

BRACELET Study: Breast Recovery After Axillary Node Clearance: Evaluating Limbs with E-Technology

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21ST ANNUAL MEETING
APRIL 29 – MAY 3, 2020 | LAS VEGAS, NEVADA

INTRODUCTION

- Upper limb morbidity is common in breast and axillary surgery but rarely measured objectively.
- Wearable Activity Monitors (WAMs) capture continuous measurements of body movement in a free-living environment.

AIM

Investigate the use of WAMs to provide objective data regarding functional recovery in patients undergoing breast and axillary surgery.

METHOD

Prospective Observational Study

National Research Ethics Service Approval (Ref:15/LO/1038) and registration with clinicaltrials.gov (NCT 03635723).

STUDY PROTOCOL

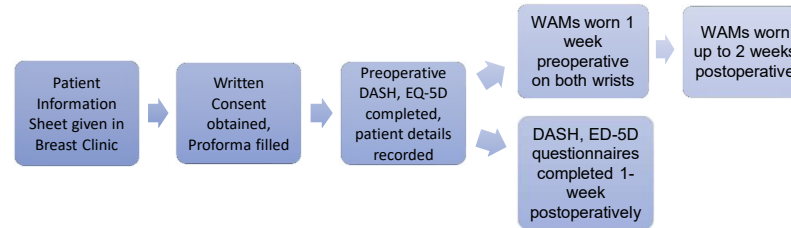


Figure 1. Flow chart showing time line of study methods including outline of patient activities.

- Gross activity levels.
- Difference in movements between arms.
- Correlations between activity and QoL questionnaires.



Figure 2. Wearable Activity Monitors, WAMs (AX3, Activity, UK.)

RESULTS

| Characteristics | Total (N=20) |
|-------------------------------------|--------------|
| Mean Age, (yrs.) (STD) | 64 (14) |
| Sex Ratio (M:F) | 0:1 |
| Mean BMI (SD) | 27 (5) |
| Handedness Ratio (R:L) | 19:1 |
| Stage of Cancer (n, %): | |
| Stage 0 | 1 (5) |
| Stage 1 | 10 (50) |
| Stage IIA and IIB | 3 (15) |
| Stage IIIA-IV | 6 (30) |
| Cancer Type (n, %): | |
| Ductal Carcinoma In-situ | 1 (5) |
| Invasive Ductal Carcinoma | 13 (65) |
| Invasive Lobular Carcinoma | 6 (30) |
| Type of Breast Surgery (n, %): | |
| Mastectomy | 7 (35) |
| Breast conserving surgery | 9 (45) |
| Reconstruction | 2 (10) |
| SLNB | 12 (60) |
| Axillary Node Clearance (n,%) | 5 (25) |
| Operation Laterality Ratio (R:L:BL) | 7:9:4 |
| Adjuvant Therapy (n,%) | 13 (65) |

Table 1. Baseline Demographics of Analysed Study Population.

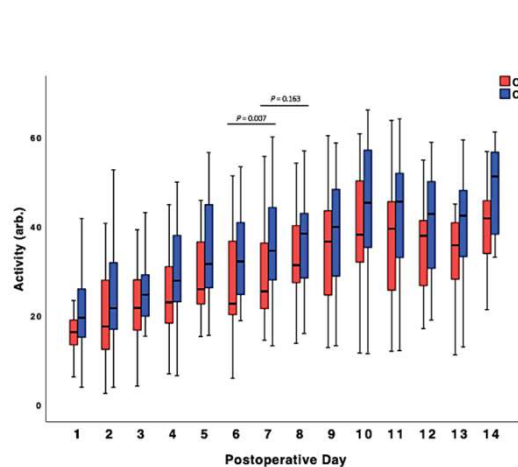


Figure 3. Disparity between recovery in operated vs control arm movement activity over 2 weeks postoperatively. (N.B. All patients right handed except for 1, 7:9:4 R:L:BL operations).

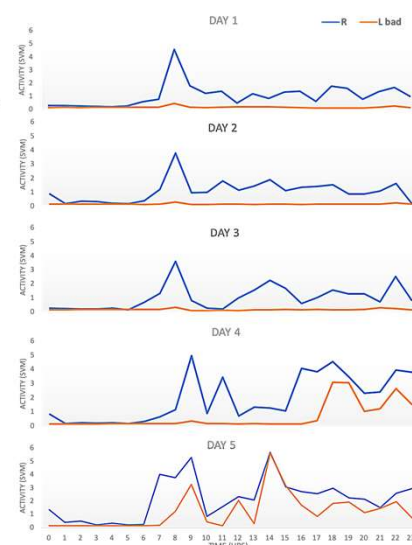


Figure 4. Variation between right and left sides can be seen for a patient who underwent left wide local excision and sentinel node biopsy post-operative day 1 to 5. Dominant hand is right.

- Statistical plateau at day 7 ($p < 0.05$).
- Difference between operated and non-operated arm activity reduced from 25% to 17% over test period.
- Post-op activity returned to 83% relative to the pre-operative baseline by day 10.
- Activity levels correlated well with pre-operative ($R = 0.66$, $p < 0.05$) and post-operative quality of life surveys ($R = 0.62$, $p = 0.06$).

CONCLUSIONS

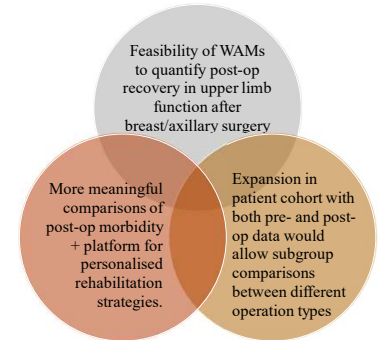


Figure 5. Venn diagram displaying study conclusions and potential application with outlining of future steps.

ACKNOWLEDGEMENTS

This work is independent research funded by the National Institute for Health Research (NIHR) Imperial Biomedical Research Centre (BRC). The views expressed in this publication are those of the authors and not necessarily those of the NHS, the NIHR or the Department of Health.

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