Reference

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Myoelectric hand prostheses in very young children

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Products

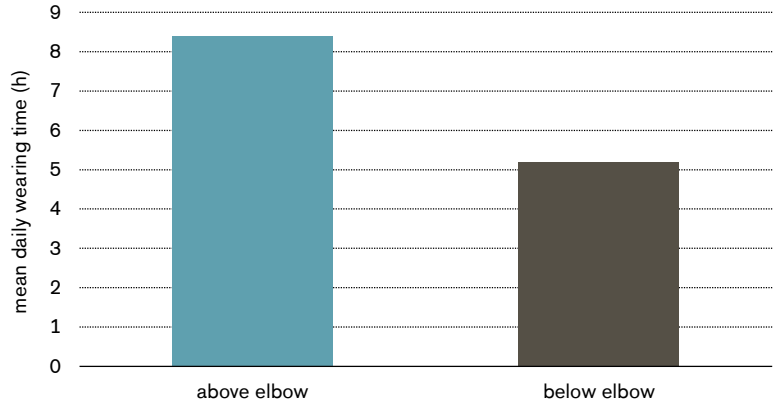
Myoelectric prosthesis with "Elektrohand 2000" vs previous prostheses

Major Findings

With Myoelectric prosthesis with "Elektrohand 2000" compared to previous prostheses (cosmetic, body-powered, myoelectric):

- → **All children learned to open myoelectric prosthetic hand**
- → **76% of studied children successfully used myoelectric prosthesis**
- → **Children amputated above elbow wore prosthesis more than 8h per day, while children with amputation below elbow wore prosthesis more than 5h per day**
- → **Prosthetic training accelerates successful use of the prosthesis**
- → **Developmental readiness to use myoelectric prosthesis starts with as early as 2 years of age**

Mean daily wearing time of myoelecric prosthesis



Children amputated above elbow wore myoelectric prostheses more than 8h per day on average, while children with amputation below elbow wore prostheses more than average 5h per day.

Population

Subjects:	41 children (35 below elbow and 6 above elbow amputees)
Previous:	24 cosmetic, 10 body-powered, 7 myoelectric
Amputation causes:	36 congenital deformities, 5 traumas
Mean age:	3.9 ± 1.1 years
Mean time since amputation:	3.9 ± 1.1 years

Study Design

Retrospective study

This study retrospectively evaluated the fitting of myoelectric prostheses in 41 preschool children with unilateral upper limb amputation.

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 Myoelectric prosthesis with "Elektrohand 2000" vs previous prostheses	Sig.*
Activity of daily life	Questionnaire (self-designed)	**Children amputated above shoulder wore prostheses more than 8h per day on average, while kids with amputation below elbow wore prostheses more than average 5h per day.**	++
		Children that wore a body-powered active device prior to myoelectric prosthesis show a tendency towards higher wearing time compared to children with a passive device only.	+
		The myoelectric prosthesis was preferentially used for playing and in kindergarten.	+
Satisfaction	Questionnaire (self-designed)	Myoelectric prosthesis brought more functional benefit to the user.	+
		Users are more satisfied with appearance of myoelectric prosthesis.	+
Technical aspects	Questionnaire (self-designed)	Myoelectric prostheses were more sustainable for breakdown than body powered prostheses.	-
		Myoelectric prostheses were heavy.	-
		Life span of battery in myoelectric prosthesis was too short	-

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

Author's Conclusion

"The prosthesis was used for an average time of 5.8 hours per day. The level of amputation was found to influence the acceptance rate. Furthermore, prosthetic use training by an occupational therapist is related to successful use of the prosthesis. The general drop-out rate in preschool children is very low compared to adults. Therefore, infants can profit from myoelectric hand prostheses. Since a correct indication and an intense training program significantly influence the acceptance rate, introduction of myoelectric prostheses to preschool children should take place at specialised centres with an interdisciplinary team."