Edwards Lifesciences

KONECT RESILIA Aortic Valved Conduit, Model 11060A

Instructions for Use

Rx Only

1.0 Device and Accessories Description

1.1 Device Description

The KONECT RESILIA aortic valved conduit (AVC), Model 11060A, is a stented trileaflet valve pre-assembled to a woven polyester graft impregnated with gelatin (Figure 1). The valve is comprised of RESILIA bovine pericardial tissue that is mounted on a flexible frame. The graft is a Terumo Aortic Gelweave Valsalva aortic root graft. The KONECT RESILIA AVC is stored in a dry packaging condition (Table 1). The KONECT RESILIA AVC is available in sizes 19, 21, 23, 25, 27, and 29 mm, with a standard 100 mm usable graft length which can be cut to size at time of implant (Table 1).

RESILIA Tissue

RESILIA tissue is created with Edwards integrity preservation technology. This technology incorporates a stable-capping anticalcification process, which permanently blocks residual aldehyde groups that are known to bind with calcium. The technology also incorporates tissue preservation with glycerol, which replaces traditional liquid-based storage solutions such as glutaraldehyde. The storage method eliminates tissue exposure to the residual unbound aldehyde groups commonly found in glutaraldehyde storage solutions, and maintains long-term protection of collagen.

The combined impact of the Edwards integrity preservation technology's stable-capping and glycerolization features makes it a superior, resilient tissue. In juvenile sheep, valves with RESILIA tissue demonstrated a statistically significant reduction in leaflet calcification ($p = 0.002$) and significant improvement in hemodynamic performance ($p = 0.03$) over commercially available pericardial tissue valves (Carpentier-Edwards PERIMOUNT Plus pericardial mitral bioprosthesis, Model 6900P) [Reference 1 and 2].

Valve Structure

The valve is based on the proven design and performance of the Carpentier-Edwards PERIMOUNT Magna Ease pericardial aortic bioprosthesis Model 3300TFX (also referred to as the Magna Ease aortic bioprosthesis).

The frame is designed to be compliant at the orifice, as well as at the commissures. The compliance of the commissure supports is intended to reduce the loading shock at the valve commissures and free margin of the leaflets [Reference 3]. The compliance of the orifice is intended to reduce the stress on the leaflets. The compliant orifice concept is based on the physiology and mechanics of natural heart valves and reported experience with implantation of unstented homografts [Reference 4 and 5].

The lightweight wireform is made of a corrosion-resistant cobalt-chromium alloy, chosen because of its superior spring efficiency and fatigue-resistant characteristics, and is covered with a woven polyester fabric.

A cobalt-chromium alloy/polyester film laminate band surrounds the base of the wireform frame. A silicone sewing ring that is covered with a porous polytetrafluoroethylene (PTFE) cloth is attached to the wireform frame. The DualFit sewing ring has three equally spaced black silk suture markers at each of the valve commissures, to aid in bioprosthesis orientation and alignment for coronary re-attachment. The versatile DualFit sewing ring design gives surgeons the flexibility to choose between a supra-annular or an intra-annular implant position in the type of procedure in which this device is used (Bentall procedure). A Bentall procedure is a cardiac surgery operation involving replacement of the aortic valve and ascending aorta, with re-implantation of the coronary arteries into the graft.

Graft

The graft portion of the device is made of woven polyester which has been impregnated with gelatin. The aim of the impregnation is to provide a polyester vascular prosthesis which does not require preclotting. The gelatin is a modified mammalian gelatin which has been cross-linked to a set level to control its rate of removal. It serves in place of fibrin, which seals the polyester prosthesis during normal preclotting. The graft mimics the geometry of the Sinuses of Valsalva as shown in the diagram in Table 1. The graft features a skirt at its proximal end that allows the creation of an anatomical configuration similar to the natural aortic root. The graft also features a single black line on the skirt to aid in coronary re-attachment and along the body to facilitate graft alignment with the ascending aorta.

Holder

The holder is a single piece that is physically mounted to the KONECT RESILIA AVC by means of sutures. The holder features an integrated handle and a single-cut release channel beyond the distal end of the graft, which allows for removal of the holder by the surgeon (refer to Figure 11).

1.2 Sizers and Tray

The use of a sizing instrument facilitates selection of the correct size device for implantation. The translucent Model 1190 sizers permit direct observation of their fit within the annulus. Each sizer consists of a handle with a different sizing configuration at each end (Figure 2). On one side of the handle is a barrel end used to size the annulus. On the other side of the handle is a replica end with an integrated lip that reflects the bioprosthesis sewing ring geometry. A sizer is available for each size of the Model 11060A (19, 21, 23, 25, 27, and 29 mm). The complete set of sizers is housed in a tray, Model TRAY1190, which can be reused and

resterilized. Refer to the sizer and tray IFU for cleaning and sterilization instructions.

2.0 Intended Use and Indications for Use

The KONECT RESILIA AVC, Model 11060A, is intended for use as a replacement for the aortic heart valve and the ascending aorta.

The KONECT RESILIA AVC, Model 11060A, is indicated for patients who require replacement of their native or prosthetic aortic valve, and the associated repair or replacement of a damaged or diseased ascending aorta.

3.0 Contraindications

There are no known contraindications associated with the use of the KONECT RESILIA AVC, Model 11060A.

4.0 Warnings and Precautions

FOR SINGLE USE ONLY. This device is designed, intended, and distributed for single use only. Do not resterilize or reuse this device. There are no data to support the sterility, non-pyrogenicity, or functionality of the device after sterile reprocessing.

DO NOT FREEZE OR EXPOSE THE KONECT RESILIA AVC TO EXTREME HEAT. Exposure of the bioprosthesis to extreme temperatures will render the device unfit for use.

DO NOT USE THE KONECT RESILIA AVC:

- **If the "OK" symbol is not apparent on the temperature indicator**
- **If the foil pouch, sealed trays, or lids are opened or damaged**
- **If there is visible staining on the Tyvek lids, since staining could indicate a compromised sterile barrier (Refer to Figure 5)**
- **If the expiration date has elapsed**
- **If it is dropped, damaged, or mishandled in any way; should a bioprosthesis be damaged during insertion, do not attempt repair**

DO NOT EXPOSE THE KONECT RESILIA AVC to any solutions, chemicals, antibiotics, etc., except for sterile physiological saline solution. Irreparable damage to the leaflet tissue, which may not be apparent under visual inspection, may result. The impact of direct tissue contact with these types of solutions has not been evaluated.

The device should not be immersed in saline for longer than five minutes to preserve the hemostatic properties of the graft gelatin coating. The graft must not be allowed to dry out after soaking.

The manufacturing process for gelatin sealed vascular grafts uses the cross-linking agent formaldehyde to achieve the graft performance. All gelatin sealed grafts are thoroughly rinsed with RO water to reduce residual formaldehyde, however residual amounts may be present in the finished graft. Formaldehyde is also found at low levels naturally in the body, some of which is derived from food. Formaldehyde is known to be mutagenic and carcinogenic. The risks of these potential harms from the product have not been established clinically.

Failure to keep the valve moist can cause the leaflets to dry out, which may compromise the valve function. Hydrating the leaflets with saline every one to two minutes is recommended.

Use of a cautery for any sealed polyester graft can cause burning. This can be prevented by wetting the device with saline at the site of cauterization.

DO NOT PRECLOT. The graft is sealed and must not be preclotted; preclotting may increase the risk of thromboembolic episodes.

DO NOT GRASP the leaflet tissue of the valve with instruments or cause any damage to the KONECT RESILIA AVC. Even the most minor leaflet tissue perforation may enlarge in time to produce significant impairment of bioprosthesis function.

As with any implanted medical device, there is a potential for patient immunological response. Components of the KONECT RESILIA AVC, Model 11060A, include a metal alloy that contains cobalt, chromium, nickel, molybdenum, manganese, carbon, beryllium, and iron. The valve leaflets are made of bovine pericardial tissue. The graft contains bovine gelatin and polyester. Care should be exercised in patients with hypersensitivities to these materials.

This device was manufactured without latex, but may have been produced in a latex-containing environment.

5.0 Adverse Events

5.1 Observed Adverse Events - Bioprosthetic Heart Valves

As with all bioprosthetic heart valves, serious adverse events, sometimes leading to death, may be associated with the use of these devices. In addition, adverse events due to individual patient reaction to an implanted device or to physical or chemical changes to the components, particularly those of biological origin, may occur at varying intervals (hours or days), necessitating reoperation and replacement of the prosthetic device.

The valve portion of the KONECT RESILIA AVC , Model 11060A, is similar in design to the Carpentier-Edwards PERIMOUNT Magna Ease pericardial aortic bioprosthesis Model 3300TFX combined with RESILIA tissue. Adverse events associated with the use of Carpentier- Edwards PERIMOUNT pericardial bioprostheses compiled from the literature and from reports received through the product surveillance system include stenosis, regurgitation through an incompetent valve, perivalvular leak, endocarditis, hemolysis, thromboembolism, thrombotic obstruction, bleeding diatheses related to the use of anticoagulation therapy, malfunctions of the valve due to distortion at implant, fracture of the wireform, and physical or chemical deterioration of valve components. Types of tissue deterioration include infection, calcification, thickening, perforation, degeneration, suture abrasion, instrument trauma, and leaflet detachment from the valve stent posts. These complications may present clinically as abnormal heart murmur, shortness of breath, exercise intolerance, dyspnea, orthopnea, anemia, fever, arrhythmia, hemorrhage, transient ischemic attack, stroke, paralysis, low cardiac

output, pulmonary edema, congestive heart failure, cardiac failure, and myocardial infarction.

5.2 Potential Adverse Events – Polyester Grafts

Adverse events potentially associated with the use of polyester vascular grafts include hemorrhage, thrombosis, graft infection, embolism, aneurysm, pseudoaneurysm, seroma, occlusion (anastomotic intimal hyperplasia), immunological reaction to collagen (shown to be a weak immunogen; infrequent, mild, localized and self - limiting), intimal peel formation, and conduit dilatation.

It is possible that these complications may lead to:

- Reoperation
- Explantation
- Permanent disability
- Death

5.3 Potential Adverse Events - KONECT RESILIA AVC

Adverse events potentially associated with the use of the KONECT RESILIA AVC and the surgical procedure include:

- Allergic reaction
- Aneurysm
- Angina
- Annulus (damage, dissection, tear)
- Arterial dissection
- Aorta (damage, dissection, tear)
- Aortic root damage
- Asystole and/or cardiac arrest
- Bleeding/hemorrhage
    - Peri- or post-procedural
    - Anticoagulant related
    - Pericardial tamponade
    - Hematoma
    - Cerebrovascular
- Blood: Coagulopathy/disseminated intravascular coagulation (DIC)
- Blood: Hemolysis/hemolytic anemia
- Blood: Anemia
- Blood pressure alteration (hypotension, hypertension)
- Cardiac arrhythmias/conduction disturbances
- Cardiac failure
- Cardiogenic shock
- Coronary artery (ostia) occlusion
- Conduit dilatation
- Deep vein thrombosis (DVT)
- Embolism
- Endocarditis
- Esophageal tear/rupture
- Graft infection
- Hypoxemia
- Infection: local wound or systemic
- Intimal peel formation
- Myocardial infarction
- Myocardial perforation
- Multi-system organ failure (MOF)
- Neurologic events
    - Stroke (CVA)
    - Transient ischemic attack (TIA)
- Occlusion (anastomotic intimal hyperplasia)
- Pericardial effusion
- Pulmonary edema
- Pneumonia
- Prosthesis nonstructural dysfunction
    - Paravalvular leak
    - Leaflet impingement
    - Leaflet tissue damage (instrument/sutures)
    - Pannus
    - Prosthesis mismatch (PPM) due to inappropriate sizing
    - Distortion at implant
- Prosthesis regurgitation/insufficiency/stenosis
- Prosthesis structural dysfunction/deterioration
- Prosthesis thrombosis
- Prosthesis wireform/stent fracture or distortion
- Pseudoaneurysm
- Reduced exercise tolerance
- Renal failure, acute
- Renal insufficiency
- Respiratory failure
- Seroma
- Thrombocytopenia, non-heparin induced
- Thrombocytopenia, heparin induced (HIT)
- Thromboembolism
    - Arterial, venous, peripheral, central
- Transvalvular or valvular leaking
- Valve dislodgement/instability/migration/embolization

It is possible that these complications may lead to:

- Reoperation
- Explantation
- Permanent disability
- Death

6.0 Clinical Studies

The clinical safety and effectiveness of the valve portion of the KONECT RESILIA AVC has been established based on the outcome of the COMMENCE trial, which assessed the Edwards Pericardial Aortic Bioprosthesis, Model 11000A. The Model 11000A was approved for commercial distribution on June 29, 2017 (PMA 150048). The Edwards Pericardial Aortic Bioprosthesis, Model 11000A, and the valve portion of the KONECT RESILIA AVC, Model 11060A, have a very similar design. The safety and effectiveness outcomes of the COMMENCE trial are applicable to the KONECT RESILIA AVC, Model 11060A.

The COMMENCE trial is an open-label, prospective, non-randomized, multicenter trial without concurrent or matched controls. Following a pre-surgical assessment, subjects were followed for one year to assess primary safety and effectiveness. Subjects are followed annually thereafter for a minimum of five years post-surgical experience. As a condition of approval of the PMA, a subset of patients who provide consent are being followed for 10 years post-implant for long term continued follow-up.

The objective of the COMMENCE trial is to confirm that the tissue processing, valve sterilization, and packaging for the Edwards Pericardial Aortic Bioprosthesis with RESILIA tissue do not raise new questions of safety and effectiveness in

subjects who require replacement of their native or prosthetic aortic valve.

The reporting period for the COMMENCE trial aortic arm is January 2013 through February 2016. At the time of the database lock, six hundred ninety-four (694) subjects were enrolled at twenty-seven (27) investigational sites in the US and Europe. Of the enrolled population, six hundred eighty-nine (689) subjects were successfully implanted with the Model 11000A and left the operating room with the trial valve.

Table 2 provides trial demographics, NYHA classification and risk scores; Table 3 lists the observed adverse event rates during study; Table 4 provides NYHA classification data at baseline and one-year follow-up; and Table 5 lists hemodynamic parameters at one year.

6.1 Specific Patient Population in COMMENCE Trial

The safety and effectiveness of the Edwards Pericardial Aortic Bioprosthesis with RESILIA tissue studied in the COMMENCE trial has not been studied in these populations in the aortic position:

- Patients who are pregnant
- Nursing mothers
- Patients diagnosed with abnormal calcium metabolism and hyperparathyroidism
- Patients who require surgical replacement of the aortic root
- Children, adolescents, and young adults under 18 years old
- Patients with hypersensitivity to metal alloys that contain cobalt, chromium, nickel, molybdenum, manganese, carbon, beryllium, and iron
- Patients with hypersensitivity to latex

7.0 Individualization of Treatment

Bioprosthetic heart valve recipients should be maintained on anticoagulation therapy, except where contraindicated, during the initial stages after implantation as determined by the physician on an individual basis. Long-term anticoagulation and/or antiplatelet therapy should be considered for patients with risk factors for thromboembolism.

The ultimate judgment regarding care of a particular patient must be made by the healthcare provider and patient in light of all the circumstances presented by that patient [Reference 7].

7.1 Patient Counseling Information

Careful and continued medical follow-up (at least by an annual visit to the physician) is advised so that device-related complications, particularly those related to material failure, can be diagnosed and properly managed. Patients with valves are at risk from bacteremia (e.g., undergoing dental procedures) and should be advised about prophylactic antibiotic therapy. Patients should be encouraged to carry their implant card at all times and to inform their healthcare providers that they have an implant when seeking care.

8.0 How Supplied

8.1 Packaging

The KONECT RESILIA AVC, Model 11060A, is provided sterile and non-pyrogenic, in a double-barrier tray package. The double tray package is in a foil pouch, which is in a carton.

Each KONECT RESILIA AVC is contained in a carton with a temperature indicator displayed through a window on the side panel. The temperature indicator is intended to identify products that were exposed to transient temperature extremes. Upon receipt of the bioprosthesis, immediately inspect the indicator and refer to the carton label to confirm an "OK" condition. If the "OK" condition is not apparent, do not use the KONECT RESILIA AVC and contact the local supplier or Edwards Lifesciences representative to make arrangements for return authorization and replacement.

WARNING: Carefully inspect the KONECT RESILIA AVC before implantation for evidence of extreme temperature exposure or other damage. Exposure of the KONECT RESILIA AVC to extreme temperatures will render the device unfit for use.

8.2 Storage

The KONECT RESILIA AVC, Model 11060A, should be stored at 10 °C to 25 °C (50 °F to 77 °F), in the foil pouch and shelf carton until just prior to use.

9.0 Directions for Use

9.1 Physician Training

The techniques for implanting this device are similar to those used for the placement of any aortic valved conduit. No special training is required to implant the KONECT RESILIA AVC, Model 11060A.

9.2 Sizing

Because of the complexity and variation of cardiac valve replacement surgery, the choice of surgical technique, appropriately modified in accordance with the previously described warnings, is left to the discretion of the individual surgeon. In general, the following steps should be employed:

Step	Procedure
1	Surgically remove the valve leaflets and all associated structures deemed necessary.
2	Surgically remove any calcium from the annulus to ensure proper seating of the sewing ring of the KONECT RESILIA AVC to avoid damage to the delicate leaflet tissue.
3	Measure the annulus using only the Edwards Lifesciences sizers, Model 1190 (Figure 2). The sizer Model 1190 can be used to measure for either supra-annular or intra-annular placement, depending on surgeon preference.

CAUTION: Do not use other manufacturers' prosthesis sizers, or sizers other than Edwards Lifesciences Model 1190, to size the KONECT RESILIA AVC, Model 11060A. Inaccurate sizing may cause damage to the bioprosthesis, injure the heart, or result in leaflet tissue failure, stent distortion and regurgitation, or patient-prosthesis mismatch.

CAUTION: When choosing a bioprosthesis for a given patient, the size, age, and physical condition of the patient in relation to the size of the bioprosthesis must be taken into consideration to minimize the possibility of obtaining a suboptimal hemodynamic result. The selection of a bioprosthesis, however, must ultimately be made by the physician on an individual basis after carefully weighing all the risks and benefits to the patient.

CAUTION: Examine sizers for signs of wear, such as dullness, cracking, or crazing. Replace sizer if any deterioration is observed.

WARNING: Fragments of sizers are not radio-opaque and cannot be located by means of an external imaging device.

CAUTION: Avoid using excessive force during sizing as it may damage the annulus tissue.

9.2.1 Supra-Annular Sizing

Step	Procedure
1	For supra-annular implantation, the sewing ring of the KONECT RESILIA AVC is placed above the annulus, thereby maximizing valve orifice area. When sizing for supra - annular implantation, the sizer should be parallel with the plane of the annulus and the following sizing technique should be used:
2	Using the KONECT RESILIA AVC sizer Model 1190, select the barrel end of the largest diameter sizer that fits comfortably in the patient's annulus (Figure 3)
3	Once the appropriate barrel end is verified, use the replica end of the same sizer to verify that the sewing ring will fit comfortably on top of the annulus. If satisfied with the fit of the replica end, choose this size of the KONECT RESILIA AVC implant (Figure 4).

9.2.2 Intra-Annular Sizing

Step	Procedure
1	For proper sizing, the sizer should be parallel with the plane of the annulus. The barrel end of the Model 1190 sizer should be used for intra-annular sizing (Figure 3).

9.3 Handling and Preparation Instructions

In-service training is recommended prior to handling and preparing the KONECT RESILIA AVC, Model 11060A.

Step	Procedure
1	**CAUTION: Do not open foil pouch upon receipt of the device and until ready for implantation, since long-term exposure of the KONECT RESILIA AVC to some environmental conditions may compromise the device function.**
2	Once the appropriate size KONECT RESILIA AVC is chosen, remove the foil pouch from the carton in the non-sterile field. Before opening, examine the pouch for evidence of damage and broken or missing seals. **WARNING: Do not open foil pouch in sterile field. Foil pouch is protective cover only. Only the innermost package tray may be introduced into the sterile field.**
3	Remove the double barrier tray package from the foil pouch in the non-sterile field. Examine the outer tray for evidence of damage, stains, and broken or missing seals. **CAUTION: Any damage to the trays renders the bioprosthesis non-sterile.** In the event of damage to the primary packaging, the product may not be used and should be returned immediately to Edwards Lifesciences (See 9.6 Return of the KONECT RESILIA AVC).
4	Near the sterile field, hold the base of the outer tray and peel the lid from the outer tray.
5	The inner tray and contents are sterile. Transfer the inner tray to the sterile field. The contents of the inner tray must be handled using a sterile surgical technique to prevent contamination.
6	**CAUTION: Do not open the inner package until surgeon is ready to implant, in order to minimize the potential for contamination.** Before opening, examine the inner tray and lid for evidence of damage, stains, and broken or missing seals. Hold the base of the inner tray and peel the lid from the inner tray. **WARNING: Do not use the KONECT RESILIA AVC if there is visible staining on the inner tray Tyvek lid. Staining could indicate a compromised sterile barrier (Figure 5).** Droplets may be visible in the inner tray. This is a result of the glycerolization process and does not impact product function and is not an indication of sterile barrier breach or improper product storage or conditioning (Figure 6).
7	While holding the tray securely, pull up on the holder grip to remove the KONECT RESILIA AVC from the tray (Figure 7).

Step	Procedure
	CAUTION: The holder is required for implantation and should not be removed until the KONECT RESILIA AVC is sutured to the annulus. To avoid damaging the device, do not grasp the KONECT RESILIA AVC with hands or surgical instruments.
8	A serial number tag is attached to the holder grip by a thread. This serial number should be confirmed with the number on the KONECT RESILIA AVC package and KONECT RESILIA AVC patient implant card. Do not remove the tag. The serial number is also provided on the silver label located outside of the inner tray. **CAUTION: If any difference in serial number is noted, the KONECT RESILIA AVC should be returned unused.** **CAUTION: If the tag is inadventently removed, ensure the attachment threads are fully removed from the holder.**
9	The KONECT RESILIA AVC must be immersed in a sterile saline solution for 5 minutes. Thereafter, the KONECT RESILIA AVC must be kept hydrated with saline throughout the remainder of the procedure and must not be allowed to dry out. **CAUTION: Do not immerse the device in saline for longer than five minutes, in order to preserve the hemostatic properties of the graft's gelatin coating. The graft must not be allowed to dry out after soaking.** **CAUTION: After soaking, hydrating both sides of the valve's leaflets with saline every one to two minutes is recommended. Failure to keep the valve moist thereafter can cause the leaflets to dry out, which may compromise the valve function.** **CAUTION: Avoid contact of the leaflet tissue with towels, linens, or other sources of particulate matter that may be transferred to the leaflet tissue.**

9.4 Device Implantation

The KONECT RESILIA AVC, Model 11060A, is designed for supra-annular and intra-annular implantation.

Step	Procedure
1	Orient the KONECT RESILIA AVC so that the coronary ostia are not compromised. The sewing ring has three equally spaced black suture markers at each of the commissures to aid in bioprosthesis orientation and alignment for coronary re-attachment (Figure 8).
2	For supra-annular placement of the KONECT RESILIA AVC, employ a suture technique such as a non-everting horizontal mattress technique. For intra-annular placement of the KONECT RESILIA AVC, employ a suture technique such as an everting mattress technique.
3	Parachute the AVC along the sutures until it is in contact with the patient's native annulus, then tie the sutures (Figures 9 and 10). **CAUTION: To avoid perforation, care must be taken when using suture fastening devices with vertical fasteners.**
4	Remove the holder at the completion of the suturing procedure. a) Using a scalpel, cut the exposed sutures that are visible in the single-cut release channel of the holder, near the top of the graft (Figure 11). Avoid cutting or damaging the graft when cutting the sutures. **WARNING: Failure to cut within the single-cut release channel may prevent the holder from releasing and may result in suture tails left in the device. Do not use excessive force when removing the holder to avoid device damage. Multiple cuts may result in the creation of suture fragments and potential embolism.** b) After the sutures are cut, ensure the KONECT RESILIA AVC remains seated while removing the holder. Remove the holder along with its suture tails. c) Discard the holder; it is for single use only.
5	A sterile cautery should be used to cut the graft for adjusting the length and creating coronary ostia. A cautery is not provided with the KONECT RESILIA AVC. The coronary arteries should be anastomosed to the skirted section of the graft. **CAUTION: Care should be taken to not touch the valve leaflets when creating the coronary ostia.** To prevent focal burning of the graft, which may result during cauterization, wet the Valsalva graft with saline at the intended site of cauterization, immediately prior to cauterization (Figure 12).

Step	Procedure
	CAUTION: Use of a cautery for any sealed polyester graft can cause burning. This can be prevented by wetting the device with saline at the site of cauterization. **CAUTION: Clamping may damage the vascular prosthesis. Atraumatic clamps, ideally with soft-shod jaws, should be used with the minimum application of force. Excessive force or tension should be avoided, as these will damage the polyester fibers and the gelatin impregnation. Care should be taken to prevent fraying or fiber damage when suturing through the graft.**
6	Use the single black line along the body of the graft to facilitate alignment for distal anastomosis. **CAUTION: If de-airing is required, then the smallest possible needle should be used; 19 gauge is normally sufficient. Hypodermic needles have a cutting point, which may result in blood leakage and may require repair by suturing.**

9.5 Accessory Cleaning and Sterilization

The accessories for the KONECT RESILIA AVC, Model 11060A, are packaged separately. The Model 1190 sizers and Model TRAY1190 tray base and lid are supplied nonsterile and must be cleaned and sterilized prior to each use. Refer to the Instructions for Use supplied with the reusable accessories for cleaning and sterilization instructions.

9.6 Return of the KONECT RESILIA AVC

Edwards Lifesciences is interested in obtaining recovered clinical specimens of the KONECT RESILIA AVC, Model 11060A, for analysis. Contact the local representative for return of recovered bioprostheses.

- Unopened package with sterile barrier intact: If the foil pouch has not been opened, return the device in its original packaging
- Package opened but bioprosthesis not implanted: Contact the local representative for return of recovered bioprostheses
- Explanted device: Contact the local representative for return of recovered bioprostheses

10.0 MRI Safety Information

MR Conditional

Non-clinical testing has demonstrated that the KONECT RESILIA AVC, Model 11060A, is MR Conditional. A patient with the Model 11060A AVC can be scanned safely immediately after placement of this implant, under the following conditions:

- Static magnetic field of 3 tesla or less
- Spatial magnetic gradient field of less than 3000 gauss/cm (30 T/M)
- Maximum MR system-reported whole-body averaged specific absorption rate (SAR) of 2.0 W/kg in the normal operating mode

Under the scan conditions defined above, KONECT RESILIA AVC Model 11060A is expected to produce a maximum *in vivo* temperature rise of less than 2 °C after 15 minutes of continuous scanning.

In non-clinical testing, the image artifact extends approximately 12.5 mm from the Model 11060A valve when imaged with a spin echo pulse sequence, and 25.5 mm from the device when imaged with a gradient echo pulse sequence and a 3-tesla MRI system. The artifact obscures the device lumen.

11.0 Patient Labeling

11.1 Patient Implant Card

A patient implant card is provided to each patient implanted with the KONECT RESILIA AVC.

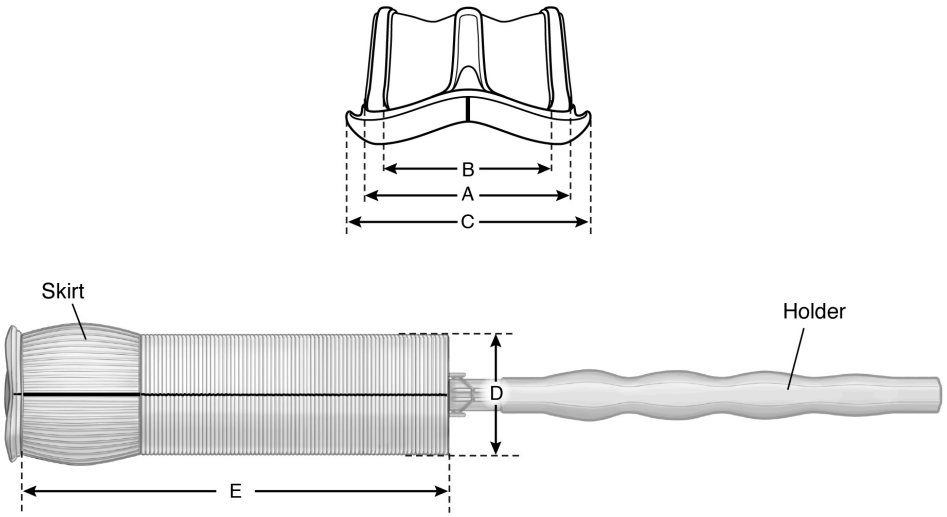
11.2 Patient Information

Patient information materials may be obtained from Edwards or an Edwards clinical sales specialist.

12.0 References

1. Flameng et. al. "A Randomized Assessment of an Advanced Tissue Preservation Technology in the Juvenile Sheep model." J Thorac Cardiovasc Surg, Article in *Press*, 2014. [Valves with Edwards XenoLogiX™ treatment were used as controls.]
2. Rabbit Calcification Study on Edwards and Competitor Tissue Heart Valves. Study on file at Edwards.
3. Reis, Robert L., et al. "The Flexible Stent. A New Concept in the Fabrication of Tissue Heart Valve Prostheses." *J Thorac Cardiovasc Surg* 1971, 62(5):683:689.
4. Barrat-Boyes, B.G. and A.H.G. Roche. "A Review of Aortic Valve Homografts Over a Six and One-half Year Period." *Ann Surg* 1969, 170:483-492.
5. Brewer, R.J., et al. "The Dynamic Aortic Root. Its Role in Aortic Valve Function." *J Thorac Cardiovasc Surg* 1976, 72:413-417.
6. Reis, Robert L., et al. "The Flexible Stent. A New Concept in the Fabrication of Tissue Heart Valve Prostheses." *J Thorac Cardiovasc Surg* 1971, 62(5):683-689 and 693-695.
7. Bonow R.O., et al. "ACC/AHA Guidelines for the Management of Patients with Valvular Heart Disease: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Committee on Management of Patients With Valvular Heart Disease)." *J Am Coll Cardiol* 2014, 63:e57-185.

Table 1: Nominal dimensions for valve and graft



Valve Size	19 mm	21 mm	23 mm	25 mm	27 mm	29 mm
A. Tissue Annulus Diameter (Stent Diameter, mm)	19	21	23	25	27	29
B. Valve Internal Diameter (Stent ID, mm)	18	20	22	24	26	28
C. External Sewing Ring Diameter (mm)	31	33	35	36	38	40
D. Graft Diameter (mm)	22	24	26	28	30	32
E. Graft Usable Length (mm)	100	100	100	100	100	100
Geometric Orifice Area (GOA) (mm^2)	238	292	357	424	503	575

Table 2: COMMENCE Trial Study Demographics

Age at Implant	**N: Mean ± SD (Min - Max)**
Age (years)	689: 67.0 ± 11.6 (20 – 90)
Sex	**% (n / N)**
Female	28.2% (194 / 689)
Male	71.8% (495 / 689)
NYHA Classification	**% (n/N)**
Class I	24.1% (166 / 689)
Class II	49.6% (342 / 689)
Class III/IV	26.3% (181 / 689)
Class III	24.4% (168 / 689)
Class IV	1.9% (13 / 689)
Risk Scores	**N: Mean ± SD (Min - Max)**
STS risk of mortality (%)[1]	538: 2.0 ± 1.8 (0.3 – 17.5)
EuroSCORE II (%)	689: 2.5 ± 2.8 (0.5 – 24.6)

N is the number of subjects with available data for the given parameter.
[1] STS scores only calculated for subjects undergoing isolated AVR or AVR+CABG.

Table 3: Observed Adverse Events

Adverse Event or Outcome	Early[1] (N=689) n, m (%)	Late[2] (LPY[3] = 800.9) n, m, (%/pt-yr)	Freedom-from Event at 1 Year (SE)[4]
All mortality	8, 8 (1.2)	18, 18 (2.2)	0.976 (0.006)
Valve-related mortality	3, 3 (0.4)	6, 6 (0.7)	0.988 (0.004)
Reoperation	1, 1 (0.1)	2, 2 (0.2)	0.997 (0.002)
Explant	0, 0 (0.0)	2, 2 (0.2)	0.998 (0.002)
Thromboembolism	15, 15 (2.2)	14, 17 (2.1)	0.965 (0.007)
Valve thrombosis	0, 0 (0.0)	0, 0 (0.0)	1.000 (0.000)
All bleeding	6, 6 (0.9)	21, 21 (2.6)	0.960 (0.008)
Major bleed	5, 5 (0.7)	11, 11 (1.4)	0.977 (0.006)
All paravalvular leak	2, 2 (0.3)	2, 2 (0.2)	0.994 (0.003)
Major PVL	1, 1 (0.1)	1, 1 (0.1)	0.997 (0.002)
Endocarditis	0, 0 (0.0)	5, 5 (0.6)	0.993 (0.004)
Hemolysis	0, 0 (0.0)	0, 0 (0.0)	1.000 (0.000)
Structural valve deterioration	0, 0 (0.0)	0, 0 (0.0)	1.000 (0.000)

[1] For "Early Events" (events occurring thru post-implant day 30): m is the number of events; n is the number of subjects experiencing an event; % = n/N.
[2] For "Late Events" (events occurring after post-implant day 30): m is the number of events; n is the number of subjects experiencing an event; and % = m/LPY.
[3] LPY: Late patient-years; LPY is calculated from post-implant day 31 until the last patient contact
[4] Based on Kaplan-Meier analysis of time to first occurrence (early or late). Standard Error (SE) based on Greenwood's formula.

Table 4: NYHA Classification at Baseline and One Year

NYHA Class	Baseline NYHA % (n / N[2])	One-Year NYHA[1] % (n / N[2])
Class I	24.0% (122 / 509)	80.7% (411 / 509)
Class II	49.7% (253 / 509)	17.3% (88 / 509)
Class III/IV	26.3% (134 / 509)	2.0% (10 / 509)
Class III	24.4% (124 / 509)	1.6% (8 / 509)
Class IV	2.0% (10 / 509)	0.4% (2 / 509)

[1] Improvement in NYHA observed demonstrated by a p-value < 0.0001 based on the test for marginal homogeneity after converting NYHA Class to numeric values (Class I = 1, Class II = 2, Class III = 3, Class IV = 4). Values of 0 were replaced with 0.5 to avoid sparseness of data.
[2] N is the number of subjects who have both preoperative and one-year NYHA data

Table 5: Hemodynamic Parameters at One Year

Parameter	19 mm Mean±SD (n[1])	21 mm Mean±SD (n[1])	23 mm Mean±SD (n[1])	25 mm Mean±SD (n[1])	27 mm Mean±SD (n[1])
Mean gradient (mmHg)	17.6 ±7.8 (16)	12.6 ±4.7 (97)	10.1 ±3.8 (158)	9.6 ± 5.2 (132)	8.2 ± 3.5 (69)
EOA (cm^2)	1.1 ± 0.2 (16)	1.3 ± 0.3 (97)	1.6 ± 0.4 (155)	1.8 ± 0.5 (131)	2.2 ± 0.6 (68)

[1] N represents the number of subjects with evaluable data for the specified valve size.

Figures

Figure 1

Figure 2: AVC Sizer (Model 1190)

Figure 3: Barrel End

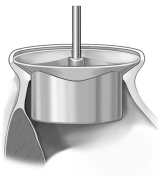


Figure 4: Replica End

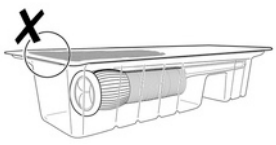


Figure 5: STAIN - DO NOT USE

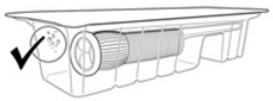


Figure 6: DROPLETS - OK TO USE

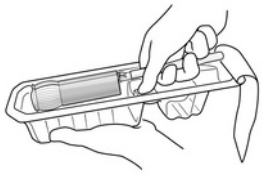


Figure 7: AVC Removal from Inner Tray

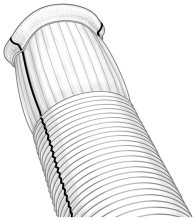


Figure 8: Sewing Ring Back Markers

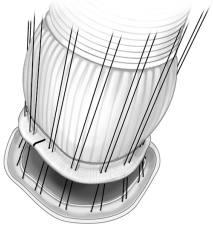


Figure 9: Non-everting Technique

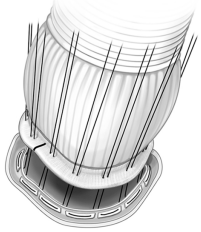


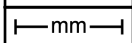
Figure 10: Everting Technique

Figure 11: Single-cut Release Channel in Holder

Figure 12: Wetting the Graft

Symbol Legend

	ISO Reg. No.[1]	English
	2493	Catalog Number
	0434A	Caution
	1641	Consult instructions for use on the website
	1051	Do not re-use
	N/A	Quantity
	2607	Use-by date
	3082	Manufacturer
	N/A	MR Conditional
	N/A	Stain - Do Not Use
	N/A	Droplets - OK to Use

	ISO Reg. No.[1]	English
	2501	Sterilized using ethylene oxide
	2606	Do not use if package is damaged
	N/A	Size
	2724	Non-pyrogenic
	0632	Store between 10 °C and 25 °C
	2498	Serial Number
	N/A	Graft Length
Rx only	N/A	Caution: Federal (USA) law restricts this device to sale by or on the order of a physician.
	N/A	Do not use product if indication is shown
	N/A	Use product if indication is shown

[1] ISO 7000 *Graphical symbols for use on medical equipment - Registered symbols*

Note: The labeling of this product may not contain every symbol depicted in the legend.

Edwards

05/2020
DOC-0144059 A / 10016319001 A

Edwards Lifesciences LLC
One Edwards Way
Irvine, CA 92614 USA

Telephone 949.250.2500
800.424.3278
FAX 949.250.2525

Web IFU