Choosing Telemetry Wisely: a Survey of Awareness and Physician Decision-Making Regarding AHA Telemetry Practice Standards

Aaron M. Brug, B.A.[1], Kayla M. Hudson, B.A.[1], Rebecca Moore, M.D.[1,2], and Chayan Chakraborti, M.D.[1]

[1]Department of Internal Medicine, Tulane University, New Orleans, LA, USA; [2]Departments of Internal Medicine and Pediatrics, 230, Brown University, Providence, RI, USA.

KEY WORDS: telemetry; cardiac monitoring; choosing wisely; decision-making.

J Gen Intern Med 34(4):496–7
DOI: 10.1007/s11606-018-4769-z

INTRODUCTION

In 2013, the American Board of Internal Medicine's (ABIM) Choosing Wisely campaign evaluated resource utilization and recommended avoidance of ordering "continuous telemetry monitoring outside of the intensive care unit without using a protocol that governs continuation".[1] One such protocol was revised twice by the American Heart Association (AHA) in 2004 and 2017 and has been found to predict cardiac events and change patient management.[2–4] No prior studies have assessed the decision-making process physicians use regarding telemetry. This study aims to assess that decision-making process in relationship to the AHA practice standards, thus having the potential to inform implementation of ABIM's recommendation.

METHODS

In spring 2017, a web-based survey was distributed to internal medicine residents and faculty at an urban academic medical center. The survey included 14 patient scenarios (Table 1) taken directly from the 2004 AHA Practice Standards. Participants were asked whether they would monitor each patient on telemetry, responding using a 3-point scale corresponding to the three classes in the AHA practice standards scale ("absolutely monitor," "consider monitoring," or "not monitor"). A correct response was defined as the accurate classification of a patient scenario according to the guidelines. The survey also employed a five-point Likert scale to assess statements about awareness and use of the AHA Practice Standards, institutional guidelines, and the extent to which each physician relied on gestalt when deciding to use telemetry (Table 2). Analysis of variance tests compared the mean correct by training level. Fisher's exact tests compared the providers' percent agreement ("agree" or "strongly agree") with statements about awareness and use by training level.

RESULTS

The survey response rate was 37% (55/149): 23 interns, 16 residents, and 16 faculty physicians. Physicians correctly classified the patient scenarios 53% of the time (Table 2). There was no consistent directionality of telemetry misuse; for example, among class II recommendations, physicians indicated overuse of telemetry 38.2% of the time and indicated underuse of telemetry 27.6% of the time. Proper utilization of telemetry was not statistically correlated with higher level of training ($p = 0.569$). At all levels of training, self-reported awareness of the AHA guidelines was not predictive of performance ($p = 0.414$).

Awareness of the AHA guidelines increased with and differed significantly based on level of training (Fisher's exact $p = 0.021$) (Table 2). Among those who agree that they utilize the guidelines (either AHA or home institution's) in determining whether to place a patient on telemetry, there was no difference by level of training (AHA $p = 0.104$, 19.6% overall; institutional $p = 0.278$, 14.2% overall). When asked how they make decisions regarding telemetry, most respondents (87.5%) agreed they rely on "previous clinical experience and physician gestalt" and there was no statistical difference in these responses when stratified by level of training ($p = 0.89$).

DISCUSSION

While awareness of guidelines increases with level of training, this does not correspond to an increase in guideline utilization. Prior clinical experience and gestalt continue to dominate the decision to use telemetry, suggesting that the guidelines alone are insufficient in addressing the Choosing Wisely campaign's recommendation.

We hypothesize three possible explanations for the ineffectiveness of the current AHA guidelines: awareness is limited; the guidelines are too complex; and the guidelines conflict with physician gestalt. Awareness can be addressed through educational interventions, which have been shown to reduce inappropriate telemetry use.[5] A common method of increasing

Table 1 Select Patient Scenarios from 2004 AHA Practice Standard by Corresponding Protocol Class

Class I. I would absolutely monitor this patient on telemetry while in the hospital.
A patient recently resuscitated from cardiac arrest
An adult patient who has undergone recent cardiac surgery
A patient with AV block
A patient with long-QT syndrome and an associated ventricular arrhythmia
A patient with acute heart failure and resulting pulmonary edema
A patient diagnosed with sepsis
Class II. I would consider monitoring this patient on telemetry while in the hospital.
A patient with myocardial infarction 5 days ago
A patient who has undergone uncomplicated, nonurgent percutaneous coronary intervention
A patient who is administered an antiarrhythmic drug or requires adjustment of drugs for rate control with chronic atrial tachyarrhythmia
A patient with subacute heart failure admitted for UTI
A patient with left bundle-branch block admitted for GI bleed
Class III. I would not monitor this patient on telemetry while in the hospital.
A patient who is confused and agitated
A patient with chronic rate-controlled atrial fibrillation
A patient with ESRD admitted and awaiting declotting procedure of dialysis catheter

Table 2 Physician Responses to Telemetry Scenarios and Statements about Utilization Stratified by Level of Training

Percent of AHA Practice Standard scenarios correct			
	Faculty physician	Resident	Intern
Mean	0.589	0.545	0.509
95% CI	(0.536, 0.642)	(0.454, 0.636)	(0.441, 0.577)
Percent agree			
	Faculty physician	Resident	Intern
I am aware of the 2004 AHA Practice Standards for Electrocardiographic Monitoring in Hospital Settings.	0.250	0.400	0.087
I utilize the 2004 AHA Practice Standards for Electrocardiographic Monitoring in Hospital Settings to guide my decisions to monitor patients on telemetry.	0.250	0.250	0.087
I utilize my institution's telemetry monitoring guidelines in my decisions to monitor patients on telemetry.	0.063	0.188	0.130
I utilize my previous clinical experience and physician gestalt in my decisions to monitor patients on telemetry.	0.938	0.876	0.826

guideline adherence is to incorporate guidelines within an EMR via "forcing-functions" or pop-up dialog boxes.[6]

With three subjective classes containing over 50 individual clinical scenarios, the 2004 guidelines may be too complicated to institute into practice. The 2017 update to the practice standards, published after the completion of this study, further classify scenarios into five categories (I, IIa, IIb, III: No benefit, III: Harm), potentially exacerbating the issues of complexity.[4]

Alternatively, use of gestalt despite awareness of the guidelines may suggest that physicians disagree with the circumstances which patients should be placed on telemetry outlined in the AHA guidelines.

The study's small sample size from a single academic center, as well as the 2017 updates to the practice standards (although published after completion of this study) may limit generalizability. Further studies may be warranted to identify why utilization of the guidelines remain suboptimal. Streamlining and incorporation into physician workflow may increase guideline adoption.

Corresponding Author: *Chayan Chakraborti, M.D.; Department of Internal Medicine, Tulane University, New Orleans, LA, USA (e-mail: cchakrab@tulane.edu).*

Compliance with Ethical Standards:

Conflict of Interest: *All authors have no conflicts of interest to disclose. They, nor their institutions, have received commercial support for the submitted work.*

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