Narwhal Tooth
The 16th Biennial Conference on the Biology of Marine Mammals in San Diego, California, in December 2005 contained some surprising news about the narwhal whale, also known as the unicorn whale due to the long tooth, or tusk, which emerges from its head. Dr. Martin Nweeia, a researcher at the Harvard School of Dental Medicine (HSDM) revealed that the narwhal’s tooth has ten million tiny nerve connections that extend from the central nerve of the tooth to its outer surface.

This lends the tooth hydrodynamic nanor sensor capabilities allowing the narwhal to detect changes in water such as particle gradients, pressure and temperature. Also, given that these whales tend to rub tusks with one another, this behavior likely grants them a unique sensation.

Ancient Drilling
A report in Nature (2006;440: 755–756) reveals that dental drilling has been around a lot longer than we ever realized. Researchers at a Neolithic graveyard in Pakistan found eleven drilled molars. The surprise is that these gravedates are from 7,500 to 9,000 years ago, which is roughly 1,500 years earlier than any other evidence of drilled teeth currently in collections. Apparently flint drill heads were used on the latest finds. Drill depth was from 0.5 to 3.5 mm, and the fact that it was performed on first or second permanent molars suggests that it certainly was not done for esthetic purposes. Only four of the eleven teeth show signs of caries in relation to the hole drilled, a fact that could mean the drilling was intended to be therapeutic in nature. Additionally, the teeth exhibit marginal smoothing, which attests to the fact that the “patients” were alive at the time and continued to chew with the teeth after the fact.

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Systemic Implications of Oral Health: Diabetes
Juliette Reeves, United Kingdom
Periodontal disease has long been considered a localised infection, however, research over the last few years is now linking the periodontal diseases to a variety of conditions and diseases with systemic implications. These include systemic infections, cardiovascular disease, pregnancy outcomes, respiratory diseases, diabetes and increased all-cause mortality rates.

It has been suggested that infection in the periodontal tissues, primarily by gram-negative anaerobic bacteria, can trigger a series of immunologic and inflammatory changes leading to the initiation of systemic disease.

The interaction between oral infection and systemic health was first described in Ancient Egypt, with the concept of focal infection dating back more than a hundred years. Willoughby Dayton Miller again proposed this relationship in an 1891 commentary published in Dental Cosmos. By the 1950’s however, the theory was being dismissed. More recently the concept has returned to the dental arena. This was partly because of new data reported by Finnish researchers in the late 1980’s when dental infections were found to be statistically linked with heart disease and stroke.

Diabetes
The effect of diabetes on the oral tissues had long been recognised. Diabetics are said to exhibit poorer oral health than non-diabetics. Diabetics have been found to have a higher average gingival index and higher or the same plaque index levels relative to controls. Periodontitis is now considered the sixth most common complication of diabetes mellitus. Persons with non insulin-dependent diabetes mellitus are three times more likely to develop periodontal disease than non diabetic individuals.
It has been suggested that a causal relationship between periodontal disease and diabetes. It is possible that periodontal disease may return a model clot in their brain. The Assembly observed a two-minute silence, and was suspended for 30 minutes following the announcement of Dr. Lee’s death. Dr. Lee, a national of the Republic of Korea, had been Director-General of the World Health Organization since 23 July, 2003. He had worked for WHO for 23 years, at country and regional levels, and at WHO Headquarters in Geneva. He is survived by his wife and son, and the families of his two brothers and one sister. Dr. Lee’s death is a great loss for WHO. His death also is a great loss for the world.”

Glycemic Control
It is well-established that poor glycemic control is an established risk factor for both periodontal disease.14 Similarly, other research has indicated that periodontal disease may be a risk factor for the development of diabetes.15,16 It has been suggested that a causal relationship is mediated through the production of endotoxins and other bacterial products that increase insulin resistance, through the up regulation of macrophage responsive advanced glycation end products. These large molecules accumulate in body tissues, causing destruction of normal function. It is suggested that these cellular reactions also occur from bacterial activity in the periodontal tissues causing tissue destruction.17,18 Another hypothesis concerns the effects of serum lipids on immune cell phenotype/function. There appears to be a causal relationship between serum lipids levels and systemic health (particularly cardiovascular disease, diabetes, tissue repair capacity, and immune cell function), susceptibility to periodontitis, and serum levels of pro-inflammatory cytokines. In terms of the periodontal relationship between periodontitis and systemic disease, it is possible that periodontal treatment-induced changes in immune cell function cause metabolic dysregulation of lipid metabolism through mechanisms, involving pro-inflammatory cytokines. Sustained elevation of serum lipids and/or pro-inflammatory cytokines may have a serious negative impact on systemic health.19 It is not clear yet whether the changes in lipid and glucose metabolism are the causal or consequence of periodontitis.20,21 Acute viral and bacterial infections are known to induce insulin resistance. To demonstrate a bidirectional effect can eliminate or improve metabolic control of diabetes?22

Nutrition
Diabetes is fundamentally affected by dietary intake. Several dietary factors have been linked to systemic disease. There are many dietary factors that link the two diseases. Con-founding risk factors may also be explained by the association of periodontal disease and diabetes.23 Further research is needed to explain the bidirectional relationship between periodontal disease and diabetes.24 Similar results have also been found with reference to diabetes.25

Conclusion
It is plausible that there may be a causal link between periodontal disease and diabetes. If this is so then it is likely to include several pathways. There are many dietary factors that link the two diseases. Con-founding risk factors may play an important role in modulating the risk of developing diabetes. Further research is needed to explain the bidirectional relationship between periodontal disease and diabetes.24
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Juliette Reeves is an experienced Dental Hygienist and qualified Nutritionist. She writes regularly for the dental press including a regular column in Dentistry magazine and clinical articles for smileon.com. Juliette has written a number of post graduate training modules in nutrition and oral health for the dental profession. Her main areas of interest are nutritional influences in periodontal disease, stress, bone density and female hormones. She currently divides her time between writing, researching and lecturing in nutrition and oral health. For further information on nutrition and oral health visit, www.pento-nutricom.com.

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