

### **Mesh4U**

Custom-made titanium mesh for guided bone regeneration

Mesh4U is a custom-made medical device, manufactured specifically under medical prescription and under the responsibility of the prescriber, with specific design features intended for use exclusively in a particular patient. Mesh4U should only be used by a qualified clinician with thorough knowledge and mastery of the specific surgical techniques of guided bone regeneration procedures. Before using a BoneEasy (Resdevmed Lda.) branded product, the responsible surgeon/physician should carefully review all information provided by the manufacturer, including indications, contraindications, warnings, instructions and other relevant information. Detailed instructions other than those contained herein may be obtained by contacting the manufacturer or its representative.

Mesh4U should be used at the discretion of the clinician, who has an obligation to determine if the product is suitable for the patient and to evaluate all relevant circumstances. The clinician is responsible for any direct and/or indirect complications or detrimental situations that may result from erroneous indication or surgical technique, misuse of material, overload, lack of asepsis, or failure to follow explicit safety instructions in the instructions for use. The manufacturer or representative of Resdevmed Lda. cannot be held responsible for complications associated with use by the physician as described above or to the patient, including the patient's anatomy and general habits. Resdevmed Lda. disclaims any liability, express or implied. It is also the surgeon/doctor's responsibility to adequately inform the patient about the function and necessary care, as well as the known risks associated with the product.

### **Description**

Mesh4U is a custom-made metallic barrier mesh made of grade 5 titanium (Ti6Al4V). It is developed

based on files from computed tomography, using computer aided design and segmentation software, and manufactured by laser sintering (SLM Selective Laser Melting).

Mesh4U must be stabilized with cap screws not included with this device.

### **Indications**

Mesh4U is a long-term implantable medical device suitable for guided bone regeneration surgical procedures.

### **Contraindications**

The clinician should be careful in selecting the patients indicated for guided bone regeneration procedures, in selecting the most appropriate postoperative treatments and should also be critical during the Mesh4U design process. Mesh4U is not designed to handle high loads. For this reason the load on the individualized mesh should be zero, with removable prostheses resting on the tissues that cover it to avoid its collapse and not to compromise the healing process. Mesh4U can be designed with pillars for provisionalization, for aesthetic use only and not for loading. This medical device was not designed for joints (eg, mandibular temporal joint reconstruction). The long-term effectiveness and safety of combining Mesh4U with bone fillers is not yet established, so when performed in combination, the clinician should follow individual material indications.

The following should not be subjected to bone regeneration procedures: patients with poor oral health, deficient oral hygiene, or who have previously undergone organ transplants, patients with cardiovascular disease, hypertension, thyroid or parathyroid disease, malignant tumors detected within 5 years prior to intervention or nodular augmentation.

Not subject to intervention: mentally unstable patients who abuse alcohol or drugs, tobacco, with poor motivation or insufficient cooperation, patients on anticoagulant, anticonvulsant, immunosuppressive therapies, with inflammatory and/or infectious active processes of the oral cavity,

in patients with abnormal creatinine and BUN values.

The following pathophysiological problems may increase the risks of the procedure: cardiovascular failure, coronary disorders, arrhythmia, chronic pulmonary or respiratory diseases, gastrointestinal disorders, hepatitis, intestinal inflammation, chronic renal failure and urinary system disorders, endocrine disorders, haematological problems, anemia, leukemia, clotting problems, osteoporosis or musculoskeletal arthritis, stroke, neurological disorders, mental retardation or paralysis. Chemotherapy reduces or nullifies bone regeneration capacity, so patients undergoing such treatments should be carefully evaluated prior to intervention.

In case of bisphosphonate administration (especially orally and intravenously), cases of osteonecrosis have been reported in oral surgeries. The presence of periodontal disease may lead to diffuse infections at the treated site level, and patients with periodontal syndromes must be previously treated and recovered. Contraindications also include: titanium allergy, chronic acute infectious diseases, chronic subacute maxillary osteitis, systemic diseases, endocrine disorders, pregnancy, lactation, renal failure, fibrous dysplasia, hemophilia, neutropenia, steroid use and diabetic disease. Other normal contraindications common to all oral surgery interventions should also be considered.

### **Warnings**

Inadequate surgical techniques can result in bone loss, harm to the patient, pain, and partial or complete medical device failure.

Steroid or anticoagulant treatments may affect the surgical site and impact the patient's ability to integrate.

Long-term exposure or use of bisphosphonate-based drugs, especially with chemotherapy, may have a negative impact on implant functionality. A detailed study of the patient's history, including consultation with the

attending physician, is recommended before opting for any solution available at Resdevmed Lda.

The clinical condition of all patients should be continuously monitored and, if necessary, the medical device removed.

Mesh4U should not be used in conjunction with stable endosseous implants.

When combining Mesh4U with any type of bone defect replacement, all indications for each material should be considered individually.

Due to the conductivity of the metal, electrosurgery can result in tissue damage, patient injury and implant failure and should be used with caution.

See also Contraindications.

### **Precautions**

Proper case planning is crucial for the long-term success of the medical device.

During surgery aseptic rules must be respected. Direct handling of the medical device should be avoided.

Mesh4U should not be used under load situations.

Mesh4U is a custom-made medical device for a particular patient, so it should not be used on a patient other than the one for whom it is manufactured.

Mesh4U is designed for single use only. It must not be reused, reprocessed or resterilized. Failure to follow these instructions can compromise the structural integrity of the device and/or lead to device failure, with consequent patient damage.

The clinical situation of the patient should be carefully monitored.

Do not use the medical device if its original packaging is open, damaged or showing signs of deterioration.

See also Contraindications.

### **Recommendations**

An oral hygiene plan should be prescribed by the clinician, which may include mechanical and chemical control of plaque and instructions for brushing and flossing.

Antibiotic therapy is recommended at the discretion of the clinician.

During the first week, at least one visit is recommended for patient monitoring and prophylaxis.

X-rays may be taken after surgery to assess tissue and medical device status, unless complications from implantation require early screening.

Medical device removal should be considered in case of exposure, complications that cannot be controlled by standard postoperative treatments, tissue inflammation or evidence of infection, but always at the discretion of the clinician.

**Possible adverse effects**

Complications that may occur from the use of this medical device include (but are not limited to): pain, discomfort, edema, bruising, inflammation, thermal sensitivity, infection, exfoliation, perforation or abscess formation, hyperplasia, gingival irregularities, complications associated with anesthesia, mechanical failure of the medical device or exposure. Other adverse effects may also occur as a result of iatrogenic factors or patient response.

Removal of the mesh should be considered whenever the site where it is placed shows signs of compromise in such a way that it cannot be controlled by postoperative treatments.

Report to the manufacturer any adverse events recorded and not shown in this document.

**Technical information**

Mesh4U is an implantable medical device that requires proper planning.

The following considerations are proposed by Resdevmed Lda. However, it is important to remember that Mesh4U implantation should only be performed by qualified clinicians, with thorough knowledge of the specific surgical techniques of guided bone regeneration procedures.

For Mesh4U placement during surgery:

- 1.Keep the sterile field throughout the procedure.
- 2.Minimize saliva or any other source of contamination to material and surgical site.
- 3.Gently open the outer blister and remove the inner blister containing the sterile Mesh4U into the

sterile field. Carefully remove the medical device from the internal blister.

4.Place the medical device in the area to be treated.

5.The stability of the medical device is ensured by fixing with suitable screws.

6. To aid in the regenerative process, the medical device should be combined with bone substitutes and covered with a resorbable membrane .

Removal of the medical device is the clinician's discretion: depending on the type of application, different time windows may be recommended for removal of implanted materials: three to nine months or until bone regeneration is complete to place the implants; four to twelve weeks for transgingival healing.

**Sterilization**

Mesh4U is sterilized by ethylene oxide. The packaging will serve as a sterilization barrier until the expiration date indicated on the box. This medical device is designed for single use only and should not be resterilized.

**Single use**

Mesh4U should not be reused. Reuse of a single use medical device that has been in contact with blood, bone, tissues, body fluids or other contaminants may lead to damage to the user. Possible risks associated with reusing a single use device include, but are not limited to, mechanical failure and transmission of infectious agents. Mesh4U is a custom-made medical device for a particular patient, so it should not be used on a patient other than the one on which it is manufactured.

**Packaging**

Mesh4U has been cleaned and packed in a controlled environment. It is supplied in multiple packaging. The outer label contains information about the batch number that should be recorded on the patient's clinical record to ensure complete traceability of the product. The manufacturer provides extra labels, available on the package,

which can be placed on the medical record for the same purpose. One of the extra labels provided must be given to the patient.

**Storage**

Mesh4U should be stored at room temperature and protected from external damage.

**Patient Information**











It is the surgeon/physician's responsibility to adequately inform the patient of the necessary function and care as well as the known risks associated with the product.

**Made in Portugal by:**

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**Information on symbology used:**

	Batch code
	Use by
	Do not reuse
	Manufacturer
	Sterilized using ethilene oxide
	Date of Manufacture
	Caution
	Do not resterilize
	Do not use if package is damaged
	The law restricts the sale of this device to a doctor or under his demand