

Reference

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The effect of vacuum assisted socket suspension on prospective, community-based falls by users of lower limb prostheses

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Products

Vacuum-assisted socket system* (VASS) vs non-VASS socket systems

* Harmony pump (Mechanical & e-pulse), Unity pump (Ossur), Limb logic pump (Willowood)

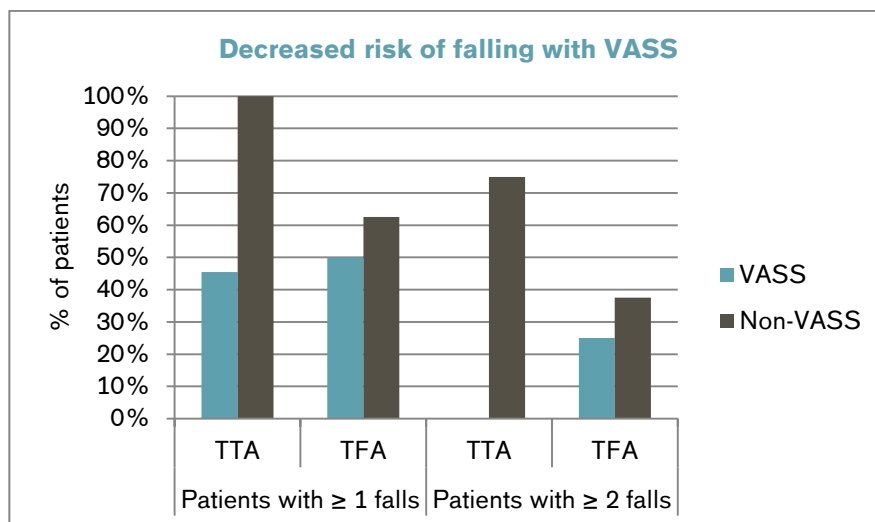
Major Findings

With VASS compared to non-VASS suspension:

→ Decreased risk of falling for transtibial amputees (TTA)

Patients with ≥1 fall: -54.6% with VASS compared to non-VASS

Patients with ≥2 falls: -75% with VASS compared to non-VASS



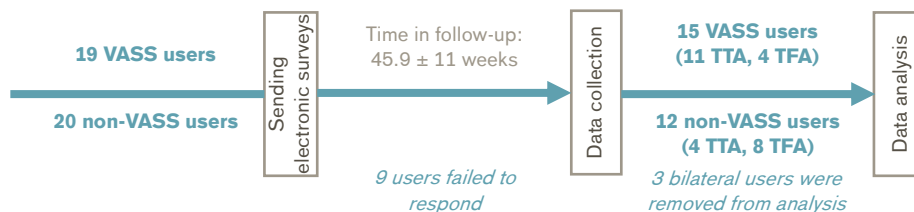
The results were analysed for VASS and non-VASS users for the two amputee subgroups TTA (transtibial amputation) and TFA (transfemoral amputation and knee disarticulation).

Population

Subjects:	<u>VASS:</u> 15 unilateral amputees (11 transtibial, 2 knee disarticulation, 2 transfemoral) <u>Non-VASS:</u> 12 unilateral amputees (4 transtibial, 1 knee disarticulation, 7 transfemoral)
Non-VASS suspension:	Suction, Pin lock, KISS
Amputation causes:	<u>VASS:</u> Trauma (53.3%), Infection (13.3%), Birth defect (13.3%), Diabetic infection (6.6%), Osteomyelitis (6.6%), Surgery complications (6.6%) <u>Non-VASS:</u> Trauma (33.3%), Osteosarcoma (33.3%), Elected due to pain or RSD (16.7%), Infection (8.3%), Diabetic infection (8.3%)
Mean age:	<u>VASS:</u> 52.3 ± 12.7 yrs <u>Non-VASS:</u> 49.8 ± 11.1 yrs
Mean time since amputation:	<u>VASS:</u> 11.6 ± 11.7 yrs <u>Non-VASS:</u> 18.1 ± 19.7 yrs
MFCL:	Not reported

Study Design

Interventional, non-randomized study:



Limitations acknowledged by the authors:

Unequal sample sizes with small number of TFAs in the VASS group (4) and a small number of TTAs in the non-VASS group (4)

Results

Body Function				Activity			Participation	Others	
Wound Healing	Limb Volume Fluctuation	Pain	Comfort, Limb Health	Level Walking	Balance	Activity, Mobility, ADLs	Preference, Satisfaction, QoL	Pistoning	Pressure Measurement

Category	Outcomes	Results for VASS compared to Non-VASS (see Table 1 in the paper)	Sig.*
Balance	Activities-Specific Balance Confidence Scale (ABC)	No difference for VASS compared to non-VASS for TTA (+5.3%). For TFA, decrease for VASS by 21.3 with VASS compared to non-VASS.	0 -
	Stumbles	<u>Number of stumbles:</u> No differences between VASS and non-VASS for TTA (+73.3%) and TFA (-4.4%)	0
		<u>Patients with ≥1 stumble:</u> No differences for VASS group compared to the non-VASS group for TTA (+31.8%) and TFA (-12.5%).	0
Falls		<u>Number of falls:</u> Lower for VASS compared to non-VASS in TTA by 72.2%. No difference in rate of falls for VASS compared to non-VASS for TFA (-33.3%).	++ 0
		<u>Patients with ≥1 fall:</u> Number of patients falling at least once was reduced by 54.6% in the VASS group compared to the non-VASS group in TTA. No difference in the proportion of patients who fell at least once for TFA with VASS compared to non-VASS (-12.5%).	++ 0
		<u>Patients with ≥2 falls:</u> Number of patients who fell 2 times or more was 75% lower in the VASS group compared to the non-VASS group in TTA. No difference in the proportion of patients who fell two times or more for TFA with VASS compared to non-VASS (-12.5%).	++ 0

Category	Outcomes	Results for VASS compared to Non-VASS (see Table 1 in the paper)	Sig.*
Activity, Mobility, Activities of Daily Living (ADLs)	Locomotor Capabilities Index 5 (LCI5)	No differences for VASS compared to non-VASS for TTA (-1.8%) and TFA (+6.5%).	0
	Houghton Scale	No difference for VASS compared to non-VASS for TTA (-1.9%). For TFA, decrease by 14.4% with VASS compared to non-VASS.	0 –

* no difference (0), positive trend (+), negative trend (–), significant (++/--), not applicable (n.a.)

Author's Conclusion

“...The current results are intended to provide initial evidence that VASS may reduce fall risk in TTA. Larger more controlled observational studies that account for suspension type, components, fall history prior to receiving VASS and/or different study designs are warranted to determine the true effect of VASS on falls for TTA as well as TFA.” (Rosenblatt & Ehrhardt, 2017)

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