

**The unique**

Pulp  
therapeutic  
&  
Restorative  
material



***Biodentine™ XP***

the Bio-Bulk Fill procedure<sup>20</sup>



# Pulp therapeutic &

**Superior  
Bioactivity<sup>1-4\*</sup>**

**Excellent  
Biocompatibility<sup>5-7\*\*</sup>**

**Antimicrobial  
Properties<sup>10</sup>**

\* Highest mean value of Calcium release and its superior concentration that encourages positive interaction with pulp cells.

\*\* Biodentine™ showed the highest % of cell biocompatibility.

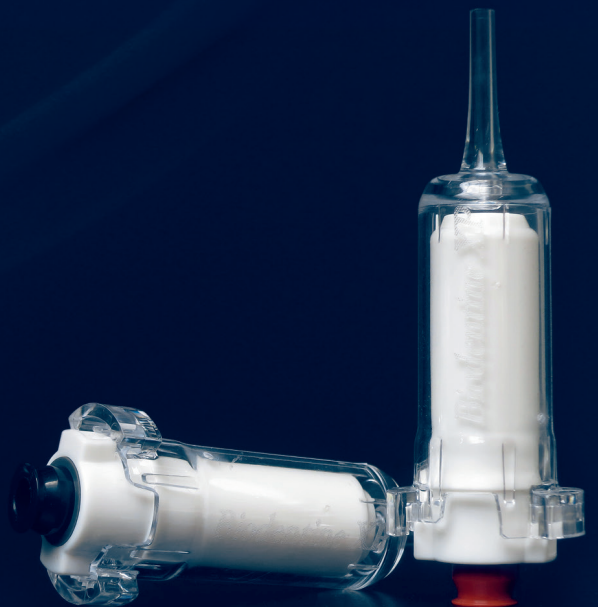
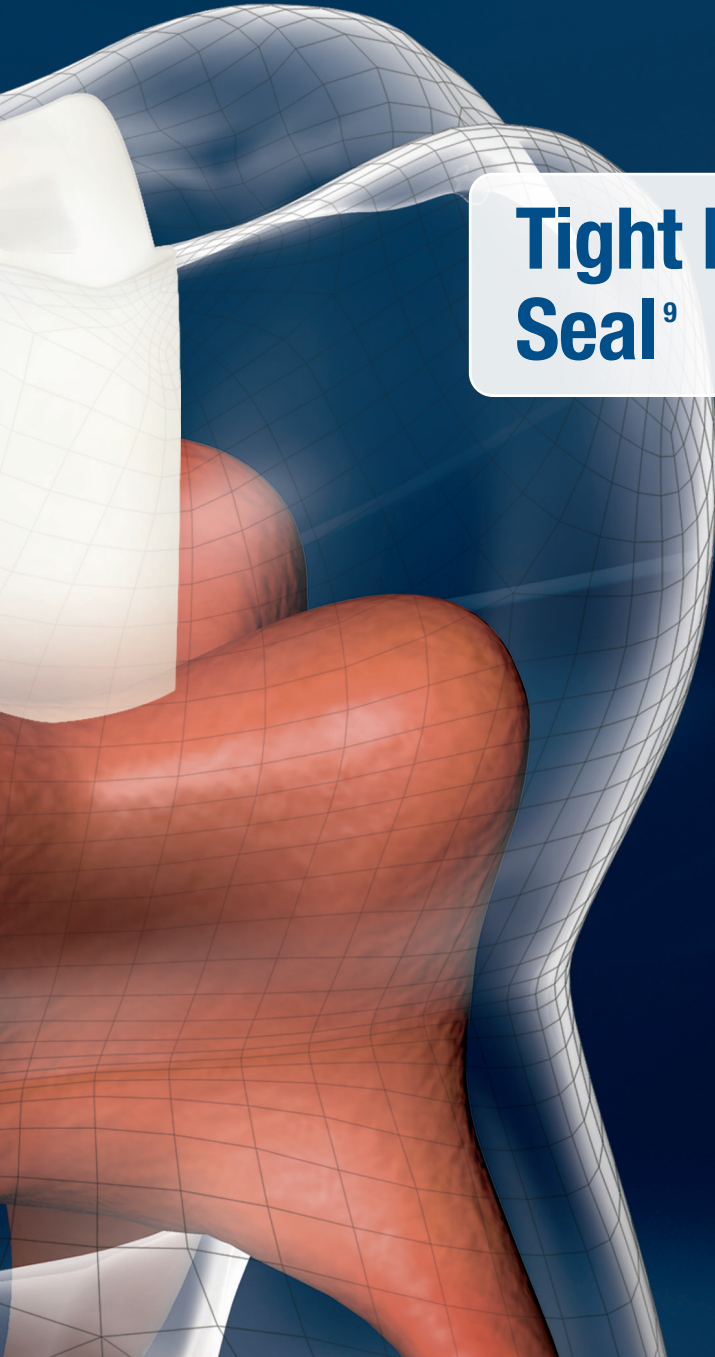
Properties verified by preclinical studies.

CE for Biodentine™ XP was obtained on the basis of equivalence with Biodentine™.

# Restorative material

**Strong Mechanical  
Properties<sup>5,7</sup>**

**Tight Marginal  
Seal<sup>9</sup>**

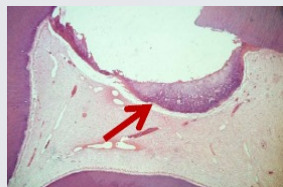


## Pulp therapeutic &

### Superior Bioactivity<sup>1-4</sup>

#### Favourable interaction with pulp cells

▼  
Dense dentinal bridge formation to protect pulp.



▼  
Remineralisation of damaged dentine.

### Excellent Biocompatibility<sup>5-7</sup>

✦ ✦ ✦  
Extra-pure  
C3S

0  
resin

0  
cell death

### Antimicrobial Properties<sup>10, 21</sup>

pH **11+**

pH 10.99 at release and  
pH >11 maintained for 28 days.

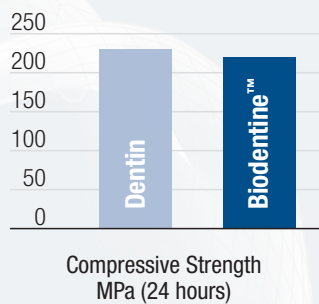
▼  
Unfavourable environment for  
bacteria responsible for pain  
and secondary caries.

## Restorative material

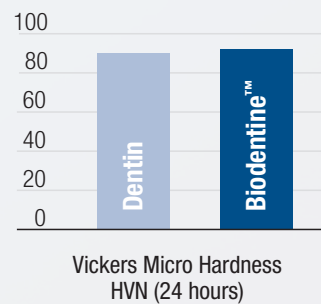
### Strong Mechanical Properties<sup>7,8</sup>

Similar to sound dentine

Resistance to external impact of mastication forces



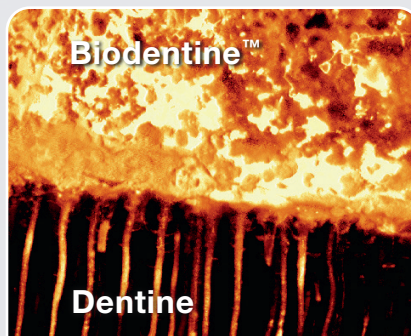
Stress absorption



### Tight Marginal Seal<sup>4,9,11</sup>

**0**  
shrinkage

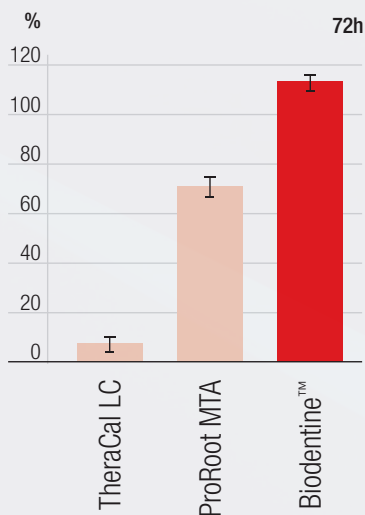
Thanks to its resin-free formulation, long-lasting dimensional stability is ensured.



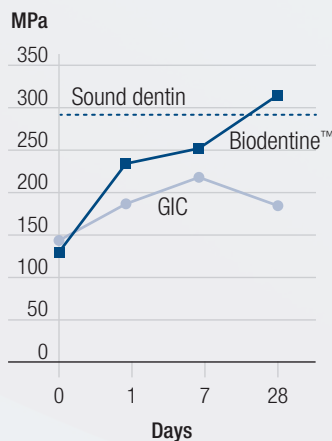
Deep penetration within dentine tubules.

## Pulp therapeutic & Restorative material

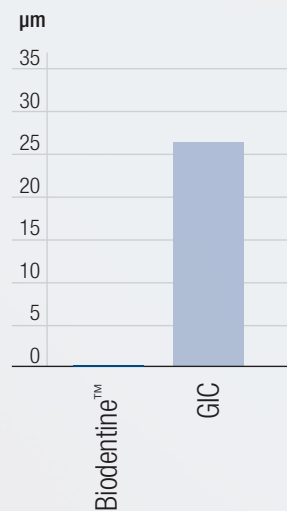
### Better cell viability<sup>5</sup>



### Better compressive strength<sup>8</sup>



### Less microleakage<sup>11, 12</sup>



“Results reflect a percentage of cell viability compared to cells cultured without pulp capping materials, which were considered 100%.”

Biodentine™ exhibited > 100%, the highest percentage of cell biocompatibility among the tested pulp capping materials.”

Poggio C et al. 2015

“A specific feature of Biodentine™ is its capacity to continue improving with time over several days until reaching 300 MPa after one month.”

This value becomes quite stable and is in the range of the compressive strength of natural dentine (297 MPa).”

Internal data: Biodentine scientific file  
O'Brian 2008

“Biodentine™ exhibits superior marginal sealing ability as well as marginal adaptation under composite resin as compared to GIC.”

“Resistance to microleakage is important for preventing challenges such as the development of secondary caries, tooth sensitivity, aesthetic concerns, and the potential for restoration failure.”

Niranjana et al. 2016  
Aljehani et al. 2023

**Biodentine™ XP is THE unique material suited for**

## **Bio-Bulk Fill procedure**<sup>17,20</sup>

Fill **the entire cavity** with only Biodentine™ XP  
**from the pulp to the DEJ.**



### **Final enamel restoration to be performed:**

- ▶ in the same session  
or
- ▶ in the second session, which can be performed  
**between 2 weeks and 6 months later**<sup>18</sup>.

**The full Bio-Bulk Fill  
procedure protocol**<sup>20</sup>



**Pulp  
therapeutic**



**Restorative  
material**

Success in your  
deep cavity restoration procedures

**daily**

Clinical success rate

**Direct  
pulp capping**

**96.4 %<sup>15</sup>**

**Pulpotomy**

**93.9 %<sup>16</sup>**

**Indirect  
pulp capping**

**95.8 %<sup>13</sup>**

When dentine thickness is:

- **Less than 0.5 mm**
- **Difficult to determine** in a clinical setting<sup>14</sup>

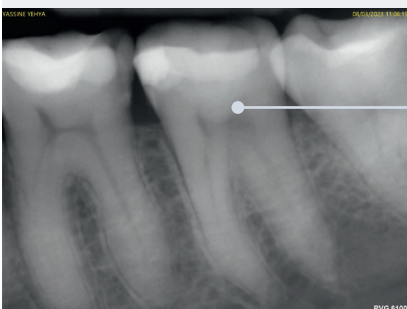
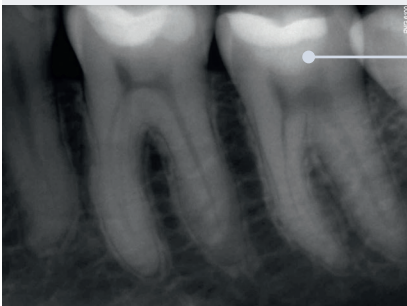


Using just one product,  
Biodentine™ XP lets you:

- Heal the pulp
- Preserve pulp vitality
- Save tooth structure<sup>21</sup>

**12** years of success of Biodentine™  
in the Bio-Bulk Fill procedure

**Patient 1**  
1- and 12-year recall



Healthy teeth with  
pulp vitality and  
tooth structure  
preserved.

Cases by Prof. J. Sabbagh  
DDS, MSc, PhD, FICD, HDR

**Patient 2**  
8-year recall



## 6.5 million teeth saved with Biodentine™<sup>19</sup>

### Biodentine™ XP in the Bio-Bulk Fill procedure



#### Time-saving

One-step  
cavity filling



#### Easy to use

Direct placement  
in the tooth



#### Daily convenience

Fewer steps in  
the procedure



#### Adapted to your practice

1- or 2-session  
procedure



#### Cost- effective

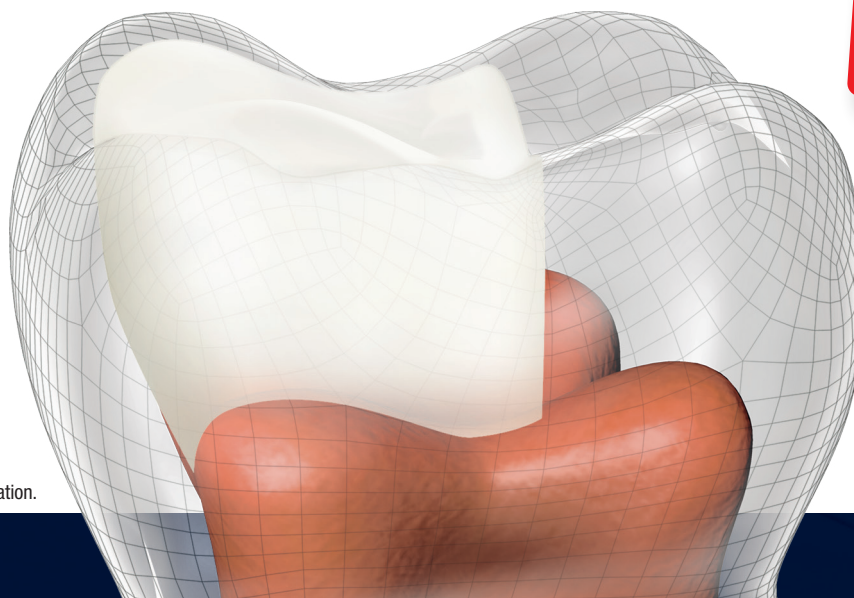
1 product  
for dentine restoration\*



#### Proven clinical success

multiple  
clinical trials

**1300+**  
publications\*\*



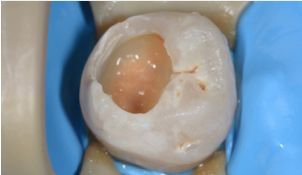
\* under final enamel restoration.

\*\* Publications available at <https://pubmed.ncbi.nlm.nih.gov/>. CE for Biodentine™ XP was obtained on the basis of equivalence with Biodentine™.

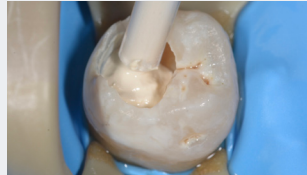
## Examples of Bio-Bulk Fill procedure in daily deep cavity restorations

### Indirect pulp capping in one session

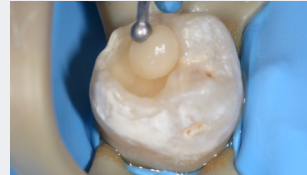
By Prof. J. Sabbagh



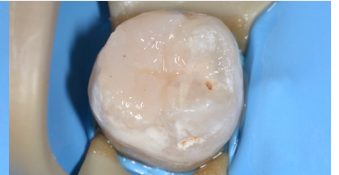
Cavity preparation.



Biodentine™ XP placement, Bio-Bulk Fill procedure.



Final restoration using self-etch adhesive system and composite in the same session.



### Indirect pulp capping in two sessions (final enamel restoration in two weeks)

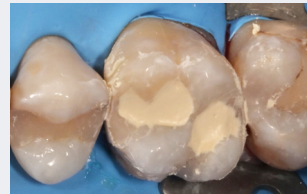
By Dr. M. Ganowicz



Tooth after preparation.



Restoration of the proximal walls with composite material.



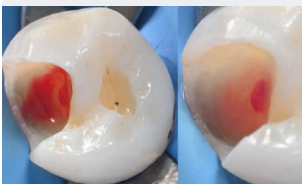
Filling of the rest of the cavity with Biodentine™.



Final enamel restoration after two weeks.

### Direct pulp capping in one session

By Dr. V. Tosco



Clean cavity with pulp exposure.



Injection of Biodentine™ XP.



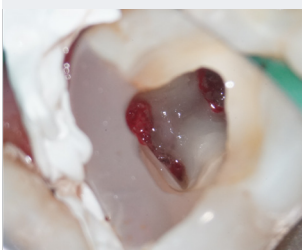
Hardening of bioceramic material before restoration.



Final restoration using selective enamel etching and composite.

### Pulpotomy in two sessions (final enamel restoration in two weeks)

By Dr. S. Herbst



Complete pulpotomy with achieved hemostasis.



Bio-Bulk Fill procedure with Biodentine™.



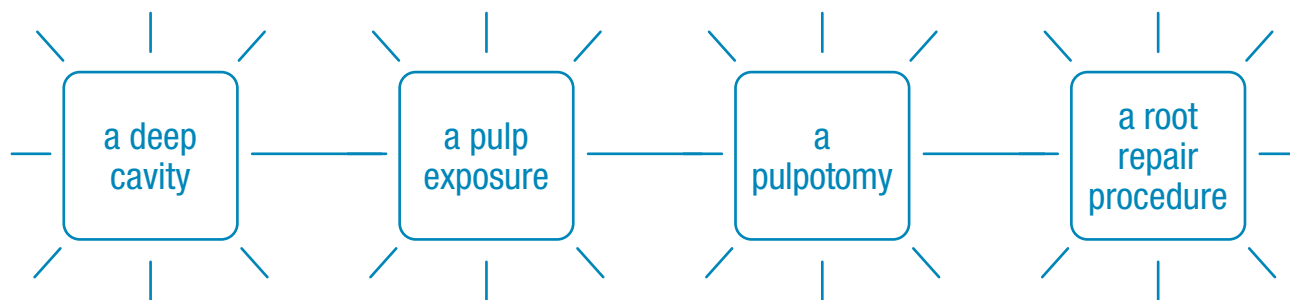
Final restoration using self-etch adhesive system and composite in a second session.



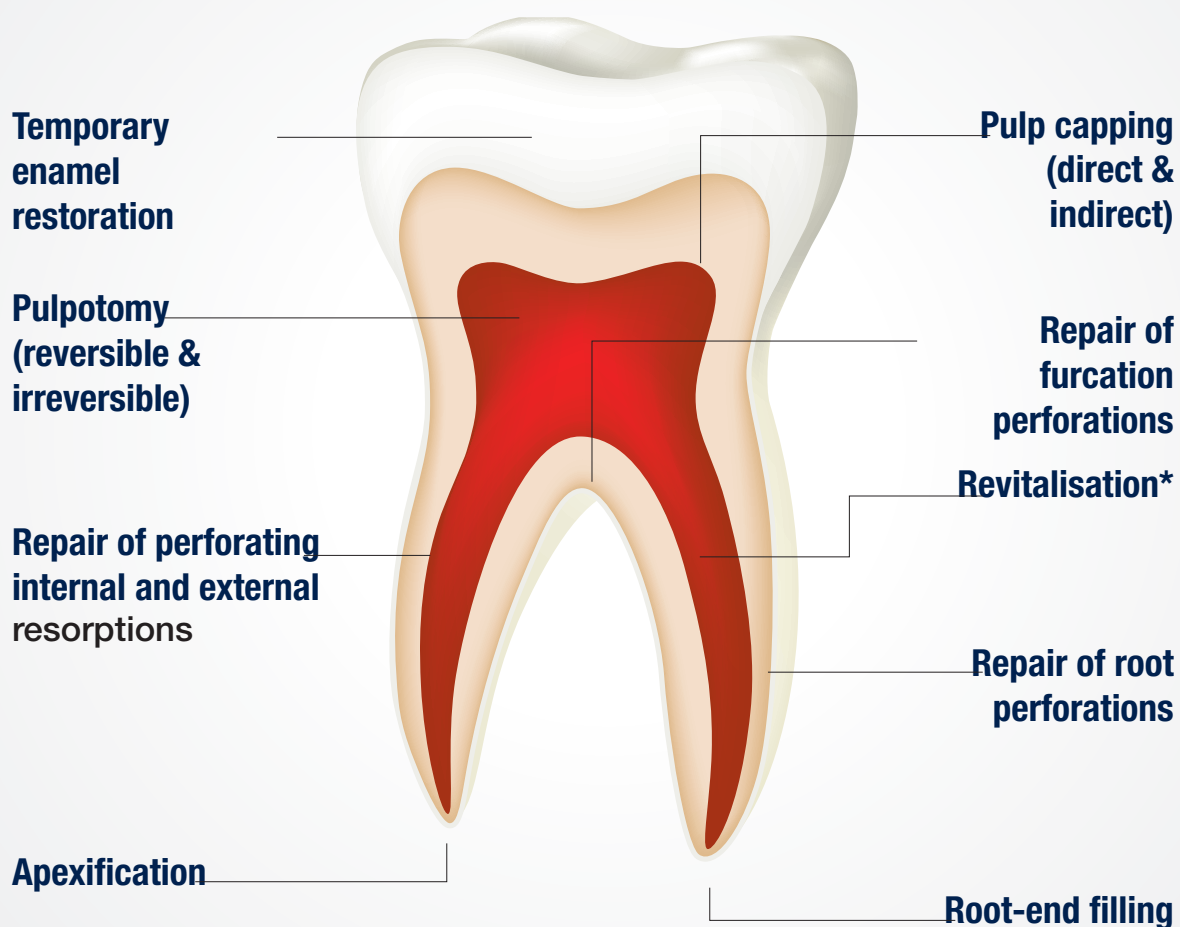
Radiology check.

## Biodentine™ XP will provide you with an optimal **daily experience**

Today, 1 out of 2<sup>(22)</sup> patients in your practice will come for:

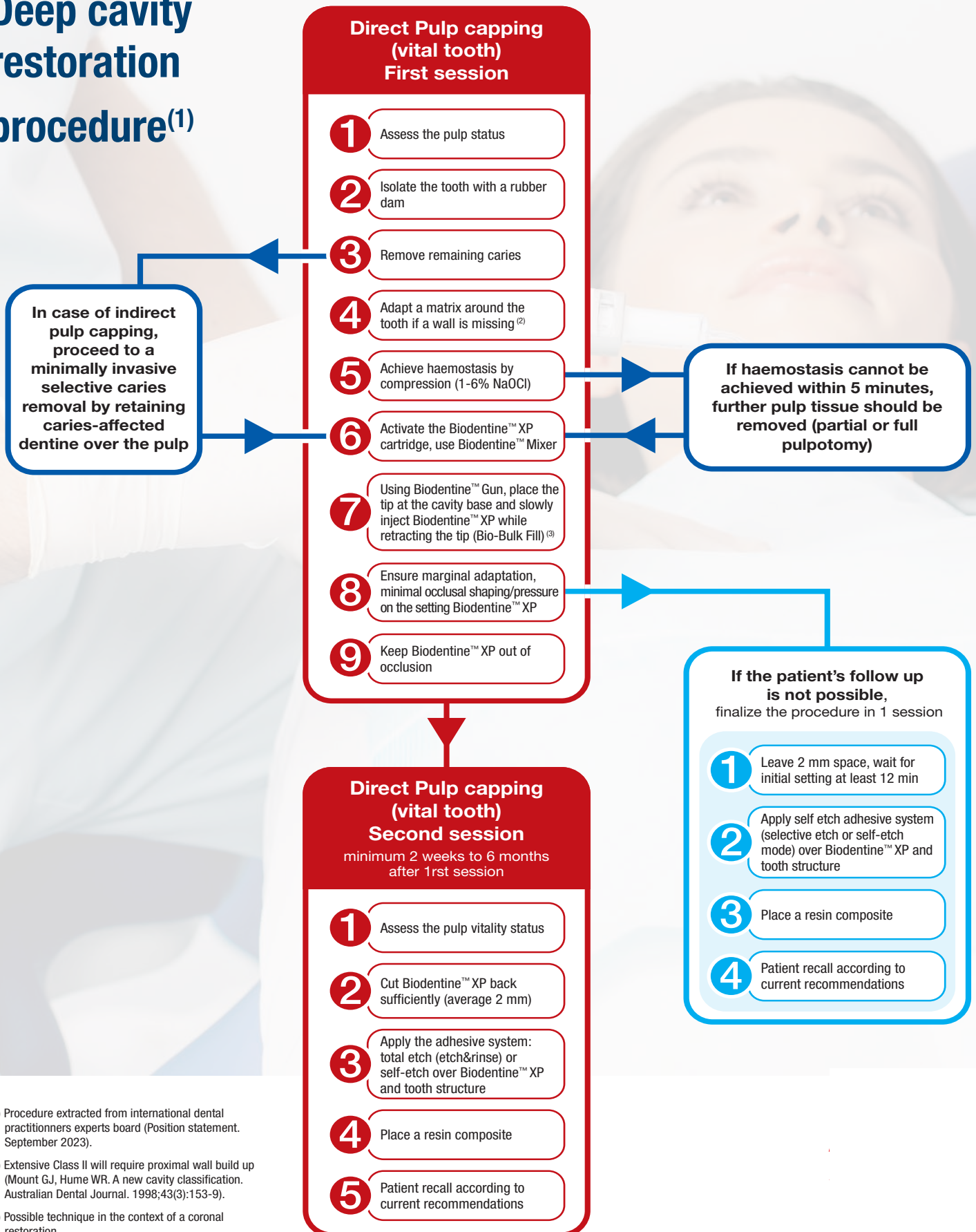


The ease of use and multiple indications of Biodentine™ from the crown to the root will help you every day to treat your patients.



\*Revitalisation procedure by means of revascularisation of permanent immature teeth with necrotic pulp

## Deep cavity restoration procedure<sup>(1)</sup>



(1) Procedure extracted from international dental practitioners experts board (Position statement, September 2023).

(2) Extensive Class II will require proximal wall build up (Mount GJ, Hume WR. A new cavity classification. Australian Dental Journal. 1998;43(3):153-9).

(3) Possible technique in the context of a coronal restoration.



## Biodentine™ saves pulps EVEN with signs & symptoms of irreversible pulpitis

### Vital Pulp Therapy

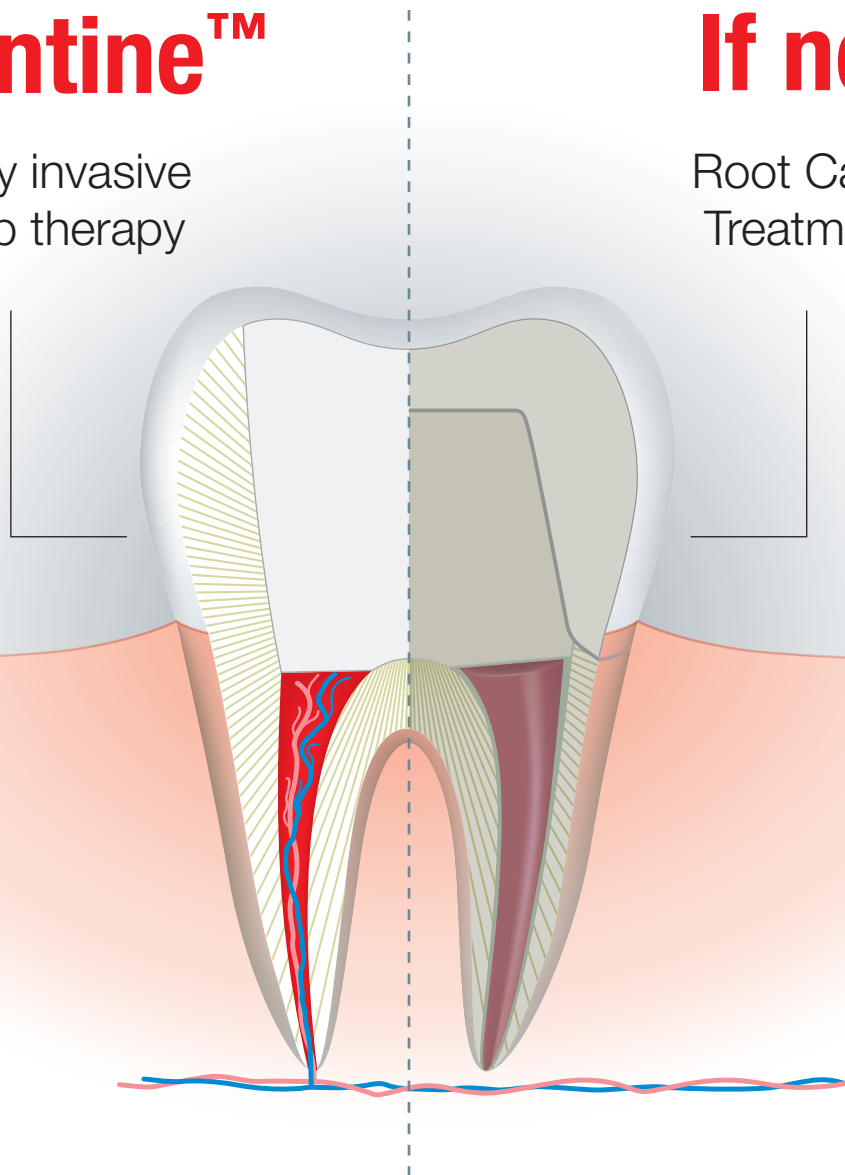
If you use

**Biodentine™**

Minimally invasive  
vital pulp therapy

If not

Root Canal  
Treatment



## Managing carious pulp exposure

E.S.E.\*

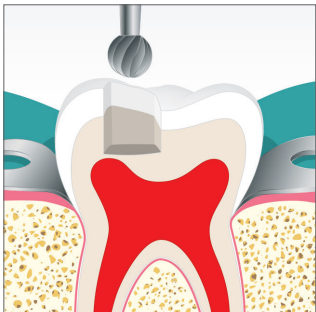
Clinical Directions

e-se

\* European Society of Endodontology

- For class II capping of deep carious lesions an enhanced protocol should be used; including magnification, a disinfection irrigant and the application of a hydraulic calcium silicate cement.
- Carious exposure with symptoms indicative of irreversible pulpitis, when no rubber dam being used and instruments contaminated during caries removal, should be treated aseptically with pulpectomy.
- Alternatively full pulpotomy may be successful using an aseptic technique in cases where there is partial irreversible pulpitis in the coronal pulp.

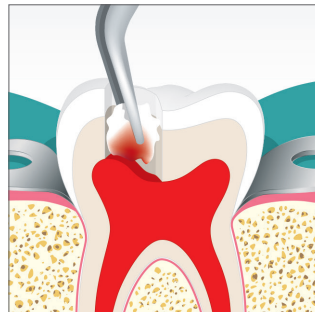
## Biodentine™: Step by step procedure



Proceed to caries excavation, first rinsing with 5% NaOCl, then using regular carbide/diamond burs.



Let the pulp appear and allow bleeding.



Control bleeding by applying a cotton pellet, moistened with 5% NaOCl.



If bleeding control is achieved within 5 min, fill the cavity with Biodentine™ and proceed to final enamel restoration within 6 months.



If not, remove a part of the pulp (partial pulpotomy) and resume attempt to control bleeding within 5 min.



Perform progressive pulpotomy until bleeding control is achieved within 5 min.



When the root canal entries are visible (full pulpotomy) and bleeding is controlled within 5 min, fill the cavity with Biodentine™ and proceed to final enamel restoration within 6 months.



If bleeding control within 5 min is impossible to achieve, then do the root canal treatment of the tooth.

# The unique

# Pulp therapeutic & Restorative material



**Biodentine XP 200**  
Box of 10 cartridges



**Biodentine XP 500**  
Box of 10 cartridges



**Biodentine Mixer**  
Box 1 mixer



**Biodentine Gun**  
Box 1 dispenser gun

## References

1. Nowicka A et al. Tomographic Evaluation of Reparative Dentine Formation after Direct Pulp Capping with Ca(OH)<sub>2</sub>, MTA, Biodentine™, and Dentine Bonding System in Human Teeth. JOE. 2015.
2. Gong V et al. Nanoscale chemical surface characterization of four different types of dental pulp-capping materials. JOD. 2017.
3. Elbanna A et al. In vitro bioactivity of newly introduced dual-cured resin-modified calcium silicate cement. DRJ. 2022.
4. Bakhtiar H et al. Human Pulp Responses to Partial Pulpotomy Treatment with TheraCal as Compared with Biodentine™ and ProRoot MTA: A Clinical Trial. JOE. 2017.
5. Poggio C et al. In vitro cytotoxicity evaluation of different pulp capping materials: a comparative study. Archives of Industrial Hygiene and Toxicology. 2015.
6. Internal R&D data.
7. Internal data: Biodentine™ XP Scientific file. 2022 - specific pages.
8. Internal data: Biodentine™ Scientific File, 2011 - specific pages.
9. Atmeh et al. Dentine-cement interfacial interaction: calcium silicates and polyalkenoates. JOD. 2012.
10. Kaur M., Singh H., Dhillon J.S., Batra M., Saini M. MTA versus Biodentine™: Review of Literature with a Comparative Analysis. J. Clin. Diagn. Res. 2017.
11. Niranjana et al. A comparative microleakage evaluation of three different base materials in Class I cavity in deciduous molars in sandwich technique using dye penetration and dentine surface interface by scanning electron microscope Journal of Indian Society of Pedodontics and Preventive Dentistry. 2016.
12. Aljehani et al. Microleakage Among Different Dental Restorative Materials: Causes, Detection, and Impact on Marginal Integrity. JOHS. 2023.
13. Kaul S, Kumar A, Jasrotia A, et al. Comparative Analysis of Biodentine™, Calcium Hydroxide, and 2% Chlorhexidine with Resin-modified Glass Ionomer Cement as Indirect Pulp Capping Materials in Young Permanent Molars. J Contemp Dent Pract. 2021.
14. M. Al-Ali<sup>1,2</sup> and J. Camilleri. The scientific management of deep carious lesions in vital teeth using contemporary materials – A narrative review. Frontiers in Dental Medicine. 2022.
15. Parinyaprom, N. et al. Outcomes of Direct Pulp Capping by Using Either ProRoot Mineral Trioxide Aggregate or Biodentine™ in Permanent Teeth with Carious Pulp Exposure in 6- to 18-Year-Old Patients: A Randomized Controlled Trial. J. Endod. 44, 341–348. 2018.
16. Guang et al. Clinical observation and histopathological evaluation of pulp after pulpotomy of primary teeth with formocresol and Biodentine. Clinical observation and histopathological evaluation of pulp after pulpotomy of primary teeth with formocresol and Biodentine. CMB. 2022.
17. Internal R&D document RDRADVPAA00DM\_283 - Biodentine™ Bio-Bulk Fill statement. 2022.
18. Koubi et al. Clinical evaluation of the performance and safety of a new dentine substitute, Biodentine™, in the restoration of posterior teeth – a prospective study. Clin Oral Investig. 2013.
19. Medical device vigilance data on 12th of March 2024 incl., 6 488 275 and 108 703 patients exposed to Biodentine™ and Biodentine™ XP.
20. Internal Septodont's document provided from Biodentine Expert Board – 11th September 2023.
21. About I. Biodentine. Properties and Clinical Applications. Springer 2022.
22. AA+ Quanti Research 2019

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