

# Blood Conservation Update

Improving Safety and Quality Through  
Evidence-Based Electronic Order Sets

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SEABB

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we believe  
in life well-lived.

WELLSTAR.  


# Project Selection

- There is growing evidence within the medical literature that **transfusing** patients **less often** *and* **within clinical guidelines** results in:
  - Fewer complications
  - Lower mortality rates
  - Higher quality outcomes
- By 2030, there is a forecasted nation-wide shortage of 4 million units of red blood cells
- Georgia is a net importer of red blood cells
- The cost of blood products is estimated to increase 5-8% annually

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# Goals and Objectives

Focusing on staff awareness and education, our initiative was designed to foster a culture focused on optimal patient outcomes. By creating an evidence-based, electronic order set, we believed we could partner with physicians and advanced practitioners to transfuse patients less often and within clinical guidelines.

# Goals and Objectives

## The primary goals were to:

- Reduce the number of routine, non-emergent transfusions with a pre-transfusion Hemoglobin greater than 7.0 g/dl
- Utilize an evidence-based, electronic order set for RBC transfusions
- Have providers order single units of blood and recheck the Hemoglobin rather than ordering multiple units at the same time

# PI Methodologies / Project Implementation

- Education through active involvement in System Blood Transfusion Management Committee
- Presentations at various CME opportunities
- Physician engagement through involvement in development of criteria as well as order set
- Use of Portal for education

# PI Methodologies / Project Implementation

- Having the physicians determine that mandating Zynx was necessary for success
- Holding the physicians accountable to their own mandate
- Active tracking of use of order set and reporting
- Rapid Cycle PDSA

# Zynx Order Set – Workflow

**Red Blood Cell Transfusion** HIM Approval: June 2010 [Help](#)

[Top](#) [Bottom](#) [Pre-transfusion](#) [Single Unit - Routine](#) [Multiple Units](#)

**Do NOT print using the file menu, print icon or Ctrl+P. You must use the print button at the bottom of the form.**

Patient: [REDACTED] Account: [REDACTED] Allergies:  
DOB: [REDACTED] MRN: [REDACTED]

**Pre-transfusion**

**Lab Values**  
*Please enter the following before proceeding. Options will appear below.*

HGB:

[Print Selected Items Only](#) [Reset Form](#)

The first screen prompts the provider to enter the patient's pre-transfusion Hemoglobin value – further action is dependant upon the value

# Zynx Order Set – Workflow

## Red Blood Cell Transfusion HIM Approval: June 2010 [Help](#)

[Top](#) [Bottom](#) [Patient Identifiers Required](#) [Pre-transfusion](#) [Single Unit - Routine](#) [Multiple Units](#)

**Do NOT print using the file menu, print icon or Ctrl+P. You must use the print button at the bottom of the form.**

### Pre-transfusion

#### Lab Values

Please enter the following before proceeding. Options will appear below

HGB:

#### Select Transfusion Amount

Single Unit  
 Multiple Units

### Single Unit - Routine

[Recommendations Regarding Indications for RBC Transfusion - Medical Literature Evidence](#)

▶ It is recommended that only one unit be ordered unless actively bleeding or emergency situation so that the hemoglobin can be checked to determine the need for additional units

Type and crossmatch for 1 unit (if not done within past 72 hours)

Transfuse 1 (one) unit of red blood cells - leukocyte reduced over 3 - 4 hours or

#### Indicate reason for transfusion

##### Adults

Hemoglobin less than or equal to 7

#### Post transfusion

Hemoglobin

If the Hgb is  $\leq 7.0$ , no other clinical justification is necessary

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# Zynx Order Set – Workflow

**Pre-transfusion**

**Lab Values**  
Please enter the following before proceeding. Options will appear below  
HGB:

**Select Transfusion Amount**  
 Single Unit  
 Multiple Units

**Single Unit - Routine**

Recommendations Regarding Indications for RBC Transfusion - Medical Literature Evidence

▶ It is recommended that only one unit be ordered unless actively bleeding or emergency situation so that the hemoglobin can be checked to determine the need for additional units

Type and screen  
 Type and crossmatch for 1 unit  
 Transfuse 1 (one) unit of red blood cells - leukocyte reduced over 3 - 4 hours or

Hemoglobin greater than 7

Hgb above recommended value, please indicate reason for infusion:

Hemorrhagic shock  
 Hemodynamic instability or inadequate oxygen delivery  
 Acute coronary syndrome with hemoglobin less than or equal to 8  
 Other

If the Hgb is > 7.0, the provider is prompted to choose from a list of acceptable clinical justifications

# Zynx Order Set – Workflow

**Single Unit - Routine**

Recommendations Regarding Indications for RBC Transfusion - Medical Literature Evidence

- ▶ *It is recommended that only one unit be ordered unless actively bleeding or emergency situation determine the need for additional units*

Type and screen

Type and crossmatch for 1 unit

Transfuse 1 (one) unit of red blood cells - leukocyte reduced over 3 - 4 hours or

**Hemoglobin greater than 7**

**Hgb above recommended value, please justify:**

Hemorrhagic shock

Hemodynamic instability or inadequate

Acute coronary syndrome with hemoglo

Other

**Special transfusion requirements:**


Irradiation (1. HLA matched products, 2. Donor is blood relative, 3. Transfusion associated graft vs host disease TAGVHD)

CMV negative (bone marrow and solid organ transplant patients)

Sickle screen negative (sickle cell patients)

saline washed (IGA deficiency with anaphylactic reactions, recurrent severe allergic reactions)

**Windows Internet Explorer**

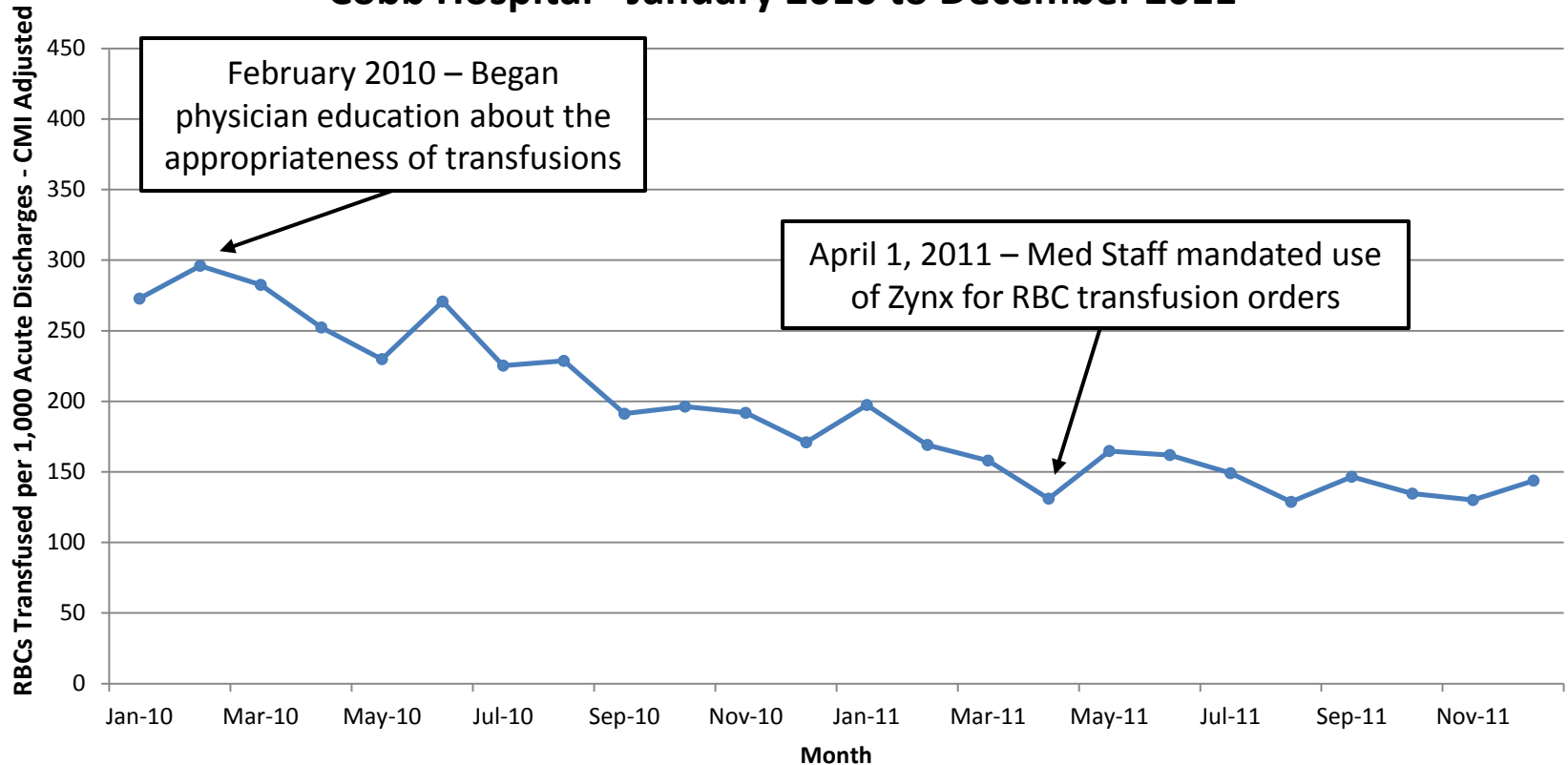
 There are errors on the form please review your entries. Errors are highlighted in red.

OK

If the provider attempts to print the order without justifying transfusion for Hgb > 7, they encounter a hard-stop programmed into the order set

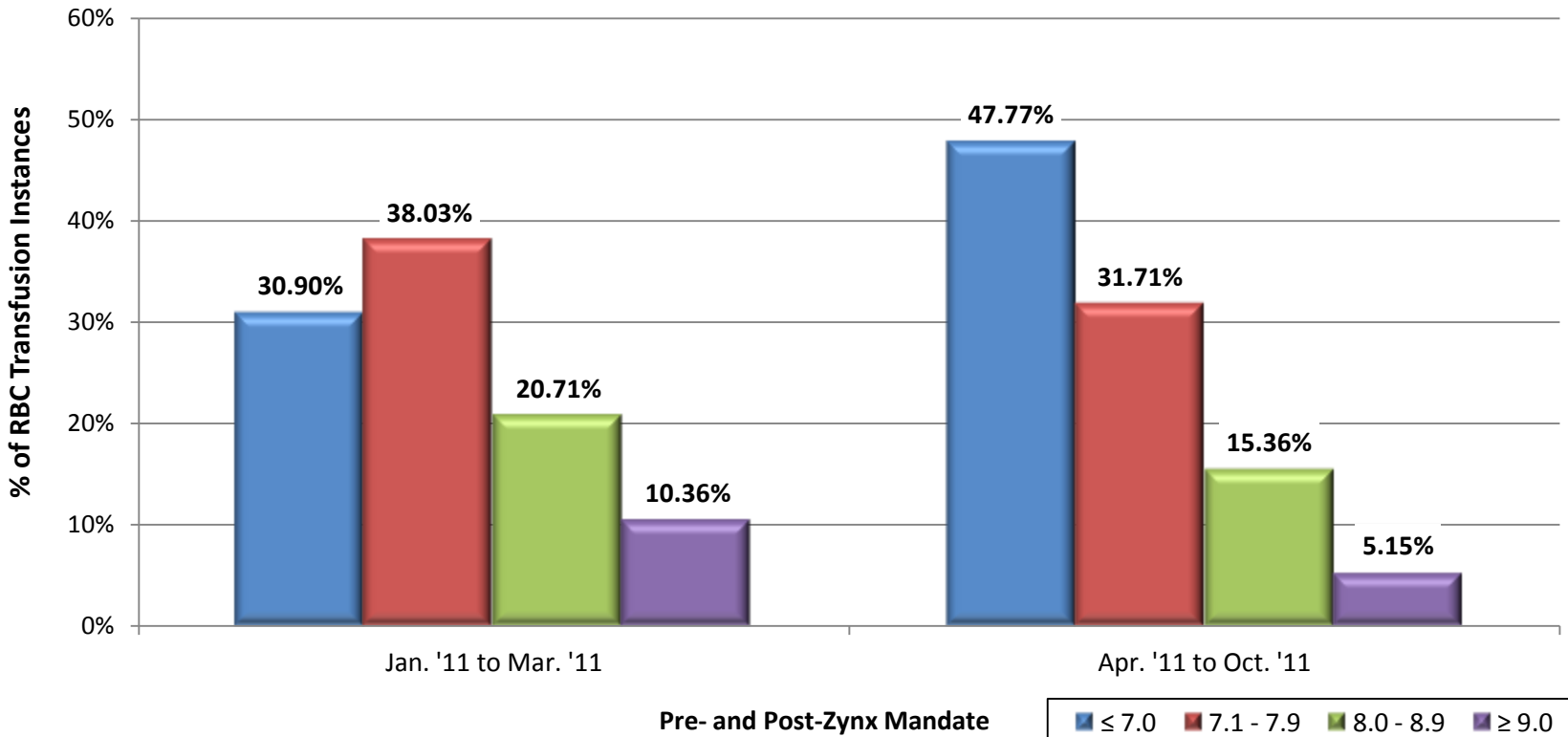
# Results / Outcomes

**RBC Transfusion Rate - CMI Adjusted  
Cobb Hospital - January 2010 to December 2011**



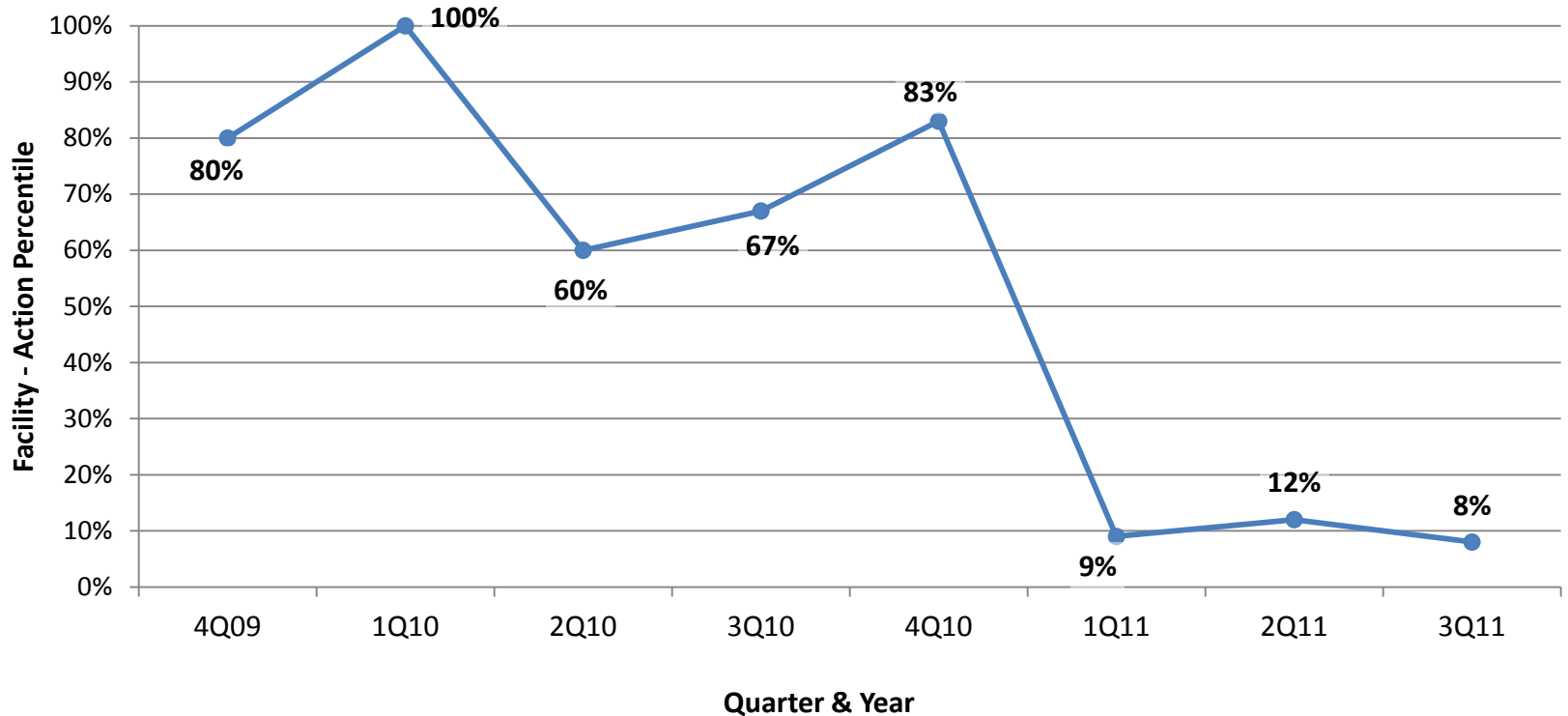
# Results / Outcomes

**Pre-Transfusion Hgb Value Distribution  
Cobb Hospital - Before and After Zynx Mandate**



# Results / Outcomes

**Blood Expense per CMI Weighted Adjusted Discharge  
Cobb Hospital - Compared to Peer (Action OI)**



# Results / Outcomes

- Transfusion rate (RBC transfusions per 1,000 acute discharges - CMI adjusted) decreased 47% in 24 months
- Not only did our efforts result in fewer transfusions, but due to the utilization of the new clinical guidelines, the transfusions that did occur were much more appropriate
  - Frequency of transfusions where pre-transfusion Hgb  $\leq 7.0$  increased by 55%

# Blood Safety Concerns

## The Joint Commission Reported Transfusion-Related Sentinel Events

Posted on January 17, 2012 by Susann Nienhaus, RN, JD

**“Until hospitals embrace a meaningful blood management program, patients will continue to be at risk for unnecessary blood product administration and transfusion-related sentinel events. The lesson, as always, is to apply current evidence to improve the quality of care and patient safety.”**

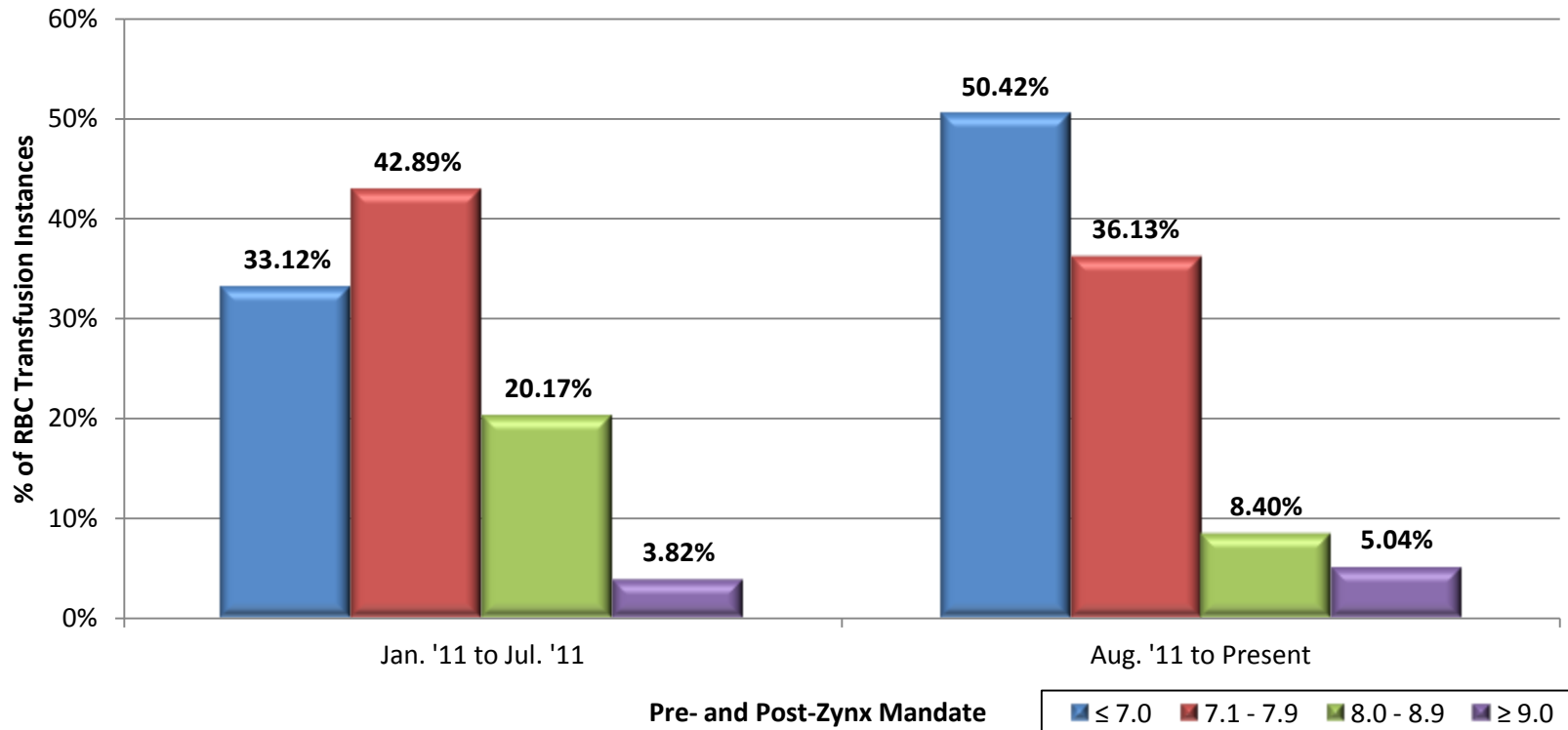
# Transferability

- Based on the success and outcomes of the initial pilot, WellStar transitioned the project and platform to a system-wide initiative including:
  - WellStar Kennestone Hospital
  - WellStar Douglas Hospital
  - WellStar Paulding Hospital



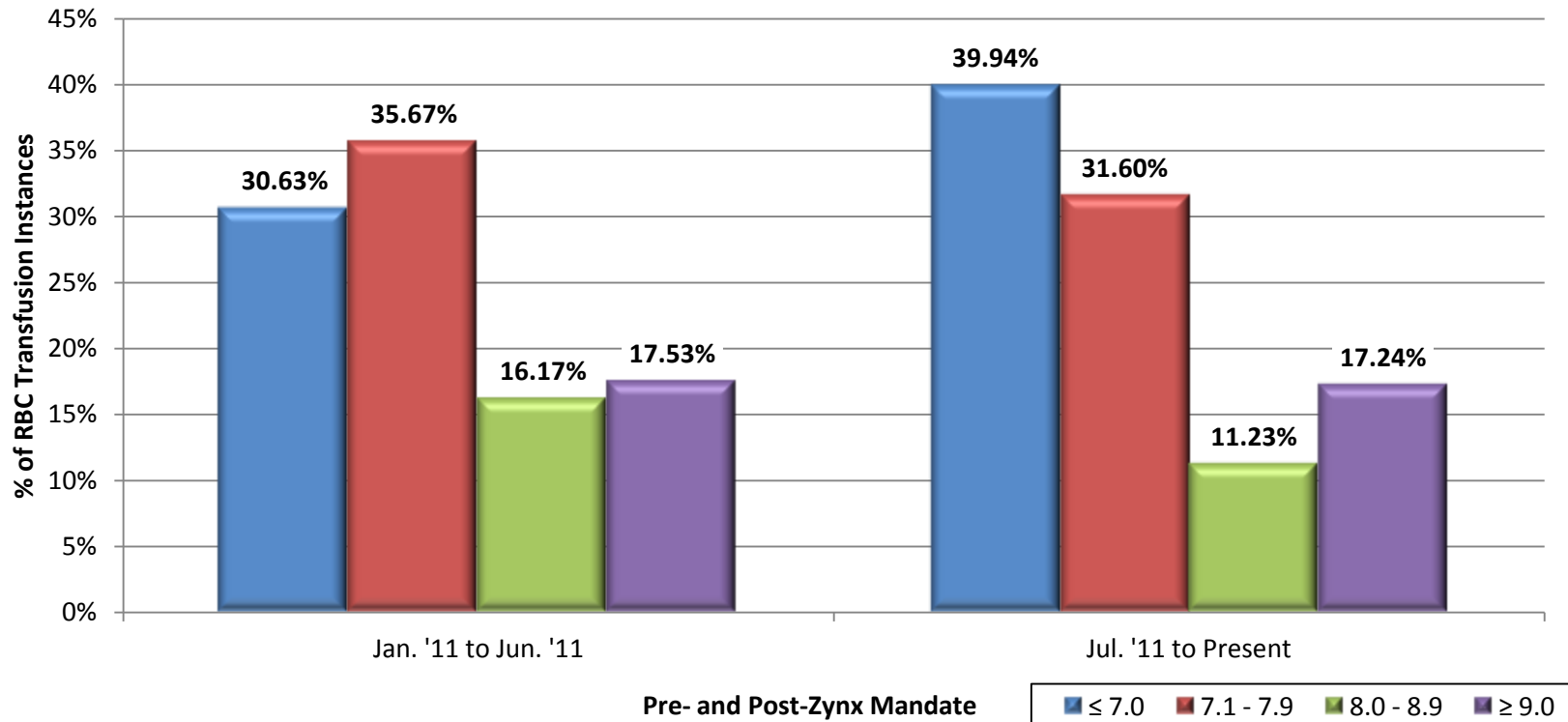
# Transferability

**Pre-Transfusion Hgb Value Distribution  
Douglas Hospital - Before and After Zynx Mandate**



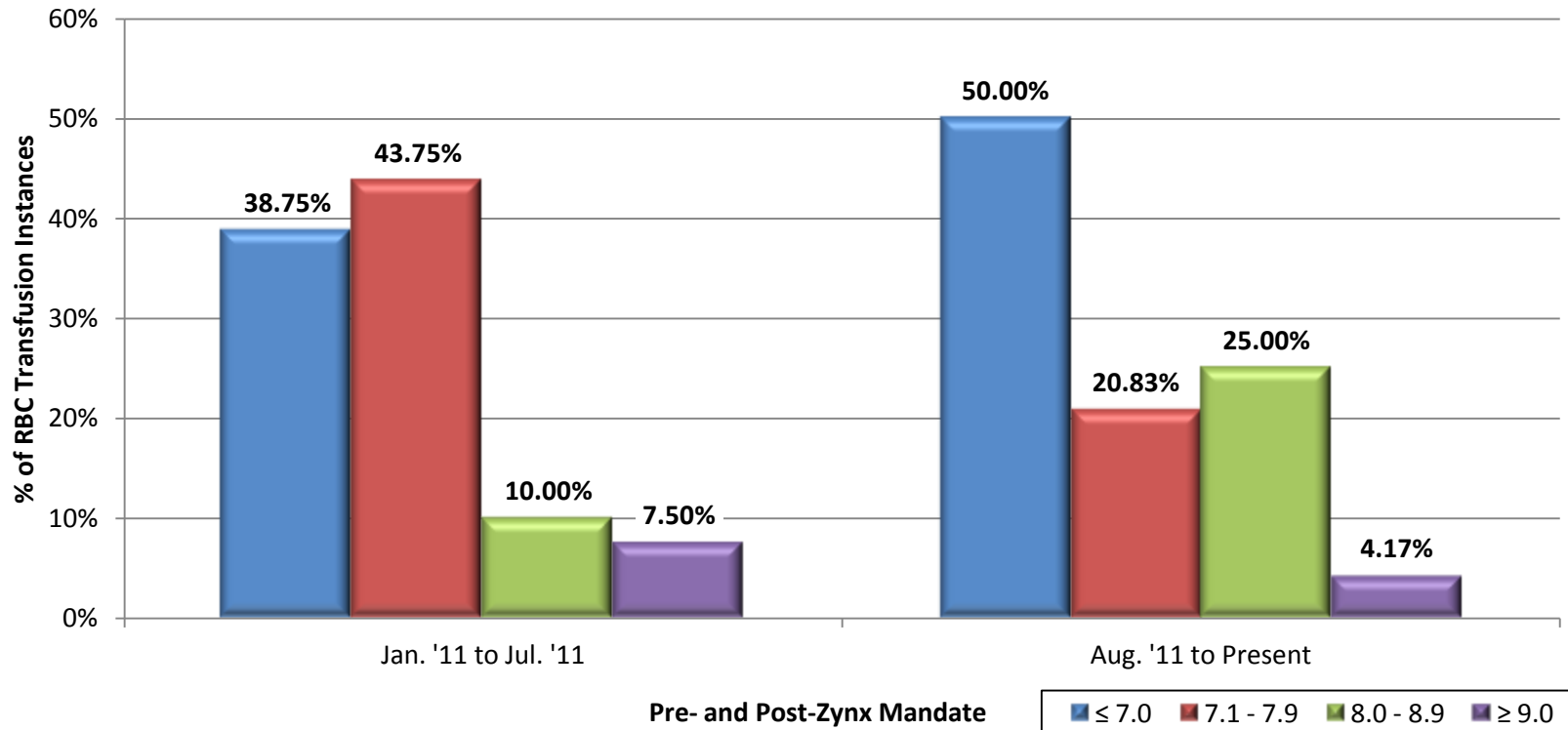
# Transferability

**Pre-Transfusion Hgb Value Distribution  
Kennestone Hospital - Before and After Zynx Mandate**



# Transferability

**Pre-Transfusion Hgb Value Distribution  
Paulding Hospital - Before and After Zynx Mandate**



# Actualized Savings

- Reductions in RBCs transfused annually:
  - Cobb Hospital: 2,919 units
  - Kennestone Hospital: 3,953 units
  - Douglas Hospital: 421 units
  - Paulding Hospital: 64 units
- Total reduction of 7,357 units RBCs

# Potential for Georgia

- WellStar accounts for 299,643 of Georgia's 4,315,698 acute IP discharges (6.9%)
- Extrapolating WellStar's initial savings, Georgia could potentially achieve reduction of 106,623 units RBCs, assuming similar success

# State-Wide Justification?

- Successful
- Sustainable
- Transferable
- Fiscally responsible
- Success independent of order set type: handwritten, pre-printed, or CPOE
- Cultural transformation of the provider

# Takeaways Next Steps

- Determine transfusion rate
  - Raw number of units over time
  - Rate: units per 1,000 discharges/CMI
- Determine pre-transfusion Hemoglobin
  - Determine % transfusions with recent Hgb
  - Aggregate by  $\leq 7.0$ , 7-8, 8-9,  $>9$

# Takeaways Next Steps

- Collect evidence-based medical literature
  - Clinical practice guideline: Red blood cell transfusion in adult and critical care (Crit Care Med 2009; 37:3124-3157)
- Share the above with medical staff under umbrella of safety and quality
- Support cultural transformation of medical and clinical staff for adoption



# Questions or Comments?

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