Remote rehabilitation after Total Knee Replacement (TKR) using visualisation and monitoring techniques

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Introduction

- Immediate post-op rehab important in total knee replacement (TKR)
- Fewer patients referred to OP Physio
- Less resource for arthroplasty follow-up
- Post-op rehab undertaken without feedback
- Can technology help?

Aim

To engage users in their rehabilitation through an innovative way of visualising, capturing and monitoring movement data.

Methods

Primary TKR patients were recruited to a pilot RCT. The control group underwent normal post-operative rehabilitation. The intervention group were given a laptop based system to use in their homes.

The system used trackers attached to thigh and leg and provided visual feedback during exercise sessions (Figure 1), recorded progress (both quality and quantity of exercises) (Figure 2) and allowed video calls between patient and clinicians (Figure 3).

Clinical outcome measures were collected prior to discharge from hospital and at six weeks follow-up. Satisfaction with the visualisation system was assessed from one (very dissatisfied) to nine (highly satisfied).

Results

Seven control and nine intervention patients completed the study. All intervention patients who completed the study found the visualisation system and video call easy to use (median satisfaction eight, range six to nine). Patients (7/9) and therapists (2/2) felt that the system enhanced communication and the overall follow-up experience. Mainly positive comments were received (Figure 4).

At six weeks the intervention group had larger improvements in knee extension and flexion (Figure 5).

Conclusion

- Home-based visualisation facilitated remote assessment sessions with trained professionals.
- Video calls and recorded visualisations allowed problems to be identified and early intervention.
- Potential to:
  - improve range of motion;
  - reduce knee extension lag;
  - prevent unnecessary hospital visits; and
  - reduce the impact on local services.