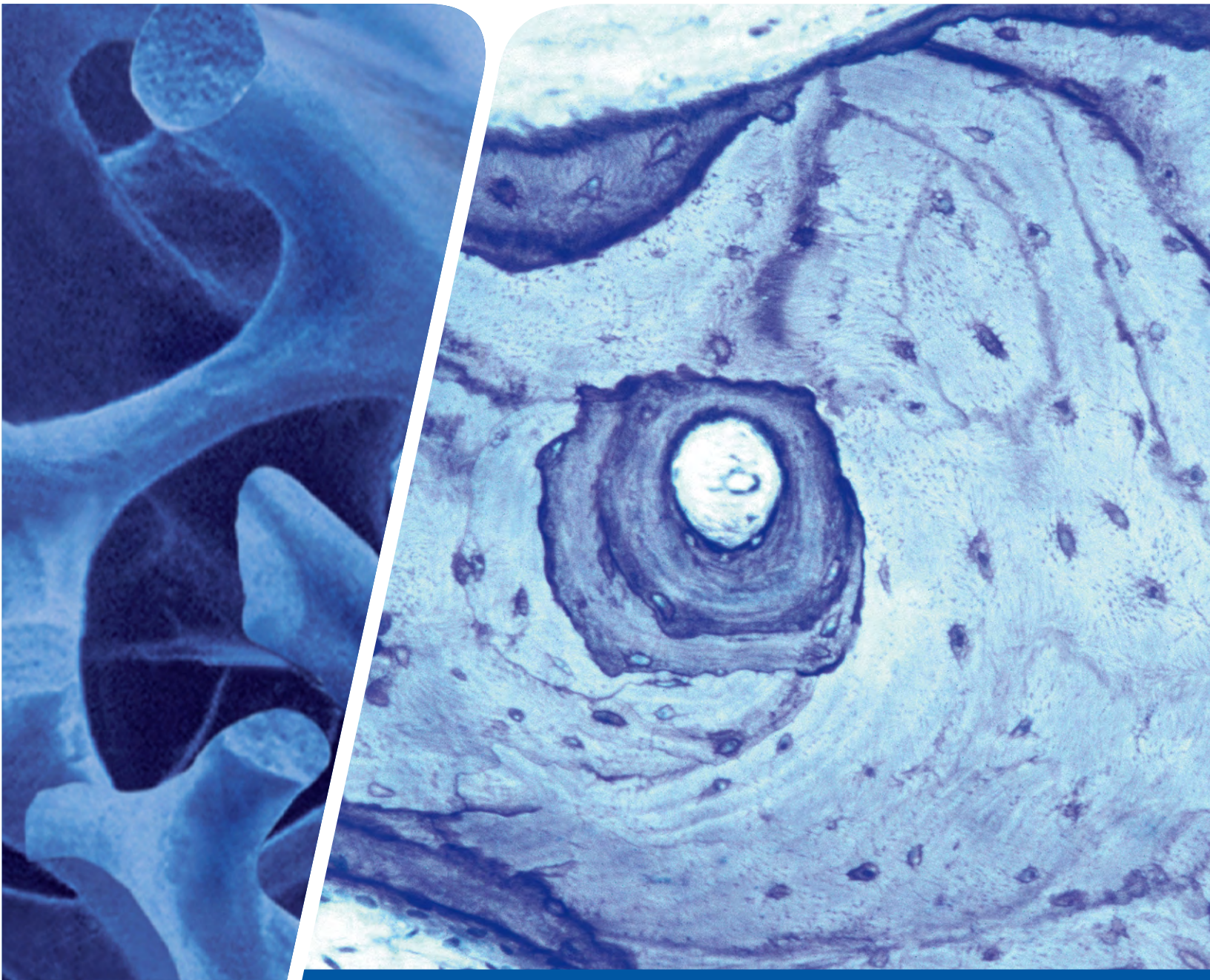
Geistlich
Bio-Oss®

The Essential Choice

With the Benefits of Biologic Predictability



LEADING REGENERATION

Geistlich Bio-Oss®

Documented, Reliable, Experienced

Geistlich Bio-Oss® is the essential choice for your daily regenerative needs. Throughout our long history and dedication to quality, Geistlich Biomaterials have been intentionally designed for each application and engineered to preserve their natural structures. In the production of Geistlich Bio-Oss®, derived from bovine bone, these complex tissues are reduced to their essential form. The native crystaline structure which is highly similar to human bone is preserved through our unique, patented technology.

This ensures that the vital building blocks are present to promote the inital biologic processes of cell adhesion and proliferation. The slow resorbing nature of Geistlich Bio-Oss® is a desirable characteristic providing long term volume preservation and as the body recognizes and accepts these native crystaline structures, the particles become fully integrated into living bone. It is the sum of these characteristics that defines the biofunctionality of Geistlich Bio-Oss® and is the basis for it's long term clinical success.

The similarity of Geistlich Bio-Oss® to human bone



Geistlich Bio-Oss®



Human Bone

Geistlich Bio-Oss®

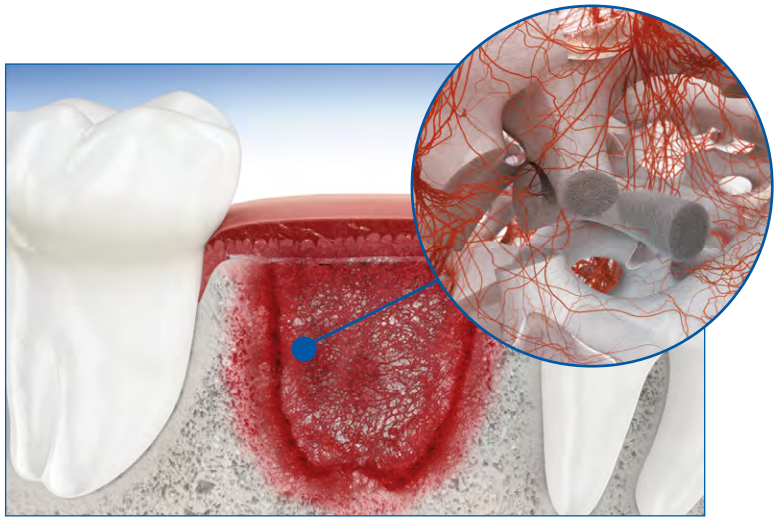
Unique properties = reliability

Geistlich Bio-Oss® continues to build on more than 25 years of clinical success. Geistlich's long-term commitment to evidence and innovation is well-documented in more than 900 publications, making Geistlich Bio-Oss® the most successful bone substitute worldwide.[1,2] Through its unique properties and reliable clinical outcomes, Geistlich Bio-Oss® remains the essential choice among an expanding range of therapeutic areas.

Three Key Factors for Success

Due to its remarkable similarity to human bone, Geistlich Bio-Oss® is readily adapted to the natural modeling and remodeling process. Its **topographic structure** features a unique and highly efficient system of pores[3,4] that supports optimal ingrowth for healthy bone formation. The **hydrophilic properties** of Geistlich Bio-Oss® ensure complete hydration of the biomaterial via the physical phenomenon of capillary action and effective blood clot stabilization.[5] The surface supports the adsorption of proteins enabling efficient adhesion of osteoblasts. Creating this environment for **biological interaction** leads to reliable bone formation.

For specific clinical indications where barrier function is needed, Geistlich Bio-Gide® is a natural companion to Geistlich Bio-Oss®.*



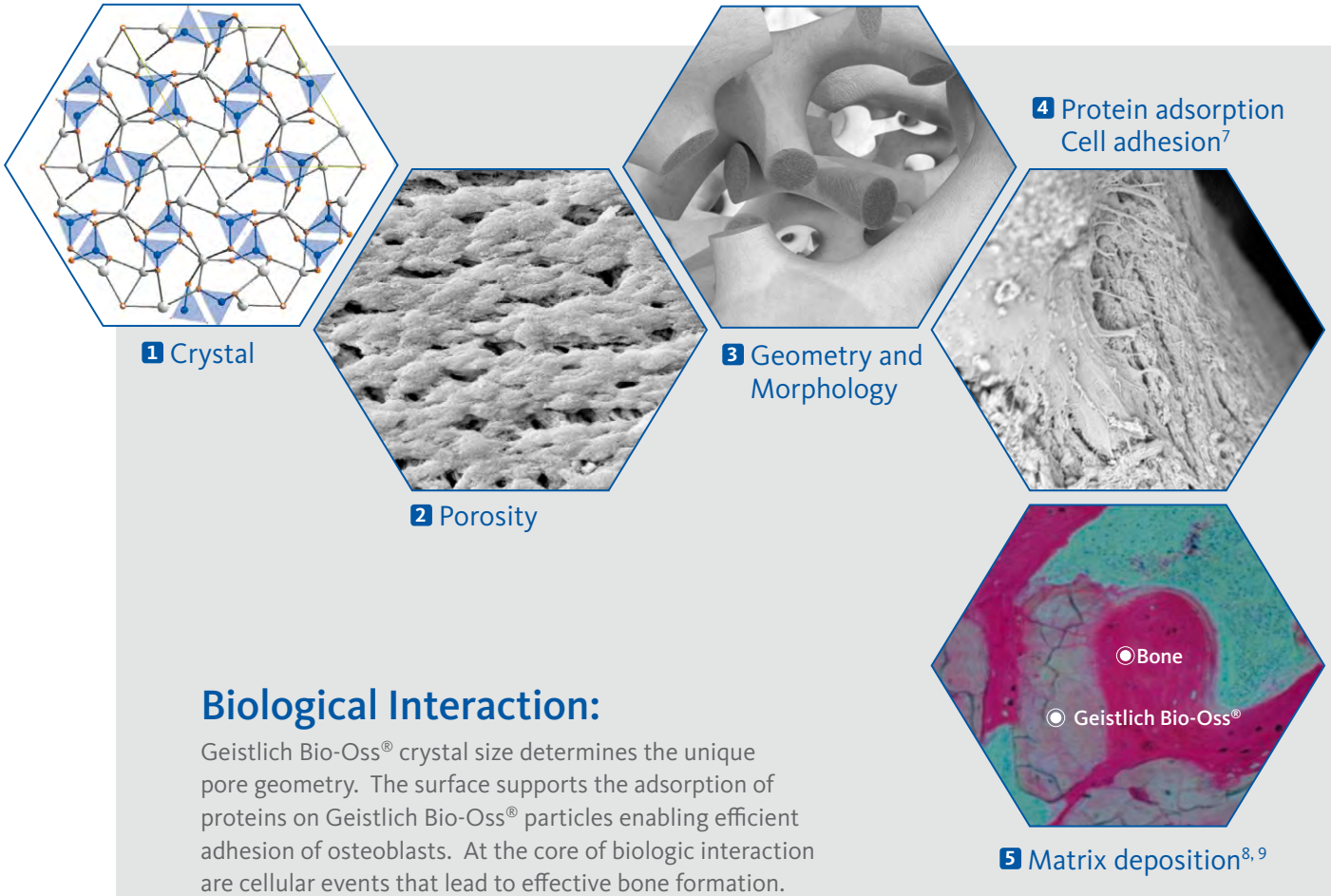
Blood clot stabilization and early vascularization is crucial for good bone formation.[6,7]

* Additional information regarding indications for Geistlich Bio-Oss® and Geistlich Bio-Gide® can be found on the back panel of this brochure.



Biological Interaction

A key factor for biofunctionality

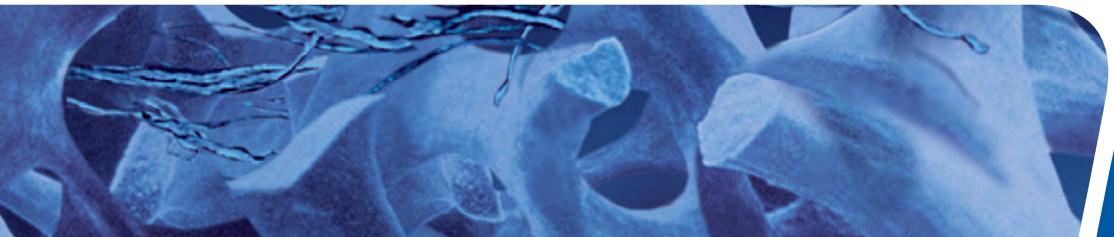


Biological Interaction:

Geistlich Bio-Oss® crystal size determines the unique pore geometry. The surface supports the adsorption of proteins on Geistlich Bio-Oss® particles enabling efficient adhesion of osteoblasts. At the core of biologic interaction are cellular events that lead to effective bone formation.

References:

1 iData Research Inc., US Dental Bone Graft Substitutes and other Biomaterials Market, 2012
2 iData Research Inc., European Dental Bone Graft Substitutes and other Biomaterials Market, 2010
3 Berglundh T, Lindhe J: Clin Oral Implants Res 1997; 8(2): 117–24
4 Cardaropoli G, et al.: J Clin Periodontol 2003; 30(9): 809–18
5 Degidi M, Artese L, Rubini C, Perrotti V, Iezzi G, Piattelli A. Oral Dis. 2006 Sep; 12(5): 469–75
6 Galindo-Moreno P, et al.: Clin. Oral Impl. Res. 21, 2010: 221–227
7 Trubiani O, Fulle S et al. (2010). Eur Cell Mater 20: 72-83
8 Traini T et al., J Periodontol 2007; 78: 955–961
9 Orsini, G, Traini T et al. (2005). J Biomed Mater Res B Appl Biomater 74(1): 448-57
10 Jensen et al. (2012) Clin. Oral Impl. Res. Mar; 23(3): 263-273
11 Aghaloo TL et al., Int Journal of Maxillofac Implants 2007; 22: 49–70
12 Urban et al., Int J Oral Maxillofac Implants 2010; 25: 1203-1212
13 Galindo-Moreno P, et al.: Clin Oral Implants Res. 2013 Jan 28. doi: 10.1111/CLR.12112. [Epub ahead of print]

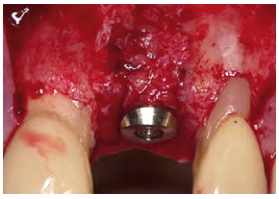


Biofunctionality
A key mechanism for clinical success

Geistlich Bio-Oss®

- Reliable bone formation[10]
- Optimal bone quality[10]
- High implant survival rate[11, 12]

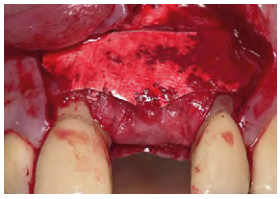
Case Prof. Dr. D. Buser



Defect filled with autogenous bone.



Contour augmentation is achieved with Geistlich Bio-Oss®.



The augmentation material is covered with Geistlich Bio-Gide® applied with a double-layer technique.



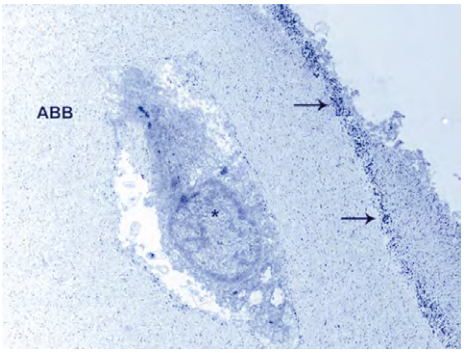
An optimal esthetic outcome and stable tissue height at 5 year follow-up.



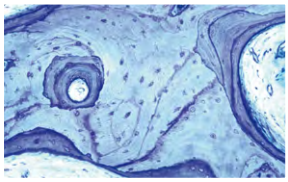
The facial bone wall shows a thickness of 3 mm.

Volume preservation
Time = quality

Due to the unique crystaline structure of Geistlich Bio-Oss®, the body sees it as native bone without eliciting a foreign body reaction. As demonstrated in the histological images to the right, Geistlich Bio-Oss® particles are incorporated over time within living bone which maintains the desired shape and preserves volume.[13] Together with the newly formed bone, it also participates in functional load bearing over time.



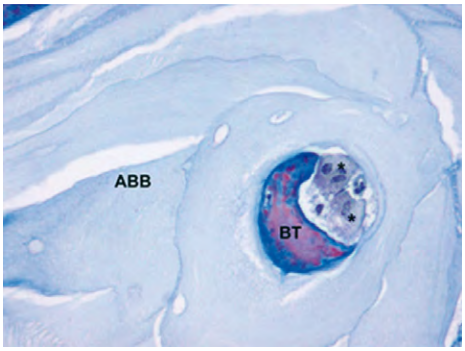
Ultrastructural demonstration of anorganic bovine bone (ABB) osteocyte lacunae colonization by viable cell (*) (TEM x4600). (ABB, ABB particles; arrows, cement line).[13]



On the cover:

Prof. Dr. Georg-Hubertus Nentwig
Co-Director of the Master Oral Implantology (MOI) programme, Goethe-University, Frankfurt

In the cement line between Geistlich Bio-Oss® and neighboring tissue, molecular interactions between Geistlich Bio-Oss® particles and both organic and inorganic constituents of bone can provide a bonding mechanism for maintaining the biomechanical integrity of bone/biomaterial during remodeling, repair, and osseointegration. The most peripheral osteocytic lacunae present in Geistlich Bio-Oss® appear to be filled by osteocytes. Geistlich Bio-Oss® is incorporated and functionally integrated into living bone.



Bone tissue (BT) and osteoclasts cells (*) inside ABB particles (Masson trichrome x400). [13]

Versatility = Treatment Options

Biofunctionality supports the ease of use and makes Geistlich Bio-Oss® the reliable treatment choice in a broad range of indications. Comprehensive long-term studies continue to support the safety and efficacy of Geistlich Bio-Oss® where predictable bone regeneration is the key to clinical success.

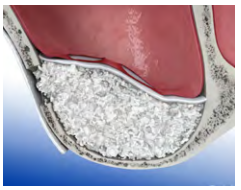
To meet functional and esthetic demands when placing implants, augmentation procedures are necessary in a growing number of indications. Similarly, Geistlich Biomaterials have become the treatment of choice for natural tooth preservation, when both a physical matrix and a barrier may be required to support new bone formation and prevent the downgrowth of soft tissue into the defect. These characteristics have made Geistlich Bio-Oss® and Geistlich Bio-Gide® the essential choice for regenerating bone and periodontal tissues.

The Geistlich Bio-Oss® product family provides a number of solutions to meet your clinical needs and is indicated in the following therapeutic areas:

Extraction Sockets



Sinus Floor Elevation



Periodontal Regeneration



Ridge Augmentation



Peri-Implantitis



The Geistlich Bio-Oss® product family:



Geistlich Bio-Oss®

Small granules (0.25 – 1 mm)

Quantities: 0.25 g, 0.5 g, 2 g, 5 g (1 g ≈ 2 cc)

The small Geistlich Bio-Oss® particles allow close contact with the surrounding bony walls. They are recommended for smaller 1–2 socket defects and for contouring autogenous block grafts.



Geistlich Bio-Oss Collagen®

Geistlich Bio-Oss® (small granules) + 10 % collagen (porcine)

Sizes: 100 mg (0.2–0.3 cc), 250 mg (0.4–0.5 cc), 500 mg (0.8–1.2 cc)

Consists of Geistlich Bio-Oss® cancellous bone granules with the addition of 10% highly purified porcine collagen. The combination offers enhanced handling and ease of application.



Geistlich Bio-Oss®

Large granules (1 – 2 mm)

Quantities: 0.5 g, 2 g (1 g ≈ 3 cc)

The large Geistlich Bio-Oss® granules offer more volume and are ideal for the regeneration of larger defects such as ridge augmentation.



Geistlich Bio-Oss Pen®

Small granules (0.25 – 1 mm)

Quantities: 0.25 g (≈ 0.5 cc), 0.5 g (≈ 1 cc)

Large granules (1 – 2 mm)

Quantities: 0.5 g (1.5 cc)

Geistlich Bio-Oss Pen® features an easy-to-use delivery system that allows for fast and precise application of small or large Geistlich Bio-Oss® granules to the surgical site.

Geistlich
Biomaterials

DOCUMENTED: More than 900 publications
RELIABLE: More than 25 years of clinical experience
EXPERIENCED: 160 years of Geistlich collagen competence



CAUTION: Federal law restricts these devices to sale by or on the order of a dentist or physician.

Indications:
Geistlich Bio-Oss®, Geistlich Bio-Oss Collagen® and Geistlich Bio-Oss Pen® are indicated for the following uses: Augmentation or reconstructive treatment of the alveolar ridge; Filling of periodontal defects; Filling of defects after root resection, apicoectomy, and cystectomy; Filling of extraction sockets to enhance preservation of the alveolar ridge; Elevation of the maxillary sinus floor; Filling of periodontal defects in conjunction with products intended for Guided Tissue Regeneration (GTR) and Guided Bone Regeneration (GBR); and Filling of peri-implant defect in conjunction with products intended for GBR.

Warnings:
Possible complications which may occur with any surgery include swelling at the surgical site, flap sloughing, bleeding, local inflammation, bone loss, infection or pain. As Geistlich Bio-Oss Collagen® contains collagen, in very rare circumstances cases of allergic reactions may occur.

Indications:
Geistlich Bio-Gide® and Geistlich Bio-Gide® Perio are indicated for the following uses: Augmentation around implants placed in immediate and delayed extraction sockets; Localized ridge augmentation for later implantation; Alveolar ridge reconstruction for prosthetic treatment; Filling of bone defects after root resection, cystectomy, removal of retained teeth; GBR in dehiscence defects; and GTR procedures in periodontal defects.

Warnings:
As it is a collagen product, allergic reactions may not be totally excluded. Possible complications which may occur with any surgery include swelling at the surgical site, flap sloughing, bleeding, dehiscence, hematoma, increased sensitivity and pain, bone loss, redness, and local inflammation.

Indications:
Geistlich Mucograft® is indicated for the following uses: Covering of implants placed in immediate or delayed extraction sockets, localized gingival augmentation to increase keratinized tissue (KT) around teeth and implants, alveolar ridge reconstruction for prosthetic treatment, recession defects for root coverage.

Warnings:
As Geistlich Mucograft® is a collagen product allergic reactions may not be totally excluded. Possible complications which may occur with any surgery include swelling at the surgical site, flap sloughing, bleeding dehiscence, hematoma, increased sensitivity and pain, bone loss, redness and local inflammation.

For more information on contraindications, precautions, and directions for use, please refer to the Geistlich Bio-Oss®, Geistlich Bio-Oss Collagen®, Geistlich Bio-Oss Pen®, Geistlich Bio-Gide®, Geistlich Bio-Gide® Perio and Geistlich Mucograft® Instructions for Use at: **www.geistlich-na.com/ifu**

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