

Augment® Bone Graft

Medical Device Patient Label

Please read this entire document carefully. Keep this document. You may want to read it again. If you have further questions, please ask your doctor. Only your doctor can determine whether Augment® Bone Graft is appropriate for you.

SURGICAL TECHNIQUE GUIDE FOR AUGMENT® BONE GRAFT

KIT COMPONENTS

Augment® Bone Graft is supplied as a two component kit. Augment Bone Graft is configured into 1.5 cc, 3cc, 6cc or 9cc kits,

Each kit consists of:

- A cup containing β -TCP particulate; and,
- A vial (or vials) containing solution of 0.3 mg/ml rhPDGF- $\beta\beta$ (becaplermin) in sodium acetate buffer.



Augment® Bone Graft kit

NOTE: Preparation of this mixture should be done at least 10 minutes ***before*** implantation in the joint space(s) because it requires this time period to saturate. ***Please plan accordingly.***

STERILITY

- The contents within each kit are supplied sterile and are **for single use only**
- The contents of the kit are sterile until the expiration date printed on the package and must be used before this date
- The sterile β -TCP cup is contained within a sterile tray
- The rhPDGF- $\beta\beta$ vial is contained in a sterile tray
- Both the sterile β -TCP cup and the rhPDGF- $\beta\beta$ vial(s) can be handled in the sterile field
- Augment® Bone Graft cannot be reused, and components of Augment® Bone Graft must not be re-sterilized by any method

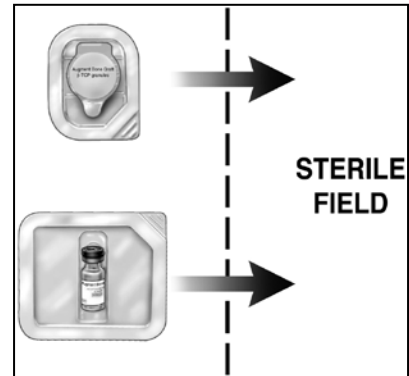
PREPARATION NOTES

- Familiarization with the device and its handling properties, proper sterile surgical grafting techniques, and thorough surgical preparation of the host bone surfaces and all associated bony defects are extremely important when using Augment® Bone Graft.

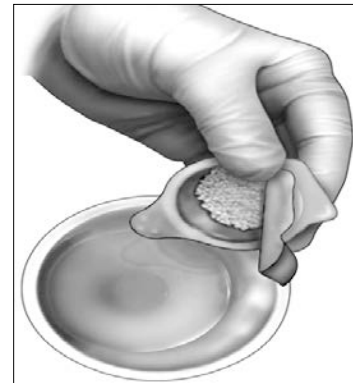
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AUGMENT® BONE GRAFT PREPARATION

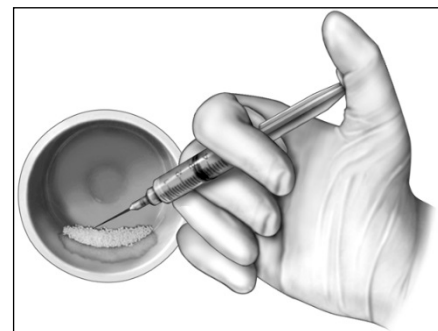
1. Using sterile technique, transfer both the cup (containing the β -TCP granules) as well as the vial(s) (containing the rhPDGF- $\beta\beta$ solution) to the sterile field.



2. First open the cup and transfer the β -TCP granules to a separately available sterile surgical bowl.

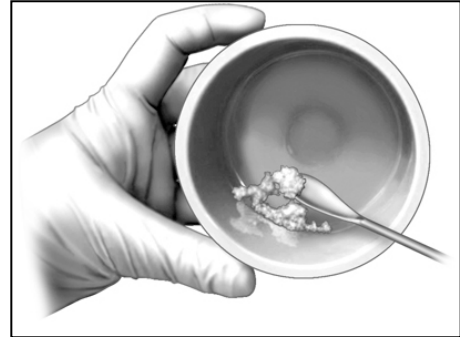


3. Then using a syringe and needle, draw up the liquid contents of the vial(s) in its entirety (the rhPDGF- $\beta\beta$ solution). Transfer all of the fluid to the surgical bowl containing the β -TCP granules.



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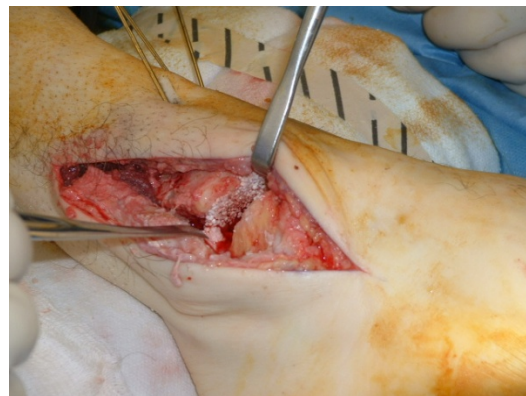
4. Using a spatula, curette, or similar instrument, gently stir these two components together for approximately 30 seconds to ensure a homogeneous mixture. This mixture should, at that point, have the consistency of wet sand.



5. The rhPDGF- $\beta\beta$ saturated graft mixture should be left undisturbed for 10 minutes before being implanted to ensure optimal saturation of the β -TCP particles. Ensure that the entire volume of both components is combined. The product should be implanted within one (1) hour of mixing the two components.

6. Immediately prior to implantation, the entire contents should be mixed briefly again to ensure complete saturation of the β -TCP particles.

7. **IMPORTANT:** Augment® Bone Graft should be implanted on already prepared host bone surfaces., being careful not to overstuff the joint space(s). This material should be inserted amongst all peri-articular defects (both pre-existent and surgically created). This will maximize bony apposition but not impede direct host bone to host bone apposition.



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8. Note: Any rhPDGF- $\beta\beta$ liquid remaining in the bowl after implantation of a sufficient amount of Augment® Bone Graft may then be drawn up and used to hydrate the already implanted Augment® Bone Graft dispersed throughout the fusion site.

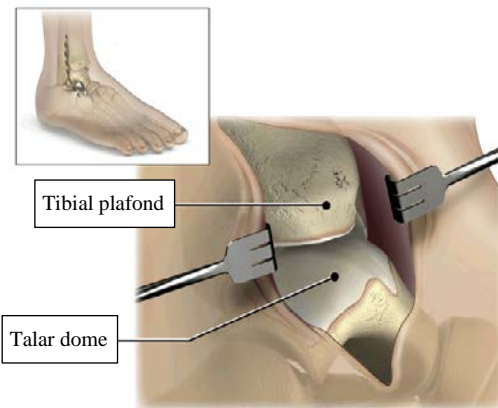


RECOMMENDED SURGICAL TECHNIQUE

NOTE: Always complete proper surgical preparation of all host articular surfaces prior to implanting any graft material to these sites.

Preparation of the Joint

1. In standard fashion for arthrodesis surgery, debride and denude all articular surfaces by exposing viable host bone and decorticating these surfaces. This will maximize an osseous healing response. Following exposure of the joint(s), all remaining cartilage should be removed. The opposing bony surfaces should be adequately prepared to optimize the osseous healing response and allow apposition of healthy, vascularized bone.

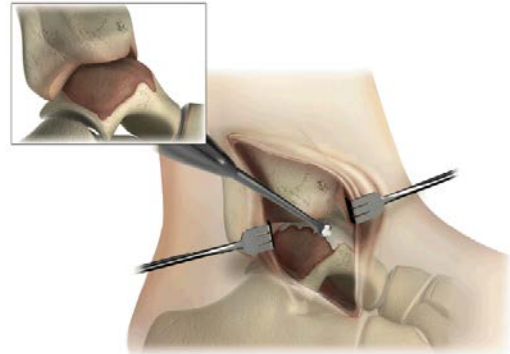


Preparation of the Bone Interface

2. Debridement

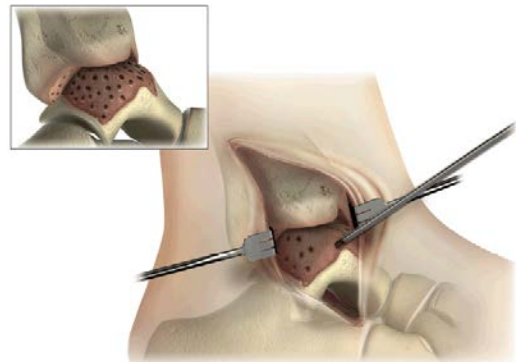
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Debridement should be performed by feathering and/or perforating the subchondral plate of all exposed articular surfaces. This can be accomplished by using any standard technique and preferred combination of curettes, burrs, drill bits, and/or osteotomes as a means of maximizing the surface area of exposed bleeding bone (see below 2a and b).



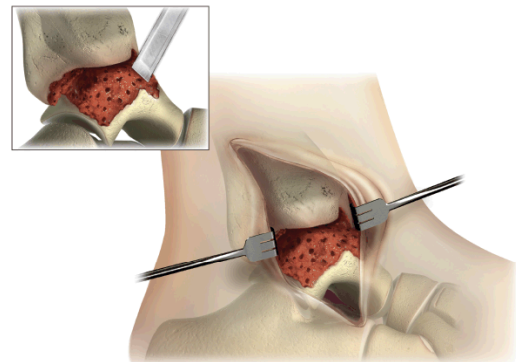
2A. Perforation

Some surgeons may prefer to perforate the cortical bone with drilling prior to placement of the Augment® Bone Graft material. Drilling of the bone surface helps to create a bleeding bone environment to promote fusion.



2B. Feathering

Alternatively, other surgeons may choose to create subchondral exposure by using a burr, osteotome and/or curette to roughen and “feather” the joint surface to maximize the surface area of bleeding bone. **It does not matter which method is chosen (2A or 2B), as long as one of these two joint preparation techniques is employed subsequent to denuding all remaining joint cartilage and prior to implantation of any Augment® Bone Graft.**

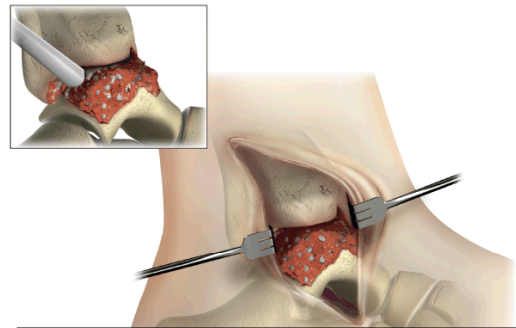


Tip: In more severe deformities, portions of the talar head may need to be resected to reduce the deformity and create a good bone-on-bone interface.

Application of the Graft to the Implant Site

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3. Irrigate and then remove all fluid from the surgical site one final time after joint preparation is complete and immediately prior to Augment Bone Graft implantation.
4. Assess the fusion site. Determine where all the bony defects (e.g., subchondral voids and surface irregularities) are which will need to be filled with Augment® Bone Graft.
5. Manually pack Augment® Bone Graft *into, not* around, all these bony defects throughout the joint(s). Be sure to place Augment® Bone Graft wherever there is not direct host bone to host bone apposition.
6. Care should be taken to ensure that all Augment® Bone Graft material is contained within the perimeter of these bony defects and that the graft remains saturated during the surgical procedure.
7. Overfilling or “overstuffing” of the joint space with this material is unnecessary, and should be avoided, particularly to the extent that direct host bone to host bone apposition is prevented. In order to achieve adequate closure and containment of the material, however, it is imperative that the material be contained with a meticulous soft tissue and capsular closure. This will keep the



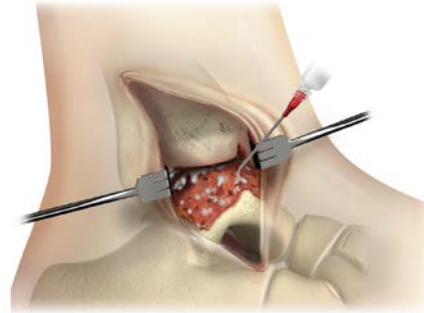
Remember: It is important to ensure that all bony defects are grafted. Adequate graft fill is needed to optimize results with any grafting material.

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material from the surrounding soft tissue, in order to achieve appropriate containment within the desired peri-articular site.

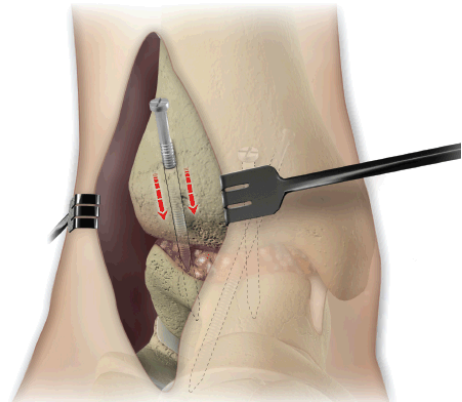
Hydration of Implant Site

8. Hydrate the implant site with any remaining rhPDGF- $\beta\beta$ solution, if desired.



Fixation of the Joint

9. Reduce the joint and apply rigid fixation.
10. Following satisfactory joint reduction and hardware fixation of the arthrodesis site(s), any remaining (unused) Augment® Bone Graft should be packed around the external perimeter of the treated joint(s).



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Closure of the Site

11. Following reduction and fixation, perform a carefully layered periosteal and capsular closure with the overlying soft tissues to enclose and contain all graft material in its intended joint spaces(s). Employ standard surgical technique to complete any remaining portion of the procedure.

12. Apply the self-adhesive labels that indicate the lot number of each device to the patient's permanent records and discard any remaining Augment® Bone Graft.



Please see the package insert for more information on Augment® Bone Graft's indications, contraindications, warnings, and precautions.

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Glossary of Terms

Abbreviation	Expanded Term	Definition
-	Bone graft	Bone removed from one location in a person's body and then placed in another location in the body of the same person. This bone is usually taken from the leg or hip during your surgery.
	Ceramic	A nonmetallic, high strength material that is brittle
FDA	Food and Drug Administration	Part of the United States government. The FDA makes rules for companies that protect the patients who need medicine or medical implants. The FDA also helps decide when and how medical products can be used.
	Sterile	Free from bacteria or other microorganisms and their spores.
	Metabolic	Energy consumption by the body
	Endocrine	Organs that produce hormone
	Physical Therapist	A person that helps you perform exercises, or forms of practice or exertion, designed to train, develop, condition, or the like
rhPDGF-BB	Recombinant Human Platelet-Derived Growth Factor – BB	Also referred to by its drug name of becaplermin, rhPDGF-BB is a man-made protein form of Platelet-Derived Growth Factor (PDGF) as described below.
	allograft	Bone from a donor
PDGF	Platelet-Derived Growth Factor	PDGF is part of blood platelets and is released from platelets at sites of injury. PDGF is also in normal bone and is released by the body when a bone breaks to help healing.
-	Yeast cells	Cells produced from yeast that are used in the making of rhPDGF-BB.
-	Antibody	Antibodies are produced by the body's immune system when it detects something that should not be there. Antibodies are also produced when the immune system mistakenly considers healthy tissue to be foreign tissue.
-	Neutralizing antibody	Antibodies that are produced by the body's immune system when it detects something that would interfere with a normal body process.

Introduction:

Augment® Bone Graft was shown to be at least as good as the way of collecting bone from other places in your body (bone graft) for improving your pain and movement during your daily activity after having surgery to join your bones together. Bone graft is considered as the most accepted way to heal your bones together (arthrodesis). In a clinical study, Augment® Bone Graft and bone graft subjects were equally good in improving pain and movement. Augment® Bone Graft subjects benefited by not having to have a second surgery to collect bone.

Purpose of the device:



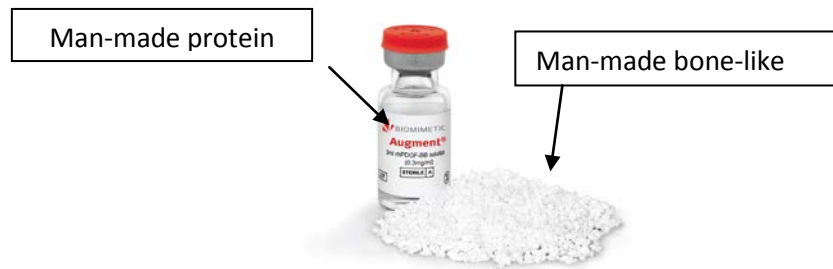
Augment ® Bone Graft is to be used in place of bone graft (bone taken from another area in your body) in ankle and foot surgeries that would otherwise need bone graft.

Description of the device:

Augment® Bone Graft is a man-made bone graft that is made up of two parts . One part is a substance called beta- Tricalcium Phosphate (β -TCP), and the other is a man-binant human platelet-derived growth factor (rhPDGF-BB).



used for many years to help repair bones that are located in the limbs , by providing a framework for bone cells to grow on. As bone grows, the replaced by the new bone.



The second part, rhPDGF-BB, is a man-made protein (growth factor) found naturally within blood cells. When the body is injured, rhPDGF-BB (proteins) are released from the blood cells as part of the natural healing process. The rhPDGF-BB used in Augment® Bone Graft works in the same way as the PDGF in the body by attracting and helping cells to repair and grow new bone.

The two parts of Augment should be mixed together in the operating room before being gently packed into a bony defect in patients who have ankle and foot surgery to relieve pain and improve movement. This product will do away with the need to have more surgery to take bone graft from some other place in the body. After Augment® Bone Graft is placed in the bony defect, the bones will be held together with fixation devices (e.g. screws, pins, staples and/or wires) while it heals. Augment Bone Graft does not replace the need for fixation devices needed to hold the bones together

Potential Benefits

- Augment® Bone Graft was shown to be at least as good as the way of collecting bone from other places in your body (bone graft) for improving your pain and movement during your daily activity after having surgery to join your bones together.
- In addition to relieving pain and improving movement during your daily activity, there is a benefit that you will not have to have a second surgery to get small amounts of bone from other areas of your body. Without this added surgery you will not have the risk that is associated with a secondary surgery.

When the device should not be used:

Augment® Bone Graft should not be used if you:

- have a known sensitivity to any of the parts of the product or are allergic to products that are made from yeast
- have cancer that is active

- are less than 18 years of age or if your doctor believes that you are still growing
- are pregnant or likely to become pregnant in the next year. The effects that rhPDGF-BB can have on the unborn child have not been studied .
- have an active infection of the foot or ankle where you will have surgery
- the surgeon cannot get soft tissue to cover your wound have a metabolic^{G3} disease known to damage the bones(e.g. kidney or calcium diseases), other than osteoporosis or diabetes
- require a structural^{G4} support graft. Augment does not provide structural support to the bony defect.

Warnings:

- There is a chance that your bone will not heal in order to relieve your pain and improve your movement during daily activity.
- If you have any allergies, especially to products that are grown from yeast then you should ask your doctor to determine if this product is right for you. It is also possible that an allergic reaction such as a rash could happen after receiving Augment[®] Bone Graft.
- Women trying to get pregnant should be advised that the safety of Augment[®] Bone Graft and its impact on an unborn child has not been studied.
- The safety and effectiveness of Augment[®] Bone Graft in nursing mothers has not been studied. It is not known if the rhPDGF-BB protein can be present human milk. Women who want to get pregnant should be advised to not become pregnant for one year following treatment with Augment[®] Bone Graft.
- The safety and effectiveness of Augment[®] Bone Graft has not been studied in other locations in your body other than the foot or ankle.
- Augment[®] Bone Graft must be used with bone screws, pins, staples and/or wires to fix the bones together for healing.
- The ceramic part of the Augment[®] Bone graft may prevent your doctor from evaluating the bones of foot or ankle on x rays.

Precautions:

- The need for very small amounts of bone graft should be left to the judgment of the doctor.
- The safety and effectiveness of repeatedly using Augment® Bone Graft has not been studied.
- Other options should be discussed with your doctor before having a surgery requiring bone graft.
- If you have severe endocrine-induced^{G5} bone diseases; or are receiving therapy that suppresses your immune system; or have a known conditions that may lead to problems with bleeding you should discuss these conditions with your surgeon.
- The safety and effectiveness of Augment® Bone Graft in patient below the age of 18 years has not been studied.
- One of the parts of Augment® Bone Graft, is the active part in another product. This other product is used to treat diabetic ulcers. At a higher dose and with repeated use of this product there were a larger number of deaths for patient who had pre-existing cancers. However, for the clinical study of Augment® Bone Graft, there was no difference in the number of deaths from cancer as compared to bone graft.

Risks:

Risks associated with any surgery include:

- Problems with skin wound healing, including pain
- Infection
- Problems with the heart or blood movement (circulation). This could include: loss of blood, a reaction to a blood transfusion, or problems with blood forming into clumps (clotting)
- A reaction to the drugs used to put you asleep during surgery (anesthesia)
- Problems with the stomach and intestines (gastrointestinal)
- Problems with the urinary or genital systems (urogenital)
- Problems breathing (respiratory). Respiratory problems could include: lung infection (pneumonia), lung collapsing (atelectasis), or swelling in the neck (edema)
- In rare situations, heart attack, stroke, or death

Risks associated with foot and ankle arthrodesis include:

- Incomplete or lack of bone healing leading to failure of the surgery
- Pain following the surgery
- Surgery may not reduce your pain

- Pain and discomfort associated with the materials used in the surgery
- Allergic reaction to the metal in the bone screws, pins, staples, or wires
- Healing time after surgery is longer than that after other treatment methods
- Your foot and/or ankle symptoms may change or get worse, and you may need another surgery

Clinical Information

In a clinical study, 434 subjects were enrolled and a total of 414 subjects had surgery. Of these, 397 were treated per study requirements. The control group for the clinical study was bone graft. Analysis of patient information showed no differences between the study and control groups. Because the radiographic review was inconclusive, effectiveness of Augment[®] Bone Graft was evaluated using clinical and functional, outcome measures as an assessment of individual subject success. The clinical trial data indicate that, at 24 and 52 weeks after surgery, Augment[®] Bone Graft is at least as effective as the bone graft control treatment, for the patient population and indications studied in terms of the individual patient success for clinical and functional outcomes without the pain and morbidity resulting from harvesting bone graft.

Description of Adverse Effects

In the clinical study for this product, patients reported problems to their doctors. Most of these problems were temporary. Common problems were reported for both groups. These events included back pain, blistered skin, decreased feeling, allergic reaction, not being able to sleep, itchy skin, pain in foot or ankle, and rash.

Please ask your doctor for any risks related to your planned surgery.

Expectations of the device and the procedure associated with the device:

Your doctor will decide if problems that you are having with your ankle and foot would benefit from a bone graft. If so a surgery will be scheduled. Before surgery, a local or general anesthetic^{G6} will be given. During surgery, the bone(s) in the foot will be prepared to receive bone graft by removing small pieces of bone, cartilage, and/or smoothing the bone surface. Once the bone has been prepared, the fixation devices (screws, pins, staples and/or wires) will be used to stabilize the bones. Augment[®] Bone Graft will be used in place of your own bone to fill in the remaining small holes or spaces between your bones. The wound from surgery will be closed with sutures or staples. The only difference between this and the surgery with bone graft is the replacement of Augment[®] Bone Graft for your own bone.

After surgery:

Ask your doctor about your specific plans that will help you recover from surgery. It is important to follow your doctor's instructions carefully. In general, a short leg cast

or boot may be placed on the foot that has undergone the surgery. The amount of weight placed on the treated foot will be limited and may require the use of crutches and walkers. Physical therapy may also be required. Increased weight-bearing may be allowed after six weeks or when allowed by your doctor. You may need the help of a physical therapist^{G7} to help you walk smoothly and without limping during your recovery. It is important to follow all instructions after surgery in order to decrease the chance that a complication may occur. Your doctor will schedule visits to check on your progress. It is common following surgery like this to have pain, swelling, redness, tenderness, and difficulty walking or other activities that require weight to be placed on the treated foot/ankle. However, you should contact your doctor immediately if you have too much pain, are sick to your stomach and vomit, or have a fever, redness or rash, itching tenderness or swelling of the foot.

Alternative Procedures

Other treatment options may include:

- Bone graft materials that do not involve another surgery. Examples of these are other man-made products, bone from a dead person (allograft), blood or bone marrow
- Use of metal screws, plates, staples, or wires in your foot/ankle without bone graft
- Using another device called a total ankle replacement (for some ankle fusion candidates)

Your doctor will have more information on each of these options and other possible treatments, as well as the benefits and risks for each of the treatment options.

When to Call the Doctor

IMMEDIATELY contact your doctor if you:

- Have too much pain
- Are sick to your stomach or vomiting
- Have a fever
- Have redness or a rash
- Have itching, tenderness or swelling of your foot

Manufacturer Contact Information:

Augment[®] Bone Graft is manufactured by BioMimetic Therapeutics, LLC. Additional information on this product can be found on the website at www.biomimetics.com or via phone at (615)-844-1280.

BioMimetic Therapeutics, LLC
389 Nichol Mill Lane
Franklin, TN 37067
USA