

Heart in mouth

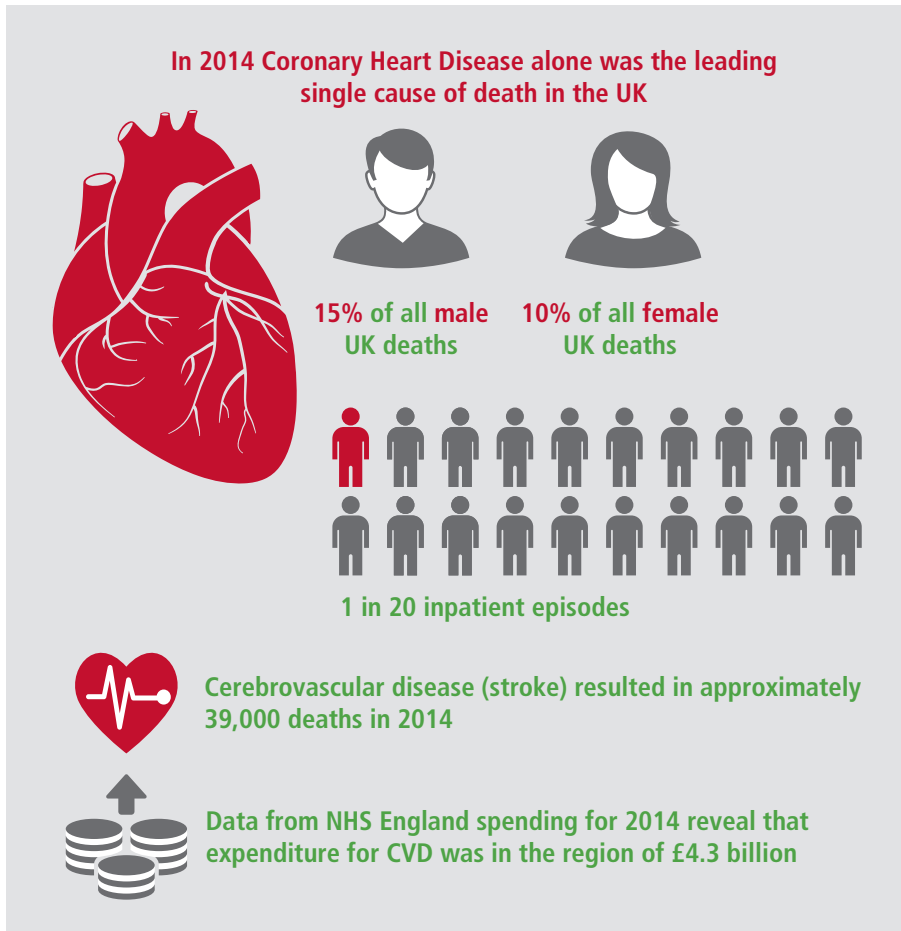
Evidence summary: the relationship between oral and cardiovascular disease
Br Dent J 2017; **222**: 379–383 <http://dx.doi.org/10.1038/sj.bdj.2017.224>

An associative link found between two seemingly unrelated health conditions could have important implications for health services and future research. Indeed, relevant cross referrals and risk assessments, promoted by cooperation across disciplines, could reduce the incidence and improve the prognosis of the diseases in question, whilst also facilitating further research into possible associative links. Might there be a relationship between oral health and atherosclerotic cardiovascular disease? And if so, could an awareness of the relationship affect patient care and health outcomes?

This *BDJ* paper reported on a review in the hope of aiding the work of health practitioners, policy makers, and teams within Public Health England. The review aimed to explore the most contemporary evidence on whether poor oral health and cardiovascular disease ▶▶



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Author Q&A

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Why use a rapid review to look at this topic?

In general, rapid reviews, in comparison to systematic reviews, are conducted quickly, may include broad questions and provide a descriptive summary of the data; thus, an overview of the contemporary evidence in a timely. We wanted to address broader questions across four key areas, and also to be able to engage colleagues who might not otherwise have time to contribute to a systematic review.

How do you see your findings being used in the future?

It is important to stimulate debate and action in support of holistic healthcare as well as informing the direction of research. ■

« co-occur in individuals or populations, and to consider the implications of such co-occurrence. Undertaken by a group comprising of consultant clinicians from medicine and dentistry, public health professionals, trainees, and academics, the review employed a streamlined rapid review process of meta-analyses published between 2005 and 2015. The relevant data were then synthesised accordingly, and the results were promising.

It was found that a number of systematic reviews of observational studies support an association between periodontitis and atherosclerotic cardiovascular disease, independent of known confounders. One review found this association to be stronger in younger patients compared with older patients, and in males compared with females. It was also found that patients with chronic periodontitis had an increased risk of developing coronary heart disease, and that periodontitis was associated with an increased risk of stroke.

Meanwhile, tooth loss was found to be associated with an increased risk of coronary heart disease and stroke. Indeed, patients with fewer



teeth are more likely to suffer cardiovascular disease and cardiovascular-related death, and stroke patients have a significantly worse oral health-related quality of life than patients who have not suffered a stroke.

An awareness of these associations could be of benefit to healthcare professionals diagnosing and managing oral and cardiovascular disease. For example, dental professionals could offer health promotion advice and signposting to patients presenting with chronic periodontitis in the presence of cardiovascular

disease risk factors such as obesity, diabetes, and old age. In addition, the findings in the review may serve to encourage further research to be undertaken into surrogate markers of disease and the associations between these two diseases.

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Listen to Stephen Hancocks' summary of this research via the BDJ Youtube Channel
www.go.nature.com/bdjyoutube

Expert view

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This rapid review by Dietrich *et al.* takes a structured approach to analysing a group of systematic reviews on oral diseases and cardiovascular diseases. Analysing systematic reviews rather than individual studies is necessary because the field has developed a substantial evidence base already, beyond individual systematic reviews. The report addresses periodontal disease, caries and periapical periodontitis, and tooth loss. Whilst the majority of the evidence base is for periodontitis, there were systematic reviews addressing the relationship between cardio- and cerebrovascular disease and tooth loss, and one addressing caries and cardiovascular diseases.

The quality of the systematic reviews is high, when analysed using a recognised analytical tool, with only 1 from 22 reviews being of low

quality. Therefore, the reported outcomes can be taken very seriously and have significant implications for both medical and dental care teams and their patients, and indeed key public health messages emerge.

Outcomes are consistent with those reported in 2013 from an international workshop on periodontal and systemic diseases,¹⁻⁴ but extend those consensus findings to other oral diseases. The medical community are aware of the need to embrace oral diseases with other chronic non-communicable diseases of ageing,⁵ and it is time for the dental community to reciprocate.

Periodontitis is strongly and independently associated with an elevated risk of atherosclerotic vascular disease (AVD), both cardio and cerebrovascular. Plausible mechanisms revolve around bacteraemia of periodontal origin firing up low grade systemic inflammation via the liver (CRP) and leukocyte activation, and also involve interactions between oral bacteria and the vascular endothelium both directly and indirectly via the immune response. Periodontal treatment improves surrogate measures of cardiovascular health, but data on hard outcomes (eg death, heart attack) is lacking and challenging to acquire. There is no evidence for a causal

relationship between oral diseases and AVD, but that relates to a lack of research rather than a lack of effect, ie the jury remains out. Data for caries remains as 'emerging' rather than robust evidence.

Importantly, the authors make the point, that it is perhaps time for dental care professionals to broaden their minds, and use oral disease as a means of communicating the need for patients to adopt healthier lifestyles, which may in turn improve their general health. This is a view shared by the WHO as one of their six leadership priorities (<http://www.who.int/about/agenda/en/>). ■

1. Dietrich T, Sharma P, Walter C, Weston P, Beck J. The epidemiological evidence behind the association between periodontitis and incident atherosclerotic cardiovascular disease. *J Clin Periodontol* 2013; **40**: S70–S84.
2. Schenkein H A, Loos B G. Inflammatory mechanisms linking periodontal diseases to cardiovascular diseases. *J Clin Periodontol* 2013; **40**: S51–S69.
3. Reyes L, Herrera D, Kozarov E, Roldán S, Progukske-Fox A. Periodontal bacterial invasion and infection: contribution to atherosclerotic pathology. *J Clin Periodontol* 2013; **40**: S30–S50.
4. D'Aiuto F, Orlandi M, Gunsolley J C. Evidence that periodontal treatment improves biomarkers and CVD outcomes. *J Clin Periodontol* 2013; **40**: S85–S105.
5. Chapple I L C. Time to take periodontitis seriously: The benefits of treatment are likely to exceed the costs. *BMJ* 2014; **348**: g2645.