

Osteostimulation



ZIMMER BIOMET
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The Synthetic Solution to Bone Regeneration

Smart Science™ - Osteostimulation

Unlike other synthetic grafts that are bioinert, NovaBone® Putty belongs to the class of bioactive regenerative materials that not only acts as an osteoconductive scaffold but also interacts with the surrounding tissues and imparts an osteostimulatory effect. Putty is not osteoinductive but a number of in vivo studies have demonstrated that it stimulates accelerated bone formation with Calcium-Phosphosilicate particles. In addition, the viability and proliferation potential of osteoblasts has been shown to be exemplified in the presence of CPS particles. Studies also demonstrate increased osteocalcin and alkaline phosphatase levels in the presence of CPS particles providing a favorable site for bone formation.

Osteostimulation is an active process. NovaBone Putty acts as a matrix and encourages differentiation of additional bone cells at the site. This phenomenon results in faster bone regeneration than exhibited by osteoconduction alone while simultaneously increasing the resorption rate of the graft material.

Evidence-Based Histology

NovaBone Putty bone growing capability has been histologically evaluated in various clinical publications. A representative sample of histology taken from a human patient 4 months post-operatively demonstrates the histological interpretation of the Osteostimulation Principle.

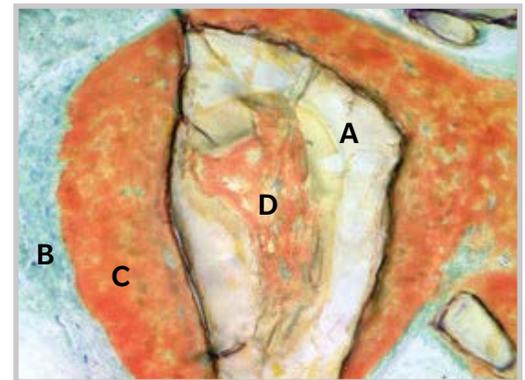
A. CPS Particle

C. Mature Bone with Osteocytes

B. Osteoid Tissue

D. Bone Growth from Within the NovaBone Particle

Note: NovaBone particle is non-porous.



Undecalcified Histology at 4 months (Socket)

Evidence-Based Publications

With over 30 clinical and 50 technical publications in peer reviewed journals, NovaBone Putty has consistently proven to regenerate bone in various osseous defects including ridge augmentations, sinuses, sockets, periodontal defects, etc. Most studies indicate that 80%-90% absorbed in 4-6 months, while regenerating bone at the same time. Putty has also redefined sinus lift techniques with minimally invasive surgical approaches and improvisations utilizing its unique dispensing system. For a comprehensive list, please refer to the product guide booklet.

- 1) A Randomized Blinded Controlled Clinical Study of Particulate Anorganic Bovine Bone Mineral and Calcium Phosphosilicate Putty Bone Substitutes for Socket Preservation. *Kotsakis GA, Salama M, Chrepa V, Hinrichs JE, Gaillard P, Int. J Oral Maxillofacial Implants. Jan-Feb 2014; 29(1):141-51.*
- 2) A simplified approach to the minimally invasive antral membrane elevation technique utilizing a viscoelastic medium for hydraulic sinus floor elevation. *Kotsakis GA, Mazor Z, Int. Oral Maxillofac Surg. 2015 Mar;19(1):97-101.*
- 3) Clinical Evaluation of 262 Osseointegrated Implants Placed in Sites grafted with Calcium Phosphosilicate Putty: A Retrospective Study. *Babbush CA, Kanawati A., J Oral Implantol. 2015 Feb;41(1):63-9.*
- 4) Clinical results of implant placement in resorbed ridges using simultaneous guided bone regeneration: a multicenter case series. *Konstantinidis I, Kumar T, Kher U, Stanitsas PD, Hinrichs JE, Kotsakis GA., Clin Oral Investig. 2015 Mar;19(2):553-9.*
- 5) A clinical and radiographic case series of implants placed with the simplified minimally invasive antral membrane elevation technique in the posterior maxilla. *Kher U, Ioannou AL, Kumar T, Siormpas K, Mitsias ME, Mazor Z, Kotsakis GA, J Craniomaxillofac Surg. 2014 Dec;42(8):1942-7.*
- 6) Data on file with NovaBone Products, LLC: 0413-1-6 Univ. Minnesota Hard Tissue Laboratory Histomorphometric Report.



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