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Advanced Architecture for **Cardiovascular Surgery**



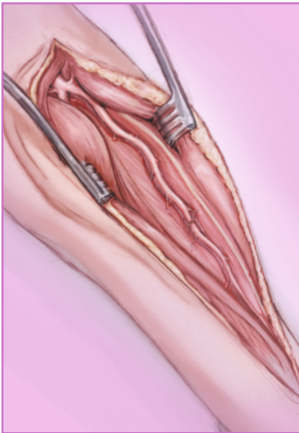
Advanced MedTech Solutions

advancing the way we care



Coronary Artery Bypass Graft Procedure

Graft Harvesting

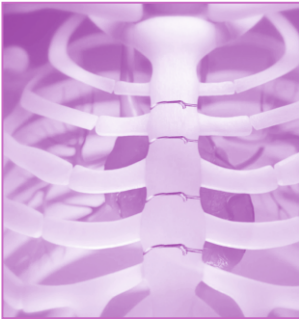


The Saphenous Vein and Internal Mammary Artery are the two most common bypass grafts used for the CABG procedure. The Saphenous Vein is harvested from the leg and LIMA is diverted from the chest wall to the coronary artery beyond the blockage.

INDICATIONS: ADVACRYL suture is indicated for use in general soft tissue approximation and/or ligation, including use in ophthalmic surgery, peripheral nerve anastomosis & micro surgery for vessels less than 2 mm diameter, but not for cardiovascular tissues.

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Transfix Ligature	ADVASYL	2-0	NA	NA	ADVA213, ADVA223
Deep Dermal Closure	ADVAMRYL	3-0	CT	3/8 Circle	ADVA1326
Subcutaneous Closure	ADVAMRYL	3-0	CT, RC	3/8 Circle	ADVA1326, ADVA3326M
Skin Closure	ADVALON ADVAMRYL	3-0	RC, CT	3/8 Circle	ADVA3328, ADVA1326

Median Sternotomy



Surgeons make 8-10 inch incision and retractor is used to hold the chest open.

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Transfix Ligature	ADVASYL	2-0	NA	NA	ADVA213, ADVA223
Skin Closure	ADVALON ADVAMRYL	3-0	RC, CT	3/8 Circle	ADVA3328, ADVA1326

Cardio - Pulmonary Bypass

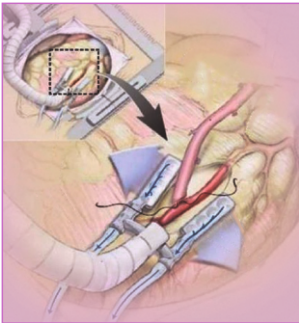


Pericardium is retracted and patient is placed on a heart-lung bypass machine. Cardioplegia is introduced so that the heart can be safely stopped for the procedure.

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Pericardium Retraction	ADVASYL	0, 2-0	RB	1/2 Circle	ADVA5332, ADVA5331
Bypass Cannulation	ADVALENE	3-0	RB	1/2 Circle	ADVA8522
Cardioplegia Cannulation	ADVALENE	4-0	CT	1/2 Circle	ADVA8845
Closure of Right Atrium & Aortotomy	ADVALENE	5-0	CT	1/2 Circle	ADVA8803, ADVA8664



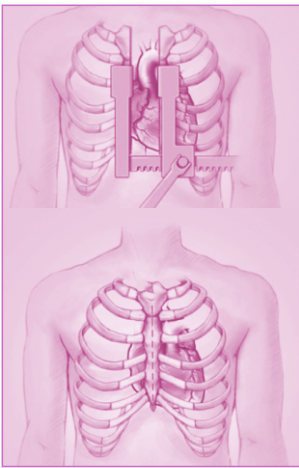
Graft Anastomosis



Grafts are stitched into the coronary arteries to bypass the blockage. Proximal and distal anastomosis are made with the graft material.

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Proximal Anastomosis	ADVALENE	5-0, 6-0	RB, CT	3/8 Circle	ADVA8321, ADVA8707, ADVA8307*
Distal Anastomosis - GSV	ADVALENE	6-0, 7-0	RB	3/8 Circle	ADVA8597, ADVA811
Distal Anastomosis - Mammary Artery	ADVALENE	7-0, 8-0	RB	3/8 Circle	ADVA8304, ADVA8735, ADVA8741, ADVA8732
Distal Anastomosis - Artificial Grafts	ADVALENE	6-0, 7-0	RB	3/8 Circle	ADVA8597, ADVA811

Chest Closure



Clamps on the aorta are removed, tubes are disconnected and blood flow to heart is restored. Chest tubes are inserted to drain the fluid and temporary pacing wires are placed. The skin layers are closed.

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Temporary Pacing Leads	ADVALENE	4-0	CT	3/8 Circle	ADVA815, ADVA816
Pericardial Closure (Optional)	ADVALENE	2-0, 3-0	TC, RB	1/2 Circle	ADVA8977, ADVA8522
Sternum Closure	ADVASTEEL	5, 6	CT, RB	1/2 Circle, 3/8 Circle	ADVA653, ADVA9495, ADVA9654, ADVA9456
Skin Closure Fascia	ADVAMRYL	3-0	CT, RC	3/8 Circle	ADVA1326, ADVA3326M
Skin Closure - Subcutaneous	ADVALON	4-0, 1, 2-0	RC	3/8 Circle, 1/2 Circle	ADVA3326, ADVA3338, ADVA3336
Drain Fixation	ADVASYL	2-0, 3-0, 0	RB, RC	1/2 Circle, 3/8 Circle	ADVA5331, ADVA5028, ADVA5037

TP - Taper Point	TC - Taper Cut	CT - Cutting	RB - Round Bodied
RC - Reverse Cutting	▲ ADVAPRIME	● ADVAGUARD	* ADVABLACK



Valve Replacement Procedure

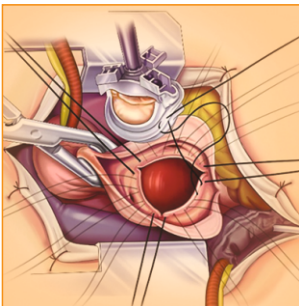
Median Sternotomy



Surgeons make 8-10 inch incision and retractor is used to hold the chest open. Top Bone Hemostasis Code: Bone Wax (BW - 2.5 Grams)

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Transfix Ligature	ADVASYL	2-0	NA	NA	ADVA213, ADVA223
Skin Closure	ADVALON	4-0, 1	RC	3/8 Circle, 1/2 Circle	ADVA3326, ADVA3338

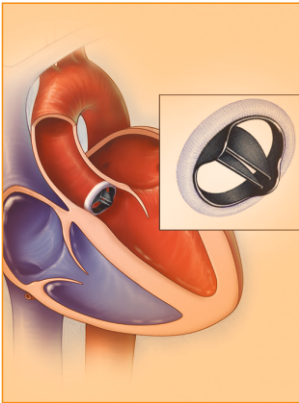
Valve Replacement



Pericardium is retracted, heart is cannulated and patient is placed on a heart-lung bypass machine. Cardioplegia is introduced so that the heart can be safely stopped.

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Pericardium Retraction	ADVASYL	0, 2-0	RB	1/2 Circle	ADVA5332, ADVA5331
Bypass Cannulation	ADVALENE	3-0	RB	1/2 Circle	ADVA8522
Cardioplegia Cannulation	ADVALENE	4-0	CT	1/2 Circle	ADVA8845

Aortic Valve Replacement

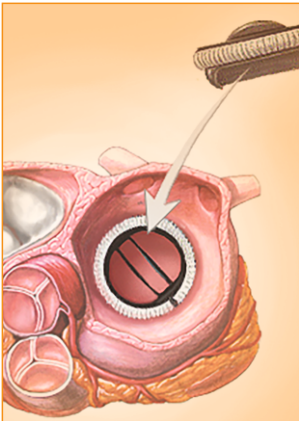


An opening is made and traction sutures are placed. The aortic valve leaflets are then accessed. A mechanical or biological valve is placed, using 12-18 sutures (alternate colors – Green and White ADVABOND 2-0). The alternating combination of green and white sutures helps in keeping the order correct. The mechanical or biological valve is glided down and secured with sutures. Once the new valve is placed, the opening in the aorta is closed.

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Traction Sutures on Aortotomy	ADVALENE	4-0	TC	1/2 Circle	ADVA8935
Aortic Valve	ADVABOND	2-0	TC	1/2 Circle	ADVA10B55, ADVA10B55PL3
	ADVABOND	2-0	TC	1/2 Circle	ADVA617, ADVA617A
Closure of Aortotomy	ADVALENE	3-0, 4-0	RB, TC	1/2 Circle	ADVA8558, ADVA8935
Closure of Right Atrium & Aortotomy	ADVALENE	5-0, 3-0, 4-0	CT, RB, TC	1/2 Circle	ADVA8803, ADVA8664, ADVA8558, ADVA8935



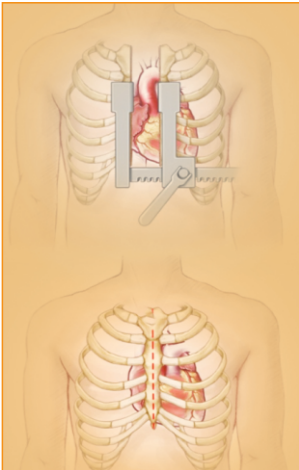
Mitral Valve Replacement



An opening is made and traction sutures are placed. The mitral valve leaflets are then accessed. A mechanical or biological valve is placed, using 16-18 sutures (alternate colors – Green and White ADVABOND 2-0). The alternate combination of green and white sutures helps in keeping the order correct. The mechanical or biological valves is glided down and secured with sutures.

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Mitral Valve	ADVABOND	2-0	TC	1/2 Circle	ADVA10B77, ADVA687, ADVA687A
Closure of Left Atrium	ADVALENE	5-0	CT	1/2 Circle	ADVA8803, ADVA8664
Closure of Right Atrium & Aortotomy	ADVALENE	5-0, 3-0, 4-0	CT, RB, TC	1/2 Circle	ADVA8803, ADVA8664, ADVA8558, ADVA8935

Chest Closure

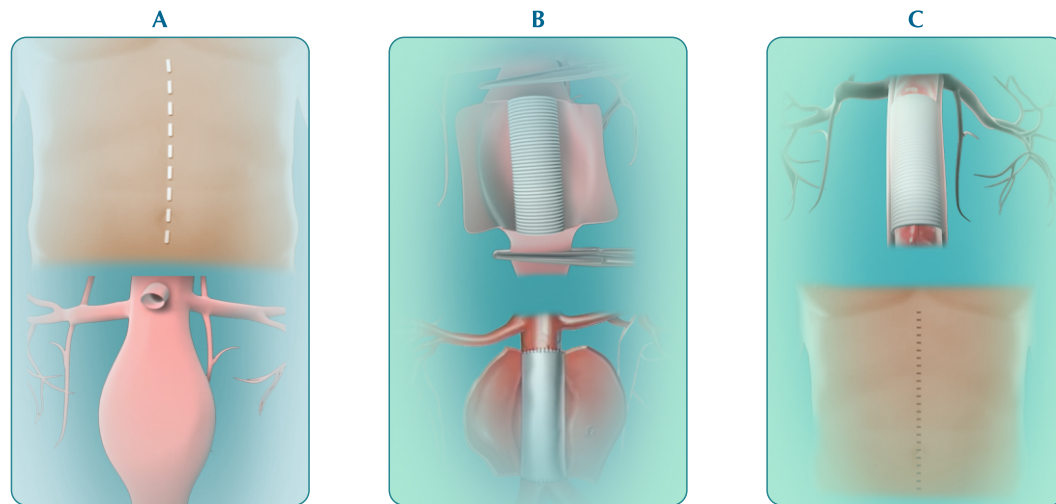


Clamps on the aorta are removed, tubes are disconnected and blood flow to the heart is restored. Chest tubes are inserted to drain fluid and temporary pacing wires are placed. The skin layers are closed.

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Temporary Pacing Leads	ADVALENE	4-0	CT	3/8 Circle	ADVA815
Pericardial Closure (Optional)	ADVALENE	2-0, 3-0	TC, RB	1/2 Circle	ADVA8977, ADVA8522
Sternum Closure	ADVASTEEL	5, 6	CT, RB	1/2 Circle, 3/8 Circle	ADVA653, ADVA9495, ADVA9654, ADVA9456
Skin Closure Fascia	ADVAMRYL	3-0	CT, RC	3/8 Circle	ADVA1326, ADVA3326M
Skin Closure Subcuticular / Epidermis	ADVALON	4-0, 1	RC	3/8 Circle, 1/2 Circle	ADVA3326, ADVA3338
Drain Fixation	ADVASYL	2-0	RB	1/2 Circle	ADVA5331

TP - Taper Point	TC - Taper Cut	CT - Cutting	RB - Round Bodied
RC - Reverse Cutting	▲ ADVAPRIME	● ADVAGUARD	* ADVABLACK

Abdominal Aortic Aneurysm (AAA) - Open Approach



A midline vertical incision is made in the abdomen (A). The intestines are pulled out to expose the aneurysm site. Arteries above and below are clamped to stop blood flow & an artificial graft stiched to proximal and distal end for blood flow restoration (B). All layers closed separately (C).

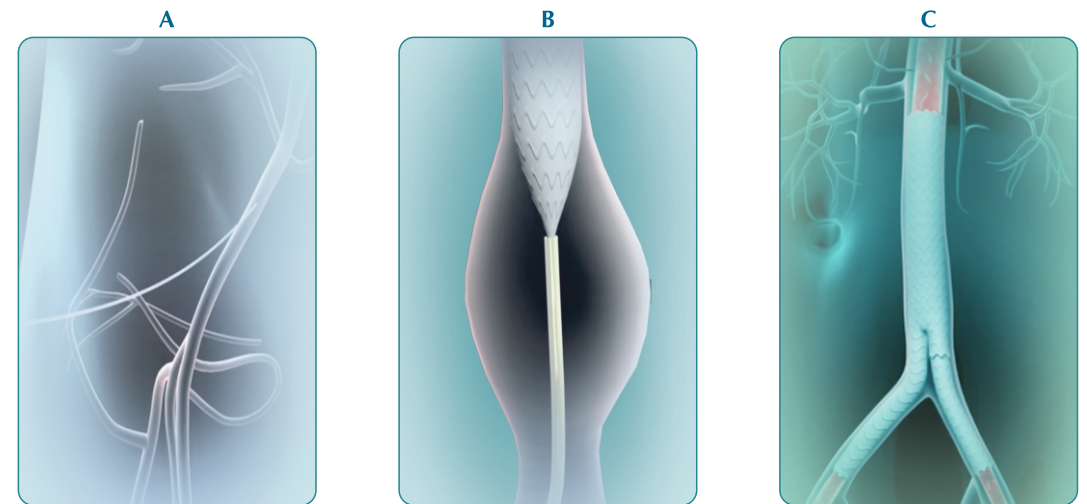
Anastomosis

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Proximal Anastomosis	ADVALENE	2-0, 3-0	Taper Cut, Taper Point	1/2 Circle	ADVA8937, ADVA8558
Distal Anastomosis	ADVALENE	2-0, 3-0	Taper Cut, Taper Point	1/2 Circle	ADVA8977, ADVA8522

Closure

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Posterior Fascia	ADVALENE	1	Round Bodied	1/2 Circle	ADVA834
	ADVACRYL	1	Round Bodied	1/2 Circle	ADVA2347
Anterior Fascia	ADVAPD	1	Round Bodied	1/2 Circle	ADVA9248
	ADVALENE	0	Round Bodied	1/2 Circle	ADVA833
	ADVACRYL	0	Round Bodied	1/2 Circle	ADVA2338
	ADVAPD	0	Round Bodied	1/2 Circle	ADVA9371
Skin Closure (Deep Dermal)	ADVACRYL	2-0	Round Bodied	1/2 Circle	ADVA2317
	ADVAMRYL	2-0	Round Bodied	1/2 Circle	ADVA1641
Skin Closure (Subcutaneous/Epidermis)	ADVAMRYL	3-0	Cutting	3/8 Circle	ADVA1326
	ADVALON	3-0	Cutting	3/8 Circle	ADVA3321

AAA - Endovascular Approach (EVAR)



A Mc Burney incision made on lower abdomen (A). A catheter is introduced to place stent on aneurysm site (B). Catheter removed after placement of stent and blood flow restoration (C).

Endovascular Aneurysm Repair (EVAR)

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Closure of Port Defect	ADVACRYL	1	Reverse Cutting	1/2 Circle	ADVA2826, ADVA2826E
Skin	ADVACRYL	3-0	Round Bodied	1/2 Circle	ADVA2437

TP - Taper Point

TC - Taper Cut

CT - Cutting

RB - Round Bodied

RC - Reverse Cutting

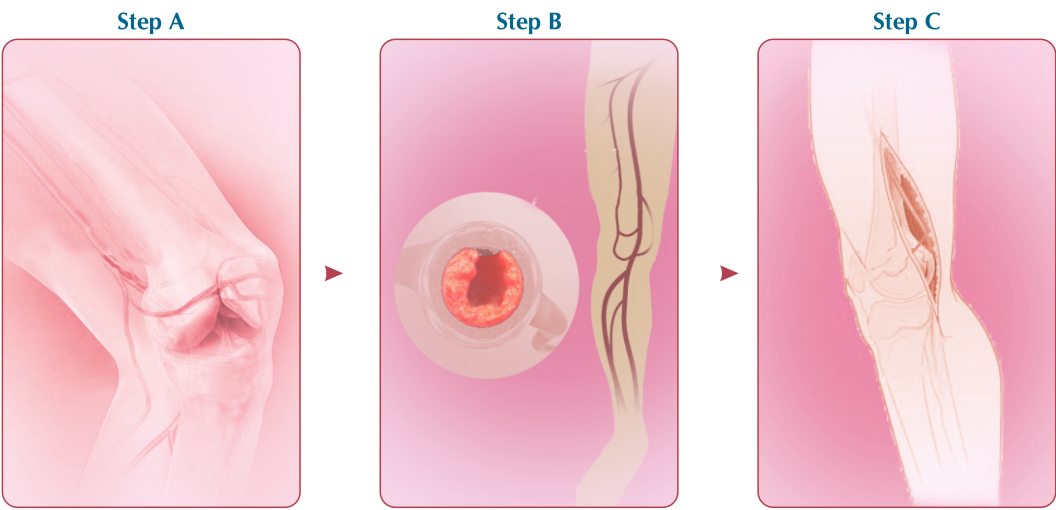
▲ ADVAPRIME

● ADVAGUARD

* ADVABLACK



Femoral - Popliteal Bypass Procedure



A vertical incision is made on thigh to access the surgical site (A). Length of obstruction is determined (B). An artificial graft anastomosed at proximal and distal end (C). All layers are closed separately.

Ligation

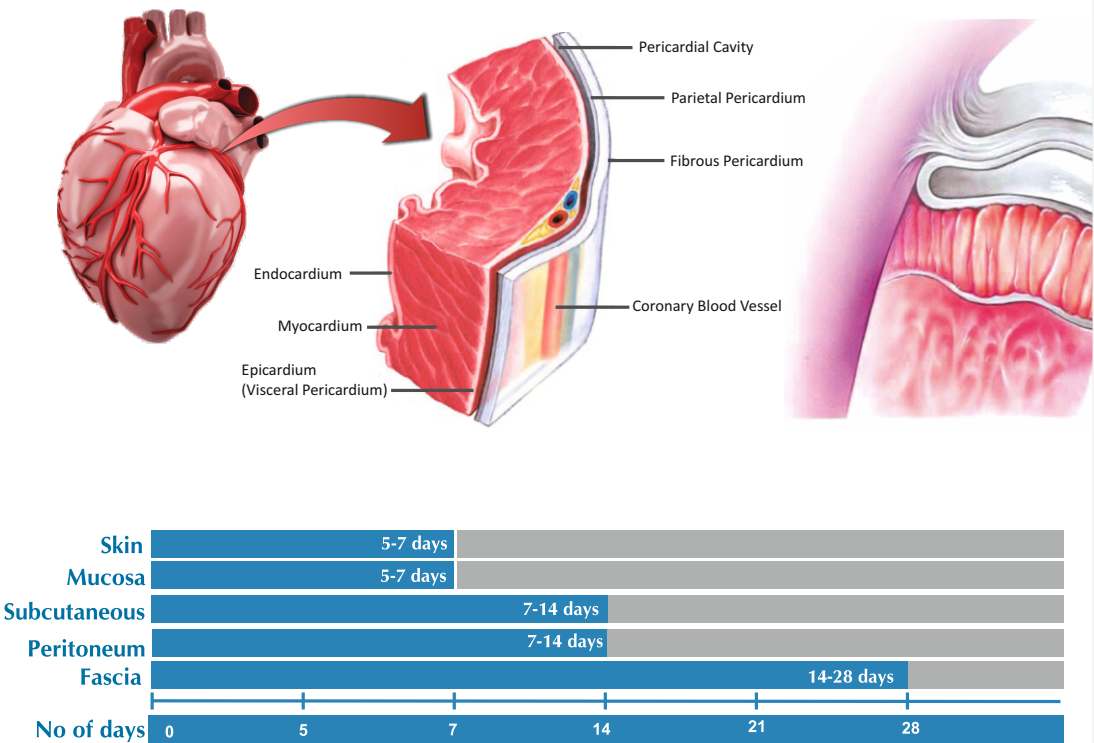
Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Transfix Ligation	ADVASYL	2-0	NA	NA	ADVA213, ADVA223
Ligation	ADVALON	4-0, 1	Reverse Cutting	3/8 Circle, 1/2 Circle	ADVA3326, ADVA3338

Graft Anastomosis

Layer	Suture Material	Suture Size	Needle Tip	Needle Curvature	Product Code
Proximal Anastomosis	ADVALENE	5-0, 6-0	Round Bodied, Cutting	3/8 Circle	ADVA8321, ADVA8707, ADVA8307*
Distal Anastomosis (Saphenous Vein)	ADVALENE	6-0, 7-0	Round Bodied	3/8 Circle	ADVA8597, ADVA811^
Skin Closure - Intradermal	ADVAMRYL	3-0	Cutting, Reverse Cutting	3/8 Circle	ADVA1326, ADVA3326M
Skin Closure - Percutaneous	ADVALON	4-0, 1, 2-0	Reverse Cutting	3/8 Circle, 1/2 Circle	ADVA3326, ADVA3338, ADVA3336

TP - Taper Point	TC - Taper Cut	CT - Cutting	RB - Round Bodied
RC - Reverse Cutting	▲ ADVAPRIME	● ADVAGUARD	* ADVABLACK

The Suture Choice is Dependent Upon Critical Wound Healing Period of the Tissue



Critical Wound Healing Time Period

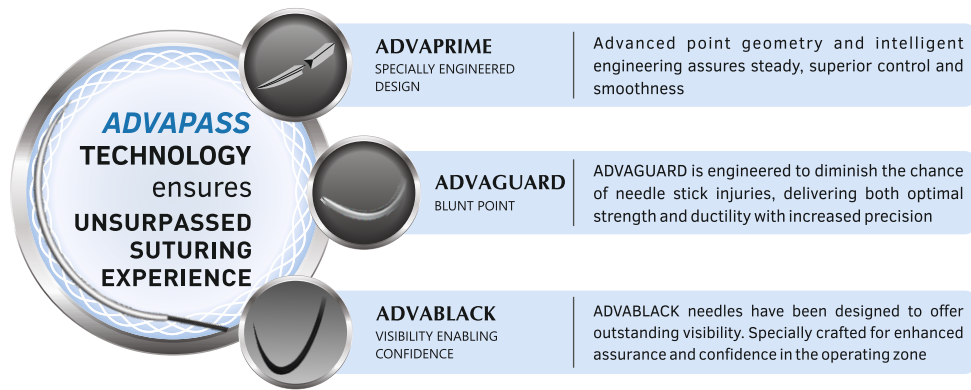
Product Categories

	ADVACRYL	ADVAMRYL	ADVAPD	ADVALENE	ADVABOND	ADVALON	ADVASYL	ADVASTEEL	ADVAWAX
Composition	90% Glycolide, 10% L-lactide Braided Coated Synthetic Absorbable Surgical Suture	Polyglactone 25 Monofilament Synthetic Absorbable Surgical Suture	Polydioxanone Monofilament Synthetic Absorbable Surgical Suture	Polypropylene Monofilament Synthetic Non-Absorbable Surgical Suture	Polyethylene Terephthalate Braided Coated Synthetic Non-Absorbable Surgical Suture	Polyamide / Nylon Monofilament Synthetic Non-Absorbable Surgical Suture	Proteinaceous Silk Fibers called Fibroin, Braided Natural Non-Absorbable Surgical Suture	316 LVM Monofilament Stainless steel Non-Absorbable Surgical Suture	Sterilized Bonewax
Tensile Strength (in days)	70% - 14 days 50% - 21 days 20% - 28 days	Dyed 60% - 7 days 40% - 14 days 40% - 14 days (4-0) Undyed 55% - 7 days 20% - 14 days 15% - 14 days (4-0)	80% - 14 days 70% - 28 days 45% - 42 days	Permanent	Gradual encapsulation of suture by fibrous connective tissue	Gradual loss in tensile strength over a period of time. Gradual encapsulation of suture by fibrous connective tissue	Gradual loss in tensile strength over a period of time. Gradual encapsulation of suture by fibrous connective tissue	Permanent	N/A
Mass Absorption* (in days)	Upto 80	Upto 90	180 - 220	Non-Absorbable	Non-Absorbable	Non-Absorbable	Non-Absorbable	Non-Absorbable	Non-Absorbable
Sizes	U.S.P. Size 2 to 6-0	Size1 to 5-0	Size 1 to 5-0	U.S.P. Size 1 to 9-0	Size 5 to 5-0	U.S.P. Size 1 to 10-0	U.S.P. Size 4 to 8-0	Size 1 to 7	2.5 Grams
Colour	Undyed and Violet	Undyed and Violet	Violet	Blue	White (Undyed) and Green	Black	Black	Undyed	Yellowish - White
Needle Availability	Round Bodied (Taper Point), Ball Point, Cutting, Taper Cut, Trocar, Reverse Cutting, Blunt Point, Oval Round Bodied, Diamond Point & Spatula Micro Point	Round Bodied (Taper Point), Ball Point, Cutting, Taper Cut, Trocar, Reverse Cutting, Blunt Point, Oval Round Bodied, & Diamond Point	Round Bodied (Taper Point), Ball Point, Cutting, Taper Cut, Trocar, Reverse Cutting, Blunt Point, Oval Round Bodied, Diamond Point & Spatula Micro Point	Round Bodied (Taper Point), Ball Point, Cutting, Taper Cut, Trocar, Reverse Cutting, Blunt Point, Oval Round Bodied, Diamond Point & Stemum Reverse Cutting	Round Bodied (Taper Point), Ball Point, Cutting, Taper Cut, Trocar, Reverse Cutting, Blunt Point, Oval Round Bodied, Diamond Point & Spatula Micro Point	Round Bodied (Taper Point), Ball Point, Cutting, Taper Cut, Trocar, Reverse Cutting, Blunt Point, Oval Round Bodied, Diamond Point & Spatula Micro Point	Available as Pre-cut Sutures and Round Bodied (Taper Point), Ball Point, Cutting, Taper Cut, Trocar, Reverse Cutting, Blunt Point, Oval Round Bodied & Diamond Point	Round Bodied (Taper Point), Taper Cut, Cutting, Reverse Cutting & Blunt Point	N/A

*Mass Absorption: Time in days required for suture to be totally absorbed by the body.

Advancing the Science of Cardiovascular Needles

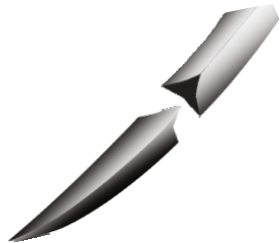
Premium Needles for consistent Superior Performance



ADVAPASS advanced coating technology offers consistency in ease of penetration and maintains needle sharpness and performance from start to finish pass after pass

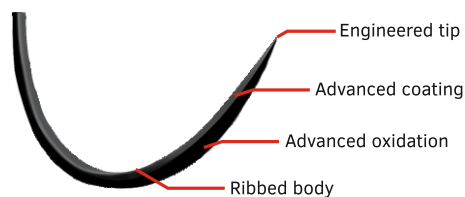
Minimal tissue trauma enables faster recovery

ADVAPRIME



- ◆ Specially engineered point geometry of the needle tip assures enhanced penetration for superior control
- ◆ Premium 300 series SS Alloy ADVAPRIME needles are available both Taper point and Cutting needles
- ◆ Intelligent design offers ease and excellent penetration in Cardiovascular surgeries

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- ◆ ADVABLACK ensures exceptional visibility for steady performance and superior confidence pass after pass

ADVAGUARD



- ◆ Premium 300 series stainless steel alloy blunt point needle delivers optimal strength and ductility to resist bending and breaking
- ◆ ADVAGUARD point geometry allows for easy soft tissue penetration with enhanced precision
- ◆ Innovation solution minimizing bleeding and tissue trauma

