Bioretec Research and Development

Bioretec ActivaPin™ and ActivaNail™ material compared to CONMED SmartNail®

- Bioretec ActivaNail™ and ActivaPin™ are made of 85L/15G, PLGA.
- CONMED SmartNail® is made of 96L/4D, PLA.

Implant made of Poly (85/15 L-lactide/glycolide) copolymer (PLGA)

- The complete bioabsorption time is about 2 years. Implant gradually loses its strength, however, maintaining its function for at least 8 weeks. That is an excellent thing. It gives the bone its original task back faster and the bone can grow back to what it was.
- PLGA has low crystallinity on the contrary to 96L/4D, PLA.
- On the contrary to 96L/4D, PLA, no similar issues with smaller bones, strength only needed for the time of healing and then bone can regain its strength.

Implant made of Poly (96/4 L-lactide/D-lactide) copolymer (PLA)

- It is a polylactide implant. That means that the bioabsorption time is about 4-6 years. The material will remain the strength for about 1 year and in about 2 years it has lost most of its strength. It is only an infirm, mushy, highly crystalline material mass, so just like a hole.
- This material has high crystallinity, which gets even higher during absorption. That means there will be particles in the product which are not easy for body to absorb. Eventually body could treat these remains as a foreign material and form a capsule around it. When this happens the bioabsorption gets almost stagnant. The patient will end up having a “hole” in the bone with material that has no strength and is not formed in to bone. This makes the bone much weaker than before and it could fracture easier.
- Smaller bones (toes, fingers) with SmartNail® are one tricky subject. With the long degradation time, the SmartNail® will leave relatively large cross section area with this foreign material without practically any strength for many years. That could lead to serious problems in the future.
- With such extremely long bioabsorption time, there is a high probability that bone’s natural ability to heal would be completely disappeared, which could remarkably increase the risk of reinjury.
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CONMED SmartNail® shape vs. Bioretec ActivaPin™ and ActivaNail™ grooved design

- SmartNail® has barbs/spikes in the nail tip area that are designed for soft tissue not for bone. Originally designed for meniscus arrow. Those barbs bring very little pull-out force in bone.
- ActivaNail™ conical head is better for smaller applications than the large nail like head of SmartNail®.
- ActivaPin™ and ActivaNail™ you can put in “smaller hole”, as seen in the picture below. That gives more pull-out force and the grooved design has been proven to bring extra rotational stability too. When you add the Self-Locking SL™ ability to this, it further improves the pull-out performance.
- SmartNail® design doesn’t bring any additional benefit for the rotational strength.

![SmartNail® and ActivaNail™](image)

- Please note that all Bioretec current products are made of PLGA:
  ActivaPin™, ActivaNail™, ActivaScrew™, ActivaScrew™ Cannulated, ActivaScrew™ Interference

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