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Update of blood transfusion protocols at a regional hospital in rural Illinois

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Introduction of the Problem

The chief nursing officer of a small regional hospital in rural Illinois requested an update to their current blood transfusion policy and protocol that reflected current evidence-based information. The protocol had last been updated in August 2015, and the chief nursing officer had requested a detailed review and update of the policy and protocol based on new evidence and practice guidelines. Many issues were evaluated including the appropriate use of blood products and assessment of patients receiving blood transfusions, with emphasis placed on symptoms that would indicate an evolving transfusion reaction.

Literature Review

Research has shown that a significant percentage of blood transfusions administered are clinically unnecessary and expose patients to risk of adverse effects and higher costs. Findings from numerous studies comparing conservative transfusion thresholds, where a patient would receive a blood transfusion only if their hemoglobin dropped to a level below 7.0 g/dL, versus liberal transfusion thresholds, when a patient receives a blood transfusion once their hemoglobin dropped to a level below 10 g/dL, suggest that there is no difference in outcomes for patients who were hemodynamically stable (Carson et al., 2016; Carson, Carless, & Hébert, 2013; Holst et al., 2014; Rygard et al., 2017; Mitchell et al., 2017; Mao et al., 2017; Holst, Petersen, Hasse, Perner, & Wetterselv, 2015; Hovaguimian & Myles, 2016; Liumbruno et al., 2016; Shah, Stanworth & McKechnie, 2015). Thus, the AABB, formerly known as the American Association of Blood Banks (AABB), and the American Society of Anesthesiologists (ASA) Task Force on Perioperative Blood Management both recommend using a conservative blood transfusion approach (Carson et al., 2016; ASA Task Force on Perioperative Blood Management, 2015). By reducing the number of transfusions, adverse effects can be avoided and costs associated with blood transfusions can be minimized. According to Mitchell et al., the potential costs savings to

the healthcare system could be upwards of \$85 million per year with the use of a conservative transfusion strategy (2017).

While a conservative transfusion strategy is recommended, care must be taken to assess each patient on an individual basis to determine when a blood transfusion is beneficial, even if the hemoglobin level is higher than the conservative threshold of 7 g/dL dL (Carson et al., 2016; Tolich, Blackmur, Stahorsky & Wabeke, 2013). If the patient is actively bleeding, other blood products may be given to help stem the flow before a red blood cell transfusion is needed. These products include plasma, cryoprecipitate, or platelets; each of these blood products has a different storage life, which is influenced by the storage medium. (AABB et al., 2013; Carabini & Ramsey, 2013; Cardigan & Maclellan, 2008). Studies have found that there is no difference in outcomes when a patient is given older blood versus newer blood, thus, the recommendation is to give blood products for the whole duration of their shelf life (Carson et al., 2016; Katsios et al., 2011). In order to help prevent human-related errors, adherence to facility procedure is essential. Education on policy, protocol, and procedure help to minimize errors and promote rapid response to any perceived transfusion reactions (DeLisle, 2018; Tolich, Blackmur, Stahorsky & Wabeke, 2013). By providing education on the procedural steps of blood transfusion administration and response to a perceived transfusion reaction, nursing staff can help minimize these reactions and improve patient safety.

Project Methods

This project was designed to: 1. Provide new evidence regarding blood products and safe administration to anesthesia providers and nurses through educational material, 2. Facilitate development of an updated blood transfusion administration policy and protocol in collaboration with the chief nursing officer and Quality Improvement Committee, 3. Introduce a new skills

checklist developed for the hospital wide Skills Lab Day, and 4. Evaluate employee perceptions of the proposed updated policy and protocol and educational material presented.

A Blood Transfusion Skills Checklist was developed using clinical skills checklists by Perry, Potter, and Ostendorf (2018) and Berman and Snyder (2016) as templates, yet adding recent evidence to support the accuracy and safety of each step. At the completion of this project, the Blood Transfusion Skills Checklist was developed and approved, however, several changes to the policy and protocol involving the communication chain in the event of a transfusion reaction or critical lab result were not officially approved by the stakeholders. Thus, only pending changes could be presented at the Skills Lab Day instead of the official policy and protocol. However, unofficially, the changes introduced by the student were approved by the Quality Improvement Committee. These changes included procedural steps involved with proper blood transfusion tubing assembly and nursing assessment steps to perform in the event of a suspected transfusion reaction.

In addition to the pending policy and protocol changes, the Blood Transfusion Skills Check List was presented at the hospital-wide Skills Lab day as part of a Skills Lab Day station. The education format included an informational presentation board highlighting information included in the pending policy and protocol changes, as well as an overview of the Blood Transfusion Skills Checklist. The information on the presentation board was reviewed by the student with each registered nurse at the Skills Lab Day. Paper copies of the Blood Transfusion Skills Checklist were also provided to the registered nurses so they could review on their own time. Once the information was presented, the registered nurses filled out a Likert Scale evaluation survey that included separate sections for their presentation and the Blood Transfusion Skills Checklist.

Evaluation

Communication during the development and implementation of this project was often difficult. The head of the anesthesia department, who initially was the external stakeholder, was unable to finish the project due to the demands of his position. The chief nursing officer was recommended as the replacement, as the head of anesthesia stated the original request for policy and protocol changes was from this office. Once contacted, the CNO agreed to join the project. However, the updates desired by the CNO in the policy and protocol had changed by this point. Instead of focusing on blood transfusion thresholds, which was the desired update expressed by the original stakeholder, the CNO wanted to include information about assessment of patients, timing of vital signs assessment and documentation, and evaluation for and management of a transfusion reaction. In addition, the CNO requested the new policy and protocol include information on how to properly assemble blood transfusion equipment, such as the tubing and the fluid-warming apparatus. Several communication methods, such as phone calls, voice messages, and email communication were utilized. However, busy schedules of everyone involved lead to slow response times and extended the project timeframe. There were also communication issues between other stakeholders in the facility that prevented the policy and protocol changes from being approved in time for the hospital-wide Skills Lab Day.

Approximately sixty registered nurses attended the hospital-wide Skills Lab Day. The registered nurses received a Likert Scale evaluation survey at the beginning of the presentation to complete on their own time. The first five questions of the survey referred to the informational presentation, while the second five questions referred to the Blood Transfusion Skills Checklist. The survey was designed to evaluate the registered nurses' perceptions of the informational presentation including the ability to understand the information, and the likelihood it would help nurses in future practice. Additional questions were designed to assess if the presentation

increased nurses' knowledge in blood transfusion procedure, equipment assembly, and the proper response to a blood transfusion reaction. Finally, the survey included assessment of the nurses' perceptions of the Blood Transfusion Skills Checklist. Topics of the questions included the ability to understand the information, the clarity of the procedural steps, if the presentation increased their knowledge and provided guidance for performing the procedures, and if they felt the presentation will benefit future clinical practice. Of the sixty registered nurses present at the Skills Day, forty returned the evaluation survey. IBM SPSS Statistics was utilized in the analysis of the survey responses. Responses to the majority of questions were "Strongly Agree" or "Agree." Only one respondent indicated the presentation and Blood Transfusion Skills Checklist were not easy to understand or follow, and did not provide guidance for blood transfusion procedures.

Although the original presentation plan included presenting the completed policy and protocol at the Skills Lab Day, they were not officially approved at the time, and thus not presented. The information that had been introduced into the policy and protocol by the student had verbal support by the Quality Improvement Committee. The committee had stated that the information was an improvement to the existing policy and protocol. In addition, the CNO and Quality Improvement Committee wanted to add a section on the appropriate person to contact in the event of a complication. However, the Lab director could not be present at the final Quality Improvement meeting before the Skills Lab Day, and the director's input was needed for instructions regarding lab specimens. Thus, the policy and protocol could not be officially approved before the Skills Lab Day. At the end of the Skills Lab Day event, the CNO decided to keep the informational presentation board and a copy of the Blood Transfusion Skills Checklist

to use in future educational presentation. This indicates the CNO believed these learning tools were an effective strategy for sharing the information.

Impact on Practice

The immediate impact on practice includes the fact that the nurses now have updated knowledge on the steps to properly assemble blood transfusion and fluid warming tubing. They also gained knowledge on the appropriate response to a blood transfusion reaction, including patient assessment. Another immediate impact on practice is that the registered nurses were able to take home a copy of the Blood Transfusion Skills Checklist. As a facility that does not often administer blood transfusions, these nurses are now able to review the procedure at home or work so they can be better prepared to safely provide a blood transfusion. Copies of the Blood Transfusion Skills Checklist will be available through the Clinical Educator.

Long term impacts on practice are that the changes in the policy and protocol will lead to improvement of patient safety during blood transfusion. In addition, the nurse educator now has the presentation board and Blood Transfusion Skills Checklist to use as an educational tool for future learning opportunities. This will help to increase the knowledge of staff, which will increase the likelihood of safe blood transfusion practices in the future.

Ongoing implementation suggestions include an actual physical demonstration of blood tubing assembly. The site did not provide physical tubing for the presentation day; instead, photographs from the manufacturer's website were included on the presentation board. Participants may benefit from the action of assembling the tubing themselves. This also includes the specialized tubing for the fluid warmer used at the facility.

Conclusions

This project involved educating registered nurses at a regional hospital in rural Illinois on the proper assembly of blood transfusion tubing, assessment and management of transfusion

reactions, and other aspects of blood transfusions; as outlined above. The development of a Blood Transfusion Skills Checklist was successful, and evaluation of the checklist indicated that the registered nurses would find the information included to be beneficial for future transfusions. Policy and protocol changes were supported by the Quality Improvement Committee and will be approved once communication guidelines are established and supported by the committee. Overall, while the project changed from its original design, the goals were achieved.

A suggestion for future efforts includes implementing a simulation day to provide education about symptoms that present with a blood transfusion reaction and the appropriate interventions to implement in case of a reaction. Several other students are developing simulation training protocols; collaboration with future groups may lead to a blood transfusion simulation that could be extended to the education of this facility's nursing staff.

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