

# CVS.411 Cardiac Monitoring & Alarm Fatigue Toward a Possible Solution: Are We Over-monitoring?

**Marge Funk, PhD, RN, FAHA, FAAN**



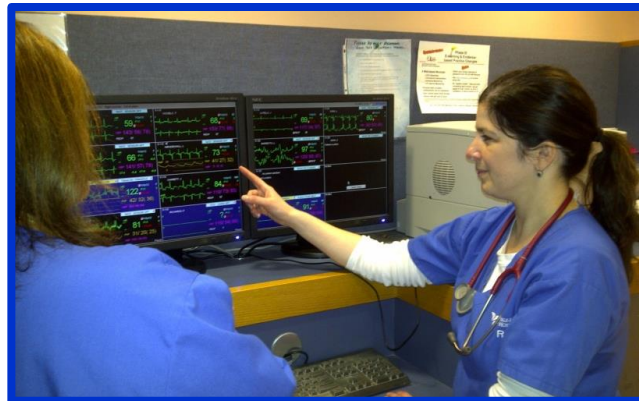
*Yale University School of Nursing*



YALE-NEW HAVEN  
HOSPITAL

# Possible Solutions to Alarm Fatigue

- 1. False alarms (occur when there is no valid triggering event)**
- 2. Non-actionable alarms (correctly sound, but for an event that has no clinical relevance)**
- 3. Appropriateness of monitoring**

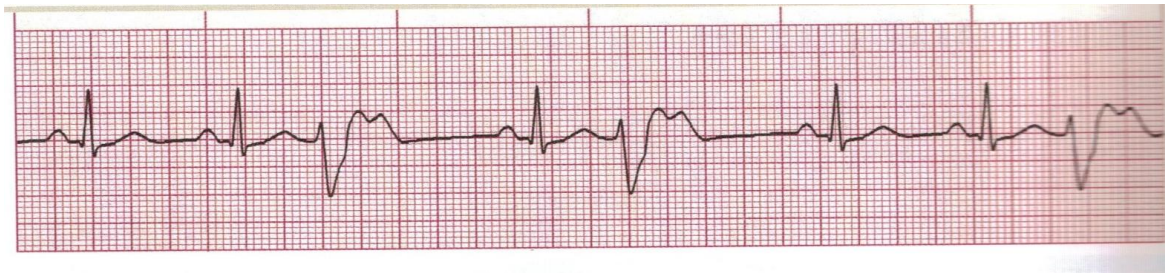


# Ways to Reduce False Alarms

- 1. Ensure good signal quality**
  - Good skin prep to ensure electrode adherence
  - Change electrodes daily
  - Good quality electrodes & lead wires
- 2. Be aware of context in which patient care occurs**
  - Silence alarms when doing patient care
  - Place BP cuffs on one arm & O<sub>2</sub> sat sensors on the other
- 3. Use “smart” monitors – consider other parameters before alarming**

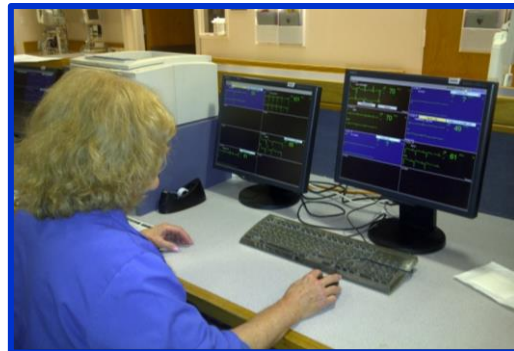
# Ways to Reduce Non-Actionable Alarms

- 1. Customize alarm settings to individual patient**
- 2. Widen alarm limits without compromising safety**
- 3. Deactivate default alarms for conditions we no longer treat, eg, PVCs**



# Avoid Unnecessary Monitoring

- The more patients on monitors → the more alarms
- Invention does not have to be the mother of necessity
- AHA Practice Standards for ECG Monitoring\*: who should be monitored & for how long
- Monitoring noninvasive → harmless?



\* Drew et al, 2004



- **Multisite-site RCT to evaluate the implementation of AHA Practice Standards on nurses' knowledge, quality of care, & patient outcomes**
- **17 hospitals with total of 64 cardiac units (ICU & telemetry)**
- **Quality of care: Research nurse on site for 5 days to collect data, including evaluating the appropriateness of monitoring**

**R01 HL081642**

# Determining Appropriateness of Monitoring

- **Review current medical record to determine if patient has Class I or II indication for monitoring, per AHA Practice Standards**
  - **Class I – indicated in most, if not all, patients**
  - **Class II – may be of benefit in some patients, but not considered essential for all patients**
  - **Class III – not indicated: a patient's risk of serious event so low that monitoring has no therapeutic benefit**
- **If patients have class I indication, they should be monitored; if patients have neither class I or II indication, should not be monitored**
- **Check if pt on monitor**

# Findings

- 82.13% of 1,388 patients with no indication for monitoring were on a monitor
- If they had not been on a monitor, would we have missed any significant events, eg, important change in rhythm or cardiac arrest?
- Monitoring justified?





# Outcome: Rhythm Changes

- **Significantly fewer rhythm changes in patients w/ no indication for monitoring vs. patients w/ indication ( $p < .0001$ )**
- **In >1,300 patients w/ no indication for monitoring:**
  - **Non-sustained VT: 23**
  - **SVT of ? etiology: 17**
  - **Atrial fibrillation / flutter: 12**
  - **Other arrhythmia: 11**

# Outcome: Cardiac Arrest

- **2 of 1,310 (0.15%) patients w/ no indication for monitoring vs. 35 of 3,290 (1.06%) patients w/ indication had a cardiac arrest (p = .002)**
- **2 w/ no indication who had a cardiac arrest:**
  - 1. 89 yo woman admitted for thyroidectomy (not an indication for monitoring). Had VF arrest associated with STEMI. Defibrillated → PCI to LAD w/ IABP. Died.**
  - 2. 27 yo man w/ endocarditis (not an indication for monitoring). While awaiting surgery, had VT → VF arrest. Survived & was discharged.**
- **Monitoring justified?**

# Is Avoiding Unnecessary Monitoring a Solution to Alarm Fatigue?

- Patients on monitor may be watched more closely?
- Over-monitoring preferable to under-monitoring?



Yale Daily News

# Cacophony of Alarm Sounds

Feeding Pump

Ventilator

Monitor

Infusion Pump

Bed Exit

Pulse Oximeter

Sequential Compression Device

IABP



# What Do You Think?

