



# Partial Hand Amputation: A review of outcome measure data to support a patient-centered approach to successful fitting of new technologies

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## INTRODUCTION

Research has shown that individuals' expectations of their upper limb (UL) prostheses play a role in prosthetic acceptance or rejection (Biddiss & Chau, 2007). We hypothesized that if both a patient and the prosthetic care team are knowledgeable in the psychosocial challenges specific to this patient population and the spectrum of available prosthetic options suitable to the patient's unique situation, the alignment of patient expectations and prosthetic rehabilitation solutions will result in positive overall acceptance and functional outcomes.

## METHOD

A convenience sampling of patients with varying levels of partial hand (PH) amputation participated in a thorough evaluation during which Advanced Arm Dynamics (AAD) UL prosthetic specialists provided education regarding suitable prosthetic options for their specific situation. Each patient made an informed prosthetic solution decision and participated in an expedited fitting that included an extensive prosthetic therapy training protocol with the goal of achieving the highest possible level of functional independence with the prosthesis. All training was performed by a physical or occupational therapist in collaboration with the treating prosthetist, who made prosthetic design modifications as needed to enhance subject capabilities for task performance.

A battery of outcome measures was used to assess patients' psychological well-being at intake and their satisfaction with their prostheses and self-perceived disability at different phases of their care. This battery included: a psychological screening tool that was completed by 192 patients (65.1% male, age range 17.5 to 82.4, 45.3% PH amputation); AAD standard of care quality assurance surveys administered at intake regarding prior care (n=25), at post-definitive fitting (n=32), and six to nine months after (n=23); the Trinity Amputation and Prosthetic Experience Scales – Revised (TAPES-R) (n=17); and the Disabilities of Arm, Shoulder, and Hand (DASH) (n=29).

## RESULTS

**Psychological Wellness:** Prior to initiation of prosthetic fitting, 59% of individuals in the PH group screened positive for depression, 29% screened positive for PTSD, and 53% reported experiencing pain.

**Satisfaction:** Responses to AAD survey items are shown in Table 1. Patient satisfaction was rated on a Likert scale where 1 indicated "Dissatisfied" and 5 indicated "Satisfied." Additionally, subjects reported 7.94 out of a maximum 10 overall satisfaction score on the TAPES-R.

**Perceived Disability:** Preliminary calculations of DASH scores of four subjects showed that scores decreased in all but one subject after fitting.

	Prior Care	Post Definitive	6 to 9 months Post Definitive
Prosthesis	2.04	4.43	4.09
Prosthesis meeting expectations	1.80	4.28	4.39
Prosthesis comfort	2.68	4.4	4.61
Team's ability to optimize fit	2.56	4.63	4.78
Team's ability to optimize function	2.04	4.75	4.83
Instruction given to operate prosthesis	2.96	4.81	4.91
Appearance of prosthesis	2.28	4.28	4.57
Understanding of how to operate prosthesis	*	4.62	4.48
Care & attention provided by prosthetic team	2.8	4.81	5.00

\* Question was not included in Prior Care survey

Table 1. Patient satisfaction with prosthetic care.

## DISCUSSION

**Psychological Wellness:** Individuals with PH amputations are more likely than individuals in the general population to screen positive for depression and PTSD. Furthermore, about 50% screen positive for pain, which may worsen depression symptoms.

**Satisfaction:** Compared to previous prosthetic care experiences, patients are more satisfied with the outcome following a thorough evaluation during which education is provided on all appropriate prosthetic options and a care plan that included ongoing collaborative prosthetic and therapeutic support.

**Perceived Disability:** DASH scores showed a trend of subjects perceiving themselves to be less disabled after prosthetic fitting.

## CONCLUSION

Subjects reported higher satisfaction following a thorough prosthetic evaluation and collaborative, specialized prosthetic fitting with therapeutic intervention. Notably, higher satisfaction with the prosthesis meeting their expectations was reported.

## CLINICAL APPLICATIONS

Psychological screening is indicated with this patient population to identify potential challenges to prosthetic rehabilitation success. Results from prior care may not be indicative of potential for satisfaction with prosthetic intervention and rehabilitation based on thorough evaluation, educated discussion of prosthetic options and comprehensive specialized training with patient-selected option. Overall patient satisfaction is influenced by the alignment of prosthetic function with patient expectations.

## REFERENCES

- Biddiss, E.A., Chau T.T., Disabil Rehabil Assist Technol 2, 71-84, 2007.
- Burger, H., Maver, T., Marinček C. Disabil Rehabil 29, 1317-1321, 2007.

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