Research Behind The Canary System®

The Canary System is an evidence-based caries detection system built upon a solid foundation of peer-reviewed lab and clinical research. This includes:

- 2 Health Canada approved clinical trials that met FDA 21 CFR standards for clinical trials.
- A clinical trial on accuracy of detecting interproximal lesions compared to x-ray radiographs.
- 60+ peer-reviewed primary journal publications.
- 50+ presentations at international dental conferences.
- 18+ publications in the "popular dental press", including Dentistry Today, Dentistry IQ, Oral Health and Dental Tribune.
- 8+ dental schools around the world conducting researching using Canary as a tool to detect and monitor caries.

Research has demonstrated that Canary's *energy conversion technology* (PTR-LUM) can be harnessed to help oral health professionals **detect and diagnose**:

- Lesions and defects ≤ 5 mm. below the enamel surface[1-4]
- Occlusal pit and fissure caries[4-7]
- Smooth surface caries[8-10]
- Acid erosion lesions[11-15]
- Root caries[16, 17]
- Interproximal caries lesions[18-23]
- Caries beneath fissure sealants[24-27]
- Caries around margins of restorations and crowns[28-30]
- Caries beneath the intact margins of composite resins[31]
- Caries beneath intact margins of amalgam restorations[32, 33]
- Demin- and remineralization of early caries lesions[17, 34-38]
- Caries beneath clear resin infiltrants[39]
- Caries Around orthodontic brackets[40, 41]

Clinical Trials

The Canary System has been investigated in three clinical trials. The first Health Canada-approved investigational study was completed in December 2009. The trial involved 50 patients using the first prototype in a number of clinical situations and found no safety issues.[42, 43] The second Health Canada clinical trial was a follow-on study designed primarily to help QDT define the Canary Scale and determine how to best integrate the system into a dental practice. The study involved 98 patients among four trial sites with 38 patients involved in multiple visits for monitoring the effects of remineralization therapy.[44-47] The third clinical study was performed in 2014 at the University of Texas to investigate interproximal caries detection. The investigators found Canary was able to detect 92% of the lesions while radiographs only found 62%.[23]

Canary Study Design Ensures Unbiased Results

Canary research at QDT is divided into two parts: 1) Canary scans are performed at the University of Toronto followed by visual ranking using ICDASII; and then 2) Polarized light microscopy (PLM) analyses are conducted in a blinded-fashion in the lab of Dr. Ben Amaechi at the University of Texas to measure the size and shape of the lesions.

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