

## News For Dental Hygienists About Dental Caries

According to recent reports, there has been remarkable progress in the reduction of dental caries - also known as tooth decay - in the United States over the past thirty years. The existence of children with no dental caries, which was known to be a rarity in the past, is no longer unusual. The use of fluoride in public water supplies, in toothpaste, and in professional dental products seems to be working as planned. Additionally, improved oral hygiene and increased access to dental care have played major roles in this dramatic improvement.

Nevertheless, dental caries remains a significant problem for much of the population. Nearly one-fifth of children between the ages of two and four have some detectable caries, and by the age of seventeen nearly four-fifths of young people have had a cavity, which is a late manifestation of dental caries infection. In addition, more than two-thirds of adults age thirty-five to forty-four years have lost at least one permanent tooth due to dental caries, and older adults usually suffer from the problem of root caries.

In a bigger look at the picture, there remains a large segment of the population in which the disease is still a major problem. These health disparities, detailed in the Surgeon General's Report on oral health, tend to be clustered in minority children, the economically underprivileged, older persons, the chronically ill, and institutionalized persons; in other words the very populations with the lowest access to dental care.

It should be noted that dental caries is both an infectious and communicable disease. It results in destruction of tooth structure by way of acid-forming bacteria which are found in dental plaque, an intraoral biofilm, in the presence of sugar. The infection generally results in loss of tooth minerals if it goes unchecked. This damage begins on the outer surface of the tooth and can then progress through the dentin to the pulp, with the ultimate result of compromising the vitality of the tooth.

During the past few decades, dental hygienists have noted that changes have been observed not only in the prevalence of dental caries, but also in the distribution and pattern of the disease throughout the population. Specifically, it has been observed that the relative distribution of dental caries on tooth surfaces has changed. Also, the rate of lesion progression through the teeth is relatively slow for most people. These changes have important implications for diagnosis and management of incipient lesions and predicting caries risk. It could change the way we look at conducting effective disease prevention and management programs for individuals and populations throughout the world.

In order to make continued progress in eliminating this common disease, new methods and strategies will be required in order to provide enhanced access for those who suffer disproportionately from the disease. New plans are forming to provide improved detection of dental caries, risk assessment, and diagnosis. There is also a need to create improved methods to arrest or reverse the non-cavitated lesion while improving surgical management of the cavitated lesion.

Some of the conclusions of the National Institutes of Health's Consensus Development Conference:

Digitally acquired images have great potential in the detection of non-cavitated caries and in the diagnosis of secondary caries. Some promising new diagnostic techniques include fiber-optic transillumination and light and laser fluorescence.

So far, past caries experience is the most consistent predictor of caries risk in children. There is also evidence of matrilineal transmission of mutans streptococci in early childhood. So the presence of caries in the mother and siblings tends to increase the risk for the child.

Inadequate exposure to fluoride confers increased risk of dental caries. Other conditions that are also associated with caries risk include certain illnesses, physical and mental disabilities, and the presence of existing restorations or oral appliances. Medications containing glucose, fructose, or sucrose may also contribute to caries risk.

In the development of caries treatment, dentistry has historically moved to surgical restoration from extraction. Identification of early caries lesions and treatment with non-surgical methods, including remineralization, represent the next era in dental care. This stopping and reversing of caries depends on an early and accurate diagnosis, which remains a developing field. Improved diagnosis is essential if maximum benefits are to be obtained.

The caries process is known to be endemic and potentially both preventable and curable. This can only be achieved by identifying, arresting, and reversing the disease at an early stage. Although more research is needed, clinical strategies to do this already exist. The panel concluded that existing strategies for primary prevention in the general population are also likely to be effective for arresting or reversing early lesions. These strategies include application of fluorides, antimicrobials, salivary enhancers, chlorhexidine, sealants, and patient education. Fluorides and chlorhexidine can be delivered as rinses, varnishes, or gels.

The dental profession has had success in promoting the prevention of caries. The opportunity now exists to extend prevention and treatment of caries to nonsurgical methods.

These include further prevention, arrest of early noncavitated lesions, and remineralization. Controlled studies that inform third-party payers can do much to support the adoption of more advanced diagnostic and preventive nonsurgical techniques into the practice of dentistry. Studies that explore a range of reimbursement options may be helpful in identifying reimbursement methods that both reward and encourage preventive nonsurgical dental treatment. Practicing dental hygienists should have adequate incentives to apply these findings. Educational institutions and their curricula, state and national dental boards and board examiners, and accreditation agencies must also support the growing evidence for prevention and nonsurgical treatment where indicated in order to promote the continued eradication of caries.

The expert panel conclusively suggested that a continued appraisal of progressional reports, experimental findings, and case studies of the dental hygienist community and associated dental practitioners indicated by the accumulated information presented conclusively to the study presented at the National Institutes of Health's Consensus Development Conference is recommended in the form of further clinical analysis if a continued enlightenment of these preventative methodologies is to continue to implement its progressive impact.

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