# The effectiveness of a device for real time pain reporting on pain scores and patient satisfaction

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## Introduction

Despite establishment of acute post-operative pain services, a large proportion of the post-surgical population suffer with moderate or severe pain. It has been shown that non-pharmacological methods are effective in reducing pain (1), which presents an opportunity for improved pain relief without the risks associated with analgesics (2).

## Device

We have shown that patients are likely to report their pain scores via a digital device more frequently than nurse recorded observations and may report higher pain scores (3). We developed a device that allows patients to report their pain scores. This device is multifunctional and gives access to information (3) tailored to their post-operative journey, both in relation to their pain (i.e., how to use a PCA) and their non-pain management (i.e, the management of a chest drain).

In this study we have allowed real time feedback of scores indicating poor and borderline pain control (NRS ≧2/4) to the nursing staff and the acute pain team. We aim to determine whether real-time feedback of pain using an interactive device can reduce the proportion of patients with a borderline or poor post-operative pain score.

## Methods

This trial was approved by the local research and ethics committee. A total of 234 inpatients were recruited to a cohort study, 1 day after thoracic or urological surgery at University College London Hospital, UK. Patients were divided into three cohorts:

**Phase 1** (n=102) standard care;
**Phase 2** (n=66) device for real time pain score feedback to the nursing staff;
**Phase 3** (n=66) device for pain score feedback to nursing staff and the acute pain team.
**Questionnaire A:** Modified Brief Pain Inventory.
**Snapshot Questionnaire:** Verbal Rating Scale (None, Mild, Moderate, Severe, Very Severe) for 1) Current Pain 2) Worst Pain in last 24 hours 3) Least Pain in last 24 hours 4) Distress 5) Overall Satisfaction (Very Satisfied, Satisfied, Neither, Dissatisfied, Very Dissatisfied), 6) recent nurse recorded VRS pain score.

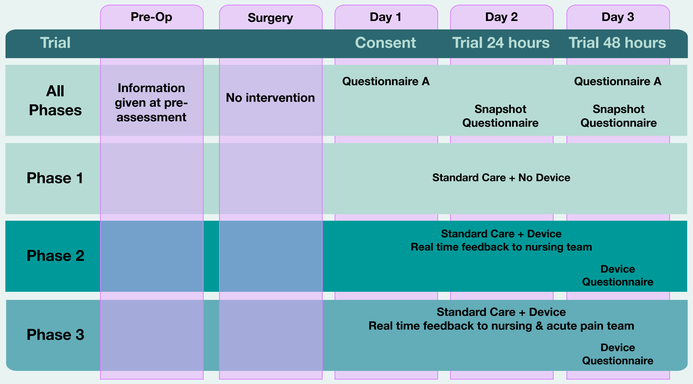


**Figure 1 - Trial Schedule**
Patients were entered into the trial following consent on post-op day 1. Patients received questionnaire A after consent and prior to the trial finishing at 48 hours. Snapshot questionnaire was asked at trial 24 and 48 hours. Patients in Phase 2 & 3 received a device and therefore completed a device questionnaire at trial 48 hours.

| | Phase 1 | Phase 2 | Phase 3 |
|---|---|---|---|
| Recruited, n | 102 | 66 | 66 |
| Female, n (%) | 44 (43%) | 31 (47%) | 27 (41%) |
| Age, mean ± SD | 60±16 | 64±15 | 59±15 |
| Thoracic Surgery, n (%) | 77 (75%) | 63 (95%) | 61 (92%) |
| Day 1 Pain NRS/10, median (IQR) | 8 (5-9) | 8 (5-9) | 8 (6-10) |
| Day 1 Analgesia "Step 4", n (%) | 76 (75%) | 63 (95%) | 64 (97%) |
| Dropout, n (%) | 11 (11%) | 8 (12%) | 8 (12%) |

**Figure 2 - Descriptive Data**
Patients were entered into the trial following consent on post-op day 1. Patients received questionnaire A after consent and prior to the trial finishing at 48 hours. Snapshot questionnaire was asked at trial 24 and 48 hours. Patients in Phase 2 & 3 received a device and therefore completed a device questionnaire at trial 48 hours.

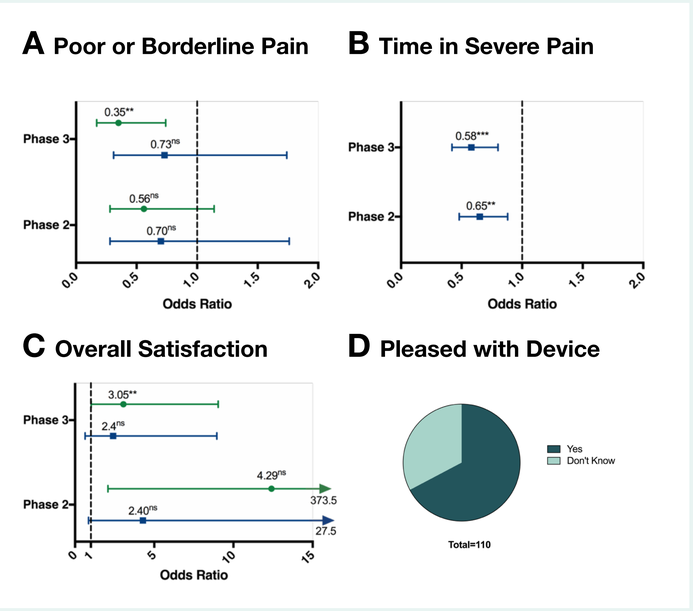


**Figure 3A-D - Pain & Satisfaction Outcomes**
3A. Odds ratio of poor/borderline pain control between Phase 1 and Phases 2/3 at 24 and 48 hours. 3B. Odds ratio of time in severe pain at 48 hours between Phase 1 and Phases 2 & 3. 3C. Odds ratio of Patient satisfaction between Phase 1 and Phases 2/3 at 24 and 48 hours. 3D. Proportion of patients pleased with the device.

## Conclusion

1. Patients with the Device were 3 times less likely to have borderline or poor pain control with realtime pain score feedback to nursing staff and acute pain team than in staåndard care.

2. While not significant there were trends for this reduction in inadequate pain control in those with the device but without feedback to the acute pain team and also those at 48hours after the device.

3. Effect at 48 hours is likely due to reduction in pain scores and lack of power at this timepoint.

4. Our device improved paitent satisfaction and was well accepted by the population studied.

## References

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