BioIntelliSense

WHITEPAPER

Solving for Telemetry Overuse in Patient Monitoring

February 2026

Current challenges in patient monitoring

Telemetry has become a standard tool in hospitals for monitoring patients who require continuous ECG monitoring, but **evidence shows it's widely overused.** Up to 43% of hospital telemetry use occurs without indication[1], while one study showed only 24% of telemetry days were determined to be appropriate based on practice standards.[2]

Despite usage guidelines by the AHA and recommendations by the Society of Hospital Medicine to adopt a protocol-driven approach to continuous ECG monitoring, **overutilization remains a problem.**[1]

One analysis found that telemetry ordered outside of AHA guidelines, had a documented benefit of less than 1%.[3] Another study demonstrated that clinical care was changed for only 7% of patients on telemetry, as a result of their telemetry usage.[4]

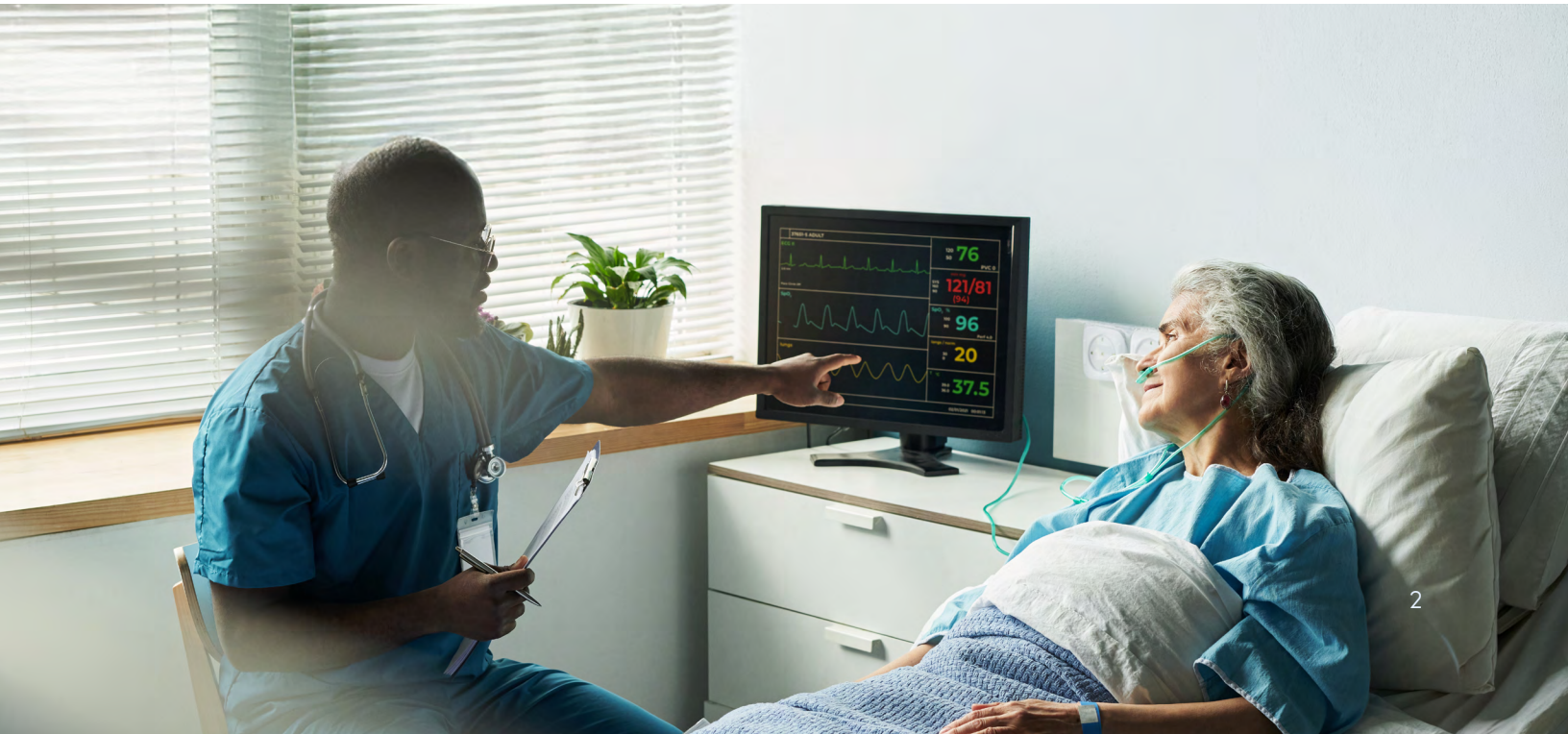
These findings suggest that telemetry is often being used as part of a "defensive medicine" strategy, fueled by a fear of missing clinical events.[5]

Evidence shows telemetry is widely overused

43% of telemetry occurs without indication[1]

76% of telemetry days were determined to be inappropriate[2]

Less than 1% of telemetry orders outside of AHA guidelines had a benefit[3]



The hidden burden of overuse

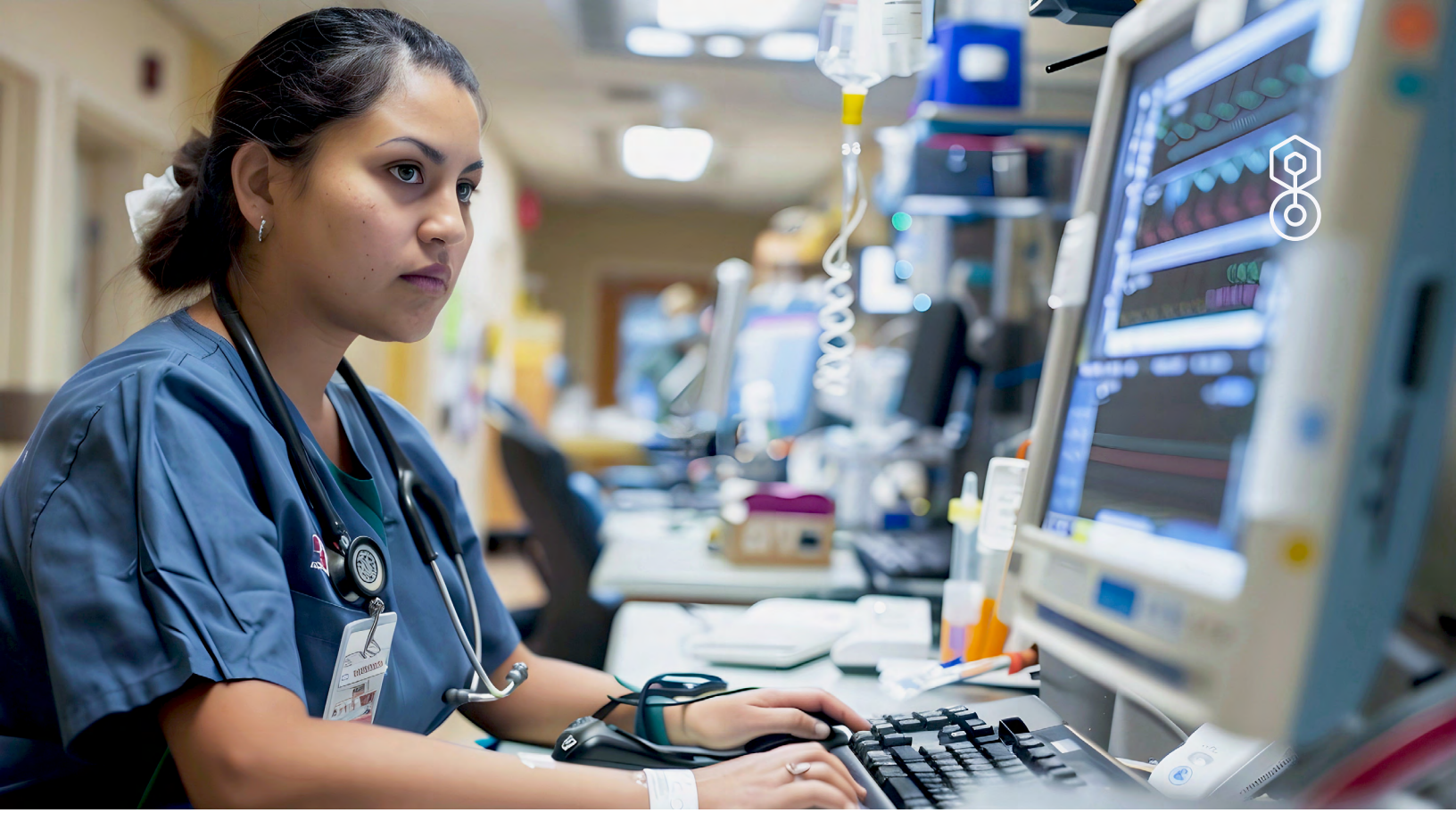
Telemetry overuse creates ripple effects across healthcare systems in the form of operational strain, patient safety risks, and financial impact.

OPERATIONAL STRAIN

Unnecessary telemetry creates a high alarm burden for clinical teams, **contributing to clinician cognitive overload.**[6,7] Alarm fatigue is a well-documented challenge in clinical care environments, driven in part by the sheer volume of alerts clinicians must process. In a study of 2,029 medical-surgical nurses, 84.6% reported feeling overwhelmed by the number of clinical alarms.[8] **Over time, this constant exposure can lead to alarm fatigue, which occurs when clinicians develop decreased reactivity and begin to tune out alarms.**[9]

Beyond alarm burden, unnecessary telemetry also places strain on hospital operations. **Its use can diminish hospital throughput and increase a patient's length of stay.**[4,11]

> **84.6%** medical-surgical nurses **reported feeling overwhelmed** by the number of clinical alarms[8]



PATIENT SAFETY RISKS

While intended to protect patients, **telemetry overuse can create unintended safety risks.** This concern is reflected in national risk assessments, where overuse of telemetry was one of the top 10 ECRI digital health hazards in 2023.[6]

As clinicians become desensitized to frequent alarms, critical events may be missed.[6,7] The consequences of alarm fatigue vary widely, ranging from disturbed rest to missed periods of instability due to alarm desensitization.[9]

Telemetry can also disrupt patient sleep,[5] and sleep disturbance has substantial potential **impacts on patient recovery from illness and operation.**[10]

Clinicians becoming desensitized to alarms may result in:

- **missed critical events**
- **disturbed rest**
- **missed periods of instability**

FINANCIAL IMPACT

Reducing inappropriate use of telemetry can reduce overall health care expenditure**,** as telemetry overutilization **costs approximately $54 per patient per day.**[1,12] In one analysis, reducing telemetry use by an average of 1.21 to 4.22 days resulted in calculated cost savings of $22,199 per month.[4]

Other analyses highlight the scale of unnecessary use driving these costs. **Nearly a quarter of patients were placed on telemetry without indication**, and 56% of the remaining patients **stayed on telemetry longer than recommended**, resulting in more than $500,000 in annualized costs associated with inappropriate telemetry use.[13]

> **More than $500,000**
> in annualized costs associated with inappropriate telemetry use

Why telemetry overuse persists

Despite awareness and published guidance, telemetry can persist as part of a "defensive medicine" strategy, fueled by a fear of missing clinical events and a fear of missing clinical arrhythmias.[5] **When telemetry is used for patients who do not require it, it can lead to patients overall being less effectively monitored.[6]**

Bridging the gap with wearable technology

What has been missing is a scalable way to continuously monitor key vital signs for patients who do not require continuous ECG monitoring but still warrant oversight for signs of deterioration. One challenge to early recognition of patient decline is variation in the frequency of manual vital sign measurements, particularly during overnight hours.[15] Because these measurements are intermittent, monitoring gaps occur, creating periods when changes in physiologic condition can go unnoticed.[16] In fact, spot-checking can leave patients unmonitored 96% of the time.[2]

This is where technologies such as the BioButton® multi-parameter wearable device can play an important role.

The BioButton® provides continuous monitoring of vital signs with high clinical accuracy.[17] It has demonstrated the ability to generate timely notifications for physiologic abnormalities, such as elevated heart rate or respiratory rate, which can precede clinical deterioration events by several hours and may allow for earlier intervention.[17]

In addition, BioButton® detects the majority of events with a minimal frequency of alarms.[17] Notifications generated by the BioButton® system have led to actionable changes in patient care, including new diagnoses and adjustments in treatment, demonstrating a measurable impact on clinical management.[17]

Finding balance through smart solutions

Telemetry plays a critical role in patient monitoring when used appropriately. However, when applied too broadly, telemetry overuse can create unintended consequences, including clinician cognitive overload and missed critical events, a high alarm burden, diminished hospital throughput, and increased patient length of stay.[6,7,11,14]

Finding the right balance means selecting the monitoring approach that best matches the patient's clinical needs.

For patients who do not require continuous ECG monitoring, wearable monitoring devices provide an alternative that supports earlier recognition of clinical deterioration and may result in reduced rapid response team activations and fewer unplanned ICU admissions.[18]

Wearable solutions such as the BioButton® enable continuous monitoring of vital signs with high clinical accuracy and support early detection of patient deterioration.[17]

Interested in learning how wearable monitoring approaches like the BioButton® can support continuous vital sign monitoring within your patient care strategy? Learn more at **BioIntelliSense.com.**

References

1. Yeow RY, Strohbehn GW, Kagan CM, et al. Eliminating inappropriate telemetry monitoring: an evidence-based implementation guide. JAMA Intern Med. 2018;178(7):971-978. doi:10.1001/jamainternmed.2018.2409
2. Curry JP, Jungquist CR. A critical assessment of monitoring practices, patient deterioration, and alarm fatigue on inpatient wards: a review. Patient Saf Surg. 2014;8:29. doi:10.1186/1754-9493-8-29
3. Brownell J, Yenigalla B, et al. Abstract 205: Does overuse of telemetry impede cost-effective patient care? Circulation. 2020;141(Suppl 1):205.
4. Pendharkar SS, Barry IB, Patibandla S, et al. AHA telemetry guidelines improve telemetry utilization in the inpatient setting. Am J Manag Care. 2020;26(11):476-481.
5. Varnika FNU, Vummaneni S, Munjal P, Walters BP, Gupta V, Jain R. Untangling the wire: exploring the overuse of continuous telemetry on regular nursing floors. Cardiol Rev. 2025.
6. ECRI. Top 10 Health Technology Hazards for 2023: Executive Brief. ECRI; 2023.
7. Srinivasa E, Mankoo J, Kerr C. An evidence-based approach to reducing cardiac telemetry alarm fatigue. Worldviews Evid Based Nurs. 2017;14(4):265-273.
8. Ruppel H, Dougherty M, Bonafide CP, et al. Alarm burden and the nursing care environment: a 213-hospital cross-sectional study. BMJ Open Qual. 2023;12:e002342. doi:10.1136/bmjoq-2023-002342
9. Hravnak M, Pellathy T, Chen L, et al. A call to alarms: current state and future directions in the battle against alarm fatigue. J Electrocardiol. 2018;51(6 Suppl):S44-S48. doi:10.1016/j.jelectrocard.2018.07.024
10. Hillman DR. Sleep loss in the hospitalized patient and its influence on recovery from illness and operation. Anesth Analg. 2021;132(5):1314-1320. doi:10.1213/ANE.0000000000005323
11. Chen S, Zakaria S. Behind the monitor—the trouble with telemetry: a teachable moment. JAMA Intern Med. 2015;175(6):963-964. doi:10.1001/jamainternmed.2015.0837
12. Benjamin EM, Klugman RA, Luckmann R, Fairchild DG, Abookire SA. Impact of cardiac telemetry on patient safety and cost. Am J Manag Care. 2013;19(6):e225-e230.
13. Chong-Yik R, Bennett AL, Milani RV, Morin DP. Cost-saving opportunities with appropriate utilization of cardiac telemetry. Am J Cardiol. 2018;122(9):1567-1573. doi:10.1016/j.amjcard.2018.07.016
14. Chaudhary R, Kingsley T, Sarkar S, et al. Telemetry: appropriateness of initial assignment and duration in nonintensive setting. Am J Manag Care. 2020;26(11):459-460. doi:10.37765/ajmc.2020.88524
15. Stellpflug C, Pierson L, Roloff D, et al. Continuous physiological monitoring improves patient outcomes: a nurse-led initiative enhances vital sign assessment using digital devices. Am J Nurs. 2021;121(4).
16. Vroman H, Mosch D, Eijkenaar F, et al. Continuous vital sign monitoring in patients after elective abdominal surgery: a retrospective study on clinical outcomes and costs. J Comp Eff Res. 2023;12:e220176. doi:10.2217/cer-2022-0176
17. Weller GB, Mault J, Ventura ME, et al. A retrospective observational study of continuous wireless vital sign monitoring via a medical grade wearable device on hospitalized floor patients. J Clin Med. 2024;13:4747. doi:10.3390/jcm13164747
18. Eddahchouri Y, Peelen RV, Koeneman M, et al. Effect of continuous wireless vital sign monitoring on unplanned ICU admissions and rapid response team calls: a before-and-after study. Br J Anaesth. 2022;128(5):857-863. doi:10.1016/j.bja.2022.01.036

BioButton® multiparameter wearable is manufactured by BioIntelliSense, Inc.
570 El Camino Real #200 Redwood City, CA 94063.

February 2026
COM-20287 Ver.0