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# Altering Overuse of Cardiac Telemetry in Non-Intensive Care Unit Settings by Hardwiring the Use of American Heart Association Guidelines

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# Letters

#### **RESEARCH LETTER**

# LESS IS MORE

# Altering Overuse of Cardiac Telemetry in Non-Intensive Care Unit Settings by Hardwiring the Use of American Heart Association Guidelines

Arrhythmia detection is reported to affect the clinical management of care in 3.4% to 12.7% of patients.<sup>1</sup> The American Heart Association's (AHA's)<sup>2</sup> published recommendations addressing the use of non-intensive care unit (non-ICU) cardiac

# $\leftarrow$

**Invited Commentary** 

telemetry stratify patients into 3 categories: cardiac telemetry is indicated, may provide benefit, or is unlikely to

provide benefit. Clinical-effectiveness studies of implementing these guidelines have either reported the use of laborintensive strategies<sup>3</sup> or nonsustained decreases in non-ICU cardiac telemetry use.<sup>4</sup> Various efforts to reduce the perceived overuse of cardiac telemetry at Christiana Care Health System, a 1100-bed tertiary care system, were unsuccessful. In August 2012 we convened a team to increase the appropriate use of non-ICU cardiac telemetry through the integration of AHA guidelines into our electronic ordering system (EOS). This effort was validated in March 2013 when non-ICU use of cardiac telemetry appeared on the Society of Hospital Medicine's top 5 list for the Choosing Wisely campaign.<sup>5</sup>

Methods | Approval for this study was received from the institutional review board of Christiana Healthcare System; need for patient consent was waived. Our interdisciplinary team redesigned and standardized all cardiac telemetry orders within our EOS. Cardiac telemetry orders were removed from order sets for clinical conditions for which monitoring was not supported by the AHA guidelines.<sup>2</sup> The remaining orders for cardiac telemetry required providers to select from a list of clinical indications, each with its AHA guideline-based predetermined telemetry duration (Box). Bedside nurse assessment guidelines were embedded in the EOS to facilitate safe, timely, and automatic discontinuation of cardiac telemetry. When telemetry discontinuation was believed to be unsafe, such as in a patient with unstable blood pressure, the nurse was required to contact the physician, and telemetry could be reordered when appropriate.

We calculated total costs (direct and indirect) for the delivery of non-ICU telemetry. Time-motion studies were conducted to measure the nondirect patient care nursing time spent on telemetry-related tasks.

The study period began December 31, 2012, and ended August 12, 1013. The redesigned telemetry orders went into effect on March 18, 2013; there were 11 and 22 weeks in the preimplementation and postimplementation periods, respectively. In non-

#### Box. Duration of Cardiac Telemetry by Clinical Indication<sup>a</sup>

#### 24 Hours

Chest pain, rule out MI Nonurgent percutaneous coronary interventions Implantation of an automatic defibrillator lead or a pacemaker lead Uncomplicated ablation of an arrhythmia Syncope of truly unknown origin Major surgery Other **48 Hours** Acute MI CHF, acute and subacute Syncope with suspected arrhythmia Thoracic (noncardiac) surgery Stroke, acute Complex major surgery

#### Indefinite

Cardiac surgery during this admission Use of a wearable personable automatic defibrillator (LifeVest; ZOLL Medical Corp) Complex cardiac disorders (eg, ventricular tachycardia storm) Abbreviations: CHF, congestive heart failure; MI, myocardial infarction. <sup>a</sup> Adapted from Drew et al.<sup>2</sup>

ICU patients 18 years or older, we measured the mean weekly number of patients with telemetry orders, the mean duration of telemetry, and the numbers of rapid response activations, codes, and deaths.

**Results** | Implementation of the revised telemetry order sets resulted in an immediate and sustained reduction in the mean (SD) weekly number of telemetry orders from 1032.3 (32.1) to 593.2 (21.3), and the mean duration of telemetry fell from 57.8 (2.4) to 30.9 (0.9) hours (reductions of 43% and 47%, respectively; P < .001) (**Figure**). The mean daily number of patients monitored with telemetry decreased 70%, from 357.5 (20.6) to 109.1 (4.3). Hospital census, code blue, mortality, and rapid response team activation rates were stable throughout the observation period. Nurses spent a mean of 19.75 minutes per patient on telemetry-related tasks daily (>115 hours system wide). The estimated total daily cost to deliver telemetry was \$53.44 per telemetry patient; thus, our mean daily cost for non-ICU cardiac telemetry decreased from \$18 971 to \$5772.

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Figure. Control Charts of Non-Intensive Care Unit (ICU) Use of Cardiac Telemetry Before and After Implementation of Electronic Ordering System (EOS) Guidelines

A, Number of telemetry orders per week. B, Number of hours of telemetry use per patient. AHA indicates American Heart Association; brown lines, mean values; and horizontal shaded bars, upper and lower control limits (corresponding to 3 SDs).

**Discussion** | Although overuse of cardiac telemetry in non-ICU settings is widely recognized, there is a paucity of literature outlining successful and safe strategies addressing this concern. Our project led to a sustained 70% reduction in telemetry use without adversely affecting patient safety. In fact, patient safety may be enhanced by reducing the potential for alarm fatigue and provider workflow interruption.<sup>6</sup> This initiative's key success factors included the algorithm's simplicity and focus on appropriateness, an interprofessional frontline team creating improvements for relevant disciplines, and "hardwiring" national guidelines into our EOS. This intervention is estimated to save our organization \$4.8 million annually, suggesting that efforts addressing opportunities listed in the Choosing Wisely campaign can be an effective strategy to enhance value-added health care.

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Study concept and design: Dressler, Dryer, Coletti, Doorey.

Acquisition, analysis, or interpretation of data: All authors.

Drafting of the manuscript: Dressler, Dryer.

Critical revision of the manuscript for important intellectual content: All authors. Statistical analysis: Dressler, Dryer, Mahoney.

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