

ACADEMY FOR EXCELLENCE IN HEALTHCARE

IMPACT ASSESSMENT PAPER

Executive Summary

Reducing Perioperative Blood Transfusion in Gynecologic Oncology Patients at Mayo Clinic

The blood transfusion rate in the GYN Surgery Division at the Mayo Clinic in Rochester was higher than national benchmarks. Unnecessary blood transfusions can lead to unfavorable outcomes (e.g., reaction to the transfusion, increased infection rates), patient dissatisfaction, and increased healthcare costs. The GYN Surgery Division examined blood transfusion rate data, and found the transfusion rate to be double the national average.

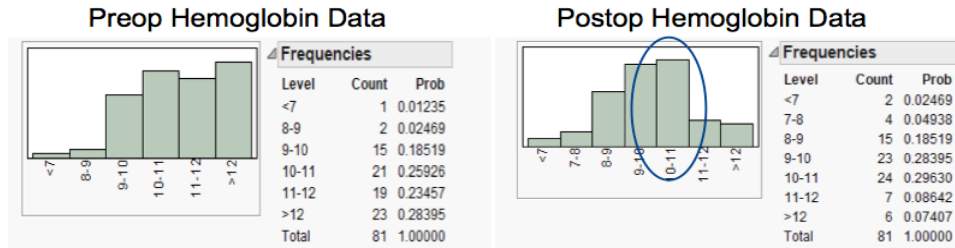
GYN Surgery became the focus of an improvement project to standardize blood transfusion practices. A cross-functional team from the Division of Surgical Gynecology and Department of Anesthesiology attended training in June 2015 at the Academy for Excellence in Healthcare (AEH) at The Ohio State University. AEH helped to unite multidisciplinary efforts across various specialties, and offered tools to help the improvement team evaluate data regarding blood transfusions (e.g., key decision points for transfusions, potential interventions based on evidence and/or best practices).

At Mayo Clinic, the team developed “swim lanes” (process flow maps) of a patient’s journey through GYN Surgery, which showed that most transfusions occurred in the operating room and postoperatively. The team also developed intraoperative and postoperative cause maps to assess if transfusions occurred only when necessary and at appropriate amounts. A post-transfusion hemoglobin goal was set at 8.5-9.5 g/dL — if the level rose above that goal, then the patient was probably overtransfused. The team reviewed data on 145 ovarian cancer procedures from 2013-14 that required a blood transfusion and examined frequency of transfusions by preoperative and postoperative hemoglobin levels: 81 patients (56 percent) had been transfused, and many resulted in hemoglobin levels above 9.5 g/dL (*see next page*).

The cause maps and data helped the team to identify root causes related to unnecessary transfusions:

- Non-standardized approach to blood transfusions
- Issues related to being a large academic center with many different care providers and many learners
- Transfusion often consisted of two units at a time
- Hemoglobin level to trigger transfusion higher than evidence suggests it should be
- Transfusions likely to occur with high-blood-loss procedures
- No standardized education on transfusions

Ovarian Cancer Procedures Requiring Blood Transfusion (2013-14)



Source: Mayo Clinic

The improvement team established a goal to reduce the transfusion rate by 30 percent and gathered Level 1 evidence to develop and promote countermeasures. The team proposed three medical algorithms for the periods when blood transfusions occur during surgery, and proposed countermeasures for each:

- *Preoperative:* The team proposed that tranexamic acid, which can decrease the rate of blood loss, be given when applicable. Level 1 evidence showed its usage to be safe and effective for GYN surgeries.
- *Intraoperative:* The team implemented nationally accepted transfusion guidelines, which had been proposed elsewhere within Mayo Clinic. The team also developed and implemented a list of intraoperative communication checkpoints (to remind those in the operating room of blood loss and transfusion levels) and a hemostasis checklist (tasks such as examining surgical sites on the body).
- *Postoperative:* Incorporating best practices developed by another department, the team put in place a postop bleeding order set, and they brought attention to the timing and the amount of blood draws, which can affect the need for a postoperative blood transfusion. The team also began to implement trainee and staff education for residents, fellows, and nurses.

In late September, all countermeasures for the project were underway, and the team began to collect data. The team also conducted interim analysis (e.g., VTE rate, cardiac event rate, ICU transfer, cost, timing of blood draws, amount of blood draws) and established a stopping rule for the use of tranexamic acid to ensure patient safety. As of February 2016, there had been no events related to tranexamic acid. Three-month data also showed a substantial drop in the transfusion rates, but a larger data sample is required for significance, so the team plans to collect and analyze data for an additional three more months.

[Read the full study of the Implementation of Multidisciplinary Rounds project](#), which illustrates that process improvements can venture into physician/patient interactions when physician decisions are among the root causes of the problem. The Mayo Clinic project shows that rigorous collection and analysis of data is critical to making informed decisions, building buy in from physicians, assessing outcomes of countermeasures, sustaining change, and protecting the welfare of patients. The project also reveals that an issue as complex as blood-transfusion rates across surgery procedures involves many causes and requires a range of countermeasures that touch many roles and specialties.

[About the Academy for Excellence in Healthcare:](#) AEH blends in-person class time with hands-on project work, interactive simulations, and recurrent coaching, all aimed at helping healthcare teams spark actionable change at their organization. To learn more about AEH, contact [Margaret Pennington](#), Faculty Director, or [Beth Miller](#), Program Director.