

Pulp measuring device to assist with proper cavity preparation above living pulp

Features

- Emits an AC current of constant amplitude into the tooth to measure dentin thickness—a calibrated electrode measures the corresponding electrical resistance of the dentin above the pulp
- Pen-like shape for easy handling
- Battery-operated; switches on at the touch of a button and switches off automatically when not in use for an extended period of time

- LED indicators signal pulpal safety
- Small disposable caps cover the electrode to minimize cross-contamination
- A lip clip ensures a complete circuit

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Red light, green Light

Prepometer device acts like a traffic signal to preserve pulpal integrity during cavity preparations

By Dr. Hans H. Sellman, Marburg University. Information provided by Hager Worldwide, Inc.

For years dentists have been “working blindly,” so to speak, during cavity preparations, approaching the pulp without diagnostic tools to indicate whether or not pulpal integrity is threatened. This is why dental schools place such emphasis on the study of anatomy, making sure that every new dentist is trained to know as accurately as possible just where the pulp is. In this age of digital radiography, intraoral cameras, and electrodes for measuring dentin depth, it seems almost archaic to approach the pulp without high-tech assistance.

Most of us have, unfortunately, at one time or another misjudged the situation. If we're lucky, we recognize the problem immediately and can treat correspondingly, capping over the pulp or treating it endodontically. Frequently, however, vaso-constriction (shrinking) of blood vessels due to local anesthesia inhibits any warning that might indicate pulp exposure. This is especially evident in the case of young teeth with large pulp and with elongated/tiled teeth. And regrettably, self-healing after treatment is the exception, while loss of tooth vitality is the rule.

The **Prepometer** instrument addresses this problem. Invented by Professor Gente of Marburg University, the Prepometer device measures the thickness of dentin by emitting an AC current of

constant amplitude into the tooth. Dentin thickness is measured via a calibrated electrode, which measures the corresponding electrical resistance of the dentin above the pulp. The pen-like device uses color-coded signals based on the principle of a traffic light: An illuminated green light indicates that preparation can safely proceed; the yellow and orange lights indicate that the user is approaching the shallowest possible thickness; and the red light indicates that preparation should be immediately stopped, as the thickness of the dentin is too thin for safety (less than 0.7 mm in mature teeth).

The following cases illustrate the ease of use of the device, even in complicated treatment scenarios.

Simple measurement

A female patient has had tooth number 5 removed for periodontal reasons. Tooth number 6 is to have a telescopic crown integrated into an existing denture (Fig. 1). The elongated tooth of the periodontally damaged denture requires careful preparation for the accurate and esthetic insertion of the other telescope at tooth number 11.

1. Place a disposable cap (Fig. 2) over the Prepometer electrode to minimize cross-contamination.
2. Place the yellow lip clip with the black cable (Fig. 3) into the corner of the patient's mouth during measurement (Fig. 4) to create a complete circuit.
3. Put the tip of the device into saline solution for conduction, and then place it onto the affected tooth for measurement. *Note:* The corresponding light on the device flashes immediately to indicate the remaining dentin thickness: green—no danger; yellow—continue with caution; orange—stop, deeper preparation is risky; or red—stop, the vitality of the pulp is endangered.
4. Shorten the tooth incisally (Fig. 5).
5. Remove approximal excess, and use the Prepometer device again to assist in resecting the vestibular side for the appearance of the double crown with an additional veneer (Figs. 6 & 7).

In the second case example, tooth number 8 is being prepared for a metal ceramic crown. Figure 8 shows the tooth prior to preparation. The Prepometer device is used in the same manner as above. Figure 9 presents the Prepometer measurement following incisal shortening and approximal reduction, and Figure 10 depicts the correct vestibular preparation for obtaining an optimally satisfying solution. **DPR**



Fig. 1 Tooth number 13 requires a new telescopic crown.



Fig. 2 Disposable caps cover the measuring probe to minimize the risk of cross contamination.



Figs. 3 & 4 The yellow lip clip (attached via a black cable) is placed in the corner of the patient's mouth to complete the circuit during measurement.

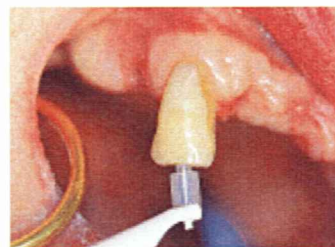


Fig. 5 A measurement is taken after incisal reduction.

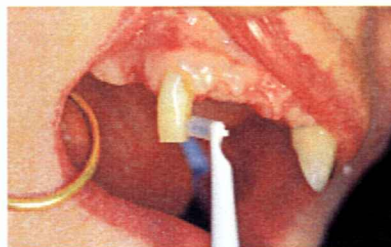


Fig. 6 An approximal measurement is taken.

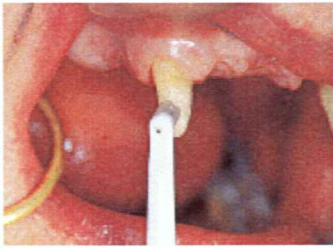


Fig. 7 The vestibular side is resected for a double crown. When the green light flashes, the dentin still has sufficient thickness.



Fig. 8 Tooth number 11 is to receive a metal-ceramic crown.



Fig. 9 A measurement is taken after incisal shortening and approximal reduction.



Fig. 10 The tooth exhibits the correct vestibular preparation.

Changing the way we practice

By Dr. Hans H. Sellman

An apical osteolysis caused by a loss of vitality is found in approximately one in 25 teeth. The dentin wounds are connected with the pulp by tens of thousands of tiny dentinal canals (diameter about 1-2 μm). In addition, very short dentinal canals result from high abrasion of tooth substance, thereby endangering the pulp. A loss of vitality can be avoided by a combination of proper cooling of the prepared tooth (minimum 50 ml/minute) and a minimum distance of 0.7 mm dentin thickness for teeth with short canals and 1.4 mm in large canals.

According to some studies, the loss of tooth vitality following capping is 4% within five years and 15% within ten years. I am surprised that we aren't seeing more lawsuits in the cases of non-vital teeth!

Is this scenario really inevitable? And if so, is there any information available regarding risks and side effects? I had these questions in mind when I discovered the Prepometer device. Imagine for a moment that preparations are never again made too deep and that this problematic issue has been rendered obsolete. From another viewpoint, think how wonderful it would be for dental technicians if they always had enough space to prepare a ceramic veneer labially.

We have thoroughly proven the safety of the Prepometer instrument in our office. Easy and safe cavity preparations are now a standard of care that everyone can readily achieve.

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