



## Current challenges in caries diagnosis

Over the past decades caries incidence has shifted in many populations, and what has been considered an eradication of the process seems to be only a postponement of the disease's manifestation. What has happened? We have learned that rates of lesion progression have slowed down and that many lesions may progress under an apparently non-cavitated enamel surface. With lesions located at root surfaces, we even have seen that rehardening is possible. We have realized that carious lesions, once penetrating deep into the dental hard tissues and thus forming cavities, will be apparent in later stages of life. However, this is only half of the truth, since we should acknowledge that discovering a frank cavity is not equivalent to caries diagnosis. It should be emphasized that such caries diagnosis does not seem to be the goal on a routine way to drill and fill.

Instead, we should focus on early stages of the caries lesion that have not cavitated yet; moreover, we should try to understand why these lesions have not cavitated yet, at least in some individuals. Facing a white spot lesion will undoubtedly lead to a caries diagnosis as well; at the same time, this should lead to several questions. For example, it should be of major interest whether this lesion is active (or not), for how long this lesion might have existed, and what would happen if any of the treatment options would be postponed. For sure, there are more particular circumstances (such as age, oral hygiene, fluoride exposure, salivary disorders, dietary habits, social background, etc) that should be considered, but these should always be associated with a great deal of uncertainty.

Therefore, subjective decision-making should be accompanied by objective parameters whenever possible. With regard to initial diagnosis of caries lesions, there have been some developments now worth being integrated into clinical practice on a routine basis. These sophisticated systems are based on light-induced fluorescence (ie, Quantitative Light-induced Fluorescence, QLF, or DIAGNOdent), and have been validated independently, both for the detection and the quantification of smooth-surface caries. Detection of occlusal caries also seems to be possible with higher sensitivity when using these ingenious machines.

It is well accepted that most dentistry is re-dentistry; therefore, postponing invasive treatment options should be our major goal. Together with modern concepts of micro-dentistry, we will be able to help our patients maintain their teeth up to a high age. This is a very challenging approach, and caries diagnosis — if defined as an intellectual course of collecting and consolidating data obtained by clinical and radiographic examination along with the use of objective diagnostic armamentarium, biological knowledge, and information gained from anamnesis — will be much more than detecting cavitated lesions. By using a series of readings over longer time periods, diagnosis of active or arrested lesions will be possible, and this will have a great impact on our patients' fate regarding an unequivocally true distinction between health and disease.

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