



# Axium™ MicroFX™

Axium PGLA & Axium Nylon  
Detachable Coil System

*No compromise.*

# No Compromise.

Axium™ MicroFX™ which features the unique LatticeFX™ Technology is designed to enhance tissue response in an aneurysm without sacrificing the delivery or packing performance of the coil.

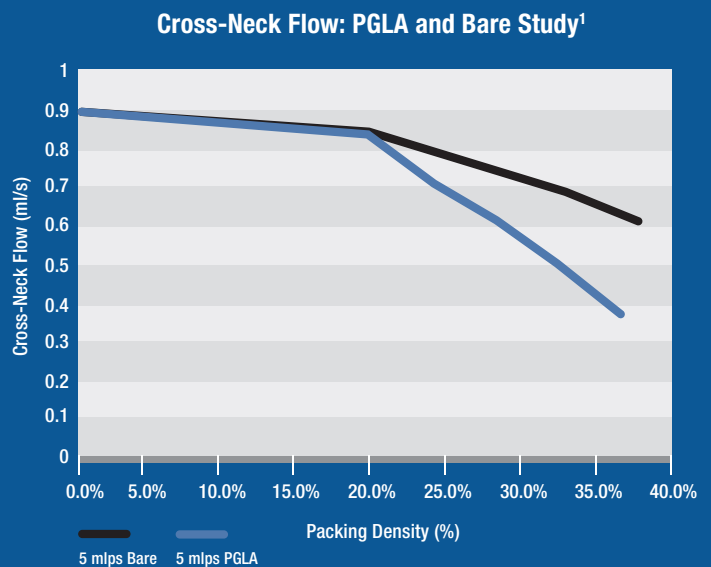
## ► LatticeFX™ Technology

- The LatticeFX or scaffolding serves to orient cell adhesion and extracellular deposition.<sup>1</sup>
- Proper orientation of fibrin serves to enhance cell attachment and migration during wound healing.<sup>3/4</sup>



## ► High Packing Density

- High packing density and interlocked intra-aneurysmal surface area may reduce flow and potentially favor early hemostasis.



## ► Configurations

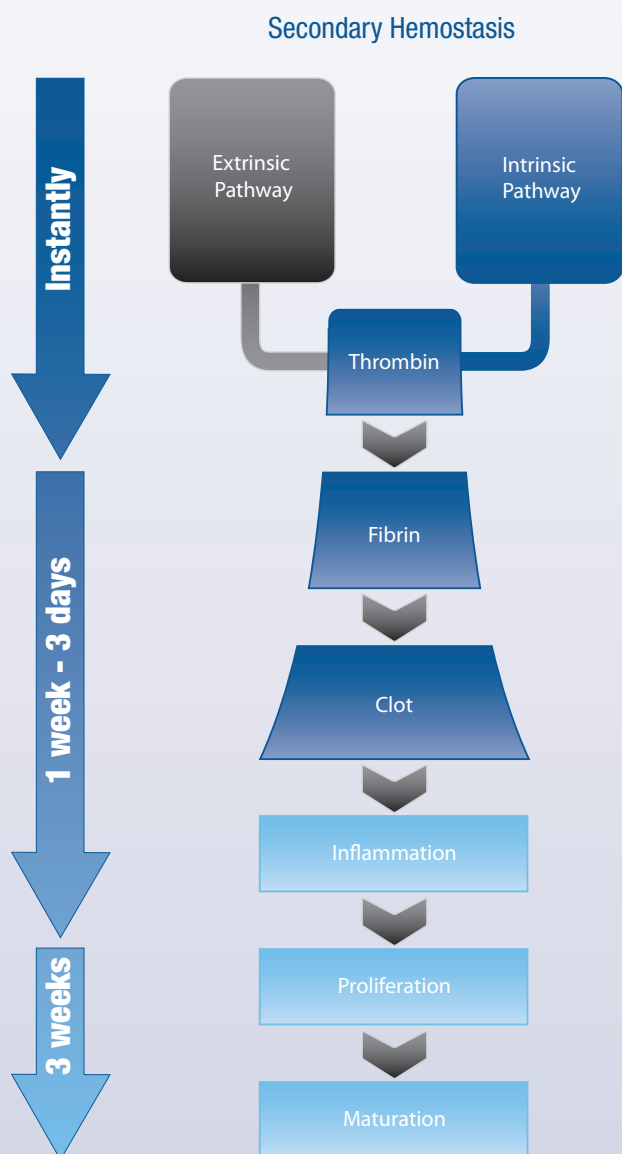
- Axium MicroFX comes in two configurations: PGLA and Nylon. The microfilaments are enlaced through the coil to ensure they are secure and to maintain the packing volume of the coil.



# Wound Healing Process

Healing is the interaction of a complex cascade of cellular events. The healing process begins with coagulation almost instantly after injury to a blood vessel that has damaged the endothelium. Platelets immediately form a plug at the site of injury. This is called primary hemostasis. Secondary hemostasis occurs simultaneously: Proteins in the blood plasma respond in a complex cascade to form fibrin strands, which strengthen the platelet plug.

Following clot formation, the healing process is traditionally explained in terms of 3 classic phases: inflammation, proliferation, and maturation.



## ➤ Intrinsic Coagulation

The initiation of the intrinsic coagulation process is enhanced through contact and absorption of blood proteins with a non-endothelial surface.

## ➤ Critical Elements

The degree of surface roughness and blood absorption is a critical element in determining how a material stimulates the initiation of the intrinsic pathway.

## ➤ Variations

Variation in human physiology and blood chemistry can influence the degree of interaction.

## ➤ Inflammation Phase

In this phase, bacteria and debris are phagocytized and removed as cells migrate to the wound in preparation of the Proliferation Phase.

## ➤ Proliferation Phase

Here the initial formation of granulation tissue by fibroblast, collagen and other cells begins.

## ➤ Maturation Phase

During the maturation phase, collagen becomes increasingly organized.

# Axium™ MicroFX™ Configurations

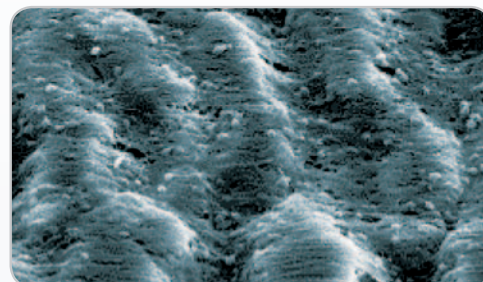
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## ► Axium PGLA Detachable Coil System

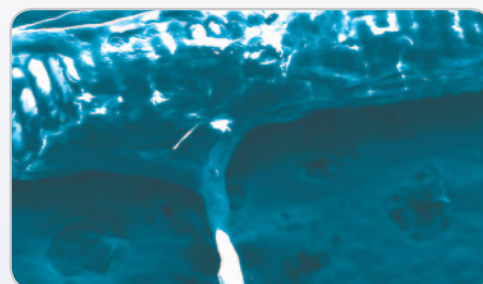
Axium PGLA utilizes a PGLA microfilament that has the potential for accelerated thrombus organization and intra-aneurysmal fibrosis before being absorbed by the body.

Blood interactions which lead to coagulation are dependent on the surface properties of the material. Rough surfaces lend themselves to a higher rate of coagulation, and therefore better thrombogenicity.<sup>2</sup>

- The chemical structure of PGLA creates a mixed, or 'rough' surface.<sup>5</sup>
- The main contributor of roughness in PGLA is the lactic acid chain that creates an alternating pattern of surfaces (like sandpaper).<sup>6/7</sup>
- In contrast, because PGA only includes a glycolic acid component, PGA presents with less rough surface and therefore is less prone than PGLA to induce higher rate of coagulation.<sup>6/7</sup>
- During the proliferation phase the PGLA LatticeFX serves to orient cell adhesion and extracellular deposition.



Scanning electron micrographs of PGLA surface



SEM image of a Axium MicroFX PGLA coil exposed to freshly drawn bovine blood (with 5 units heparin/mL) for one hour

## ► Axium Nylon Detachable Coil System

Axium Nylon utilizes a nylon microfilament which is a non-absorbable material that presents with higher potential for more durable and complete thrombosis.

- Compared to PGLA or PGA, nylon is a more durable material as it is a non-absorbable material which will lead to a more structurally sound lattice effect.<sup>8</sup>
- Proper orientation of fibrin serves to enhance cell attachment and migration during wound healing process.<sup>3/4</sup>



VIS image of nylon microfilaments exposed to freshly drawn bovine blood (5 units heparin/ml) for one hour

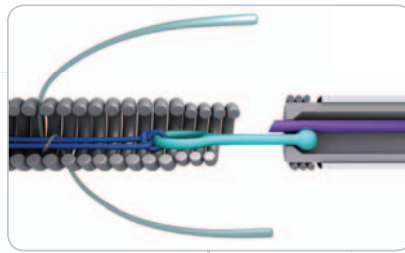
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When Axium Nylon is used in conjunction with Axium PGLA, an ideal environment is potentially created for accelerated and durable thrombus formation.

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## No Compromise to Bare Performance

Axium MicroFX provides the acute performance of an Axium Bare Coil with the added benefit of LatticeFX.



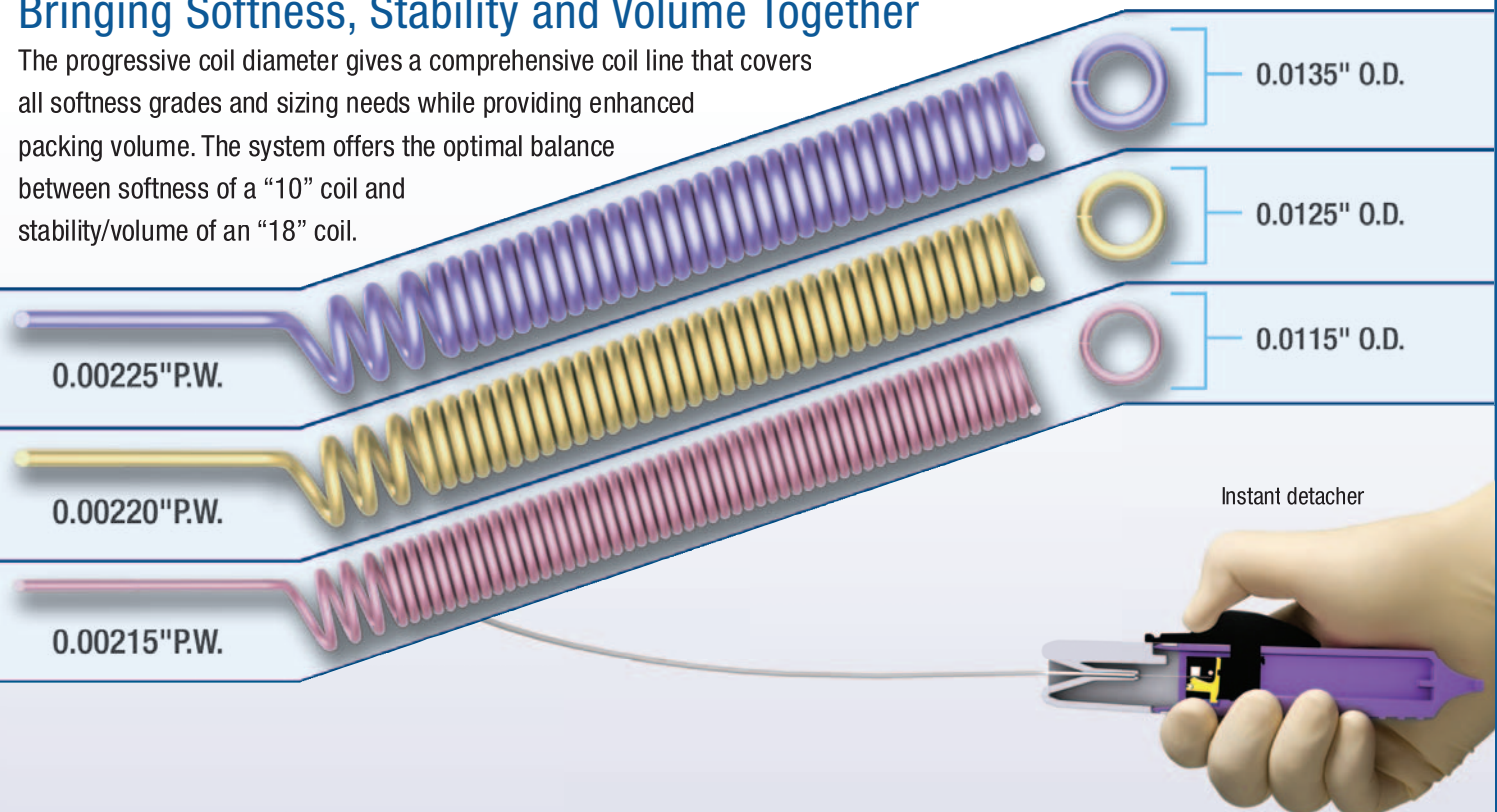
Axium MicroFX also utilizes the articulating detachment zone for a smooth implant-to-pusher transition for less catheter kickout



Axium MicroFX also has a large loop-to-sphere ratio that allows for enhanced conformability and softness

## Bringing Softness, Stability and Volume Together

The progressive coil diameter gives a comprehensive coil line that covers all softness grades and sizing needs while providing enhanced packing volume. The system offers the optimal balance between softness of a “10” coil and stability/volume of an “18” coil.



## Axium™ PGLA and Axium™ Nylon Detachable Coil System

Axium 3D PGLA				Axium Helix PGLA				Axium Helix Nylon			
Order Number	D(mm)	L(cm)	O.D.(in)	Order Number	D(mm)	L(cm)	O.D. (in)	Order Number	D(mm)	L(cm)	O.D.(in)
PC-2-2-3D	2	2	0.0115	PC-2-1-HELIX	2	1	0.0115	NC-2-1-HELIX	2	1	0.0115
PC-2-4-3D	2	4	0.0115	PC-2-2-HELIX	2	2	0.0115	NC-2-2-HELIX	2	2	0.0115
PC-2-6-3D	2	6	0.0115	PC-2-3-HELIX	2	3	0.0115	NC-2-3-HELIX	2	3	0.0115
PC-3-4-3D	3	4	0.0115	PC-2-4-HELIX	2	4	0.0115	NC-2-4-HELIX	2	4	0.0115
PC-3-6-3D	3	6	0.0115	PC-2-6-HELIX	2	6	0.0115	NC-2-6-HELIX	2	6	0.0115
PC-3-8-3D	3	8	0.0115	PC-2-8-HELIX	2	8	0.0115	NC-2-8-HELIX	2	8	0.0115
PC-4-8-3D	4	8	0.0125	PC-3-4-HELIX	3	4	0.0115	NC-3-4-HELIX	3	4	0.0115
PC-4-12-3D	4	12	0.0125	PC-3-6-HELIX	3	6	0.0115	NC-3-6-HELIX	3	6	0.0115
PC-5-10-3D	5	10	0.0125	PC-3-8-HELIX	3	8	0.0115	NC-3-8-HELIX	3	8	0.0115
PC-5-15-3D	5	15	0.0125	PC-4-8-HELIX	4	8	0.0125	NC-4-8-HELIX	4	8	0.0125
PC-6-15-3D	6	15	0.0125	PC-4-10-HELIX	4	10	0.0125	NC-4-10-HELIX	4	10	0.0125
PC-6-20-3D	6	20	0.0125	PC-4-12-HELIX	4	12	0.0125				
PC-7-20-3D	7	20	0.0135	PC-5-15-HELIX	5	15	0.0125				
PC-7-30-3D	7	30	0.0135	PC-5-20-HELIX	5	20	0.0125				
PC-8-20-3D	8	20	0.0135	PC-6-20-HELIX	6	20	0.0125				
PC-8-30-3D	8	30	0.0135	PC-7-30-HELIX	7	30	0.0135				
PC-9-20-3D	9	20	0.0135	PC-8-30-HELIX	8	30	0.0135				
PC-9-30-3D	9	30	0.0135	PC-9-30-HELIX	9	30	0.0135				
PC-10-20-3D	10	20	0.0135	PC-10-30-HELIX	10	30	0.0135				
PC-10-30-3D	10	30	0.0135								

### Instant Detacher

Order Number ID-1-5

All Axium MicroFX PGLA & Nylon are able to accommodate microcatheters with ID>0.0165".

Indications, contraindications, warnings, and instructions for use can be found in the product labeling supplied with each device.

CAUTION: Federal (USA) law restricts this device to sale by or on the order of a physician.

1. In-vitro experimentation in two 4 mm wide-neck bifurcation aneurysm models, one coiled with Axium Bare and the other with Axium MicroFX. Performed by Prof. David H. Frakes, PhD, Assistant Professor, and Haithem Babiker, *School of Biological and Health Systems Engineering School of Electrical, Computer, and Energy Engineering* Arizona State University, in collaboration with Dr. Fernando Gonzales at the *Keller Center for Imaging Innovation*, Barrow Neurological Institute.
2. Effect of fiber diameter and orientation on fibroblast morphology and proliferation on electrospun poly (D,L-lactic-co-glycolic acid) meshes. *Biomaterials*, 2006;27(33):5681-5688. Bashur, et.al.
3. The Behavior of Human Mesenchymal Stem Cell in 3D Fibrin Clots. *Tissue Engineering*, 2006; 12(6): 1587-1595. Ho W, et al.
4. Fibrin Microthreads Promote Stem Cell Growth for Localized Delivery in Regenerative Therapy. MS Thesis, Worcester Polytechnic Institute 2008. M Murphy.
5. Plasma coagulation response to surfaces with nanoscale chemical heterogeneity. *Biomaterials* 2006; 27(2): 208-215.
6. Surface characteristics of PLA and PGA films. *Applied Surface Science* 2006; 253(5): 2758-2764.
7. Enhanced cell affinity of poly (D,L -lactide) by combining plasma treatment with collagen anchorage. *Biomaterials* 2002; 23: 2607-2614, Yang et. al.
8. Electrospun nitrocellulose and nylon. *J of Biological Engineering*. 10 OCT 2007 Volume 1, Issue 2. Manis et.al.

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