Adherence and Usability of a Wrist-worn Device for Recording Pain Scores
Hardy B, Jasko J, Powers J, Reed, M, Philips Respironics, Monroeville, PA

Introduction
A recording of patient pain perception is required for proper assessment of pain therapies. A wrist-worn device for collecting patient reported pain scores could be more convenient than paper diaries or electronic tablets that could be misplaced, but the usability and adherence of a wrist-worn device needs validation.

Objective
Compare a wrist-worn device with a paper diary for collecting pain and fatigue scores.

Methods
The wrist-worn device was a prototype of a Philips Respironics Actiwatch Spectrum PRO actigraphy device that allows entry of a 0-10 score on channels A (pain) and B (fatigue). The alarm was set to cue an entry at 8am, 12pm, 4pm, and 8pm with a reminder in 5 minutes if no score was entered. Twenty subjects (12 males, mean age = 54 ± 7 years) diagnosed with chronic pain were asked to wear the device for 5 days and enter scores (0-10) for pain at the cued times, and simultaneously enter the same scores on paper diaries.

Results
The subjects reported that the wrist-worn device was readable and comfortable:

The subjects entered the data at the requested time for the device.

Wrist-worn device: Data entered on time 90% of the time with no reminder and 95% of the time with reminder. All subjects entered at least 3 of the 4 scores per day.

Paper diary: 80% overall adherence but times of entry are unknown.

The device and diary detected an increase pain score during the day.*

But the diary and device scores agreed only 80% of the time. The cause of the difference is not known, but it may have been due to the diary being completed after the subject forgot what they entered on the device.


Conclusion
The wrist-worn device for recording patient-reported pain and fatigue levels was well accepted, provided data that replicated published findings on pain levels during the day, and, with the help of the electronic reminder, provided 95% subject adherence.
A recording of patient pain perception is required for proper assessment of pain therapies. A wrist-worn device for collecting patient reported pain scores could be more convenient than paper diaries or electronic tablets that could be misplaced, but the usability and adherence of a wrist worn device needs validation. Twenty subjects from a pain clinic (54 ± 7 yo, 60% female) were asked to wear a prototype of a new wrist-worn actigraphy device for 5 days. The device allowed the subjects to enter two scores, either spontaneously or in response to an alarm, several times per day. No entry after an alarm was followed by a reminder 5 minutes later. They were asked to enter scores for pain (0-10) and fatigue levels (0-10) when the device sounded/vibrated 4 times each day and to also record the same value in a paper diary. The subjects entered pain and fatigue scores on cue 90% of the time and with the reminder 5% of the time for a total of 95% adherence. Data was available from at least 3 of the 4 daily time points every day for all subjects. The electronic recordings agreed with the paper recording 80% of the time which suggests that 20% of the paper entries may not have been recorded at the proper time. Subjects gave favorable scores for device readability (90-95%), and comfort (90%). The device scores demonstrated the expected increase in pain and fatigue during the course of the day (Murphy, Arthritis & Rheum., 59: 849, 2008). This wrist-worn device for recording pain and fatigue was well accepted by pain patients and, with the help of the electronic reminder, delivered excellent adherence.