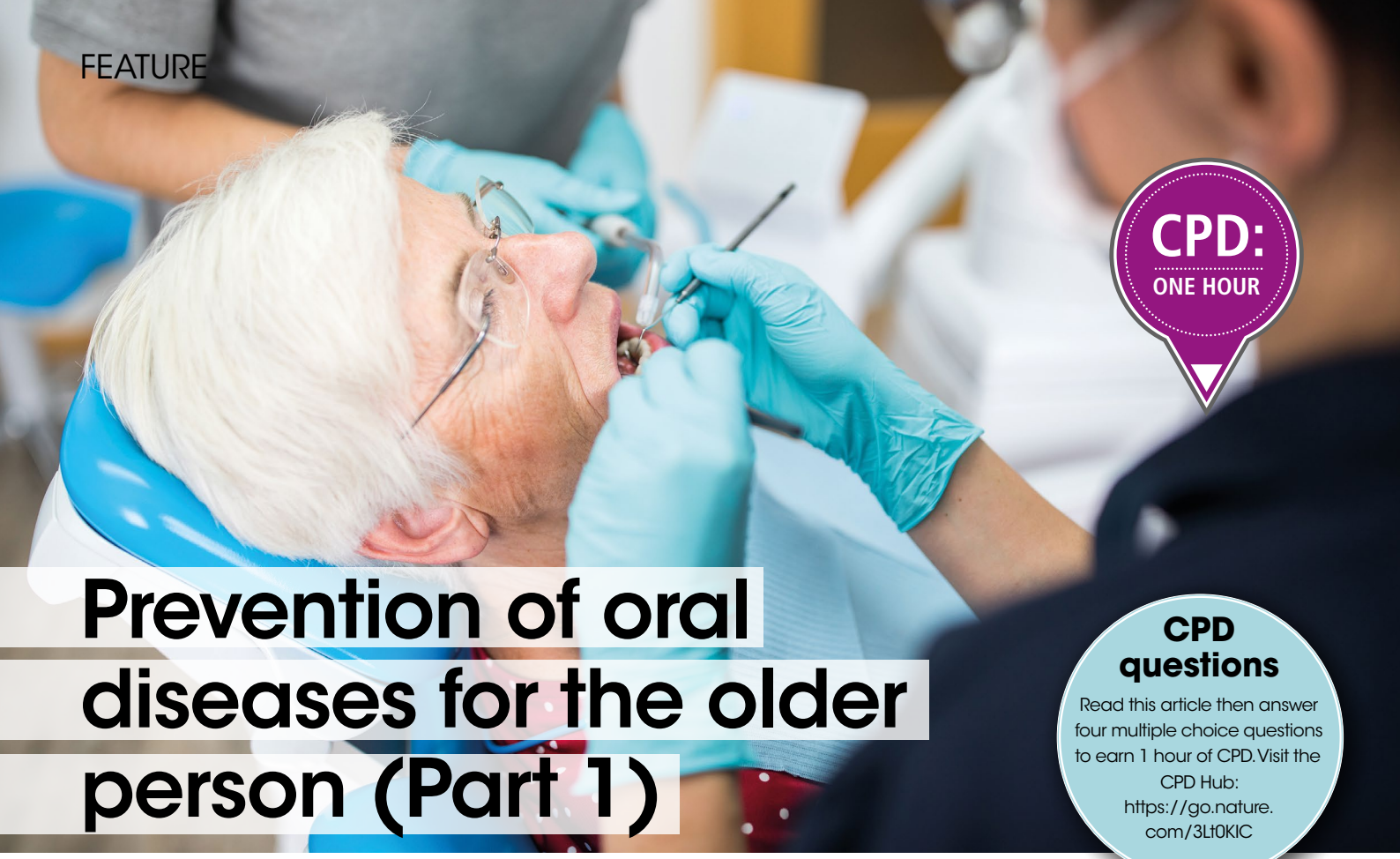

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Prevention of oral diseases for the older person (Part 1)

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Adapted from a chapter of a *BDJ Clinician's Guide*, **Rosalyn Davies**[1] and **Mili Doshi**[2] look at the main reasons for oral health deterioration in older people and its impact, and the role of dental care professionals.

Abstract

Older adults often experience poorer levels of oral health than younger adults, especially if they have become dependent on a third party to support their daily oral care routine. However, the deterioration of oral health does not need to be a part of the ageing process. Most oral diseases are largely preventable with the daily removal of dental plaque that forms on teeth and dentures, using a fluoride toothpaste, eating a healthy diet and reducing any tobacco consumption. The dental team have a duty of care to ensure that older people receive evidence-based oral health preventative advice tailored to the individual, taking into account individual risk factors that can increase with age. This can include the clinical application of topical fluoride and minimally invasive dentistry. Older people at an increased risk of poor oral health include those with cognitive conditions, physical impairments and certain medical conditions. Care home residents face particular barriers to attaining a satisfactory standard of oral care which are discussed herein. Good oral health preventative routines must be established early after the diagnosis of progressive chronic conditions and will help to prevent the need for dental intervention later in life when treatment can be more difficult to tolerate. Inclusion of oral health prevention within health policy and legislation is necessary to improve the oral health for older people living in all health and care settings.

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Introduction

Prevention of oral diseases should be lifelong, starting from childhood, and adapt with ageing, factoring in changes in medical health, dietary intake, cognition and manual dexterity. The impact of poor oral health on the general health and wellbeing in the older population is significant, so focusing on prevention for this group is important. Caries and periodontal disease, the two most common oral health conditions, are largely preventable through interventions including a low sugar diet, use of a fluoride toothpaste and effective daily oral hygiene. Prevention can slow down the progression of dental diseases that can lead to pain and infection and the need for dental intervention later in life when people may be frailer and find treatment more difficult to tolerate.[1] With older age, risk factors for oral diseases increase, including a dry mouth, dietary changes and reduced manual dexterity.

There has been a considerable transformation in the epidemiology of edentulism over the last century, with people retaining their teeth into later life due to positive oral health changes, including access to fluoride toothpaste and advances in clinical dentistry.[2,3] The number of people wearing complete dentures has decreased and continues to do so.[4] Today's older population will have increasingly undergone more restorative dental care, including endodontics, crowns, bridges and implants throughout their lifetime. Heavily restored teeth require a meticulous oral care regime to maintain in a healthy condition, together with regular reviews with dental professionals. Xerostomia, periodontal disease, dental caries (especially root surface), tooth surface

Table 1 Prevention framework

Primary (improving overall oral health of the population)	Secondary (disease detection)	Tertiary (restoring function and reducing impact of disease)
Fluoride toothpaste	Oral health screening	Restoration of teeth
Oral hygiene advice	Periodontal screening	Replacing missing teeth
Dietary advice		
Smoking and alcohol advice		

loss, advanced tooth loss, denture-related issues, mucosal lesions and oral cancer are more prevalent with increasing age.[5] The dental team needs to work closely with other health care professionals and care providers to raise awareness of the need for pro-active support with mouth care and regular dental attendance, and this is especially important in the early diagnosis stage of any chronic health condition.[6]

The first part of this chapter focuses on the main reasons for oral health deterioration in older people and its impact. The second part provides practical advice on supporting older people with their oral care.

Impact of poor oral health on general health and wellbeing in older adults

Understanding of the consequences of poor oral care amplifies the importance of good oral hygiene and dental care.[7] Poor oral health can cause enduring dental pain and infection and can lead to problems with eating and drinking, resulting in nutritional deficiencies and increasing frailty.[8] Poor dental appearance, for example, broken teeth, lost or ill-fitting dentures, or halitosis, can result in low self-esteem, particularly in social situations centred around food.[9,10] Some older people may find it difficult to communicate when they have dental problems, for example, in people with advanced dementia, and oral pain can lead to behavioural changes, including decreased food intake, changes in sleeping habits and increased agitation and restlessness.[11]

Oral health prevention and the role of dental professionals

Prevention aims to inhibit either the onset or the progress of a disease or to restore function lost due to disease. The framework of primary, secondary and tertiary prevention according to the stage of disease that Leavell and Clark proposed in the 1940s[12] has been widely used to help attain this goal and can be applied to oral health (Table 1). Primary prevention includes the provision of information to help individuals make informed choices about their health-related behaviour and strategies to reduce the risk factors associated with developing disease. Secondary prevention strategies include those that detect disease early and intervene to prevent its progression. Tertiary prevention strategies include those that reduce morbidity by restoring function and reducing disease-related complications.

All members of the dental team have an important role in delivering person-centred oral health preventative messages. Most older adults will continue to be able to carry out effective oral hygiene as they get older independently; however, they should still be advised on age-related changes in the mouth. For example, periodontal disease may mean that gaps between teeth become larger and there is a greater need for interdental cleaning with interdental brushes rather than using dental floss.

> *'All members of the dental team have an important role in delivering person-centred oral health preventative messages'*

Oral health prevention can be provided verbally and in written form for older people considering sensory impairments and memory issues. There has been an increase in the use of digital technology, including smart phone apps as part of health communication, and teledentistry (the use of health information technology and telecommunications) has an increasing role in delivering preventative oral care advice in the older population where regular access to dental clinics can be a problem.[13]

There is strong evidence that fluoride can reduce the incidence of dental caries, and while most of the research to date has been conducted in children and younger adults, there is growing evidence of the benefit of fluoride for prevention in older people. The quarterly application of fluoride varnish in conjunction with daily oral cleaning has been shown to reduce the risk of developing caries in older people in care homes.[14] High fluoride toothpaste (5,000 ppm) has been found to be more effective than standard toothpaste in reducing root surface caries and can be considered an alternative option when it is not possible to restore a tooth, for example, poor compliance with dental intervention.[15] There has been increasing interest in silver diamine fluoride (SDF) as a preventative treatment to arrest caries, notably root caries in older people.[16] Treatment with SDF requires minimal instrumentation and application at less frequent intervals than other caries preventive materials. It can be particularly beneficial in older people who face increased challenges accessing dental services, or for those with frailty to avoid more invasive dental treatment. In all cases, fluoride should only be prescribed or applied when there is a benefit in doing so, for example, in an older person with a dry mouth and carious lesions. Topical chlorhexidine has been suggested to reduce caries as it is bactericidal and could inhibit Streptococcus mutans; however, the evidence for this is weak so far[17] and it is not recommended for routine use.

Minimally invasive dentistry (MID) is discussed in Chap. 6 and is part of tertiary prevention. The availability of adhesive restorative materials and increased understanding of dental caries means that MID is a good option, especially for frail older people who may find it more challenging to regularly attend dental appointments.

The Delivering better oral health (DBOH) toolkit[18] provides clear, evidence-based oral health improvement interventions and updated advice to help dental teams promote oral health to prevent oral disease. It is intended for use by the whole dental

team throughout primary dental care and other health and social care workers. DBOH recommends that older people visit a dentist every 3–24 months, depending on the individual's risk status. However, older people, especially those living in care settings, often face increased barriers in accessing dental care as highlighted in the Care Quality Commission's (CQC's) report Smiling matters.[19]

Individual related risk factors for poor oral health in the older adult

Individual related oral health risk factors include both behaviours and biological determinants; many of these factors are also common to several chronic systemic diseases. Therefore, oral health prevention can simultaneously benefit both oral health and general health. Risk factors include the following.

Socioeconomic status

In older adults, there are social gradients in the prevalence of dental caries, tooth loss, oral cancer, self-rated oral health quality of life, oral hygiene and dental service use. Older adults with a lower income and level of education have poorer levels of oral health, with higher rates of caries, periodontal disease, increased tooth loss and more removable compared to fixed prostheses.[20]

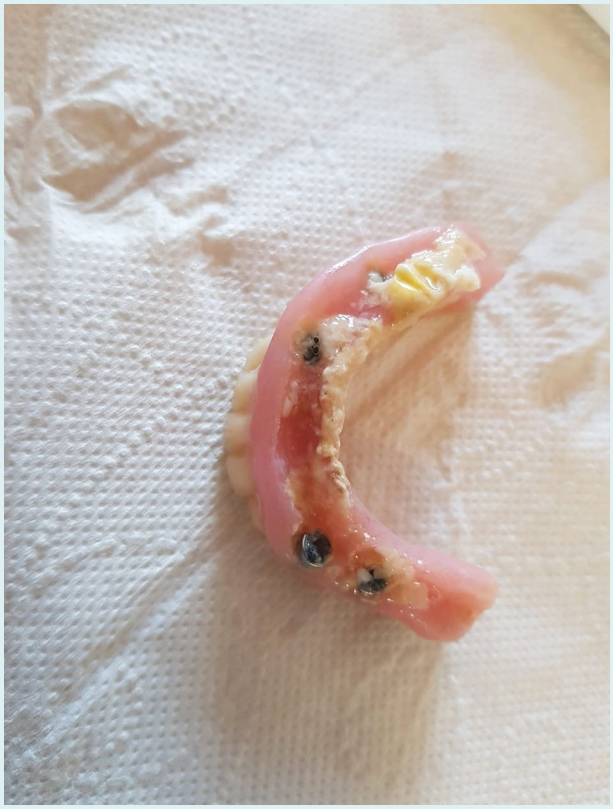
Frailty and increasing need for support

Frailty is discussed in detail in Chap. 4. It is a separate entity from ageing and is defined as 'a dynamic state affecting an individual who experiences losses in one or more domains of human functioning (physical, psychological and social), which is caused by the influence of a range of variables and increases the risk of adverse outcomes'.[21] As the level of frailty increases, the ability to carry out oral hygiene independently decreases. Motivation and the priority to maintain good oral health can also be impacted. Dental attendance can become more irregular leading to increased attendance only when having symptoms. Although people can move in and out of phases of dependency or frailty, there is an association with increased frailty and having fewer teeth and a dry mouth.[22]

Diet and nutrition

A balanced diet is very important for older people to ensure essential nutrient intake. As part of ageing, muscle mass decreases and metabolic rates declines, and there is an increase in multimorbidity that can lead to decreased appetite and impaired nutrient absorption. Oral health status is closely integrated with eating; dry mouth, loss of teeth and ill-fitting prostheses can impact masticatory function and avoidance of hard food, leading to an increased intake of soft cariogenic carbohydrates.[23] Oral nutritional supplements (ONS) are often advised for older people who are unable to meet their dietary requirements through oral diet alone or who have dysphagia. ONS come in various types, including juices, milkshakes, high-energy powders, soups and cereal bars. Many ONS have a high sugar content and can increase the risk of developing dental caries. Furthermore, there is a trend towards more liquid medication, particularly in relation to end-of-life care. It is important to respect the balance and need for calorific intake against the caries risk and preventative advice should be given, including frequent mouth care and regular exposure to fluoride. It will not always be practical or appropriate to consider alternatives to these sugar- based supplements because of more pressing health concerns, and, in such cases, greater emphasis should be placed on prevention and regular dental reviews.

Fig. 1 Food debris on implant-retained denture



'It will not always be practical or appropriate to consider alternatives to these sugar-based supplements because of more pressing health concerns'

Tobacco and alcohol use

Modifiable risk factors such as tobacco and alcohol intake (particularly when excessive) are the leading cause of cardiovascular disease, diabetes, cancer, cognitive decline and dementia.[24] Smoking is a major risk factor for periodontal disease. Despite a marked decline in smoking behaviours over the last few decades, around ten million adults in the UK still smoke and 11% (1.1

Table 2 Types of residential settings

Type of residential home	Type of care
Residential homes	Provide support for personal care, such as washing, dressing, taking medication and going to the toilet. They may also offer social activities such as day trips or outings.
Nursing homes	Provide personal care as well as assistance from qualified nurses. Sometimes called care homes with nursing.
Care homes with dementia care	Designed to make people with dementia feel comfortable and safe.
Dual-registered care homes	Care for residents who need both personal care and nursing care. This means that someone who initially just needs personal care but later needs nursing care won't have to change homes.
Palliative care	Palliative care provides specialist care for those suffering from an incurable, terminal illness and aims to control pain and relieve symptoms.
Respite care	Short-term care and holiday care, short breaks, and day-care facilities for those who are usually looked after by a family member or a professional home carer.

million) are over the age of 60.[25] Smokers who quit after the age of 65 benefit from reduced mortality (2–4 extra years of life) and reduced morbidity, so there are clear benefits.[26] The incidence of oropharyngeal cancer increases with any level of alcohol consumption or tobacco use.[27] The duration of smoking is more important than the frequency; smoking fewer cigarettes per day over a longer number of years has a higher risk for oral cancer than more cigarettes per day over fewer years. Smokeless (chewing) tobacco, often used as a component of betel quid, and betel quid without tobacco (for example, betel quid and areca nut) are associated with an increased risk of oral cancer.[28] Supporting smokers to quit is a prevention priority in the NHS Long Term Plan[29] and every health and care professional has a role to play, including the dental team. As many of the adverse effects of tobacco use on the oral tissues are reversible, stressing their impact on oral health may provide a useful means of motivating patients to quit. Quitting smoking is the best thing a smoker can do for their health and the benefits of stopping begin almost immediately. DBOH[18] provides comprehensive advice on effective interventions to support people to reduce smoking. It describes asking about smoking, providing very brief advice, acting on the patient's motivations, signposting to local services, and pharmacotherapy. E-cigarettes or vapes have been found to help smokers stop smoking, and although less harmful that cigarettes, do still have some risks.[18]

Many older adults, both in the UK and internationally, drink at hazardous or harmful levels.[30] For alcohol consumption, frequency is more important than duration – higher consumption (more than three drinks per day) over a few years has a higher risk for oral cancer than a lower intake over many years.[31] There is evidence that the dental team can play an important role in identifying older adults with alcohol risk factors and support them to reduce alcohol consumption.[18]

Dementia and cognitive impairments

Dementia is discussed in detail in Chap. 10. People living with dementia are at an increased risk of developing oral diseases,[32] often as a consequence of a decline in memory, self-care, or motor skills.[33] People with more advanced cognitive decline have been found to have the highest increase in plaque levels, underpinning their higher risk of oral diseases.[34]

Physical impairment

People living with a physical disability experience poorer oral health due to barriers accessing dental services and maintaining effective oral hygiene. With an ageing population, many people grow older with physical disabilities they were born with or acquired when they were younger, such as muscular dystrophy, multiple sclerosis, or spinal cord injury. The incidence of physical disabilities, including Parkinson's, Huntington's disease and stroke, increase with age. A physical impairment that affects the hands and arms, such as arthritis and paralysis, will inevitability affect an individual's manual dexterity for effective oral care, which will in turn negatively impact their oral health status. Patients who have had a stroke are likely to have a long-term physical impairment, with more than one-third of stroke patients reporting difficulty with toothbrushing.[35] Furthermore, the physical weakness, lack of coordination and the cognitive problems that can accompany a stroke may prevent a person from maintaining good levels of oral hygiene independently.[36] Figure 1 shows an implant-retained denture that belonged to an individual in a rehabilitation care home who, after having a stroke, did not have the manual dexterity to remove and clean it independently. The nursing team did not feel confident and adequately trained to remove the implant-retained denture.

Dry mouth

A dry mouth as a result of xerostomia or hyposalivation is more prevalent in older people and can profoundly affect quality of life and oral health. Xerostomia is the subjective feeling of oral dryness, while hyposalivation is an objective symptom of decreased salivary flow rate.[37] These symptoms may impair speaking, chewing, tasting and swallowing and may affect the quality of life.[38,39] Individuals who complain about xerostomia with a low or altered salivary flow may be at a higher risk of dental caries, periodontal disease, dental erosion, mucosal ulceration, oral candidiasis, dysgeusia, and dysphagia.[40] An older person may experience pain and soreness and a dry mouth can impact denture retention and stability. The most common cause of hyposalivation is prescription and non-prescription medications. Sreebny and Schwartz reported that 80% of the most commonly prescribed medications cause xerostomia, with more than 400 medications[41] associated with salivary gland dysfunction as an adverse side effect. Older people are much more likely to take multiple medications and are at increased risk of dry mouth. Other causes of dry mouth include dehydration, oxygen therapy, systemic diseases such as diabetes, Sjogren's disease, and the side effect of head and neck radiotherapy.

Dysphagia

The prevalence of dysphagia (swallowing difficulties) in the general population is 16–23%, increasing to 27% in those over 76 years of age, and is higher in the presence of neurological diseases, such as dementia, Parkinson's disease or stroke.[42] People with dysphagia may be on modified diets, oral nutritional supplements or be non-orally fed via an enteral route. Some people may be completely unable to swallow or may

have trouble safely swallowing liquids, foods, or saliva. The reduced oral clearance negatively impacts oral health, increasing the risk of caries, periodontal disease, Candida infections, and potentially aspiration pneumonia.[43]

Oral health inclusion in policy and legislation

The impact of poor oral health on an individual's general health and quality of life is often poorly recognised outside the dental profession. Oral health policies are frequently produced separately from overall health policies. This results in oral health and mouth care being considered in isolation from the rest of general health and personal care, which gives it a low priority.[44] Oral health should be prioritised as an essential determinant of health care and given the same importance as other determinants of health, including nutrition, hydration, tissue viability and falls. The importance of oral health needs to be a greater priority within the multidisciplinary team that care for older people, including medical teams, nursing teams, allied health care professionals and importantly, within social care.[45,46] One positive example of oral health inclusion within guidance in England is the Enhanced health in care homes (EHCH) framework.[47] EHCH is part of the 'ageing well' branch of the Long Term Plan to ensure that people living in care homes receive the same level of health care and support as those living in their own homes. The implementation framework advises on best practices in all aspects of care, including an oral health assessment within seven days of admission.

Oral health for dependent adults in care homes, hospitals and their own homes

Most older people in industrialised countries will continue to live in their own homes and continue to care for themselves. However, many older adults with chronic illnesses, frailty, or increased levels of dependency will reside long-term in residential care or short-term in hospitals, hospices, or rehabilitation units, all requiring varying levels of support in all aspects of life. In all these settings, oral care had been found to be suboptimal, leading to poorer oral health for vulnerable older adults.

Oral health in care homes

The number of older people living in care homes is increasing. The number needing community or residential care in the UK will rise to 1.2 million by 2040 – almost double the 2015 rate.[48] There are different types of care settings based on an individual's need that may change with time when people require different levels of support (Table 2).

Fig. 2 Deteriorating oral health for a resident in a care home

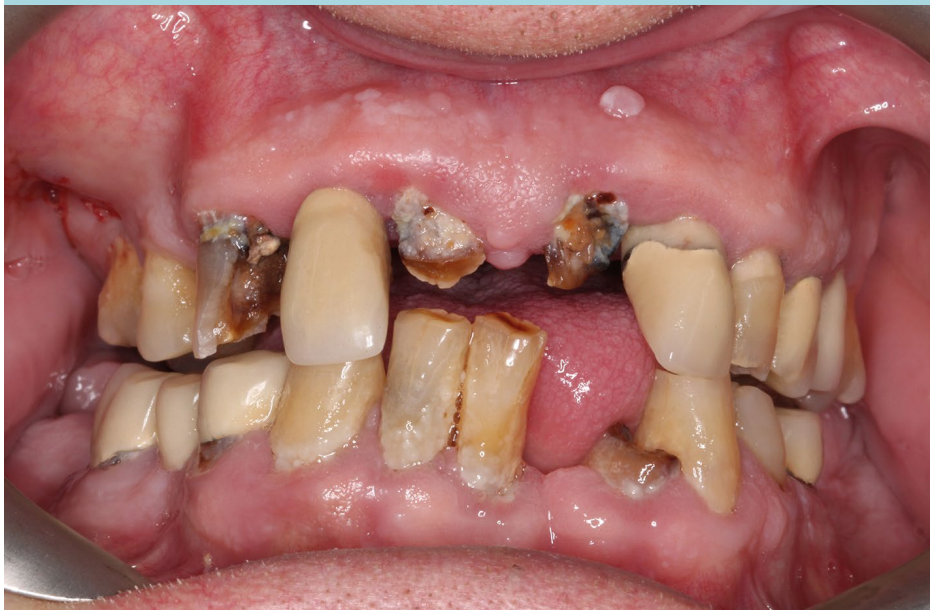
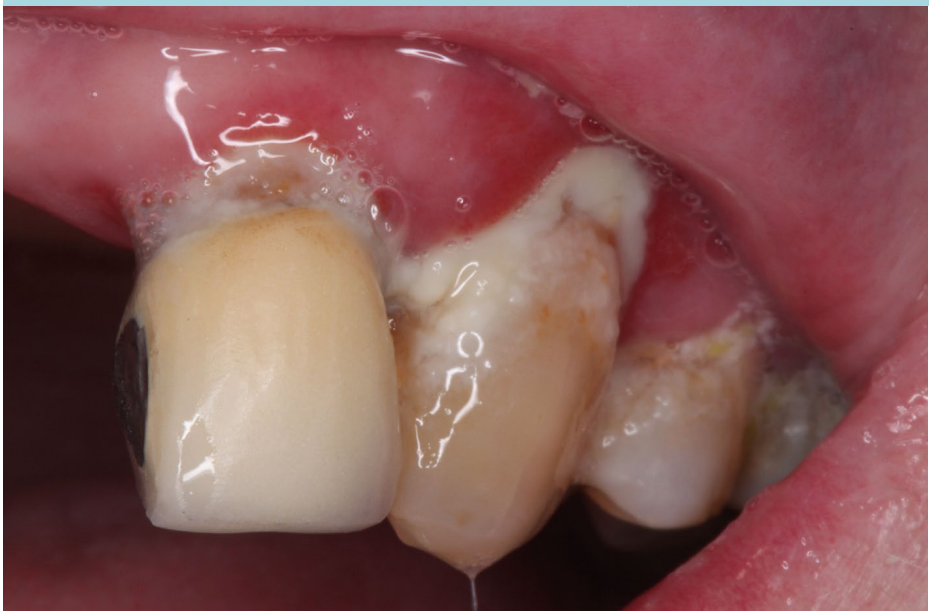


Fig. 3 Inadequate oral care leading to plaque build-up for a care home resident five weeks after admission



When people move into a care home, a person's diet and oral care regime changes and a combination of poor oral hygiene, frequent sugar intake and dry mouth can lead to the dentition deteriorating rapidly (Fig. 2, Fig. 3). Dry mouth, periodontal disease, caries and dental infections are more common in older people in care homes[49] and can be debilitating for those already living with frailty. Barriers to good mouth care support for care home residents include care-resistant behaviour (opposing the action of the care giver), time pressures, inadequate mouth care products and lack of knowledge or training for staff.[50]

As discussed earlier in the chapter, a minimal emphasis on oral health training can lead to mouth care being given a low priority. The Care Certificate curriculum released[51] in 2015 in England for healthcare assistants and carers who work in hospitals and social care omits mouth care from the agreed standards. This undoubtedly contributes to the perception that oral care is a low priority rather than an essential part of holistic patient care.

The National Institute for Health and Care Excellence guideline NG48,[52] published in July 2016, recognised the importance of good oral care for care home residents and recommends that care homes develop policies on oral health, including supporting residents to access dental services, undertake individual

oral health-related needs assessments, develop mouth care plans, and provide appropriate levels of staff training. Care home managers and staff have a duty of care to ensure that good mouth care is carried out effectively every day. Care home staff must be suitably trained and skilled to provide support with mouth care. Training should take place at induction and be refreshed throughout their working career. Other multidisciplinary health and care professionals have a part to play and can support care home staff. They include nursing teams, speech and language therapists, dietitians, occupational therapists and pharmacists, and therefore should not be excluded from receiving mouth care training.

Care homes residents can find it challenging to access dental care, in particular, domiciliary dental care and urgent dental care, and this was highlighted in the 2019 CQC Smiling matters report.[19] The lack of dental interaction can mean individual-based prevention is not regularly reinforced and dental diseases are not identified until quite advanced, requiring more invasive management, like extractions rather than restorations.

There are a number of well-advanced oral health initiatives in the United Kingdom working to improve the oral health of older people living in care homes. These include Caring for Smiles in Scotland,[53] Gwên am Byth in Wales[54] and the ROCS (Residential Oral Care Sheffield) project in Sheffield.[55]

Oral health in hospitals

A growing body of evidence has shown that following hospital admission, oral health deteriorates, with an increase in dental plaque, gingival inflammation and subsequent deterioration in oral mucosal health.[56] Poor oral health can affect nutritional uptake and patient recovery, leading to a longer admission and increased frailty. This, in turn, can mean older people are less independent after they are discharged from the hospital. Of particular relevance within the hospital setting is the association between poor oral health and the development of hospital-acquired pneumonia,[57,58] which has a very high mortality rate and can extend a hospital admission by on average eight days. An absence of oral health protocols and policies included within hospital governance indicates that oral health is given a low priority in nursing compared to other aspects of care.[59] A study carried out in 33 trusts in England with 1,576 nursing staff found that 42% of nursing staff had not had training in oral health. The most commonly reported barriers to providing mouth care was lack of patient cooperation (70%) and time pressures (45%).[60] A lack of suitable equipment including toothbrushes and toothpaste is a frequently cited barrier for providing mouth care.[61] Increasing patient complexities and staffing shortages may lead to nurses struggling to have the capacity to support patients with all aspects of their personal care, including mouth care.

Mouth Care Matters[62] and the All Wales National Oral Health Improvement Programme for Patients in Hospital[63] have been introduced into secondary care settings throughout England and Wales to improve oral health standards. Both these programmes provide useful risk assessment and care planning tools. However, it must be stressed that no tool can obviate the need for good nursing care.

'A growing body of evidence has shown that following hospital admission, oral health deteriorates, with an increase in plaque [and] gingival inflammation…'

Oral health at home

The number of older people with complex needs living in their own home with the support of home care services or families is growing. Many older people prefer to stay in their own homes rather than move into a residential setting. Home care can involve paid and non-paid carers, often family members. There is very little evidence on the oral health of people living in their own homes compared to other settings, and more research is needed.

There are many examples of oral health quality improvement programmes for healthcare workers in care environments focusing on improving patient experience and up-skilling staff through training, including small group teaching, simulation and practical hands-on training.[64] However, there is limited evidence of the long-term effectiveness and sustainability of these initiatives. With the ever-increasing financial pressures placed upon health and social care, any intervention ideally needs to improve health outcomes and provide value. There is the potential for oral health improvement programmes to have a cost-benefit when factoring in improved nutritional uptake and the lower risk of oral related infections, but more evidence is needed in this field.[65] Healthcare professionals, including dental care professionals, are often best placed to lead on oral health promotion work and develop and deliver training for non-dental staff in residential settings, hospitals, and carers supporting people in their own home.

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