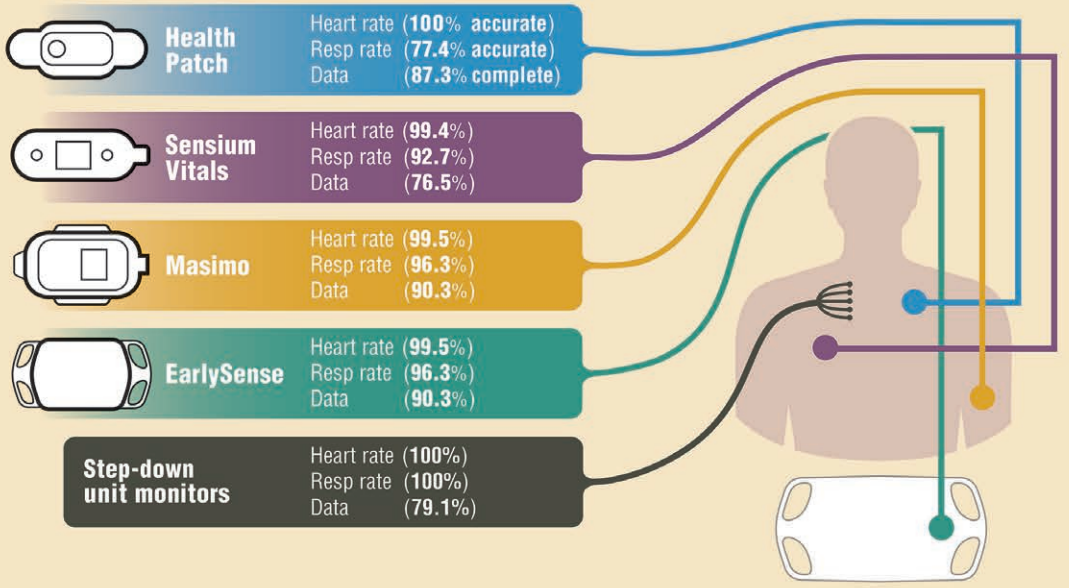
Continuous Postoperative Monitoring: Validation of the Next Frontier

Up to 60% of patients who suffer cardiac arrest on the hospital wards have abnormal vital signs hours before the event.[1] Wearable monitors could detect those abnormalities, but they have undergone limited real-world validation.

Breteler *et al.*[2] monitored 25 high-risk patients after surgery, comparing 4 wearable devices to reference intensive care-grade bedside monitoring. They analyzed a total of 720 h of vital signs.



Most wearable devices[3] were highly accurate for determining both heart rate and respiratory rate. Next steps in using these devices should focus on:


Workflow integration


Alarm management


Education

Accuracy was defined as the percentage of paired data elements in zone A or B of the Clarke Error Grid. Data completeness was defined as the percentage of total monitoring time for which data were received, averaging heart rate and resp (respiratory) rate.

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1. Saugel B, Hoppe P, Khanna AK: Automated continuous noninvasive ward monitoring: Validation of measurement systems is the real challenge. ANESTHESIOLOGY 2020; 132:407–10
2. Breteler MJM, KleinJan EJ, Dohmen DAJ, Leenen LPH, van Hillegersberg R, Ruurda JP, van Loon K, Blokhuis TJ, Kalkman CJ: Vital signs monitoring with wearable sensors in high-risk surgical patients: A clinical validation study. ANESTHESIOLOGY 2020; 132:424–39
3. Taenzer AH, Spence BC: The afferent limb of rapid response systems: Continuous monitoring on general care units. Crit Care Clin 2018; 34:189–98