



An overview of head support solutions for people with reduced or altered head mobility

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Introduction

This research is part of the Symbionics project which aims at creating assistive devices which are able to adapt automatically to the user.

Aim of the study

- To create an overview of existing wheelchair mounted head supports;
- Identify opportunities for development of advanced dynamically adaptive head supports.

Method

To create an overview of existing head supports, a review was performed using various sources. Additionally, feedback was gathered from a small number of head support users.

Existing head supports

Literature review

Product brochures

User interviews

Diagnosis: SMA (type I/II)

Static

Electrically adjustable

Results

Existing head supports

Head supports of varying complexity have been identified. Devices were categorized with respect to type of interface with the user, functionality and amount of adjustability in the system. Head supports which enable the user to adjust the head support position can be regarded as current state of the art.



Opportunities for development

Advancements in the design of wheelchairs will allow the user to adapt their posture more easily for a certain activity, social situation or comfort [1]. It is of high importance to adapt the position of the head accordingly [2]. To achieve this, prototypes are currently being developed of intelligent wheelchair mounted head supports.

User interviews

- Existing adjustment mechanisms are mainly used to change posture between daily activities.
- Possibility to adjust position is valued by users with electrically adjustable system, but motions can appear more natural.
- Also with future developments it is essential that the user maintains control of the head position at all times.

Discussion/Conclusion

There exists a need for assistive devices which are able to combine changes in position of the trunk and/or head with continuous stabilization of the head. To serve this need, currently prototypes of head supports are being developed which will combine intuitive user interfacing with automatic adaptation to changes in seat settings.

References

- 1) Inskip, J. A. et al (2017). Dynamic wheelchair seating positions impact cardiovascular function after spinal cord injury. PLOS One, 12(6)
- 2) H. A. M., & Haaster, F. A. C. van. (1995). Het zitboek - Zithoudingsproblematiek in rolstoelen.
- 3) <http://www.aelseating.com/c-63-tri-pad-headrest-pads.aspx>
- 4) <http://www.dynaproducts.nl/nl/product/dynaparts/hoofdsteun-max>
- 5) <http://www.medifab.com.au/products/wheelchair-seating/savant-wheelchair-headrest-system>

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