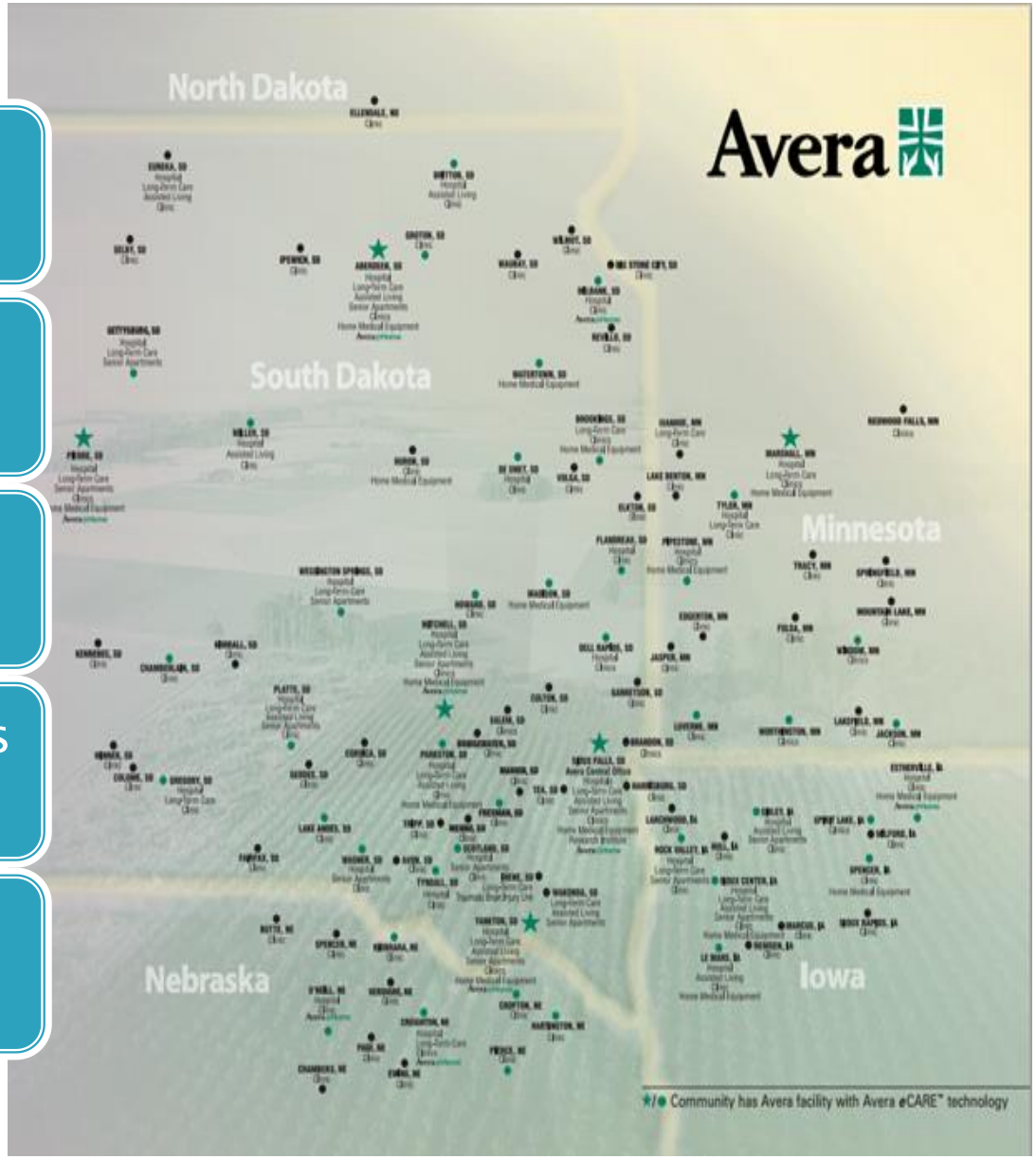
Avera Heart Hospital's Journey to Alarm Management Improvement

Cheryl Osmond, RN, MS
VP Clinical Services
Avera Heart Hospital

Disclosures

No disclosures to report

- Span 5 states
- 40 Hospitals
- 160 Clinics
- 2.5 M Outpatient & Clinic Visits Annually
- 45,000 Discharges per Year



Avera Heart Hospital

- Provides Heart and Vascular services for the Avera System
- Combined Cardiology and Surgery Practice
  - 2 Cardiovascular Surgeons
  - 6 Cardiologists
  - 6 Interventional Cardiologists
  - 3 Electrophysiologists
  - 3 Vascular Medicine and Interventional physicians
  - 8 CNPs specializing in cardiology

Avera Heart Hospital

- 53 bed patient-focused care hospital
  - Universal bed design; patients stay in one room admission to discharge
- Cardiac Cath Lab Volumes (5 Labs)
  - Average of 400 cases per month
- Surgical Volume (3 Suites)
  - Average of 70 cases per month
- All patients are monitored during their admission

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- Alarm Hazards were #1 of the Top 10 Technology Hazards for 2012 (ECRI Institute)
- The Joint Commission Sentinel Event Alert in April 2013
- NPSG.06.01.01: Improve the safety of clinical alarm systems
  - Elements of Performance to be implemented between July 1, 2014 and January 1, 2016

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- Where should we start??

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- Leadership Commitment
  - Letter to our employees and medical staff

To Avera Heart Hospital Employees and Medical Staff:

In June 2013, the Joint Commission issued a National Patient Safety Goal intended to address issues related to clinical alarm safety. As healthcare professionals, you're familiar with the ever-present sound of these clinical alarms in our patient care areas. Their fundamental purpose is simple: to promote patient safety by warning caregivers of potentially dangerous conditions before lasting harm can occur.

However, the steadily increasing use of alarm-equipped medical devices has presented caregivers with dizzying array of alarms to manage. When they are not managed effectively, patient safety can actually become compromised. Alarms that are poorly understood or improperly used may not provide our caregivers with adequate warning of changes in the patient's condition or the medical device status. And the proliferation of alarm signals contributed to the phenomenon known as alarm fatigue, in which caregivers subjected to a constant bombardment of alarms may become desensitized to their meaning and fail to recognize truly urgent conditions when they arise.

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- Alarm Management Team

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- Literature Review
  - AAMI, ECRI, Hopkins
  - Physiologic monitoring companies—Dräger and Philips
- Webinars
- Staff Education
  - Nursing and Respiratory Therapists—Working Together for Safe Alarm Management (AAMI)

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- Gap Analysis
- Staff Survey and verbal input from nursing staff on “nuisance” alarms

How noisy do you feel the unit you work in currently is?	1	2	3	4	5
How disruptive are false or nuisance clinical alarms to your daily workflow?	1	2	3	4	5
How much do you attribute this to our monitor alarms?	1	2	3	4	5
How much would you attribute to other alerting systems (call lights, tube system, etc.)?	1	2	3	4	5

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- Results
  - Staff felt the nursing units were noisy.
  - Nurses felt like false or nuisance alarms disrupted their daily workflow.
  - Nursing felt that “alarms were an annoyance”, but they were not complaining
  - When asked, nurses guessed that the “SpO2 alarms were the biggest offender.”

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- Lots of ideas…

- How do we know what will work?

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- Partner with our Physiologic monitoring company—Dräger
  - Workflow Consultant visit for observation and review of our alarm management process
  - Baseline data collection via Connexall Software

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- What did the data show?
  - 18,798 alarms in one week
  - An average of 71 alarms per patient, per day
  - 73% of the alarms were advisory alarms
  - The biggest alarm source was advisory alarms specific to SpO2—this accounted for 46% of the total alarms.

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- Time for Action!
  - Risk assessment of Physiologic Monitor alarms to assign a risk score for each patient alarm

Avera Heart Hospital Alarm Fatigue Risk Assessment

As a team, review the comprehensive list of medical devices that are present. Assess each devices potential to harm a patient by assigning a risk score of 0 to 3. Your risk score is based upon a combination of the following: a) purpose of the device (i.e. life support = higher risk; b) how frequently the device is used in your unit (exposure); b) consequences of harm to the infant if any alarm was inadvertently disabled and/or from provider delays in responding to the alarm on that specific system or device.

0= No Patient Risk 1= Low Patient Risk 2= Moderate Patient Risk 3= High Patient Risk

	0	1	2	3	N	Comments
Cardiac Monitor						
Asystole						
Vtach						
VF						
Systolic High:BP						
Systolic Low: BP						
Diastolic High: BP						
Diastolic Low: BP						

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- Time for Action!
  - Review of the default alarm setting for Dräger monitors
    - Found duplicate and unactionable alarms. Turned off:
      - Couplet
      - Bigeminy
      - AIVR
      - Bradycardia
      - Tachycardia
    - Limits changed based on best practice research:
      - PVC/Min = 20/minute
      - SpO2 Lo= 88

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- Time for Action!
  - Policy Development
    - Used JC Criteria
      - Initiation and Proper application
      - Settings—customized based on patient condition
      - Response times
      - Establishment and responsibilities of committee
  - ECG Patch Hygiene
    - Clipping
    - Application to dry skin
    - Sensitive patch use

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- Time for Action!
  - Delay for SpO2 monitoring
    - Changed from fast to normal—Reflects 90% of an SpO2 change within 30 seconds versus 15 seconds
  - Use of Oximax Pods for SpO2 monitoring
    - Uses Cardiac-based signal and alternate algorithms for SpO2 averaging

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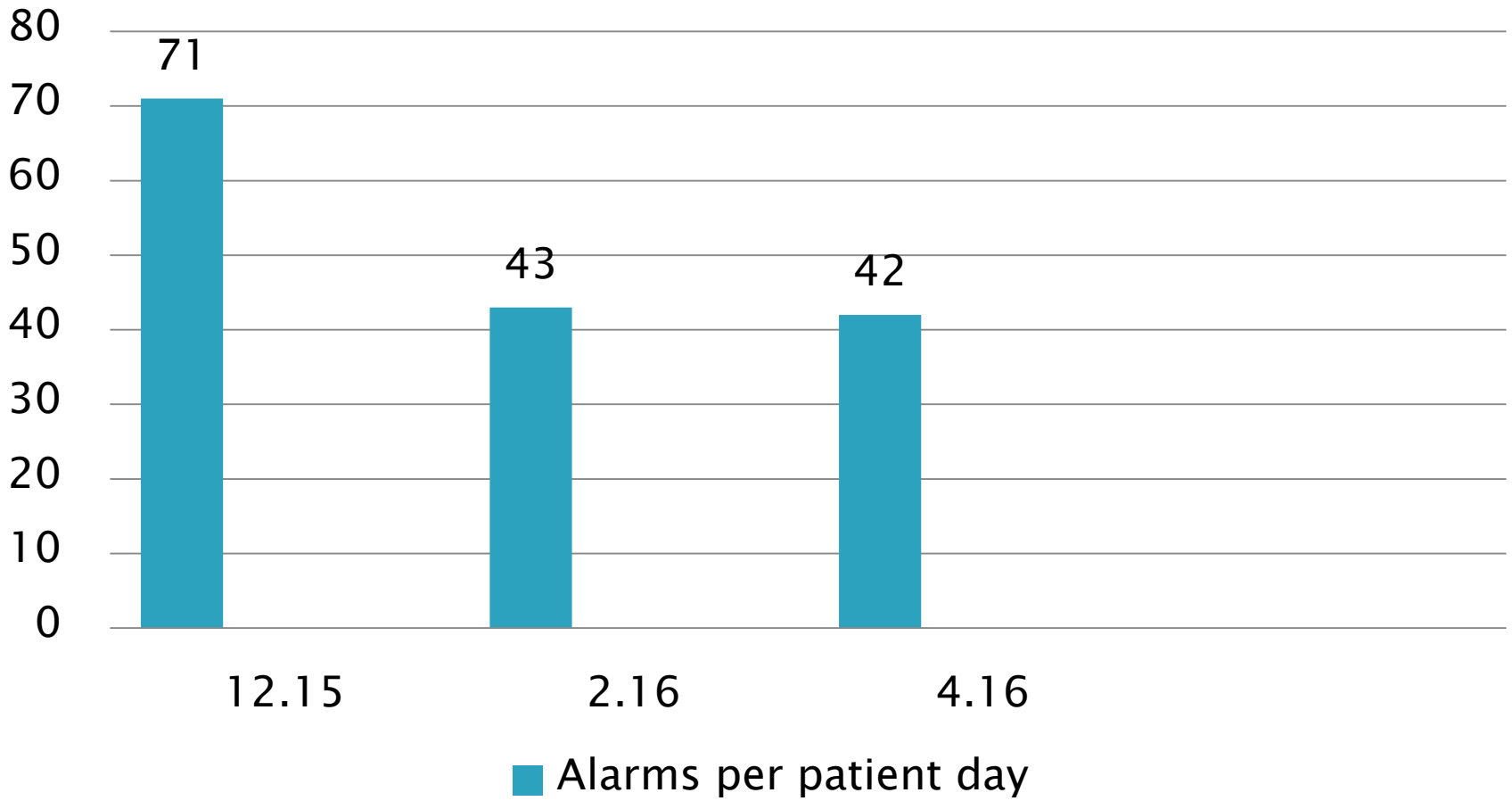

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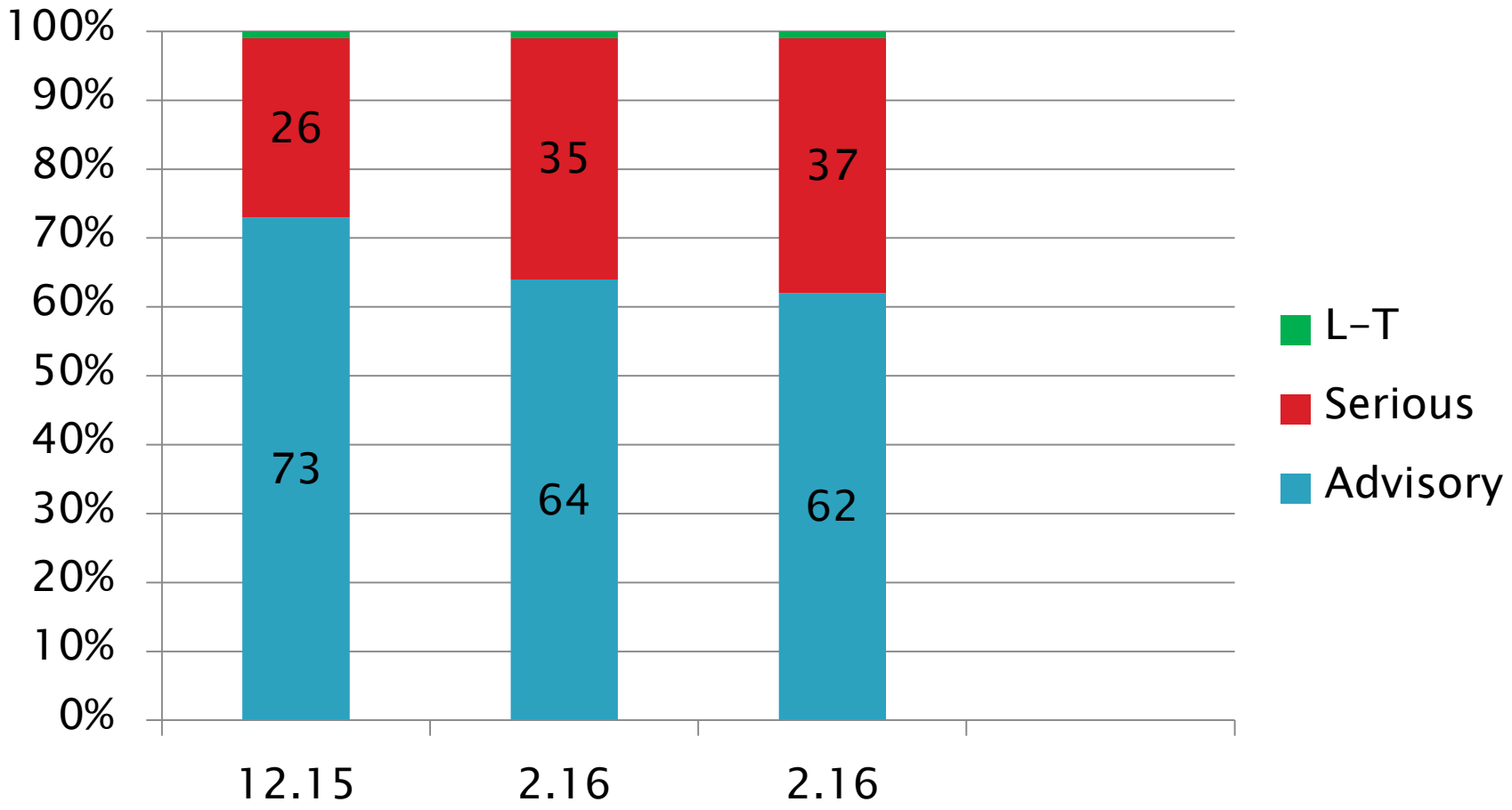

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- What is next?
  - Added Respiratory Therapist, Patient Care Unit Nurse and CRNA to the team
    - SpO2 monitoring criteria
    - Proper monitor disconnection

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- SpO2 Monitoring Criteria
  - CCL patients monitored only until flat time is complete
  - Spot checks with Vital Signs and PRN
  - When patients no longer require oxygen therapy or are on their home oxygen dose, SpO2 monitoring is discontinued.
  - Outpatients: Spot check on admission and is SpO2 is greater than 92%, discontinue until after procedure is completed.

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- Proper monitor disconnection
  - Portable monitors that alarm on the central station in the home unit even when the patient is in procedural area
  - Education to CCL and OR staff on how to suspend alarms prior to disconnecting the patient from the monitor and turning it off

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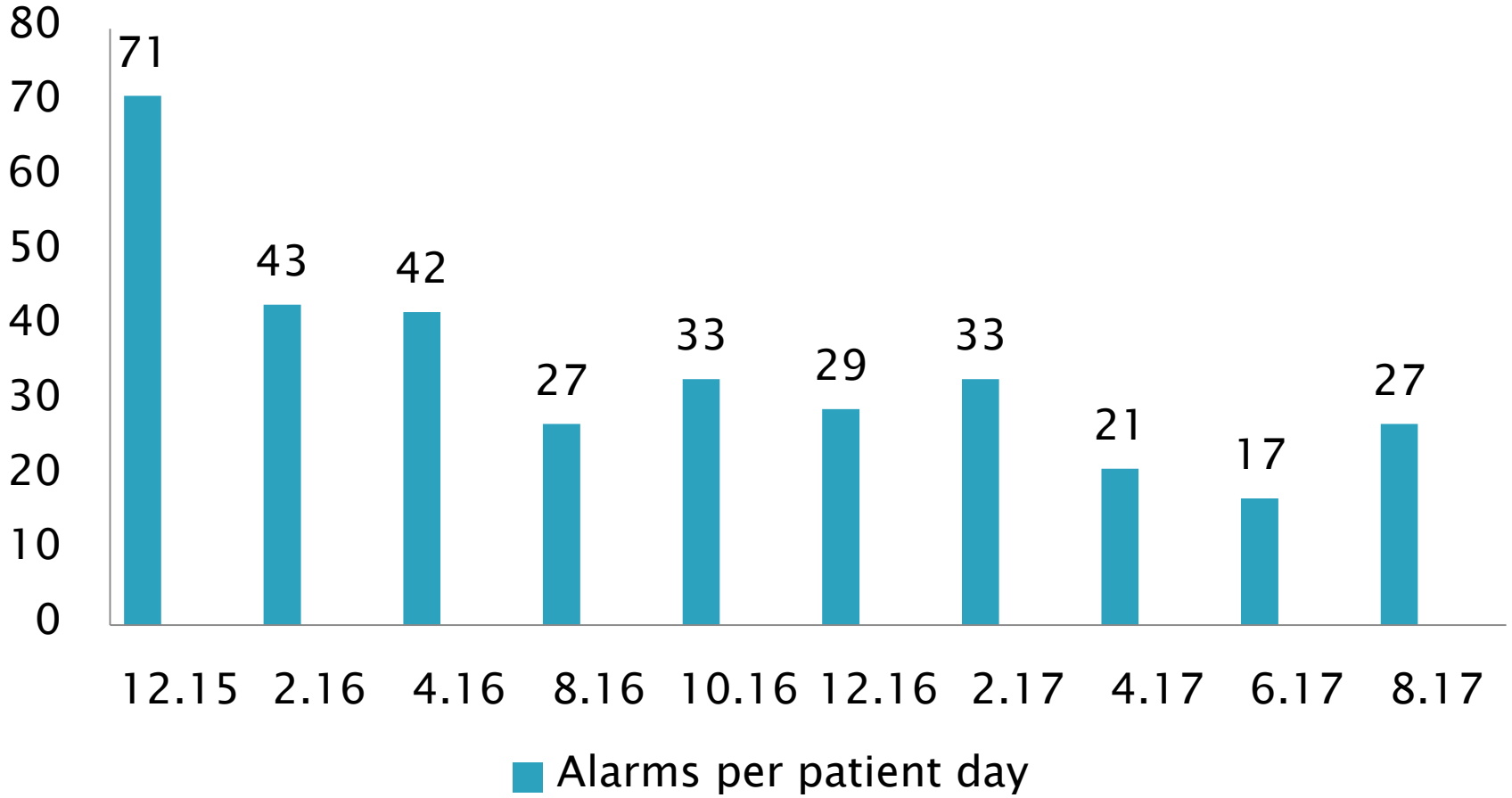

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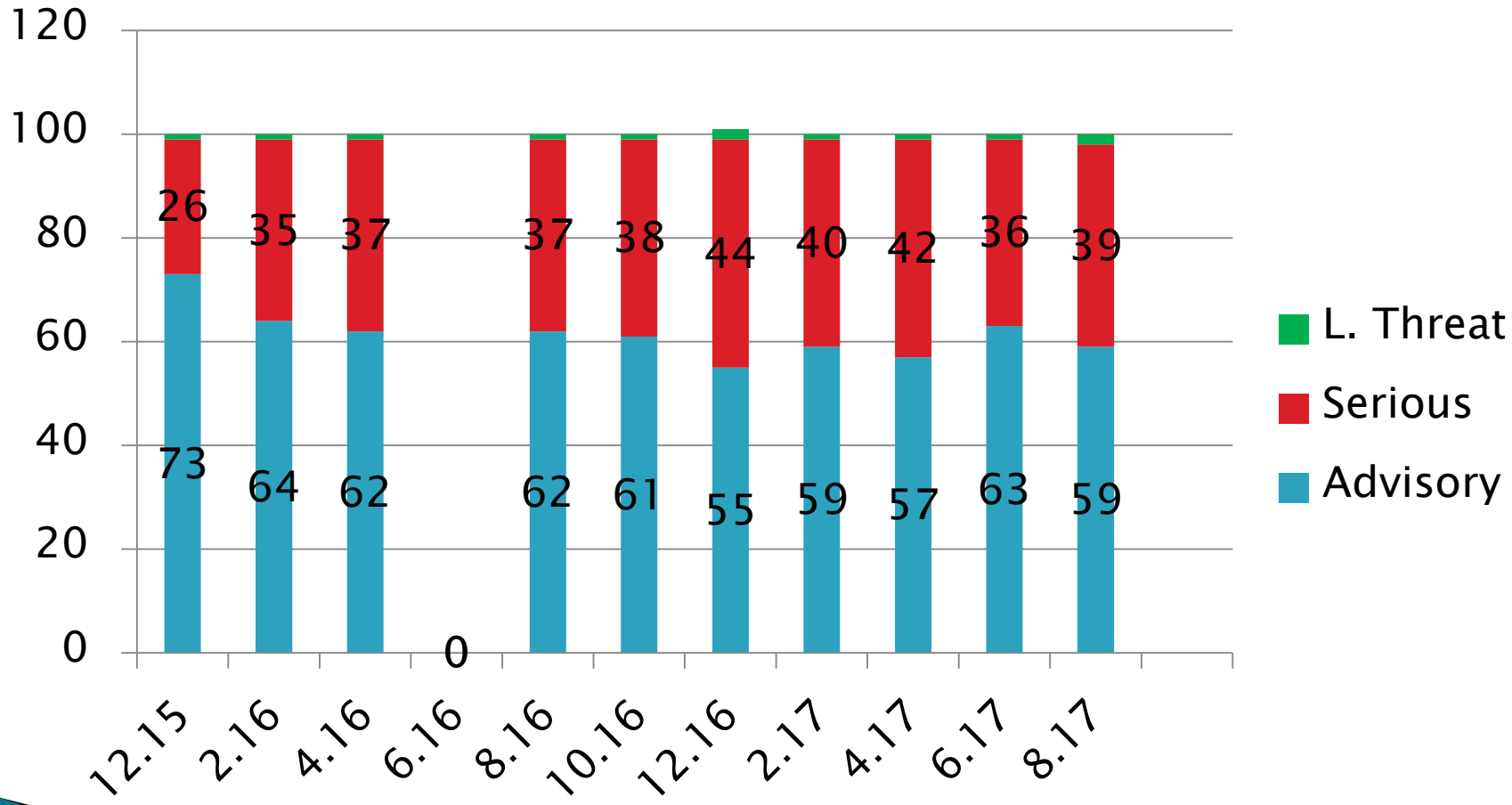

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- Challenges
  - Changing practice

Invention does <u>not</u> have to be the mother of necessity

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- Future Goals
  - Continue to work on SpO2 alarms
  - Integrate other alarms
    - IV pumps
    - Ventilators
    - IABP
    - Impella
    - Other monitoring equipment


physician
safety
culture
just
Patient
policies
healthcare
different
approaches
Physicians
system
adverse
providers
professional
medical
care
patient
liability
events
knowledge
Safety