

# INTEGRATION OF COMFORT AND CONTROL FOR UPPER LIMB TREATMENTS

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## INTRODUCTION (HEADING 1)

According to a survey (Stark, 2013), the factors which significantly affect upper limb prosthetic acceptance, is amputation level, functional advantage, socket & harness comfort, and peer/family support.

In this presentation, the author is referring to the topics socket & harness comfort.

Since the inception of prosthetic devices usage by people with upper limb loss, the prosthetic socket design presents orthopedic technologists a challenging task. Especially because this connection- element between human body and prosthetic device must allow comfortable and secure use. For myoelectric prosthesis, an absolutely secure fit and adhesion between skin and socket is required. Every slide produces malfunctions and insecurity in the myoelectric controls. Easy donning and doffing of the device is also a very important factor for acceptance.

## METHODS

People were fitted with prosthetic devices and harnesses in an individual and modern style. In these fittings, silicone use is shown with new and unique applications and approaches. Silicone is used, because of its well known advantages for use in medical devices.\*

Successful applications presented, show use in cases from the transradial through to bilateral shoulder disarticulation level. Some examples:

- Elbow-disarticulation prosthesis fitting with use of an inflatable air-bladder to increase fit through following contours
- TMR with use of an integrated air- bladder to increase electrode pressure on the skin for complex control schemes
- Localized use of silicone gel in a socket to provide high adhesion or to follow the contours of invaginated scars
- Adaptations to individual harnesses to increase comfort and for a unique force- distribution.

## RESULTS

The results presented show well accepted upper- limb sockets and harness prosthetic treatments, with outcomes showing better comfort and more long- term use of the prostheses. The applications shown will be readily usable in cases with and without myoelectric control and use available materials and techniques.

## DISCLOSURE

The author is a full-time employee of Ottobock. References

## Acknowledgements

The author thanks the members of the Department Upper Limb of Competence Center Headquarters Otto Bock/ Germany

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- Bio- compatible/ Antiallergenic
- High temperature-stability (-60 - +200°C)
- Different shore-hardness's are combinable
- Unique hygienic characteristics
- High adhesion
- Inner-layer can be coated with silicone-gel
- Durability • Highly flexible
- Positive influence on scar