Welcome to

Advanced Textiles EXPO

ORGANIZED BY ATA

Implantable Fabrics – Designing Textiles for the Medical Device Industry

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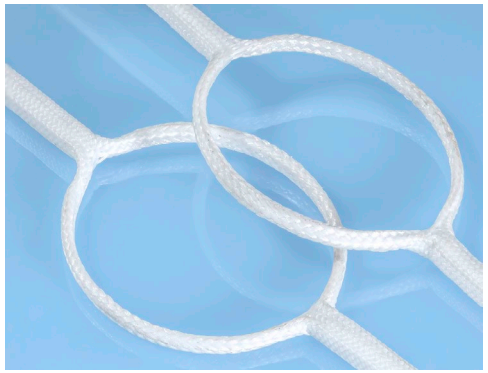
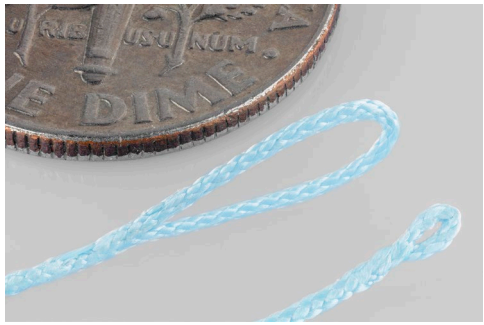
Today's Talk:

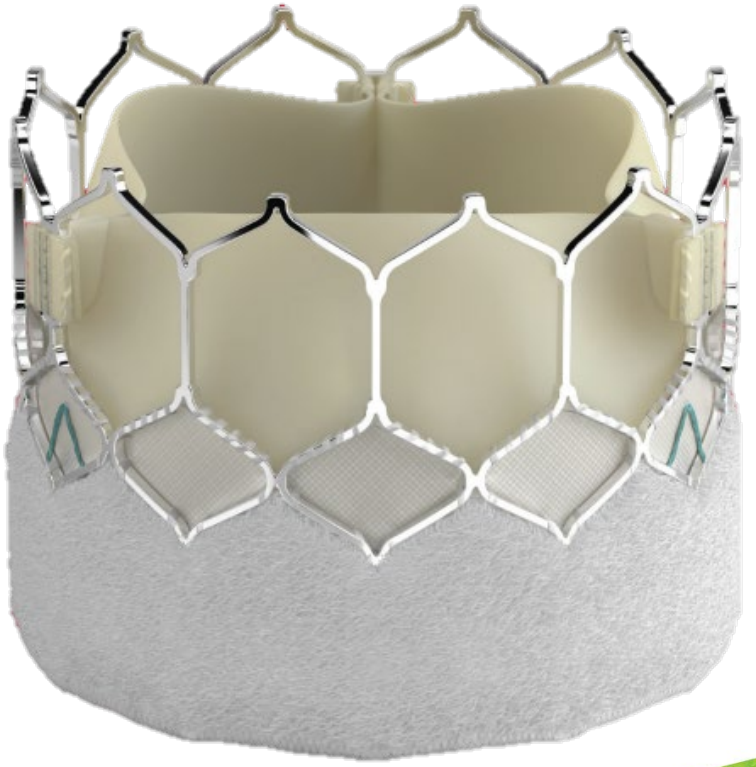
- Background
- Why Textiles?
- Raw Material Selection
- Challenges
- Differences & Similarities

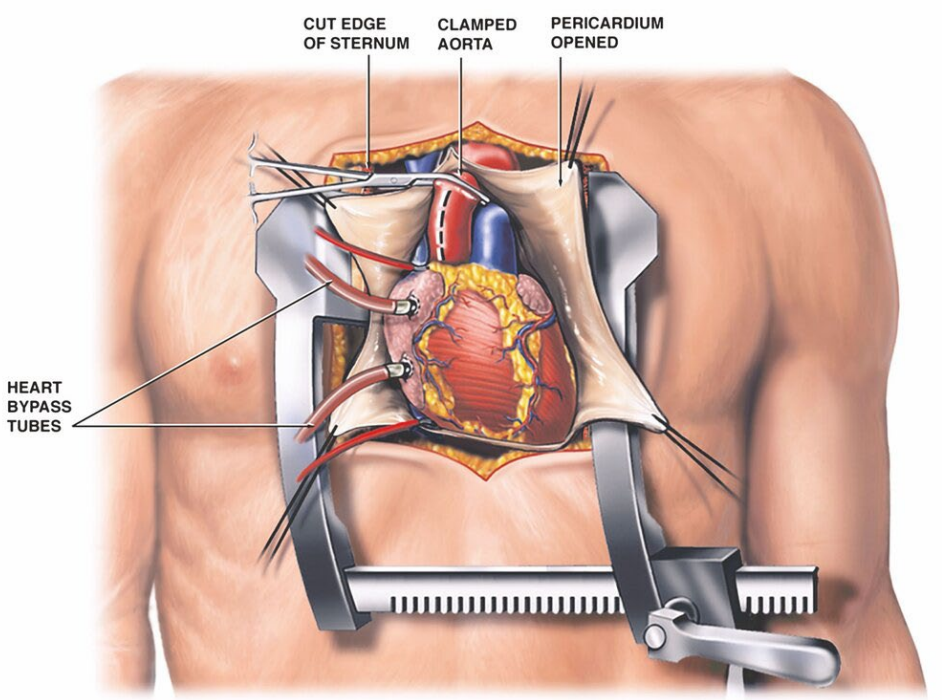


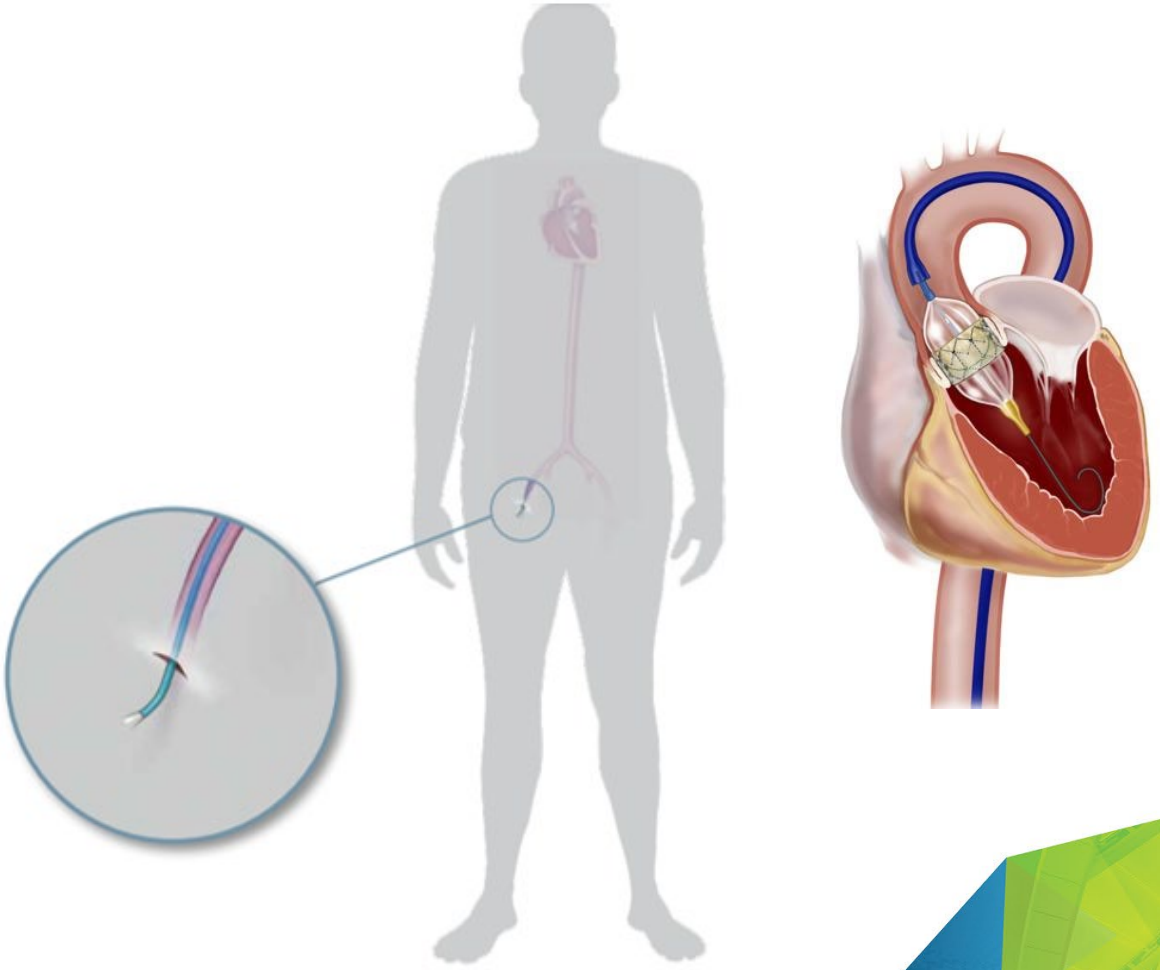


1960s:

2022:



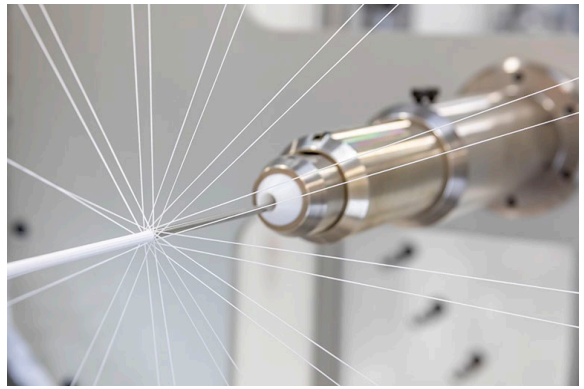




What Happened?

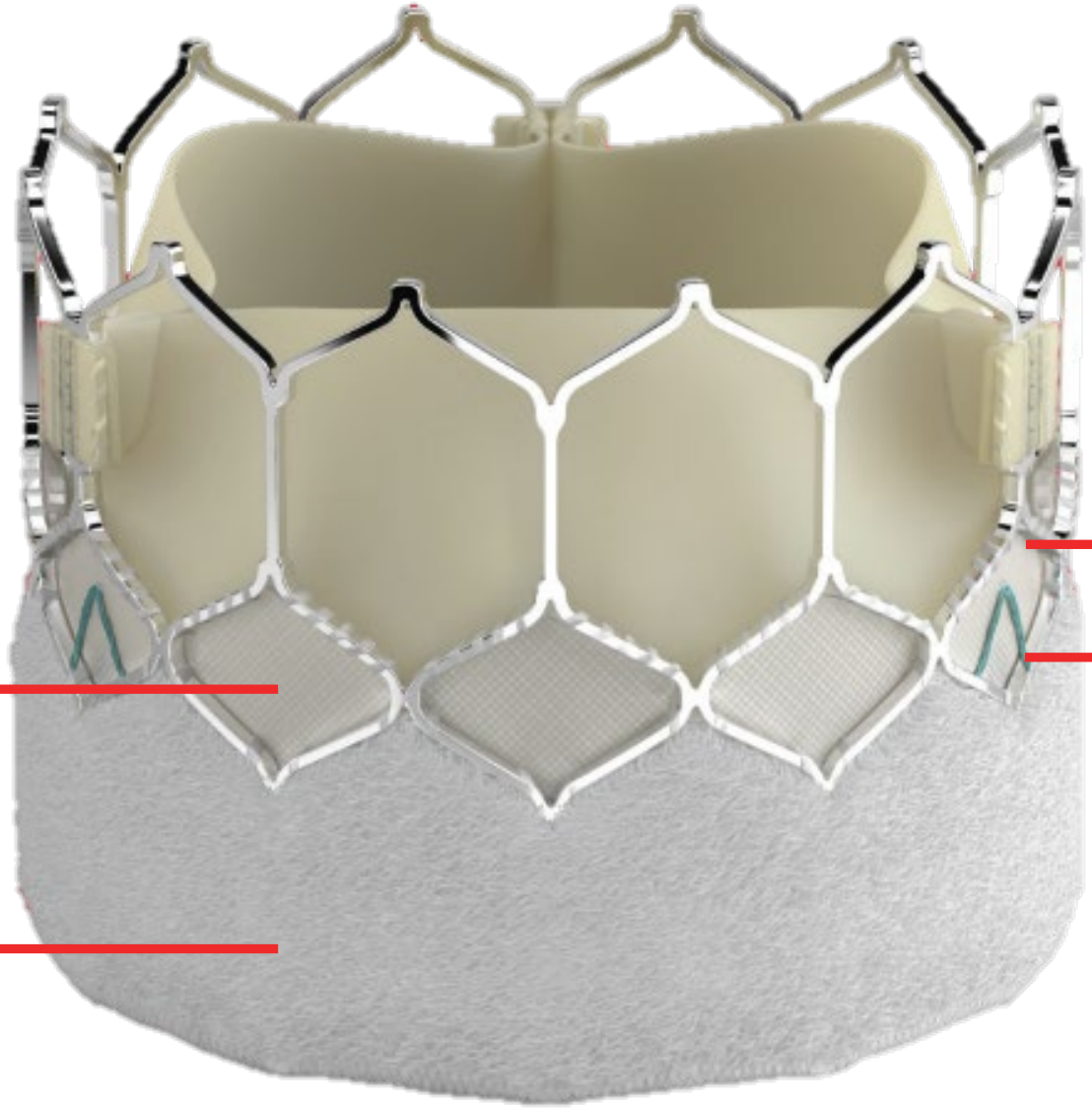
What Happened?

- Polymer Knowledge
- Complex Designs
- Equipment Advancements
- Material Size
- Delivery Systems



Details..

- Polymer Knowledge
  - Medical Grade Yarns
- Complex Designs
  - Multi-Layer Structures, Bi-, Tri-, up to Oct-furcated Braids
- Equipment Advancements
  - Digitization of Machine Recipes, Variable Density Capabilities, Visualization Software
- Material Size
  - “Small” = ~10 denier, “Large” = 500 denier
- Delivery Systems
  - Collapsible Devices for Catheters & Cannulas



Why Textiles?

Why Textiles?

- Customizable
- Biocompatible
- Manufactured at Scale
- Wide Selection of Raw Materials
- Lower $

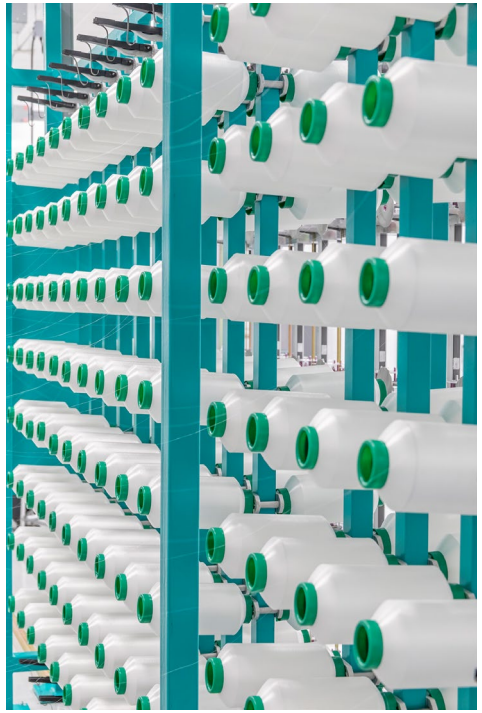
Braids for Catheter Articulation

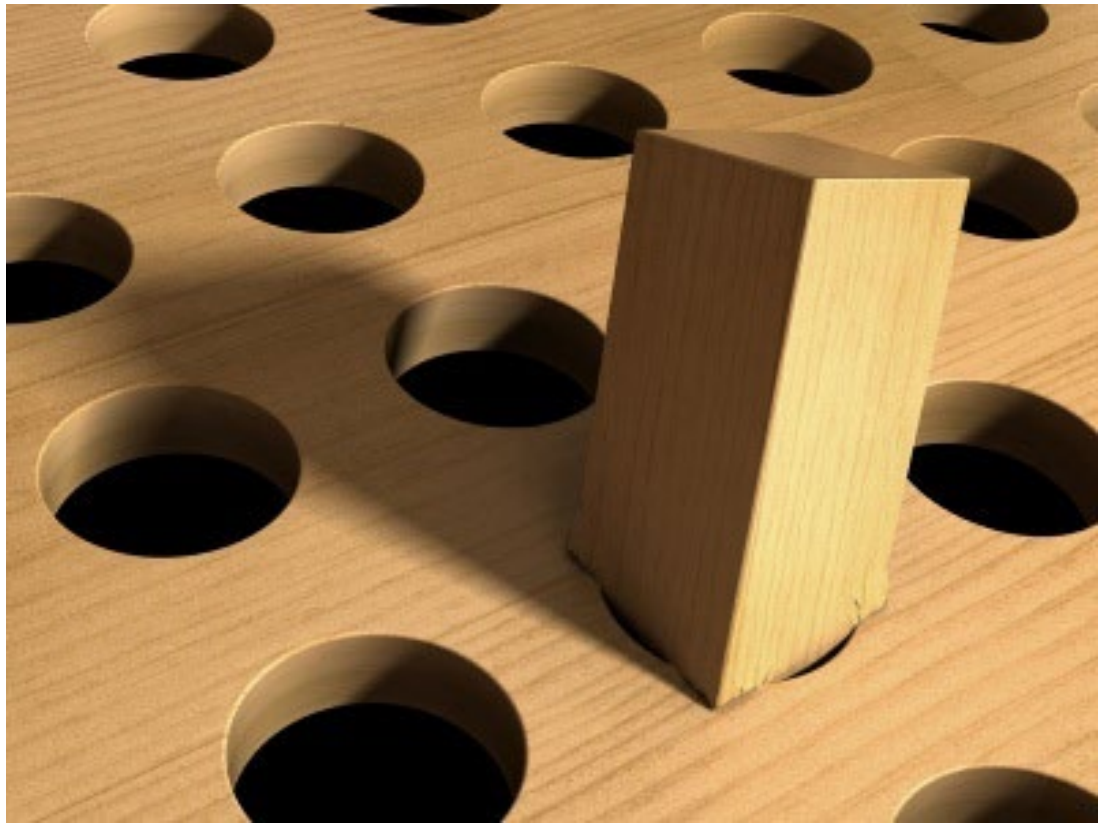
Braided Cord for Scoliosis Treatment

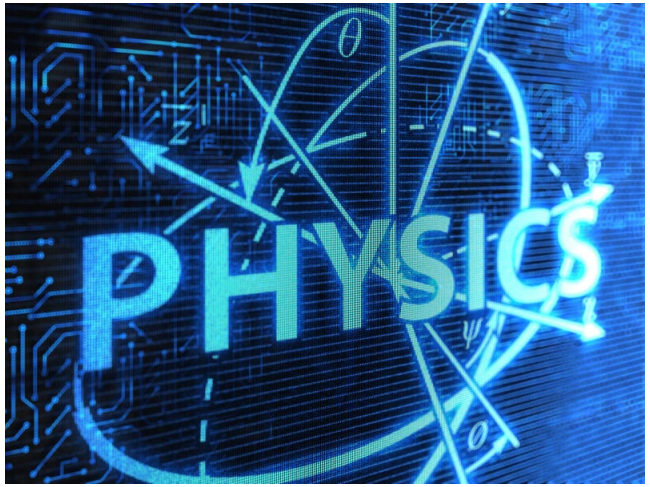
Raw Material Selection

Medical Grade Raw Materials

- Synthetic
  - Monofilament / Multifilament
  - PET, UHMWPE, LCP, PP, PTFE, PEEK
- Metallic
  - Various Diameters & Treatments
  - Nitinol, Stainless Steel, Platinum, Titanium, Cobalt-Chrome
- Resorbable
  - Various Mass & Strength Degradation Times
  - PGA, PLLA, PGLA
- **New Frontiers!!** Biologics (Collagen), Radiopaque Fibers







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Common Examples: Application + Polymer

Application	Polymer Selection	Why?
Heart Valve	PET	• Positive Cell/Tissue Response • Compliant with Adjacent Anatomy • Hydrophilic (*Relative..)
Robotic Pull Wire	LCP	• Bioinert • Temperature + Chemical Resistance • Strength
Orthopedic Repair Tape	UHMWPE	• Bioinert • Strength • Low Coefficient of Friction

Raw Material Selection is Critical!!!

Challenges

+/- 0.25 **mm** ☹

!!!!

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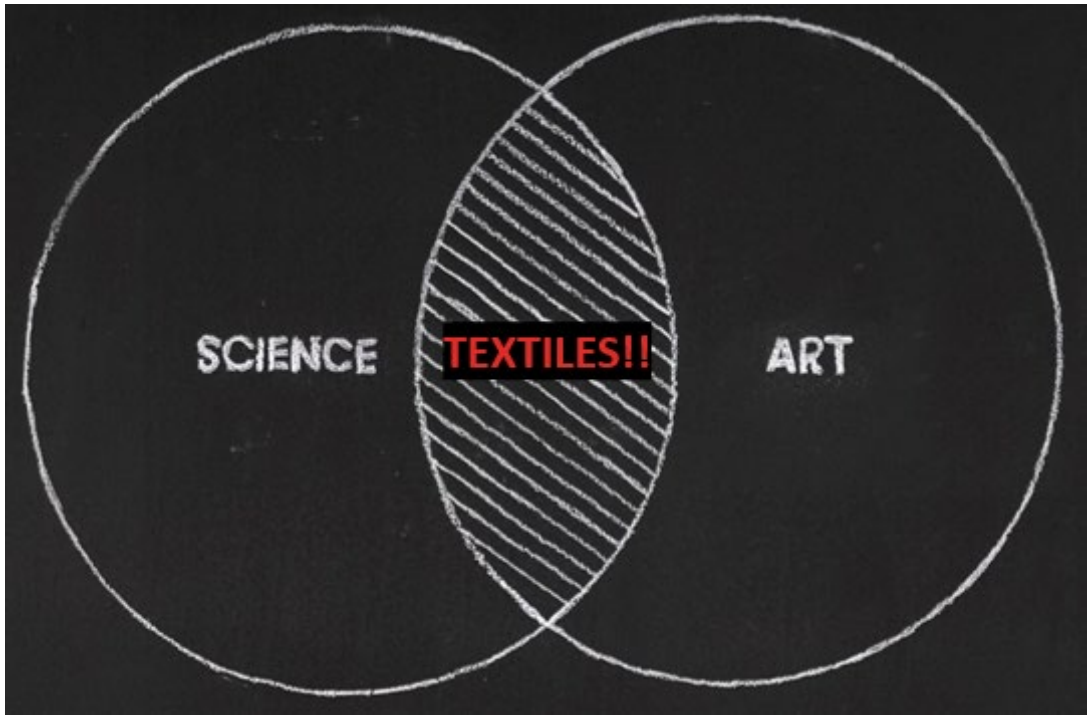

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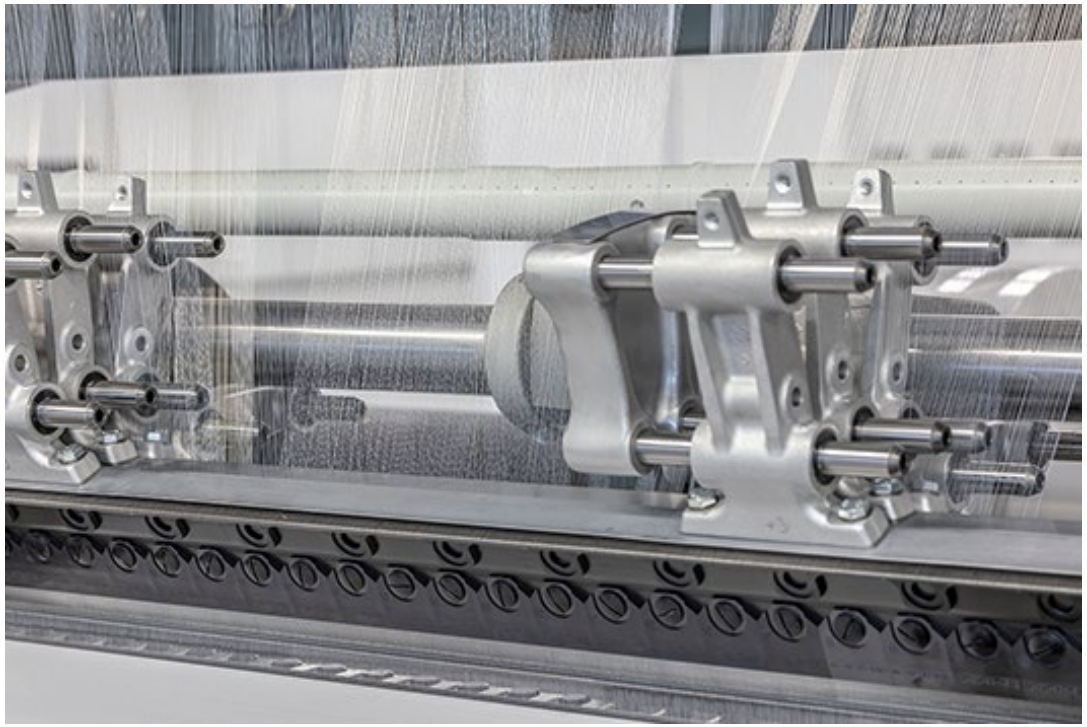
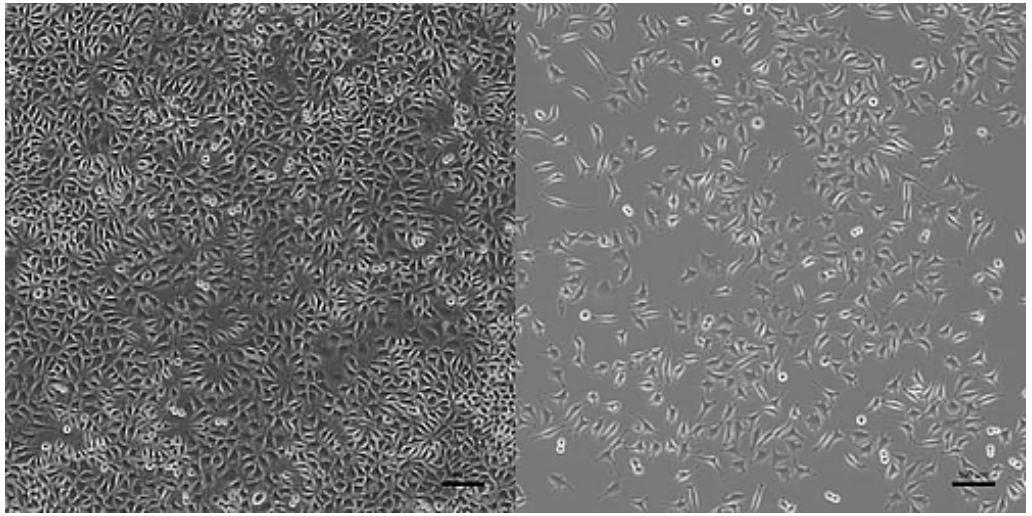
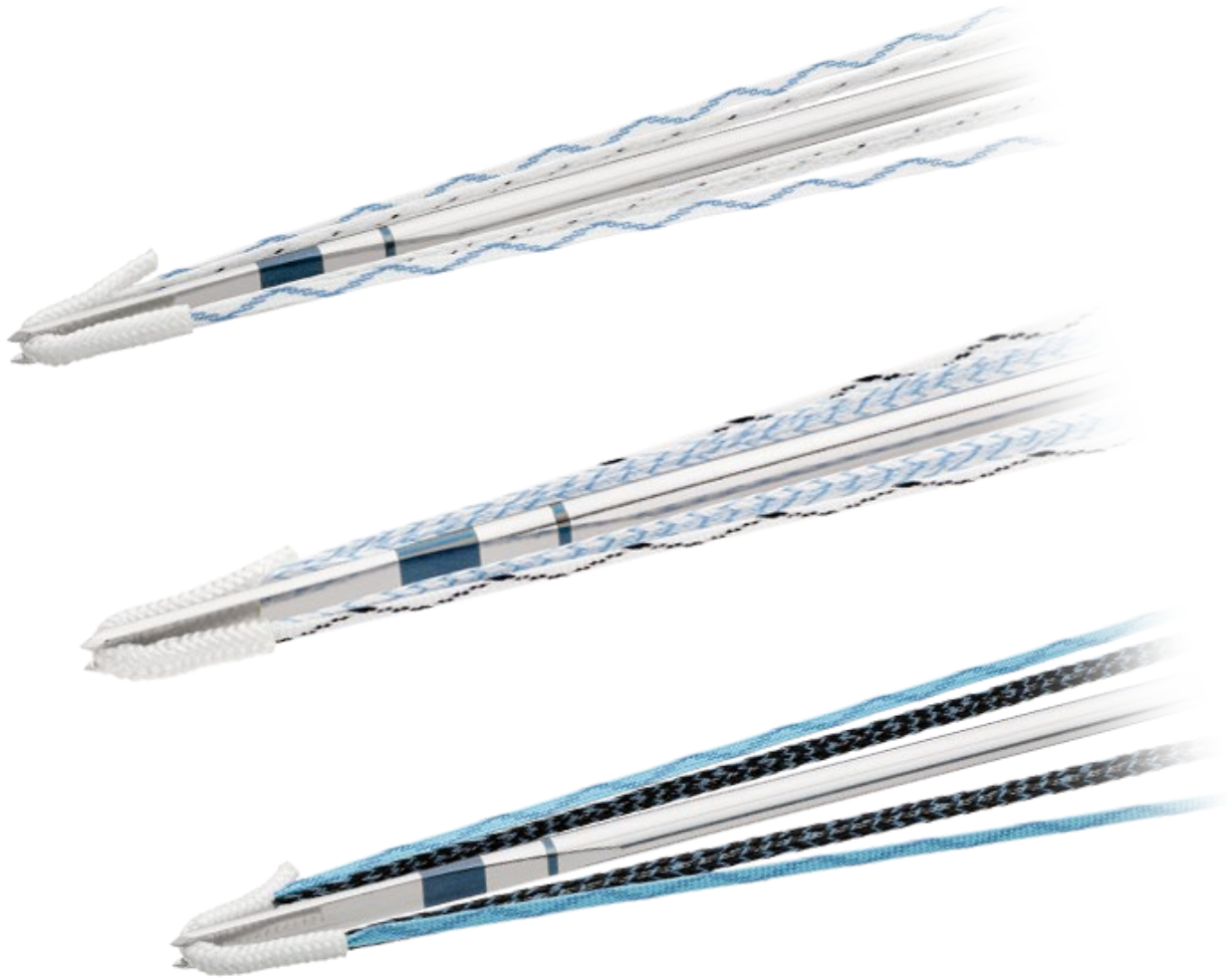


Differences





Similarities

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Cardiovascular

Robotic Surgery

Sports Medicine

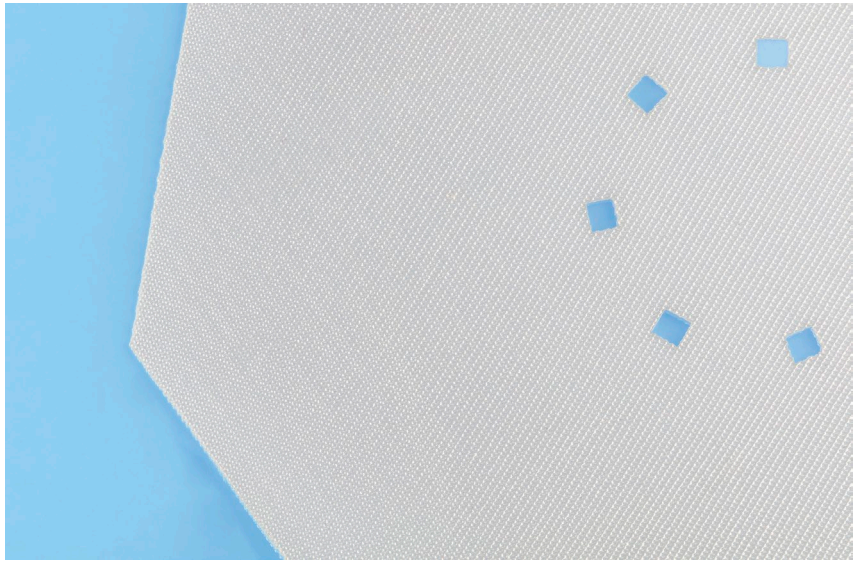
Orthopedics

Neurovascular

General Surgery

Endoscopy

Performance Sutures
and Wound Closure



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