

Oral disease contributes to illness burden and disparities

Oral health cannot be isolated from physical or mental health and should form part of comprehensive care

Dental disease affects 3.9 billion people worldwide, with untreated caries being the most prevalent condition in the Global Burden of Disease Study 2010.¹ In spite of this, disparities in oral ill health receive less attention than those in other chronic illnesses, even though dental disease is significantly more prevalent and severe in socially disadvantaged and marginalised groups. These include people on lower incomes, those born outside Australia, Indigenous Australians and people with severe mental illness.²⁻⁴ For instance, in comparison with the overall Australian population, Indigenous Australians have 2.77 times the prevalence of untreated dental caries,³ while people with severe mental illness have nearly three times the odds of total tooth loss, the end result of untreated caries and gum disease.⁴

Explanations for these disparities are common across all socially disadvantaged or marginalised groups and include smoking, poverty and reduced access to dental care.²⁻⁴ As with other aspects of physical ill health, high rates of alcohol and substance misuse, smoking and the consumption of carbonated drinks all contribute to poor oral health.²⁻⁴ Dry mouth (xerostomia) is a side effect of many medications, including most antipsychotics, all classes of antidepressants, and mood stabilisers.⁴ In turn, xerostomia increases plaque formation and leads to caries, gingivitis and periodontitis.

Dental disease has more than oral effects

The disability associated with dental disease extends well beyond the mouth. Painful, unsightly dentition or ill-fitting dentures can exacerbate social withdrawal and poor self-esteem, as well as create difficulties with both speaking and eating. As a result, severe tooth loss was associated with the same level of disability as moderate heart failure in the Global Burden of Disease Study.¹ Oral conditions featured prominently in the top 100 causes of disability, and severe periodontitis and untreated decay were the sixth and tenth most prevalent conditions, with each affecting about 10% of the global population.¹ In contrast to other areas, there has been little evidence of improvement in oral health over the past 25 years.⁵

Aside from the localised impacts on quality of life, dental disease is an important source of systemic medical morbidity. The mouth is the site of many infectious and inflammatory illnesses associated with diseases such as diabetes and cardiovascular disease.⁴ Some of these associations may be due to shared risk factors such as smoking, but there are also direct effects of bacterial colonisation. For instance, the aspiration of bacteria increases the risk of pneumonia,⁶ while the abundant vascular supply of the oral cavity facilitates bacteraemia and the spread of both bacterial products and immune



complexes.⁷⁻¹⁰ This can lead to chronic inflammation at distant sites including the liver, pancreas and arteries, initiating or exacerbating underlying diseases such as arteriosclerosis or diabetes.⁷⁻¹⁰ There may also be a link to chronic renal disease, although common comorbidities such as diabetes may act as confounding variables.⁷ Chronic inflammation may contribute to the reported association between periodontal disease and a range of adverse outcomes in pregnancy.¹¹ These include maternal infection, low birth weight and pre-term delivery.

More indirectly, periodontitis is associated with raised cytokine and C-reactive protein levels, possibly mediated through lipopolysaccharides from the outer membrane of gram-negative bacteria.⁸ These compounds are implicated in atherosclerosis and the occurrence of heart disease and stroke.^{8,9} For instance, cytokines facilitate the adhesion of monocytes to endothelial cells and their migration into tissues, the first step in the formation of foam cells and the fatty streaks seen in atherosclerotic lesions.⁸ C-reactive protein also appears to promote the formation of foam cells through an alternative mechanism of triggering complement.⁸

Association does not prove causality and there are methodological problems in some studies, such as the ascertainment of both periodontal disease and the systemic disease. However, further evidence comes from randomised controlled trials that demonstrate changes to markers of systemic disease including glycated haemoglobin assays, C-reactive protein levels and endothelial function following treatment of periodontal disease,^{9,10} although these findings are not universal.¹² Hospital-acquired pneumonia has a clearer relationship to poor oral health, with one in ten deaths preventable through improved hygiene.⁷ Improvements in clinical outcomes are, however, harder to demonstrate as there have only been a limited number of studies and these involve complex chronic diseases with multifactorial aetiologies.¹¹ Nevertheless, improving oral health may still be beneficial even in the absence of a full

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understanding of the underlying mechanisms of a particular disease.⁷ Given international evidence of an association between healthy dentition and life expectancy,¹³ dental disease may contribute to the 10–15-year gaps in life expectancy in people with severe mental illness and Indigenous Australians.¹⁴

Poor oral health contributes to avoidable admissions to general hospital for physical conditions such as diabetes, cardiovascular disorders and respiratory diseases; with appropriate primary medical or dental care, such conditions should not become serious enough to require inpatient treatment.⁴ Avoidable admissions can be divided into those due to acute disorders (eg, epilepsy, cellulitis or dental conditions) and those resulting from chronic diseases (eg, diabetes, chronic obstructive pulmonary disease or hypertension).⁴ Dental conditions are one of the most common causes of acute avoidable admissions, accounting for 20% of these presentations, with the rate among both Indigenous Australians and psychiatric patients exceeding that of the general population.⁴

No physical or mental health without oral health

Oral health cannot be isolated from physical or mental health and should form part of comprehensive care.

At a clinical level, primary health care has an important role in promoting oral health, especially in regional and remote areas where dental services are scarce. Consideration of oral health should form part of a comprehensive assessment of patients at greater risk of dental disease, such as Indigenous Australians and people with severe mental illness. Standard checklists are available that can be completed by non-dental personnel. An example is the contribution of psychotropic medication to xerostomia, a side effect that should be considered in the choice of agent and which requires subsequent monitoring and management.⁴ For instance, agomelatine causes the least dry mouth of all the antidepressants.¹⁵ Following prescription, patients should be checked for lip dryness, halitosis and mouth sores, as well as establishing whether they have any trouble swallowing, speaking, or eating dry foods.

Closer collaboration between primary carers and dentists is also important, with efforts being made to remove psychosocial and financial barriers to care. For instance, dentists may be the first clinician to suspect an eating disorder through observation of the associated oral pathology, while oral hygienists can advise on the use of

artificial saliva (to address xerostomia), mouthwashes and topical fluoride applications.

There is evidence that although poor oral health is common in acute admissions of older people to hospital, little is being done to manage it.⁶ Nursing care plans should include the recording of factors known to cause oral ill health in marginalised populations, such as psychotropic medication and tobacco or substance use, as well as the supply of toothbrushes and denture baths.⁴ After discharge, patient management should include referral to dentists who are willing to see people with complex needs.⁴

At a health service level, dental services need to recognise the specialised needs of disadvantaged groups, such as longer appointment times to allow greater time for explanation, counselling and the performance of procedures. This includes a greater emphasis on cultural safety and exposure to special needs dentistry during training.^{4,5} An example is the partnership between the University of Queensland and Mission Australia to provide dental care for homeless clients. Decision makers should also expand services such as the Dental as Anything program in Melbourne, which offers a collaborative outreach service to people with severe mental illness without charge.¹⁶ This service successfully treated marginalised groups with high rates of dental decay who had previously lacked access to dental care. A further step might be reinstating the Medicare Chronic Disease Dental Scheme, which provided rebates for dental care in people with chronic medical conditions. Another would be greater stability in funding for public dental services.

At a population level, fluoride in the water supply mitigates the gap in oral health between people from socially disadvantaged backgrounds and the general population.^{4,5} Given the effects of dental disease on systemic health, the debate on fluoridation should include consideration of whether it could contribute to overcoming health disparities.

In conclusion, dental disease has more than just oral impacts and is therefore the concern of all health professionals. Further, the risk factors and unequal distribution of burden mirror those of other chronic illnesses, suggesting the need for a common evidence-based approach.

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