



Caries-risk Assessment And Management

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Abstract

This best practise examines the patient care pathways and caries-risk assessment for paediatric patients. The issues discussed in this article that are relevant to caries include active surveillance, caries prevention, radiography, nutrition, sealants, fluoride, and non-restorative treatment. Age-specific disease indicators and three component categories (social/behavioral/medical, clinical, and protective factors) are included in the caries-risk assessment forms, which are divided into two age groups: 0–5 years and 6 years old. Each factor category includes a set of particular requirements that, if met, are to be scored as yes; the results are added up to provide a high, moderate, or low caries-risk assessment score. The care management pathway promotes individualised treatment plans based on patient age, adherence to preventive strategies, and other suitable strategies. It also presents clinical care options beyond surgical or restorative options. Infants, children, adolescents, and people with special needs can receive individualised periodicity, diagnostic, preventative, and restorative care thanks to caries-risk assessment and therapeutic management pathways. The American Academy of Pediatric Dentistry Councils on Clinical Affairs and Scientific Affairs worked together to generate this publication, which provides updated knowledge and suggestions for risk-based caries control procedures.

KEYWORDS: caries risk assessment, caries prevention, clinical management pathways, dental sealants, fluoride

INTRODUCTION

Dental caries, or tooth decay, is one of the most prevalent diseases in humans, affecting 97% of the population worldwide during their lifetimes (1). The term “dental caries” can be used to describe both the disease process and the lesion (noncavitated or cavitated) that is formed as a result of the disease process (2).

The American Academy of Pediatric Dentistry (AAPD) acknowledges that caries-risk assessment and caries management protocols is important component of modern clinical care for infants, children, and adults. These procedures can help clinicians make treatment plan based on the child's age, caries risk, and patient compliance. These guidelines are meant to inform medical professionals and other interested parties on how to estimate the risk of caries in modern pediatric dentistry and to support clinical judgments about evidence- and risk-based diagnostic, fluoride, dietary, and restorative procedures.

METHODS

The Council on Clinical Affairs created this document, which was adopted in 2002 (3) and last updated in 2019 (4). Using the terms "caries risk assessment AND diet, sealants, fluoride, radiology, non-restorative treatment, active surveillance, caries prevention," an electronic search of publications from 2012 to 2021 that included systematic reviews/meta-analyses or reports from expert panels, clinical guidelines, and other pertinent reviews was conducted to update this document. These requirements were met by 592 articles. Papers for review were picked from this list as well as from citations in certain publications. Recommendations were based on expert and/or consensus opinion by knowledgeable researchers and physicians where data did not seem to be sufficient or were inconclusive.

BACKGROUND

Caries Risk Assessment

A person's disease susceptibility may typically be reliably quantified using risk assessment methodologies employed in medical practise, allowing for the implementation of preventive interventions. There are, however, few multivariate screening techniques in dentistry that are sufficiently proven to identify which kids are more likely to develop dental caries. (5,6) The Cariogram (7) and the CAMBRA tools (8) are two caries risk assessment tools that have been shown effective in clinical trials and clinical outcomes studies. However, the assessment of the caries risk:

- encourages treating the disease process rather than the symptoms of the sickness.
 - allows for the individualization of preventive conversations and helps in understanding the illness variables for a particular patient.
 - individualises, chooses, and establishes the frequency of a patient's preventive and restorative treatment.
 - predicts the progression or stability of caries.
- decides on potential treatment plans and customises the precise, unique self-management objectives.

A comprehensive treatment plan approach based on the child's age, beginning with the age one appointment, includes a caries-risk assessment. According to current caries-risk assessment models, a number of social, cultural, and behavioural factors interact with dietary habits, fluoride exposure, a vulnerable host, and microbiota. (9) Determining the possibility of an increase in the incidence of caries or the likelihood that there will be a change in the size or activity of lesions currently present is known as caries-risk assessment. Health care professionals can aid in preventing cavitation by identifying caries in its earliest stages (i.e., non-cavitated or white spot lesions). (10)

Low salivary flow, visible plaque on teeth, frequent sugar consumption, the presence of appliances in the mouth, health issues, sociodemographic factors, access to care, and cariogenic microbiota are some of the most common caries risk factors. (11) Numerous studies have demonstrated that the presence of caries lesions, whether cavitated or non-cavitated, is a powerful indicator of the likelihood of developing the disease. Since existing caries lesions do not directly or indirectly cause the disease but, more crucially, show the presence of the causes that produce the disease, clinical observation of these lesions is better regarded of as disease indicators rather than risk factors. A child's exposure to appropriately fluoridated water, daily use of fluoridated toothpaste, professional application of topical fluoride, and regular dental care are all protective factors in the risk of developing cavities. (12,13)

The following are some restrictions on the risk factors:

- In young children, previous caries experience is not particularly helpful, and the activity of lesions may be more significant than the total number of lesions.
- It can be challenging to assess low saliva flow, and in young children, it might not be important.(13)
- It might be challenging to quantify daily sugar consumption.
- Socio-demographic factors are merely a stand-in for different exposures and behaviours that may influence the risk of caries.
- It is unknown how risk varies with age and how different risk factors predict risk across the lifespan.
- Risk factors at the genome level may be responsible for significant variations in caries risk. (14)

Care pathways for caries management

Care pathways are documents that contain criteria for diagnosis and treatment and lead to suggested courses of action in order to aid clinical decision-making. (15) The routes are supported by evidence from recent peer-reviewed research, the thoughtful assessment of expert panels, and practitioners' clinical expertise. The first care paths for managing caries in children between the ages of 0 and 2 and 3 years old were launched in 2011. (16)

Decisions on tailored treatment and treatment thresholds are further refined for paediatric patients depending on risk factors, age, and adherence to preventive measures. In comparison to less standardised treatment, such therapeutic paths offer a higher chance of success, less complications, and more effective use of resources. (15)

The current caries management protocol's content is based on the findings of systematic reviews and the recommendations of an expert panel, which improve knowledge of and suggestions for diagnostic, preventative, and restorative treatments. On the basis of four systematic reviews, recommendations for using fluoride toothpaste have been made. (17,18)the Centers for Disease Control and Prevention's fluoride recommendations serve as the foundation for dietary fluoride supplementation. Using data from two systematic reviews, (19), professional application and prescription-strength topical fluoride are used at home. (20,21), and two systematic reviews were used to support the use of silver diamine fluoride in preventing caries lesions. (22,23). Recommendations for radiographic diagnostic procedures are based on consistent criteria from national organisations. (24) Two systematic reviews (25,26), with only the American Dental Association/AAPD review addressing sealants for primary teeth, form the basis for recommendations for pit and fissure sealants. A systematic study of methods to cut back on sugar-sweetened beverages served as the foundation for dietary treatments. (27)

Other measures for caries management:-

- **Antimicrobial agents:** Antimicrobial agents destroy or suppress the growth or multiplication of microorganisms, including bacteria. CAMBRA clinical guidelines recommend the use of antimicrobials for patients over 6 years of age who are classified as being at high or extreme risk for caries.(28,29). Chlorhexidine gluconate rinse has been widely studied that when used as a 30 s rinse every day of the 1st week of every month, reduces MS bacterial level but is not as effective against LB. (30)
- **Resin sealants and infiltrants:** Sealants protect the surface of the teeth by inhibiting continuous attacks by plaque acids. This will prevent plaque accumulation and dissolution of minerals from the tooth surface. Resin infiltrants act by concurrent sealing of the caries lesion from the oral environment, the progression of the lesion is disrupted .
- **Habits:** Reducing the amount and frequency of carbohydrate consumption, continues to be important for patients at high-risk for caries. (31). power toothbrushes focuses on the ability of the brush to remove plaque biofilm, power toothbrushes may be helpful in the delivery and retention of fluoride. Recent research has shown that one sonic toothbrush enhances effects of fluoride on the plaque biofilm, causing increased fluoride delivery and retention at the tooth surface (32). The strategies involved in motivational

interviewing are more persuasive and supportive and argumentative and are designed for the patient's intrinsic motivation. (33)

Conclusion:

- Dental caries-risk assessment should be a standard part of both initial and follow-up exams by oral health and medical professionals. This assessment should be based on a child's age, social/behavioral/medical factors, protective factors, and clinical findings.
- The estimation of children at low, moderate, and high caries risk by a preponderance of risk and protective factors and disease indicators will enable a more evidence-based approach for referrals by medical providers as well as establish the frequency and intensity of diagnostic, preventive, and restorative services, even though there is not currently enough information to conduct quantitative caries-risk assessment analyses.
- Care pathways offer health professionals criteria and standards for deciding the kinds and frequency of diagnostic, preventative, and restorative care for patient-specific management of dental caries. Care pathways are based on a child's age and caries risk.
- Management can be done by various means such as applying sealants and infiltrants, habits such as cutting down sugar consumption in diet, use of fluoridated toothpaste and antimicrobial agents

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