

**September 18, 2017
12pm to 1pm**

From the National Coalition for Alarm Management Safety

**A JOURNEY TO REDUCE ALARM FATIGUE:
Tips on What Not to Do**

**Peggy Bartholomew, MHSM, RN, PMP
Project Manager
Quality Project Management
UT Southwestern Medical Center**

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Speaker Introduction

Peggy Bartholomew, MHSM, RN,
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A JOURNEY TO REDUCE ALARM FATIGUE: Tips on What Not to Do



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Conflict of Interest Disclosure

- I have no actual or potential conflict of interest in relation to this presentation.

Who is UT Southwestern?

Zale Lipshy University Hospital



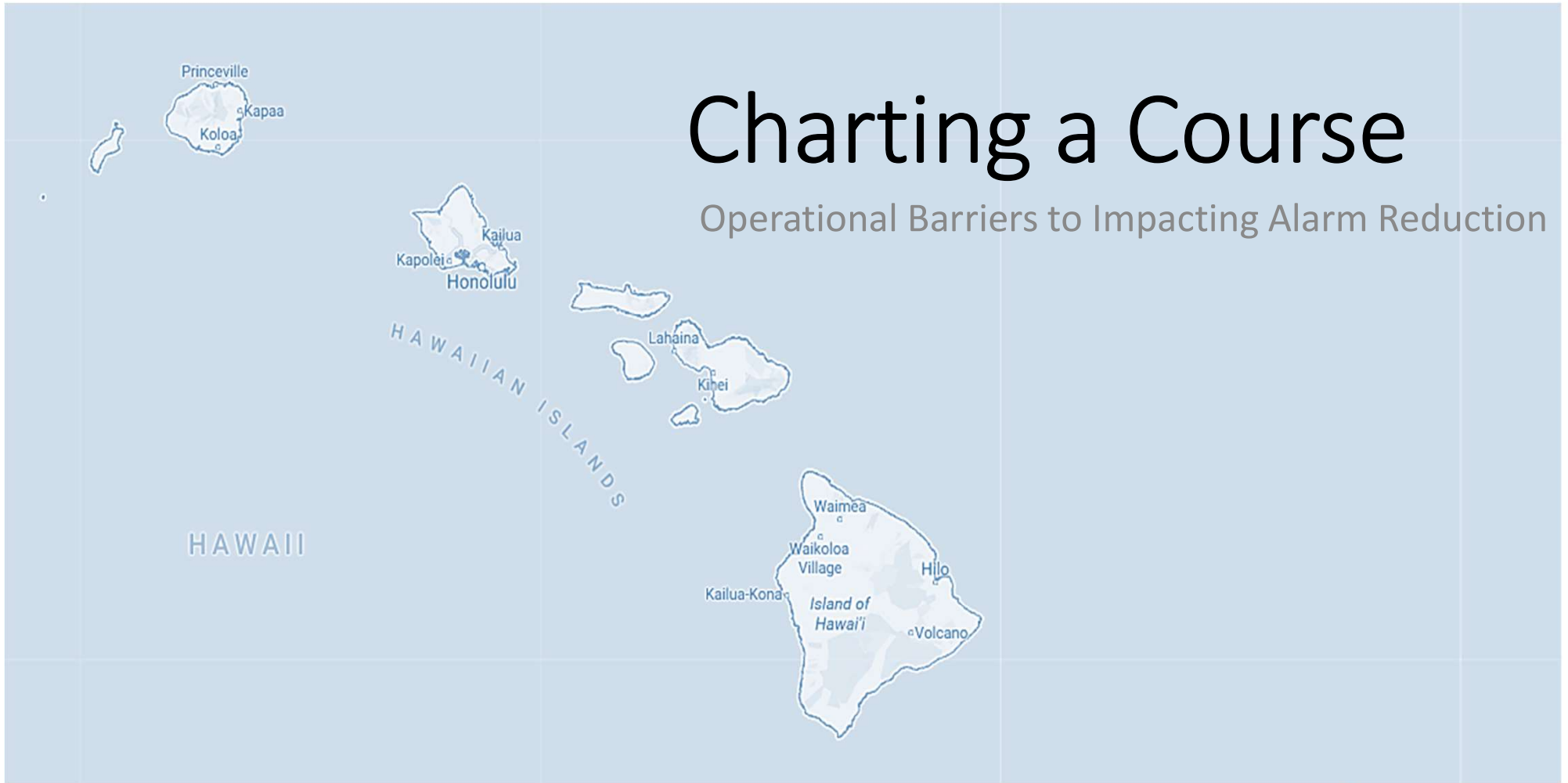
William P. Clements University Hospital



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Charting a Course

Operational Barriers to Impacting Alarm Reduction



Know the Destination

- Navigating uncharted territory



The Joint Commission Announces 2014 National Patient Safety Goal (continued)

Continued from page 1

The image shows the cover of a publication from the Joint Commission. It features a blue and yellow color scheme. The text on the cover includes the Joint Commission logo, the title 'National Patient Safety Goal on Alarm Management', and the effective date 'Effective January 1, 2014'. It also lists the applicable hospitals and the specific performance element A.1.

Joint Commission
Requirement

Official Publication of Joint Commission Requirements
National Patient Safety Goal on Alarm Management

APPLICABLE TO HOSPITALS AND CRITICAL ACCESS HOSPITALS
Effective January 1, 2014

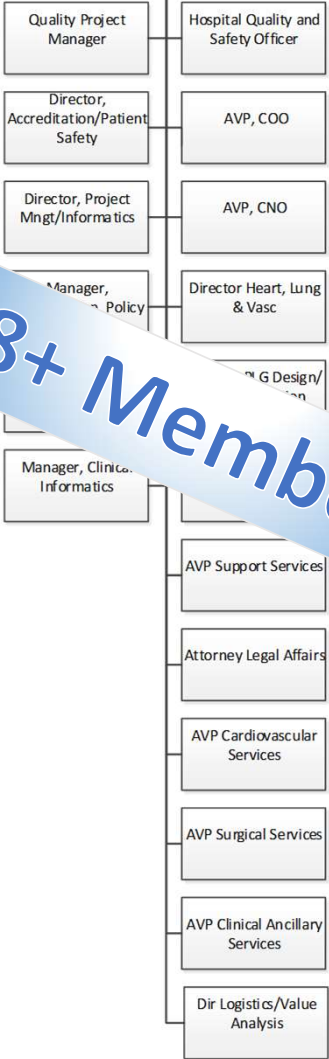
Elements of Performance for NPSG.06.01.01
A 1. As of July 1, 2014, leaders establish alarm system safety as a [critical access] hospital priority. **R**

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How many people does it take to create a project team?

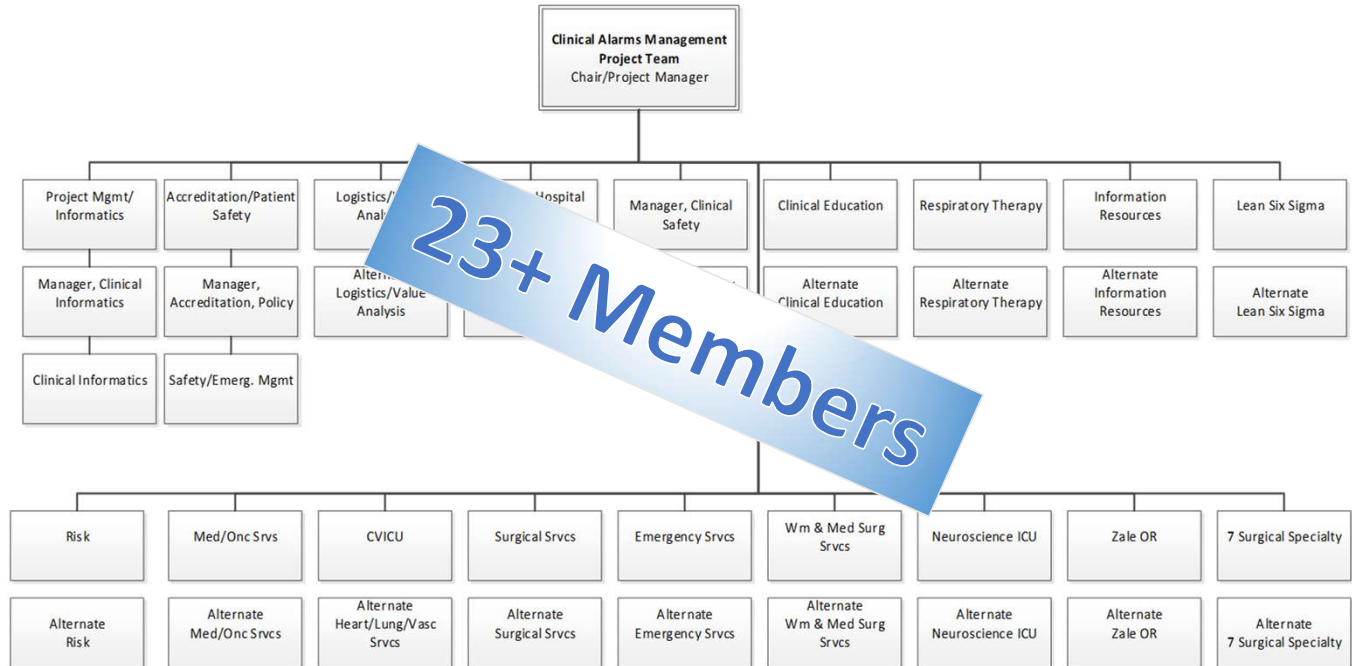
Clinical Alarms Management Steering Team

Chair/Sponsor:

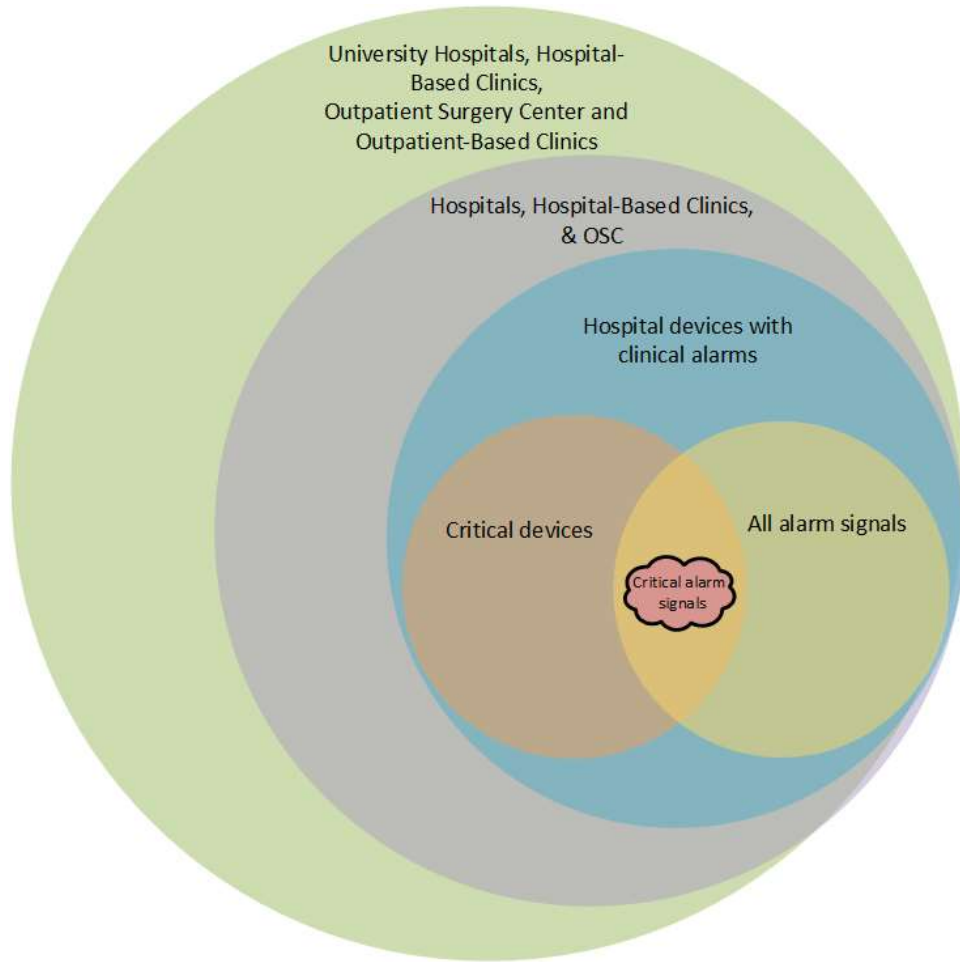


18+ Members

Clinical Alarms Management Project Team Membership



23+ Members



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Logistical Challenge

- Two hospitals
 - In 1989, Zale Lipshy opened as the first University Hospital
 - In 2000, St. Paul Hospital joined with Zale Lipshy Hospital



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Infusion Pump



Ventilator

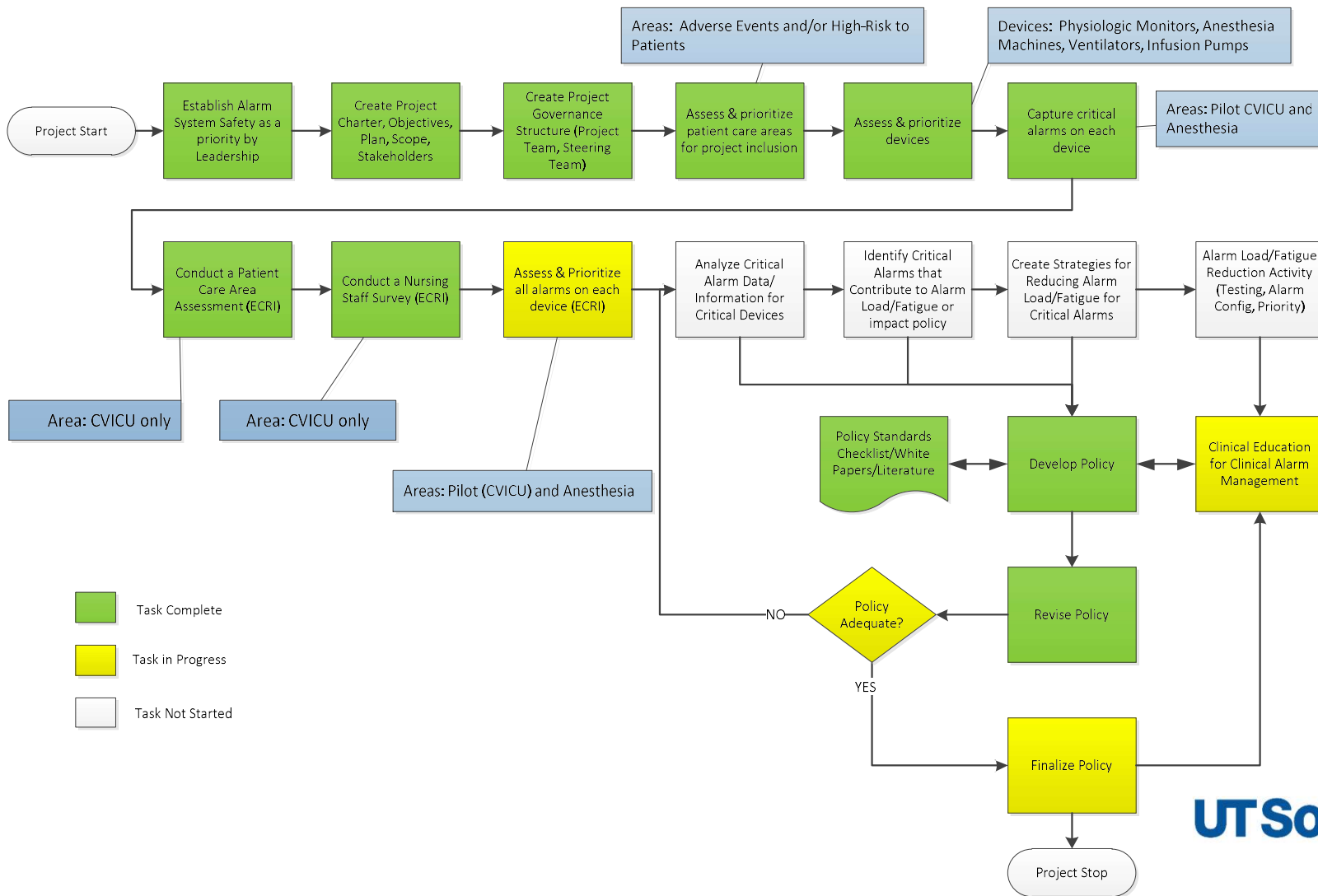


Anesthesia Machine



Physiologic Monitor

Clinical Alarms Management – Project Critical Path



Creation of a new policy



HOSPITAL AND HOSPITAL-BASED CLINICS POLICY

Chapter: Provision of Care, Treatment, and Services (PC)

UHPC 19 Clinical Alarm Response and Alarm Management – Hospital Policy



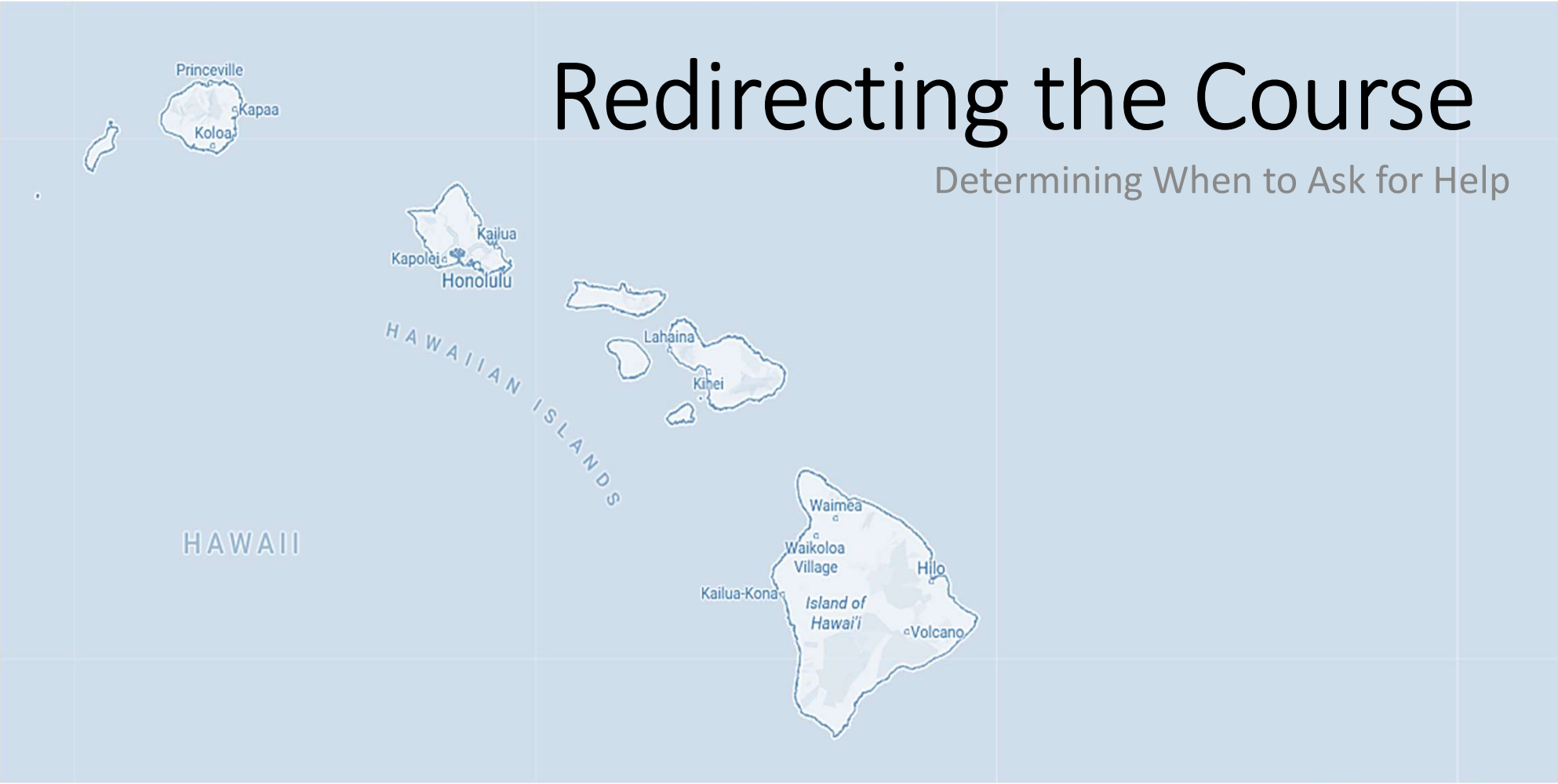
Move to a New Facility



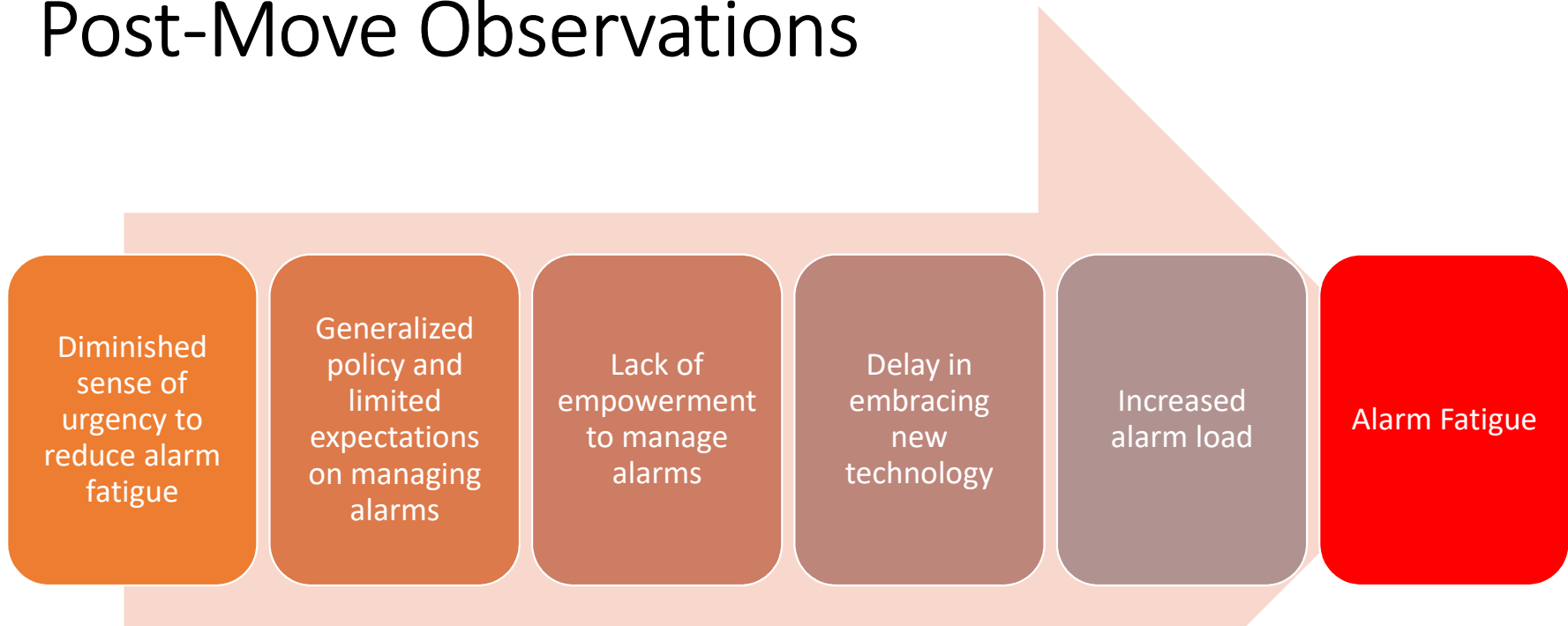
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Redirecting the Course

Determining When to Ask for Help

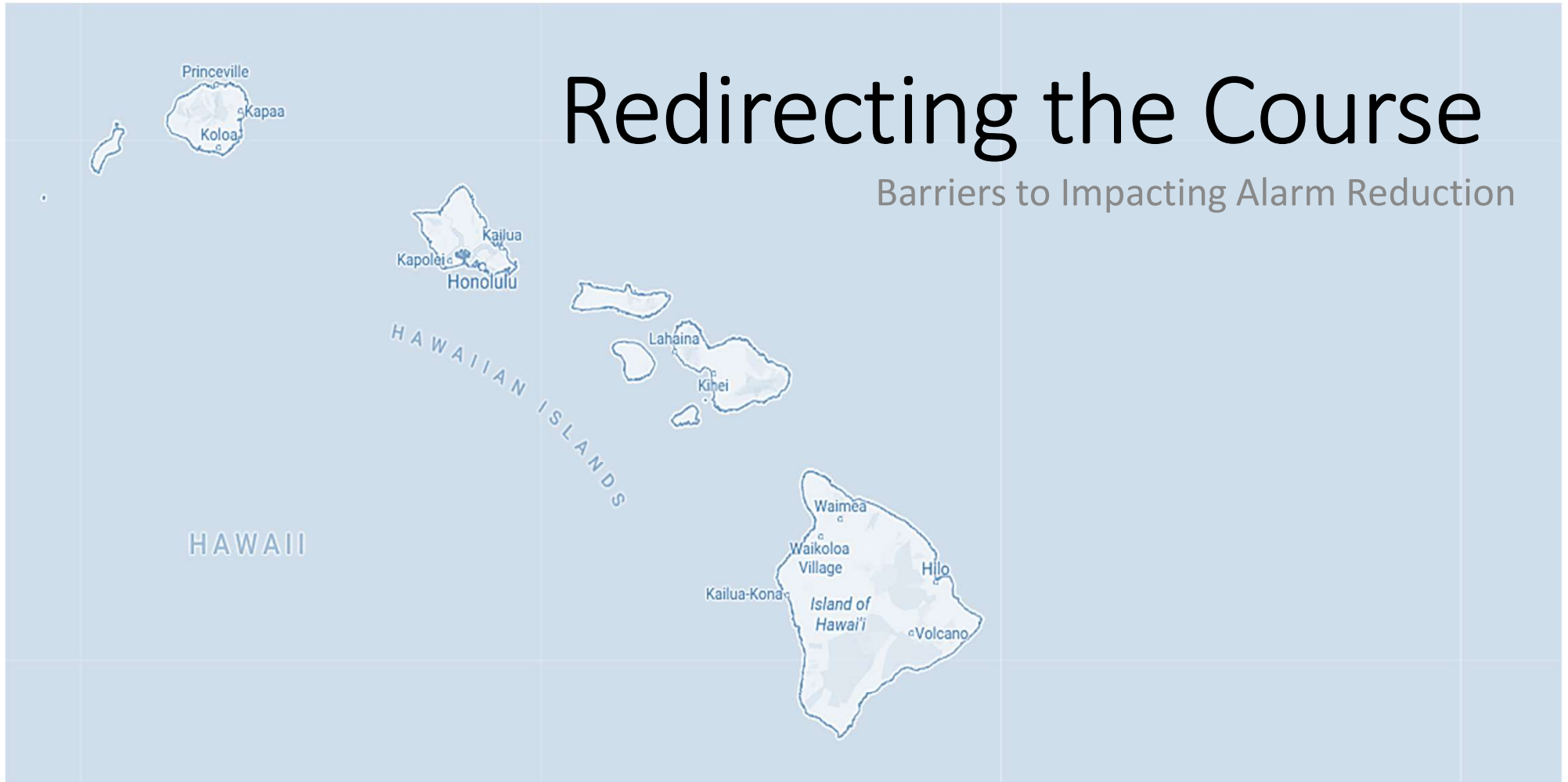


Post-Move Observations




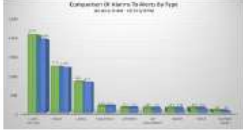



Redirecting the Course

Barriers to Impacting Alarm Reduction

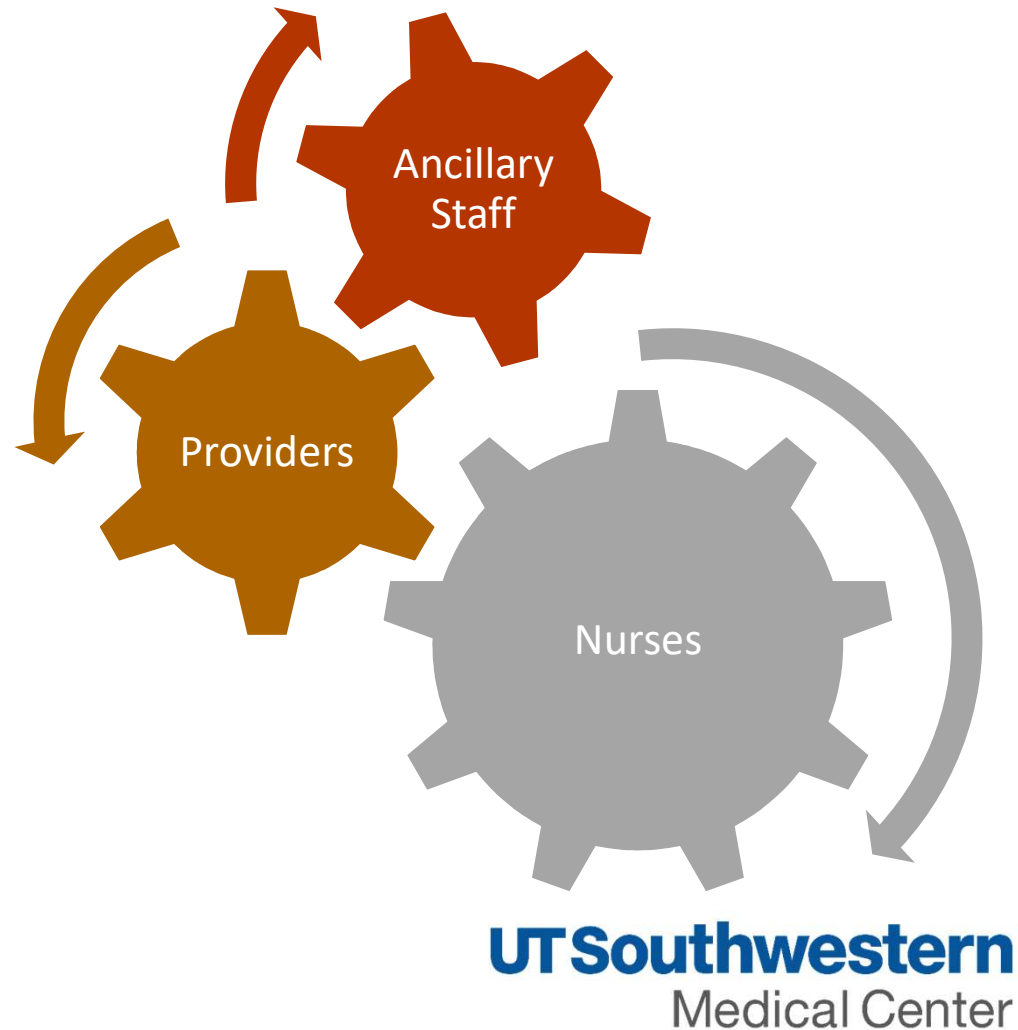


Assessment

Data was analyzed to support the current baseline and analysis

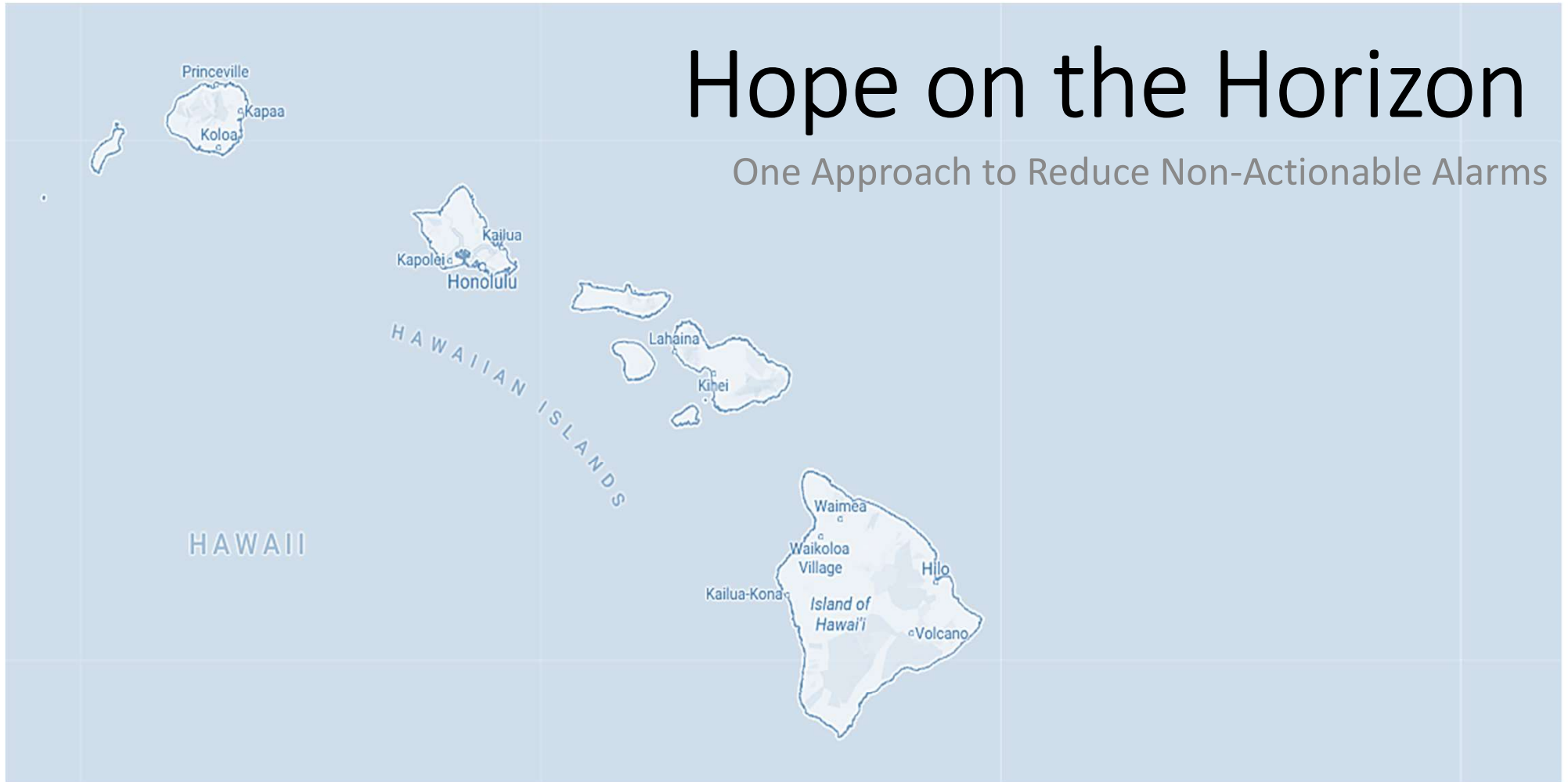
DATA SOURCES	SCOPE and ACTIVITIES
<p>Floor Plans</p>  <p>SPOK Reports</p>  <p>Policies & Procedures</p>  <p>Benchmarks AAMI Advancing Safety in Healthcare Technology</p> <p>PIIC iX Audit Log</p>  <p>Configuration Reports</p> 	<ul style="list-style-type: none">• Data Analysis<ul style="list-style-type: none">— Monitoring alarm data for 30 days on 19 units— SPOK Alert data (limited) for CVICU, SICU, and MICU— Configuration reports• Interviews<ul style="list-style-type: none">— Formal with leadership & committee members— Informal with staff• Observations<ul style="list-style-type: none">— 4 units and the CMU— Day, night, and weekend shifts• Reviews<ul style="list-style-type: none">— Policies— Committee Meeting participants and structure

- High occurrence of non-actionable alarms
- Lack of awareness of default settings
- Gaps in our customization processes and practices
- Gap in understanding and use of our technology
- Identified policy gaps

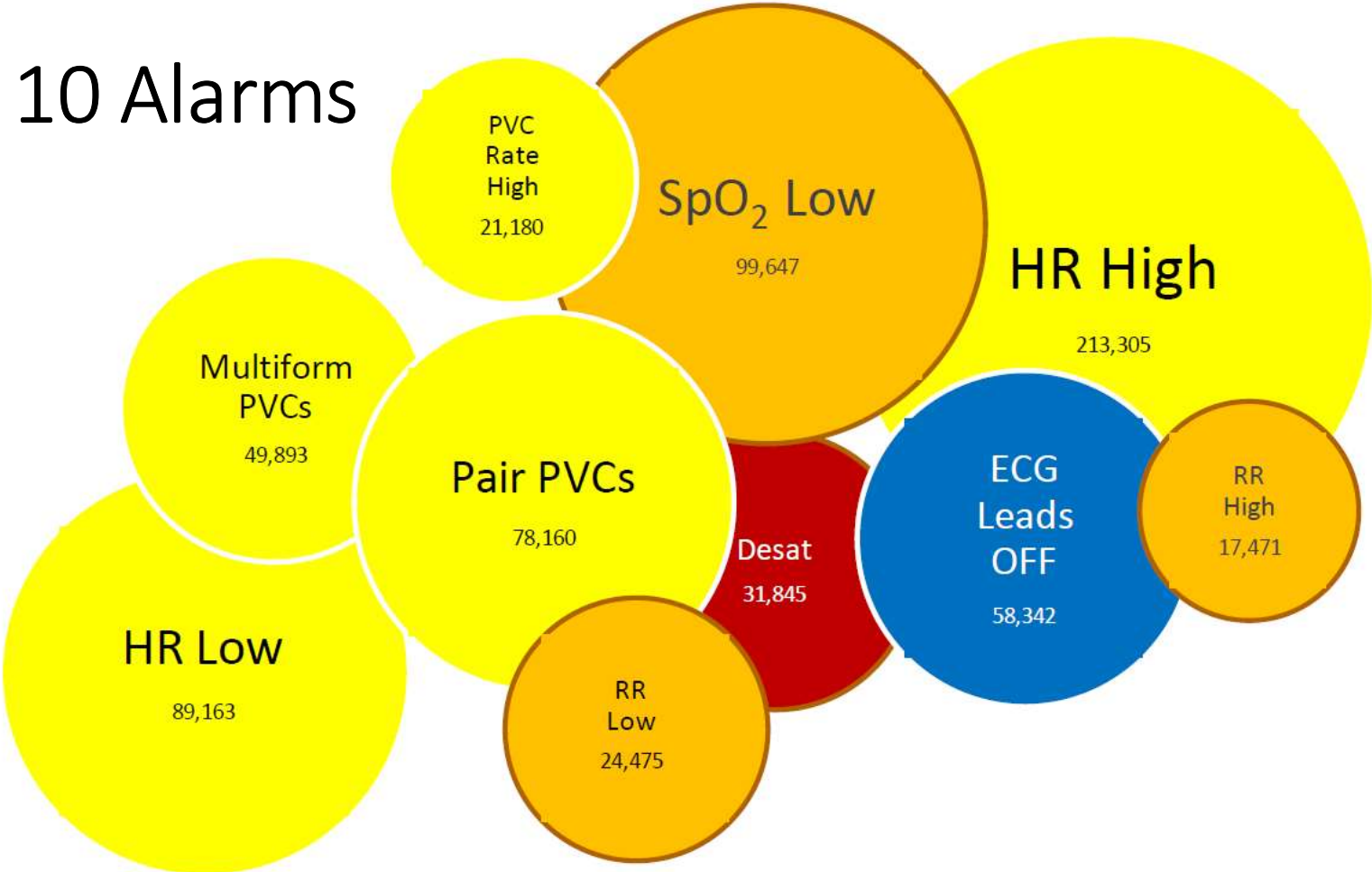


Hope on the Horizon

One Approach to Reduce Non-Actionable Alarms



Top 10 Alarms



ECG Leads Off Alarm

Hazard Report

ECG Leads-Off Alarms Shouldn't Be a Low Priority

PROBLEM

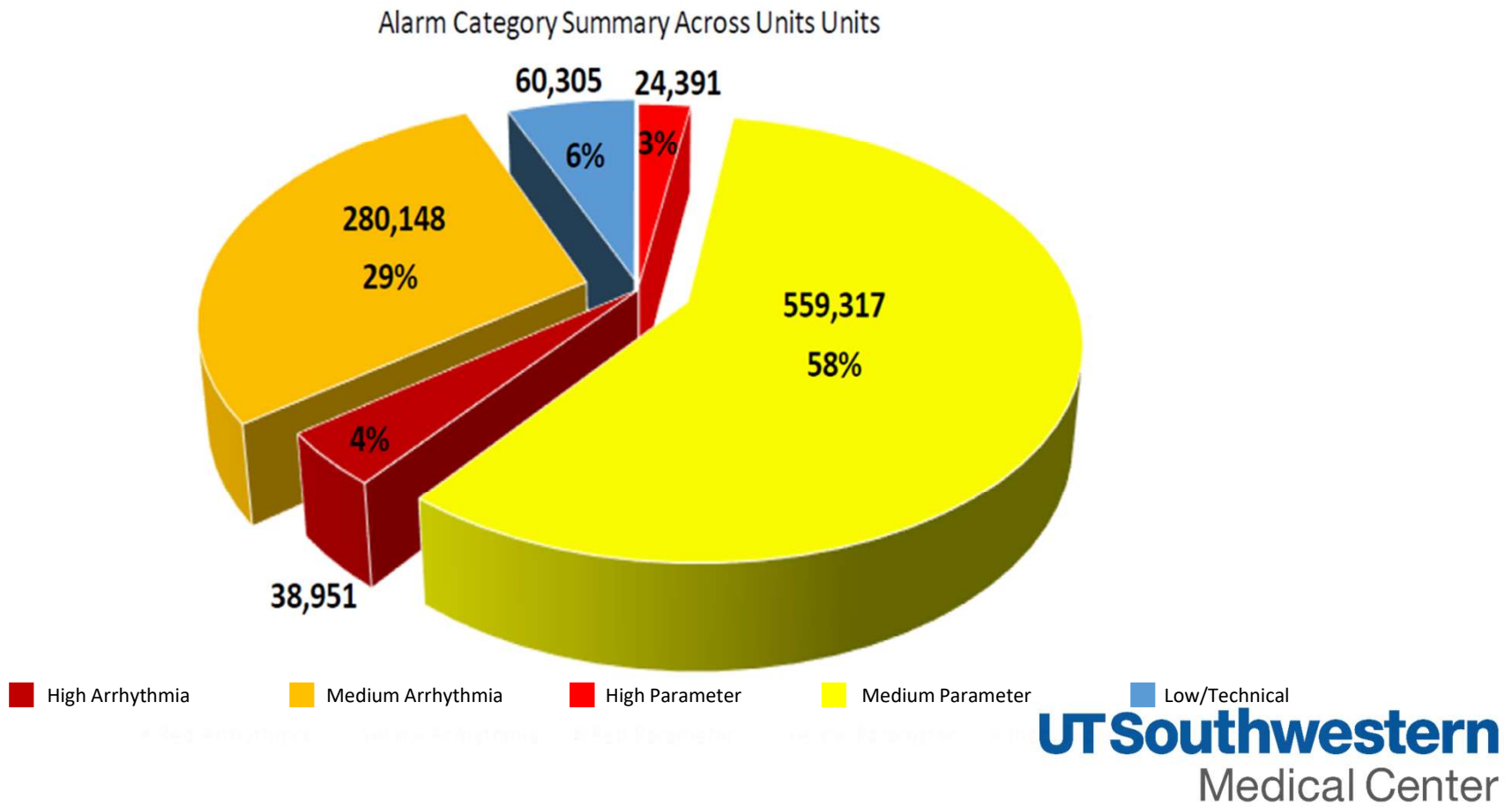
Many incidents have been reported to ECRI and to the U.S. Food and Drug Administration (FDA) documenting patient injury and death during an electrocardiogram (ECG) leads-off condition. Most often, these incidents occurred because a clinician ignored, silenced, or permanently disabled the leads-off alarm, and the patient experienced a cardiac event that was not detected.

From the clinician's perspective, leads-off alarms are often viewed as a nuisance, since they occur frequently but don't directly signal a critical problem. In addition, they are generally set as low-priority alarms, meaning that they have a different — usually less ear-catching — tone and/or a lower volume than do critical alarms. As a result, clinicians may silence these alarms without resolving the

Is the alarm properly prioritized for UTSW?

Alarm Categories Across Units

Medium priority arrhythmia alarms contribute to over half of all the alarms captured



CVICU

- Piloted arrhythmia default setting changes

MICU

- Piloted alarm parameter default setting changes

NSICU

- Piloted manual customization of all alarm settings

In Zale ICU, the following alarms will be customized to the patient if provider is aware that the condition is pre-existing and patient is hemodynamically stable :

Turn OFF Arrhythmia alarms -

- | | |
|-----------------------|-------------------------|
| • Atrial Fibrillation | • Pair PVCs |
| • Irregular HR | • Ventricular Bigeminy |
| • Missed Beat | • Ventricular Trigeminy |
| • Multiform PVCs | • Ventricular Rhythm |

NIBP alarms – adjust up to **10 mmHg above/below** if charge nurse agrees; consult provider for anything beyond

Resp High/Low Limit – allowed **OFF** if patient has ETCO₂ monitor/alarms

ICP Low Alarm, any Temperature-related alarm – Nurse discretion

Discuss alarm settings or alarm setting changes with provider –

- **ART, ABP** – Turning alarm settings OFF (must have either invasive pressure or NIBP alarms on)
- **PAP** – Turning alarms OFF
- **Pause, PVCs/min, Run PVCs, awRR High/Low, ICP High, CPP High/Low, ETCO₂ High, SpO₂ Desat** – Changing alarm limits Higher/Lower






Piloted Changes

In CVICU, the following Arrhythmia alarms will be defaulted to OFF:

Ventricular Rhythm	Ventricular Trigeminy
Run PVCs	Multiform PVCs
Pair PVCs	Missed Beat
Ventricular Bigeminy	Irregular HR

- In addition,
- Pause threshold has been increased from 1.50 seconds to **2.00 seconds**
 - PVCs/min has been increased from 10 PVCs/min to **15 PVCs/min**

In MICU, the following Alarm Parameter changes will be piloted:

SpO ₂ Low alarm delay  to 15 sec	ART & ABP Mean Low  to 65 mmHg
Resp High Limit  to 40	PAP Systolic Low  to 10 mmHg
Resp Low Limit  to 6	CVP Alarms turned OFF

ART, ABP, PAP, & NIBP Diastolic High & Low Alarms turned OFF

Clinical Alarm Management

Situation:

Emergency Department, Surgery ICU, Medicine ICU, Cardiovascular ICU, and Neurosurgery ICU experience alarm fatigue related to nuisance/non-actionable Philips monitor alarms

Background:

- To promote a culture of safety in support of the organization's commitment to quality and patient safety
- UHPC 6-606: Clinical Alarm Response and Alarm Management
- The Joint Commission, 2017 NPSG.06.01.01
 - Make improvements to ensure that alarms on medical equipment are heard and responded to on time

Assessment:

- Many low level Philips monitor default settings are currently defaulted to ON which contribute to alarm fatigue
- The ECG Leads Off alarm is defaulted to a low level (Blue, INOP) alarm which appears as low priority to staff and does not indicate when a serious patient condition exists

Recommendation:

- Modify lower level (Yellow) alarm default Department, Surgery ICU, Medicine ICU,
- Modify the ECG Leads Off alarm to a critical monitored to ensure the alarm is address:

The following Arrhythmia alarms will be default:

Ventricular rhythm	Ventricular Trigeminy	Ventricular Bigeminy	Mis Beat

- In addition,
- Pause threshold has been increased from 1.50 sec
 - PVCs/min has been increased from 10 PVCs/min

The following Alarm parameters will be change:

- SpO2 Low alarm delay increased from 10 sec to 15 sec
- Resp high limit increased from 35 to 40
- Resp low limit decreased from 8 per min to 6
- ART, ABP, PAP, & NIBP Diastolic High & Low Alarms turn
- ECG Leads Off will change from a low level (Blue, INOP)

Expectations:

- Any of the listed alarms may be turned appropriate, safe, and actionable to the

- For any near misses or perceived negative outcomes, please submit a Quick Submission event report using the Event Reporting site through the Clinical Portal

The screenshot shows the UT Southwestern Clinical Portal interface. The 'Quick Links' section is highlighted with a red circle, and a red arrow points to the 'Event Reporting - Use Internet Explorer' link. Other visible links include 'Contact Service Desk', 'Epic', 'Children', 'EMR', and 'PHS'.

- If you have any other questions or concerns, please contact your Nurse Manager
- Changes are effective:
 - CVICU – Monday, April 17th, 0530 - 0630
 - MICU – Tuesday, April 18th, 0530 – 0630
 - SICU – Wednesday, April 19th, 0530 - 0630
 - ED – Thursday, April 20th, 0530 - 0630
 - NSICU – Friday, April 21st, 0900 - 1000

Carol L. Lukaszewicz, E. A. (2015). Understanding Clinical Alarm Safety. *Critical Care Nurse*, Vol 35, No. 4, 45-57.

ECRI Health Devices. (2003). *ECG Leads Off Shouldn't Be A Low Priority*.

Integrated Incentives & professional practice

Nursing Excellence is our starting point...not our finish line.

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SBAR Communication

- Shared with providers and nursing
- Modified event reporting system to include clinical alarms
- Encouraged staff to submit event reports or notify Nursing manager to ensure patient safety

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Arrival to Destination

Achieving the Goal

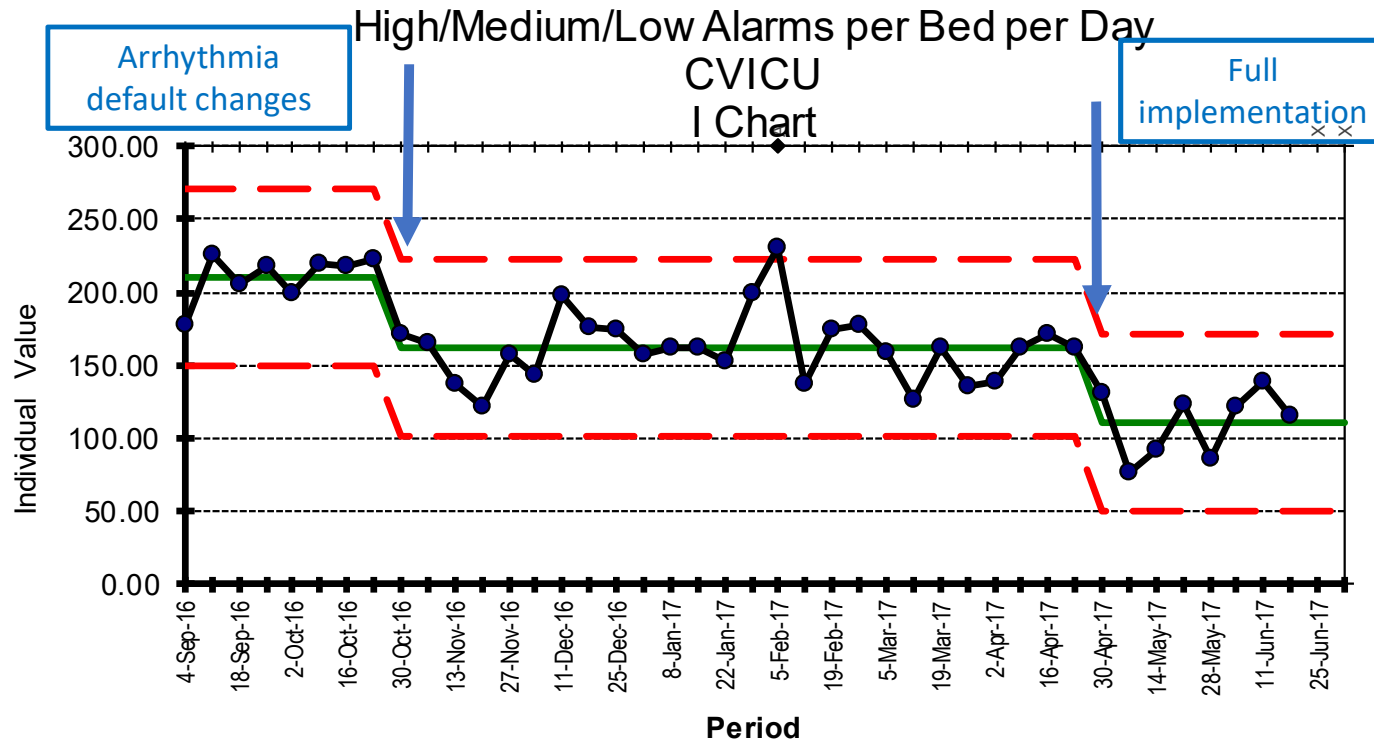


Pre/Post Full Implementation

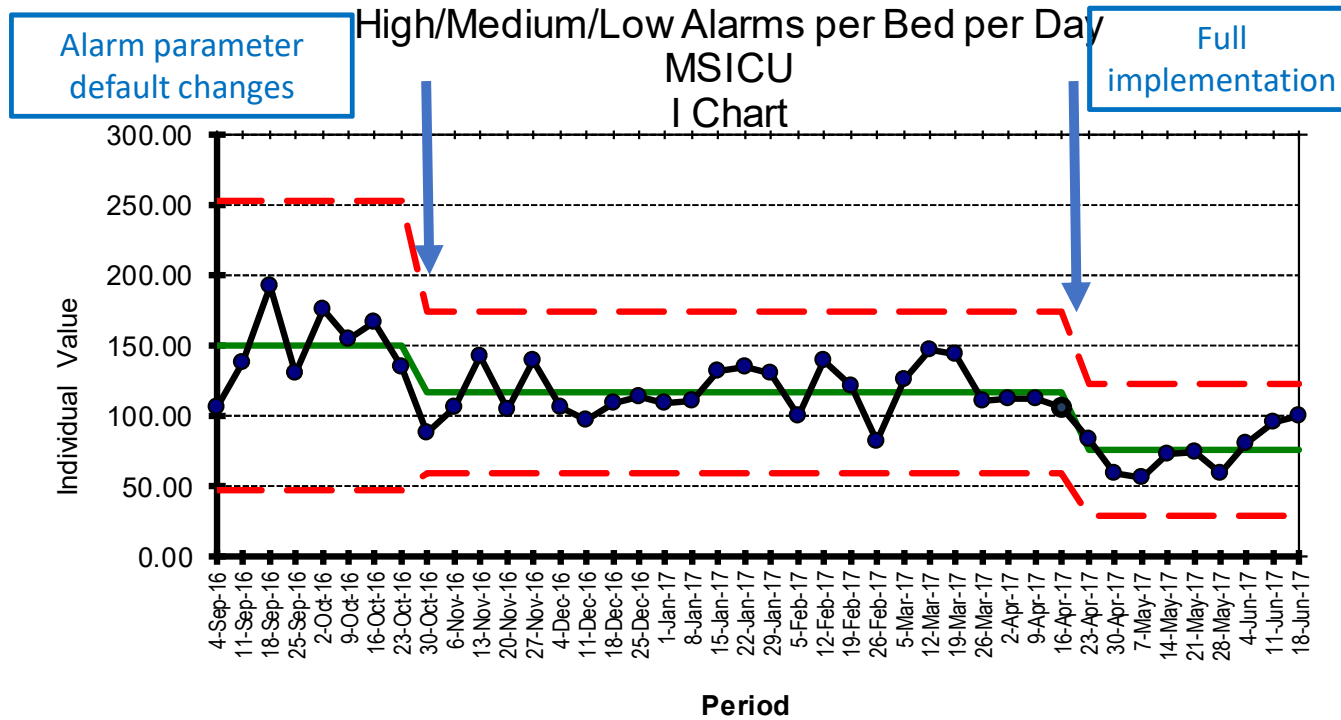
	Total Alarms (Pre/Post Full Implementation)	% Change in Total Alarms (Pre/Post Implementation)	Total Alarms Per Bed/Per Day (Pre/Post Implementation)	% Change in Total Alarms Per Bed/Per Day (Pre/Post Implementation)
MICU	118,576/ 56,422	- 48%	173/79	- 46%
CVICU	152,043/ 77,933	- 51%	216/116	- 46%
NSICU	68,526/ 43,462	- 37%	120/74	- 38%
SICU	54,433/ 45,843	- 16%	81/68	- 16%
ED	79,710/ 49,331	- 38%	71/44	- 38%

Four weeks pre-intervention – Jan 2017
 Four weeks post-intervention – dates variable

Monitoring Plan – CVICU

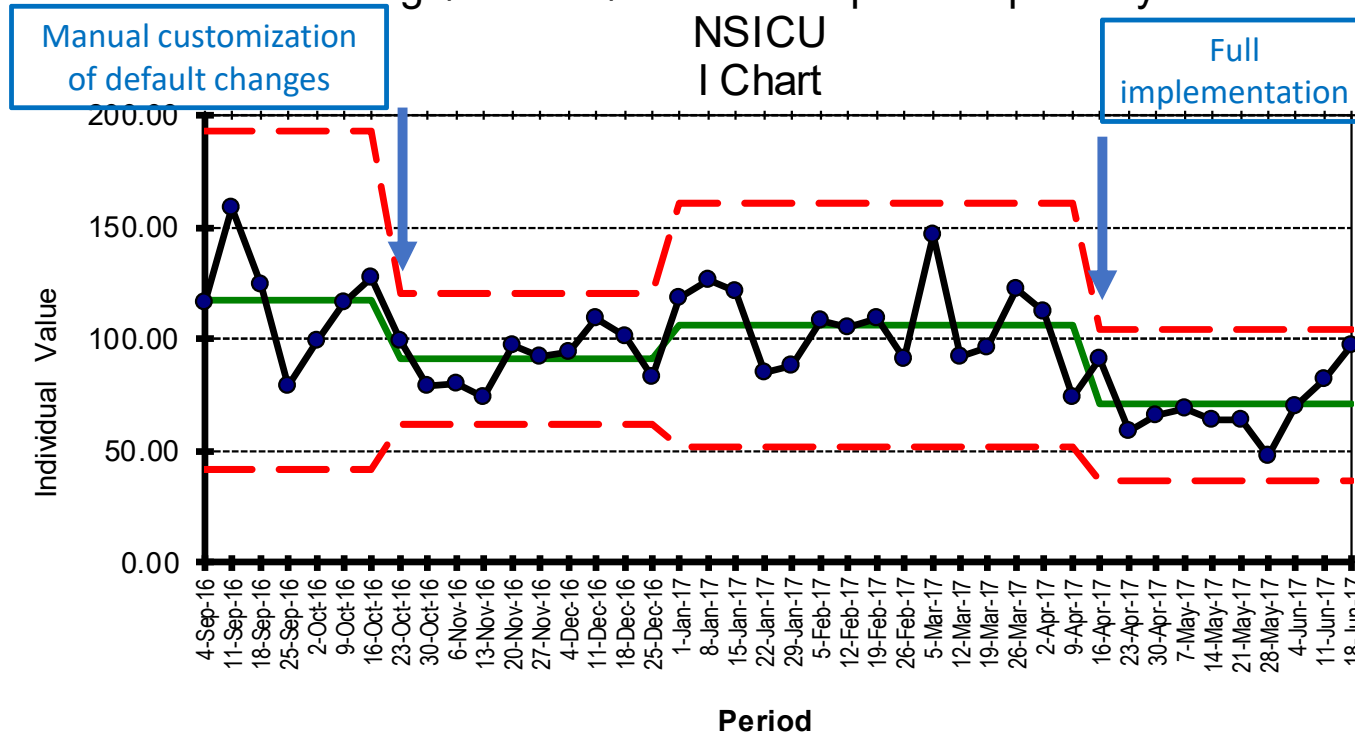


Monitoring Plan – MICU



Monitoring Plan – NSICU

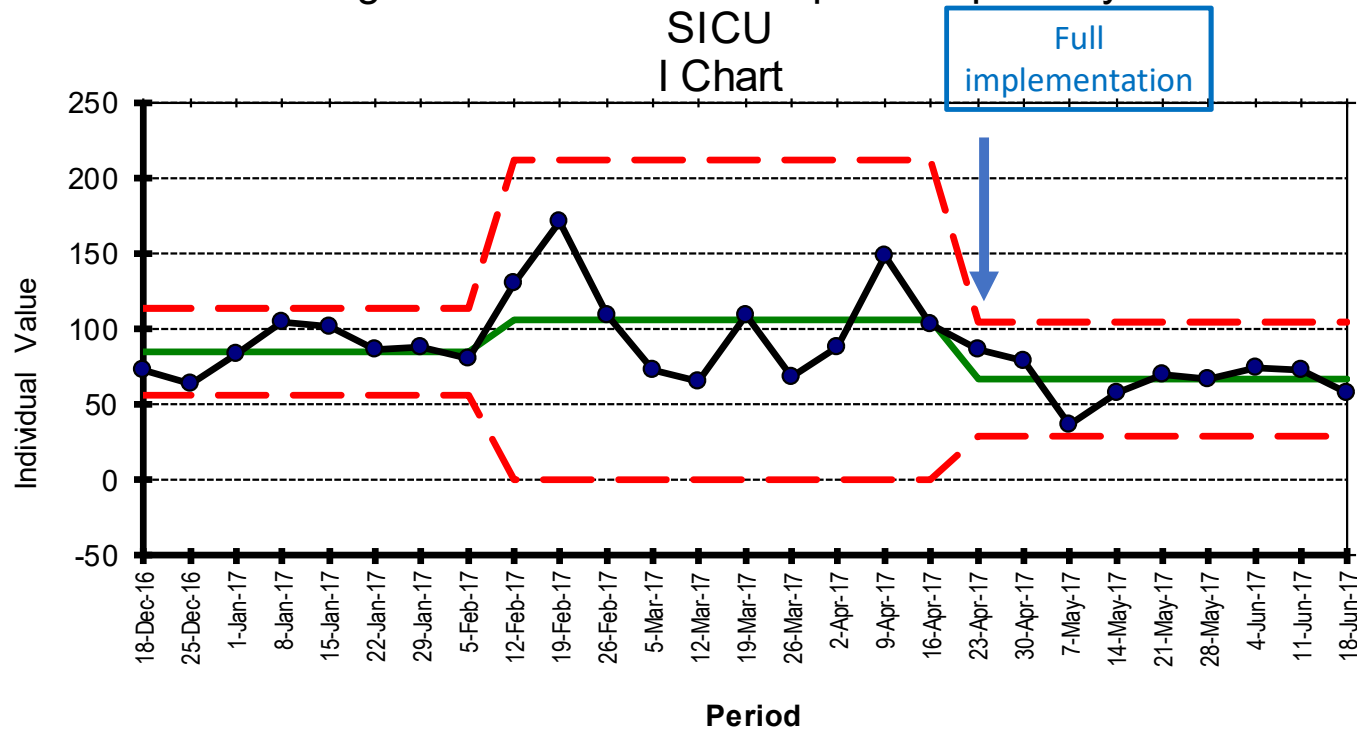
High/Medium/Low Alarms per Bed per Day



Monitoring Plan – SICU

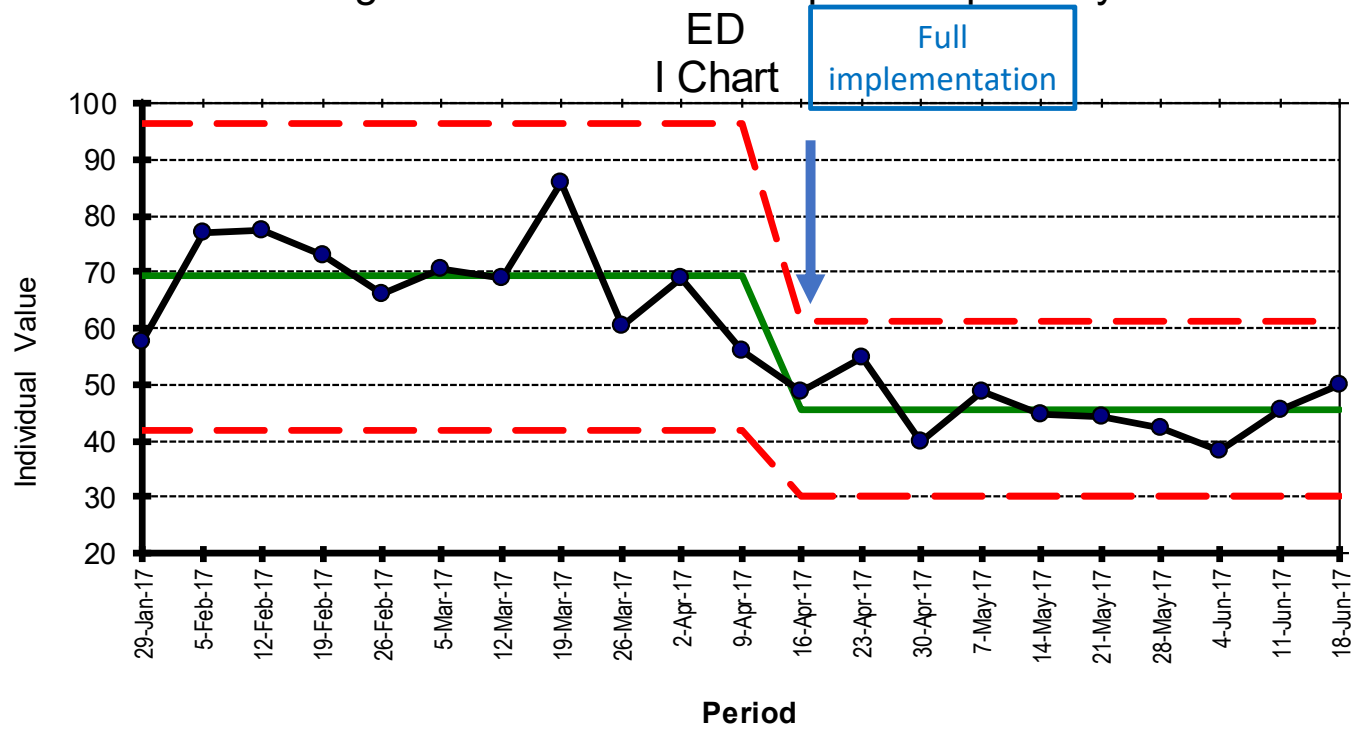
High/Medium/Low Alarms per Bed per Day

SICU
I Chart

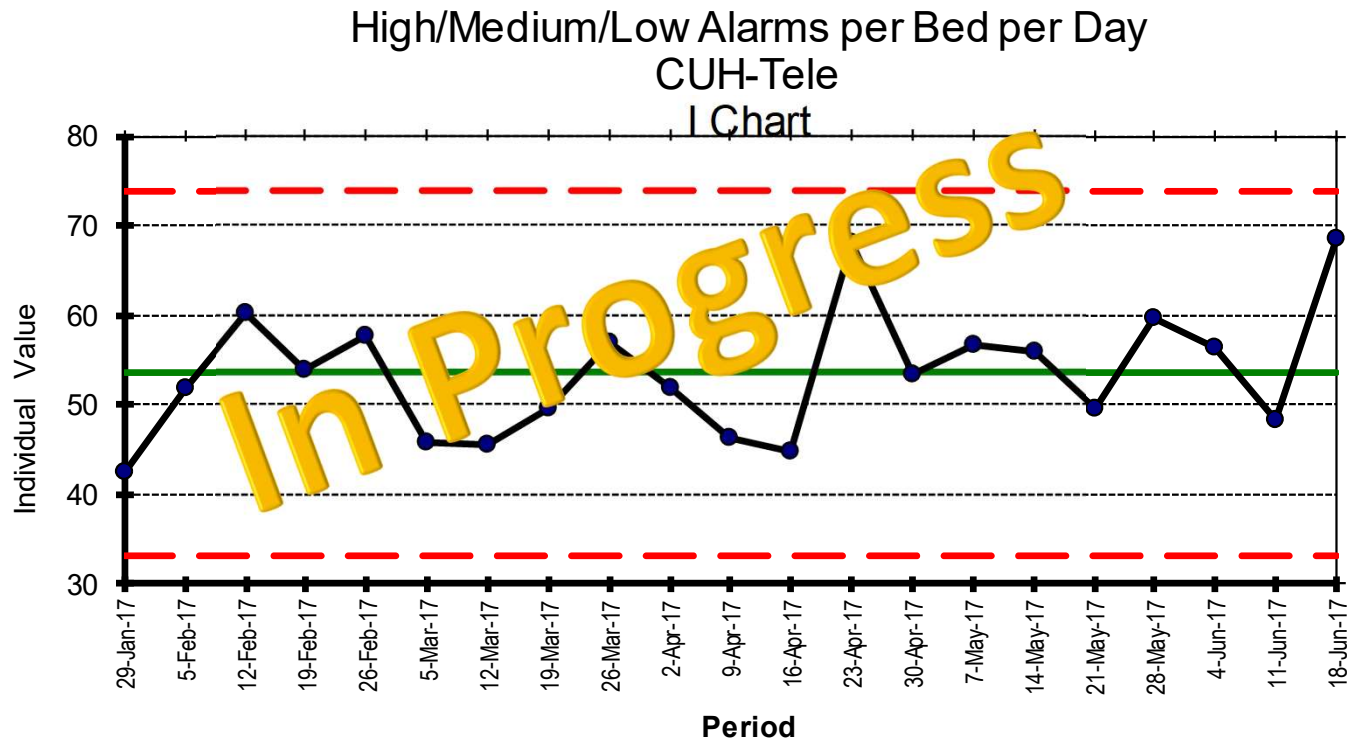


Monitoring Plan – ED

High/Medium/Low Alarms per Bed per Day



Just Do It – Central Monitoring Unit





Sustaining the Progress & Future Plans

- Transitioning to a future Alarm Safety Committee and Process Owner
- Determining the frequency of monitoring
- Developing Standard Operating Procedures
- Sharing the data
- Continuing the progress



Lessons Learned

- Determine a governance structure
- Organize, structure, and plan efforts early
- Find a process owner sooner rather than later
- Narrow the focus
- Understand the workflow and equipment
- Educate early and often
- Ask for help if needed; know your limitations

References

- Alarm & Noise Management – Phase I: Current State Assessment; Healthcare Transformation Services, Lisa Pahl and Jillann Walker, February 25th, 2016.
- Alarm Management - Phase II: Post Changes - Healthcare Transformation Services, Lisa Pahl and Jillann Walker, December 21, 2016.
- American Association of Critical-Care Nurses. AACN Practice Alert. Alarm management. *Crit Care Nurse*. 2013;33(5): 83-86. Available at: <http://www.aacn.org/wd/practice/docs/practicealerts/alarm-management-practice-alert.pdf>. Accessed July 20, 2015.
- ECRI Health Devices (2003). ECG Leads Off Shouldn't Be a Low Priority.
- ECRI Institute. The Alarm Safety Handbook. Strategies, Tools, and Guidance. ECRI Institute. 2014.



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