
Reference

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Age at first prosthetic fitting and later functional outcome in children and young adults with unilateral congenital below-elbow deficiency: A cross-sectional study

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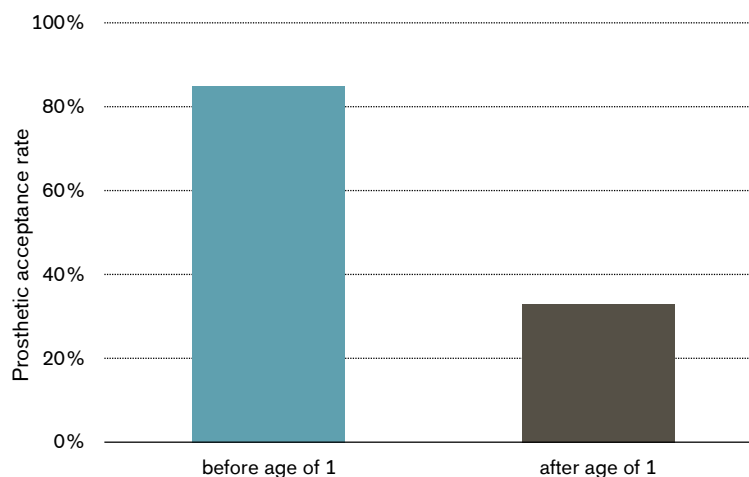
Products

Passive, body-powered and myoelectric prosthesis

Major Findings

- **Prosthesis fitting before the age of one year was related to a longer period of prosthetic usage.**
- **Users could use their prostheses in 92% of the activities, either actively or passively.**
- **The prosthesis was found to be very useful in activities such as: riding a bicycle, using scissors, and playing sports.**
- **80% of users were fitted with a myoelectric prosthesis.**

Prosthetic acceptance rate



85% of children who received their first prosthesis before the age of one but only 33% children who received their prosthesis after being one year old accepted their prosthesis.

Population

Subjects:	20 children with unilateral congenital below-elbow deficiency (5 prosthesis users and 15 non-users)
Previous prosthesis:	n.a.
Amputation aetiology:	congenital malformation
Median age:	14.2 years (range: 6–21 years)
Median time since first fitting:	6.5 years (range: 1.5–17 years)

Study Design

Observational, cross-sectional study

The objective of this study was to evaluate whether prosthesis fitting before the age of one year is associated with better outcomes in children with unilateral congenital below-elbow deficiency compared to children fitted after the age of one.

Results

Body Function		Activity			Participation	Others	
Mechanics	Pain	Grip patterns / force	Manual dexterity	Activities of daily living (ADL)	Satisfaction and Quality of life (QoL)	Training	Technical aspect

Category	Outcomes	Results for non-users vs users	Sig.*
Activities of daily living (ADL)	Prosthetic Upper Extremity Functional Index (PUFI)	Non-users performed tasks with more ease compared to users with a prosthesis.	-
		Prosthesis users found their prostheses useful in 39% of daily activities.	n.a.
		The prosthesis was found to be very useful in activities such as: <ul style="list-style-type: none"> • riding a bicycle, • using scissors, • playing sports. 	n.a.
		Users could use their prostheses in 92% of the activities, either actively or passively, while they were actually using their prostheses in only 44% of the activities .	n.a.
Satisfaction	Rejection rate	Prosthetic fitting before the age of one year was related to longer use of the prosthesis (longer than four years).	+
		Of 5 prosthesis users, 4 were fitted with a myoelectric and one with a passive device.	n.a.
	The Child Amputee Prosthetics Project-Prosthesis Satisfactory Inventory (CAPP-PSI)	Satisfaction ratings were relatively high for users and non-users.	0
		Parents of prosthesis users showed higher scores than those of non-users on the item "aids in daily activities" for both the parent-rated child satisfaction and the parent satisfaction subscales.	+
Manual dexterity	Videotapes	No difference was observed between users and non-users in the quality of motor behaviour.	0
		The evaluation of the quality of motor behaviour revealed that 6 (4 non-users) of the 20 individuals showed impaired adaptation of movements in at least three out of the 10 tasks.	+

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

Author's Conclusion

"In conclusion, our study suggests that fitting a prosthesis prior to one year of age may have a limited impact on prosthetic use during later stages of life. The limited impact may indicate that the hypothetical disadvantages of prosthesis use in early life, such as interference with sensory exploration using the affected limb, outweigh the hypothetical advantages associated with early fitting, such as an increased repertoire of motor strategies. Both prosthetic users and non-users with a unilateral congenital transverse below-elbow deficiency (UCBED) function very well and use their residual limb actively in bimanual activities. Persons with UCBED use the pros-

thesis for specific activities rather than for general activities in daily life. Our data suggest that one of the factors that determine whether a person with UCBD will benefit from a prosthesis is superior adaptive motor behavior – a suggestion which deserves exploration in future studies." (*Huizing et al. 2015*)

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