



Patient Perspectives on Physical Exercise 1-Year Post-Transfemoral Osseointegration: A Qualitative Analysis

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Summary

- Nine BAL users described four themes — **Restored Personhood, Decreased Activity Pacing, Exercise Barriers & Facilitators, and Contextual Constraints**
- BAL users described improved participation and ↓ mental load associated with activity
- Socket-associated barriers ↓; BAL-specific constraints emerged
- This is the first qualitative analysis of exercise post-BAL; findings can inform general exercise guidelines and return-to-duty rehabilitation

Results

5M/4F | Age at BAL: 51.5 ± 11.9 yrs | 10.8 ± 15.7 yrs post-amputation

Theme 1: Restored Personhood

- Confidence
 - Women uniquely reported improved social reception
- Improved and expanded role participation
- ↓ cognitive load during ADLs and daily planning

Theme 2: Exercise Barriers & Facilitators

- Comorbidities / post-BAL adverse events as barriers
- Lack of safe aerobic exercise options (loss of swimming as preferred exercise)
- ↓ pain as facilitator
- Social/structured activities are facilitators for some

Theme 3: Decreased Activity Pacing

- ↑ participation in the community
- Walking for leisure, not just function

Theme 4: Contextual Constraints

- Caution due to fall consequences on implant
- Functional status misalignment with pre-BAL goals

- *Common barriers: time, energy, competing roles*
- *BAL-specific: torque, impact, stoma considerations*

Background

- Osseointegrated **bone-anchored limbs (BAL)** improve function for people who cannot use a socket prosthesis, supporting service members to stay in active duty
- Favorable BAL quantitative outcomes are documented, but patient perspectives on **participation, physical activity, and exercise** are underexplored
- *We aimed to examine physical activity and exercise **priorities** for BAL users to inform return-to-duty rehabilitation*

Methods

- Participants were 1-year post-transfemoral BAL and enrolled in a CDMRP-funded telerehabilitation trial (NCT05695911)
- 1-on-1, semi-structured 1-hr interviews discussed current physical activity and exercise levels, changes since BAL, and future goals
- A secure, university-approved AI application supported initial coding and categorization
- A qualitative researcher independently reviewed transcripts before adding/collapsing codes, updating definitions, adjusting code counts, refining themes, and identifying outliers

Discussion

- 1st qualitative analysis of exercise experiences post-BAL
- Improved walking eased daily activities and enabled pleasurable walking; barriers to long-term exercise remained
- Participants want:
 - clinician-supervised and peer-supported opportunities
 - clarity on BAL-specific modifications
 - sufficiently intense aerobic exercise that does not compromise BAL loading restrictions
- *Findings highlight the need for general exercise guidelines beyond post-surgical rehabilitation*
- *Programs leveraging patients' increased desire to walk may improve sustainability*

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