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We Rebuild Lives.

Hospital *for Special* Care, New Britain, CT

A Case Study on Ventilator Alarm Management

Presenter: Connie Dills, MBA, RRT, RPFT

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is 228 bed Long Term Acute Care Hospital (LTACH)

11 bed regional ventilator weaning unit

is 228 bed Long Term Acute Care Hospital (LTACH)

27 bed
pediatric unit

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is 228 bed Long Term Acute Care Hospital (LTACH)

2 chronic ventilator units (36 & 38 beds)

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is 228 bed Long Term Acute Care Hospital (LTACH)

10 bed cardiac unit – CHF & VADs

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is 228 bed Long Term Acute Care Hospital (LTACH)

28 bed rehabilitation unit – CVA, pulmonary, TBI, SCI, Orthopedic

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is 228 bed Long Term Acute Care Hospital (LTACH)

23 bed satellite unit in Hartford

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is 228 bed Long Term Acute Care Hospital (LTACH)

8 bed
autism unit

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2 neurobehavioral units (10 & 15 beds)

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is 228 bed Long Term Acute Care Hospital (LTACH)

22 bed chronic rehabilitation unit

The Issue: Managing 100 ventilators a day

- A typical critical care ventilator can alarm for approximately 135 different reasons

- Ventilator population at HSC comprised primarily of awake & active patients, most of which are in private & semi-private rooms

- Average number of ventilator *device* alarms per ventilator per day at HSC is a staggering 48 X 100 = **4800!**

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The Solution

Middleware

2003 the organization sought options for increasing patient safety by utilizing an alarm management system

- Existing monitoring was through nurse call
- Every ventilator alarm, every time
- **Bernoulli®** was the product selected
- Alarms filtered (LowVe, LIP, No Data, Patient Disconnect)
- Immediately actionable
- Not immediately actionable but if unresolved default to actionable

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How We Manage: The Basics

- The Respiratory Therapists use Bernoulli® for their patient assignment

- Each patient is assigned to the Respiratory Therapist taking care of them for that shift by assigning a pager that the RT carries

- When actionable alarm conditions occur the RT is alerted by pager, overhead audible alarm, visual alerts through desktop/laptop computers and in pediatrics via an overhead scrolling message bar

- Alarm settings are verified by RTs once a shift

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Circle Time

OCTOBER   Fall

1 2 3
4 5 6

C RCLE
TIME

EXIT

larm: Low Ve,

The Result: Safer Sailing in a Stormy Sea

Enhanced ventilator alarm response time
18 second average

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The Result: Safer Sailing in a Stormy Sea

Realized an **80% reduction** in alarms requiring immediate action

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The Result: Safer Sailing in a Stormy Sea

No serious ventilator related safety events in 13 years

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The Result: Safer Sailing in a Stormy Sea
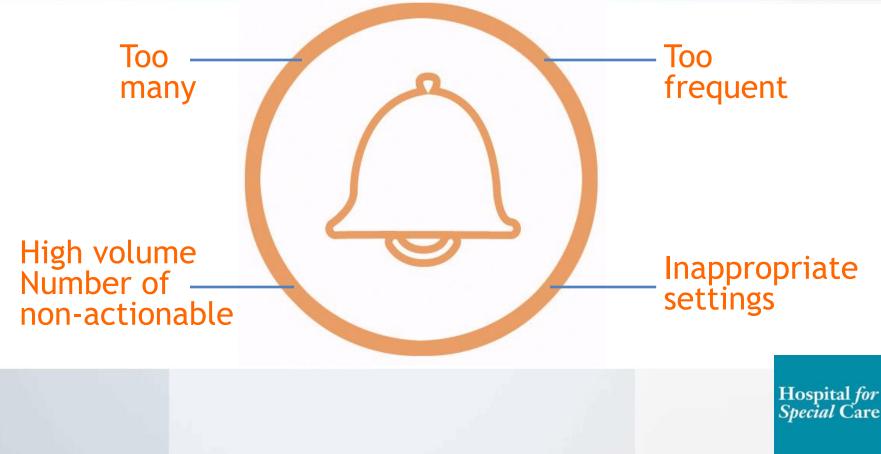
Significant reduction in ambient noise and resultant alarm fatigue

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The Joint Commission NPSG.06.01.01

Improve the Safety of Clinical Alarm Systems

Too many

Too frequent

High volume
Number of
non-actionable

Inappropriate settings

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NPSG.06.01.01: Alarm Management

- Monitoring and responding to alarm signals

- Checking individual alarm signals for accurate settings, proper operation, and detectability

- Customize for specific clinical units, groups of patients, or individual patients

Joint Commission Perspectives®,
July 2013, Volume 33, Issue 7 Copyright 2013 The Joint Commission

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Current Conditions: Well Positioned

In meeting TJC's NPSG.06.01.01 by 1/1/2016

Middleware facilitates monitoring & checking of alarm signals for accurate settings, proper operation & detectability for appropriate response on a shift to shift basis

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The Future: Enhanced Patient Safety

Data Gathering & Benchmarking

Response time
- Reducing alarm duration – fatigue

Further alarm reduction efforts
- Device specific – bedside for patient comfort
  - Enhanced ventilator technology
  - Device alarm volumes

Benchmarking with other sites

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