Biodentine™

... is the first all-in-one, biocompatible and bioactive material to use wherever dentine is damaged

For **crown** and **root** indications
Helps the **remineralisation** of dentine

**Preserves pulp vitality** and **promotes pulp healing**
Replaces natural dentine with the **same mechanical properties**
Biodentine™ is the first material offering bioactivity and outstanding sealing properties to fully replace dentine, both in the crown and in the root with unique benefits:

1 - Preservation of pulp vitality
2 - Prevention of clinical failures
3 - Ultimate dentine substitute

From an unique innovative technology

- 10 years of research and development in Septodont laboratories
- Unique technological platform of biocompatible and bioactive materials promoting remineralisation and pulp healing
- In-house synthesised Tricalcium Silicate to guarantee high purity
- Strict control at each manufacturing stage to guarantee high quality of the product
BIODENTINE™: CLINICAL IMPLEMENTATION

Direct restoration in a deep cavity

1. Prepare the cavity
2. Fill the cavity with Biodentine™
3. After at least 48h, prepare the upper part of Biodentine™ for enamel restoration
4. Finish the restoration with a composite

Inlay/Onlay

1. Prepare the cavity
2. Re-build the tooth with Biodentine™ and keep it as a temporary enamel restoration
3. After at least 48h, prepare the upper part of Biodentine™ for enamel restoration
4. Finish the restoration with a composite or with an inlay/onlay

Pulp exposure

1. Prepare the cavity
2. Use Biodentine™ as a pulp capping agent and bulk filling material to re-build the tooth
3. After at least 48h, prepare the upper part of Biodentine™ for enamel restoration
4. Finish the restoration with a composite

Pulp floor perforation

1. Perform your root canal filling with Gutta-Percha and endodontic sealer
2. Place Biodentine™ to seal the perforation
3. Fill the cavity with Biodentine™ before placing the final restoration
PRESERVATION OF PULP VITALITY

- Absence of post-operative sensitivity: high biocompatibility reducing the risk of pulp or tissue reaction
- Bioactive: remineralisation of dentine for unique pulp healing properties
- Formation of reactionary dentine and dentine bridges
- Pulp healing promotion after pulp exposure: reversible pulpitis, trauma or iatrogenic exposure

Direct Pulp Capping with an Adult Patient

Pre-operatory x-ray
Pulp exposure
Placement of Biodentine™ used for direct pulp capping

Biodentine™ is used as a bulk filling material and kept as a dentine substitute
3-year follow-up x-ray
3-year follow-up clinical view

Indirect Pulp Capping: Study in Rat Molars

"Biodentine™ stimulates the formation of reactionary dentine and maintains pulp vitality despite the preparation of a deep cavity and the placement of a filling material" (Goldberg 2009)

<table>
<thead>
<tr>
<th></th>
<th>1 week</th>
<th>2 weeks</th>
<th>1 month</th>
<th>3 months</th>
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<tbody>
<tr>
<td>thickness</td>
<td>20-40 µm</td>
<td>40-80 µm</td>
<td>140-180 µm</td>
<td>180-200 µm</td>
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</tbody>
</table>

Reactionary dentine thickness on Rat Molars

Courtesy Prof. G. Koubi, University of Marseille, France

Courtesy Prof. Goldberg, University of Paris, France
**Prevention of Clinical Failures**

- Long lasting sealing properties: mineral tags in the dentine tubules combined with high dimensional stability over time
- Less risk of bacterial percolation: outstanding microleakage resistance
- Absence of post-operative sensitivity: no shrinkage
- No conditioning or bonding: natural mechanical anchorage in dentine tubules

### Micro-mechanical anchorage ensuring long lasting seal

**Biodentine™** labelled with fluorescein dye which has moved from the cement into the dentine tubules. Notice the plugs of material in the tubule openings

_Courtesy Dr Amre Atmeh, King's College London_

### High micro-leakage resistance

**Biodentine™** has better resistance to leakage than Fuji II LC on enamel and dentine interfaces

_Courtesy Prof. Dejou_
3 ULTIMATE DENTINE SUBSTITUTE

- Easy handling for optimised clinical use
- Superior radiopacity for clear short and long term follow-up
- Comparable to human dentine: similar mechanical behaviour

Easy handling

<table>
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<th>TOTAL HANDLING TIME</th>
<th>12 min</th>
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</thead>
<tbody>
<tr>
<td>MIXING AND PLACEMENT TIME</td>
<td>SETTING TIME IN MOUTH</td>
</tr>
<tr>
<td>6 min</td>
<td>6 min</td>
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</tbody>
</table>

- Minimal modelling of Biodentine™ during the working time, not overworking it
- Let it set for 6 min without touching it

Superior radiopacity

- 3.5 mm Aluminium radiopacity
- Easy differentiation from tooth structure for simple short and long term follow-up

Comparable to human dentine

<table>
<thead>
<tr>
<th>Similar strength to dentine</th>
<th>Biodentine™ cuts like dentine</th>
<th>Similar stress absorption and flexural behaviour as dentine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive Strength, MPa (1 month)</td>
<td>Vickers Micro Hardness, HVN (24 hours)</td>
<td>Flexural Modulus, GPa (24 hours)</td>
</tr>
</tbody>
</table>

Source: Septodont internal data, data on file
**Indirect pulp capping**

Pre-op x-ray: proximal caries on the upper premolar

Deep cavity in the distal surface

Placement of Biodentine™ in the distal cavity

Biodentine™ is reworked and kept as a dentine substitute. Mesial cavity is prepared

Final restoration is done using N'Durance® Dimer Flow as a base

Clinical view of the final restoration with N'Durance®

*Courtesy Dr M. Kaup, University of Münster, Germany*

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**Pulp floor perforation**

Pre-op x-ray with a point inserted in a palatal fistula

Removal of the filling material shows a pulp floor perforation

Dentine loss repair with Biodentine™ used as a dentine substitute

Post-op x-ray

*Courtesy Dr F.Bronnec, University of Paris, France*
### ADOPTED BY ACKNOWLEDGED EXPERTS IN THE DENTAL COMMUNITY

**Prof. Tim Watson PhD BSc MCSP**

“Biodentine™ is a material that, for the first time, allows a dentist to achieve biomimetic mineralisation within the depths of a carious cavity. Biodentine™ has the potential to revolutionise the management of the deep carious cavity in operative dentistry, whether or not the pulp is exposed.

**Prof. Callum Youngson BDS, DDSc, FDS, DRD, MRD, FDS(Rest Dent) RCS (Edin), FDS RCS (Eng)**

“Biodentine™ finally provides us with a material that closely resembles lost dentine and has the potential to promote, rather than just allow, healing of the pulpitic tooth. Biodentine™ is also compatible with the final composite restoration, making it an important addition to the clinician’s armamentarium.”

**Dr. Julian Webber BDS MSc DGDP FICD**

“Sophisticated biosilicate technology and 100% biocompatibility makes Biodentine™ the perfect root canal repair material. With its improved handling ability and quick setting time, Biodentine™ offers considerable advantages over other similar materials. I cannot recommend it more highly.”

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**MORE THAN 300 PATIENTS INCLUDED IN CLINICAL STUDIES SINCE 2005**

<table>
<thead>
<tr>
<th>University</th>
<th>Subject</th>
<th>Duration</th>
<th>Date of Publication</th>
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<tr>
<td>Paris VII - Prof. Machtou</td>
<td>Clinical study: Endodontic applications</td>
<td>3 years</td>
<td>2011</td>
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<tr>
<td>Marseille - Prof. Koubi</td>
<td>Clinical study: Direct pulp capping</td>
<td>3 years</td>
<td>2011</td>
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<tr>
<td>Marseille - Prof. Koubi</td>
<td>Clinical study: Class I and Class II restorations</td>
<td>3 years</td>
<td>2011</td>
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<tr>
<td>Lyon - Prof. Colon, Dr Grosgogeat</td>
<td>Bactericidal properties</td>
<td>3 months</td>
<td>2010</td>
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<td>Brussels - Dr Shayegan</td>
<td>Pulpotomies in swine teeth</td>
<td>1 year</td>
<td>2010</td>
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<td>Marseille - Prof. About</td>
<td>Early stages of dentinal genesis</td>
<td>1 year</td>
<td>2010</td>
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<td>Paris - Prof. Colon</td>
<td>Microleakage of open sandwich class II restoration</td>
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<td>London - Prof. Watson</td>
<td>Evaluation of permeability</td>
<td>3 months</td>
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<td>Paris - Prof. Goldberg</td>
<td>Indirect pulp capping in rat molars</td>
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<tr>
<td>Marseille - Prof. About</td>
<td>Induction of specific cell response to a Ca$_3$SiO$_5$ - based material</td>
<td>1 year</td>
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**Available in:**
Box of 15 capsules, 15 single-dose containers

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