

# Measuring Resident Experience with Intraoperative Hemorrhage

**Matthew Caldwell, MD**

**University of Michigan  
Department of Anesthesiology**

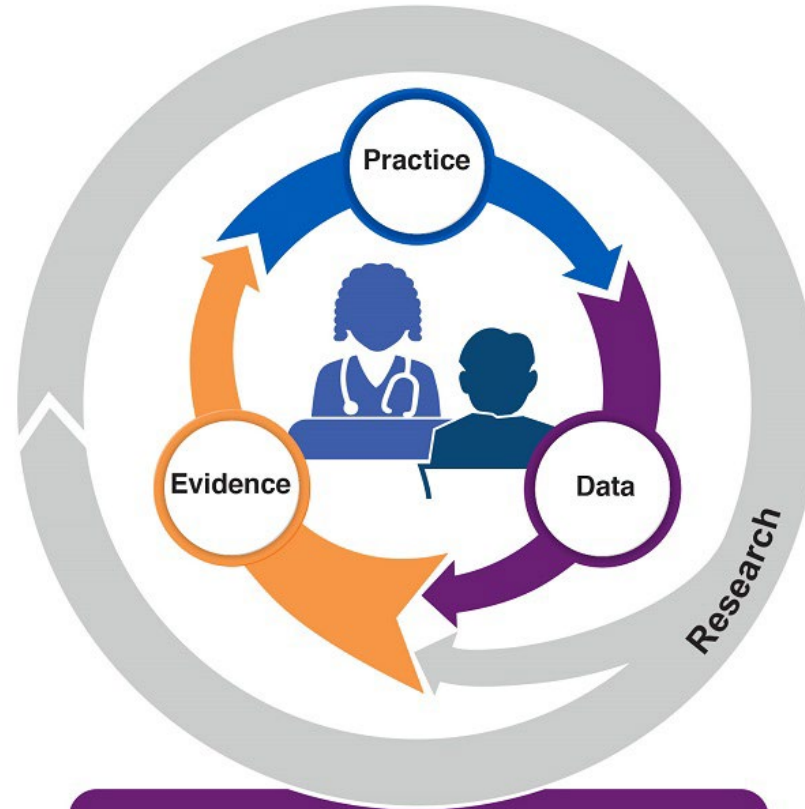
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# Disclosures

- Foundation for Anesthesia Education and Research
  - FAER-REG 08-15-2023
  
- Michigan Medicine Graduate Medical Education Innovation Grant Program
  - Award U078433

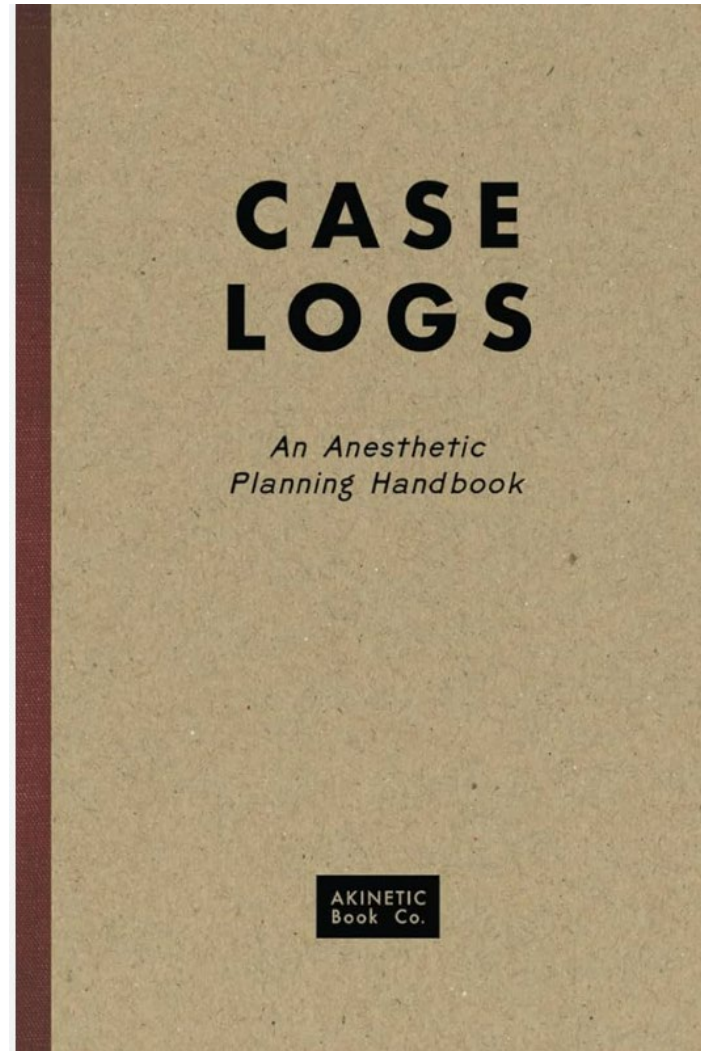
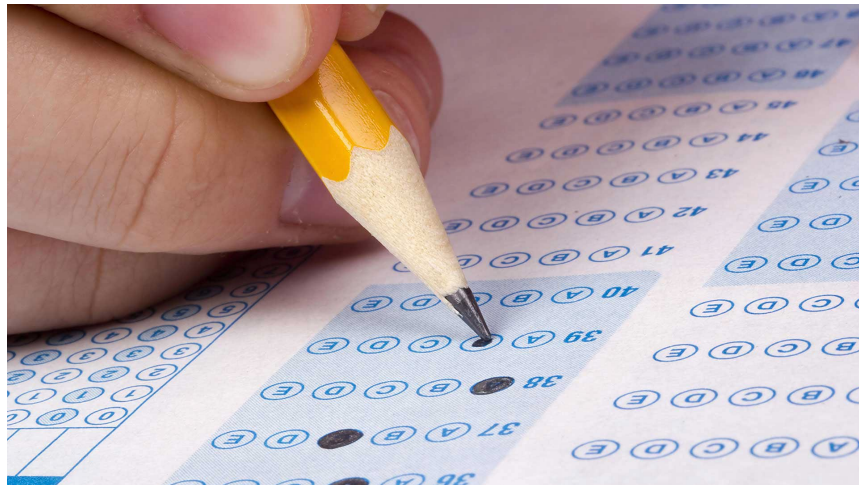
# Learning Health Systems



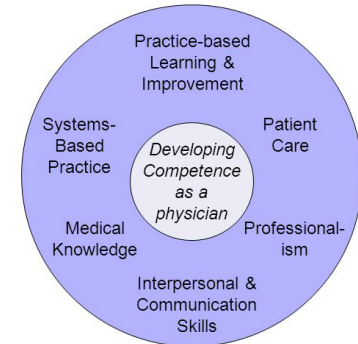
**Systematically gather and create evidence.**

**Apply the most promising evidence to improve care.**

# Current data for anesthesiology GME



## ACGME Competencies



## Anesthesiology Milestones

The Accreditation Council for Graduate Medical Education

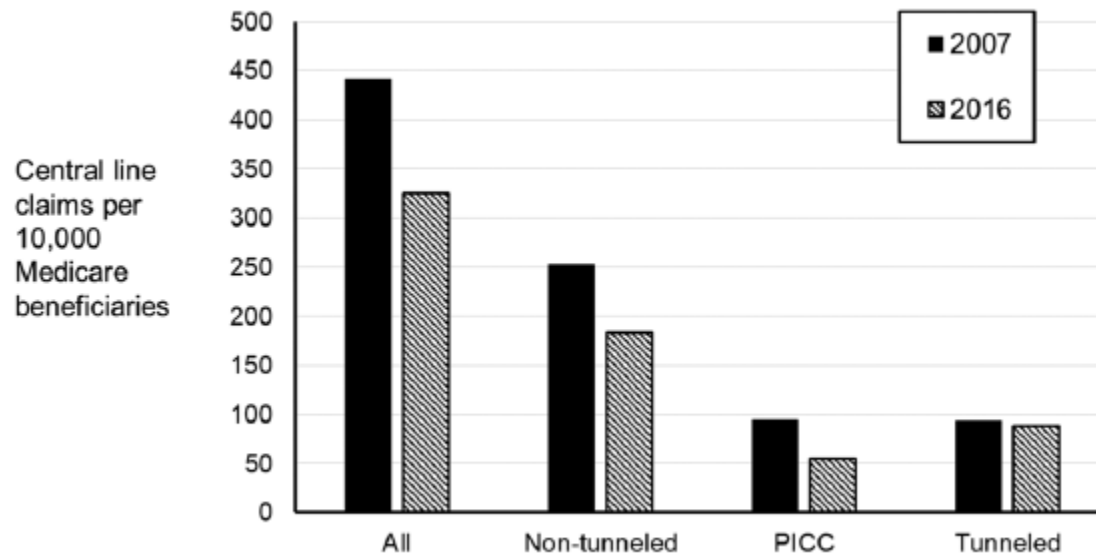
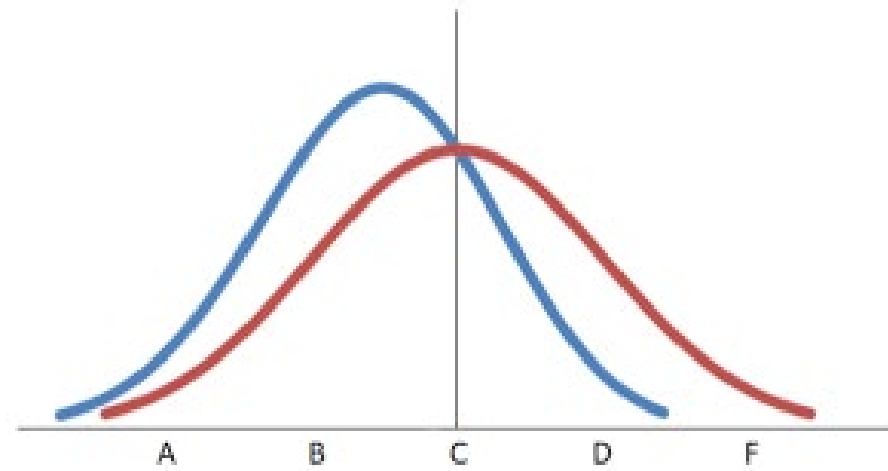


ACGME

# How might MPOG data help improve Graduate Medical Education?



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**Figure 1.** Central venous catheter claims by catheter type in 2007 and 2016. All values are adjusted to claims/10,000 participants in the Medicare Part B database during the study period. PICC indicates peripherally inserted central catheter.

Rubin et al. Anesth Analg. 2020 Apr;130(4): 1026-1034.

# INSPECT: Improvement in the Scope and Precision of Educational Cases for Trainees

- Aim 1: Quantify and describe the experience of anesthesiology residents with severe intraoperative hemorrhage resuscitation.
- Aim 2: Determine trainee and program factors associated with low (<25<sup>th</sup> percentile) resident exposure to severe hemorrhage resuscitation.
- Aim 3: Develop and optimize data visualization tools for use by Program Directors to improve resident education.

# Study population

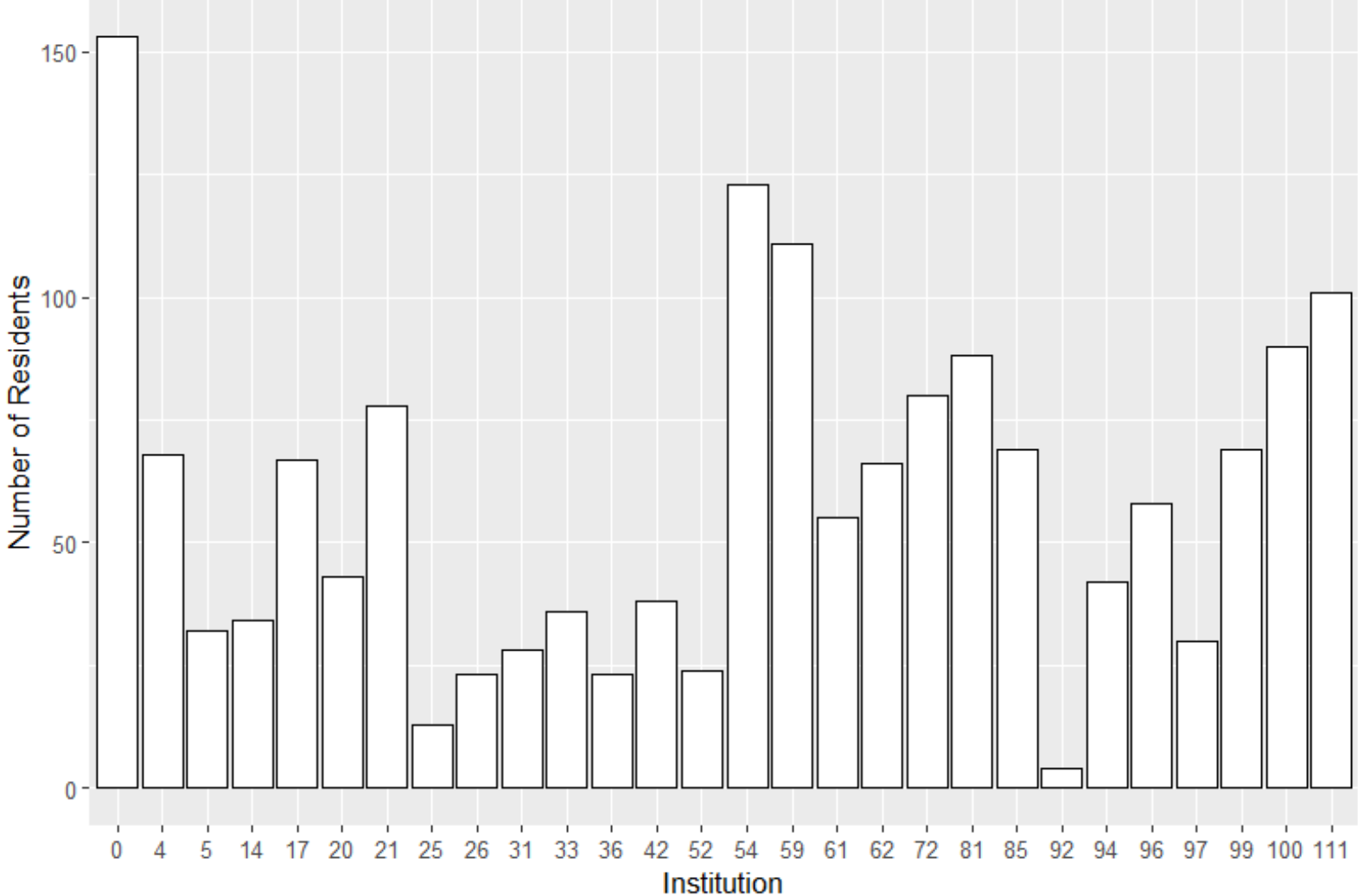
- 37 MPOG centers with anesthesiology residency training programs
  - 28 centers with sufficient resident data for inclusion in study
- 4 resident cohorts from graduation years 2020-2023
- 1640 total residents



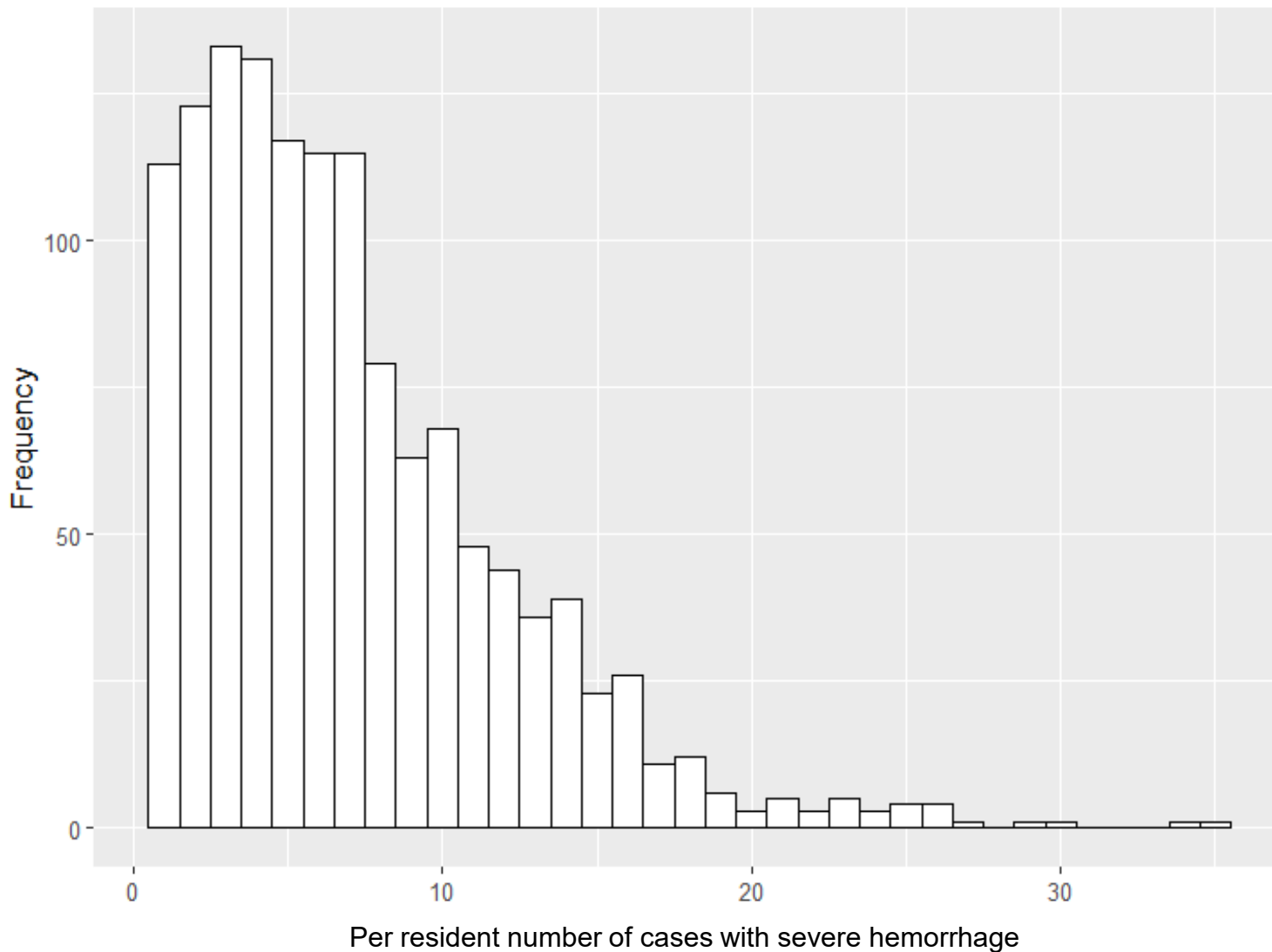
# Study outcomes

- Primary outcome severe hemorrhage resuscitation (equivalent of 4 units of pRBCs)
- Secondary outcomes
  - pRBC transfusion management (transfusion of any volume of red blood cells)
  - Non-pRBC transfusion
  - Pediatric transfusion
- Subgroup analyses
  - Emergency status
  - Surgical subgroups
- Factors associated with resident participation in severe hemorrhage resuscitation

# Distribution of residents across centers (preliminary data)

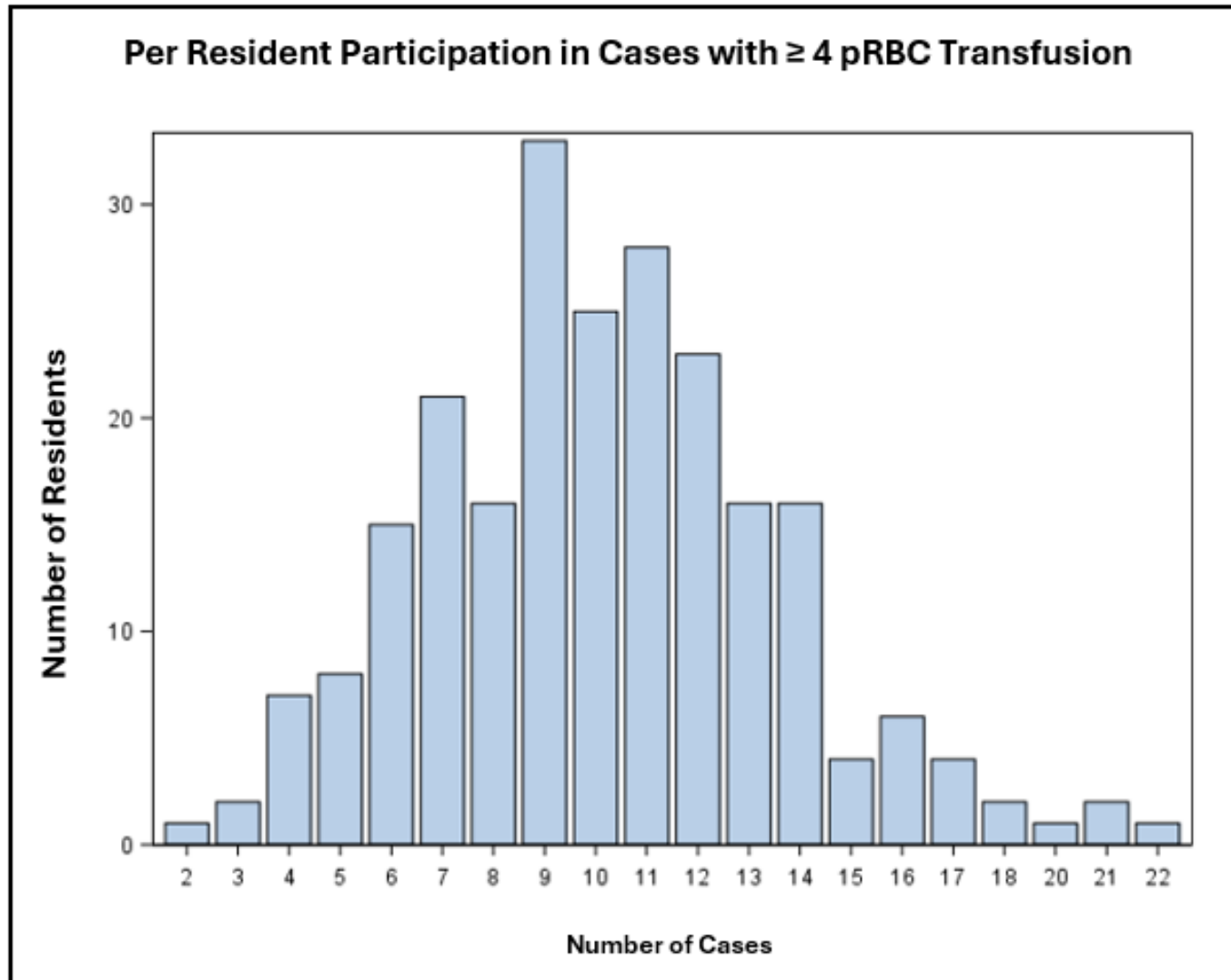


# Resident cases with severe hemorrhage (preliminary data)



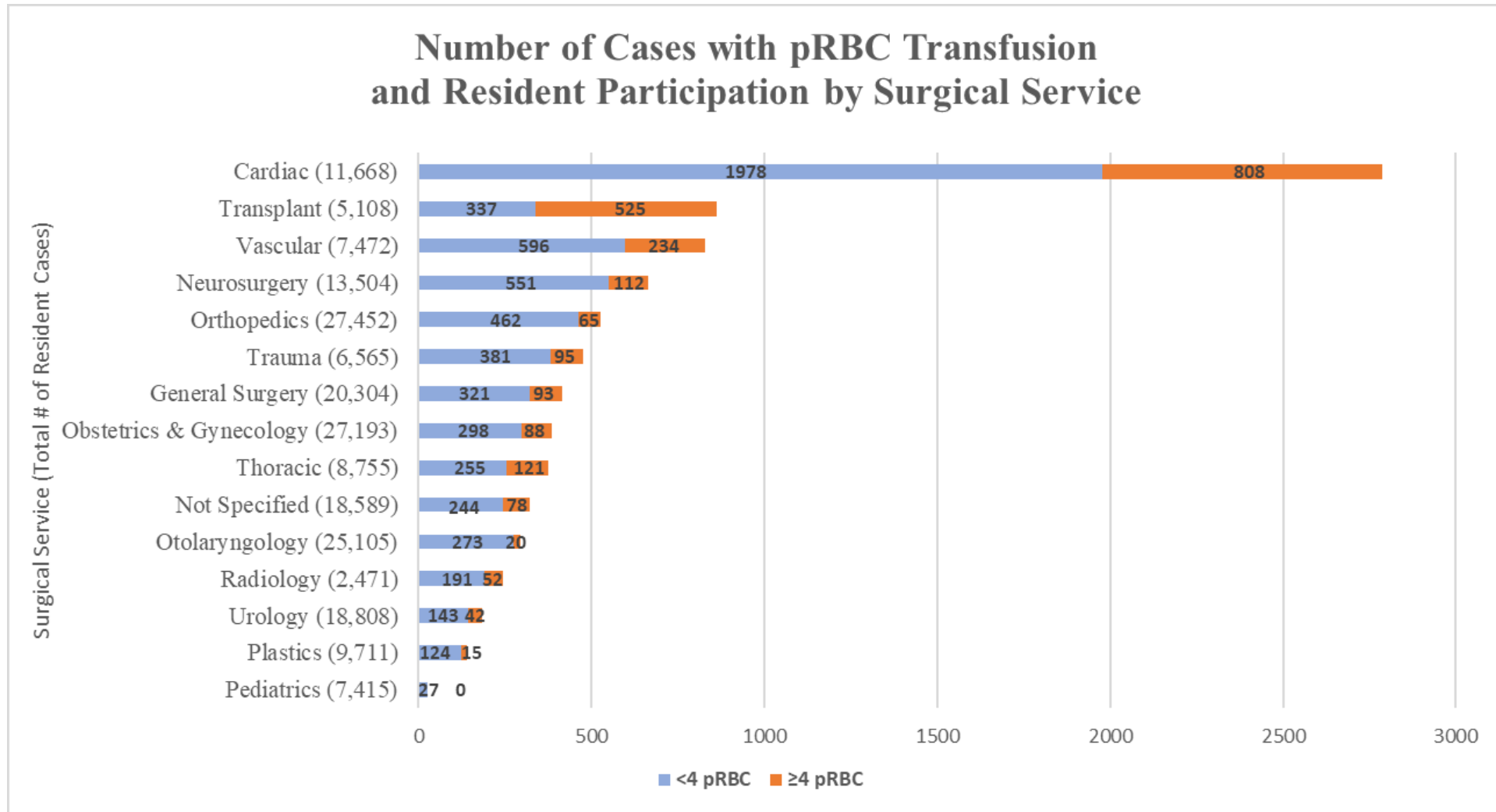
Median	Range (min, max)	IQR (Q1, Q3)
6	(1,35)	(3,10)

# Single Center Data: Severe Intraoperative Hemorrhage



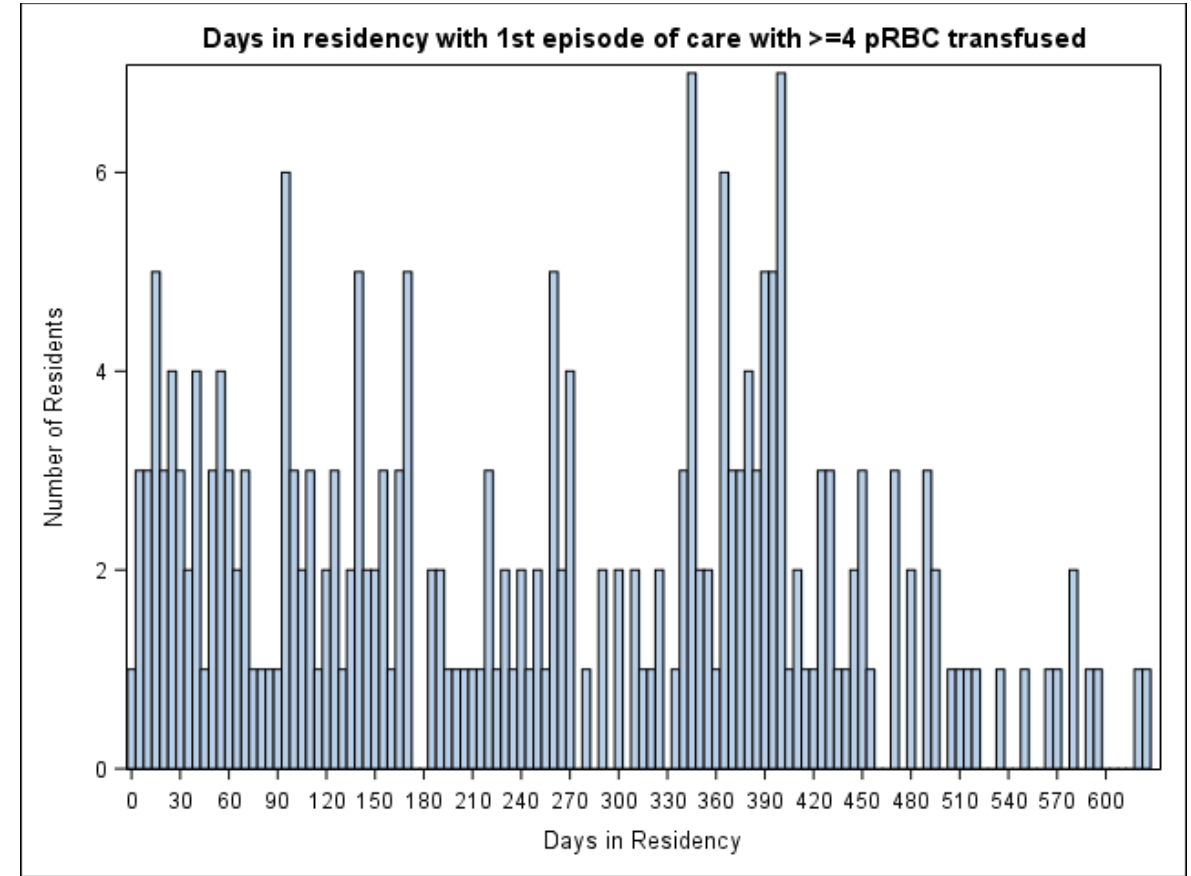
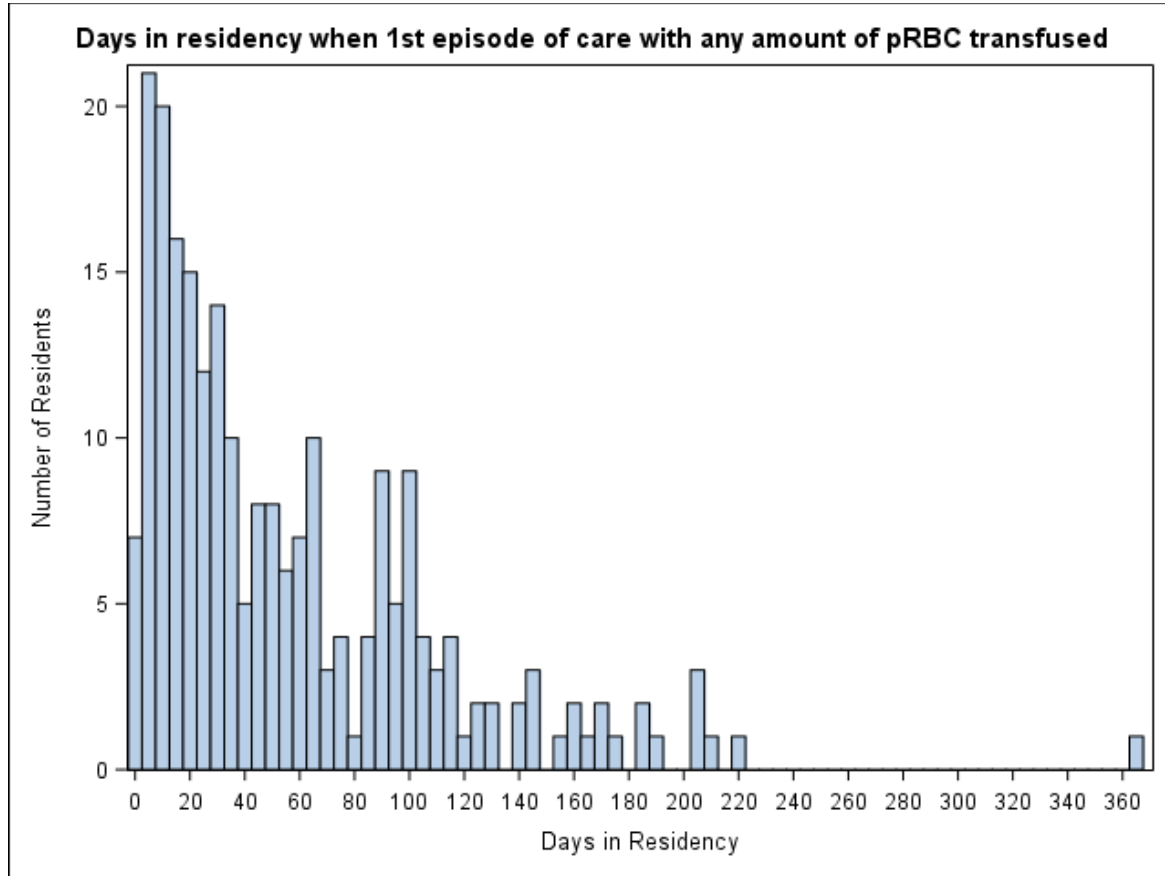
Median	Range (min, max)	IQR (Q1, Q3)
10	(2, 22)	(8, 12)

## Number of Cases with pRBC Transfusion and Resident Participation by Surgical Service



\*Single center data

# Timing of first exposure



\*Single center data

# How might we use this data to improve education and ultimately patient care?

- Educational scaffolding
- Reflective practice
- Smooth variability across residents
- Intentional scheduling to increase likelihood of specific clinical scenarios
- Identify high value low frequency scenarios for simulation

# Key Points Summary

- MPOG data can be used to support GME
  - Can provide normative data
  - Responsive to shifts in clinical practice
  - Precision education
- May allow for optimized experiential learning
- Rich opportunity to further explore





# Mentors and Collaborators

- **University of Michigan**
  - Douglas Colquhoun, MB ChB
  - Sachin Kheterpal, MD
  - Michael Mathis, MD
  - Graciela Mentz, PhD
  - Norah Naughton, MD
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  - Xinyi Zhao, MS
- **Oregon Health & Science University**
  - Zheyang Jenny Chen, MD, PhD
  - Amy Miller Juve, EdD
- **University of California San Francisco**
  - Christy Boscardin, PhD
  - Kristina Sullivan, MD
- **University of North Carolina**
  - Greg Balfanz, MD
  - Alexander Doyal, MD
  - Fei Chen, PhD
- **University of Oklahoma**
  - Christine Vo, MD
  - Casey Windrix, MD
- **Washington University St. Louis**
  - Avi Dobrusin, MD
  - Muthuraj Kanakaraj, MD
  - Rachel Moquin, EdD
- **Yale University**
  - Sadhvi Khanna, MPH
  - Daniel Kinney, MD