Northwestern University

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Class 406 - Assignment 4

CDS Research – Provation Order Sets *powered by UpToDate Decision Support*

Abstract

In critical care, careful and meticulous attention must be paid to orders being done correctly and timely. Something as simple as forgetting to place an order for patients in critical care can be a life or death situation.

Industry best practices, new research and methodologies are ever-changing and nearly impossible to keep up with. To help address these issues, Sibley Memorial Hospital, a 328 bed acute care hospital in Washington, DC, implemented the ProVation evidence – based order sets, a CDS module from the UpToDate program.

Overview of the CDSS

Sibley Memorial Hospital faced many challenges such as decentralized order-sets, a lack of standardized processes, a hybrid medical record that was electronic and paper, and difficult and time-consuming processes to implement and develop new order sets, just to name a few.

The ProVation Order Sets module provides easy links to access up to date evidence based order sets, provides a library of current evidence-based order sets, allow for easy customization of the order sets, compare old and new order sets, audit order set history, and more benefits. It also uses a catalog that is mapped to terminology standards such as ICD, CPT, SNOMED, and LOINC and provides a point-of-care solution.

Study Overview

Sibley did a 6 month pilot where they replaced their paper-based order sets in the ICU and joint-replacement program with the ProVation evidence-based order sets. They used an interface of ProVation into the hospital's CPOE system for ease of use and point-of-care workflow.

For the study, Sibley selected only a few "champion" physicians for the 6 month pilot as a mass undertaking would be too much to move forward with a smooth process. In the ICU, the ProVation order sets served as checklists to ensure nothing was overlooked or missed.

One of the improvements made by Sibley was the revision of the order set for “stress ulcer prophylaxis”. Prior to the implementation of ProVation Order Sets, most patients admitted to the ICU would receive a prophylaxis for stress ulcer until they were discharged even though some of those patients were at low risk for developing a stress ulcer. Due to the high costs incurred with this process, Sibley revised the order set using a template provided within ProVation and linked to evidence based guidelines to ensure the validity of the order set. Needless to say the change proved to be more efficient and cost-effective for the hospital.

Results

The medical staff at Sibley far exceeded expectations. Even though “the hospital’s ICU admission order went from one page to five, the end result has been an execution of more efficient and effective patient care alongside improved workflows.” The use of ProVation evidence-based order sets has allowed Sibley to standardize care on a high level.

Conclusion

Not much information was provided as to the thoroughness of the implementation process and measured success of ProVation Order Sets with Sibley Hospital other than the process of only implementing a few providers versus implementing the entire staff. In my past experience, there are usually more successful implementations of new processes when only a few users pilot the program rather than all of the staff.

It wasn’t mentioned in the article, but I think to improve the process, in order to maintain a streamlined workflow that only certain users be given the ability to make changes to order sets. Ensure that the process is fully detailed before any changes are made and feedback (both negative and positive) be taken into full consideration. Another improvement would be to run reports monthly to show any gaps in protocols and the frequency of changes made to order sets to ensure the templates are useful and current with the workflow.

Retrieved from:

1. http://web.ebscohost.com.turing.library.northwestern.edu/ehost/pdfviewer/pdfviewer?sid=78efef6a-f234-4430-9570-d237e1d5133f%40sessionmgr113&vid=2&hid=125

2. http://www.provationordersets.com/provation-order-sets-management.aspx

CDS Research – Smart Anesthesia Manager™ (SAM)

Abstract

Anesthesia Information Management Systems (AIMS) are being widely used in the operating rooms for documenting anesthesia care. However the need for a decision support system was necessary to assist anesthesiologists during surgery to ensure patient safety and also adhering to other regulations. The Smart Anesthesia Manager (SAM) was developed by the University Of Washington Medical Center, Seattle WA, to work in conjunction with AIMS to provide clinical and billing decision support.

Overview of the CDSS

The SAM decision support tool uses the information in the AIMS database to provide *near* real-time alerts and reminders related to issues involving clinical, billing and compliance and material waste. These alerts show up as “pop-up” messages over the AIMS screen or as text pages to notify the anesthesiologists of potential issues occurring during surgery.

The AIMS and SAM databases run on two separate servers but are tightly interfaced. The SAM server has an AIMS interface module that extracts data from the AIMS database but is then translated into an AIMS standardized anesthesia data dictionary to be used as part of the decision support rules. The data is used in the decision rules engine which then turns out predefined decision rules to detect ongoing or potential problems.

The rules are then sent to the *message composer* which formulates the message and the suggested steps to fix any potential issue, however the messages are prioritized and only the three highest messages for an operating room are considered for notification. This design was put in place to avoid alert fatigue and also to limit too many messages being displayed during surgery.

When building these rules, and notification message, the highest priority was quality of care and patient safety, billing and compliance issues were the second priority and material waste was the lowest priority.

Study Overview

The implementation of SAM was done first in a test environment. No training was given to the anesthesia providers and any time new rules or changes were made, they were notified via email or through department meetings.

To evaluate SAM’s decision rules effectiveness, clearly defined quantitative measures of each clinical and business need were made before and after implementation.

Results

The following table shows a comparison of the following improvements in clinical care before and after the implementation of SAM:

EFFECT OF SAM DECISION SUPPORT ON CLINICAL AND BUSINESS NEEDS Clinical or Business Need Item	Without SAM	With SAM
Antibiotic initial dose compliance [8] ($p<0.05$)	88.5±1.4%	99.3±0.7%
Antibiotic redose compliance [9] ($p<0.05$)	62.5±1.6%	83.9±3.4%
Beta-blocker protocol compliance [10] ($p<0.05$)	60.5±8.6%	94.6±3.5%
Yearly additional invasive line billing charges [11]*	-	$144,732
Yearly additional billable records due to correct attestations	-	1,200 records
Large gaps (>15min) in blood pressure monitoring / 1000 cases [12]* ($p < 0.05$)	192±58 min	34±30 min
Monthly Inhalation anesthetic agent consumption [13]* Sevoflurane (Bottles) Desflurane (Bottles) Isoflurane (Bottles)	128 91 64	96 49 58

Conclusion

Based on the data shown above, the SAM decision support tool has proven to be very successful. However I could not find any other data where this has been implemented in other institutions. Even though they were able to show drastic improvements in the clinical and business needs, I think their method of communicating changes and update and that there was no training offered, is not the best approach. I would rather see a more streamlined process of notifying staff when a change has occurred in the system

to avoid any chance of misunderstanding and hold formal training sessions to make sure staff clearly understands the process and new changes that were made.

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http://ieeexplore.ieee.org.ezproxy.galter.northwestern.edu/stamp/stamp.jsp?tp=&arnumber=6221957