Detecting caries at the margins of restorations with The Canary System

By Stephen Abrams, DDS

Caries detection around the margins of restorations is a major challenge in clinical practice. Typically, the restorative material will hide the detection of caries from accurately examining the margins for caries. However, The Canary System, powered by an energy conversion technology (PIT-LUM), provides the solution. The Canary System™ directly examines the status of the tooth crystal structure. Rapid, safe pulses of laser light combining infrared and luminescence allow users to examine lesions as small as 50 microns and subsurface caries up to 0.5 mm below the tooth surface or along the margin of composites and amalgams.

Dentists can choose caries around the margins of a Class V amalgam restoration can be a challenge. Figures 2 and 3 illustrate a patient who was at very low risk for developing caries. The existing restoration was placed more than 30 years ago; the margins were intact; oral hygiene was excellent; and no restorations had been placed or replaced in the last 15 years. Radiographs could not image the restoration margins and the amalgam restoration on the buccal or occlusal part of the tooth may have created a silver stain or halo around the margin. The Canary Score of 0 from scanning around the margin indicated advanced caries around the restoration. Upon removal of the amalgam, a large carious lesion was found extending well beyond the margins of the restoration. Therefore, the subsurface caries that would have otherwise gone undetected, possibly requiring a root canal, successfully detected by The Canary System, diagnostic scouting, for decay around the margins of this restoration.

Research shows that PIT-LUM technology used in the Canary System can detect:
- Occlusal pit and fissure caries
- Subsurface caries
- Acid erosion lesions
- Root caries
- Interproximal caries lesions

- Demineralization and remineralization of early caries lesions

The Canary System captures both signals and images of the tooth surfaces being examined. These images are displayed on an accompanying interactive touch-screen monitor for immediate side-by-side review with the patient who can also take home a printed Canary Report. The Canary System creates an opportunity for dialogue and co-diagnosis, two strong motivators for a new long-term, recurring patient relationship. Odontograms are also added to patient's files so treatment progress can be monitored over time. The data is saved on the Canary computer, and merged into detailed user-friendly reports.

These unique characteristics of The Canary System provide a clinical diagnostic practice with the ability to monitor the entire spectrum of the caries process. From initial demineralization to caries beneath pits and fissures and around restoration margins. The Canary System will enable a practice to provide preventive minimally invasive oral health care.

References

Fig. 1: The Canary System displaying scanning results. Provided by The Canary System

Fig. 2: Canary Scan results.

Fig. 3: Mandibular molar with small buccal amalgam restoration and no visible marginal defects.

Fig. 4: Amalgam restoration removed showing caries around the margins, especially along the gingival floor.

Fig. 5: Preparation complete showing the extent of the caries.