

DIAGNOdent and Caries Detection (12/04)

Bader JD, Shugars DA. A systemic review of the performance of a laser fluorescence device for detecting caries. J Amer Dent Assoc 2004;135:1413-1425.

The purpose of this study was to conduct a systematic review of the literature to assess the diagnostic performance of DIAGNOdent (KaVo, Lake Zurich, IL), a caries-detection system based on laser-stimulated fluorescence. Twenty-five studies were included in the review. The DIAGNOdent is a laser-probe handpiece that uses 655-nanometer wavelength light for the detection of caries. The pulsed light is directed onto the tooth surface via specially-designed tips. The unit's internal processor interprets changes in the level of fluorescence of the light emitted back by the tooth as indicative of caries. Please visit the Product Evaluation section (*Equipment Evaluations*) of the DECS Web site to view the results of the DIAGNOdent evaluation.



The authors concluded from their literature review that the DIAGNOdent is more sensitive (i.e., detecting caries when it actually exists) than traditional diagnostic methods. However, the device is less specific (i.e., not detecting caries when it does not actually exist) than visual methods leading to potentially more false-positive diagnoses. Unfortunately, a false-positive diagnosis of dentinal caries may lead to tooth preparation with irreversible damage. **The reviewers concluded that DIAGNOdent should not be relied upon as a clinician's primary diagnostic tool. However, clinicians could use the device after visual/tactile examinations to provide additional information about the chances of disease on the surface in question or to identify surfaces with demineralization to signal the use of preventive services such as fluoride varnish or sealants.**

DIS Comment: The diagnosis of occlusal caries may be highly subjective. Restorative intervention on the basis of poor diagnostic information could lead to overtreatment. Visual and tactile methods alone, in the absence of cavitation, generally have relatively poor diagnostic capability for occlusal surfaces. Radiographs tend to only reveal significant caries.¹ There is an obvious need for diagnostic methods that can accurately detect dentinal involvement at an earlier stage. As new diagnostic technologies emerge, they must be thoroughly investigated and evaluated before clinical use.² According to this review article DIAGNOdent is more sensitive than traditional diagnostic methods, however, the increased likelihood of false-positive diagnoses limits its usefulness as the principle diagnostic instrument.

References

1. McComb D, Tam L. Diagnosis of occlusal caries: Part I. Conventional methods. J Can Dent Assoc 2001;67:454-457.
2. Tam L, McComb D. Diagnosis of occlusal caries: Part II. Recent diagnostic technologies. J Can Dent Assoc 2001;67:459-463.