How and Why We Implemented a Preop Anemia Service as Part of our Patient Blood Management Program

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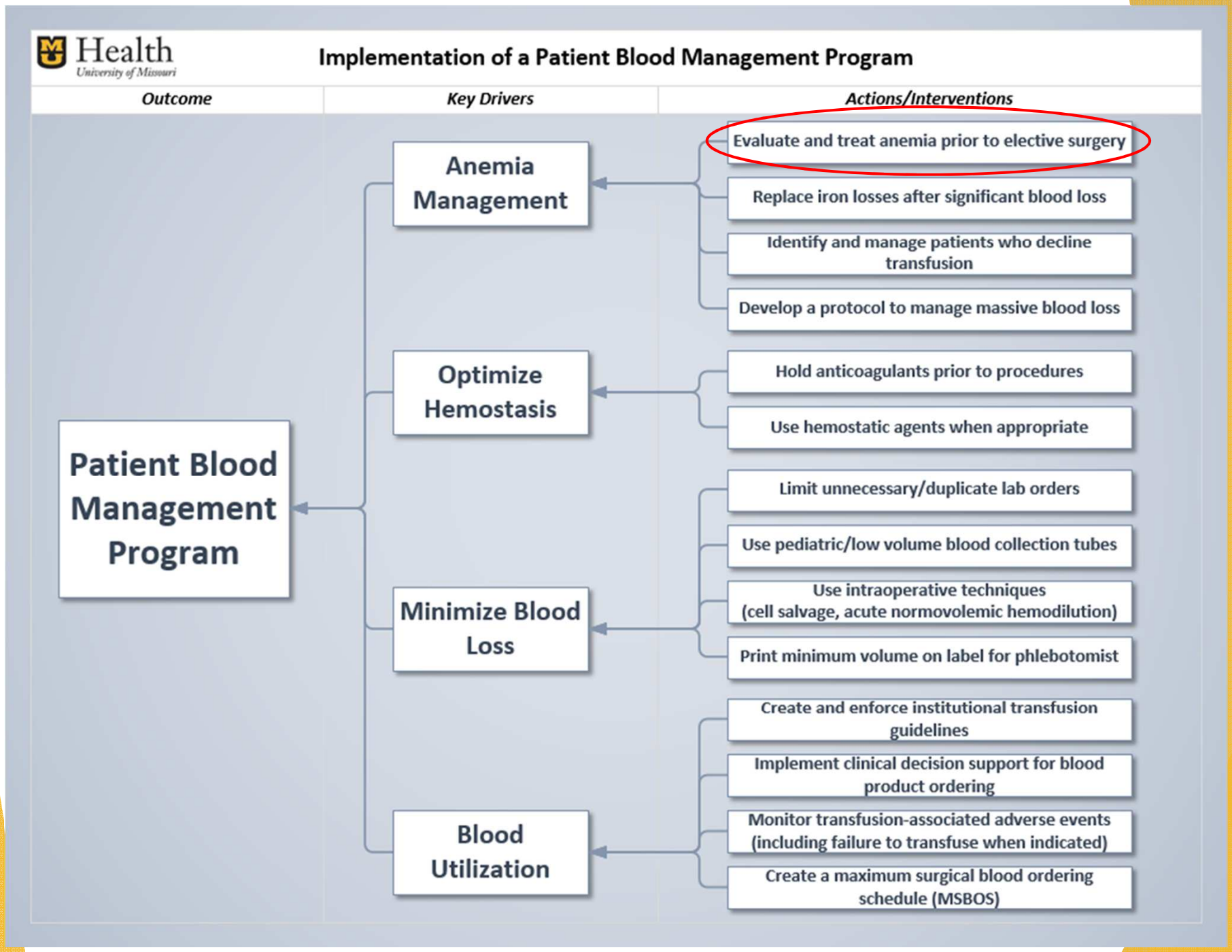
Outline

- Background
- Why preop anemia?
- Implementation process
- Results
- Future plans

Background

- University of Missouri Health Care
  - Academic Medical Center in Columbia, MO
  - Combined 487 acute care beds across 3 hospitals (Main University Hospital, Women's and Children's Hospital, and Orthopedic Hospital)
  - Level I Trauma Center
  - 15,000 total transfusions annually, 10,000 prbcs
  - State funded, Medicare and Medicaid accounted for 64% of blood unit charges in the last fiscal year


Health
University of Missouri
Implementation of a Patient Blood Management Program
Outcome
Key Drivers
Actions/Interventions
Patient Blood Management Program
Anemia Management
Optimize Hemostasis
Minimize Blood Loss
Blood Utilization
Evaluate and treat anemia prior to elective surgery
Replace iron losses after significant blood loss
Identify and manage patients who decline transfusion
Develop a protocol to manage massive blood loss
Hold anticoagulants prior to procedures
Use hemostatic agents when appropriate
Limit unnecessary/duplicate lab orders
Use pediatric/low volume blood collection tubes
Use intraoperative techniques (cell salvage, acute normovolemic hemodilution)
Print minimum volume on label for phlebotomist
Create and enforce institutional transfusion guidelines
Implement clinical decision support for blood product ordering
Monitor transfusion-associated adverse events (including failure to transfuse when indicated)
Create a maximum surgical blood ordering schedule (MSBOS)

Why Pre-Op Anemia?

- A mandatory component of the AABB PBM Standards
- The WHO estimates that 20% of elective surgical patients are anemic prior to surgery
- Preop anemia is associated with a 4-5x increased risk of perioperative transfusion
- Preop anemia is independently associated with increased length of stay and increased mortality

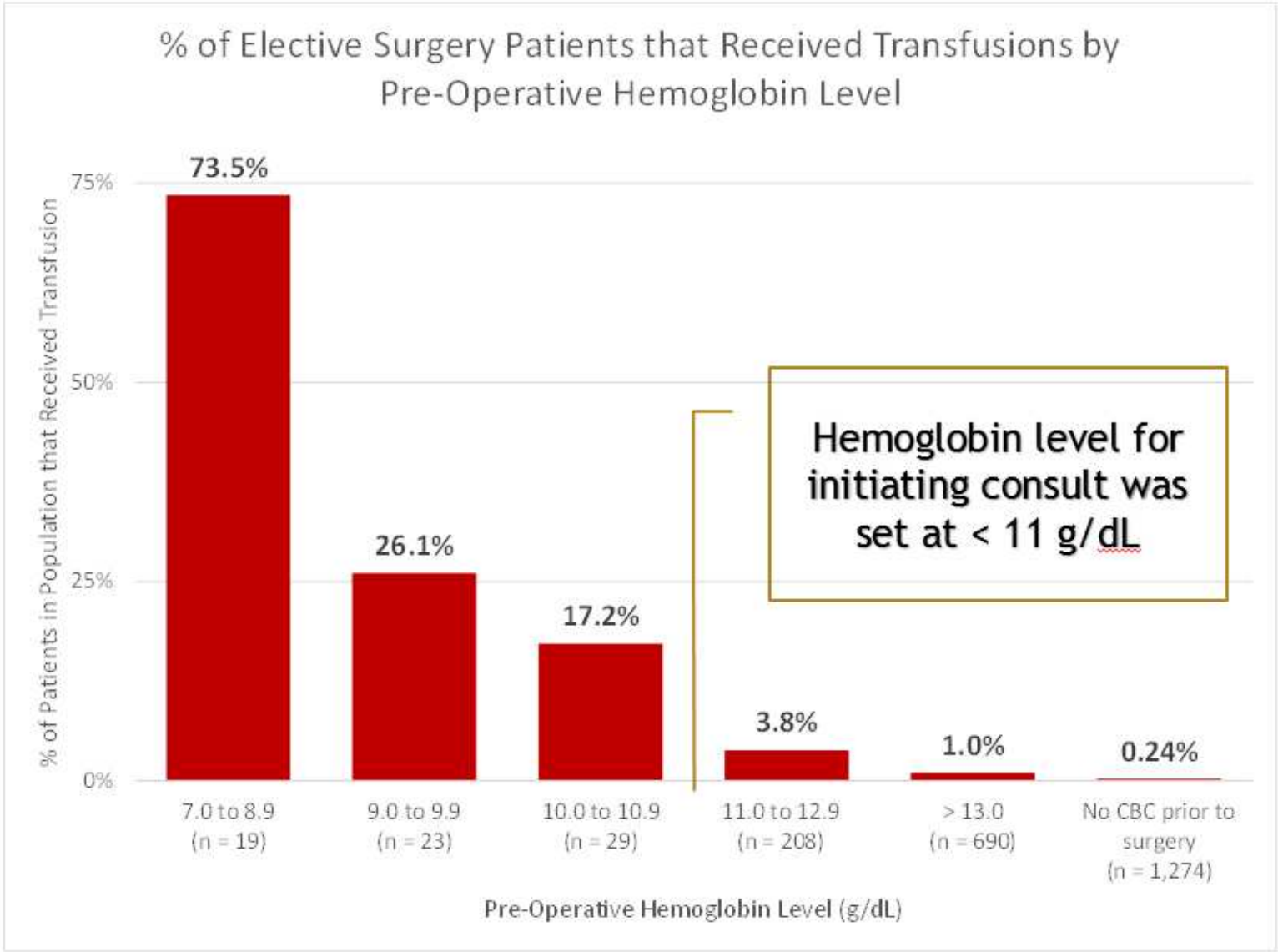
Implementation

1. Selected our pilot group
2. Reviewed baseline data
3. Reviewed current workflow
4. Created a new preop anemia consult order to support new workflow
5. Go-live with new workflow
6. Evaluate results
7. Determine barriers

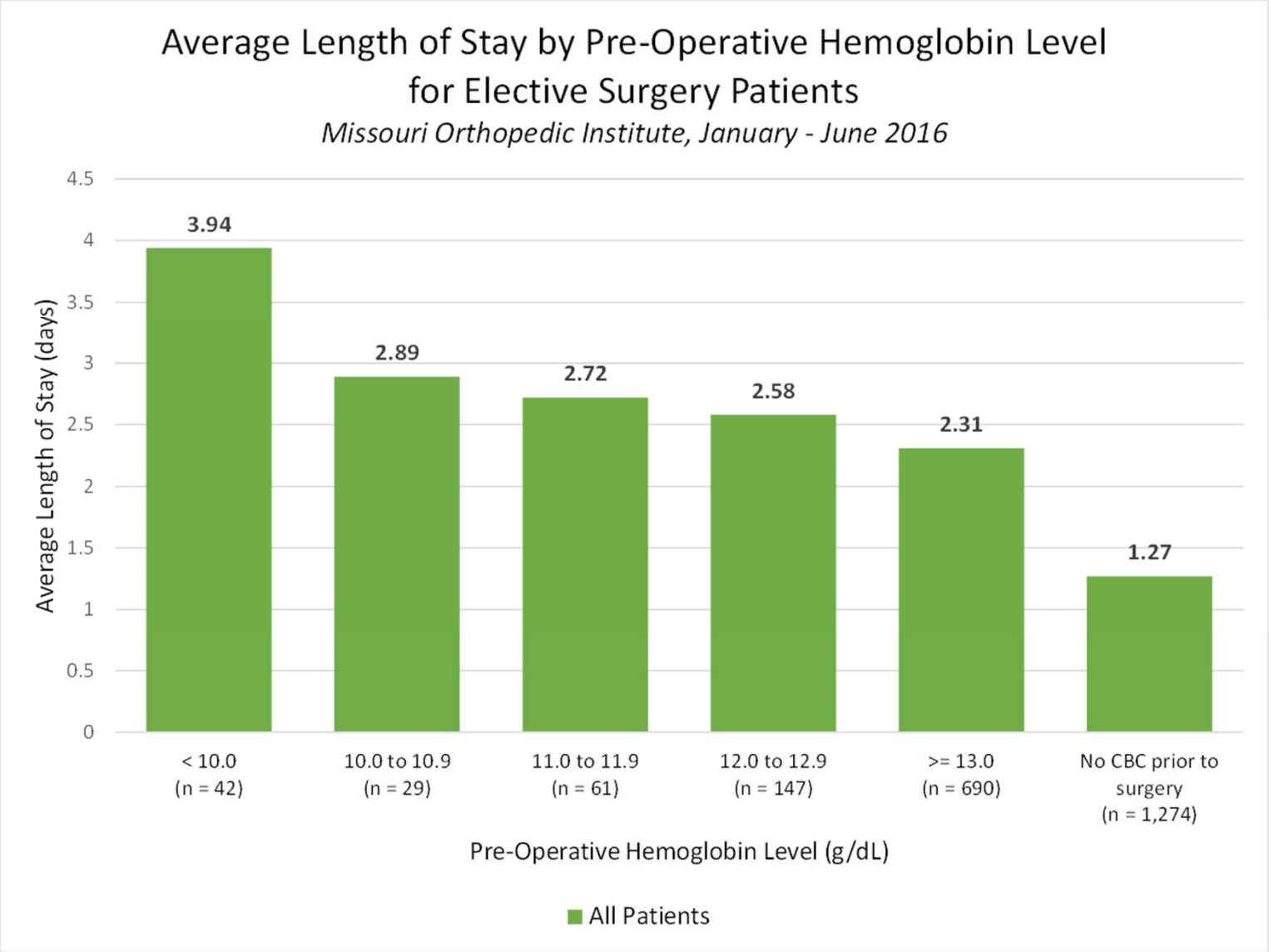
Target patient population: Orthopedic surgery patients

- Freestanding orthopedic hospital across the street from our main hospital, a natural pilot group
- Engaged and supportive leadership/stakeholders in that area
- Rate of preop anemia is lower than average, so initial volume won't be overwhelming (7% vs. 20%)

Transfusion rates



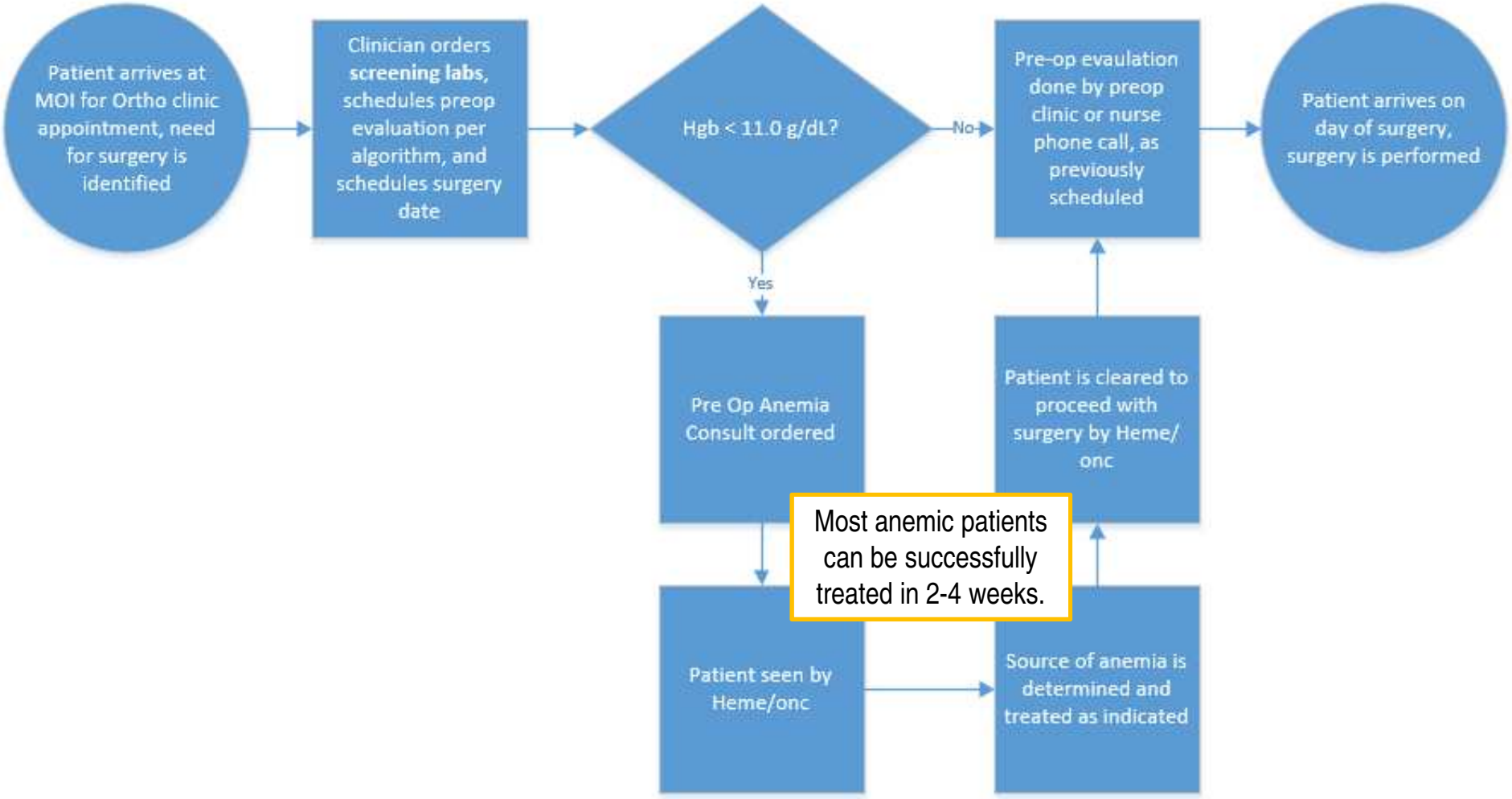
Length of Stay



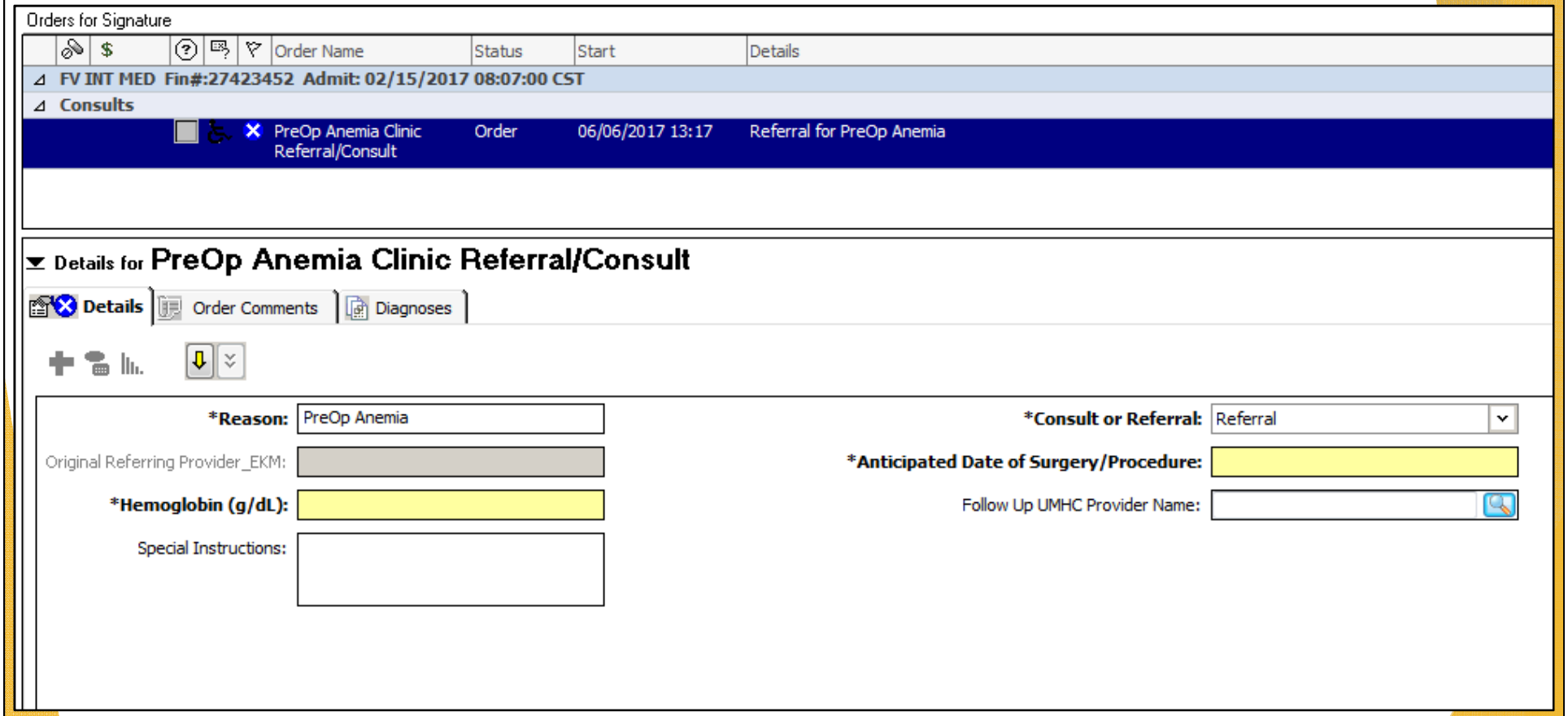
Previous workflow

- Majority of ortho clinic appointments occurred greater than 2 weeks before surgery date
- Majority of anesthesia preop appointments occurred less than 7 days before surgery date
  - Preop labs usually not drawn until anesthesia preop appointment
  - For patients found to be anemic, no standardized process but usually just crossmatched extra units and proceeded with surgery as scheduled
- 7 DAYS IS NOT ENOUGH TIME TO CORRECT ANEMIA!
  - Two options:
    - Cancel surgery for anemic patients, treat anemia, then reschedule surgery date
    - Draw screening labs at earlier ortho clinic appointment

New Preop Anemia Program workflow



New Preop Anemia Consult Order

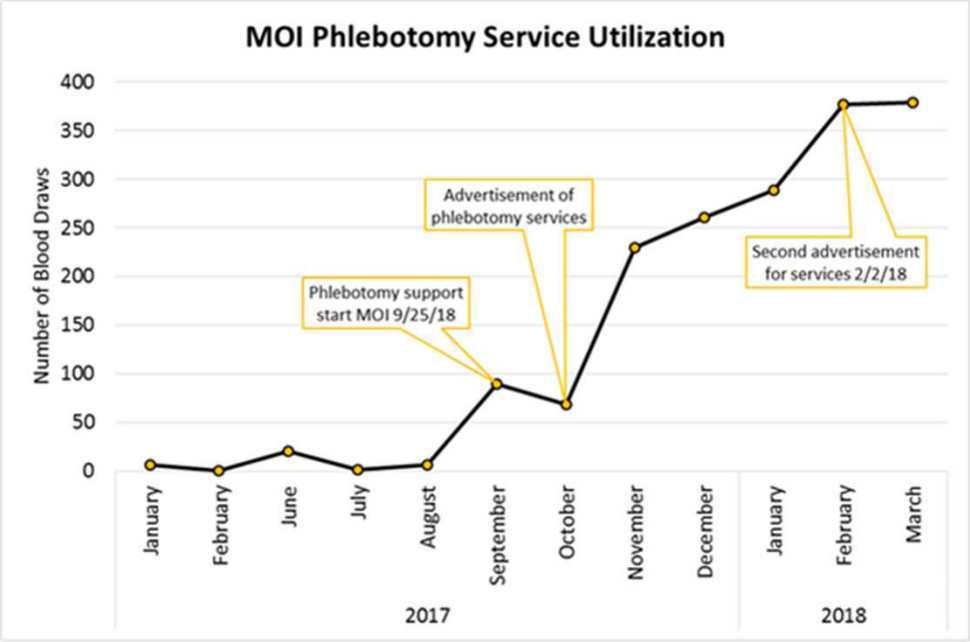


Go Live, Summer 2017!
Pilot results

- Very few anemic patients were being referred for consult
- WHY?
  - Ortho clinic nurses not drawing the labs
    - No time in busy clinic schedule, caused delay of room turnover
    - Some nurses less experienced with blood draws and lacked confidence
- We need to have onsite phlebotomy support!

Phlebotomy Support

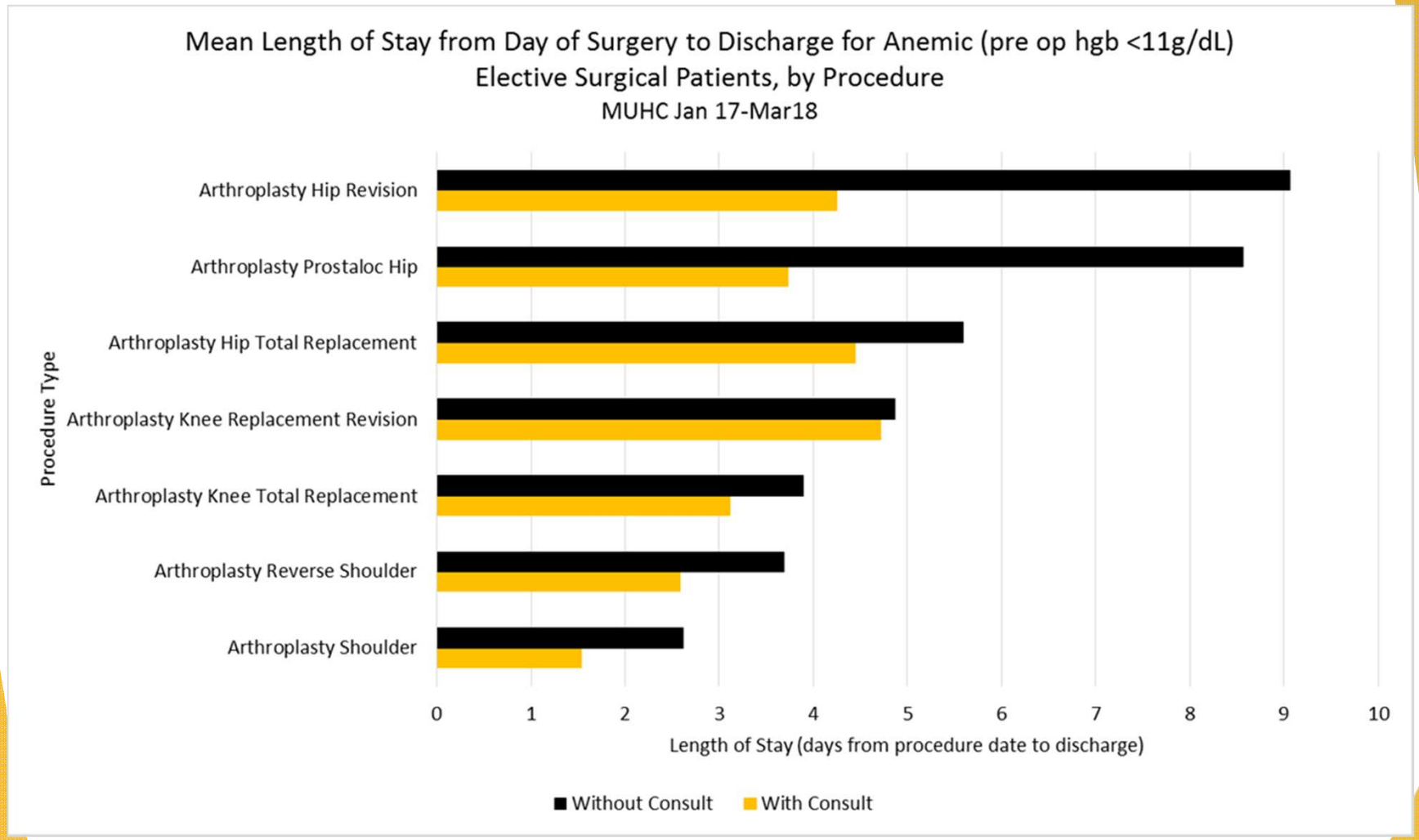
- Pilot phlebotomist to estimate volume, found that projected volume would support a full time phlebotomist (also clinic staff were so happy they were literally hugging the phlebotomist during the pilot)
- Budget request made and approved
- New phlebotomist started and…scope creep!



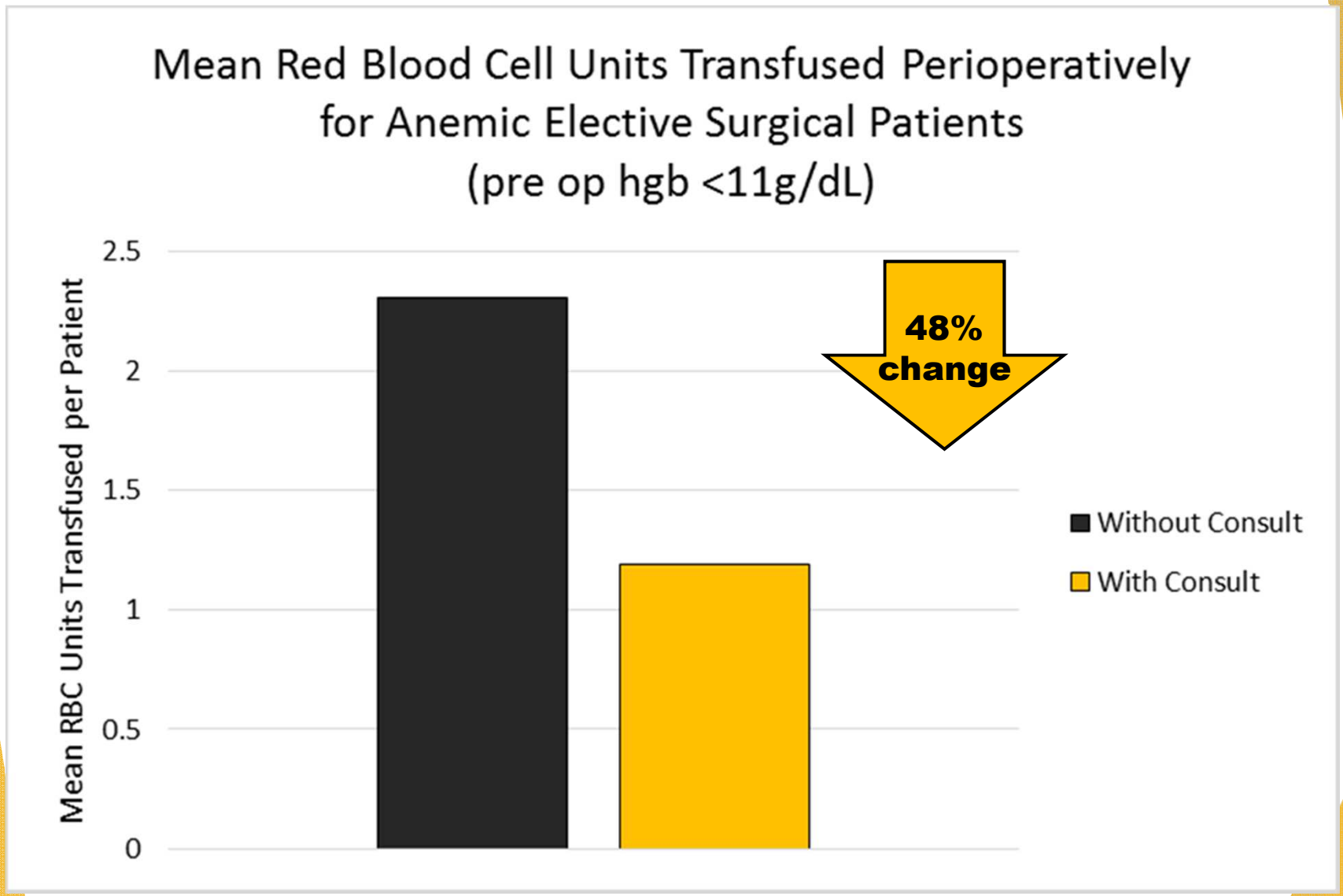
Post-Implementation Results

- Several patients were referred to the preop anemia program with NORMAL hemoglobin levels due to a religious objection to blood transfusion
- One patient who was found to be anemic because he had previously undiagnosed Multiple Myeloma
- Multiple consults for patients with iron deficiency anemia who were not up to date with colon cancer screenings
- About 50% of patients have been found to have iron deficiency anemia, and the remainder have had anemia from other causes (anemia of chronic disease)

Length of Stay



RBC Utilization



Continued Barriers

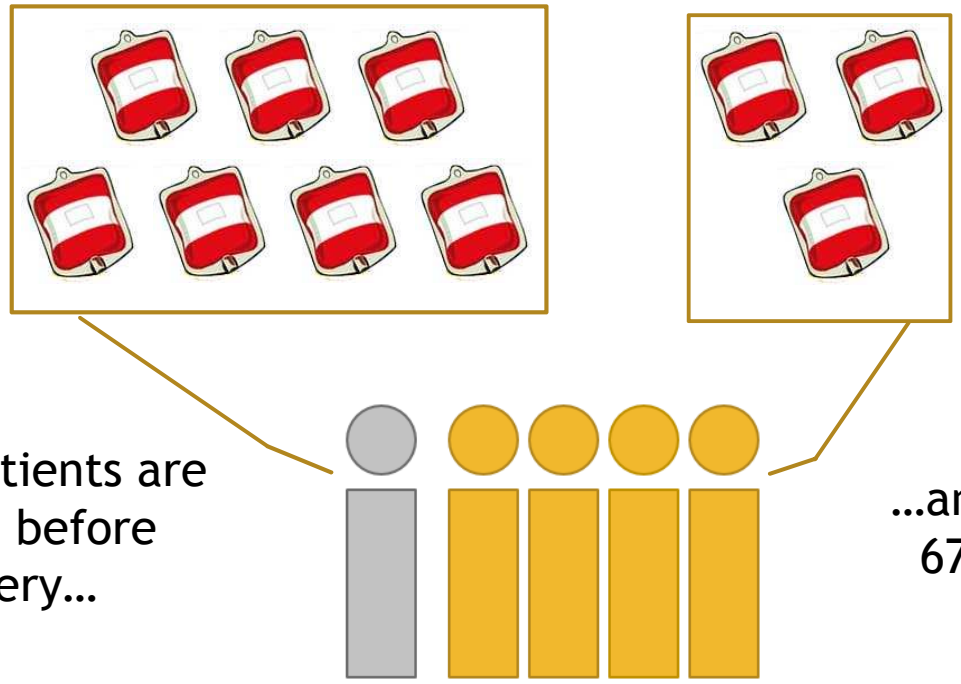
- One primary physician seeing all patients, and she is overbooking them into her schedule
  - Presented to administration, she was given more clinic time to take care of preop anemia patients
  - Additionally, a new faculty member will be hired this summer and will support the preop anemia clinic part-time
- Ambulatory infusion unit has inadequate staffing at times to support increase in IV iron infusions
- Some surgeons are resistant to using the service due to concern that surgery will be delayed and a misunderstanding of the potential benefit
- Patients sometimes resist the extra appointment, and significant time is spent educating patients on why it's important to have their anemia treated
  - Patient education video

Looking Ahead

- Planning to expand to all surgical services at our main hospital

Future impact?

- Over 3 months (Feb—April 2017):
  - 2038 elective surgical patients used 1070 units of blood
  - 418 patients with preop anemia (hgb < 11.0) used 713 of those units

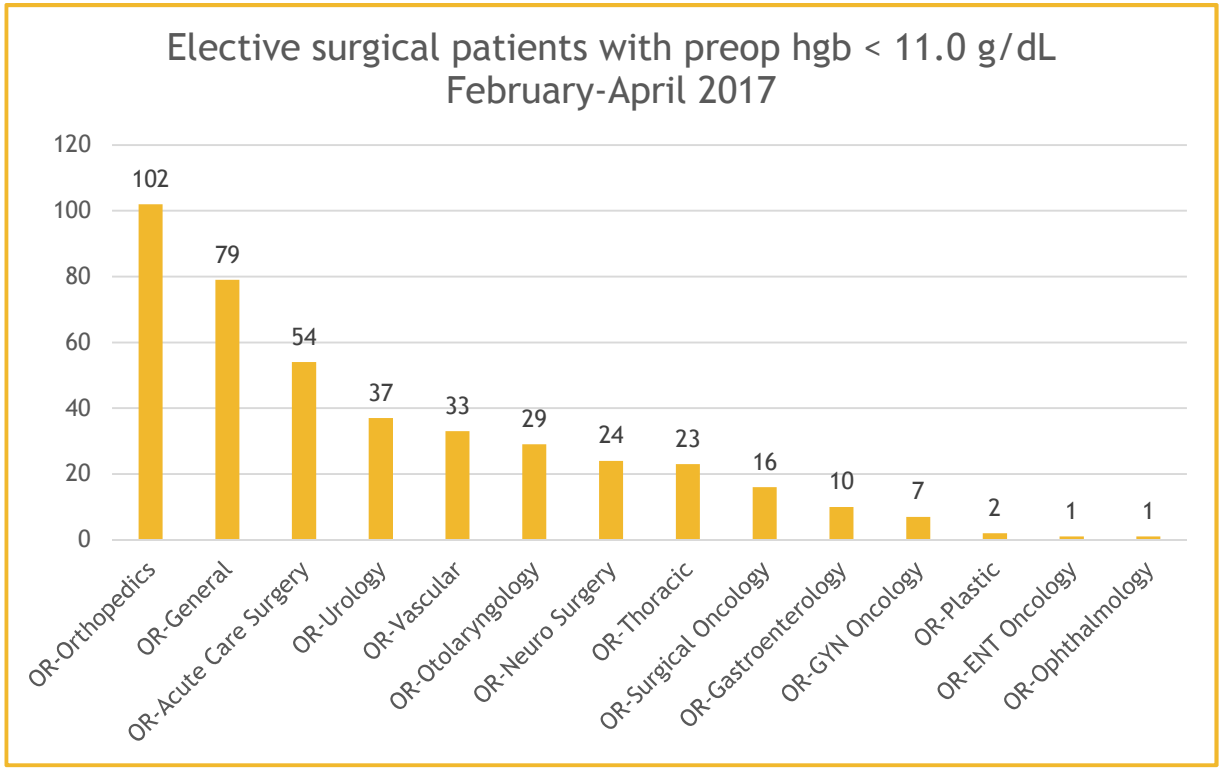


21% of patients are anemic before surgery…

…and they are using 67% of the blood!

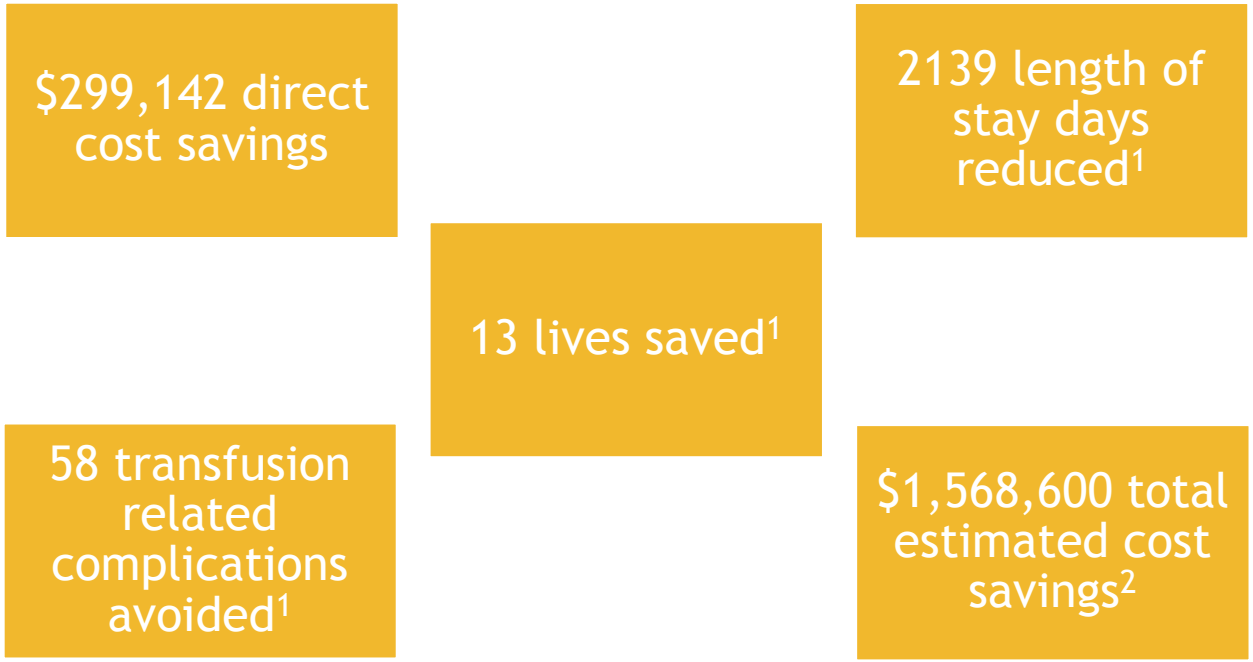
Estimated future patient volumes

- 1814 total elective surgical patients with preop hgb < 11.0 g/dL annually
  - Combined 35 patients/week



Estimated impact on transfusions

- 1814 total anemic elective surgical patients annually
  - 75% go through the preop anemia protocol = 1360 patients annually
  - Assuming a 50% reduction in transfusion rate*, this will save **1,426 units of prbcs annually (~14% of our annual rbc utilization!)**



[1]Ferris et al, Arch Surg 2012:147(1)
[2]Shander et al, Transfusion 2010;50:753-65

*other programs have reported transfusion rate reductions of 90%

Predicted financial impact

- Cost savings:
  - Decreased blood product costs due to reduced transfusions
  - Decreased length of stay
  - Decreased patient morbidity and mortality
- Revenue generation:
  - Hematology/oncology outpatient consults
  - Outpatient anemia laboratory workup
  - IV iron infusions
  - Erythropoietin injections
  - Outpatient diagnostic colonoscopies for source of anemia
  - Outpatient bone marrow biopsies for source of anemia

Revenue generation, IV iron

- Half of preop anemia consult patients seen so far have had iron deficiency anemia and been candidates for IV iron
- Some patients with anemia of chronic disease may also be candidates for IV iron
- If 1360 patients (75% of eligible anemic patients) annually go through preop anemia consult service, and 50% receive one dose of IV iron:
  - Estimated $337,150 revenue generation from IV iron infusions annually, based on current reimbursement rates
- Potential for IV iron reimbursement rates to change in the future, though…

Summary

- Preop anemia is very common, and is a major risk factor for perioperative transfusion, morbidity, and mortality
- Being proactive in evaluating and treating anemia before elective surgery is the right thing to do for our patients
- We've already seen dramatic drops in length of stay and transfusion rate, and this will only continue to improve as the program is expanded out to all surgical services
- Implementing a preop anemia program is hard work, but it's worth it!

Special Thanks To…

- Dr. Kan Huang, Hematology Oncology
- Dr. James Keeney, Orthopedic Surgery
- The “Preop Anemia Team”
  - Rachel Mullins, Simone Camp, Brent Henke, Amy Christensen, Hannah Tomlinson, Eric Franks, Koby Clements