MANAGING THE PULPAL RESPONSE with High Performance Materials

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General dentists spend an estimated 80% of their time performing restorative procedures, and in every case, the pulpal health of the tooth is a concern. Whether the procedure is simple or complex, protection of the pulp is essential for long-term success and patient satisfaction.

Materials that have been available to clinicians for pulpal protection are zinc phosphate, CaOH, glass ionomer, and Mineral Trioxide Aggregate (MTA). Although they have had various levels of clinical success, each has certain drawbacks, such as long set times. Designed to provide a more comprehensive solution, a new class of material—a resin-modified calcium silicate cement—offers unique features for full pulpal protection.

**CLINICAL VERSATILITY**

A light-curable hydrophilic resin combined with MTA technology, TheraCal LC is indicated for direct and indirect pulp capping, and as a liner. It performs as an insulator barrier and protectant of the dental pulpal complex¹ and may aid in the healing process.²,³

In addition, its handling and light-curing features make it an optimal choice over conventional calcium hydroxide-based materials, as it facilitates precise, immediate placement, and subsequent condensation of restorative material.

**CLINICAL USES**

- Protective liner: for use under restorative materials, cements, or other base materials.
- Pulp capping agent: may be placed directly on pulpal exposures after hemostasis is obtained. It is indicated for any pulpal exposures, including carious exposures, mechanical exposures, or exposures due to trauma.

**View a step-by-step technique for a Class I direct composite restoration using TheraCal LC as a liner**
According to Paul Child, Jr, DMD, CDT, an indirect pulp cap is the procedure by which incomplete excavation is provided, leaving a thin layer of affected or sound dentin when near the pulp. This procedure, he explains, may provide the tooth the opportunity to repair itself and maintain vitality. However, factors such as self-etching adhesives, additional material costs, and lack of insurance reimbursement have discouraged the use of the indirect pulp cap—even though adhesives are acidic, do not disinfect the dentin, and do not provide the necessary chemicals for tooth remineralization.

An indirect pulp cap and/or liner with TheraCal LC offers many clinical benefits. Along with a well-sealed restoration, this procedure offers protection and may comfortably delay endodontic treatment for years.⁴
Much has been written about the preferred features of an optimal pulp capping material for today’s practices. The list includes a material that will:

- Support remineralization of the dentin and formation of new hard tissue
- Maintain an alkaline environment
- Promote healing
- Reduce postoperative sensitivity
- Be efficient, easy to apply

The ultimate goal in pulp capping is to give the patient’s tooth a chance to heal. TheraCal LC is designed to meet these goals: its sustained high calcium release stimulates hydroxyapatite and secondary bridge formation, creates a bond to dentinal tissue, and can be placed directly on the pulp. Easy and efficient to use in a clinical setting, this material is a strong, hard, fast-setting pulp protectant.
Prevention of postoperative sensitivity is one of the main reasons for the use of protective liners. Sensitivity can greatly impact a patient’s satisfaction and evaluation of treatment. Over time, larger, deeper restorations can exhibit microleakage and stress fractures, resulting in sensitivity. Liners offer added protection and can be used to manage subsequent polymerization shrinkage stress.

**FIG 1.** Patient presented with occlusal decay.

**FIG 2.** Upon excavation a small pulpal exposure was noticed.

**FIG 3.** TheraCal LC is placed over pulp exposure and used for pulpal protection.

**FIG 4.** Final restoration.
WHAT MAKES THERACAL LC UNIQUE?

• It is a liner and pulp-capping material with the ability to induce apatite crystal formation, similar to commercially available self-curing MTA products.

• Its proprietary resin formula consists of tri- and di-calcium silicate particles in a unique, patented hydrophilic monomer that provides significant calcium and hydroxide ion release.

• Stable and durable as a liner, base, or pulp-capping material, it is permeable to dentinal fluid but resists dissolution.

A SCAFFOLD FOR REPARATIVE DENTIN FORMATION

Dentinal fluids are absorbed within TheraCal LC, resulting in the release of calcium and hydroxide ions. The tooth responds to form apatite and a bond, supporting the natural sealing ability of the product. This ability to assist in the formation of apatite plays a critical role in pulpal protection.

5 MILLION RESTORATIONS

In the past three years, over five million restorations have been placed using TheraCal LC as a direct or indirect pulp capping material.
TheraCal LC is a new step toward taking what research understands and creating improved materials that address the needs of healing and pulpal protecting:

**KEY FEATURES**

- Sustained high calcium release stimulates hydroxyapatite and secondary dentin bridge formation, and forms to a protective seal.² ³ ⁵
- The alkaline pH (hydroxide ions) promotes healing.¹⁰
- Forms a protective barrier that insulates the pulp (which may lead to less tooth sensitivity).⁹
- Moisture tolerant with very low solubility.⁶
- High radiopacity making it easily identifiable on radiographs.
- Light-curable with immediate set and easy to use.
- Strong physical properties to withstand the forces of mastication under composites, amalgams, cements, and other base materials.⁷
- Flowable yet stays where it is placed.

**CLINICAL TIPS**

- Apply to visibly moist dentin
- Apply in 1mm increments
- Light cure for 20 seconds

TheraCal LC®
We are celebrating our 35th anniversary as a leader in adhesion dentistry and restorative materials. Founded in 1981 by Dr. Byoung I Suh, we are a family owned and operated business. We have built a tradition of excellence and continual progress through our core competencies: research and development, manufacturing and customer service.

At BISCO “adhesion is our passion” and we are dedicated to understanding and improving restorative dentistry. BISCO offers all the products you need, from start to finish, for each restorative procedure including bonding agents, etchants, resin composites, core materials and fiber posts. BISCO products are proudly made in the U.S.A.

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TheraCal LC®
Resin-Modified Calcium Silicate Liner/Pulp Protectant

- **EASE OF USE**
  - Light curable, flowable-like handling

- **RADIOPAQUE**
  - Radiopaque properties allow for easy detection on x-rays

- **CALCIUM RELEASE**
  - Hydroxyapatite formation\(^1\), \(^2\)

- **HEALING & INSULATION**
  - Liner insulates the pulp\(^1\), providing virtually no post-operative sensitivity
  - Promotes healing\(^1\)

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