

Evidence Essentials

Vacuum Assisted Socket Systems (VASS)

	Mobility need or deficit of the patient	Evidence for benefits of VASS vs. standard sockets in transtibial amputees
Safety	<p>Patient stumbles and/or falls repeatedly</p> <p>Patient avoids activities due to fear of falling</p> <p>Patient sustained fall-related injuries</p>	<ul style="list-style-type: none"> - Significant reduction in risk of multiple falls of up to 75% (Rosenblatt et al., 2017a) - Significant improvements in balance and indicators for the risk of falling, such as Timed-up-and-go-test, Berg Balance Scale, Four Square Step Test (FSST), ABC scale, etc. (Ferraro et al., 2011; Rosenblatt et al., 2017b; Samitier et al., 2014)
Mobility	<p>Patient is limited in his/her mobility</p>	<ul style="list-style-type: none"> - Significant increase in walking speed, also in individuals with dysvascular amputation (Kuntze Ferreira et al., 2015; Rosenblatt et al., 2017b; Samitier et al., 2014) - Significant increase in walking capacity and distance in timed walk test in individuals with dysvascular amputation (Samitier et al., 2014)
Socket fit	<p>Patient has problems with socket fit, residual limb volume fluctuations, pistoning</p>	<ul style="list-style-type: none"> - Significant increase in Socket Comfort Score of up to 3 points (Rosenblatt et al., 2017b) - Significant prevention of residual limb volume loss during the day (Board et al., 2001; Gholizadeh et al., 2016; Goswami et al., 2003; Kahle et al., 2014; Sanders et al., 2011; Stevens et al., 2019; Youngblood et al., 2020) - Significantly reduced pistoning / relative movement between residual limb and socket with reduction of pressures and shear forces (Beil et al., 2022; Board et al., 2001; Darter et al., 2016; Gholizadeh et al., 2016; Kahle et al., 2014; Klute et al., 2011; Stevens et al., 2019) - Significantly reduced perspiration in the socket (Klute et al., 2016)

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Residual limb health	Patient suffers from recurring residual limb pressure sores, ulcers, or wound healing delay after amputation	<ul style="list-style-type: none"> - Significantly earlier prosthesis fitting and mobilization after amputation without interference with wound healing (Traballesi et al., 2014) - Significantly improved mobility in the first 5 months after amputation despite wound healing delay (Traballesi et al., 2012) - Patients can maintain prosthetic mobility despite residual limb ulcers without interfering with wound healing (Hoskins et al., 2013) - Significantly improved perfusion of the residual limb (Rink et al., 2016)
Musculo-skeletal pain	Patient suffers from joint and back pain due to gait asymmetry and excessive loading	<ul style="list-style-type: none"> - Significant improvement in gait symmetry and, thus, loading of the locomotor system (Board et al., 2001; Kuntze Ferreira et al., 2015)

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