NENIC

Posters!

NENIC

New England Nursing Informatics Consortium

NENIC Member Highlights
2019

1. **Laura Ritter-Cox**
   Developing an Intensive Care Unit Acuity Tool

2. **Danielle Perley**
   Assessment, Creation and Adoption of a Sepsis Trigger Tool in the EHR

3. **Mary Ellen Kinnealey**
   Utilizing the Electronic Health Record in the Perioperative Arena in the Prevention of Pressure Injuries

4. **Sarah Wright**
   Implementation of Digital Whiteboard & Interactive Patient Education and Care Application

5. **Naomi Mercier**
   Improving User Efficiency with Plan of Care Automation

NENIC
New England Nursing Informatics Consortium

*Nurses Transforming Healthcare **Through Informatics***

NENIC Member Highlights 2019

Developing an Intensive Care Unit Acuity Tool

Laura Ritter-Cox, MSN, RN-BC

ICU Application Administrator

Beth Israel Deaconess Med Center

NENIC

New England Nursing Informatics Consortium

DEVELOPING AN INTENSIVE CARE UNIT ACUITY TOOL

Laura Ritter-Cox, MSN, RN-BC

NENIC

April 26, 2019

Beth Israel Lahey Health

Beth Israel Deaconess Medical Center

INTRODUCTION

➢ **Patient acuity refers to the physical and psychological complexity of patients**

➢ **The Therapeutic Intervention Scoring System 28 (TISS – 28) was developed to stratify patients by severity of illness**

➢ **Data from the electronic medical record can automatically calculate the TISS – 28 score**

➢ **Massachusetts law requires all ICUs to have an acuity tool**

Goal

➢ In accordance with Massachusetts General Law regulating nurse to patient ratios in critical care units, we developed a tool and process to approximate acuity and guide patient assignments using bio-psycho-social assessment measures

ICU Dashboard

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

Performance Manager

BIDMC ICU DASHBOARD

FICU (4I)

401 - SURG	402 - MED	403 - MED	404 - MED	405 - MED	406 - MED	407 - MED	408 - CSURG
C=12 PS=1	C=28 PS=6	C=35 PS=7	C=14 PS=5	C=20 PS=5	C=22 PS=5	C=14 PS=5	C=12 PS=5

409 - OPEN	410 - MED	411 - OPEN	412 - OPEN
	C=14 PS=5		

CCU (CC6D)

0681 - CMED	0682 - CMED	0683 - CMED	0684 - CMED	0685 - CMED	0686 - MED	0687 - CMED	0688 - CMED
C=15 PS=7	C=14 PS=7	C=38 PS=7	C=12 PS=5	C=12 PS=5	C=14 PS=7	C=44 PS=7	C=42 PS=8

MICU A (CC7D)

0781 - MED	0782 - MED	0783 - MED	0784 - MED	0785 - CMED	0786 - MED	0787 - MED	0788 - CMED
C=12 PS=1	C=35 PS=3	C=28 PS=7	C=28 PS=1	C=17 PS=7	C=32 PS=9	C=17 PS=7	C=39 PS=6

Neuro ICU (FA6B)

F618 - NMED	F619 - SURG	F620 - NSURG	F621 - OPEN	F622 - NSURG	F623 - SURG	F624 - NMED	F625 - SURG
C=12 PS=5	C=27 PS=5	C=27 PS=7		C=24 PS=3	C=12 PS=5	C=12 PS=1	C=26 PS=1

CVICU-B (CC6B)

0672 - VSURG	0673 - VSURG	0674 - CSURG	0675 - CSURG	0676 - OPEN	0677 - CSURG	0678 - CSURG
C=34 PS=8	C=42 PS=7	C=27 PS=5	C=32 PS=7		C=16 PS=0	C=21 PS=0

CVICU-A (CC6C)

0691 - VSURG	0692 - CSURG	0693 - CSURG	0694 - CSURG	0695 - CSURG	0696 - SURG	0697 - CSURG	0698 - CMED
C=49 PS=2	C=40 PS=5	C=26 PS=5	C=38 PS=5	C=30 PS=7	C=32 PS=9	C=27 PS=5	C=56 PS=3

TSICU (CC5B)

C561 - OPEN	C562 - TRAUM	C563 - MED	C564 - CSURG	C565 - SURG	C566 - ENT	C567 - TSURG	C568 - SURG
	C=32 PS=5	C=19 PS=5	C=31 PS=6	C=40 PS=8	C=23 PS=5	C=28 PS=5	C=28 PS=5

C569 - SURG	C570 - SURG
C=20 PS=5	C=33 PS=5

SICU A (CC7B)

0771 - OPEN	0772 - SURG	0773 - SURG	0774 - SURG	0775 - MED	0776 - SURG	0777 - SURG	0778 - MED
	C=18 PS=7	C=24 PS=5	C=42 PS=6	C=18 PS=3	C=28 PS=6	C=54 PS=3	C=17 PS=5

MICU B (CC7C)

0791 - MED	0792 - MED	0793 - MED	0794 - MED	0795 - MED	0796 - MED	0797 - MED	0798 - MED
C=29 PS=2	C=12 PS=7	C=19 PS=6	C=12 PS=7	C=27 PS=3	C=50 PS=3	C=16 PS=1	C=29 PS=5

NURSING ACUITY Clinical: Low = 15-25 Med = 26-36 High = 37-90 Psychosocial: Low = 3-4 Med = 5-7 High = 8-9 Updated 4/9/2019 2:19:04 PM

LEGEND | Call Out | Mech Vent | Non-Inv Vent | Pressor | Neg Flu Test | Pos Flu Test | Flu Rx | Hx Flu Rx | Bariatric | Artic Sun

Results / Lessons Learned

➢ The dashboard is used to ensure each unit is staffed appropriately

➢ The scores are only a guide and provide an objective measure to support nursing judgement while making patient assignments

➢ Patient conditions are dynamic and acuity measurement is static and only valid at the time it is measured

➢ Nursing judgement is still utilized ultimately for assignments

➢ With changing technology, constant oversight is required

➢ Reiterative training to assure all users are entering data consistently

Next Steps

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

➢ Assess the need for further user education to ensure documentation accuracy

➢ Review how this acuity tool is being used and evaluate areas for improvement

➢ Reexamine the TISS-28* weighting of therapies

➢ Possibly interfacing with other scoring systems

➢ Assessing the skill mix and acuity of each ICU to better manage allocation of resources

References:

Massachusetts Rule 958 CMR 8.00 - Bulletin HPC-2015-04, ICU Nurse Staffing Quality Measures.

Katz, A, Andres, J, Scanlon, A. (2018). Application of Therapeutic Intervention Scoring System (tiss) to an Electronic Health Record: A Feasibility Study. Pediatrics. DOI: 10.1542/peds.141.1_MeetingAbstract.321.

Contact info: lritter@bidmc.harvard.edu

NENIC Member Highlights
2019

Assessment, Creation and Adoption of a Sepsis Trigger Tool in the EHR

Danielle Perley, BSN, RN, CPHON

Clinical Informatics Specialist

Boston Children's Hospital

Introduction

- One million patients diagnosed with sepsis each year[2]
  - Increasing awareness
  - Increasing vigilance
  - Quick diagnosis
- Surviving Sepsis Campaign
  - Focus on identifying and providing quick appropriate care
  - Latest guidelines published in 2016[1]
- Opportunity for inappropriate testing and treatments[3]

Assessment/Methods

Request made to build Sepsis Trigger Tools in the EHR

Key Components to Clinical Decision Support Tools

- Increase awareness
- Protect patient from excessive testing/diagnostics[4]

Initial Wave for Electronic Sepsis Trigger Tools:

- Intensive Care Units
- General Medical Floors

Assessment/Methods

- Assess original paper tools used for pilots

ICU Sepsis Trigger Tool

Areas assessed to be included in electronic sepsis trigger tool

New fever/hypothermia or infection concern?

AND

BP*	Hypotension* (new or worse) Increased vasopressors ≥2x? (within 2 hrs)

OR

VENT	If mechanically ventilated - increased airway pressures OR FiO2 (>25% for ≥ 2 hours)

OR

UOP	Drop to < 0.3 cc/kg/hr ≥ 2 hours (if Foley)

NO

YES

Huddle with NP/Resident/Fellow & Charge RN Attending notified by phone at minimum

If multiple consider

Signs of Sepsis

Sustained tachycardia >baseline Change in pulses or perfusion

Sustained tachypnea, O2 sats <92% on >2L NC OR BiPAP/CPAP FiO2 >40%

Mental status change (not sedated)

Sepsis Risk Factor**

Suspected Sepsis?

Huddle Considerations

[ ] Adequate access
[ ] Team responsibilities [ ]
Antibiotic plan: add or change? delivery priority

Sepsis not suspected

Reference Text

*AGE	<1mo	1mo-1y	1y-10y	>10y
SBP	<60	<70	<70 + 2x age	<90

Assessment/Methods

- ## Sepsis Trigger Tool Built in the EHR

  – Build within nursing's current workflow

  – Create a custom section in the flowsheet which included:

    - Conditional logic

    - Selection based calculations

    - Discrete fields with interpretation capability

      – 72 different interpretation scenarios built to accommodate all documentation possibilities for the ICU Sepsis Trigger Tool

Electronic Flowsheet Build
Intensive Care Unit Sepsis Trigger Tool

Fields denoted by a star are linked to reference text to provide clinical decision support the nurse

This field opens the appropriate Sepsis Trigger tool for the patient location

The "Risk for Sepsis?" field is interpretive, it will interpret the 72 answer combinations for the previous fields for the tool and automatically determine if the patient is at risk for sepsis.

Sepsis ICU Hypotension

Reference

Sepsis ICU Hypotension

○ CarePlan information ● Chart guide ○

Per sepsis guidelines:

Age	<1mo	1mo-1y	1y-10y	>10y
SBP	<60	<70	<70+2x age	<90

Sepsis Trigger Tool

Patient Location	Intensive Care Unit
New Concern	New hypothermia
Blood Pressure	New hypotension
Respiratory Status	Mech ventilated, no change
Urine Output	<0.3 mL/kg/hr for >/= 2 hours
Risk for Sepsis?	Yes
Need for Huddle	Yes
Action Planned	Provider notified
Action Taken	Sepsis huddle occurred

Assessment/Methods

EHR Utilization in Additional Areas

- Neonatal Intensive Care Unit
  - New specialized tool
- Dialysis/Therapeutic Apheresis
  - Utilizing existing acute care tool

Discussion/Conclusion

- Tool usage is monitored the initial adoption areas
  - Intermittent chart audits
  - Data collection through our data warehouse
  - Included in our specialty views, including our new Illness Severity View.

- Sepsis Trigger Tools have been integrated into policy
  - Help to ensure it is being used to capture early signs of sepsis.

References

1. The Society of Critical Care Medicine (2018) Surviving Sepsis Campaign: Guidelines. Retrieved from http://www.survivingsepsis.org/Guidelines/Pages/default.aspx

2. Backer D.D., Dorman, T. (2017). Surviving Sepsis Guidelines: A Continuous Move Toward Better Care of Patients with Sepsis, Journal of the American Medical Association, 317(8), 807-808. doi:10.1001/jama.2017.0059

3. McCulloh, R.J., Fouquet S.D., Herigon, J., Biondi E.A., Kennedy, B., Kerns, E. ,… Newland, J.G. (2018). Development and implementation of a mobile device-based pediatric electronic decision support tool as part of a national practice standardization project. *Journal of the American Medical Informatics Association*, 25(9), 1175–1182. https://doi-org.proxy.hsl.ucdenver.edu/10.1093/jamia/ocy069

4. Hussaain S., Dewey J., & Weibel, N. (2017). Reducing alarm fatigue: exploring decision structures, risks, and design, European Alliance for Innovation Endorsed Transactions on Pervasive Health and Technology, 17(10). **http://dx.doi.org/10.4108/eai.13-7-2017.152886**

Contact Info

- Email:

  Danielle.perley@childrens.harvard.edu

- LinkedIn

  www.linkedin.com/in/danielle-perley

Boston Children's Hospital
Until every child is well

HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

NENIC Member Highlights 2019

Utilizing the Electronic Health Record in the Perioperative Arena in the Prevention of Pressure Injuries

Mary Ellen Kinnealey, RN , MSHI

Perioperative Informatics Staff Specialist

Massachusetts General Hospital

NENIC
New England Nursing Informatics Consortium

*Nurses Transforming Healthcare **Through Informatics***

Utilizing the Electronic Health Record in the Perioperative Arena in the Prevention of Pressure Injuries

M. Ellen Kinnealey, RN, MSHI

Pamela Wrigley, RN, MS

NENIC
New England Nursing Informatics Consortium

*Nurses Transforming Healthcare **Through Informatics***

Introduction/Background

- Pressure injuries (HAPI) cause devastating physical and emotional impact for patients and research demonstrates that many hospital-acquired injuries originate in the operating room (OR).

- The incidence rate ranges from 12% to 66%

- The length of surgery is a significant factor.

- Patient safety literature supports the hand off communication of intraoperative patient positioning. It is a mystery to most floor nurses how the patient is positioned in the OR.

- Our project team devised a way to communicate visually the OR positioning and potential pressure injury areas electronically.

- Using EPIC functionality, **"Annotated Image,"** developed unique enhancements.

- The result is a shared drive with files of structured images of patient positions with arrows highlighting areas of potential pressure injury.
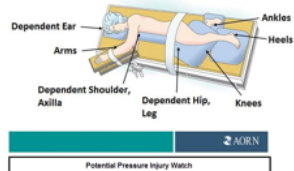
Image Library

*Nurses Transforming Healthcare **Through Informatics***
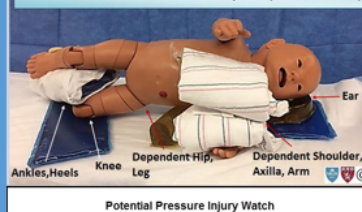
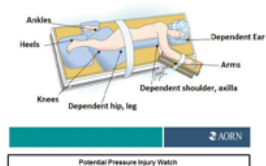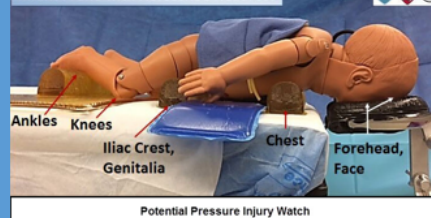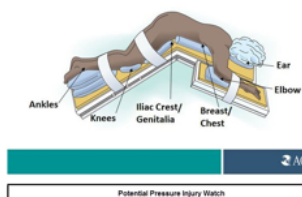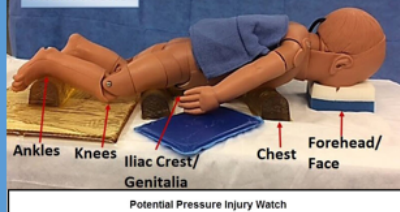# Methods

- This project involves the entire MGH OR staff (250 RN's) entering the annotated image for all surgical patients and procedures, seven days a week.

- Baseline PI prevalence rate from the OR was collected from the hospital-wide PI prevalence survey.

- Prior to implementation, education included staff meeting demonstrations and tip sheet development for OR and inpatient staff.

- To encourage project compliance, members of the Skin Injury Prevention committee were recruited to provide at-the-elbow support.

- A post implementation survey was sent to the OR staff to determine clinician satisfaction and the ease of use.

- Data is currently being collected via daily random audits of 10 procedures a day along with run chart trend analysis.

Results: Annotated Image Entered in OR Record

Average Compliance Rates
(% image found in surgical charts)

*Nurses Transforming Healthcare **Through Informatics***
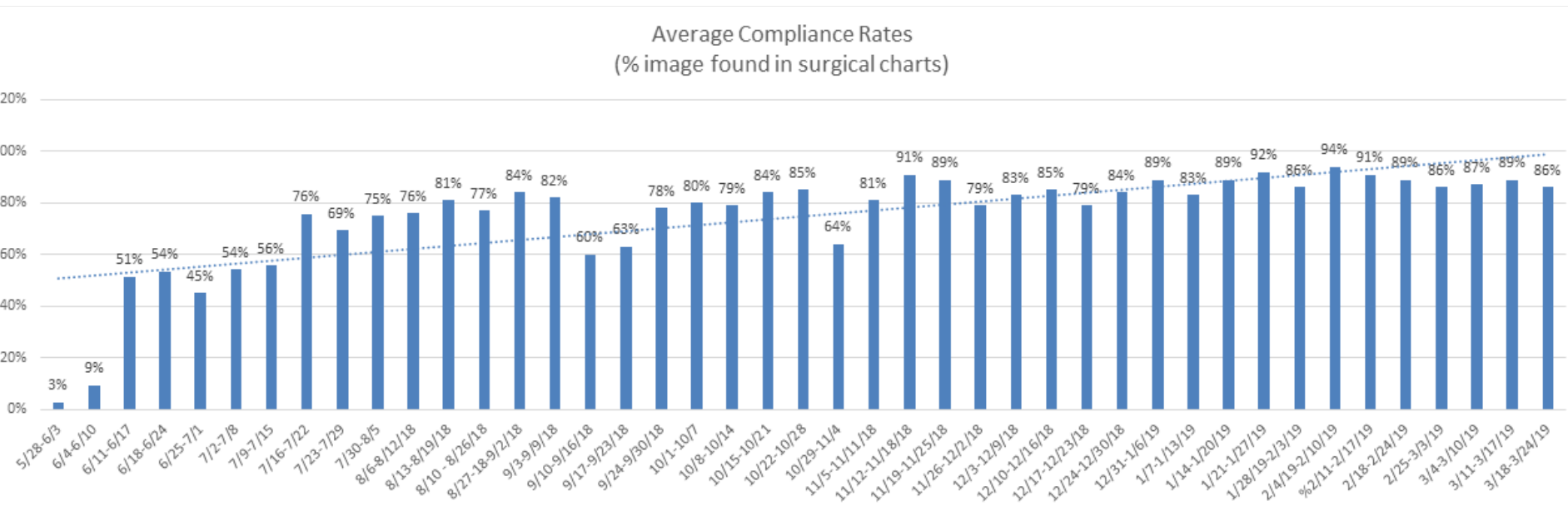
Discussion/Conclusion

- This quality improvement project provides nurses electronically with an image which communicates potential skin areas that may be at risk for pressure injury due to length of surgery and intraoperative positioning.

- Implementing evidence-based nursing interventions for example, turning and repositioning post-operatively, will help prevent skin breakdown and potentially avoid a pressure injury.

NENIC Member Highlights 2019

Implementation of Digital Whiteboard & Interactive Patient Education and Care Application

Sarah A. Wright RN, MSN

Nursing Informatics Specialist

Nantucket Cottage Hospital

NENIC

New England Nursing Informatics Consortium

*Nurses Transforming Healthcare **Through Informatics***

Implementation of Digital Whiteboard & Interactive Patient Education and Care Application

Sarah Wright, RN, MSN

Clinical Informatics Specialist

NENIC
New England Nursing Informatics Consortium

*Nurses Transforming Healthcare **Through Informatics***

Introduction and Background

- With the recent completion of a new hospital, Nantucket Cottage Hospital (NCH) evaluated the advantages of utilizing new digital technology to replace the standard dry erase whiteboard in the patient rooms.

- The standard board was historically updated manually with patient demographics, key vitals, and care team information and would often lag behind with up-to-date information.

- NCH chose to implement a hardware and software solution in 14 patient rooms.

*Nurses Transforming Healthcare **Through Informatics***

Goals

- Digitize patient information from the whiteboard and integrate it with the electronic health record (EHR).

- Assign patient education on various topics in both English and Spanish.

Methods

- On-site demos from the vendor

- Workflow observations and discussions with nursing staff

- Interdisciplinary meetings with clinical management, information technology and NCH senior leadership to reach final user interface design

- Prioritization of education videos based on most frequent diagnosis and labor and delivery patient specific needs

Results

- Whiteboard was live at the moment we welcomed the first patient into her room

- Content was integrated so updates in the EHR are viewed in real time

- The patient pillow speaker is integrated with the TV controls, as well as the nurse call system

- Nurses are able to work with each patient to "bookmark" health focused topics addressing individualized education needs

49" Smart T.V. Displays

MED SURG ROOMS

LDRP ROOMS

Fall Risk Score ≥ 45

Hearing Impaired

Visually Impaired

Dentures

Braden Scale Score

*Nurses Transforming Healthcare **Through Informatics***

Discussion and Conclusion

- The NCH Clinical Business and Technology team is working closely Partners eCare EHR clinical teams to identify further patient specific information for display

- DocFlowsheet interface - clinical information such as Pt goals, pain scores, icons for falls, activity limitations and newborn/mother data will be pulled realtime into the patient screens

- Further work is planned to map available educational videos to commonly chosen Plan of Care education interventions

*Nurses Transforming Healthcare **Through Informatics***

Improving User Efficiency with Plan of Care Automation

Naomi Mercier DNP, RN,
Traynor Canny MBA,
Courtney Green, RN, MS,
Mary Hudson MS, RN,
Christine Suchecki MSN, RN,
Mary Swenson MBA, RN

Partners Healthcare Boston MA

Introduction/Background

- Evidence supports the automation of nursing care plans in the EHR
- The Partners Healthcare Nursing Informatics Council prioritized nine patient problems to automate
- The problems selected directly align with National Patient Safety Goals and NDNQI measures.

1. CAUTI – Catheter Associated Urinary Tract Infection Risk or Actual – Adult/Pediatric

2. CLABSI – Central Line Associated Bloodstream Infection, Risk or Actual – Adult/Pediatric

3. Fall Risk – Adult

4. Fall Risk – Pediatric

5. Pain, Acute/Chronic – Adult/Pediatric

6. Pressure Injury – Adult/Pediatric

7. Restraint Use – Adult/Pediatric

8. Suicide/Self-Harm- Adult/Pediatrics

9. Venous thromboembolism Risk or Actual – Adult/Pediatric

Methods

Streamlining Problems for Automation:

- Three, 2-hour Clinical Content Build-Out (CCBO) sessions were held to review, update and streamline the content
- Subject matter experts from each entity and a variety of inpatient settings participated.
- Software limitations in the 2015 version of the system did not allow users customize goals and interventions before the problem populated the Plan of Care.
- Subject matter experts focused on including the minimum necessary goals and interventions for each problem.

Development of Automation Criteria:

- The clinical informatics team applied an Agile framework for this effort.
- User workflows were evaluated to define appropriate decision support inclusion and exclusion criteria logic to automate each problem.
- Logic for this automation include a specific order, assessment, patient class, and encounter type.

PARTNERS®
H E A L T H C A R E

Results

- The nine problems automate for most patients during their hospital encounter.
- Requests to automate additional plans of care continue to be submitted and evaluated.
- The problem automation count correlate with the patient department.
- Perioperative departments have higher counts for CLABSI and CAUTI problems due to the number of assessments they enter for urinary and central catheters.

Problem	Count	Department with Highest Count
Fall Risk	9594 (Adult) 171 (Pedi)	NSM Davenport 9 SH (230) MGH Ellison 18 Pedi (42)
Pain, Acute / Chronic	8895	MGH Perioperative (483)
Pressure Injury, Risk or Actual	8055	NSM Davenport 9 SH (222)
CAUTI, Infection Risk or Actual	4805	MGH Perioperative (986)
CLABSI, Infection Risk or Actual	2719	BWH Perioperative (221)
Venous Thromboembolism (VTE) Risk or Actual	2426	BWH Perioperative (232)
Restraint Use	816	MGH Lunder 6 Neuro ICU (53)
Suicide/Self-Harm Risk	94	MGH Ellison 18 Pedi (6)
Skin/Wound Integrity - Skilled Nursing Facility	79	SRB 1st Floor (37)

Discussion/Conclusion

- End user feedback is positive overall
- Nurses have evidence that their documentation and the system's decision support is used build a relevant plan of care
- Automation saves clicks and streamlines documentation
- Concerns have been voiced that the automatically generated plans of care lack patient individualization.
- Design changes are being implemented to allow personalization of the plan of care from the Best Practice Advisory alert.
- Future work includes additional automation based on specific patient criteria.
- End user feedback and analytics inform iterative adjustments to the decision-support logic

Reference:

Agile Alliance: https://www.agilealliance.org/agile101/