



Caries Management by Risk Assessment: Implementation Guidelines

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ABSTRACT This consensus statement supports implementation of caries management by risk assessment in clinical practice by using the following principles: modification of the oral flora, patient education, remineralization, and minimal operative intervention. The statement includes a list of supporters.

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Adopted by the authors of this issue of the *Journal of the California Dental Association* and the general assembly of the World Congress of Minimally Invasive Dentistry.

Members of the Western, Central, and Eastern CAMBRA Coalitions, ADEA Cariology Special Interest Group, WCMID, and others listed in **TABLE 1** recognize the 2002 FDI Policy Statement, Minimal Intervention in the Management of Dental Caries as the current clinical standard for caries management and further support implementation of the following principles:

Main principles for CAMBRA implementation

- Modification of the oral flora to favor health.

- Patient education and informed participation.

- Remineralization of non-cavitated lesions of enamel and dentin/cementum, and

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TABLE 1

The following organizations/individuals support the main principles of this consensus paper. The purpose of this table is to illustrate interorganizational collaboration across our profession in support of developing an improved standard for caries management. Time constraints did not allow all institutions to be included, and we encourage interested parties to contact the authors of this consensus paper.

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■ Minimal operative intervention of cavitated lesions and defective restorations.

Implementation Guidelines for Clinical Practice

The following statements are suggested ways to implement caries management by risk assessment principles into clinical practice:

1. TREATING THE DISEASE OF CARIES

Successful clinical use of CAMBRA requires the dental team to understand:

■ Caries is defined as an infectious, transmissible disease process where a complex cariogenic biofilm, in the presence of an oral environmental status that is more pathological than protective, leads to the demineralization and eventual cavitation of dental hard tissues.

■ Caries, the most common chronic disease of our children, and virtually universal among adults, is both curable and preventable, and therefore should be given top priority and the full resources of our profession.

■ The conventional restorative approach alone will not eliminate the disease of caries. Preventing caries and remineralizing early lesions are cost-effective treatment options and will enhance success of all aspects of dentistry.

■ CAMBRA uses evidence-based treatment decisions based on the caries risk status of the individual as determined by the balance or imbalance between the pathological factors and protective factors of each patient. Pathological factors include cariogenic bacteria, frequent ingestion of fermentable carbohydrates, and salivary dysfunction. Protective factors include, but are not limited to, adequate saliva and its caries preventive components, fluoride therapy, and antibacterial therapy.

■ Evidence-based dentistry, as

defined by the American Dental Association Council on Scientific Affairs in 2006, is an approach to oral health care that requires the judicious integration of systematic assessments of clinically relevant scientific evidence relating to the patient's oral and medical condition and history, with the dentist's clinical expertise and the patient's treatment needs and preferences (www.ada.org/prof/re-

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sources/pubs/jada/reports/index.asp).

■ CAMBRA, which includes minimally invasive restorative procedures, is a way to clinically implement the principles outlined in the 2002 FDI Policy Statement, Minimal Intervention in the Management of Dental Caries. CAMBRA, Minimal Intervention, and Minimally Invasive Dentistry are all terms that support these principles.

■ Minimally invasive dentistry is a concept involving early to advanced carious lesions and their treatment by minimal intervention. It includes the principles of remineralization techniques for early and advanced lesions, treatment of cariogenic plaque to reduce and prevent future carious lesions, use of minimal intervention for cavitated lesions, repair rather than replacing defective restorations when possible and control-

ling caries as a multifactorial disease.

■ Diagnosing the disease of dental caries is much more involved than simply detecting the signs of the disease process (the physical changes on teeth).

■ The contemporary definition of prevention is the art and science of managing the risk factors of each individual patient to promote optimum oral health.

■ Elevating the standard for caries management requires global collaboration among the entire dental profession, industry, and government.

2. PEDIATRIC RISK ASSESSMENT FOR THE CHILD FROM BIRTH TO AGE 5

■ Assessment of the caries risk status of the young child is essential before a treatment plan can be designed.

■ Children should be under the care of a dental professional by age 1.

■ Caries risk assessment for the young child starts with a parent or caregiver interview and education.

■ A clinical examination of the child completes the assessment.

■ The risk assessment drives the decisions about preventive, therapeutic, behavioral, and restorative approaches and determines which of the risk factors involved needs modification to correct the imbalance.

■ The overall aim is to determine whether the child has active dental caries, or is likely to have dental caries in the future, and to intervene with patient/caregiver education and a combination of approaches designed to arrest or reverse the disease and markedly improve the future oral health status of the child.

3. RISK ASSESSMENT FOR AGE 6 THROUGH ADULT

■ Assessment of the caries risk status of children and adults is essential before a treatment plan can be designed.

- Caries risk assessment for the child and adult combines an assessment of disease indicators and risk factors.

- A small number of key disease indicators and risk factors determine whether the individual is at low, moderate, high, or an additional category called extreme risk. Extreme risk is designated when a patient at high risk from other factors also has severe hyposalivation or other special needs.

- Risk factors are biological, behavioral, or socioeconomic contributors to the caries disease process that can be modified as part of the treatment plan.

- If the disease is currently active, or if there is the future risk of progression of dental caries, intervention appropriate to the risk status is required to correct the caries imbalance before cavitation occurs.

4. CLINICAL PROTOCOLS

The clinical management of dental caries is based upon the caries risk assessment.

- Following a caries risk assessment, an evidence-based treatment plan is developed based upon the level of risk, namely low, moderate, high, or extreme.

- The objective clinical judgment of the dentist, i.e., the ability to combine and use the identified risk factors based on the patient's clinical situation, has been shown to be one of the most powerful ways to determine an individual's caries risk.

- High- and extreme-risk individuals require antibacterial therapy, reduction of identified risk factors, remineralization therapy. Extreme risk individuals with severe salivary dysfunction require additional therapy, such as the use of buffering agents and calcium and phosphate supplementation.

- Moderate-risk individuals require improved remineralization therapy and reduction of other risk factors, which may include antibacterial therapy.

- Topical antibacterial therapy should be used whenever a high cariogenic bacterial challenge is identified and patients should be informed it could require repeated treatments. In addition to bringing down the bacterial challenge, intensive remineralizing actions must be taken.

- Elements of a successful remineralization therapy include thorough caries disease diagnosis, early lesion detection,

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and determination of proper treatment interventions based on location, activity, and severity of the carious lesions, including the development of a treatment plan to minimize surgical treatment based on the individual risk level.

- Chemical therapy is employed to adjust the imbalance between the pathological factors and the protective factors in order to reverse or halt the progression of early carious lesion progression toward cavitation.

- Minimally invasive restorative work is included in the treatment plan as needed to restore the function and esthetics of the tooth. Proper material selection should be based on the individual risk assessment to reduce future failures in restored teeth.

- Restoration may be needed to restore the function of the tooth and eliminate retentive sites for plaque accu-

mulation. Unfortunately, restorative work alone does not deal with the bacterial infection in the remainder of the mouth.

- Caries recall appointments at appropriate intervals are essential to monitor, renew, and reinforce the proposed caries management and prevention plan for the individual patient.

- Reassessment of the caries risk status is necessary at each caries recall visit.

- The overall aim of the clinical protocol is to reduce the acidogenic bacterial challenge, to reduce or eliminate other risk factors, to enhance salivary function where needed, to enhance the repair process by remineralization, and to employ a minimally invasive approach when restorative treatment is needed.

- All patients should be informed of preventive choices and appropriate minimally invasive restorative options, if needed, based on the location (site), depth (severity), and activity of the problem as well as their current caries risk status.

- Adhesive dental materials such as composite resin and glass ionomer products should be considered for conservative treatment of caries. Glass ionomer because of its chemical, rather than micromechanical, interaction (seal) to tooth mineral may have additional caries protective effects, especially on dentin or cementum (root surfaces).

5. PRODUCTS

- The evidence base for current products used to treat and prevent dental caries should be evaluated and considered prior to use in practice.

- Antibacterials (e.g., chlorhexidine, iodine, xylitol, combinations of essentials oils, chlorine-based products) can be used to reduce levels of pathogenic organisms. Bacterial assessment may help in monitoring the process and motivating patient involvement.

■ Buffering products are needed to neutralize acid attacks when there is a lack of healthy saliva.

■ Topical fluoride from numerous sources (office and home) should be used to enhance remineralization. (e.g., 5 percent sodium fluoride varnish, 1,000-5,000 ppm fluoride toothpastes, .05 percent sodium fluoride rinses). Patients not adhering to home-care fluoride recommendations should receive more individual office-based professional topical applications of fluoride, such as fluoride varnish.

■ The evidence-based clinical recommendations for professionally applied topical fluoride, as endorsed by the ADA Council on Scientific Affairs in 2006, can serve as a chairside reference for patient care and can be found at www.ada.org/prof/resources/pubs/jada/reports/index.asp.

■ To increase patient cooperation, products can be dispensed directly by the clinician, rather than prescribed.

■ Calcium and phosphate products can be used to replace those minerals missing in patients with reduced salivary function. Other patients with observed surface demineralization (e.g., white spots) may benefit from this therapy in addition to fluoride treatments.

■ New products and treatment strategies are emerging that are expected to be even more useful to effectively modify the oral environment and should be evaluated and considered when appropriate.

6. IMPLEMENTATION INTO PRACTICE

■ There are many reasons to implement CAMBRA into practice, including ethical, legal, and standard of care issues, but the most important reason is the benefit to the patient. CAMBRA provides strategies to attain and maintain a healthy environment in a patient's mouth.

■ The dentist must communicate passionately to the dental team the goals and

visions in a concise, concrete, and easy-to-understand manner, as well as provide the resources required for the acquisition of new skills, knowledge, or materials.

■ Successfully integrating CAMBRA into a practice requires that the entire dental team understands and supports the philosophical change. Once an implementation strategy is set, deciding which team members are responsible for each step is crucial.

■ Use established networks and evidence-based resources to find information and colleagues for support and advice such as:

- www.cdafoundation.org/journal
- www.first5oralhealth.org
- www.adea.org/DMS/sections/sigcariology/sigcariology.html
- www.aapd.org
- www.icdas.org
- www.midentistry.org
- www.wcmid.com

■ Supplement patient education sessions using multiple approaches (e.g., newsletters, Web sites, pamphlets, handouts, and literature search engines such as PubMed or DVDs). Fully inform patients of all options available to them, including recommended, as well as elective procedures, and let them choose.

■ It is important to follow the principles and rules of high-quality practice.

- Use proper documentation and record clinical and radiographic findings.
- Include location, activity, and severity of lesions (e.g., use of ICDAS codes, laser fluorescence readings, photographs before, during, and after treatment, etc.)
- Record accurately the agreed-upon treatment plan and include detailed progress note entries.

■ Establish a sound business model for CAMBRA procedures that generates

sufficient revenue to justify its economic existence. The entire dental team must be comfortable with charging patients a fee commensurate with the service provided. Patients may be comfortable with CAMBRA-related fees once the dental professional helps them understand what value they are receiving.

7. THE TEAM APPROACH

■ The team approach is essential for the successful caries management program in the dental office, and the role of the dental auxiliary is critical in the overall management of the program. The dental auxiliary will prepare and maintain the CAMBRA dental practice by providing the caries risk assessment, thorough patient education and necessary supplies.

■ A CAMBRA-trained dental auxiliary (dental hygienist or dental assistant) can be the designated prevention specialist overseeing all CAMBRA activities in the practice (where permissible by the Dental Practice Act). This prevention specialist will ensure the CAMBRA protocol is being implemented with each patient encounter to develop and implement preventive patient care based on the patient's risk assessment.

■ The practice administrative staff plays an important role as practice ambassadors. The administrative staff will take the lead role in CAMBRA patient communication and third-party payer reimbursement opportunities.

■ The dental team, led by the dentist, is a practical way to make CAMBRA work. The dentist will support the CAMBRA process financially and philosophically to provide a successful environment for implementation.

■ New and existing patients benefit from the CAMBRA protocol by having the disease addressed before expensive restorative procedures are

implemented. All patients will be informed about the CAMBRA protocol with the goal of disease management through risk assessment procedures.

- New and existing patients are likely to refer more people to the CAMBRA office as they see the benefits of practicing this philosophy has for them.

8. BEHAVIORAL CHANGE

As the complexity of prevention increases, the disparity between what we know and what we do is likely to widen. The following are suggestions for positive behavioral change in the active implementation of the CAMBRA initiative.

- Do not simply tell patients to do what is good for them. Use motivational interviewing, active listening, functional analysis, goal setting, and demonstrations of appropriate behaviors.

- It is important for dentists to establish which option works best with each of the employees in their office, and for the dental care team to do the same with each patient in the practice.

Summary

Current standards in caries management emphasize risk assessment and appropriate therapeutic interventions, detection of early noncavitated lesions, diagnosis of severity and activity of lesions, and minimally invasive surgical intervention only when needed using the optimum dental materials based on the patient's problems. Collaboration among research, education, industry, dental health care workers, and patients, along with the use of evidence-based treatment recommendations, dental caries infections can be prevented and controlled. ■■■■

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