

# Carie Scan- A Diagnostic Test for Dental Caries

Ankit Shah<sup>1</sup>, Naiya Shah<sup>2</sup>, Dwija Raval<sup>3</sup> and Dev Desai<sup>\*4</sup>

<sup>1</sup>Reader, Goenka Dental college & hospital, Gandhinagar, India.

<sup>2</sup>Director, Smiles & Roots Dental Care & Implant Centre, Gho-dasar, Ahmedabad, India

<sup>3</sup>Dr.M.K. Shah Medical College & Research Centre, Ahmedabad, India

<sup>4</sup>Smt.NHLMMC, Ahmedabad, India

**Corresponding Author:** Dev Desai, Smt. NHLMMC, Ahmedabad, India

**Received:** 📅 2023 May 01

**Accepted:** 📅 2023 May 18

**Published:** 📅 2023 May 30

## Abstract

An infectious microbiologic condition known as dental caries affects the teeth and results in localized tissue deterioration and dissolution. This is one of the most widespread chronic infections in the world. Dental professionals should combine different diagnostic tests in order to offer the most precise and effective treatment. More recent diagnostic tools, like CarieScan, provide more precise data on demineralization. It is a compact, cordless, and ergonomic device that is simple to use every day. Early detection and evaluation of lesions with the least number of false positives is helpful in the dental caries process. An electrochemical measurement system using an impedance platform is very useful for accurately diagnosing dental caries.

**Keywords:** Dental Caries, Dental Diagnostics, Dental Diseases, CarieScan, Demineralisation

## Introduction

Dental caries is an infectious microbiologic disease of the teeth that results in localized dissolution & destruction of the calcified tissue. It is one of the most prevalent chronic infections worldwide [1, 2]. Luckily, many diagnostic tests are there to detect the disease sooner rather than later, allowing for prompt intervention that will eventually tackle the caries matter [3, 4].

To provide the most accurate and efficient treatment, dental practitioners should combine various diagnostic tests [1]. A visual-tactile examination allows for an initial diagnosis later supplemented and verified by the tool that best fits the case [5]. Diagnostic tests can be further separated into qualitative and quantitative according to the type of information provided [6]. Radiographs are commonly used as the first aid in diagnosis after the clinical examination and offer the practitioner a qualitative diagnosis [5]. Caries detection dyes are mainly implemented to help caries removal than to diagnose caries. The uses of fiber optic transillumination (FOTI) are numerous, but the device is still primarily utilized for caries diagnosis [3].

Newer diagnostic tools such as CarieScan give more accurate information about the demineralization & early stage of carious lesion. Since this tool provides a numerical value, it is considered a quantitative test [7, 8].

## Carie Scan

It is a small, cordless & ergonomic device for easy utilization everyday. It is with its innovative remote view software rep-

resents major advances both in dental diagnostics & in clinical & patient oriented documentation [3]. It helps to identify & evaluate lesions very early in the dental caries process with a minimum false positive [8-10]. It develops specific treatment planning options & to improve maintenance & restoration outcome. It detects hidden dentinal caries [5, 8].

## Machine Software

It is a wireless device to save patient-based data in a custom database. It allows to present patient data in a variety of useful format for both professional & patient. Software is readily visible & highly understandable [4]. Images are utilized as both a patient education tool & accessible patient chart documentation [4]. Data from software are printed in PDF format. It can detect sudden changes in oral health or maintenance habits. Early demineralisation or caries formation can be identified with this software.

## Mechanics

Insert the blue cable test adaptor into the unit, close the contact with the cable & complete the test. Snap the single use sensor with wire tufts on the Carie-scan PRO & click into place. Attach the lip hook cable to scanner & hang the metal hook passively anywhere over the patient lips to close the circuit. Isolate the teeth to be scanned with cotton rolls on both sides of quadrant, suction devices or rubber dam the teeth to be treated are air dried.

## Conclusion

It is an impedance platform electrochemical measurement system that works by subjecting the tooth to a very low level,

multiple frequency electrical current. It, then collect the data & analyse it & assist in diagnosing the presence of demineralization & early stage of caries.

## References

1. Sabharwal, A., Stellrecht, E., & Scannapieco, F. A. (2021). Associations between dental caries and systemic diseases: a scoping review. *BMC Oral Health*, 21, 1-35.
2. Nigel B. Pitts, Domenick T. Zero, Phil D. Marsh, Kim Ekstrand, Jane A. Weintraub, et al. (2017). Dental Caries. *Nature Reviews Disease Primers*, 3(1), 17030.
3. Kazeminia, M., Abdi, A., Shohaimi, S., Jalali, R., Vaisi-Raygani, A., et al. (2020). Dental caries in primary and permanent teeth in children's worldwide, 1995 to 2019: a systematic review and meta-analysis. *Head & face medicine*, 16(1), 1-21.
4. Teo, T. K. Y., Ashley, P. F., & Louca, C. (2014). An in vivo and in vitro investigation of the use of ICDAS, DIAGNOdent pen and CarieScan PRO for the detection and assessment of occlusal caries in primary molar teeth. *Clinical oral investigations*, 18, 737-744.
5. Nomura, Y., Otsuka, R., Wint, W. Y., Okada, A., Hasegawa, R., et al. (2020). Tooth-level analysis of dental caries in primary dentition in Myanmar children. *International Journal of Environmental Research and Public Health*, 17(20), 7613.
6. Listl, S., Galloway, J., Mossey, P. A., Marcenes, W. (2015). Global economic impact of dental diseases. *Journal of dental research*, 94(10), 1355-1361.
7. Govind, S., Jena, A., Kamilla, S. K., Mohanty, N., Mallikarjuna, R. M., et al. (2023). Diagnosis and Assessment of Dental Caries Using Novel Bioactive Caries Detecting Dye Solution. *Biomedicines*, 11(2), 500.
8. Besnard, C., Marie, A., Sasidharan, S., Harper, R. A., Marathe, S., et al. (2023). Time-Lapse In Situ 3D Imaging Analysis of Human Enamel De-mineralisation Using X-ray Synchrotron Tomography. *Dentistry Journal*, 11(5), 130.
9. James, S. L., Abate, D., Abate, K. H., Abay, S. M., Abbafati, C., et al. (2018). Global, regional, and national incidence, prevalence, and years lived with disability for 354 diseases and injuries for 195 countries and territories, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet*, 392(10159), 1789-1858.
10. Bagramian, R. A., Garcia-Godoy, F., & Volpe, A. R. (2009). The global increase in dental caries. A pending public health crisis. *Am J dent*, 22(1), 3-8?