

# Guideline on Caries-risk Assessment and Management for Infants, Children, and Adolescents

## Originating Council

Council on Clinical Affairs

## Review Council

Council on Clinical Affairs

## Adopted

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## Purpose

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. This guideline is intended to educate healthcare providers and other interested parties on the assessment of caries risk in contemporary pediatric dentistry and aid in clinical decision making regarding diagnostic, fluoride, dietary, and restorative protocols.

## Methods

This guideline is an update of AAPD's "Policy on Use of a Caries-risk Assessment Tool (CA1) for Infants, Children, and Adolescents, Revised 2006" that includes the additional concepts of dental caries management protocols. The update used electronic and hand searches of English written articles in the medical and dental literature within the last 10 years using the search terms "caries risk assessment", "caries management", and "caries clinical protocols". From this search, 1,909 articles were evaluated by title or by abstract. Information from 75 articles was used to update this document. When data did not appear sufficient or were inconclusive, recommendations were based upon expert and/or consensus opinion by experienced researchers and clinicians.

## Background

### Caries-risk assessment

Risk assessment procedures used in medical practice normally have sufficient data to accurately quantitate a person's disease susceptibility and allow for preventive measures.<sup>1</sup> 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.<sup>2</sup> Risk assessment:

1. fosters the treatment of the disease process instead of treating the outcome of the disease;

2. gives an understanding of the disease factors for a specific patient and aids in individualizing preventive discussions;
3. individualizes, selects, and determines frequency of preventive and restorative treatment for a patient; and
4. anticipates caries progression or stabilization.

Caries-risk assessment models currently involve a combination of factors including diet, fluoride exposure, a susceptible host, and microflora that interplay with a variety of social, cultural, and behavioral factors.<sup>3-6</sup> Caries risk assessment is the determination of the likelihood of the incidence of caries (ie, the number of new cavitated or incipient lesions) during a certain time period<sup>7</sup> or the likelihood that there will be a change in the size or activity of lesions already present. With the ability to detect caries in its earliest stages (ie, white spot lesions), health care providers can help prevent cavitation.<sup>8-10</sup>

Caries risk indicators are variables that are thought to cause the disease directly (eg, microflora) or have been shown useful in predicting it (eg, socioeconomic status) and include those variables that may be considered protective factors. Currently, there are no caries-risk factors or combinations of factors that have achieved high levels of both positive and negative predictive values.<sup>2</sup> Although the best tool to predict future caries is past caries experience, it is not particularly useful in young children due to the importance of determining caries risk before the disease is manifest. Children with white spot lesions should be considered at high risk for caries since these are precavitated lesions that are indicative of caries activity.<sup>11</sup> Plaque accumulation also is strongly associated with caries development in young children.<sup>12,13</sup> As a corollary to the presence of plaque,<sup>14</sup> a child's mutans streptococci levels<sup>3</sup> and the age at which a child becomes colonized with cariogenic flora<sup>15,16</sup> are valuable in assessing risk, especially in preschool children.

While there is no question that fermentable carbohydrates are a necessary link in the causal chain for dental caries, a systematic study of sugar consumption and caries risk has concluded that the relationship between sugar consumption and

caries is much weaker in the modern age of fluoride exposure than previously thought.<sup>17</sup> However, there is evidence that night-time use of the bottle, especially when it is prolonged, may be associated with early childhood caries.<sup>18</sup> Despite the fact that normal salivary flow is an extremely important intrinsic host factor providing protection against caries, there is little data about the prevalence of low salivary flow in children.<sup>19,20</sup>

Sociodemographic factors have been studied extensively to determine their effect on caries risk. Children with immigrant backgrounds have 3 times higher caries rates than non-immigrants.<sup>21</sup> Most consistently, an inverse relationship between socioeconomic status and caries prevalence is found in studies of children less than 6 years of age.<sup>22</sup> Perhaps another type of sociodemographic variable is the parents' history of cavities and abscessed teeth; this has been found to be a predictor of treatment for early childhood caries.<sup>23,24</sup>

The most studied factors that are protective of dental caries include systemic and topical fluoride, sugar substitutes, and tooth brushing with fluoridated toothpaste. Teeth of children who reside in a fluoridated community have been shown to have higher fluoride content than those of children who reside in suboptimal fluoridated communities.<sup>25</sup> Additionally, both pre- and post-eruption fluoride exposure maximize the caries-preventive effects.<sup>26,27</sup> For individuals residing in non-fluoridated communities, fluoride supplements have shown a significant caries reduction in primary and permanent teeth.<sup>28</sup> With regard to fluoridated toothpaste, studies have shown

consistent reduction in caries experience.<sup>29</sup> Professional topical fluoride applications performed semiannually also reduce caries,<sup>30</sup> and fluoride varnishes generally are equal to that of other professional topical fluoride vehicles.<sup>31</sup>

The effect of sugar substitutes on caries rates have been evaluated in several populations with high caries prevalence.<sup>32</sup> Studies indicate that xylitol can decrease mutans streptococci levels in plaque and saliva and can reduce dental caries in young children and adults, including children via their mothers.<sup>33</sup> With regard to toothbrushing, there only is a weak relationship between frequency of brushing and decreased dental caries, which is confounded because it is difficult to distinguish whether the effect is actually a measure of fluoride application or whether it is a result of mechanical removal of plaque.<sup>34</sup> The dental home or regular periodic care by the same practitioner is included in many caries-risk assessment models because of its known benefit for dental health.<sup>35</sup>

Risk assessment tools can aid in the identification of reliable predictors and allow dental practitioners, physicians, and other nondental health care providers to become more actively involved in identifying and referring high-risk children. Tables 1, 2, and 3 incorporate available evidence into practical tools to assist dental practitioners, physicians, and other nondental health care providers in assessing levels of risk for caries development in infants, children, and adolescents. As new evidence emerges, these tools can be refined to provide greater predictability of caries in children prior to disease initiation.

**Table 1. Caries-risk Assessment Form for 0-3 Year Olds<sup>59,60</sup>**  
(For Physicians and Other Non-Dental Health Care Providers)

Factors	High Risk	Moderate Risk	Protective
<b>Biological</b>			
Mother/primary caregiver has active cavities	Yes		
Parent/caregiver has low socioeconomic status	Yes		
Child has >3 between meal sugar-containing snacks or beverages per day	Yes		
Child is put to bed with a bottle containing natural or added sugar	Yes		
Child has special health care needs		Yes	
Child is a recent immigrant		Yes	
<b>Protective</b>			
Child receives optimally-fluoridated drinking water or fluoride supplements			Yes
Child has teeth brushed daily with fluoridated toothpaste			Yes
Child receives topical fluoride from health professional			Yes
Child has dental home/regular dental care			Yes
<b>Clinical Findings</b>			
Child has white spot lesions or enamel defects	Yes		
Child has visible cavities or fillings	Yes		
Child has plaque on teeth		Yes	

Circling those conditions that apply to a specific patient helps the health care worker and parent understand the factors that contribute to or protect from caries. Risk assessment categorization of low, moderate, or high is based on preponderance of factors for the individual. However, clinical judgment may justify the use of one factor (eg, frequent exposure to sugar containing snacks or beverages, visible cavities) in determining overall risk.

Overall assessment of the child's dental caries risk: High  Moderate  Low

**Table 2. Caries-risk Assessment Form for 0-5 Year Olds<sup>59,60</sup>**  
(For Dental Providers)

Factors	High Risk	Moderate Risk	Protective
<b>Biological</b>			
Mother/primary caregiver has active caries	Yes		
Parent/caregiver has low socioeconomic status	Yes		
Child has >3 between meal sugar-containing snacks or beverages per day	Yes		
Child is put to bed with a bottle containing natural or added sugar	Yes		
Child has special health care needs		Yes	
Child is a recent immigrant		Yes	
<b>Protective</b>			
Child receives optimally-fluoridated drinking water or fluoride supplements			Yes
Child has teeth brushed daily with fluoridated toothpaste			Yes
Child receives topical fluoride from health professional			Yes
Child has dental home/regular dental care			Yes
<b>Clinical Findings</b>			
Child has >1 decayed/missing/filled surfaces (dmfs)	Yes		
Child has active white spot lesions or enamel defects	Yes		
Child has elevated mutans streptococci levels	Yes		
Child has plaque on teeth		Yes	

Circling those conditions that apply to a specific patient helps the practitioner and parent understand the factors that contribute to or protect from caries. Risk assessment categorization of low, moderate, or high is based on preponderance of factors for the individual. However, clinical judgment may justify the use of one factor (eg, frequent exposure to sugar-containing snacks or beverages, more than one dmfs) in determining overall risk.

Overall assessment of the child's dental caries risk: High  Moderate  Low

**Table 3. Caries-risk Assessment Form for >6 Years Olds<sup>60-62</sup>**  
(For Dental Providers)

Factors	High Risk	Moderate Risk	Protective
<b>Biological</b>			
Patient is of low socioeconomic status	Yes		
Patient has >3 between meal sugar containing snacks or beverages per day	Yes		
Patient has special health care needs		Yes	
Patient is a recent immigrant		Yes	
<b>Protective</b>			
Patient receives optimally-fluoridated drinking water			Yes
Patient brushes teeth daily with fluoridated toothpaste			Yes
Patient receives topical fluoride from health professional			Yes
Additional home measures (eg, xylitol, MI paste, antimicrobial)			Yes
Patient has dental home/regular dental care			Yes
<b>Clinical Findings</b>			
Patient has ≥1 interproximal lesions	Yes		
Patient has active white spot lesions or enamel defects	Yes		
Patient has low salivary flow	Yes		
Patient has defective restorations		Yes	
Patient wearing an intraoral appliance		Yes	

Circling those conditions that apply to a specific patient helps the practitioner and patient/parent understand the factors that contribute to or protect from caries. Risk assessment categorization of low, moderate, or high is based on preponderance of factors for the individual. However, clinical judgment may justify the use of one factor (eg, >1 interproximal lesions, low salivary flow) in determining overall risk.

Overall assessment of the dental caries risk: High  Moderate  Low

Furthermore, the evolution of caries-risk assessment tools and protocols can assist in providing evidence for and justifying periodicity of services, modification of third-party involvement in the delivery of dental services, and quality of care with outcomes assessment to address limited resources and workforce issues.

**Caries management protocols**

Clinical management protocols are documents designed to assist in clinical decision-making; they provide criteria regarding diagnosis and treatment and lead to recommended courses of action. The protocols are based on evidence from current

**Table 4. Example of a Caries Management Protocol for 1-2 Year Olds**

Risk Category	Diagnostics	Interventions		Restorative
		Fluoride	Diet	
Low risk	– Recall every 6-12 months – Baseline MS <sup>a</sup>	– Twice daily brushing with fluoridated toothpaste <sup>b</sup>	Counseling	– Surveillance <sup>x</sup>
Moderate risk parent engaged	– Recall every 6 months – Baseline MS <sup>a</sup>	– Twice daily brushing with fluoridated toothpaste <sup>b</sup> – Fluoride supplements <sup>d</sup> – Professional topical treatment every 6 months	Counseling	– Active surveillance <sup>e</sup> of incipient lesions
Moderate risk parent not engaged	– Recall every 6 months – Baseline MS <sup>a</sup>	– Twice daily brushing with fluoridated toothpaste <sup>b</sup> – Professional topical treatment every 6 months	Counseling, with limited expectations	– Active surveillance <sup>e</sup> of incipient lesions
High risk parent engaged	– Recall every 3 months – Baseline and follow up MS <sup>a</sup>	– Twice daily brushing with fluoridated toothpaste <sup>b</sup> – Fluoride supplements <sup>d</sup> – Professional topical treatment every 3 months	Counseling	– Active surveillance <sup>e</sup> of incipient lesions – Restore cavitated lesions with ITR <sup>f</sup> or definitive restorations
High risk parent not engaged	– Recall every 3 months – Baseline and follow up MS <sup>a</sup>	– Twice daily brushing with fluoridated toothpaste <sup>b</sup> – Professional topical treatment every 3 months	Counseling, with limited expectations	– Active surveillance <sup>e</sup> of incipient lesions – Restore cavitated lesions with ITR <sup>f</sup> or definitive restorations

**Table 5. Example of a Caries Management Protocol for 3-5 Year Olds**

Risk Category	Diagnostics	Interventions			Restorative
		Fluoride	Diet	Sealants <sup>3</sup>	
Low risk	– Recall every 6-12 months – Radiographs every 12-24 months – Baseline MS <sup>a</sup>	– Twice daily brushing with fluoridated toothpaste <sup>7</sup>	No	Yes	– Surveillance <sup>x</sup>
Moderate risk parent engaged	– Recall every 6 months – Radiographs every 6-12 months – Baseline MS <sup>a</sup>	– Twice daily brushing with fluoridated toothpaste <sup>7</sup> – Fluoride supplements <sup>d</sup> – Professional topical treatment every 6 months	Counseling	Yes	– Active surveillance <sup>e</sup> of incipient lesions – Restoration of cavitated or enlarging lesions
Moderate risk parent not engaged	– Recall every 6 months – Radiographs every 6-12 months – Baseline MS <sup>a</sup>	– Twice daily brushing with fluoridated toothpaste <sup>7</sup> – Professional topical treatment every 6 months	Counseling, with limited expectations	Yes	– Active surveillance <sup>e</sup> of incipient lesions – Restoration of cavitated or enlarging lesions
High risk parent engaged	– Recall every 3 months – Radiographs every 6 months – Baseline and follow up MS <sup>a</sup>	– Brushing with 0.5% fluoride (with caution) – Fluoride supplements <sup>d</sup> – Professional topical treatment every 3 months	Counseling	Yes	– Active surveillance <sup>e</sup> of incipient lesions – Restoration of cavitated or enlarging lesions
High risk parent not engaged	– Recall every 3 months – Radiographs every 6 months – Baseline and follow up MS <sup>a</sup>	– Brushing with 0.5% fluoride (with caution) – Professional topical treatment every 3 months	Counseling, with limited expectations	Yes	– Restore incipient, cavitated, or enlarging lesions

**Table 6. Example of a Caries Management Protocol for >6 Year-Olds**

Risk Category	Diagnostics	Interventions			Restorative
		Fluoride	Diet	Sealants <sup>λ</sup>	
Low risk	<ul style="list-style-type: none"> <li>– Recall every 6-12 months</li> <li>– Radiographs every 12-24 months</li> </ul>	<ul style="list-style-type: none"> <li>– Twice daily brushing with fluoridated toothpaste<sup>μ</sup></li> </ul>	No	Yes	<ul style="list-style-type: none"> <li>– Surveillance<sup>κ</sup></li> </ul>
Moderate risk patient/parent engaged	<ul style="list-style-type: none"> <li>– Recall every 6 months</li> <li>– Radiographs every 6-12 months</li> </ul>	<ul style="list-style-type: none"> <li>– Twice daily brushing with fluoridated toothpaste<sup>μ</sup></li> <li>– Fluoride supplements<sup>β</sup></li> <li>– Professional topical treatment every 6 months</li> </ul>	– Counseling	Yes	<ul style="list-style-type: none"> <li>– Active surveillance<sup>ε</sup> of incipient lesions</li> <li>– Restoration of cavitated or enlarging lesions</li> </ul>
Moderate risk patient/parent not engaged	<ul style="list-style-type: none"> <li>– Recall every 6 months</li> <li>– Radiographs every 6-12 months</li> </ul>	<ul style="list-style-type: none"> <li>– Twice daily brushing with toothpaste<sup>μ</sup></li> <li>– Professional topical treatment every 6 months</li> </ul>	– Counseling, with limited expectations	Yes	<ul style="list-style-type: none"> <li>– Active surveillance<sup>ε</sup> of incipient lesions</li> <li>– Restoration of cavitated or enlarging lesions</li> </ul>
High risk patient/parent engaged	<ul style="list-style-type: none"> <li>– Recall every 3 months</li> <li>– Radiographs every 6 months</li> </ul>	<ul style="list-style-type: none"> <li>– Brushing with 0.5% fluoride</li> <li>– Fluoride supplements<sup>β</sup></li> <li>– Professional topical treatment every 3 months</li> </ul>	<ul style="list-style-type: none"> <li>– Counseling</li> <li>– Xylitol</li> </ul>	Yes	<ul style="list-style-type: none"> <li>– Active surveillance<sup>ε</sup> of incipient lesions</li> <li>– Restoration of cavitated or enlarging lesions</li> </ul>
High risk patient/parent not engaged	<ul style="list-style-type: none"> <li>– Recall every 3 months</li> <li>– Radiographs every 6 months</li> </ul>	<ul style="list-style-type: none"> <li>– Brushing with 0.5% fluoride</li> <li>– Professional topical treatment every 3 months</li> </ul>	<ul style="list-style-type: none"> <li>– Counseling, with limited expectations</li> <li>– Xylitol</li> </ul>	Yes	<ul style="list-style-type: none"> <li>– Restore incipient, cavitated, or enlarging lesions</li> </ul>

**Legends for Tables 4-6**

- α Salivary mutans streptococci bacterial levels.  
 χ Periodic monitoring for signs of caries progression.  
 ε Careful monitoring of caries progression and prevention program.  
 γ Parental supervision of a “pea sized” amount of toothpaste.  
 μ Less concern about the quantity of tooth paste.

- β Parental supervision of a “smear” amount of tooth paste.  
 δ Need to consider fluoride levels in drinking water.  
 φ Interim Therapeutic Restoration.<sup>65</sup>  
 λ Indicated for teeth with deep fissure anatomy or developmental defects.

peer-reviewed literature and the considered judgment of expert panels, as well as clinical experience of practitioners. The protocols should be updated frequently as new technologies and evidence develop.

Historically, the management of dental caries was based on the notion that it was a progressive disease that eventually destroyed the tooth unless there was surgical/restorative intervention. Decisions for intervention often were learned from unstandardized dental school instruction, and then refined by clinicians over years of practice. Little is known about the criteria dentists use when making decisions involving restoration of carious lesions.<sup>36</sup>

It is now known that surgical intervention of dental caries alone does not stop the disease process. Additionally, many lesions do not progress, and tooth restorations have a finite longevity. Therefore, modern management of dental caries should be more conservative and includes early detection of noncavitated lesions, identification of an individual’s risk for caries progression, understanding of the disease process for that individual, and “active surveillance” to apply preventive measures and monitor carefully for signs of arrestment or progression.

Caries management protocols for children further refine the decisions concerning individualized treatment and treatment thresholds based on a specific patient’s risk levels, age, and compliance with preventive strategies (Tables 4, 5, 6). Such protocols should yield greater probability of success and better cost effectiveness of treatment than less standardized treatment. Additionally, caries management protocols free practitioners of the necessity for repetitive high level treatment decisions, standardize decision making and treatment strategies,<sup>36-38</sup> eliminate treatment uncertainties, and guarantee more correct strategies.<sup>39</sup>

Content of the present caries management protocol is based on results of clinical trials, systematic reviews, and expert panel recommendations that give better understanding to, and recommendations for, diagnostic, preventive, and restorative treatments. The radiographic diagnostic guidelines are based on the latest guidelines from the American Dental Association (ADA).<sup>40</sup> Systemic fluoride protocols are based on the Centers for Disease Control and Prevention’s (CDC) recommendations for using fluoride.<sup>29</sup> Guidelines for the use of topical fluoride treatment are based on the ADA’s Council on Scientific Affairs’ recommendations for professionally-applied

topical fluoride,<sup>41</sup> the Scottish Intercollegiate Guideline Network guideline for the management of caries in pre-school children,<sup>42</sup> a Maternal and Child Health Bureau Expert Panel,<sup>43</sup> and the CDC's fluoride guidelines.<sup>29</sup> Guidelines for pit and fissure sealants are based on ADA's Council on Scientific Affairs recommendations for the use of pit-and-fissure sealants.<sup>44</sup> Guidelines on diet counseling to prevent caries are based on 2 review papers.<sup>45,46</sup> Guidelines for the use of xylitol are based on the AAPD's oral health policy on use of xylitol in caries prevention,<sup>32</sup> a well-executed clinical trial on high caries-risk infants and toddlers,<sup>47</sup> and 2 evidence-based reviews.<sup>48,49</sup> Active surveillance (prevention therapies and close monitoring) of enamel lesions is based on the concept that treatment of disease may only be necessary if there is disease progression,<sup>50</sup> that caries progression has diminished over recent decades,<sup>51</sup> and that the majority of proximal lesions, even in dentin, are not cavitated.<sup>52</sup>

Other approaches to the assessment and treatment of dental caries will emerge with time and, with evidence of effectiveness, may be included in future guidelines on caries risk assessment and management protocols. For example, there are emerging trends to use calcium and phosphate remineralizing solution to reverse dental caries.<sup>53</sup> Other fluoride compounds, such as silver diamine fluoride<sup>54</sup> and stannous fluoride<sup>55</sup>, may be more effective than sodium fluoride for topical applications. There has been interest in antimicrobials to affect the caries rates, but evidence from caries trials is still inconclusive.<sup>56</sup> However, some other proven methods, such as prescription fluoride drops and tablets, may be removed from this protocol in the future due to attitudes, risks, or compliance.<sup>57,58</sup>

## Recommendations

1. Dental-caries risk assessment, based on a child's age, biological factors, protective factors, and clinical findings, should be a routine component of new and periodic examinations by oral health and medical providers.
2. While there is not enough information at present to have quantitative caries-risk assessment analyses, estimating children at low, moderate, and high caries risk by a preponderance of risk and protective factors will enable a more evidence-based approach to medical provider referrals, as well as establish periodicity and intensity of diagnostic, preventive, and restorative services.
3. Clinical management protocols, based on a child's age, caries risk, and level of patient/parent cooperation, provide health providers with criteria and protocols for determining the types and frequency of diagnostic, preventive, and restorative care for patient specific management of dental caries.

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TABLE 1

## CAMBRA for Dental Providers (0-5) Assessment Tool

Caries Risk Assessment Form for Age 0 to 5

Patient name: \_\_\_\_\_ I.D.# \_\_\_\_\_ Age \_\_\_\_\_ Date \_\_\_\_\_

Initial/base line exam date \_\_\_\_\_ Caries recall date \_\_\_\_\_

Respond to each question in sections 1, 2, 3, and 4 with a check mark in the "Yes" or "No" column	Yes	No	Notes
<b>1. Caries Risk Indicators — Parent Interview**</b>			
(a) Mother or primary caregiver has had active dental decay in the past 12 months			
(b) Child has recent dental restorations (see 5b below)			
(c) Parent and/or caregiver has low SES (socioeconomic status) and/or low health literacy			
(d) Child has developmental problems			
(e) No dental home/episodic dental care			
<b>2. Caries Risk Factors (Biological) — Parent Interview**</b>			
(a) Child has frequent (greater than three times daily) between-meal snacks of sugars/cooked starch/sugared beverages			
(b) Child has saliva-reducing factors present, including: 1. Medications (e.g., some for asthma or hyperactivity) 2. Medical (cancer treatment) or genetic factors			
(c) Child continually uses bottle - contains fluids other than water			
(d) Child sleeps with a bottle or nurses on demand			
<b>3. Protective Factors (Nonbiological) — Parent Interview</b>			
(a) Mother/caregiver decay-free last three years			
(b) Child has a dental home and regular dental care			
<b>4. Protective Factors (Biological) — Parent Interview</b>			
(a) Child lives in a fluoridated community or takes fluoride supplements by slowly dissolving or as chewable tablets			
(b) Child's teeth are cleaned with fluoridated toothpaste (pea-size) daily			
(c) Mother/caregiver chews/sucks xylitol chewing gum/lozenges 2-4x daily			
<b>5. Caries Risk Indicators/Factors — Clinical Examination of Child**</b>			
(a) Obvious white spots, decalcifications, or obvious decay present on the child's teeth			
(b) Restorations placed in the last two years in/on child's teeth			
(c) Plaque is obvious on the child's teeth and/or gums bleed easily			
(d) Child has dental or orthodontic appliances present, fixed or removable: e.g., braces, space maintainers, obturators			
(e) Risk Factor: Visually inadequate saliva flow - dry mouth			
<b>**If yes to any one of 1(a), 1(b), 5(a), or 5(b) or any two in categories 1, 2, 5, consider performing bacterial culture on mother or caregiver and child. Use this as a base line to follow results of antibacterial intervention.</b>	Parent/Caregiver	Child	
	Date:	Date:	
(a) Mutans streptococci (Indicate bacterial level: high, medium, low)			
(b) Lactobacillus species (Indicate bacterial level: high, medium, low)			
<b>Child's overall caries risk status: (CIRCLE) Extreme</b>	Low	Moderate	High
Recommendations given: Yes _____ No _____ Date given _____ Date follow up: _____			

SELF-MANAGEMENT GOALS 1) \_\_\_\_\_ 2) \_\_\_\_\_

Practitioner signature \_\_\_\_\_ Date \_\_\_\_\_

## Instructions for Caries Risk Assessment Form — Children Age 0-5

**1. Answer the questions:** Respond to questions 1 to 5 with “yes” or “no” answers. You can make special notations such as the number of cavities present, the severity of the lack of oral hygiene, the brand of fluorides used, the type of bottle contents used, the type of snacks eaten, or the names of medications/drugs that may be causing dry mouth.

**2. Determine the overall caries risk of the child:** Add up the “yes” answers to the disease indicators/risk factors from caries risk categories 1, 2, and 5. Then add up the number of “yes” answers for the protective indicators/factors identified in categories 3 and 4. Make a judgment as to low, moderate or high overall caries risk based on the balance between the pathological factors (caries disease indicators and risk factors) and the protective factors. **Note:** Determining the caries risk for an individual child requires evaluating both the number as well as the severity of the disease indicators and risk factors. Certainly a child with caries presently or in the recent past is at high risk for future caries. A patient with low bacterial levels would need to have several other risk factors present to be considered at moderate risk. Some judgment is needed while also considering the protective factors to determine the risk.

**3. Bacteria testing:** If the answer is “yes” to any one of 1(a), 1(b), 5(a), or 5(b) questions regarding parent/caregiver’s recent active decay, or child’s recent restorations, or any obvious white spots, decalcifications or obvious decay; or any two of the questions in 1, 2, 5, consider performing bacterial cultures on parent/caregiver and child (see \*\*notes on the form). See separate “Bacterial Testing” instructions for technique steps. Use the bacterial colony density level (low, medium, or high) to determine who would benefit from antibacterial therapy and to establish a base line to assess the impact of any prescribed antibacterial intervention(s) and whether to carry out antibacterial therapy for the parent/caregiver or child.

**4. Plan for caries intervention and prevention:** Develop a caries control and management plan for the child and parent/caregiver based on completed assessments incorporating antibacterial therapy and fluoride delivery forms as indicated. (See “CAMBRA Clinical Guidelines for Patients 0-5 Years,” **TABLE 2**.) High caries risk status is generally an indication for the use of both antibacterial therapy and fluoride therapy. If the answer is “yes” to any one of questions regarding the presence of white spots, decalcification or obvious decay on the child’s teeth or parent/child restorations (1(a), 1(b), 5(a), or 5(b)), strongly consider using antibacterial therapy for the parent/caregiver as well as the child. Once strategies have been planned to aggressively deal with caries as a bacterially-based transmissible infection, determine which teeth have cavitation and treatment plan for minimally invasive restorative procedures designed to conserve tooth structure.

**5. Home care recommendations:** Review with the parent/caregiver the individualized home care recommendations you have selected for them on the “Parent/Caregiver Recommendations for Control of Dental Decay in Children 0-5” form (**TABLE 4**). Use this interaction as an opportunity for a brief patient-centered approach to engage the parent/caregiver in two-way communication on strategies for caries control and management. During this motivational interviewing intervention, ask the parent/caregiver to commit to two goals and note them on the “Self-management goals 1) and 2)” area in the last section of the CAMBRA 0-5 form (**TABLE 1**). Inform the parent/caregiver that you will follow up with them on these goals at the next appointment. Give one copy of the signed recommendations form to the parent/caregiver and keep one in the child’s chart. Point out to the parent/caregiver that the back of the recommendations form includes additional information on “How Tooth Decay Happens” and “Methods of Controlling Tooth Decay” to help them further understand the caries disease process and ways to control it (**TABLE 4**).

**6. Bacteria test results:** After the inoculated media sticks or culture tubes have incubated for 72 hours (see **TABLE 3** for instructions), determine the colony density level, and inform the parent/caregiver of the results of the bacteria tests. Since showing the parent/caregiver the bacteria grown from their own mouth can be a good motivator, show them the culture tube at the next visit (the culture keeps satisfactorily for some weeks) or provide them with a photograph or digital image of their bacterial colonies. If the parent/caregiver has high cariogenic bacterial counts then work with them to lower their caries risk and get their caries infection under control. The goal is to eliminate this source of infection and reinfection for the child.

**7. Follow up:** After the parent/caregiver/child has been following your recommendations for three to six months, have them back to reassess how well they are doing. Some practicing clinicians report good motivational success in doing a bacterial culture immediately after the patient’s very first month of antibacterial treatment. Patients need encouragement early on when behavior change is required. Ask them if they are following your instructions and how often. If the bacterial levels were moderate or high initially, repeat the bacterial culture to see if bacterial levels have been reduced by antibacterial therapy. Make changes in your recommendations or reinforce protocol if results are not as good as desired or the parent/caregiver is not cooperating as much as expected. It is very important to inform patients that changing a pathogenic biofilm is not going to happen overnight. In fact, it may take several months to even years in some cases.

## CAMBRA Treatment Guidelines (0-5 years)

## Caries Management by Risk Assessment (CAMBRA) Clinical Guidelines for Patients 0-5 years

Risk Level	Saliva Test	Antibacterials	Fluoride	Frequency of Radiographs	Frequency of Periodic Oral Exams (POE)	**** Xylitol and/or Baking Soda	Sealants ****	Existing Lesions
<b>Low risk</b>	Optional (Base line)	Not required or if saliva test was performed; treat main caregiver accordingly	Not required	After age 2; Bitewing radiographs every 18-24 months	Every 6-12 months to re-evaluate caries risk AND ANTICIPATORY GUIDANCE**		Optional	
<b>Moderate risk</b>	Recommended	Not required or if saliva test was performed; treat main caregiver accordingly	OTC fluoride-paste twice daily (a pea-sized amount) Sodium fluoride treatment gels/rinses	After age 2; Bitewing radiographs every 12-18 months	Every 6 months to re-evaluate caries risk AND ANTICIPATORY GUIDANCE	Xylitol gum or lozenges Two sticks of gum or two mints four times daily for the caregiver Xylitol food, spray or drinks for the child	Sealants for deep pits and fissures after two years of age. High fluoride ionomer is recommended	Lesions that do not penetrate the DEJ and are not cavitated should be treated with fluoride toothpaste and fluoride varnish
<b>High risk*</b>	Required	Chlorhexidine 0.12% 10 ml rinse for main caregiver of the infant or child for one week each month. Bacterial test every caries recall. Health provider might brush infant's teeth with CHX	Fluoride varnish at initial visit and caries recall exams OTC fluoride-containing toothpaste and calcium phosphate paste combination twice daily Sodium fluoride treatment gel/rinses	After age 2; Two size #2 occlusal films and 2 bitewing radiographs every 6-12 months or until no cavitated lesions are evident	Every 3 months to re-evaluate caries risk and apply fluoride varnish AND ANTICIPATORY GUIDANCE	Xylitol gum or lozenges. Two sticks of gum or two mints four times daily for the caregiver Xylitol food, spray, or drinks for the child	Sealants for deep pits and fissures after two years of age. High fluoride ionomer is recommended	Lesions that do not penetrate the DEJ and are not cavitated should be treated with fluoride toothpaste and fluoride varnish ART might be recommended
<b>Extreme risk*</b>	Required	Chlorhexidine 0.12% 10 ml rinse for one minute daily at bedtime for two weeks each month. Bacterial test at every caries recall Health provider might brush infant's teeth with CHX	Fluoride varnish at initial visit, each caries recall and after prophylaxis or recall exams OTC fluoride-containing toothpaste and phosphate paste combination twice daily Sodium fluoride treatment gel/rinses	After age 2; Two size #2 occlusal films and 2 bitewing radiographs every 6 months or until no cavitated lesions are evident	Every 1-3 months to re-evaluate caries risk and apply fluoride varnish and anticipatory guidance	Xylitol gum or lozenges. Two sticks of gum or two mints four times daily for the caregiver Xylitol food, spray, or drinks	Sealants for deep pits and fissures after two years of age. High fluoride ionomer is recommended	Holding care with glass ionomer materials until caries progression is controlled (ART) Fluoride varnish and anticipatory guidance/self-management goals

\* Pediatric patients with one (or more) cavitated lesion(s) are high-risk patients.

\* Pediatric patients with one (or more) cavitated lesion(s) and hyposalivary or special needs are extreme-risk patients.

\* Pediatric patients with daily medication such as inhalers or behavioral issues will have diminished salivary function.

\*\* Anticipatory guidance - "Appropriate discussion and counseling should be an integral part of each visit for care." AAPD

\*\*\* ICIDAS protocol presented by Jensen et al. this issue may be helpful on sealant decisions.

\*\*\*\* Xylitol is not good for pets (especially dogs).

For all risk levels: Pediatric patients, through their caregiver, must maintain good oral hygiene and a diet low in frequency of fermentable carbohydrates.

Patients with appliances (RPDs, orthodontics) require excellent oral hygiene together with intensive fluoride therapy. Fluoride gel to be placed in removable appliances.

TABLE 1

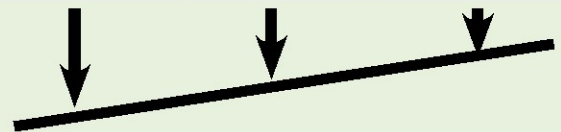
**Caries Risk Assessment Form — Children Age 6 and Over/Adults**

Patient Name: \_\_\_\_\_ Chart #: \_\_\_\_\_ Date: \_\_\_\_\_

Assessment Date: Is this (please circle) base line or recall

Disease Indicators (Any one "YES" signifies likely "High Risk" and to do a bacteria test**)	YES = CIRCLE	YES = CIRCLE	YES = CIRCLE
Visible cavities or radiographic penetration of the dentin	YES		
Radiographic approximal enamel lesions (not in dentin)	YES		
White spots on smooth surfaces	YES		
Restorations last 3 years	YES		
<b>Risk Factors (Biological predisposing factors)</b>			
MS and LB both medium or high (by culture**)		YES	
Visible heavy plaque on teeth		YES	
Frequent snack (> 3x daily between meals)		YES	
Deep pits and fissures		YES	
Recreational drug use		YES	
Inadequate saliva flow by observation or measurement (**If measured, note the flow rate below)		YES	
Saliva reducing factors (medications/radiation/systemic)		YES	
Exposed roots		YES	
Orthodontic appliances		YES	
<b>Protective Factors</b>			
Lives/work/school fluoridated community			YES
Fluoride toothpaste at least once daily			YES
Fluoride toothpaste at least 2x daily			YES
Fluoride mouthrinse (0.05% NaF) daily			YES
5,000 ppm F fluoride toothpaste daily			YES
Fluoride varnish in last 6 months			YES
Office F topical in last 6 months			YES
Chlorhexidine prescribed/used one week each of last 6 months			YES
Xylitol gum/lozenges 4x daily last 6 months			YES
Calcium and phosphate paste during last 6 months			YES
Adequate saliva flow (>1 ml/min stimulated)			YES
<b>**Bacteria/Saliva Test Results: MS: LB: Flow Rate: ml/min. Date:</b>			

VISUALIZE CARIES BALANCE  
 (Use circled indicators/factors above)  
 (EXTREME RISK = HIGH RISK + SEVERE SALIVARY GLAND HYPOFUNCTION)  
 CARIES RISK ASSESSMENT (CIRCLE): EXTREME HIGH MODERATE LOW



Doctor signature/#: \_\_\_\_\_ Date: \_\_\_\_\_

TABLE 1

### Caries Management by Risk Assessment Clinical Guidelines for Patients Age 6 and Older

Risk Level ### ***	Frequency of Radiographs	Frequency of Caries Recall Exams	Saliva Test (Saliva Flow & Bacterial Culture)	Antibacterials Chlorhexidine Xylitol ****	Fluoride	pH Control	Calcium Phosphate Topical Supplements	Sealants (Resin-based or Glass Ionomer)
Low risk	Bitewing radio- graphs every 24- 36 months	Every 6-12 months to re- evaluate caries risk	May be done as a base line refer- ence for new patients	Per saliva test if done	OTC fluoride-containing toothpaste twice daily, after breakfast and at bedtime. Optional: NaF varnish if excessive root exposure or sensitivity	Not required	Not required Optional: for excessive root exposure or sen- sitivity	Optional or as per ICDAS seal- ant protocol (TABLE 2)
Moderate risk	Bitewing radio- graphs every 18- 24 months	Every 4-6 months to re- evaluate caries risk	May be done as a base line refer- ence for new patients or if there is suspicion of high bacterial challenge and to assess efficacy and patient coop- eration	Per saliva test if done Xylitol (6-10 grams/day) gum or candies. Two tabs of gum or two candies four times daily	OTC fluoride-containing toothpaste twice daily plus: 0.05% NaF rinse daily. Initially, 1-2 app of NaF varnish; 1 app at 4-6 month recall	Not required	Not required Optional: for excessive root exposure or sen- sitivity	As per ICDAS sealant protocol (TABLE 2)
High risk*	Bitewing radio- graphs every 6-18 months or until no cavitated lesions are evident	Every 3-4 months to re- evaluate caries risk and apply fluoride varnish	Saliva flow test and bacterial culture initially and at every car- ies recall appt. to assess efficacy and patient coop- eration	Chlorhexidine gluconate 0.12% 10 ml rinse for one min- ute daily for one week each month. Xylitol (6-10 grams/day) gum or can- dies. Two tabs of gum or two candies four times daily	1.1% NaF toothpaste twice daily instead of regular fluoride tooth- paste. Optional: 0.2% NaF rinse daily (1 bottle) then OTC 0.05% NaF rinse 2X daily. Initially, 1-3 app of NaF varnish; 1 app at 3-4 month recall	Not required	Optional: Apply calcium/ phosphate paste several times daily	As per ICDAS sealant protocol (TABLE 2)
Extreme risk** (High risk plus dry mouth or special needs)	Bitewing radio- graphs every 6 months or until no cavitated lesions are evident	Every 3 months to re-evaluate caries risk and apply fluoride varnish.	Saliva flow test and bacterial culture initially and at every car- ies recall appt. to assess efficacy and patient coop- eration	Chlorhexidine 0.12% (preferably CHX in water base rinse) 10 ml rinse for one minute daily for one week each month. Xylitol (6-10 grams/day) gum or candies. Two tabs of gum or two candies four times daily	1.1% NaF toothpaste twice daily instead of regular fluoride tooth- paste. OTC 0.05% NaF rinse when mouth feels dry, after snacking, breakfast, and lunch. Initially, 1-3 app. NaF varnish; 1 app at 3 month recall.	Acid-neutralizing rinses as needed if mouth feels dry, after snacking, bedtime and after breakfast. Baking soda gum as needed	Required Apply calcium/phos- phate paste twice daily	As per ICDAS sealant protocol (TABLE 2)

\* Patients with one (or more) cavitated lesion(s) are high-risk patients. \*\* Patients with one (or more) cavitated lesion(s) and severe hyposalivation are extreme-risk patients. \*\*\* All restorative work to be done with the minimally invasive philosophy in mind. Existing smooth surface lesions that do not penetrate the DEJ and are not cavitated should be treated chemically, not surgically. For extreme-risk patients, use holding care with glass ionomer materials until caries progression is controlled. Patients with appliances (RPDs, prosthodontics) require excellent oral hygiene together with intensive fluoride therapy e.g., high fluoride toothpaste and fluoride varnish every three months. Where indicated, antibacterial therapy to be done in conjunction with restorative work. ### For all risk levels: Patients must maintain good oral hygiene and a diet low in frequency of fermentable carbohydrates. \*\*\*\* Xylitol is not good for pets (especially dogs).

TABLE 4

## Parent/Caregiver Recommendations Form

### Parent/Caregiver Recommendations for Control of Dental Decay in Children 0-5 Years

#### Daily Oral Hygiene/Fluoride Toothpaste Treatment

(These procedures reduce the bacteria in the mouth and provide a small amount of fluoride to guard against further tooth decay as well as to repair early decayed areas.)

- Brush child's teeth with a fluoride-containing toothpaste (small smear or pea-sized amount on a soft small infant-sized toothbrush) twice daily (gently brushed by parent or caregiver)
- Selective daily flossing of areas with early caries (white spots)
- Other: \_\_\_\_\_

#### Diet

(The aim is to reduce the number of between-meal sweet snacks that contain carbohydrates, especially sugars. Substitution by snacks rich in protein, such as cheese will also help.)

- OK as is
- Limit bottle/nursing (to avoid prolonged contact of milk with teeth)
- Replace juice or sweet liquids in the bottle with water
- Limit snacking (particularly sweets)
- Replace high carbohydrate snacks with cheese and protein snacks
- Other \_\_\_\_\_

#### Xylitol (Parent/caregivers)

Xylitol is a sweetener that the bacteria cannot feed on. Using xylitol-containing chewing gum or mints/lozenges is a way that parents/caregivers of high-risk children can reduce the transfer of decay-causing bacteria to their baby/toddler. This is most effective when used by the parent/caregiver starting shortly after the child's birth. Parents/caregivers with dental decay place their children at high risk for early childhood caries. Xylitol is not good for pets (especially dogs).

- Parents/caregivers of children age 3 and under with high bacterial levels should use xylitol mints/lozenges or xylitol gum two to four times daily.

#### Antibacterial Rinse (Parents/caregivers)

(In addition, parents/caregivers of high-risk children may require antibacterial treatment to decrease the transmission of cariogenic bacteria and lessen the infant/child's risk of early childhood caries.)

- Parents/caregivers of children age 3 and under with high bacterial levels should rinse with 10 ml of chlorhexidine gluconate 0.12 percent (Periogard, Peridex, Oral Rx by prescription only). Rinse at bedtime for 1 minute 1x/day for one week. Repeat each month for one week until infection is controlled. Separate by one hour from fluoride use. Continue for six months or until bacterial levels remain controlled.

Practitioner signature \_\_\_\_\_ Date \_\_\_\_\_

Parent/caregiver signature \_\_\_\_\_ Date \_\_\_\_\_

TABLE 5

Self-management Goals for Parent/Caregiver

Patient Name \_\_\_\_\_ DOB \_\_\_\_\_



Regular dental visits for child



Family receives dental treatment



Healthy snacks



Brush with fluoride toothpaste at least twice daily



No soda



Less or no juice



Wean off bottle (At least no bottle for sleeping)



Only water or milk in sippy cup



Chew gum with xylitol



Drink tap water



Less or no candy and junk food

**IMPORTANT:**  
The last thing that touches your child's teeth before bedtime is the toothbrush with fluoride toothpaste.

Circle the goals you will focus on between today and your next visit.

On a scale of 1-10, how confident are you that you can accomplish the goals? 1 2 3 4 5 6 7 8 9 10

Not likely

Definitely

My promise: I agree to the goals circled and understand that staff may ask me how I am doing with my goals.

Date: \_\_\_\_\_ Signed by: \_\_\_\_\_

Review Date: \_\_\_\_\_ Comments: \_\_\_\_\_ Staff Initials: \_\_\_\_\_

Review Date: \_\_\_\_\_ Comments: \_\_\_\_\_ Staff Initials: \_\_\_\_\_