

I'm not robot!

[illegible][illegible]

Patient's first name	Last name	MRN	Name of provider	Today's date	/ /					
Type of visit: (circle all that apply)	Child's DOB	/ /								
Initial	Recall	DMF	Fluoride varnish	Restorative	ITR	Sealants	Sedation	Emergency	OR	Other
Can be completed by clinical staff, patient or dentist										
Biologic Factors				Comments						
Child has history of active caries				Y	N					
Mother has active caries				Y	N					
Siblings have active caries				Y	N					
Continuous bottle use				Y	N	SW				
Sleeps with bottle or nurses on demand				Y	N	SW	Describe			
Juice/milk in sippy cup				Y	N	SW	Describe			
Frequent snacking				Y	N	SW	Describe			
SHCN				Y	N					
Potential caries causing medications				Y	N	Describe				
Protective factors										
Tooth brushing				Y	N	___x/day				
Assistance with brushing				Y	N	SW				
Fluoride toothpaste				Y	N	___x/day				
Topical fluoride (stannous fluoride toothpaste, Prevident, ACT)				Y	N	___x/day				
Floss				Y	N	NA				
Drinks fluoridated water				Y	N					
To be completed by dentist										
Disease indicators/risk factors (from clinical examination)										
Cavitation				Y	N	Where _____				
New cavitation				Y	N	NA	Where _____			
Demineralization / New Demin (WS)				Y	N	Where _____				
Radiographic decay				Y	N	NA	Where _____			
Enamel defects				Y	N	Where _____				
Visible plaque				Y	N	SW	Where _____			
Gingivitis				Y	N	Improved	Describe _____			
Deep pits/sulcus				Y	N	Where _____				
Indicators of improved caries risk (from clinical examination)										
Remineralization				Y	N	SW	Where _____			
New remineralization				Y	N	Where _____				
Meeting self-management goals				Y	N	SW	NA			
Stannous fluoride staining				Y	N	NA				
Other										
Pain due to untreated caries				Y	N	Where _____				
Referral to OR/sedation				Y	N					
Behavior (Frankl score)				1	2	3	4			
Overall caries risk: Low Medium High										
NV: ___ months for DM/F varnish and _____										
Self management goals										
(1)										
(2)										
F-toothpaste ___ x/day 0.4% stannous fluoride ___x/day										

Caries risk assessment guidelines. How to assess caries risk. Caries risk assessment methods. Why is caries risk assessment important.

[illegible]



available depending on child's age and cooperation and local regulations), detect and record radiographic decay. This completes the disease indicator section of Table 1, column 3. 5. Assess and document the caries risk level as low, moderate, high or very high. It is the responsibility of the dental care provider to make the final judgment of caries risk status based upon the data collected on the CRA, taking into consideration other factors like expected parental compliance to recommendations and re-care visits, coupled with the provider's clinical judgment. Apply fluoride varnish if appropriate. Steps 1, 3 and 4 are familiar elements of any conventional oral examination for this age group. Step 2 compiles a few simple questions (as listed in the CRA form in Table 1, columns 1 and 2) that attempt to identify the potential causes of the ongoing disease or to evaluate whether it is under control. Only those biological risk factors that have been shown to be statistically significantly related to ongoing caries and successful risk assessment in previous studies are included here [17, 25]. Table 1 is a ready to use CRA form that provides a visual summary of the factors that contribute to the overall caries risk assignment. Definitions of terms and justification for inclusion are. Biological and Environmental Risk Factors—Table 1, Column 2 Biological risk factors contribute directly to the initiation or progression of dental caries (both the caries disease and caries lesions). They include an assessment of factors that have been established as most important (Table 1). The risk factors utilized in this CRA form are: 1. Frequent snacking on fermentable carbohydrates, at least three times daily outside of mealtimes. Frequent carbohydrate intake results in a prolonged acidic environment in the plaque that dissolves the tooth mineral and can act as a driving force to reinforce the overgrowth of cariogenic bacteria and the suppression of oral commensal (beneficial) bacteria, leading to future caries development [26]. Fermentable carbohydrates such as sucrose, fructose (high fructose corn syrup), glucose, and cooked starch are included. Fruit juice (e.g., apple juice) is an important but often overlooked source of fermentable carbohydrates among young children. 2. Use of bottle or non-spill cup containing liquids other than water. This provides a continuous ingestion of carbohydrates, such as from fruit juices, that leads to a continual acid environment in the plaque. It should be stressed that the use of milk in a bottle overnight and/or nursing on demand in the presence of cariogenic bacteria provides a prolonged acid challenge that increases the risk for caries and should be strongly discouraged. 3. Mother/primary caregiver or sibling has current decay or a recent history of decay. Presence of recent decay indicates they have high levels of cariogenic bacteria, especially Mutans Streptococci (MS), that can be transmitted to the child. Early colonization of MS by 3 years of age will increase the child's risk for developing caries [26, 27]. Current or recent decay in the parent or caregiver is an important indicator of potential high caries risk for the child. This becomes more important in infants with few teeth present, where signs of additional risk factors are not yet evident, and is supported by the strong correlation found in numerous studies [28-31]. 4. Family has low socioeconomic and/or low health literacy status. Low socioeconomic status, of course, is not a biological contributor to the caries process. However, as a social determinant of health for many other diseases, it is one of several statistically significant factors associated with high caries risk [17, 25]. Practitioners should account for a challenging family socioeconomic context in formulating a personalized caries management plan. Similarly, low health literacy is not a biological risk factor, but it is often associated with socioeconomic level and contributes to increased risk of disease. Importantly, it is possible to educate the parent/primary caregiver regarding caries and its prevention. 5. Use of medications that induce hyposalivation. Hyposalivation is a side effect of some of the most commonly prescribed medications such as those used to treat allergies, asthma, mental disorders and cancer [32]. The risk of dry mouth increases with the number of medications prescribed. Hyposalivation can also be caused by other factors including some medical conditions and genetic factors. In the CRA procedure, any items on this list with a positive response are marked with a yes (Table 1, column 2). Each yes adds to the risk level. Items 1 and 2 can be modified by behavioral management. A yes to item 3 may indicate a potentially very high risk patient that requires additional care and therapy. Biological Risk Factors—Clinical Exam—Table 1, Column 2 Heavy Plaque on the Teeth This simple measure, as observed by the clinician, has been shown in our clinical outcomes studies in children of all ages and in adults, to be a strong indicator of cariogenic bacterial activity, and it is strongly related to ongoing caries [12, 17, 18, 25]. This factor may indicate a combination of items that include high levels of cariogenic bacteria, ineffective plaque removal, food accumulation, and inadequate brushing with fluoride toothpaste. Gingivitis, or gums that bleed easily can be a sign of consistent presence of heavy plaque in specific areas, and a clinical risk indicator related to presence of plaque. There is ample evidence that cariogenic bacteria levels are strongly related to caries risk [33-36]. However, at the time of writing there is no validated chairside test commercially available for measuring cariogenic bacterial levels. Therefore, cariogenic bacteria counts have been eliminated from the CRA form in this revised version. A quantitative bacteria test can be added back at a later date when an evidence-based chairside test becomes available. In the CRA procedure, any items on this list with a positive response are marked with a yes (Table 1, column 2). Each yes adds to the risk level. Heavy plaque on the teeth can be modified by behavioral management. Protective Factors - Table 1, Column 1 Protective factors are biological factors, environmental factors or chemical therapy that help to swing the caries balance to caries lesion prevention or reversal (Table 1, part 2). The factors included in the 0-6 years age group CAMBRA CRA form are: 1. Lives in a fluoridated drinking water area 2. Drinks fluoridated water The beneficial effect of drinking fluoridated water is well-established. 3. Uses a fluoride-containing toothpaste at least twice daily The beneficial effect of brushing with fluoridated toothpaste has been well-established in numerous clinical trials and is a major factor in reductions in caries over recent decades [37-40]. The American Academy of Pediatric Dentistry (AAPD) and the American Dental Association (ADA) recommend at least twice-a-day use of a smear of a fluoride toothpaste for ages 0-2 years and a pea size for ages 3-6 years, when using a 1,000 part per million fluoride (ppm F) toothpaste [38, 41]. For children ages 0-6 years, it is recommended that the parent/caregiver brushes the child's teeth, or supervises toothbrushing, twice a day. Parent-supervised toothbrushing with F toothpaste (preferably 1,000 ppm F or higher) at least twice daily provides considerable added benefit above once daily [42, 43]. Countries and regions other than USA have published different guidelines appropriate to the region. 4. Has had fluoride varnish applied in the last 6 months The caries-reducing benefit of fluoride varnish (FV) is well-established, including when used in young children [44, 45]. In the CRA procedure each of these items with a positive response receives a "yes" score in column 1, Table 1. Note: xylitol use by the caregiver is no longer listed as a protective factor in this revised CRA version as the evidence of its antimicrobial effects to achieve caries prevention is limited for adults or children [46]. However, xylitol is non-cariogenic and its use is still recommended to substitute other sugars to reduce frequency of snacking on fermentable carbohydrates [46]. Disease Indicators - Clinical Exam—Table 1, Column 3 Disease indicators are the clinically observed results of previous and/or ongoing dental caries destruction of the tooth mineral. They do not contribute to the disease; they are simply manifestations and clinical signs of the effects of dental caries at different stages. Disease indicators fit into two overall descriptions as evaluated in the outcomes assessments over several years of the original CAMBRA CRA form for the 0-6 year age group. They are strong indicators of ongoing disease. 1. Evident tooth decay or white spots This descriptor includes: a) Observed cavitation or radiographic evidence of progression into dentin, b) White spot lesions (that are new or active) on smooth surfaces, c) Radiographic or visual evidence of non-cavitated demineralization into the enamel (usually by bitewing radiographs). 2. Existing restorations Restorations that were placed due to caries in the last 2 years for a new patient or the last year for a patient of record. For a new patient visit, one or more of these disease indicators signals "high caries risk." For a patient of record at a follow up visit any new appearance of tooth decay, white spots, or recent restorations signals "high caries risk." If hyposalivation is present, in addition, this will require additional care and therapy. Determination of Caries Risk (Table 1) Details are provided in part 2 of Table 1. In addition to the written guidelines the determination of caries risk level is guided by visualizing the caries balance from the results on the CRA form or when using an electronic version of the questions and clinical observations. To aid in this visualization we have included a simple quantitative tool known as CAMBRAI23. Protective factors in column 1 that are marked yes each receive a score of -1. Risk factors in column 2 with a yes are each scored +2. Yes to disease indicators in column 3 each receive a score of +3. Then simply add the scores for columns 2 and 3 and subtract the total from column 1. Consult the chart in Table 1, part 2 and be guided to a caries risk level. Oral Health During Pregnancy and Maternal Pre-natal Caries Risk Because maternal prenatal oral health is linked to the oral health of the child, it is necessary to address the maternal prenatal risk factors for caries in children and the possibility of caries transmission from mother to child [47, 48]. Emphasizing early interventions for women during pregnancy is recommended to improve the likelihood of early intervention for the child. Although misconceptions still exist regarding the safety and effectiveness of oral health care for pregnant women, in reality the establishment of a healthy oral environment for pregnant women is both important and achievable, and includes plaque control through brushing, flossing, use of F toothpaste and antimicrobial agents (e.g., chlorhexidine rinses). This can be followed by a professional prophylaxis including coronal scaling, root planning, and polishing. Expectant mothers should be encouraged to continue these practices after the child is born as a means of promoting oral health for the mother and her infant [47]. Caries Management Based on Risk Assessment- Practical Step-By-Step Guidelines for the Age Group 0-6 Years The following are step-by-step guidelines for use of the CAMBRA system for caries management with young children ages 0-6 years. Parts of the following sections are reproduced and updated with permission from Featherstone et al. [3]. 1. Carry out a CRA as described above and classify the child as low, moderate, high or very high caries risk. 2. Produce and document a caries management plan that addresses all the risk factors that may contribute to the development or progression of disease for that specific patient, including lifestyle/behavior modification for caregivers and child to achieve plaque control and diet improvements [24]. 3. Prescribe and/or provide chemical therapy for the patient, that includes fluoride with or without antibacterial therapy, based upon the caries risk level and the age of the patient. Details are described below. Provide anticipatory guidance and integrate motivational interviewing principles for caregivers and patients (when age appropriate) to set up achievable self-management goals for home management plans [20, 21, 49]. 4. Develop a restorative treatment plan (if necessary) that takes into consideration age, behavior (cooperation for treatment delivery), health status and social determinants, favoring minimally invasive restorative procedures to conserve tooth structure whenever possible, restoring function and aiming at providing that patient with the means to achieve adequate plaque control. 5. Establish periodicity of recalls, and review at intervals appropriate to the caries risk status, to continue active surveillance of non-cavitated lesions, provide in-office preventive measures, and reinforce behavioral changes and adherence to prescribed daily home regimens. 6. Reassess and document caries risk level at each recall and modify the caries management plan and self-management goals as necessary. CAMBRA therapies for older children and adults place special importance on chemical therapy, because placing restorations can restore tooth form and function but does not affect the risk factors that caused the disease, such as a cariogenic diet or high levels of cariogenic bacteria in the rest of the mouth [50-52]. One recommended antimicrobial chemical therapy in children 6 years and older and in adults as part of a caries management plan is chlorhexidine mouthrinse [12, 50]. However, use of chemotherapeutic agents in infants and toddlers requires special considerations due to toxicity/safety and behavioral acceptance issues. For this reason, in this age group, most of the recommendations within a caries management plan rely heavily on a chronic disease management model, where different strategies, such as education about the disease process, motivational interviewing style counseling (to change diet practices and plaque control routines), and periodic evaluation of self-management goals in conjunction with age appropriate chemical therapy to modify the oral pH environment, are used to target the individual risk factors that can trigger the disease process on the individual patient (frequent snacking, bottle feeding, visible plaque accumulation, etc.) [11, 20, 21, 24]. Several publications describe in detail this style of counseling and surveillance goals to reduce specific risk factors, promote protective factors and perform active surveillance of lesions at all stages. The caries management plan should include a restorative treatment plan that aims to limit tissue destruction, diminish sensitivity to allow adequate plaque control measures and restore the most effective ways to prevent problems that traditional infectious-disease models fail to address. Advocacy and promotion of an age-one visit is critical in preventing early childhood caries and laying a foundation of good oral health throughout the life course [24]. All children should receive their first oral exam upon the eruption of their first tooth or before 1 year of age. In evidence-based minimum intervention dentistry, which includes use of CAMBRA, fluoride, sealants (preventive and therapeutic), remineralization substances such as casein phosphopeptide, prevention of early cariogenic bacteria colonization by xylitol product use for family members with caries, and acid neutralization agents such as baking soda wiping after meal/snacks, the patient/caregiver is encouraged to assume responsibility for the level of infection and is educated, instructed, and monitored in the proper control techniques. It is the child who has the disease, but it is the health professional's responsibility to provide the patient and parent/caregiver the appropriate tools to overcome it. Care pathways as defined by the AAPD are "documents designed to assist in clinical decision-making; they provide criteria regarding diagnosis and treatment and lead to recommended courses of action" [41]. The care pathways described below are summarized in Table 3. Table 3. Care pathways for caries management based upon risk assessment for ages 0-6 years. Low Caries Risk Management Protocol If the plaque levels are low as an indication of adequate home care, and fluoride exposure has prevented signs of disease under their current dietary conditions, patients should be praised and advised to continue their daily routine. Chemical therapy indicated for infants and toddlers, namely in the form of fluoride toothpaste at least twice daily, must be included in the treatment plan for all patients (even low risk) [37] in the appropriate amount. The AAPD and the ADA recommend a smear or an amount the size of a grain of rice for children 0-2 years, and pea size for 3-6 years when using a 1,000 ppm F toothpaste [38, 39] as it is likely to be sufficient to maintain a healthy caries balance in low-risk patients. Fluoride-free "training toothpastes" should not be recommended as its use has not proven to have the same therapeutic effect as fluoride toothpaste. Recalls for periodic re-evaluation should be set for every 6 months, where their preventive home care routine should be reinforced. Low risk patients do not benefit from in-office fluoride applications [53, 54]. Radiographic examinations, if necessary (contact areas closed and not visible) and feasible (if patient's cooperation allows, and according to local regulations) should be performed at 12-24 month intervals as per AAPD and ADA guidelines [55, 56]. Moderate Caries Risk Management Plan Even with no signs of caries lesions at any stage, moderate risk children will present with several risk factors that indicate a greater chance of developing caries in the near future and that additional chemical therapy could prevent frequent acid exposure from tipping the balance to the establishment of disease. Caregivers and children (when appropriate) should be informed about the caries process and counseled on strategies to improve their individual dietary or home care routines. Anticipatory guidance should be provided, as described above. Fluoride toothpaste recommendations indicated above should be stressed, additional forms of fluoride exposure (fluoride in drinking water) should be promoted, and children at moderate risk should be recalled at 6-month intervals for monitoring of adherence to the improvement of diet and home care routines. These patients will also benefit from in-office FV applications at 6-month intervals starting at the first visit. Radiographic examinations should be performed every 6-12 months. High Caries Risk Management Plan Children with obvious signs of caries at any stage and children with several risk factors and minimal fluoride exposure, are at high risk of developing more lesions in the future. In addition to the chemical therapy (F toothpaste recommendations and promotion of other forms of fluoride exposure as well as use of agents that enhance remineralization, acid neutralization, or inhibit MS transmission), and behavioral counseling to improve practices as mentioned above, patients at high risk benefit from additional in-office FV applications at 3-6 months intervals. Therefore, 3-6 month recall visits should include FV application, reinforcing self-management goals to reduce specific risk factors, promote protective factors and perform active surveillance of lesions at all stages. The caries management plan should include a restorative treatment plan that aims to limit tissue destruction, diminish sensitivity to allow adequate plaque control measures and restore function and form, taking into consideration the cooperation and health status of the patient, as well as the family situation. Following principles of minimal intervention dentistry [21], the choice of restorative treatment (which is typically needed in high risk patients), could include traditional restorative treatment or non-surgical therapies [interim therapeutic restorations with glass ionomer cements, caries arrest with silver diamine fluoride (SDF), etc.] after careful discussion explaining to the parents the risk and benefits of each option, and trying to delay or defer more complicated and risky procedures like sedation and/or general anesthesia. The informed consent of the parent is essential following this discussion and laying out of recommended options. Very High Risk Patients With Extensive Treatment Needs-Additional Guiding Principles The outcomes studies described above [17] and the results of our 6 year through adult studies [12] show that in-office topical fluoride applications and home fluoride toothpaste use may not be sufficient to prevent future caries in high-risk patients. When there is a prolonged acidic environment in the plaque created by frequent sugary/carbohydrate diet and poor oral hygiene this leads to microbial dysbiosis and serves as the driving force for caries formation in children [26, 57] resulting in high caries recurrence in high risk children [51, 58, 59]. Therefore, home care behavior modification can be the key to caries management in children. Children at high risk, who already require extensive restorative treatment (for example, more than four restorations), may benefit from intensive care including preventive sealants in surfaces "at risk." As studies show that supervised brushing achieves much higher prevention results than brushing alone [42, 43], supervised brushing with a fluoride toothpaste should be a major point in the counseling sessions. Brushing three times a day (after every meal) and spitting the toothpaste with no rinsing [60] are simple strategies that may maximize the protective action of fluoride on these children. Additional possible antimicrobial regimens to consider are wiping/brushing teeth with xylitol [61-63] and/or baking soda [64-66] after feedings or meals. Xylitol is non-cariogenic, and baking soda is an effective acid naturalizing agent, which can effectively neutralize the oral environment and have antiplaque and antimicrobial effects in children and adults [64-66]. For children with numerous cavitated lesions who may need multiple visits to complete restorative care and/or may have limited cooperation for treatment, SDF therapy can be used to achieve caries arrest and desensitization of lesions with no pulpal involvement. Sensitivity from open lesions can be a significant barrier for implementation of effective plaque removal, creating a vicious circle that can easily be broken by doing initial caries control by arresting and desensitizing lesions with SDF or glass ionomers depending on the location and visibility of the lesions and preference of the parents. Once better homecare has been established, and less sensitivity is followed by improved behavior, plaque retentive lesions can be followed-up at subsequent visits and if necessary, restored with glass ionomer cement interim restorations to prevent plaque accumulation and combined with FV at 3-month intervals to prevent new lesions [67-70]. This combination therapy can help to delay or defer more complicated and risky procedures like sedation or treatment under general anesthesia, which is especially important for children under 3 years of age. The care pathways for caries management for each of the assessed caries risk levels for ages 0-6 years are summarized in Table 3. Conclusions Successful management of dental caries in young children requires a risk-based approach to formulate an individualized treatment plan using a chronic disease management model, which aims at targeting the patient's specific risk factors (biological, environmental and social) that contribute to the establishment and progression of this multifactorial disease with adequate education, support and follow-up to guide the patient to sustained health outcomes. Caries Risk Assessment-Practical Step-By-Step Guidelines for the Age Group 6 Years Through Adult Parts of the following sections are reproduced and updated from Featherstone et al. [4] with permission. The following are step-by-step guidelines for use of the CAMBRA CRA system with the age group 6 years through adult. Details are given in the following sections. The CAMBRA system identifies four caries risk levels, namely low, moderate, high and extreme. CRA takes place as part of the regular comprehensive oral exam in the following sequence, leading to formulating an individualized caries management treatment plan that includes chemical therapy. Here are the steps in the process: 1. Evaluate dental and medical history. 2. Evaluate prevention items with the patient and ask questions that provide answers for biological and environmental risk factors in the CRA form (Table 2). Enter the answers into the CRA form or the electronic version. This can all be done by a dental assistant, dental hygienist, or equivalent. 3. Conduct clinical examination. Detect caries lesions early enough to reverse or prevent progression. 4. Assess and document the caries risk as low, moderate, high or extreme utilizing data from 1, 2, 3 above and the short list of questions listed in the CRA form (Table 2). 5. Produce and document a treatment plan that includes caries management, chemical therapy and necessary restorative treatment appropriate to the caries risk level. 6. Prescribe and/or provide chemical therapy for the patient, that includes fluoride with or without antibacterial therapy, based upon the caries risk level. 7. Use minimally invasive restorative procedures, if necessary, to conserve tooth structure and function. 8. Recall and review at intervals appropriate to the caries risk level. 9. Reassess and document caries risk level at recall and modify the treatment plan as necessary. The first 4 steps of the process comprise the CRA, which identifies, protective factors, biological and environmental risk factors, and clinical status to provide an individualized, overall portrait of caries risk (as per Table 2). In the following steps, that CRA, in turn, informs the development and implementation of a personalized caries management plan as described in detail below. Hence, CAMBRA is a two-phase process involving both CRA and management of caries as a biologically determined, clinical disease. Steps 1, 2 and 3 are familiar elements of any conventional oral examination and form the basis of the CRA. Step 3 provides a list of what are called "disease indicators," which are simply clinical signs of the presence of caries, most likely ongoing over time. Step 4 uses a few simple questions (as listed in the CRA form in Table 2) to attempt to identify the potential causes of the ongoing disease, or to evaluate whether it is under control. Only those factors that have been shown to be statistically significantly related to ongoing caries risk or reversal are included here [18]. Table 2 is a ready to use CRA form. Definitions of terms follow here, and instructions are provided in the Table 2, part 2. Protective Factors (Table 2, Column 1) Protective factors are environmental factors, biological factors or chemical therapy that helps to swing the caries balance to caries prevention or reversal. The most important factors that are proven effective for CRA are: 1. Lives, goes to school, or works in a fluoridated drinking water area 2. Uses a fluoride toothpaste at least once daily 3. Uses a fluoride toothpaste at least twice daily. It is well-established that twice daily provides considerable added benefit [42, 43]. If the patient provides a yes to this question, a yes should also be marked to item 2 4. Uses a high concentration prescription (5,000 ppm F) fluoride toothpaste twice daily 5. Has had FV applied in the last 6 months 6. Uses 0.05% sodium fluoride mouthrinse daily 7. Uses 0.12% chlorhexidine gluconate mouthrinse daily for 1 week each month as prescribed for caries control, or other proven antibacterial treatment [50] 8. Has adequate salivary flow and function by inspection or measurement Each of these items with a positive response receives a "yes" score. Yes scores in this category reduce the level of risk. Note: xylitol use is no longer listed as a protective factor in this revised CRA version as the evidence is limited [46]. For patients with high frequency carbohydrate consumption, xylitol gum or lozenges can be recommended. Chewing a sugar free gum enhances saliva flow and thereby provides additional protection. Biological and Environmental Risk Factors (Table 2, Column 2) The following are biological and environmental risk factors that have been shown to be statistically related to caries risk [12, 18]: 1. Frequent snacking on fermentable carbohydrates, at least three times daily outside of mealtimes. Frequent snacking on fermentable carbohydrates is a major caries risk factor. Snacking on fermentable carbohydrates more than 3 times daily between meals is the minimum for this risk factor. Snack foods that contain fermentable carbohydrates are those that contain, or are comprised of, glucose, sucrose, fructose, high fructose corn syrup, cooked starch. It includes juices such as apple juice and sticky fruits such as raisins. 2. Use of medications that induce hyposalivation. Xerostomia is a side effect of some of the most commonly prescribed medications, and risk of dry mouth increases with the number of medications prescribed [32]. Medications in the classes of anti-anxiety, antidepressants, antihistamines, and antipsychotic can have hyposalivatory side effects, depending on the individual's reaction. Multiple hyposalivatory medications are much more likely than one to have a measurable effect on salivary flow and function. Examination of the medical/dental history will highlight the use of these medications if they are present. These medications may be the reason that a patient has severe tooth decay. 3. Daily, or regular use of recreational drugs. A simple yes answer in this category does not indicate what drugs are in use. It is a red flag, however. Not all drugs are hyposalivatory, however, hard drugs have severe hyposalivatory effects, such as methamphetamine. "Meth mouth," caused by methamphetamine use, is serious rampant decay with major destruction of the teeth. This is an example of extreme caries risk. 4. Heavy plaque on the teeth. This observation is a straightforward clinical observation where the practitioner simply observes that "there is heavy plaque on the teeth." There is no specific quadrant, nor selection of teeth, nor calibrated amount. This simple measure, as observed by the clinician, has been shown in our clinical outcomes studies in thousands of patients to be a strong indicator of cariogenic bacterial activity, and it is strongly related to ongoing caries [12, 17, 18, 25]. Note: at the time of writing there is no validated chairside test commercially available for measuring cariogenic bacterial levels so this item from earlier CRA versions is no longer included in the current CRA. 5. Reduced salivary function (hyposalivation) as assessed by observation or by measurement. Hyposalivation is extremely serious to the oral health of the patient. Reduction in all of the beneficial components of saliva is serious and can lead to rampant and severe dental caries, which will become more serious over time and is very difficult to control. Hyposalivation, together with other high caries risk factors, signals extreme caries risk. The clinical signs of hyposalivation are: lack of saliva, difficulty stimulating salivary flow, dull and non-glistening soft tissue surfaces, patient complaints of "dry mouth." The stimulated saliva flow rate can be measured easily at chair side. The patient is asked to chew on sugar-free gum and spit continually into a small measuring cup for 3 min. At the end of 3 min measure the ml of saliva produced, divide by 3 and the result is ml/minute of saliva flow. More than 1.0 ml/min is normal, and

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