# Caries Risk Assessment: Where Do We Stand Today?

**Tushar Pruthi[1]\*, Nikhil Srivastava[2], Vivek Rana[3], Sakshi Gaind[4], Noopur Kaushik[5] and Shruti Jha[6]**

*[1]Associate Professor, Department of Pediatric & Preventive Dentistry, Subharti Dental College & Hospital, SVSU, Meerut*

*[2]Principal & Head of Department, Department of Pediatric & Preventive Dentistry, Subharti Dental College & Hospital, SVSU, Meerut*

*[3]Professor, Department of Pediatric & Preventive Dentistry, Subharti Dental College & Hospital, SVSU, Meerut*

*[4]Assistant Professor, Department of Periodontology , Institute of Dental studies and Technologies, Modinagar, Gaziabhad*

*[5]Professor, Department of Pediatric & Preventive Dentistry, Subharti Dental College & Hospital, SVSU, Meerut*

*[6]Assistant Professor, Department of Pediatric & Preventive Dentistry, Subharti Dental College & Hospital, SVSU, Meerut*

**\*Corresponding Author:** Tushar Pruthi, Associate Professor, Department of Pediatric & Preventive Dentistry, Subharti Dental College & Hospital, SVSU, Meerut.

**Received:** January 12, 2024; **Published:** February 01, 2024

## Abstract

Caries Risk" is defined as the probability that an individual will develop at least a certain number of carious lesions reacting a giver stage of disease progression during a specified time conditional on his/her exposure status remaining stable during the period in question. This is generally considered "high" or "low". "Caries risk assessment" is the identification of individuals at high risk for future caries. Assessment of caries risk is an important part of contemporary dental practice. Dental practitioners perform such assessments every day of their practicing lives. The patient should be made aware of their risk status so that they become involved in their preventive care. For dentists to practice preventive dental medicine, they need information about the caries-risk status of their patients. The validity of a caries-risk assessment can be evaluated as regards specificity, sensitivity, positive and negative predictive values. Thus, this review article will the risk assessment can be tested for how well it correlates with the future disease.

*Keywords:* caries; risk assessment; dental; Practitioners; preventive care

## Introduction

The most common disease that has affected the dentition of a child patient since a long time is dental caries. Dental caries has a multi-factorial etiology in which there is an interplay of four principal factors [1]:
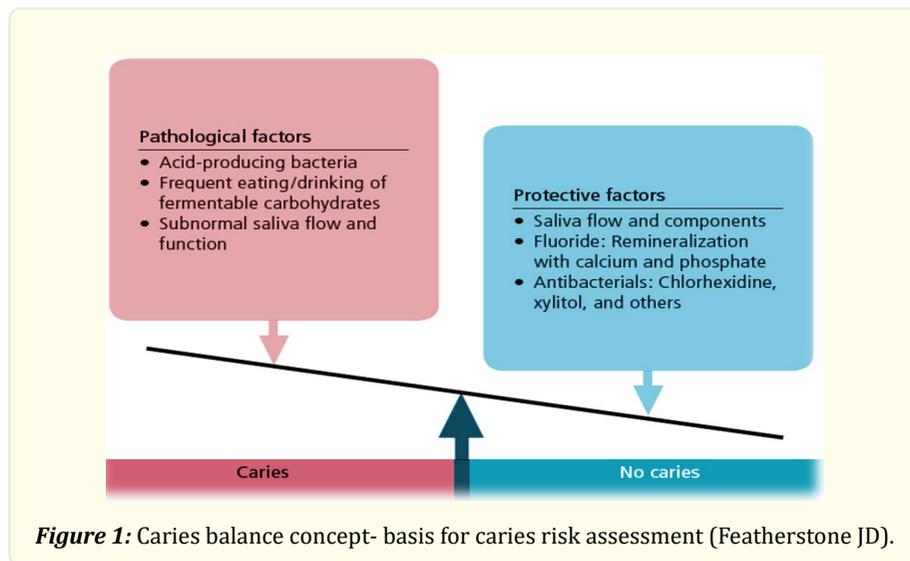
1. the host (saliva and teeth).
2. The microflora (plaque).
3. the substrate (diet).
4. Time.

The American Academy of Pediatric Dentistry (AAPD) recognizes that caries-risk assessment and management protocols can assist clinicians with decisions regarding treatment based upon caries risk and patient compliance and are essential elements of contemporary clinical care for infants, children, and adolescents and it aids in clinical decision making regarding diagnostic, fluoride, dietary,

and restorative protocols [2].

### *Caries-risk assessment* [3]

- ✓ Risk assessment procedures used in medical practice normally have sufficient data to accurately quantitate a person's disease susceptibility and allow for preventive measures.
- ✓ Even though caries-risk data in dentistry still are not sufficient to quantitate the models, the process of determining risk should be a component in the clinical decision making process.
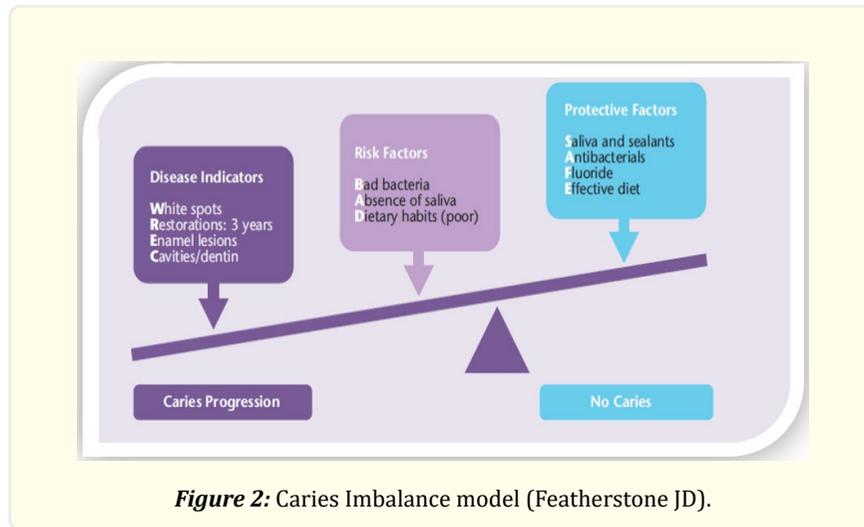


**Figure 1:** Caries balance concept- basis for caries risk assessment (Featherstone JD).

### *Caries risk assessment occurs in two phases*

A) The first is to determine specific disease indicators, risk factors and protective factors.
B) The second step is to determine the level of risk that the sum of these factors indicates.

### *Caries risk factors* [4]

- ➤ Caries risk factors are defined as biological reasons that cause or promote current or future caries disease.

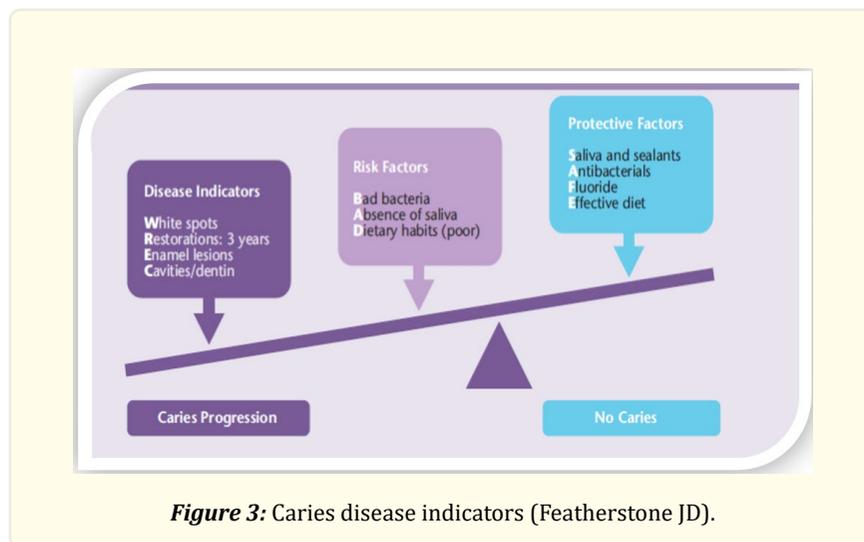*Figure 2:* Caries Imbalance model (Featherstone JD).

The Caries Imbalance model uses the acronym "BAD" to describe three risk factors that are supported in the literature as causative for dental caries:

✓ Bad bacteria, meaning Acidogenic, Aciduric or Cariogenic bacteria.

✓ Absence of saliva, meaning hyposalivation or salivary hypofunction.

Destructive lifestyle habits that contribute to caries disease, such as frequent ingestion of fermentable carbohydrates, and poor oral hygiene (self care).

## Caries disease indicators

Caries disease indicators are described as physical signs of the presence of current dental caries disease or past dental caries disease history and activity.



*Figure 3:* Caries disease indicators (Featherstone JD).

The Caries Imbalance model uses the acronym "WREC" (pronounced "wreck") to describe the following four disease indicators:

- ✓ White spots visible on smooth surfaces.
- ✓ Restorations placed in the last three years as a result of caries activity.
- ✓ Enamel approximal lesions (confined to enamel only) visible on dental radiographs.
- ✓ Cavitation of carious lesions showing radiographic penetration into the dentin.

## Discussion

Caries risk assessment is an important process used by dental professionals to evaluate an individual's susceptibility to tooth decay (caries) [4]. It helps dentists identify patients who are at higher risk of developing cavities and enables them to develop personalized preventive strategies and treatment plans. The process of caries risk assessment typically involves the following components:

1. *Medical and dental history*: Dentists collect information on the patient's medical conditions, medications, previous dental treatments, oral hygiene habits, and dietary patterns. These factors can influence the risk of caries development.
2. *Clinical examination*: Dentists visually inspect the teeth, gums, and oral tissues. They may also use dental instruments or diagnostic tools like X-rays to assess the presence of current cavities, areas of enamel demineralization, and other signs of dental decay.
3. *Evaluation of risk factors*: Dentists consider specific risk factors that contribute to tooth decay, such as inadequate oral hygiene, frequent consumption of sugars or acidic foods and beverages, reduced salivary flow, previous history of cavities, orthodontic appliances, and certain medical conditions.
4. *Scoring or grading system*: Various caries risk assessment tools employ scoring or grading systems to categorize patients into different risk levels, such as low risk, moderate risk, or high risk. These assessments can be based on a combination of factors, including the presence of risk indicators and historical data.
5. *Determining preventive strategies*: Based on the individual's risk level, dentists can recommend appropriate preventive strategies. These may include regular dental check-ups, professional cleanings, fluoride treatments, sealants, dietary modifications, oral hygiene instructions, and the use of antimicrobial products.

It's essential to note that caries risk assessment is an ongoing process, and risk levels can change over time. Regular dental visits and re-evaluation help monitor changes in risk status and allow for adjustments in preventive strategies to best manage oral health effectively. Indeed, aesthetic considerations play a role in dentistry, with patients increasingly valuing the appearance of their smiles. Advancements in cosmetic dentistry contribute to this trend, offering a range of options to enhance both oral health and the visual appeal of teeth [6].

Caries, commonly known as tooth decay, is a prevalent oral health issue that affects a large portion of the global population. Over the years, scientists and dental professionals have been striving to develop methods for caries risk assessment, aiming to identify individuals with a higher risk of developing tooth decay [7]. Permanent posterior teeth with deep pit and fissure are more prone to dental caries [8].

## Conclusion

Caries risk assessment is still in the developmental stage. In conclusion, caries risk assessment has come a long way in the field of dentistry. The development of comprehensive protocols such as CAMBRA, the incorporation of fluorescence-based technologies, and the evolving understanding of genetic influences have significantly enhanced our ability to assess caries risk accurately. By identifying high-risk individuals and implementing appropriate preventive strategies, dental professionals can effectively combat tooth decay and promote optimal oral health. Caries risk assessment serves as a vital tool in preventive dentistry, helping to reduce the impact of caries on individuals and society as a whole.

## References

1. Colak H., et al. "Early childhood caries update: A review of causes, diagnoses, and treatments". J Nat Sci Biol Med 4.1 (2013): 29-38.
2. American Academy of Pediatric Dentistry. "Caries-risk assessment and management for infants, children, and adolescents". The Reference Manual of Pediatric Dentistry. Chicago, Ill.: American Academy of Pediatric Dentistry (2023).
3. Frencken JE., et al. "Minimal intervention dentistry for managing dental caries - a review: report of a FDI task group". Int Dent J 62.5 (2012): 223-43.
4. Featherstone JDB., et al. "Evidence-Based Caries Management for All Ages-Practical Guidelines". Front Oral Health 2 (2021): 657518.
5. Anil S., et al. "Transforming Dental Caries Diagnosis Through Artificial Intelligence-Based Techniques". Cureus 15.7 (2023): e41694.
6. Pruthi T. "From a dark past to a bright future: cosmetic dentistry". Medicon Dental Sciences 1 (2022): 1-2.
7. Giacaman RA., et al. "Understanding dental caries as a non-communicable and behavioral disease: Management implications". Front Oral Health 3 (2022): 764479.
8. Pruthi T., et al. "Bonding Technologies in Young Permanent Molars: A Case Series". Int J Clin Pediatr Dent 16.1 (2023): 159-161.

**Volume 4 Issue 2 February 2024**