



## Dental Caries

### An Update on Dental Trends and Therapy

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#### Keywords

- SDF (Silver diamine fluoride) • Prevention • Caries risk • Remineralization
- Minimal invasive • Fluoride

#### Key points

- Update on caries risk assessment (CRA).
- Describe the role of pediatric health care providers in oral health care with respect to caries risk assessment (CRA).
- Draw attention to patients with special needs and oral health from youth to adult.
- A new philosophy and trend in the minimally invasive approach to dental caries treatment.
- Dental caries is a preventable disease and all health care providers should be able to identify and refer high and extreme caries risk patients for care.
- Dental disease that does not cause pain to the patient may be treated in a noninvasive manner that is effective but has potential.

In the 2007 *Advances in Pediatrics* article on dental caries by Drs David Krol and Michael Nedley, the state of the science for dental caries was well presented [1]. This article focuses on recent updates on the dental sciences regarding caries management of particular interest to medical health care providers so that they may be fully informed of new interprofessional opportunities for them to identify and treat the caries disease process and perhaps avoid a lifetime of oral problems for those at greatest risk. A segment also discusses the medical-dental management of patients with special needs.

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In the 2009 *Journal of American Dentistry*, a current review of the available epidemiologic data from many countries clearly indicated that there is a marked increase in the prevalence of dental caries. This global increase in dental caries prevalence affects children as well as adults, primary as well as permanent teeth, and coronal as well as root surfaces. This increase in dental caries signals a pending public health crisis [2]. Unless a new model is adopted, dental caries shall remain as one of the most commonly overlooked pediatric issues. Brushing and flossing alone is not going to reduce the dental caries rate on patients with high caries risk. At one time, dentistry had believed that mutans streptococci and lactobacillus were the only bacteria involved in the dental caries process; we now know that it is more complex than just that. Dental caries is a complex multifactorial biofilm disease that results in prolonged periods of low pH in the mouth and a net mineral loss from the teeth [3]. Acid-producing bacteria exposed to dietary carbohydrates (including but not limited to sucrose) will produce weak organic acids in the 3.8 to 4.8 pH range, sometimes in combination with decreased salivary function, that can lead to a subsurface demineralization of the teeth. If the condition is allowed to progress, it will eventually cause a cavitation or cavity through the enamel layer. If left untreated it will cause damage to deeper layers of the tooth, the tooth nerve, and possibly result in tooth loss. Pattern recognition of the risk factors that modulate this disease will help the health care provider halt and overcome the destruction caused by dental caries. The factors are genetics, bacterial activity, diet, saliva, and pH. Numerous genes are now associated with dental caries; more than 17 studies in the past 5 years have identified 34 genes and more than 54 bacteria are now identified as potential cariogens [3].

If the risk factors are well controlled or managed, the dental caries process can be prevented, arrested, and reversed (remineralized). The medical community should be the first to support the concept of treating dental disease rather than knowingly leave the disease and wait until there is irreversible damage to the teeth, which will then require irreversible surgical restoration (which does not treat the source of the disease). This is covered in the section under “Caries disease information for health care providers.”

Other areas of growing interest are for patients with special health care needs. This population is one of the most underserved and at highest risk for dental caries disease. Pediatric health care providers are well positioned to help patients reduce their risk factors and avoid tooth damage and costly treatment. Due to the health and cooperation of patients with special health care needs, there are times when treatment needs to be performed under general anesthesia. General anesthesia is safe in a hospital setting but has risks as well as substantial costs.

The 2015 Centers for Disease Control and Prevention (CDC) report from the National Center for Health Statistics describes its review of children and adolescents from the period of 2011 to 2012. Although dental caries has been declining in permanent teeth for many children since the 1960s, previous

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