Lumos! Bringing Light to Informatics Failures and Innovative Solutions

Case Study: Nursing Best Practice Advisory (BPA) for Delirium and At-risk Patients

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Purpose

Demonstrate how re-examining an informatics failure can be used to re-design, develop, and inform an improved solution to achieve desired outcomes.

Background

Fundamental maintenance for EHR vendor updates, practice improvements, health system expansion, and the constantly changing regulatory landscape leaves **little time to examine informatics failures.**

Projects implement informatics solutions in a rapid-cycle approach (Plan-Do-Study-Act [PDSA]). When projects do not succeed in meeting their objectives, they are frequently abandoned, thus, halting the PDSA cycle before getting to 'study' and 'act'. However, these **failures are key and should be studied.**

One of the many types of informatics solutions that fail in meeting their objectives are best practice advisories (BPA), which unfortunately have become the de facto, even for simply reinforcing standard work.

A nursing BPA, for patients screened to be at risk for/or having delirium was implemented in September 2017. The advisory objectives were:

1) Ensure nursing notified providers if a patient screened positive so that providers could place a delirium order set

2) Prompt nurses to initiate a nursing care plan for delirium

Plan

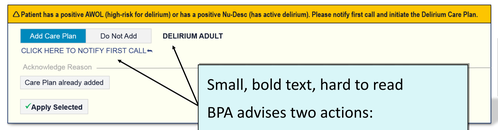
Four months after implementation, data was evaluated and the BPA was declared to be ineffective. Rather than retire the BPA and call it a failure, a cohort of nurse informaticists convened to **assess if the BPA could be made more effective through:**

- **Collection and analysis of qualitative data**
- **Further analysis of quantitative data**
- **Application of human-computer interaction design principles**

METRIC	Sep-17	Oct-17	Nov-17	Dec-17
PATIENTS WITH A POSITIVE SCORE	470	486	464	512
PATIENTS WITH ALERT SHOWN	394	416	379	410
ALERTS GENERATED	1519	1602	1604	1745
USERS SHOWN ALERT	473	529	501	566
ALERTS WITH CAREPLAN APPLIED	123	154	108	134
ALERTS WITH LINK CLICKED TO PAGE CARETEAM	0	4	0	5
POSITIVE PATIENTS WITH CAREPLAN STARTED	167	200	161	189
POSITIVE PATIENTS WITH ORDER SET	196	228	256	259
POSITIVE PATIENTS WITH ORDER SET AFTER ALERT	84	100	107	112
POSITIVE PATIENTS WITH ORDER SET BEFORE ALERT	95	114	126	125

Interventions—Round 1

Analyze BPA#1



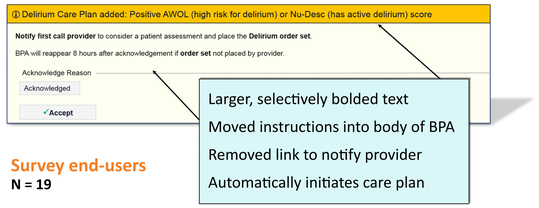
Survey end-users
N = 26

0% **Used link in BPA to notify provider**

65% **Did NOT recognize that the BPA advises two actions: Notify provider AND initiate delirium care plan**

Interventions—Round 2

Redesign based on survey feedback—BPA#2



Survey end-users
N = 19

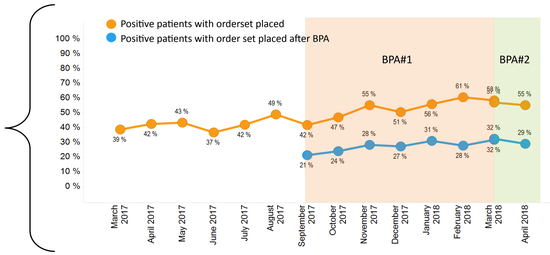
95% **Found redesigned BPA easier to understand**

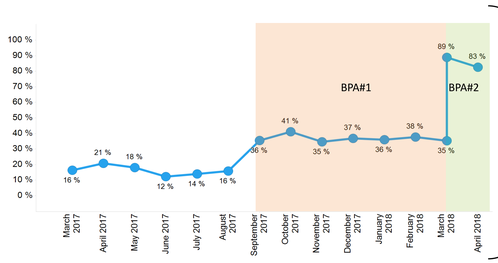
100% **Felt that automatically adding delirium care plan is a significant improvement**

Outcomes

4% Improvement

Objective: Delirium Order Set	PRE BPA	BPA#1	BPA#2
Percent of patients screened positive with delirium order set placed *after* BPA first appeared	**	27%	**31%**



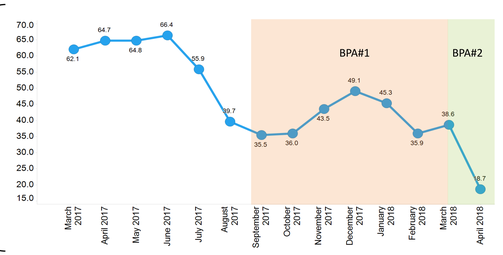


Objective: Delirium Care Plan	PRE BPA	BPA#1	BPA#2
Percent of patients screened positive with a delirium care plan	16%	37%	**86%**

49% Improvement

19h Reduction

Objective: Delirium Care Plan	PRE BPA	BPA#1	BPA#2
Hours from positive screening score to delirium care plan initiation	59.1	41.0	**21.8**



Discussion

Objective: Delirium Care Plan

- Increase of 49% (p-value=0.018) in the percent of positively screened patients with a delirium care plan after BPA#2
- Care plan activation time was cut nearly in half for these patients
- Changes are statistically significant from BPA#1 to BPA#2, however only two months of data have been collected since implementing BPA#2 in March 2018

Objective: Delirium Order Set

- Only a 4% (p-value=0.108) increase in the percent of positively screened patients with a delirium order set placed after the alert first appearing
- Change is not statistically significant, however we have only two months since implementing BPA#2 in March 2018

BPA#1

- Only data from the BPA itself was initially analyzed to determine:
  - ➥ How many patients had the delirium care plan initiated (from the BPA)
  - ➥ How many BPAs had the link clicked to notify provider
- Problematic: only told a partial story
  - ➥ Users may be doing appropriate actions, using workflow outside of the BPA
  - ➥ Initial qualitative data also highlighted this point
  - ➥ RNs were using alternate workflows outside the BPA to contact the provider and in some cases start the care plan
  - ➥ Additionally, it confirmed that the BPA design was not providing RNs with clear directions or even displaying the information in an optimal way
- Two questions remained:
  - ➤ **Do we only care what people are doing from within the BPA, or rather the overall effect on the objectives?**
  - ➤ **Is it necessary that the RN to contact the provider through the BPA?**

BPA#2

- Improvements made for readability to provide clarity in the actions being advised and incorporate human-computer interaction design principles
- Advisory simplified from advising two actions to one by automating the initiation of the delirium care plan
- Removed 'notify provider' link to align with established operational workflow
  - ➥ Transformed our priority from an actionable BPA to an informational BPA with automation
  - ➥ Focus shifted to the overall effect of the BPA on objectives rather than the BPA serving as the vehicle to accomplish the actions to meet the objectives

Lessons Learned

1) Measuring your successes and failures can be challenging and should always include qualitative components. Additionally, all metrics should be identified prior to implementation of any solution.

2) Nursing Informatics adds undeniable value when fusing technology and clinical care (i.e. performing a technology assessment, involving end-users).

3) Examining failures can trigger growth, lessons learned, inform future work, and foster wisdom.

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