



# Addressing the Problem of Alarm Fatigue: Enhancing Patient Safety through Cardiac Alarm Customization

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## Background

This project took place on the Surgical Unit at a 625-bed, Magnet recognized, teaching hospital in southern California. This facility is located in an urban setting with a very diverse population. The Surgical Unit is a 32-bed unit, caring for adult patients ages 18 and older. The majority of the population has undergone a general or orthopedic procedure, or has sustained a traumatic injury.

## Statement of the Problem

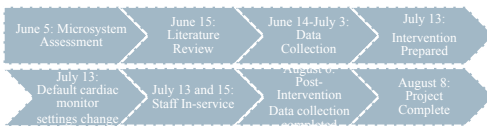
Alarms are intended to enhance patient safety. However, unnecessary and non-actionable alarms contribute to alarm desensitization and fatigue, lessening response time to critical alerts. An estimated 85-99% of alarms do not require clinical intervention. For the last four years, clinical alarm hazards have remained number one on the ECRI Institute's Top 10 Health Technology Hazards list (ECRI, 2014). One of the Joint Commission's 2015 Hospital National Patient Safety Goals is to "reduce the harm associated with clinical alarm systems" (The Joint Commission, 2015, p.7).

## Objectives

**Global Aim:** Improve patient safety through enhanced cardiac alarm customization.

**Specific Aim:** Reduce the number of cardiac alarms by 20% by August 8<sup>th</sup>, 2015.

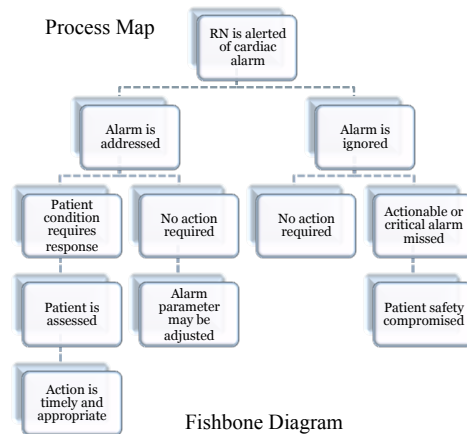
## Project Timeline



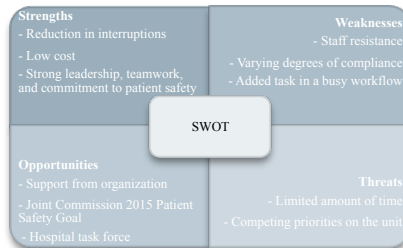
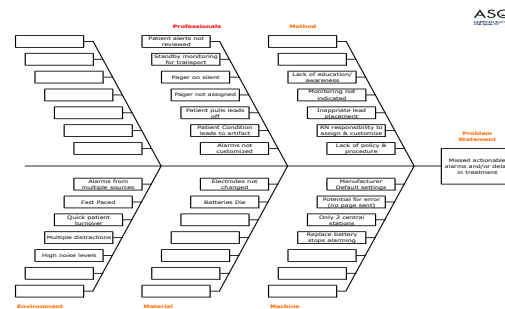
## Methodology

Lewin's change theory consisting of three phases- unfreezing, changing (or moving), and refreezing was utilized for the project.

## Microsystem Assessment (Plan)



## Fishbone Diagram

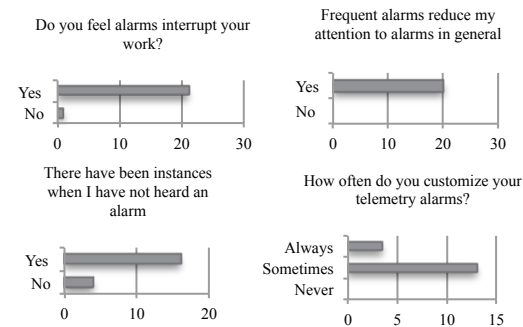


## Rationale

### Cost-Benefit Analysis

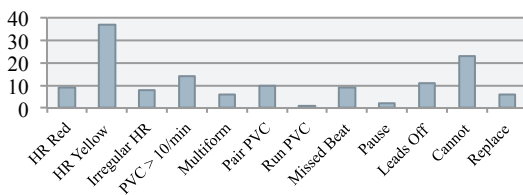
Operational Costs Year 1	Potential Savings Year 1	Net Benefit
CNL Salary with Benefits (150hrs x \$63.09) \$9463.50	Additional Hospital Days (\$4767.06 x 5) \$23,835.30	
30 min Staff Education (\$24 x 50 RN) \$1,200	Adverse Event x 1with Litigation \$118, 750.00	
<b>Total \$10,663.50</b>	<b>Total \$142,585.30</b>	<b>\$131,921.50</b>

### Pre-Intervention (Baseline) Data



### Telemetry Alarms on 5E over a 6-hour Period

136 Total Alarms: 23/hr. or 552/Day



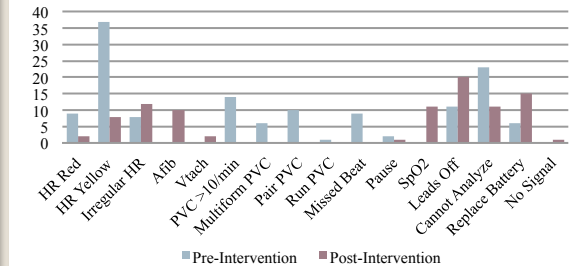
## Intervention (Do)

The default alarm settings were adjusted to better match the patient population on the Surgical Unit. Staff were provided an in-service during staff meetings in July. Content included an overview of alarm fatigue and scope of the problem, Joint Commission information and data, pre-intervention data on the unit, evidence-based guidelines including customization, changes to the default settings, and compliance with assigning the pager.

## Results (Study)

In the post-intervention period, there were a total of 93 alarms/6 hours, translating to 16/hr. or 384/day. This is a 32% decrease from the pre-intervention results. Compliance with assigning the cardiac pager to the correct patient improved from 53% in the pre-intervention period to 75% post-intervention.

### Alarm Types: Pre and Post Intervention



## Evaluation and Conclusions (Act)

Overall, the 32% percent reduction in cardiac alarms exceeded the goal of 20%. Based on literature, this reduction largely contributes to patient safety. Customizing alarms and changing the default settings were successful interventions in decreasing the total number of cardiac alarms. Future work will focus on lead management due to the high volume of artifact related alarms.

## References

The Joint Commission (2013). The Joint Commission sentinel event alert: medical device alarm safety in hospitals. Retrieved from [http://www.jointcommission.org/assets/1/18/SEA\\_50\\_alarms\\_4\\_5\\_13\\_FINAL1.PDF](http://www.jointcommission.org/assets/1/18/SEA_50_alarms_4_5_13_FINAL1.PDF)  
 The Joint Commission (2015). National patient safety goals effective January 1, 2015. Retrieved from [http://www.jointcommission.org/assets/1/6/2015\\_NPSG\\_HAP.pdf](http://www.jointcommission.org/assets/1/6/2015_NPSG_HAP.pdf)  
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## Acknowledgments

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