HIMSS Analytics

HIMSS Analytics Stage 7 Case Study

WellSpan Health

Profile

WellSpan Health is an integrated health system that serves the communities of central Pennsylvania and northern Maryland. The organization is comprised of a multi-specialty medical group with more than 850 physicians and advanced practice clinicians, a home care organization, six respected hospitals, more than 15,000 employees, and over 140 patient care locations. WellSpan has been recognized by IMS Health as one of the Top 100 Integrated Health Networks in the United States and by Health Imaging and IT as one of the nation's "Top 25 Connected Healthcare Facilities."

In 2015, WellSpan Surgery and Rehabilitation Hospital achieved HIMSS Analytics electronic medical record adoption model (EMRAM) level 7 status. This 73 bed hospital opened in 2012 and includes state-of-the-art operating rooms and rehabilitation equipment. WellSpan Surgery and Rehabilitation Hospital features 48 beds dedicated to rehabilitation, 25 post-surgical inpatient beds and four operating rooms for orthopedic and neurosurgical patients. This modern, patient-centered facility offers advanced orthopedic, spine, and neurosurgical treatment, as well as orthopedic and traumatic brain rehabilitation.

The WellSpan Surgery & Rehabilitation Hospital is accredited by CARF International. By pursuing and achieving CARF accreditation in 2012, and reaccreditation in 2015, the WellSpan Surgery & Rehabilitation Hospital has demonstrated that it meets international standards for quality and is committed to pursuing excellence. CARF is an independent, nonprofit accrediting body whose mission is to promote quality, value, and optimal outcomes of patient-care services through a consultative accreditation process that centers on enhancing the lives of the persons served. Founded in 1966 as the Commission on Accreditation of Rehabilitation Facilities, and now known as CARF International, this accrediting body establishes consumer-focused standards to help organizations measure and improve the quality of their programs and services.

WellSpan Surgery & Rehabilitation Hospital also received a three-year accreditation from Det Norske Veritas (DNV) in 2014. This hospital is one of only four in Pennsylvania to achieve DNV accreditation. DNV Healthcare is the leading accreditor of United States hospitals integrating ISO 9001 quality compliance with the Medicare Conditions of Participation. ISO 9001 is a series of standards that define, establish and maintain an effective quality assurance system.

In September 2014, WellSpan Surgery & Rehabilitation Hospital was one of two hospitals with fewer than 100 beds selected as a top performing facility by National Research Corporation in its "Path to Excellence" program. This recognition is based on the highest percentage of patients rating the hospital a "nine" or "ten" on patient satisfaction measures. Winners of the Path to Excellence Award were selected from the extensive database of National Research Corporation's client hospitals for their performance over the past four quarters. Winning this award demonstrates that the WellSpan Surgery & Rehabilitation Hospital is committed to providing patient-centered care.

WellSpan Surgery & Rehabilitation Hospital was identified as one of eight hospitals in the country where at least 95% of its patients responded "Yes, I would definitely recommend this hospital." This was based on Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey results reported to CMS' Hospital Compare databases, regarding post-surgery patients.

WellSpan Surgery & Rehabilitation Hospital is listed in Modern Healthcare magazine as the fifth highest scored hospital for value-based purchasing reward/penalty, 2015 (readmissions, value based purchasing and hospital acquired condition score).

The Challenge

WellSpan Health prides itself on providing safe and reliable healthcare to its patients. Despite continuous attention to error-proofing of care delivery processes, WellSpan found that low-frequency, high-impact events still occurred.

Heparin-Induced Thrombocytopenia (HIT) is an unpredictable immune-mediated adverse drug reaction (ADR) associated with the use of unfractionated heparin (UFH) and low-molecular-weight heparin. Although it occurs in less than 5% of patients receiving heparin, HIT can have devastating consequences including thromboembolism and death. The risk of these complications can be lessened with optimal management of HIT, which includes active surveillance, prompt recognition, heparin discontinuation, ordering confirmatory laboratory tests, and initiation of an alternative non-heparin anticoagulant. Unfortunately, this ADR is not always promptly recognized or managed appropriately. We present such a case, along with the alerting and work-flow redesign solution implemented to facilitate more timely recognition and intervention.

In June 2014, an ADR report was submitted through the WellSpan safety reporting system involving an unexpected inpatient mortality due to HIT. The patient had a relatively uneventful postoperative course after undergoing aortic valve replacement surgery until his platelet count suddenly dropped by more than 50%. He subsequently became unresponsive, was diagnosed with multiple ischemic strokes, and a possible pulmonary embolism. He died the following day after suffering multiple cardiac arrests and further decompensation.

This case triggered a multidisciplinary meeting of key stakeholders from pharmacy, nursing, patient-safety, laboratory informatics, and clinical informatics. A laboratory report of all confirmed cases of HIT over a two-year period at WellSpan was obtained and each individual case was investigated. In a few cases, absence of routine platelet count monitoring was thought to have contributed to delayed recognition of thrombocytopenia and HIT. Recognition was delayed by more than three days in four cases. In each of those identified cases, the patient suffered at least one thromboembolic event.

Implementation Overview

The Solution:

As a result of the above described analysis, multiple inter-related strategies were developed by the multidisciplinary workgroup. The first strategy was the creation of an automatic rule in Cerner Millennium that would look for a resulted platelet count on all patients receiving UFH, and if a platelet count had not been resulted in the previous forty-eight hours, a Complete Blood Count would be ordered for the next morning's lab draw.

Next, an alert was created, which would fire on all patients experiencing a 50% decrease in platelet count from a baseline level prior to heparin administration. This alert advises the clinician of the drop in platelet count, a

hallmark of HIT, and presents a validated HIT risk stratification tool, the 4T's score1, in a structured format for completion by the clinician.

Additional information is displayed within the alert to assist with risk stratification, including a graph of platelet count trend correlated with heparin administration and recent imaging results for thrombosis. Using a color-coded error-proofing approach, the pre-test probability of HIT is calculated from structured responses within the 4T's score, with low-risk scores being shaded as green, moderate-risk as yellow, and high-risk as red. As a further error-proofing measure, in the case of moderate to high-risk scores, a link to an evidence-anchored HIT treatment order set is embedded in the advisory message. In the case of low-risk scores, this link is intentionally not available.

Results:

In a one-month retrospective data sample conducted after the go-live date, the HIT alert fired on 49 patients. One patient, who was identified by the tool, had laboratory-confirmed heparin-induced thrombocytopenia with thrombosis. HIT was promptly recognized in this patient after the alert fired, heparin administration was discontinued, and alternative anticoagulation was initiated. The patient was subsequently discharged home. A separate laboratory report confirmed that this was the only case of confirmed HIT during the same time period.

Resulting Value / ROI

- Automated lab ordering process for disease surveillance
- Just-in-time alerting of potentially significant drops in platelet count with consistent standardized risk stratification using a validated tool
- Link to a best practice order set imbedded in the clinician's workflow
- Increased provider awareness for a rare, but serious adverse drug event

Lessons Learned

- Maintaining high clinical decision-support sensitivity, while avoiding excessive provider alerting can be difficult. With a low-frequency, high-impact event such as HIT, the goal of our alert is 100% sensitivity. Although an algorithm was developed to identify patients with potential HIT, based on heparin exposure and a decrease platelet count, patients with other causes of thrombocytopenia could not be excluded.
- Optimization of new clinical decision support technology is an iterative process. Within months after implementation, an additional option was added for clinicians who had "No Clinical Suspicion of HIT" in order to appropriately suppress the alert for that patient encounter. This increased the alert response rate and encourages appropriate use of the HIT order set.
- By implementing a solution, related solutions may present themselves. In the process of evaluating the outcomes of this intervention, our laboratory services department posited that management of patients with suspected HIT could be expedited by providing confirmatory testing in-house, instead of as a "send-out" test. It has been conjectured that in-house testing would provide results faster thus enabling the clinician to deliver patient care with a higher degree of safety.