

Risk Assessment

Risk assessment is a diagnostic tool that helps professionals individualize oral health supervision. It is based on the concept that the frequency and type of oral health supervision needed by a child depends on the likelihood that specific diseases or conditions may develop.

The concept of differential risk is clearly evident for conditions such as dental caries, where individuals experience widely different levels of disease. Although the incidence of dental caries is very high in children, the majority of decay is concentrated in a small percentage of children. Risk assessment is a process that attempts to identify those children who are at greater risk for a high level of caries, for example, and will need more oral health supervision.

Risk assessment involves examining *risk factors* that may negatively impact a child's oral health, and *protective factors* that promote oral health. Using risk assessment, the dental professional is better able to make specific preventive and treatment recommendations to reduce a child's risk and improve overall oral health. Risk assessment also contributes to efficient delivery of care by eliminating unnecessary interventions.

Level of risk varies from child to child and can change over time. Some risk factors are related to age and development. For infants and young children, inappropriate baby bottle use is a major problem. As children grow and become more active, dental injuries are more

likely. For adolescents, particular risks come from using tobacco or other drugs, or from not wearing mouth guards during sports. Every child needs periodic oral health supervision so that a dental professional can reassess the number, type, and extent of risk and protective factors present.

The concept of formal risk assessment and its application to oral health capitalizes on long-standing informal attempts by dental professionals to tailor care to individual patients. Thoughtful clinicians have always tried to individualize their preventive and treatment recommendations. Empirically based formal risk models are currently being developed to provide appropriate weights to various objectively measured risk and protective factors.¹ Nevertheless, risk assessments involve subjective evaluations as well as objective measures and are therefore weaker at the individual level than at the community level. As laboratory science and epidemiologic studies continue to refine risk models, they will become increasingly sophisticated at the individual level.

Risk assessment is also useful for allocating resources to oral health programs. The specific design of a risk assessment paradigm must depend on the age, culture, and needs of the population served; the risk factors that are significant in the population; and the oral conditions that are important in the care of those children.



How To Do Risk Assessment

The first component in risk assessment involves identifying the child's risk and protective factors. The dental professional uses information obtained in the interview, observation of parent-child interaction, oral exam, and diagnostic procedures to identify the potential risks to full attainment of good oral health outcomes. In addition, the dental professional identifies the protective factors that can reduce the negative impact of risk factors and contribute to attaining those outcomes.

Both risk and protective factors can be classified in various ways, such as physical, socioeconomic, behavioral, and treatment related. A child who lives in a community without a fluoridated water system has a risk factor for dental caries. On the other hand, if the child has been receiving systemic fluoride supplements prescribed by a dentist or physician, the child's risk for dental caries has been reduced.

The second part of risk assessment involves weighing the risk and protective factors to determine an oral health supervision plan. This plan forms the framework for creating the partnership between the professional, the child or adolescent, and the family, in order to help reduce risks and develop and maintain protective factors. The anticipatory guidance and counseling provided will be determined by the risk and protective factors generated in the assessment. The plan also suggests the type and frequency of professional intervention needed not only to address disease, but also to monitor progress toward elimination of risk factors and achievement of desired outcomes.



Risk and Protective Factors for Dental Caries

Children who have had dental caries will most likely continue to develop them in the future. Since children's teeth provide a ready profile of past experiences, the best way to assess the child for future caries risk is to determine the extent of a child's past and current caries through an oral exam. Other risk factors such as fluoride, oral hygiene, dietary habits, and medical/dental history can also be considered.

Caries, however, takes time to develop, so for children under three years of age, caries risk assessment depends more on other factors. Young children who have already begun an active caries process may appear perfectly healthy during an oral exam. For young children, important caries risk factors include a history of caries in

parents or siblings, the habit of sleeping with a baby bottle containing milk or juice, a high level of salivary mutans streptococci, and inadequate fluoride.

For all children, the most important protective factors are adequate fluoride and good oral hygiene.



Dental Caries

RISK FACTORS	PROTECTIVE FACTORS
Physical: Examples	
Variations in tooth enamel; deep pits and fissures; anatomically susceptible areas	Sealants (if possible) or observation
Gastric reflux	Management of condition
High mutans streptococci count	Reduction of mutans streptococci
Special health needs	Preventive intervention to minimize effects
Previous caries experience	Increased frequency of supervision visits
History of baby bottle tooth decay	Increased frequency of supervision visits
Behavioral: Examples	
Bottle used at night for sleep or "at will" while awake	Prevention of bottle habit and weaning from bottle by 12 months
Frequent snacking	Reduction in snacking frequency
Inadequate oral hygiene	Good oral hygiene
Eating disorders, including self-induced vomiting (bulimia)	Referral for counseling
Socioenvironmental: Examples	
Inadequate fluoride	Optimal systemic and/or topical fluoride
Poor family oral health	Access to care and good oral hygiene
Poverty	Access to care
High parental levels of bacteria (mutans streptococci)	Good parental oral health and hygiene
Disease or Treatment Related: Examples	
Special carbohydrate diet	Preventive intervention to minimize effects
Frequent intake of sugared medications	Alternate medications or preventive intervention to minimize effects
Reduced saliva flow from medication or irradiation	Saliva substitutes
Orthodontic appliances	Good oral hygiene for appliances



Risk and Protective Factors for Periodontal Disease

Children are at risk for periodontal problems when they do not or cannot perform oral hygiene techniques. Irregular or ineffective oral hygiene techniques can lead to gingival inflammation, plaque accumulation, dental caries, and bad breath. Other risk factors for periodontal disease include hormonal changes during adolescence and habits such as tobacco or other drug use.

Children with special health needs may be at higher risk for periodontal disease. Systemic disease that compromises immune function, such as diabetes or neoplasia, affects the ability of oral tissues to respond to challenges. Treatments such as phenytoin for seizures or antineoplastic medication for cancer can alter gingival health. Orthodontic and other appliances also play a role in increasing susceptibility to periodontal disease because they trap plaque and make hygiene more difficult.

Families who understand the importance of oral health, regularly perform oral hygiene practices, and help supervise their young children's oral hygiene can help increase their children's protective factors against periodontal disease.



Periodontal Disease

RISK FACTORS

Physical: Examples

Anatomical variations (e.g., frenum)

Malpositioned and crowded teeth

Gingivitis

Puberty

Pregnancy

Mouthbreathing

Genetic predisposition (e.g., Down or Papillon Lefevre syndrome)

Behavioral: Examples

Inadequate oral hygiene

Tobacco use

Birth control pills

Socioenvironmental: Examples

Poor family oral health

Poverty

Disease or Treatment Related: Examples

Injury

Nutritional deficiencies (e.g., vitamin C)

Metabolic disease (e.g., diabetes, hypophosphatasia)

Neoplastic disease (e.g., leukemia or its treatment)

Infectious disease (e.g., HIV/AIDS)

Medications (e.g., Dilantin)

Poor-quality restorations

Unrestored carious lesions

Periodontal Disease

PROTECTIVE FACTORS

Surgical correction

Orthodontic care

Treatment of disease

Preventive measures to address oral effects

Preventive measures to address oral effects

Management of mouthbreathing

Preventive intervention to minimize effects

Good oral hygiene

Tobacco cessation

Preventive measures to minimize effects

Access to care and good oral hygiene

Access to care

Use of age-appropriate safety measures and treatment of injury

Healthy eating habits

Treatment of disease

Treatment of disease and preventive intervention to minimize effects

Treatment of disease and preventive intervention to minimize effects

Preventive intervention to minimize effects

Restoration of carious lesions

Properly contoured and finished restorations

