

# Feedback from Activity Trackers Improve Daily Step Count after Knee and Hip Arthroplasty. A Randomised Controlled Trial.

Matthew Lyons,  
Benjamin Gooden,  
Justin Roe,  
Michael O'Sullivan,  
Lucy Salmon,  
Kaka Martina,  
Claire Monk,  
Leo A Pinczewski

Accepted for presentation at :

- Arthroplasty Society Noosa, June 2017
- Australian Knee Society, Noosa October 2017
- International Society of Orthopaedic Centres Conference, Sydney, November 2017
- American Academy of Orthopaedic Surgeons Annual Meeting, New Orleans, March 2018



NORTH SYDNEY ORTHOPAEDIC  
& SPORTS MEDICINE CENTRE



MATER HOSPITAL  
SYDNEY  
A FACILITY OF ST VINCENT'S HEALTH AUSTRALIA

**AIM:** Commercial wrist worn activity trackers have a great potential to accurately assess activity levels, and are being increasingly adopted in the general population. The aim of this study was to determine if feedback from a commercial activity tracker improved activity levels after total hip (THA) or knee arthroplasty (TKA).

## METHODS:

160 consecutive subjects undergoing primary TKA or THA were randomized into 2 groups. Subjects received a Garmin Vivofit® device 2 weeks prior to surgery and completed patient reported outcome measures (PROMS). The step count display was obscured in all subjects in the preoperatively. On day 1 after surgery participants were randomised to either the

“Feedback Group” (FB) or the “Non Feedback Group” (NFB). The FB group were able to view their daily step count via the activity monitor or using the app on a mobile device, and were given a daily step goal. Participants in the NFB group wore the device with the display

obscured for 2 weeks after surgery, after which time they were also able to see their daily step count, but did not receive a formal step goal. The mean daily steps at 1, 2, 6 weeks, and 6 months were expressed as a percentage of the subject’s preoperative steps and compared between the FB and NFB groups. At 6 months after surgery subjects repeated PROMS and daily step count collection.

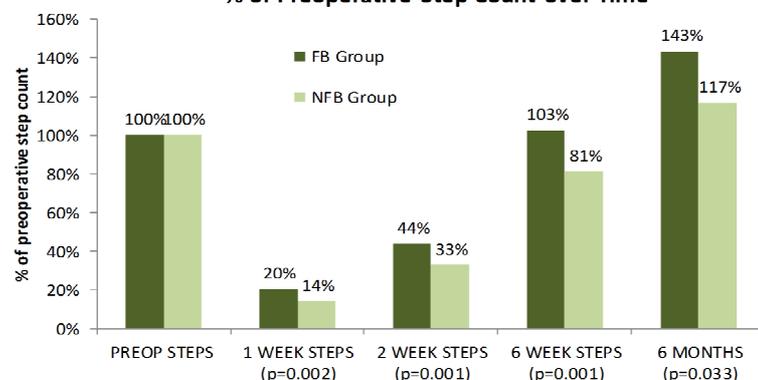


## RESULTS:

Of the 160 joints, 96 underwent THA and 64 underwent TKA. The FB group had a significantly higher mean daily step count by 45% in week 1 ( $p=0.002$ ), 33% in week 2 ( $p=0.001$ ), 26% in week 6 ( $p=0.001$ ) and 23% a 6 months, ( $p=0.03$ ) compared to the NFB group (Figure 1).

There was no significant difference between the 2 groups for preoperative steps ( $p=0.020$ ), operative type ( $p=0.79$ ), gender (0.21), mean age

Figure 1: Daily Step Count of FB and NFB Group as % of Preoperative Step Count over Time



( $p=0.94$ ), BMI ( $p=0.51$ ), or preoperative PROMS ( $p>0.30$ ). There was no significant difference between the groups in patient reported outcomes at 6 months. At 6 months 91% of the FB group and 82% of the NFB group reported they were satisfied with the results of the surgery ( $p=0.08$ ). At 6 months after surgery 70% of subjects had a mean daily step count of more than 100% of their preoperative level.

## CONCLUSIONS

Subjects who received feedback from a commercial activity tracker with a daily step goal had significantly higher activity levels after hip and knee arthroplasty over 6 months, compared to subjects who did not receive feedback in a randomised controlled trial. Commercial activity trackers may be a useful and effective adjunct to treatment of subjects after arthroplasty.