Nebraska Methodist Hospital/Methodist Women's Hospital

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Topic and Category of Criteria: Newborn Glucose Management

Leadership/Planning/Human Resources

Hospital Leadership Establishing Vision

In an introductory preamble to Nebraska Methodist's Hospital's (NMH's) Leadership Standards of Behavior, President and Chief Executive Officer of Nebraska Methodist Health System John Frazier states: "#1 Now is the time, #2 We are the people who will make it happen." Leaders in this organization are familiar with the ever changing demands of health care, personnel, financial climates, and organizational change in general. Within the last few years Nebraska Methodist Hospital/Methodist Women's Hospital (NMH/MWH) has experienced changes in reimbursements, informatics, technologies, unit remodeling projects, construction of a new parking structure, a new pathology center, and building a new hospital which is the first in the region dedicated to caring for women and babies. NMH/MWH's leadership team shows expertise and confidence in meeting the challenges to prepare staff for changes, both expected and unexpected, and strives to make revolutionary changes within the organization as comfortable for direct care staff as possible; including staff in decision-making and providing feedback in a timely manner.

Emphasis on Quality as a Strategic Initiative

NMH/MWH's Strategic Plan outlines the organization's strategic priorities as pillars. Each pillar upholds the priority and direction of Methodist Health System. Pillars include Smart Growth; System-ness, Collaboration and Physician Alignment; Heighten Focus on Efficiency; Quality and Safety; and People. Keeping focused on these organizational priorities will lead the organization successfully into the future. NMH/MWH's mission, vision, values, and strategic and quality plans reflect these priorities

NMH's mission, *improving the quality of life through excellence in health care,* permeates the organization. Excellence in health care can only be accomplished when all entities are working together to bring about the best possible outcomes. At NMH/MWH, our mission is clear, thus strategic planning and strategic priorities align throughout the organization at all levels of care.

Reflecting the organization's strategic priority of quality and safety, excellence in health care at NMH/MWH has been validated by various distinctions and awards. Nursing services was recognized as excellent by the ANCC Magnet Recognition Program since 2004 and is a designation nurses throughout the organization hold in high regard. Nursing Improving Care for Health system Elders (NICHE) accreditation validates nursing's commitment to excellence in elder care. As a result of NMH/MWH holding both prestigious distinctions, NMH was chosen to be a pilot site for a multigenerational nurse residency program in geropalliative care called AgeWISE

Ultimately, the strategic plan and strategic priorities are shared with all staff at Patient Care Division Forums which are held and presented by hospital vice presidents at both NMH and MWH. Patient Care Forums allow strategic priorities to be shared with all employees throughout the organization, making strategic priorities transparent within the organization.

NMH/MWH's Performance Improvement Plan, provides an organizational framework and functional strategies used in coordinating the design, measurement, assessment, continuous monitoring, and on-going evaluation to improve the quality of clinical and operational processes designed to promote health and deliver patient care. Leadership, through the strategic planning process: 1) sets expectations and priorities; 2) reprioritizes

as needed; and 3) develops plans and manages processes to assess and improve the quality of the organization's management, clinical, financial, and support activities which support the mission, vision, and values.

The hospital's Performance Improvement (PI) Committee, which is a medical staff and senior leadership committee, has the authority to direct medical staff and PI teams to complete studies and forward findings to appropriate channels for problem resolution. Nursing's PI Council reviews quality data and devises action plans to improve areas that need improvements. The PI plan reflects strategic priorities of quality and safety. NMH's PI plan reflects patient care that is outcome-driven, enhances outcomes, and provides excellent patient experiences.

Quality Issue Identified

The quality issue that was identified was Newborn Glucose Management.

Overview and Stakeholders

Newborn hypoglycemia affects 3-43% of all full term newborns (Johnson, 2003). Prolonged and untreated hypoglycemia in the newborn may result in acute systemic effects and serious, long term adverse neurologic sequelae (Comblath, 2000). American Academy of Pediatrics suggests that routine screening for hypoglycemia in newborns should first include an assessment of the mother and infant for risk factors and not be performed in the absence of such factors (Hoops, 2010).

Risk factors most commonly occur in infants with impaired glucogenesis and/or ketogenesis. Newborn hypoglycemia occurs most often in the following infants: small for gestational age, infants born to mothers who have diabetes, and late-preterm infants. Infants who are large for gestational age are also at risk.

It was noted that 43% of newborns in this population had a risk factor and there was non-programmed decision making at that time. Providers are not on site at delivery of baby, leaving assessment of risk factors and selection and initiation of appropriate protocol to be done by nursing. Protocols were on paper and transcribed into electronic medical record (EMR).

Methods

Patient-focused Newborn Population

Methodist took a multi-phased approach over several years when issues of newborn glucose management needed improvement. Nursing leaders from informatics and birth services along with newborn providers (neonatologists and pediatricians) collaborated to improve outcomes with newborn glucose management. Marie Kozel, RN, service executive clinical informatics and Jodi Gute, CNS, birth service collaborated on a process to improve adherence to newborn glucose protocol.

Intervention/Approach

Phase I involved looking at the original hypoglycemia protocol. Although there were specific orders to follow, no algorithm existed for staff to follow and there was no standardized follow-up care for the nurse to follow. Changes made to the original orders included using formula instead of D10 water for low blood sugars, lab value cutoff changed from < 40 to < 45, and point of care glucose (POC) testing.

In Phase II POC glucose was done 30-60 minutes after birth. Identification of infant risk factors was outlined: infant of diabetic mother, large for gestational age (LGA), small for gestational age (SGA), intrauterine growth restriction (IUGR), premature infant (< 37

weeks), postdate infant (>42 weeks), and 5 minute apgars < 5. Protocols with low risk and high risk blood sugar frequencies were developed

Protocol development of Phase III included POC glucose 30-60 minutes after birth and identification of infant risk factors. Protocols were developed for low risk, high risk, and LGA/postdate blood sugar frequencies. Assessments and risk factors were still being done by nursing, and selection and initiation of appropriate protocol was done by nursing as well. Protocols were still all on paper. During this phase, MWH Pediatric Subcommittee on Newborn Hypoglycemia Protocol was born to review newborn glucose protocol.

Timeframe

Six months after initiation of new protocols, medical staff was dissatisfied with current protocol process. Their dissatisfaction was validated by a 21% error rate. Some errors included:

- No protocol orders entered when indicated (34%)
- Greater than 30 minutes before orders entered (29%)
- Wrong protocol orders entered (21%)
- Duplicate protocol orders entered (8%)
- POC glucose not collected (5%)
- Risk factors not recorded (3%)

Organizational Buy-in

Organizational buy-in is exhibited by the amount of resources and support allowed to this project. Resources for performance improvement, staff and leadership were granted to support improving newborn glucose management. Organizational support is exhibited in

pulling together resources from informatics and birth services to improve outcomes for newborns in regards to glucose control.

Results and Lessons Learned

Results

The goal developed to address the problem was “to support the appropriate newborn hypoglycemia risk assessment, protocol selection and protocol initiation by nursing.”

Process Changes

Interventions to improve outcomes included an automation of newborn glucose protocol based on the hypoglycemia risk factors rather than relying on human factor. Automation via Clinical Decision Support System using discern rules in Electronic Medical Record were initiated. The interventions were approved by the Hypoglycemia Subcommittee and Pediatric Department. Approval for the Decision Support automated in EMR and medical executive approval was received. Next came the step of development of Clinical Decision Support System (CDSS).

The CDSS used Boolean logic to help nurses determine the correct orders to use for newborn glucose orders. Once newborn risk factors and gestational age were documented in the EMR, orders are automated for nurses to carry out. Labor and Delivery and Mother/Baby staff nurses were educated in scenario training regarding the new system. Ongoing monitoring and follow up education were provided as necessary. Data was collected before and after automated orders implementation. Decreases in error rate were noted, specifically in *omission of orders, wrong protocol being entered, and glucose not being drawn.*

Indicators Measured

Improvements Noted

		Before	After
Overall Error Rate		21%	7%
Breakdown		Before	After
Omission		34%	0%
Timing over 30 minutes		29%	62%
Wrong Protocol		21%	0%
Duplicate		8%	23%
Glucose not drawn		5%	0%
Risk factors not documented		3%	15%

Although improvements were noted, work was still needed to improve other areas in error. At this time, the American Academy of Pediatrics (AAP) published a clinical report entitled "Postnatal Glucose Homeostasis in Late Preterm and Term Infants" which is the first publication on this subject. Based on evidence in this article, a phase IV algorithm was created to include a separate protocol for infants of diabetic mothers. Assessment of risk factors was still completed by nursing but selection and initiation of the appropriate protocol was now automated. Providers worked to standardize the care for follow-up blood sugars with any POC < 45 mg/dL. The newborn glucose management continued to be monitored and after one year data was collected again.

		Before	6 Months	12 Months
Overall Error Rate		21%	7%	5%
Breakdown		Before	6 Months	12 Months
Omission		34%	0%	8%
Timing over 30 minutes		29%	62%	50%
Wrong Protocol		21%	0%	0%
Duplicate		8%	23%	0%
Glucose not drawn		5%	0%	0%
Risk Factors not documented		3%	15%	41%

The overall error rate continues to decrease along with every aspect except documentation of risk factors.

Lessons Learned

Lessons learned from this project included:

- While automation of hypoglycemia protocol assured a higher level of care and surveillance for the newborn, changing nursing documentation behavior is challenging, and real time monitoring of documentation error leading to CDS error is essential to change behavior

- Assure rules are evoking per design

Next steps regarding newborn glucose management include ongoing monitoring to validate effectiveness of protocol and standardization across the health system. Additionally, plans to initiate a quality committee to review blood sugar data and appropriate placement of newborns and automation of orders for electronic signature with computerized physician order entry (CPOE) to begin in April 2013.