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Caries Classification

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Dental caries remains a significant public health problem in the United States. By age 19, 67% of children will have experienced tooth decay. Once Americans reach the age of 75, 99% will have had dental caries. Oral health disparities persist despite sincere efforts by public health organizations to reduce disease incidence. Individuals with low socioeconomic status experience higher caries incidence and difficulty accessing professional dental care compared with their more affluent peers.

Early-life risk factors for caries are especially relevant for oral health because permanent teeth start to develop in utero and during the first years of life. The “drill and fill” paradigm emphasizes treatment, not prevention of caries lesions and only negatively affects the caries disease process. It has been 10 years since Featherstone and colleagues presented their evidence-based model of caries management: caries management by risk assessment (CAMBRA). This approach relies on a careful analysis of a patient’s risk factors and protective factors. Oral health professionals assess the degree to which a patient’s individual risk factors outweigh the protective factors, and provide recommendations in order to tip the balance toward health. Thus, a patient who presents with an active caries lesion (clinically or radiographically visible) or has had a restoration placed in the past 3 years, is deemed high risk. Oral health professionals may perform a saliva flow test and/or bacterial culture, apply fluoride varnish, and recommend the use of prescription fluoride. Additional recommendations include increasing the frequency of a caries recare exam and recommending chewing gum containing xylitol. Those who exhibit positive oral health behaviors—such as maintain good oral hygiene, adhere to an anti-cariogenic diet, and live in areas with community water fluoridation—are deemed low risk. Recommendations for this group may include decreasing the frequency of radiographs and professional fluoride application. Recently, a systematic literature review revealed that a majority of dentists and dental therapists would opt to
TABLE 1. G.V. Black’s Classification of Dental Caries

<table>
<thead>
<tr>
<th>Class</th>
<th>Illustration</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td></td>
<td>Caries affecting pits and fissures on occlusal third of molars and premolars.</td>
</tr>
<tr>
<td>II</td>
<td></td>
<td>Caries affecting proximal surfaces of molars and premolars.</td>
</tr>
<tr>
<td>III</td>
<td></td>
<td>Caries affecting proximal surfaces of central incisors, lateral incisors, and cusps without involving the incisal angles.</td>
</tr>
<tr>
<td>IV</td>
<td></td>
<td>Caries affecting proximal including incisal angles of anterior teeth.</td>
</tr>
<tr>
<td>V</td>
<td></td>
<td>Caries affecting gingival one-third of facial or lingual surfaces of anterior or posterior teeth.</td>
</tr>
<tr>
<td>VI</td>
<td></td>
<td>Caries affecting cusp tips of molars, premolars, and cusps.</td>
</tr>
</tbody>
</table>

G.V. BLACK’S CLASSIFICATION OF DENTAL CARIES

For many years, caries lesions were classified according to G.V. Black’s Classification of Dental Caries, which was first introduced in 1908 and is still used today. Black’s original classification consisted of five categories, with a sixth added later (Table 1).

Today, much more is known about the caries disease process and how to most effectively treat it. In 2001, the National Institutes of Health sponsored the Consensus Development Conference on Diagnosis and Management of Dental Caries Throughout Life. The consensus was that the effective identification and classification of caries are critical to its treatment, which should focus on less invasive strategies, such as the use of fluoride and antimicrobials and sealant placement.

INTERNATIONAL CARIES DETECTION AND ASSESSMENT SYSTEM

The ICDAS is an evidence-based tool used to classify dental caries. The ICDAS Foundation is charged with updating and disseminating information regarding the system. First introduced in 2004, ICDAS has been updated as new innovations prove their effectiveness. The process, simplified, is as follows:
1. Tooth surfaces are cleaned and visually inspected.
2. The oral health professional uses a ball-point probe to examine the tooth surface. While still common in clinical practice, the use of an explorer to detect caries lesions has long been discouraged.
3. Lesions are scored from 0 to 6 (Table 2, page 21).
4. Treatment recommendations are made based on the score.

AMERICAN DENTAL ASSOCIATION CARIES CLASSIFICATION SYSTEM

In 2008, the ADA Council on Scientific Affairs convened a group of experts to develop a new caries classification system that could be easily adapted to its treatment, which should focus on less invasive strategies, such as the use of fluoride and antimicrobials and sealant placement.

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 Neither the ICDAS nor the ADA CCS recommend the use of caries detection devices. Most of these devices use light and lasers to detect caries lesions before they are clinically detectable. Changes in tooth density will cause light, heat, and electrical stimuli to transmit differently when compared to healthy hard tissues. The May 2015 issue of the ADA Professional Product Review includes a review of manufacturer claims and determined that
The devices are better suited to help manage the caries disease process. These devices have yet to reach a level of reliability to make them capable of determining the presence of caries lesions.

CONCLUSION
In a 2015 survey of dentists, the National Dental Practice-Based Research Network discovered that more than 70% of respondents were unaware of the ADA CCS. Dental caries is a preventable, infectious disease whose eradication will require the diligent use of new, evidence-based methodologies and therapies. As the ICDAS and ADA CCS include a thorough assessment of caries risk factors (sugary foods/drinks, low socioeconomic status, xerostomia, community water fluoridation, visible plaque, deep pits/fissures, history of caries, pathogenic bacteria, use of fluoride dentifrice) incorporating one of these systems into a caries-prevention program—along with the use of fluoride and nonfluoride caries preventive agents—will help ensure positive outcomes. The responsibility of detecting and managing caries falls on all dental team members, not just the dentist. Oral health professionals have an ethical responsibility to promote those practices that most benefit patients. Table 4 provides a list of resources so clinicians can learn more about both the ICDAS and ADA CCS approaches.

Researchers have advanced the management of the caries disease process by creating caries classification systems. Now it is up to clinicians in private practice to implement the evidence so that caries can be more effectively reduced across all populations.

**REFERENCES**