ICU
MANAGEMENT & PRACTICE

Continuous Monitoring of Patients Using Wearable Technology

Vital sign deterioration may be preventable if strategies are used to identify patients at a higher risk. Early Warning Score (EWS) systems were developed many years ago to identify patients at risk of clinical deterioration using physiological parameter-based protocols. Since then, many hospitals have adopted periodic vital sign monitoring protocols which mandate a stepwise increase in vital sign measurement frequency when EWS exceeds predefined levels. Early intervention can potentially improve clinical outcomes, but the clinical effectiveness of EWS systems has not been up to the mark due to poor protocol adherence and inaccurate vital sign recordings.

Continuous vital sign monitoring can be improved by using wearable monitors linked wirelessly to hospital electronic patient records. This could, in turn, improve the early detection of physical deterioration and may help save lives.

In this single-centre before-and-after study at a university hospital in The Netherlands, researchers used continuous vital sign monitoring using wearing monitors. Patients were admitted with conditions related to general internal medicine, rheumatology and infectious diseases. The primary outcomes of the study were unplanned ICU admission and rapid response team calls. Secondary items included length of hospital stay and in-patient death.

Before the study intervention, nurses measured and recorded five vital signs. These included respiratory frequency, heart rate, systolic and diastolic blood pressure, oxygen saturation and core temperature. During the intervention period, patients were monitored with a wearable device which provided continuous measurements.

Findings show that patients monitored using wearable monitors experienced fewer unplanned ICU admissions and fewer rapid response calls. The number of rapid response team calls that did not result in ICU admission also declined. There was no significant difference in the number of rapid response team calls that did result in ICU admission, nor was there any significant difference in the length of hospital stay or in-patient deaths between the two stud periods (before and after).

Overall, these results suggest that continuous vital sign monitoring of patients using wearable monitoring technology linked wirelessly to hospital systems was associated with a reduction in unplanned ICU admission and rapid response team calls. However, more research is required to determine the impact of this approach on patient survival.

Source: British Journal of Anaesthesia
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Published on : Wed, 27 Apr 2022

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