

NHS England - TECS CASE STUDY 004: Wearable vital signs monitor for patients in general wards and Accident & Emergency waiting areas

Location and commissioners: Spire Health Montefiore Hospital, Brighton

Provider: Sensium Healthcare

Ambition level: 7 (Making significant progress towards eliminating avoidable deaths in our hospitals caused by problems in care)

Background – what does the project hope to achieve?

Since May 2014, Spire Health's Montefiore Hospital, Brighton is using *SensiumVitals* to generate better patient outcomes and shorter hospital stays by giving early warning of sudden deterioration of both mobile and immobile patients.

The system particularly benefits patients who develop problems such as sepsis, or are bleeding internally – where early detection and treatment is crucial – and traditionally available only in IC and high dependency units.

The system has been used for patients who have undergone moderate to major surgery, elderly and neutropenic patients.

How does it work?

SensiumVitals is a lightweight, wireless patch that measures patients' heart rate, respiration and temperature – taking readings every two minutes. The results (including trend data) are sent wirelessly to nurse stations or web-enabled portable devices. When readings fall outside pre-set thresholds, notifications are issued to nurses to alert them early to potential patient deterioration.

It is a very lightweight patch – only 15 grams so extremely unobtrusive / very comfortable for patients and it allows patient roaming – as a wearable, wireless device, an important factor in speeding recovery.

It has a five-day battery, so once applied, remains effective for the length of most hospital stays and is easily disposable – patches are single use only, which limits the risk of cross infection.

What was achieved?

From a clinical perspective, the key benefit was the early detection of deterioration in the condition of a significant number (12%) of patients. This allowed earlier intervention and, for

those affected, greatly improved patient outcomes than would have been expected under normal monitoring protocols.

For the patient, it offers reassurance, mobility, and better outcomes. For patients and the wider health economy, it offers improved patient recovery, reduced length of stay, and avoids higher treatment costs through earlier detection.

Between October 2012 and March 2013, a six-month pilot was undertaken at Saint John's Health Center in Los Angeles.

During this period, 270 general ward patients were monitored, of whom the first 168 were included in a White Paper publication.

The average cost saving for each of these patients was \$5,500 (~£3,000). On an annualised basis, the saving for the pilot ward was over \$200,000 – against an annual cost of \$20,000.

Detecting patient deterioration more quickly enables earlier clinical intervention and improved patient outcomes, e.g. for septic shock, Kumar (2006) demonstrated a 7.6% increase in mortality for every hour that the application of antimicrobials was delayed.

SensiumVitals addresses concerns about patient safety highlighted in a number of recent reports. It provides reassurance both to patients and to nursing staff - the latter able to spend time with patients needing more immediate attention, whilst confident that if there is a sudden change with a "patched" patient, they can respond immediately.

Commissioning, procurement, information governance challenges

SensiumVitals has only recently been launched in the UK. As a result, they do not yet have strong UK health economics evidence to support the introduction of the system in NHS but early indications show:

There is a lack of funding for operational costs associated with new technologies (e.g. the focus of the Nursing Technology Fund is on capital expenditures). Ideally, funding should be made available to the budget of those who purchase patient monitoring equipment – down to ward level.

In general, there has been strong positive interest from potential adopters of the SensiumVitals system. However, at this early stage of market development, a key barrier to uptake is a reluctance amongst some decision makers to be “early adopters”.

Based on the experience of the US pilot, hospitals might expect to generate a return on investment in the region of 10:1.

For example, a hospital with 60 general ward beds, might expect to patch about 2,100 patients per year (based on 70 patients per bed per year; 50% of patients being patched).

The cost to the hospital would be £73,500 p.a. (patches costing £35 each).

Based on the US pilot, the cost saving to the hospital could be in the region of £756,000: 12% of patients (252) might expect to receive early warnings. Each of these patients might expect to stay on average four days less than would have been expected without the patch – delivering an average saving of £3,000.

In addition, the integration of SensiumVitals data with hospital EMR systems reduces the risk of errors in the transcription / interpretation of vital signs readings that have been taken manually.

Links to related information on the programme:

<http://www.bbc.co.uk/news/health-28415753>