

Orion3

Blatchford was the first company in the world to have a microprocessor knee (MPK) available on the prosthetic market; the Intelligent Prosthesis (IP) in 1993. Sensors were incorporated and took measurements to determine walking speed and the behaviour of the pneumatic section of the piston was adapted, providing the appropriate degree of swing phase extension. Further iterations of this technology included the IP+ and Smart IP, which had programming advancements and were simpler for the prosthetist to calibrate.

Blatchford's first microprocessor knees to provide control of both stance and swing phase were the Adaptive and Smart Adaptive. These devices measured the loads applied by the user and provided resistance to knee flexion during stance phase, as well as retaining the swing phase control from older models.

The Orion family of knees was also based on these well-established and proven MPK technologies.

Improvements in Clinical Outcomes using microprocessor-controlled prosthetic knees

Improvement in **SAFETY**

- Significantly reduced number of falls^{1,2}
- Reduced centre-of-pressure fluctuations by 9-11% with standing support active when standing on sloped ground³
- Less cognitive demand during walking, leading to reduced postural sway⁴

Improvement in **MOBILITY**

- Increased walking speed⁵
- Easier to walk at different speeds⁶
- Higher scores in mobility-related patient-reported outcome measures⁷
- More natural gait^{6,8}
- Easier to walk on slopes⁶

Improvement in **ENERGY EXPENDITURE**

- Reduced energy expenditure compared to mechanical knees⁹⁻¹³
- Equivalent energy expenditure to other MPKs¹⁴
- Reduced self-perceived effort^{6,8}
- Energy expenditure closer to that of able-bodied control subjects¹⁵
- Able to walk further before becoming tired⁶

Improvement in **SYMMETRY**

- Better step length symmetry⁵
- Reduced loading asymmetry with standing support active when standing on sloped ground³

Improvement in USER SATISFACTION

- Reduced fear of falling¹
- Reduced limitations due to an emotional problem⁷
- Preference over other prosthetic knees^{1,14}

Improvement in HEALTH ECONOMICS

- Reductions in direct and indirect healthcare costs when using an MPK¹⁶

References

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