WHY BIOACTIVE BIOCERAMICS (MTA) ARE THE FUTURE

NuSmile NeoPUTTY[®] is a dimensionally stable, resin-free root and pulp treatment material that promotes the formation of hydroxyapatite (HA) to support healing responses.

A simplified view of hydroxyapatite formation is shown below in two stages

1 HYDRATION



NeoPUTTY® (TRI/DI CALCIUM SILICATE CEMENTS) 3CaO • Si O $2CaO \bullet SiO_{2}$

> WATER FROM SURROUNDING TISSUES

> > $H_{2}O$

CEMENT MATRIX AND CALCIUM HYDROXIDE $Ca(OH)_{2}$

Calcium hydroxide provides initial high pH for planktonic antimicrobial effects. The high pH supports the osteogenic response.



2 HYDROXYAPATITE (HA)

CALCIUM HYDROXIDE Ca²⁺ and OH⁻ ions

PHOSPHATE IONS FROM SURROUNDING TISSUES **PO**³⁻

HYDROXYAPATITE (HA) $Ca_{10} (PO_4)_6 (OH)_2$

Calcium phosphate precipitated crystals scattered on the hydrated tricalcium silicate cement surface.

BIOLOGICAL RESPONSE



Bioactive layer of HA supports reparative dentine formation.



When HA coats the surface, it hides the underlying MTA to minimize foreign body reactions and support healing responses of the pulpal or periapical tissue.



▲ Preoperative view of carious #19 with signs and symptoms of advanced pulpal inflammation.





