Evidence Essentials
Microprocessor-Controlled Hydraulic Ankle-Foot

	Mobility need or deficit of the patient	Evidence for benefits of the Meridium or other hydraulic or MP ankles compared to standard feet
Safety	Patient trips and falls repeatedly	- **Significant improvement in minimal toe clearance** (De Asha et al., 2014; Rosenblatt et al., 2014) - **Significant increase in minimal toe clearance during slope ascent** (Lamers et al., 2019) - **Reduction of the risk of tripping over an unseen obstacle of 5 mm (1/5 in) height from 1 in 166 steps to 1 in 3,169 steps** (Rosenblatt et al., 2014) - **Patient reported improved perceived safety and balance as well as 35% fewer stumbles and 23% fewer falls with Meridium** (Hahn et al., 2018)
Mobility	Patient feels limited or restricted in his/her overall mobility	- **Cross-sectional study found that users of MP controlled ankles had significantly higher overall mobility compared to users of other types of prosthetic feet** (Wurdeman et al., 2019) - **Significant increase in self-selected walking speed and walking distance in K2 patients** (Barnett et al., 2018) - **Significant improvement in overall patient-reported prosthetic function in K2 and K3 patients as measured with the PEQ** (Kaluf et al., 2020; Moore et al., 2017)
Mobility	Patient has difficulty negotiating uneven terrain	- **Significantly improved gait symmetry and reduction in kinematic and kinetic gait deviations and, thus, unloading of the locomotor system** (Bai et al., 2017; Schmalz et al., 2019) - **Patients perceived walking on uneven terrain as safer and easier** (Bai et al., 2017; Hahn et al., 2018)

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Mobility	Patient feels limited or restricted in ambulating on level ground	- **Significant reduction in braking forces ("dead spot phenomenon") in level walking with consecutive significant increase in self-selected walking speed** (De Asha et al., 2013A and 2014) - **Significant reduction in kinetic compensations of the sound limb** (De Asha et al., 2013B) - **Significantly improved gait symmetry and reduction in kinematic and kinetic gait deviations in K2 and K3 as well as bilateral patients** (Moore et al., 2016) - **Significantly reduced metabolic energy consumption** (Askew et al., 2019; Delussu et al., 2013)
Mobility	Patient has difficulty ascending and descending stairs	- **Improved gait symmetry and reduction in kinematic and kinetic gait deviations during stair ascent and descent and, thus, unloading of the locomotor system** (Alimusaj et a., 2009)
Residual limb health	Patient suffers from residual limb pressure sores or ulcers due to frequent ambulation on non-level surfaces	- **Significant reduction in interface pressures between the residual limb and the socket when walking on level and uneven terrain, slopes and stairs** (Moore et al., 2018; Portnoy et al., 2012; Wolf et al., 2009) - **Significantly improved socket comfort when walking on non-level terrains** (Kaluf et al., 2020)

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Mobility	Patient has difficulty standing on and/or negotiating slopes and hills	- **Significant increase in minimal toe clearance during slope ascent** (Lamers et al., 2019) - **Significant increase in self-selected walking speed during slope ascent** (Askew et al., 2019) - **Significantly slowed shank rotational velocity and, thus, improved control over walking speed during slope descent** (Struchkov et al., 2016) - **Significantly improved gait symmetry reduction in kinematic and kinetic gait deviations and, thus, unloading of the locomotor system during slope descent** (Darter et al., 2014; Fradet et al., 2010; McGrath et al., 2018) - **Patients perceived slope ambulation and standing on slopes as safer and easier** (Darter et al., 2014; Fradet et al., 2010; Hahn et al., 2018) - **Significantly improved symmetry and reduction in kinematic and kinetic gait deviations and, thus, unloading of the locomotor system during standing on slopes** (Ernst et al., 2017; McGrath et al., 2019; Thomas-Pohl et al., 2019) - **Significantly reduced metabolic energy consumption for slope ascent** (Askew et al., 2019)

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