

## GUEST EDITORIAL

# Modern perspectives on caries activity and control

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**D**etecting dental caries and providing timely and appropriate treatment is not quite as simple as it seemed to be when many of us were in dental school; the world and the science have moved on.

We know much more about the caries disease process than we did. Detecting and assessing carious lesions have become more difficult tasks, and there now is a wider range of care options available—all of which means that optimal clinical decision making has moved beyond the instant “fill” or “no-fill” call. The challenge for clinicians is to keep up to date with new thinking and new evidence about assessing caries, its activity and its control that continue to cascade from multiple directions. The prize, if dentists can adopt emerging best practice, is that long-term outcomes and satisfaction for their patients should improve. I hope that a brief summary of some of the recent work undertaken in this field may inform and stimulate a wider interest in caries activity and preventive control.

Some nine years ago, a mixed group of dental researchers and educators was frustrated with the continued widespread use of out-moded and incompatible caries measurement systems, which prevented systematic attempts to find the best ways of preventing and controlling caries. The group decided to merge many of the available visual systems of assessing caries and to harmonize them into a “wardrobe” of compatible options. These group efforts produced the International Caries Detection and Assessment System (ICDAS).<sup>1</sup> This international open system was devised (and has been developed further) to facilitate comparable activities across caries epidemiology, research, clinical practice and education.

A number of stakeholders have been seeking to make progress in this fundamental but difficult area and, in 2008, the American Dental Association (ADA) held a Caries Classification Conference, bringing together a broad range of interested parties to discuss what the future would look like in terms of how dentists classify and treat caries.<sup>2</sup> It was (and still is) felt, as stated by conference organizer Dr. John Kuehne, director of research and laboratories at the ADA, that “[t]here is a scientific and clinical necessity for the profession to examine this issue ... the shortcomings of the current classification system and the need to address more complex issues, such as demineralization and remineralization, the extent of a lesion's activity or inactivity [and] how we approach disease man-

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agement ... .”<sup>2</sup> Work across the profession has been continuing in this vein on multiple fronts since.

To facilitate a new approach moving from a restorative-only strategy toward the use of a nonoperative/preventive caries management strategy whenever possible, dentists should be compensated for this type of treatment.<sup>3</sup> If we are to be able to plan treatment for and with our patients properly, we need to stage lesion severity, assess lesion activity and take the patient’s overall caries risk into account. As Fontana and Zero<sup>4</sup> stated, “Assessing a patient’s risk of developing caries is a vital component of caries management” and is “a prerequisite for appropriate preventive and treatment intervention decisions ... .”

#### DENTAL CARIES IN 2011

Caries still is a significant burden around the world, even though the disease process and the potential to prevent and control the disease are now much better understood.<sup>5</sup> What has come from scientific study of cariology is an awareness of the need for an accurate and consistent terminology in this area,<sup>6</sup> as there is confusion surrounding a variety of terms used across clinical dentistry, education, research and public health. The way we choose to communicate may reflect what we believe or understand regarding the caries process and, hence, how we eventually choose to act. This is important for communication both between clinicians and with patients.<sup>6</sup>

A glossary has been developed by an international team including representatives of ICDAS, the European Organization for Caries Research, the European Association of Dental Public Health and the Ameri-

can Dental Education Association Cariology Special Interest Group (now Section). This glossary has also been distributed internationally by the FDI World Dental Federation (FDI) in response to the expressed need for a common language to use in discussing modern cariology and preventive caries care. A recent review has endorsed these definitions and emphasized that the need for recording carious lesion severity and activity in our clinical charts is increasingly

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recognized as a starting point to risk assessment and monitoring of the impact of management strategies aimed at controlling the caries disease process and arresting or remineralizing carious lesions.<sup>7</sup>

#### CARIES CONTROL IN PRACTICE

There are some who maintain that, for general dentistry, all treatment planning and care steps must be kept very simple; others argue that as the leaders of teams of health care professionals capable of multistep restorative or implant procedures, dentists are well able to cope with staging disease, assessing activity and providing appropriate care plans. This author’s bias is toward the second view.

Recent evidence-based guidance on oral health assessment and review<sup>8</sup> emphasized a need

for early detection and assessment of caries, before the macroscopic cavitation stage, to allow time for secondary preventive treatments (such as with fluoride varnish and remineralization therapies) to work and prevent progression of initial-stage caries. Where control of initial-stage decay cannot be achieved—that is, where caries is active and progressing—prompt and effective restorative intervention still is indicated.

It also should be appreciated that, when we are monitoring the dynamics of initial caries, ideally we also need information beyond that which can be generated using clinical examination alone by even the most skilled and diligent dentist. Therefore, there is a continuing need for valid adjuncts to caries detection and activity assessment that do not employ ionizing radiation.

As has been pointed out in these pages recently, “When new science-based information becomes available, we should be open to it, incorporating demonstrably beneficial changes into our practices while continuously evaluating outcomes.”<sup>9</sup> There are a number of practical ways of implementing risk assessments in clinical practice<sup>4,10</sup>; these include some of the examples disseminated widely by members of the Caries Management By Risk Assessment (CAMBRA) group, who focus on identification of active lesions “where there is caries imbalance.”<sup>10</sup>

#### SOME WAYS FORWARD

At the present time—because it has been designed to merge and harmonize many different systems on the basis of best evidence for assessing both lesion depth and activity across caries epidemiology, research, clinical practice and education, and because it has been tested,

improved and retested in recent years—ICDAS's International Caries Classification and Management System (ICCMS) is the only current viable "system" that meets the requirements specified in this editorial.

A number of members of the ICDAS coordinating committee are working to advance matters systematically, by incorporating new evidence from amalgamated systems to update the logic of the original ICDAS "wardrobe."<sup>1</sup> This ongoing work is informing and contributing to both the FDI's Global Caries Initiative and concurrent action in the International Association for Dental Research Dental Caries Task Group.<sup>11</sup> ICDAS investigators describe three ICCMS modules—standard, comprehensive and basic—that can be used together with assessments of pain and sepsis.

At a global health level, FDI's Global Oral Health Initiative reflects the shift in focus of the global health agenda, away from a disease-oriented approach toward a holistic (collaborative) management and common risk factor approach. The ICCMS has been included as one of the systems in the FDI's global oral health improvement matrix, which will be developed at regional

meetings and forthcoming annual World Dental Congresses over the next few years. More information about these developments can be obtained on the Web sites "www.fdiworldental.org/content/global-caries-initiative" and "www.icdas.org", and information on initiatives to advance the CAMBRA agenda can be found documented in an issue of *Journal of the California Dental Association*.<sup>12</sup>

It is to be hoped that those planning and providing caries care to patients in general dentistry can use information about the current and emerging evidence regarding caries activity and control to best advantage to improve both patient care and professional satisfaction. ■

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