

Patient Safety Tip of the Week

April 16, 2019

AACN Practice Alert on Alarm Management

Among our numerous columns on alarm fatigue and alarm management issues, three columns were aimed at helping hospitals meet Joint Commission’s national patient safety goal on alarm safety (see our Patient Safety Tips of the Week July 2, 2013 [“Issues in Alarm Management”](#) and August 16, 2016 [“How Is Your Alarm Management Initiative Going?”](#) and October 17, 2017 [“Progress on Alarm Management”](#)).

The AACN (American Association of Critical-Care Nurses) Practice Alert “Managing Alarms in Acute Care Across the Life Span: Electrocardiography and Pulse Oximetry” ([AACN 2018](#)) is actually a year old now, but a couple recent studies have reinforced one very important point we’d like to emphasize.

Here are the AACN recommendations for bedside caregivers:

Provide proper skin preparation for and placement of ECG electrodes

That includes washing the site with soap and water and wipe the electrode area with a washcloth or gauze to roughen a small area of the skin when appropriate. They stress that alcohol should not be used because it dries out the skin.

Consider daily ECG electrode changes

This is based more on theoretical grounds and case reports and lacks a strong clinical evidence base but it makes good sense.

Use proper oxygen saturation probes and placement

That means placing the probe on a warm extremity and avoiding placement of a fingertip pulse oximetry sensor on the ear.

Check alarm settings at the start of every shift, with any change in patient condition and with any change in caregiver

Again, lesser level of evidence but makes good sense.

Customize alarm parameter settings for individual patients in accordance with unit or hospital policy

Settings should be adjusted according to individual patient's condition and age to reduce clinically insignificant alarms

AACN recommended strategies for nursing leaders include the following:

Establish an interprofessional team to gather data and address issues related to alarms

See our Patient Safety Tips of the Week July 2, 2013 "[Issues in Alarm Management](#)" and August 16, 2016 "[How Is Your Alarm Management Initiative Going?](#)" for discussions of who should be on such teams and how you go about collecting data.

Develop unit-specific default parameters and alarm management policies

Collaborate with an interprofessional team, including biomedical engineering, to determine the appropriate default alarm settings for the unit's patient population.

Provide initial and ongoing education on monitoring systems and alarm management for unit staff

This should be done for new nurses and periodically for all staff. They also note you should budget for appropriate education any time new alarm systems are introduced.

Consider use of an alarm notification system

This would include things like middleware, monitor watchers/technicians, etc. See our October 17, 2017 Patient Safety Tip of the Week "[Progress on Alarm Management](#)" for examples of middleware implementations. But also see our February 9, 2016 Patient Safety Tip of the Week "[It was just a matter of time...](#)" for what can go wrong with such systems. And a recent AHRQ Web M&M case ([Sandau 2019](#)) also illustrates problems that can arise with inadequate communication when telemetry is being monitored remotely.

Develop policies and procedures for monitoring only those patients with clinical indications for monitoring

We consider this one of the most important interventions to reduce unnecessary alarms and reduce alarm fatigue.

This last recommendation is the one we want to stress. In multiple columns we have emphasized that the biggest "bang for the buck" usually comes from eliminating unnecessary telemetry (see, for example, our October 2014 What's New in the Patient Safety World column "[Alarm Fatigue: Reducing Unnecessary Telemetry Monitoring](#)"). We've stressed that such policies should include not only criteria for initiation of telemetry but should also include criteria for cessation of telemetry.

Clinicians and researchers conducted a study at UCSF where they randomized an EHR alert randomized to half of the teams on the general medicine service ([Najafi 2018](#)). The alert displayed during daytime hours when physicians attempted to place an order for patients not in the intensive care unit whose telemetry order duration exceeded the

recommended duration for a given indication. The alert prompted a significant reduction in telemetry monitoring duration (8.7 fewer hours per hospitalization) with no significant change in rapid-response calls or medical emergency events. The most common physician response to an alert was to discontinue telemetry monitoring (62%). They authors conclude that a targeted EHR alert can safely and successfully reduce cardiac monitoring by prompting discontinuation when appropriate. They also note that this single-component electronic intervention is less resource intensive than typical multicomponent interventions that include human resources.

Another study ([Sendelbach 2019](#)) evaluated the impact of implementation of an electronic order set based on the American Heart Association practice standards for electrocardiographic monitoring on the occurrence of appropriate monitoring. Implementation of the order set was associated with an increase in appropriate monitoring (from 48.0% pre-intervention to 61.2% post-intervention). The largest increase was in ordering by medical residents, with appropriate monitoring increasing from 30.8% to 76.5% (note that medical residents had mandatory education on the order set, whereas hospitalists on received a one-slide overview on the order set). There was no significant increase in adverse patient outcomes. Also, more patients had fewer days of monitoring without an indication for monitoring after implementation but the difference was significant for the subgroup of medical residents.

Prior Patient Safety Tips of the Week pertaining to alarm-related issues:

- March 5, 2007 “[Disabled Alarms](#)”
- March 26, 2007 “[Alarms Should Point to the Problem](#)”
- April 2, 2007 “[More Alarm Issues](#)”
- June 19, 2007 “[Unintended Consequences of Technological Solutions](#)”
- April 1, 2008 “[Pennsylvania PSA’s FMEA on Telemetry Alarm Interventions](#)”
- February 23, 2010 “[Alarm Issues in the News Again](#)”
- March 2, 2010 “[Alarm Sensitivity: Early Detection vs. Alarm Fatigue](#)”
- March 16, 2010 “[A Patient Safety Scavenger Hunt](#)”
- November 2010 “[Alarms in the Operating Room](#)”
- February 22, 2011 “[Rethinking Alarms](#)”
- February 2013 “[Joint Commission Proposes New 2014 National Patient Safety Goal](#)”
- May 2013 “[Joint Commission Sentinel Event Alert: Alarm Safety](#)”
- July 2, 2013 “[Issues in Alarm Management](#)”
- August 2013 “[Joint Commission Formalizes 2014 NPSG on Alarm Management](#)”
- February 4, 2014 “[But What If the Battery Runs Low?](#)”
- October 2014 “[Alarm Fatigue: Reducing Unnecessary Telemetry Monitoring](#)”
- December 15, 2015 “[Vital Sign Monitoring at Night](#)”
- February 9, 2016 “[It was just a matter of time...](#)”
- August 16, 2016 “[How Is Your Alarm Management Initiative Going?](#)”
- February 21, 2017 “[Alarm Fatigue in the ED](#)”

- April 18, 2017 “[Alarm Response and Nurse Shift Duration](#)”
- April 25, 2017 “[Dialysis and Alarm Fatigue](#)”
- October 17, 2017 “[Progress on Alarm Management](#)”
- November 21, 2017 “[OSA, Oxygen, and Alarm Fatigue](#)”
- May 1 2018 “[Refrigerator Alarms](#)”

References:

AACN (American Association of Critical-Care Nurses). Practice Alert. Managing Alarms in Acute Care Across the Life Span: Electrocardiography and Pulse Oximetry. AACN April 3, 2018

<https://www.aacn.org/clinical-resources/practice-alerts/managing-alarms-in-acute-care-across-the-life-span>

Sandau KE, Funk M. What Happened on Telemetry? AHRQ PSNet Web M&M 2019; March 2019

<https://psnet.ahrq.gov/webmm/case/473>

Najafi N, Cucina R, Pierre B, et al. Assessment of a Targeted Electronic Health Record Intervention to Reduce Telemetry Duration. A Cluster-Randomized Clinical Trial. JAMA Intern Med 2018; Published online December 10, 2018

<https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2717954>

Sendelbach S, Sandau KE, Smith L, et al. Implementing Practice Standards for Inpatient Electrocardiographic Monitoring. Am J Crit Care 2019; 28(2): 109-116

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