Amnis Therapeutics

aneugraft® Nx

Biocompatible Pericardium Covered Stent

CE 0344

INSTRUCTIONS FOR USE

STERILE - Ethylene Oxide Sterilized.

For single use only. Do not re-sterilize.

The clinical techniques and procedures described here do not represent all medically accepted ENDOVASCULAR procedures nor are they intended as a substitute for physician experience. THEY are offered to clinicians as a guide.

1. INTRODUCTION

Physicians are using covered stent grafts in a variety of endovascular procedures (cardiovascular, peripheral vascular and neurovascular). Covered stents are placed in damaged vessels via a balloon expandable delivery catheters (during Percutaneous Transluminal Angioplasty, PTA) in order to expand the stent's cover along the vessel wall, thus excluding any disruption in the vessel wall while restoring or maintaining patency to the vessel.

The AneugraftNx is a Pericardium Covered Stent designed for intraluminal chronic placement where an overlay of a cover on the vessel wall is beneficial. This stent addresses the need of an immediate lesion occlusion and provides an arterial reconstruction specifically in the neuro vasculature. Importantly, implantation of a covered stent graft across an intracranial aneurysm neck has evolved to be a promising endovascular technique, allowing for the exclusion of the aneurysm sac, while preserving the native artery. AneugraftNx can be also used in emergency cases of perforation / dissection and other life threatening acute events.

2. DEVICE DESCRIPTION

AneugraftNx (Figure 1) consists of one flexible laser cut stent (made of implantable high grade surgical stainless steel 316L) combined with one piece of pericardial tissue that has been selected for minimal tissue blemishes. The tissue is treated with a glutaraldehyde process, which cross links the collagen fibers and minimizes antigenicity and is attached to the stent with polypropylene suture. The pericardium tissue sleeve partially covers the stent, leaving the stent edges uncovered. The sleeve is circumferential and is mounted in the center of the stent. To visualize the covered section of the stent under fluoroscopy a platinum wire is added to the pericardium sleeve. This wire is placed along the tissue sleeve suture line and its length is 0.5mm shorter than the sleeve (0.25mm from distal side and 0.25mm from proximal side).

The stent assembly is mounted on a balloon catheter, specially designed for tortuous vessels, that hosts the AneugraftNx stent design. AneugraftNx PCS is ethylene oxide sterilized.

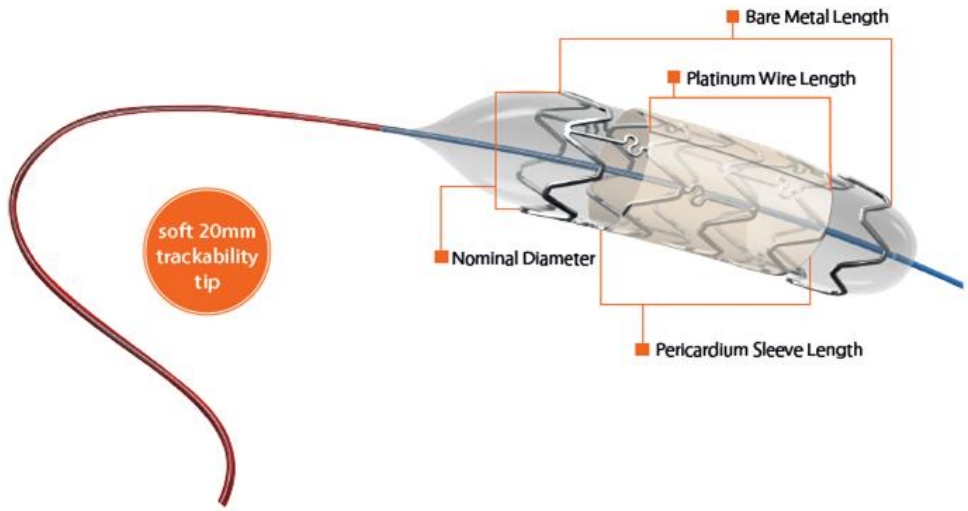

Figure 1. The AneugraftNx PCS.

3. HOW SUPPLIED

AneugraftNx is packaged in a balloon catheter dispenser and then placed in a medical pouch, suitable for EO sterilization. It is finally packaged in the AneugraftNx box. The sterility is maintained inside of the pouch unless the pouch is damaged or opened.
This product is intended for single use only. Do not resterilize. Doing so may damage the balloon catheter or tissue cover and render the product unfit for use. Do not use if the pouch is damaged or opened.

Box Content:

- One (1) AneugraftNx stent in a sealed sterile pouch
- One (1) Flushing needle
- One (1) Instructions for Use manual

3.1 Storage

AneugraftNx should be stored at temperatures between 4°C - 40°C (39°F - 104°F). **REFRIGERATION IS NOT REQUIRED**. **LONG TERM EFFECTS OF STENT FREEZING HAVE NOT BEEN STUDIED.**

4. COMPATIBILITY

AneugraftNx is compatible with the following:

- Guiding catheter with minimum I.D. 0.070" (1.78 mm)
- 0.014" (0.36 mm) guide wire
- large lumen "Y" connector (i.e. 0.125" (3.2 mm))
-

5. INDICATIONS

The AneugraftNx Equine Pericardium Covered Stent is designed for intraluminal chronic placement where overlay of a cover on the vessel wall is required specifically to be used in the neuro vasculature.

6. CONTRAINDICATIONS

AneugraftNx is contraindicated for the following patients:
Patients with hemorrhagic diathesis or other disorders in which the application of anticoagulant or antiplatelet therapy is contra-indicated (peptic ulceration, stroke complications, etc.); imminent thrombus formation and alteration of flow after myocardial infarction; Patients with proximal atherosclerosis and/or vessel in whom guidewire access and adequate guiding catheter support is prohibited; Patients in whom adequate pre-dilatation of the lesion site is not possible; Patients in whom the necessary medication is contra-indicated; direct stenting; severe allergic reaction to the contrast medium; severe allergic reaction to the stent materials.
The fixed pericardium used in making AneugraftNx has no known contraindications.

7. POTENTIAL COMPLICATIONS AND ADVERSE EFFECTS

During the stent implantation, complications and adverse effects similar to those experienced during a standard endovascular procedure or regular stent placement may occur. Groin hematoma, pseudoaneurysm, intracranial and gastrointestinal hemorrhages, cardiac arrhythmia, angina pectoris, acute myocardial infarction, side branch occlusion, vascular thrombosis, acute or sub acute closure of vessel, acute or sub acute closure of stent, distal emboli (air, particle, thrombus), vessel perforation, ventricular flutter and fibrillation, haemolysis, subscribed tissue reaction, fever, inflammation, spasm, hematuria, adverse effects related to drug protocol, death. The principal complications, which have been reported for pericardial tissue, are fibrosis and infection. These complications are observed only in a small minority of patients after implantation of the pericardial tissue and are minimized with the proper handling of the product.

8. DIRECTIONS FOR USE:

8.1. Prior to use:

- Select the correct AneugraftNx PCS (Pericardium Covered Stent) size as appropriate for the procedure being performed. For that purpose, use the AneugraftNx size chart (Figure2).

PART NUMBER	STENT DIAMETER (mm)	BARE METAL STENT LENGTH (mm)	PERICARDIUM SLEEVE LENGTH (mm)	PLATINUM WIRE LENGTH (mm)
PWS2555E	2.5	13	5.5	5.0
PWS2579E	2.5	13	7.9	7.4
PWS3005E	3.0	13	5	4.5
PWS3009E	3.0	13	9	8.5
PWS3011E	3.0	18	11.2	10.7
PWS3505E	3.5	13	5	4.5
PWS3509E	3.5	13	9	8.5
PWS3511E	3.5	18	11.2	10.7
PWS4005E	4.0	13	5	4.5
PWS4009E	4.0	13	9	8.5
PWS4011E	4.0	18	11.2	10.7

Figure 2. The AneugraftNx size chart.

- Carefully inspect the pouch for damage. **DO NOT USE AneugraftNx IF THE PACKAGE IS DAMAGED. Select a new one for the procedure.**
- Before opening the AneugraftNx package, examine the expiration date indicated on the pouch label. If the product has expired DO NOT USE THE PRODUCT. Select a NON expired product.
- After opening the pouch, carefully retrieve the stent from the balloon catheter dispenser. Inspect the balloon catheter and ensure it is free of kinks.
- Do not remove the stent from the delivery balloon. Removal may damage the stent and/or lead to stent embolization. The stent system is intended to perform as a system. Stent manipulation (e.g., rolling the mounted stent with your fingers) may loosen the stent from the delivery system balloon and cause dislodgment.
- Using the needle provided, flush twice the guide wire lumen with clean saline.
- Mount the balloon catheter with the AneugraftNx covered stent on the guide wire and advance just proximal to the haemostatic valve.

8.2. PreDilation:

At your discretion you may pre-dilate the lesion with a balloon of appropriate size prior to using AneugraftNx if found necessary.

8.3. Delivery process:

- Introduce the balloon mounted AneugraftNx through the valve. Do not use “push button” like hemostatic valves. Fully open the hemostatic valve. Introduce and retrieve the tip of a vessel dilator to ensure adequate opening of the valve.
- Slowly advance while flushing gently with contrast to avoid air being aspirated into the guiding catheter.

- As soon as the proximal end of the balloon has reached the hub of the guiding catheter, verify under fluoroscopy that no air bubbles are inside the guiding catheter.
- DO NOT inject contrast material or saline while the AneugraftNx is still inside the guiding catheter. Injections of saline or contrast should be done only once the covered stent has exited the guiding catheter.
- Confirm adequate guiding catheter position and advance the AneugraftNx to the desired site for deployment following the hospital standard procedure for stent implantation.
- Expansion of the stent should be performed according to the table below (Figure 3):

Pressure (atm)	Ø2.5	Ø3.0	Ø3.5	Ø4.0
4	2.47	2.97	3.47	3.97
***5**	**2.50**	**3.00**	**3.50**	**4.00**
6	2.53	3.03	3.53	4.03
7	2.57	3.06	3.53	4.06
8	2.60	3.10	3.60	4.10
9	2.64	3.14	3.64	4.14
10	2.68	3.18	3.68	4.18
11	2.71	3.22	3.72	4.21
12	2.75	3.25	3.75	4.25
13	2.79	3.29	3.79	4.28
14	2.83	3.33	3.83	**4.32**
15	**2.87**	**3.37**	**3.87**	4.36
16	2.91	3.41	3.91	4.40
17		3.45	3.95	4.45
18		3.50	4.00	4.50
19		3.56	4.06	4.56
20		3.62	4.12	4.62

* Minimum deployment pressure. Full stent opening ≤ 9 atm.

Nominal Pressure
Rated Burst Pressure (RBP)

Figure 3

The nominal pressure in the compliance chart specifically relates to the inflation pressure versus diameter characteristics of the balloon. Therefore, applicable only during the inflation process and until the stent reaches its fully opened state to the overhang section between the stent edge and the balloon shoulder. Once the stent reaches its fully opened state, the chart is applicable to the entire balloon/stent segment.

After the stent has reached its target site and is positioned correctly across the lesion (using a platinum wire marker that indicates the location of the stent covered part) stent inflation takes place, due to the common dogbone effect, as follows:

1. First phase: The unconstrained balloon catheter edges inflate ("edges first" shape, as shown in the figure 4 below).
2. Second phase: The uncovered bare metal stent edges are opened.
3. Third phase: The stent covered part is fully opened.

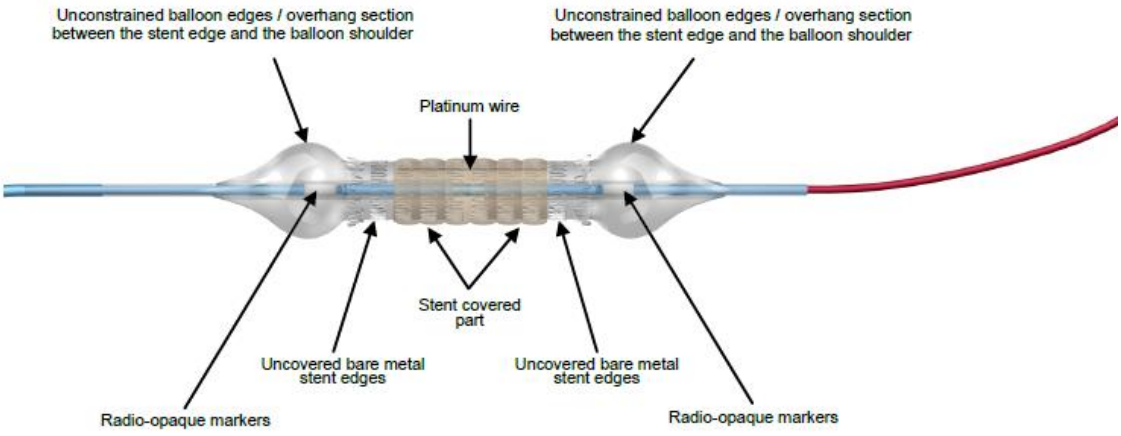

Figure 4. The AneugraftNx Inflation Process ("edges first" shape)

- **Do not attempt to pull an unexpanded stent back through the guiding catheter, as dislodgment of the stent from the balloon may occur.** Should **unusual resistance** be felt **at any time** during either lesion access or removal of the stent delivery system before stent implantation, the entire system **should be removed as a single unit.**
- Before withdrawing the delivery system, visually confirm complete balloon deflation by fluoroscopy. Failure to do so may cause vessel / arterial damage.
- **OVER EXPANSION of the AneugraftNx PCS WILL SERIOUSLY DAMAGE THE COVERING TISSUE**. If further to deployment expansion or high-pressure inflation is needed, use a second balloon of suitable size and proceed as on a regular stent but NOT exceeding the stent nominal diameter by more than indicated in the table below. Do NOT inflate the provided balloon above the maximum allowed pressure.

  Use the following reference compliance table for the maximal expansion diameter:

NOMINAL DIAMETER (mm)	MAXIMUM DIAMETER (mm)
2.5	2.9
3.0	3.5
3.5	4.0
4.0	4.6

9. WARNINGS

- AneugraftNx is for **SINGLE USE ONLY**.
- All persons responsible for the handling and preparation of AneugraftNx must exercise utmost care to avoid damaging it.
- Do not handle AneugraftNx with traumatic forceps.
- Do not attempt to re-sterilize an AneugraftNx.
- Do not inflate the provided balloon above the maximum allowed pressure.
- Do not expose AneugraftNx to steam, ethylene oxide, chemical or radiation (gamma/electron beam) sterilization.
- The implantation of a stent requires advanced technical skills and expertise. It is beyond the scope of these Instructions for Use manual to instruct the physician in specific endovascular procedures. Amnis Therapeutics Ltd assumes that any interventionalist performing the above procedures has received adequate training and is thoroughly familiar with the pertinent scientific literature.
- AneugraftNx should be used only by physicians, specifically trained in endovascular procedures. The medical techniques and procedures described here do not represent all medically accepted stent implantation procedures, nor are they intended as a substitute for the physician's training and experience, but are offered to clinicians as a guide.
- Stent placement should only be performed at hospitals where surgical emergency can be readily performed. Administration of appropriate medication is critical to successful stent implantation and follow-up in order to minimize potential complications and adverse effects. Guidelines for an appropriate medication protocol before, during and after stent implantation should be based on experiences and routine in your clinic. Post procedural treatment with anti-thrombotics should be at least for 3 months. This device is not intended as a direct stenting device. Previous artery balloon dilatation is recommended.

10. PRECAUTIONS

- A review of the existing literature shows that the AneugraftNx is MR conditional at field strengths of 3 Tesla (T) or less.
- Do not perform Magnetic Resonance Imaging (MRI) scan on patients' post-stent implantation until the stent has been completely endothelialized (eight weeks) to minimize the potential for migration. The stent may cause artifacts in MRI scans due to distortion of the magnetic field.
- At this time, the long-term durability of fixed pericardial tissue is unknown. The clinical advantages in using this material along with its known characteristics must be weighed against its current undetermined long-term durability.
- To avoid the possibility of dissimilar metal corrosion, do not implant stents of different materials in tandem where overlap or contact is possible
- The use of Tandem stents in aneurysms has not been verified.
- Do not induce a vacuum on the delivery system prior to reaching the target lesion.

11. DISCLAIMER OF WARRANTS

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SYMBOLS

ATTENTION: SEE IFU	STORE BETWEEN 4°C-40°C (39°F-104°F)	GUIDEWIRE	GUIDING CATHETER
USE BY DATE	STERILIZED BY ETHYLENE OXIDE (EO)	LOT NUMBER	MANUFACTURER
SINGLE USE ONLY	RAPID EXCHANGE	CATALOG NUMBER	DO NOT USE IF PACKAGE IS DAMAGED
DO NOT RE-STERILIZE			

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