Exploring the role of Prosthetic Technology in the Participation of Older Adults with Limb Loss
BM. Pousett, N. Parag, A. Battalova, C MacKay, WC. Miller *Gerontechnology* 25(s)

Purpose People with limb absence or amputation (LA) face challenges in their physical and psychosocial function which may lead to participation limitations (1). Older adults may face unique challenges to participation which may not be well supported in existing rehabilitation programs, further limiting their engagement in their community (1–3). We seek to understand how older adults with LA use their prosthesis to engage in meaningful activities and social roles and to explore factors that moderate their participation. **Method** A sequential mixed-methods approach was used to explore the participation of adults with LA. Eligible participants (people 18+ years old with LA living in BC) could participate in an interview, survey or both. This analysis focuses on older adults 50+. Semi-structured interviews, exploring factors impacting participation, were conducted over Zoom and analyzed using reflexive thematic analysis. A survey, exploring prosthetic technology, funding sources and participation, was administered over the phone or via Qualtrics. It included the WHOQoL-BREF, Prosthesis Evaluation Questionnaire: Ambulation Subscale (PEQ) and the Patient-Reported Outcome Measurement Information System Ability to Participate in Social Roles and Activities Questionnaire (PROMIS). The survey was analyzed using descriptive statistics, correlation matrices, t-tests, and ANOVAs. **Results and Discussion** 66 older adults completed the survey (mean age 63.0 years, 74% male, 85% lower LA) and 17 completed the interviews (mean age 65 years, 59% male, 88% lower LA). People used a variety of prosthetic technologies, including passive, mechanical, electric, secondary and recreational prostheses. 26% of people with lower LA and 57% of people with upper LA had multiple prostheses. 65% of people rated their overall quality of life (WHOQoL-BREF) as “good” or “very good,” and with the physical health being the lowest domain (59/100) and psychological and environmental being the highest domains (66/100, 67/100). The mean ambulation score for people with lower LA (PEQ) was 53/100, indicating reduced mobility. Participation (PROMIS = 42.3) was almost one standard deviation below the average, demonstrating mild participation limitations. Interview participants reported that prosthetic technology was a substantial factor supporting their participation and agreed that they needed to be strategic about getting a prosthesis(es) that met their needs. They described the “tiered standard of living for disabled people in Canada” as access to prosthetic technology is impacted by funding source which is tied to cause of amputation, occupation, socioeconomic status, and ability to advocate. The survey supported this, as the funding source was moderately correlated with the cause of amputation and both the funding source and personal income were moderately correlated with the number of prostheses. There were no statistically significant differences in participation or ambulation for people with different types of access to prostheses (t-tests and ANOVAs ps > 0.05). However, the means suggest that people with multiple prostheses tended to report higher levels of perceived participation and ambulation. Interview participants described participation as related to several other factors. Many mentioned how the negative repercussions of LA (e.g., comorbidities, overuse injuries) increase as you age. They also described how support from family and friends promoted participation and reported very few experiences of stigma and judgment. Regardless of prosthetic treatment, older adults described how adaptation was key to participation and participation came down to one’s mindset. By understanding the impact of prosthetic treatment and the other facilitators of participation, we can tailor rehabilitation programs to meet the needs of older adults with LA.

References:

1. Roepke, A. M., Williams, R. M., Turner, A. P., Henderson, A. W., Norvell, D. C., Henson, H., et al. (2017). A longitudinal study of social participation after dysvascular lower extremity amputation. *American Journal of Physical Medicine & Rehabilitation, 96*(10), 741–747.
2. Van Twillert, S., Stuive, I., Geertzen, J. H. B., Postema, K., & Lettinga, A. T. (2014). Functional performance, participation and autonomy after discharge from prosthetic rehabilitation: Barriers, facilitators and outcomes. *Journal of Rehabilitation Medicine, 46*(9), 915–923.
3. Amtmann, D., Morgan, S. J., Kim, J., & Hafner, B. J. (2015). Health-related profiles of people with lower limb loss. *Archives of Physical Medicine and Rehabilitation, 96*(8), 1474–1483.

Keywords: Prosthetic technology, limb loss, participation, mixed methods,
Affiliation: Barber Prosthetics Clinic; Graduate Program in Rehabilitation Sciences, University of British Columbia; Rehabilitation Research Program, Centre for Aging SMART, Vancouver Coastal Research Institute, Canada.
Acknowledgements: This project was supported by The War Amps. B. Pousett is supported by the Canadian Institutes of Health Research (CIHR) and the EPIC-AT Health Research Training Program.