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## **Javelin**

Javelin is an energy-storing-and-return prosthetic foot, which uses e-carbon foot springs to efficiently absorb energy during weight bearing and return it during off-loading, in order to aid propulsion. The forefoot spring extends up to act as the prosthetic pylon, giving extra flexibility and range-of-motion. The split-toe design permits medial-lateral slope compliance.

## Clinical Outcomes using e-carbon feet

Much research confirms the substantial equivalency of all energy-storing and return feet, including Blatchford e-carbon feet<sup>1</sup>.

### With respect to **SAFETY**

• High mean radius of curvature for Esprit-style e-carbon feet<sup>2</sup>: "The larger the radius of curvature, the more stable is the foot"

#### With respect to **MOBILITY**

- Allow variable running speeds<sup>3</sup>
- Increased self-selected walking speed<sup>4</sup>
- Elite-style e-carbon feet (L code VL5987) or VT units demonstrate the second highest mobility levels, behind only microprocessor feet<sup>5</sup>

#### With respect to **LOADING SYMMETRY**

- Users demonstrate confidence in prosthetic loading during high activity<sup>6</sup>
- Improved prosthetic push-off work compared to SACH feet<sup>7</sup>
- Increased prosthetic positive work done<sup>4</sup>

# With respect to **USER SATISFACTION**

High degree of user satisfaction, particularly with high activity users<sup>8</sup>

#### References

- 1. Crimin A, McGarry A, Harris EJ, et al. The effect that energy storage and return feet have on the propulsion of the body: A pilot study. Proc Inst Mech Eng [H] 2014; 228: 908–915.
- 2. Curtze C, Hof AL, van Keeken HG, et al. Comparative roll-over analysis of prosthetic feet. J Biomech 2009; 42: 1746–1753.
- 3. Strike SC, Arcone D, Orendurff M. Running at submaximal speeds, the role of the intact and prosthetic limbs for trans-tibial amputees. Gait Posture 2018; 62: 327–332.
- 4. Ray SF, Wurdeman SR, Takahashi KZ. Prosthetic energy return during walking increases after 3 weeks of adaptation to a new device. J Neuroengineering Rehabil 2018; 15: 6.
- 5. Wurdeman SR, Stevens PM, Campbell JH. Mobility analysis of AmpuTees (MAAT 5): Impact of five common prosthetic ankle-foot categories for individuals with diabetic/dysvascular amputation. J Rehabil Assist Technol Eng 2019; 6: 2055668318820784.
- 6. Haber CK, Ritchie LJ, Strike SC. Dynamic elastic response prostheses alter approach angles and ground reaction forces but not leg stiffness during a start-stop task. Hum Mov Sci

Blatchford

2018; 58: 337-346.

- 7. Rock CG, Wurdeman SR, Stergiou N, Takahashi KZ. Stride-to-stride fluctuations in transtibial amputees are not affected by changes in push-off mechanics from using different prostheses. PloS one. 2018;13(10).
- 8. Highsmith MJ, Kahle JT, Miro RM, et al. Differences in Military Obstacle Course Performance Between Three Energy-Storing and Shock-Adapting Prosthetic Feet in High-Functioning Transtibial Amputees: A Double-Blind, Randomized Control Trial. Mil Med 2016; 181: 45–54.