PRODUCT DESCRIPTION

The *BioIntegral* ***No-React®*** Versaflex, Model **NRV** is a composite of three porcine aortic valves, which have been preserved by a low-pressure glutaraldehyde fixation process. The non-coronary leaflets from each of three aldehyde fixed porcine aortic heart valves are dissected, matched and sutured together. The resulting composite semi-stented valve has an optimum orifice area due to the absence of the muscular (septal) shelf found on the right coronary leaflet of the natural porcine aortic valve. In addition, the composite trileaflet valve is covered with porcine pericardium. The Model **NRV** has a flexible ring between the valve and the pericardium. Extensive research has shown that the addition of a very soft ring with 3 short prongs gives the valve a "skeleton" which makes the implantation very simple, yet the valve retains all the hemodynamic advantages of stentless valves. The presence of the flexible ring allows the valve to be used in the aortic position, using a regular base annulus and an additional suturing of the flanges.

MODELS AND SIZES

The BioIntegral ***No-React®*** Versaflex, Model **NRV** is available for replacement of the aortic valve in the following sizes: 21mm, 23mm, 25mm, and 27mm. Since the valve can be oversized by one size, size 19mm is not needed.

We strongly recommend to oversize by one size in each implantation. A BioIntegral sizer must be used.

PACKAGING AND STORAGE

PACKAGING

The device is supplied STERILE in a 2% Benzyl alcohol solution. The valve and the storage solution are sterile as long as the container has not been damaged and the shrink seal is intact. The outside of the container is not sterile and should not be placed in the sterile field.

STORAGE

The device must be stored in its package at a temperature between 5 and 25 degrees Celsius. Refrigeration is not required and freezing may damage the device. Room temperature storage is satisfactory (up to 25 degrees C), provided the device is not exposed to sunlight. The device package is supplied with a freeze indicator that should be inspected prior to use of the device. If the device is exposed to freeze/thaw conditions, coloured ink will spread throughout the indicator. Do not use the device if the indicator has been activated. If it is necessary to store the device under refrigeration, include the freeze indicator with the device package and inspect upon removal for assurance that the device was not exposed to freezing conditions.

INDICATIONS

The BioIntegral No-React® Versaflex, Model **NRV** is indicated as replacement for a damaged or diseased aortic heart valves. Glutaraldehyde fixed porcine xenografts are indicated when the physician wishes to use a prosthetic valve with low noise annoyance, satisfactory hemodynamic function without significant hemolysis, a lower incidence of thromboembolism, and which does not require long-term anticoagulant therapy. Since the valve is detoxified with the *No-React®* treatment, it is expected that the valve will calcify at a lower rate than conventionally glutaraldehyde treated valves.

CONTRAINDICATIONS

The BioIntegral *No-React®* Versaflex Model **NRV** is contraindicated for use in patients undergoing chronic hemodialysis due to a high incidence of calcification within this group of patients.

WARNINGS AND PRECAUTIONS

THIS DEVICE IS FOR SINGLE USE ONLY.

DO NOT RESTERILIZE THE VALVE BY ANY METHOD.

DO NOT USE IF:

- The device has been frozen or is suspected of being frozen.
- There has been damage to the glass container and jar, and/or the jar cap shrink seal is not intact.
- The storage solution does not completely cover the bioprostheses, or the device has dried.

ANITIBIOTICS: the valve should not be exposed to antibiotics prior to implant.

DO NOT EXPOSE TO ANY SOLUTION except for the storage solution or sterile saline.

RINSING IS NOT REQUIRED and could increase the risk of device contamination.

No instrument or object should come into contact at any time with the valve cusps as they could be damaged.

DO NOT ALLOW THE VALVE TISSUE TO DRY. Maintain tissue moisture with periodic irrigation or immersion in saline solution to avoid drying, which can cause irreparable damage to the tissue.

No catheter or pacemaker leads must ever be left across the device. Cardiac catheterization across a device may be accomplished using soft tip catheters that should not damage the tissue.

STERILIZATION OF ACCESSORIES

See Accessory IFU for more information.

DIRECTIONS FOR USE

HANDLING

The shrink seal on the container should be broken and the screw cap lid removed from the jar. Upon opening, verify that there is no evidence of leakage around the edge of the lid.

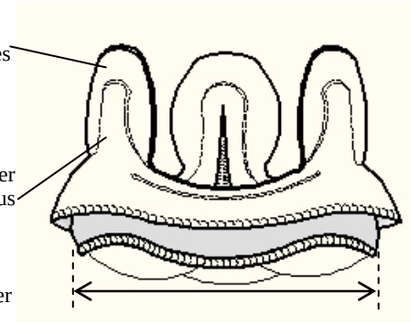
The xenograft can be removed from its container by grasping the identification tag with a pair of atraumatic forceps. When necessary, the valve may be handled with sterile gloved hands, taking care to remove glove powder residue with sterile physiological saline prior to handling the valve.

DEVICE IMPLANTATION

AORTIC VALVE REPLACEMENT

The aortic annulus should be sized using a selected sizer with an outer diameter equivalent or one size smaller (the valve should be oversized) to the stated valve size of the BioIntegral *No-React®* Versaflex Model **NRV** so that the sizer fits in the supra annular position. The coronary ostia should not be obstructed. The **NRV** aortic model is designed for implantation with one suture line. In addition the commissural "flanges" are sutured to the corresponding aortic wall. Two or three mattress sutures should be used for each commisure; 3.0 Prolene is recommended for this purpose. All knots are tied outside the aorta. (Please review the video instructions of the implantation). The annular suture line is done like any other bioprosthesis. The pericardial annulus of the valve should be used for this annular suture line (See Figure 1).

Figure 1: Side view of the valve



Particular care should be taken when the valve is being seated onto the annulus. The valve should be handled and lowered into position in such a manner that there is no risk that the instruments will damage the valve leaflets. Since the valve has a holder as well as a "skeleton", it can be implanted respecting absolutely the "no touch technique".

CAUTION: Unlike other implanted tissues, No-React tissues do not cause inflammation and scarring, and one cannot rely on the body's inflammatory response to improve tissue conformation.

INDIVIDUALIZATION OF TREATMENT: ANTICOAGULATION / ANTIBIOTICS

12 weeks of anticoagulant and/or antiplatelet therapy is always strongly recommended.

If there is the presence of endocarditis, 6 weeks of IV antibiotics are additionally recommended.

For any patient undergoing dental procedures, oral antibiotics are recommended 24 hours before and 48 hours after those procedures.

The patient's temperature should be checked daily for 3 weeks post-op, and the patient should be instructed to contact the physician if there is any unexplained fever above 38.5 degrees Centigrade. In such cases, it is recommended the physician take blood cultures and simultaneously begin a course of IV antibiotics.

The use of anticoagulant drugs may be contraindicated for some patients. The decision as to whether anticoagulant or antiplatelet therapy is

appropriate for the patient must ultimately rest with the physician.

COMPLICATIONS
Reported postoperative complications with bioprostheses in general have included: perivalvular leakage, endocarditis, calcification, thrombosis, thromboembolism, primary tissue failure, hemorrhage, unacceptable hemodynamics, congestive heart failure, and hemolysis. Each physician must consider all the risks and benefits to the patient on an individual basis when choosing a valvular prosthesis.

RETURN OF EXPLANTED BIOPROSTHESES
BioIntegral Surgical is very interested in learning of any clinical experiences involving our devices. We are particularly interested in receiving for analysis any explants for any reason. It is ideal to receive an explant within 72 hours in a leak proof specimen jar containing refrigerated saline. If not, an appropriate preservative solution such as 10% Formalin may be used to return the device. Information regarding the patient's history (e.g. patient records, test reports) and the reason for explantation should be sent with the product to the company address.

In addition, it would be of assistance if the name of an appropriate contact be provided should additional information be required.

An analysis will be conducted at BioIntegral Surgical in accordance with the reported clinical experience of the device. Upon completion of this analysis, a written report will be submitted to the physician. The information obtained from these reports will enable us to monitor the clinical experience with our product.

PRODUCT INFORMATION DISCLOSURE
BioIntegral Surgical has exercised reasonable care in the manufacturing of this device. BioIntegral Surgical excludes all warranties whether expressed or implied by operation of the law or otherwise including but not limited to any implied warranties of merchantability or fitness. Handling and storage of this device by the user as well as factors related to the patient, diagnosis, treatment, surgical procedures, and other matters beyond BioIntegral Surgical's control may directly affect this device and the results obtained from its use. BioIntegral Surgical neither assumes nor authorizes other persons to assume for it any other additional liability or responsibility in connection with this device. This device should not be used except on the order of a physician.

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BioIntegral Surgical

Versaflex™ Nr™ NO-REACT

Semi-Stented Porcine Bioprosthesis

Instructions for Use
Model NRV

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