

# Sustained Drug Release Optimizes Long-Term Outcomes

Is the drug-eluting vascular stent a game-changer?

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New stent designs and drug-eluting technologies are intended to improve outcomes following femoropopliteal artery treatment for peripheral artery disease. Long-term patency following bare-metal stenting (BMS) is encouraging but remains unsatisfactory, with reported 1-year primary patency peaking at approximately 80%.<sup>1-5</sup>

Likewise, target lesion revascularization (TLR) rates for BMS also show room for improvement, with 1-year rates averaging approximately 13% in recent clinical trials.<sup>2-5</sup>

## THE MAJESTIC TRIAL

MAJESTIC is a prospective, single-arm, multicenter clinical trial enrolling 57 patients across multiple sites in Europe, Australia, and New Zealand. Eligible patients had chronic lower limb ischemia and de novo or restenotic lesions in the native superficial femoral artery (SFA) and/or proximal popliteal artery (PPA). The primary endpoint was defined as 9-month primary patency assessed by duplex ultrasound as adjudicated by an independent core laboratory compared against a literature-derived performance goal. Major adverse events (MAEs) included all-cause death through 1 month, target limb major amputation, and TLR.

The Eluvia Drug-Eluting Vascular Stent System (Boston Scientific Corporation) is a self-expanding nitinol stent with a dual-layer coating and active layer consisting of the fluorocopolymer (polyvinylidene fluoride-co-hexafluoropropylene) and antiproliferative agent paclitaxel. The MAJESTIC study population for treating femoropopliteal artery lesions included a relatively challenging set of lesions:

- 77% extended into the distal SFA
- 9% extended into the PPA
- 65% were severely calcified
- 46% had total occlusions
- 7.1-cm average lesion length

At 12 months, primary patency was 96.1% (49/51) and the MAE rate was 3.8% (2/53); both MAEs were TLRs. A 7.5% TLR rate was achieved at 2 years with no stent fractures. There were only two new TLRs between 1 and 2 years. These results represent the highest primary patency rates reported at 1 year and the lowest TLR rates at 2 years between comparable studies in the treatment of femoropopliteal lesions.<sup>6,7</sup> In MAJESTIC, a reduction in primary patency between 6 and 12 months was not observed, a period of time during which patency has been seen to drop in other SFA trials (Figure 1).<sup>6,8-11</sup>

The Eluvia Drug-Eluting Stent system was designed to elute paclitaxel over time to match the restenotic process

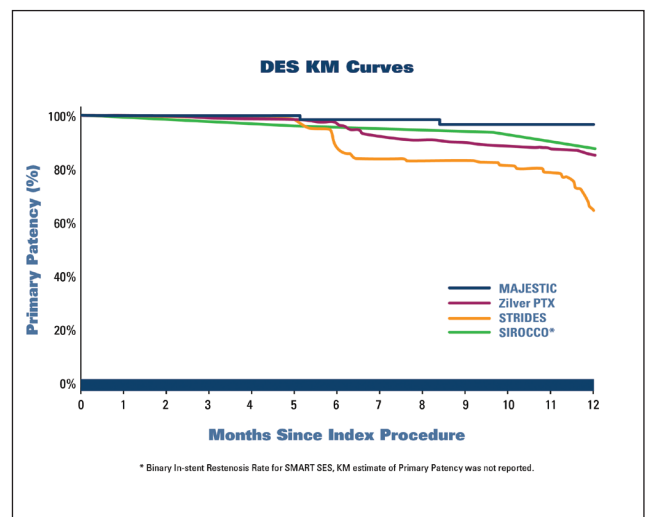


Figure 1. The decline in patency observed between 6 and 12 months in other trials testing similar technologies was not observed in MAJESTIC, which maintained a very flat curve throughout the first year, suggesting that sustained drug release may have a positive impact in this critical period when restenosis usually develops.

## The MAJESTIC results represent the highest primary patency rates reported at 1 year and the lowest TLR rates at 2 years between comparable studies in the treatment of femoropopliteal lesions.

in the SFA. Prolonged paclitaxel elution is made possible by the PVDF-HFP (poly-vinylidene fluoride-hexafluoropropylene, a biocompatible fluoropolymer<sup>12</sup>) coating, which provides sustained and controlled drug release and does not inhibit endothelialization or promote thrombus formation in preclinical models.<sup>13,14</sup> Several studies have suggested that restenosis following nitinol stenting in the SFA typically occurs within 12 months.<sup>15</sup> This pattern was not observed in MAJESTIC, suggesting that sustained drug release may have a positive impact in this critical period when restenosis usually develops. No new TLR events occurred from 9 through 12 months, and the TLR rate remained low through 24 months.

### CONCLUSION

The MAJESTIC clinical study showed that patients whose femoropopliteal arteries were treated with the Eluvia stent sustained a high patency with clinical improvement, low MAE rate, and an extraordinarily low TLR rate at 2 years. These results will have a significant impact on the future treatment of SFA lesions: if a stent is warranted, a dual-layer drug-eluting stent with prolonged paclitaxel elution seems to be the ideal solution from the current perspective. ■

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