

# An Introduction to the Multicenter Perioperative Outcomes Group

Version: 2024



# What is MPOG?

- Academic and community hospital consortium that includes 60+ hospitals across the United States, Canada (1) and Lebanon (1)
- Platform for collaboration for research and QI
- Formed in 2008
- Data: mostly perioperative focused EHR data extracted using automated tools

Congratulations to Dr. Sydney Brown and team on  
Their Publication in Anesthesiology & Analgesia

[READ MORE](#)

ANESTHESIA  
&  
ANALGESIA

PERIOPERATIVE ANESTHESIOLOGY

**Factors Associated With Decision to Use and Dosing of Sugammadex in Children: A Retrospective Cross-Sectional Observational Study**

Brown, Sydney B.S. MD PhD<sup>1</sup>; Morici, Grace M.D.<sup>2</sup>; Cassidy, Kate MD<sup>3</sup>; Bada, Sherida MD, PhD<sup>4</sup>; Liu, Xinyue MD<sup>5</sup>; Zhang, Shengyu MD<sup>6</sup>; Zhou, Jia MD<sup>7</sup>; Moore-Gutjahr, Rebecca MD<sup>8</sup>; Stenhouse, Sachin MD, PhD<sup>9</sup>; Colquhoun, Douglas A. MD, PhD, FRC, MPH<sup>10</sup>; the Multicenter Outcomes Group (MPOG) Perioperative Clinical Research Consortium



## Our Mission

Our mission is to promote safe and evidence-based perioperative care for all patients through collaboration, research, education, and quality improvement.

Please [join us](#) on our mission.



26

Million  
Cases



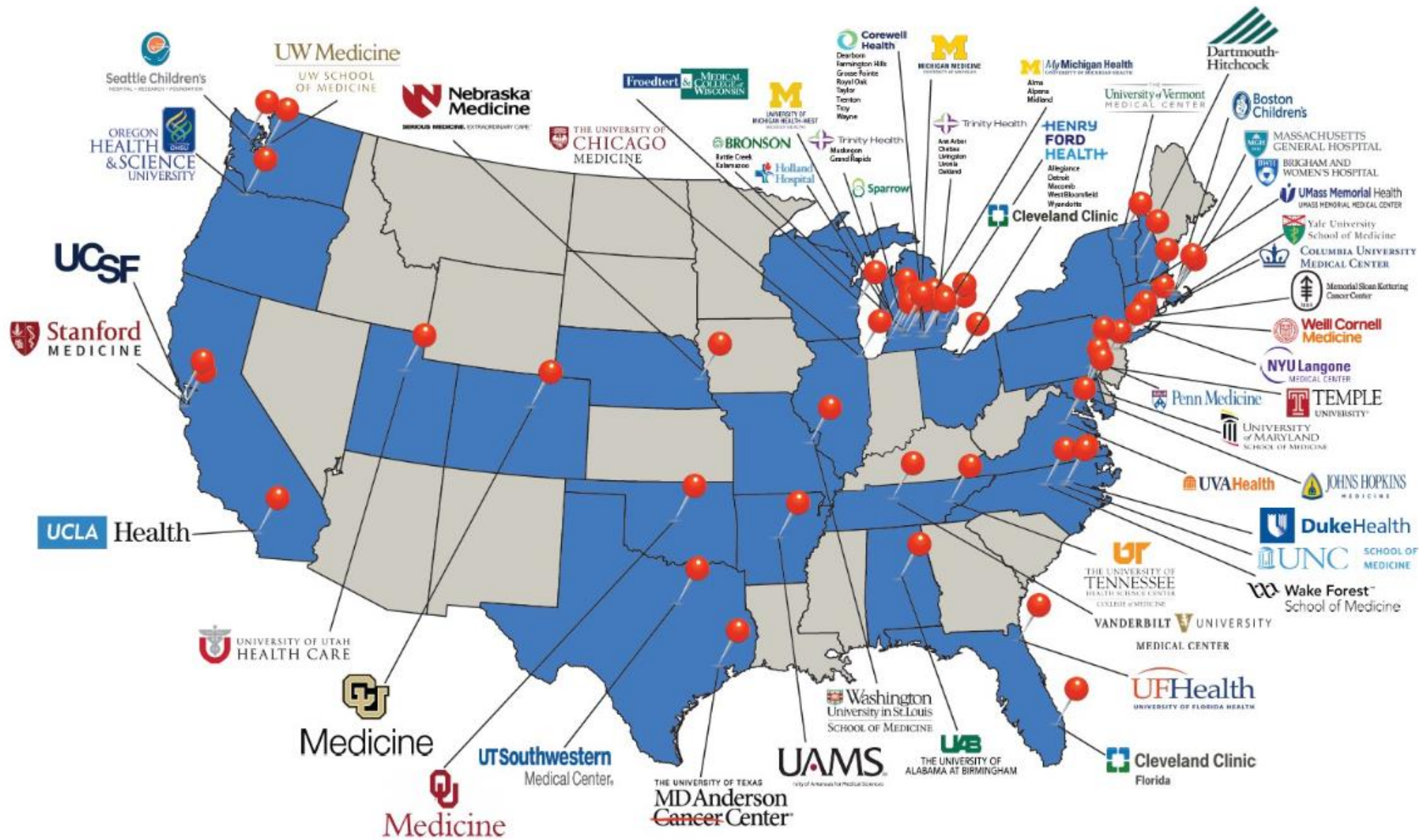
452

Million  
Medication  
Records



58

Billion  
Physiologic  
Observations



# Data Included in MPOG Registry

- Demographic Information
- Preoperative H&P
- Medications / Infusions / Fluids / Outputs
- Physiologic values/ Laboratory values
- Intraop events
- IV Access
- Staff in / out
- Professional fee CPT codes
- Discharge ICD 9/10 codes
- Outcome record / Outcome registry

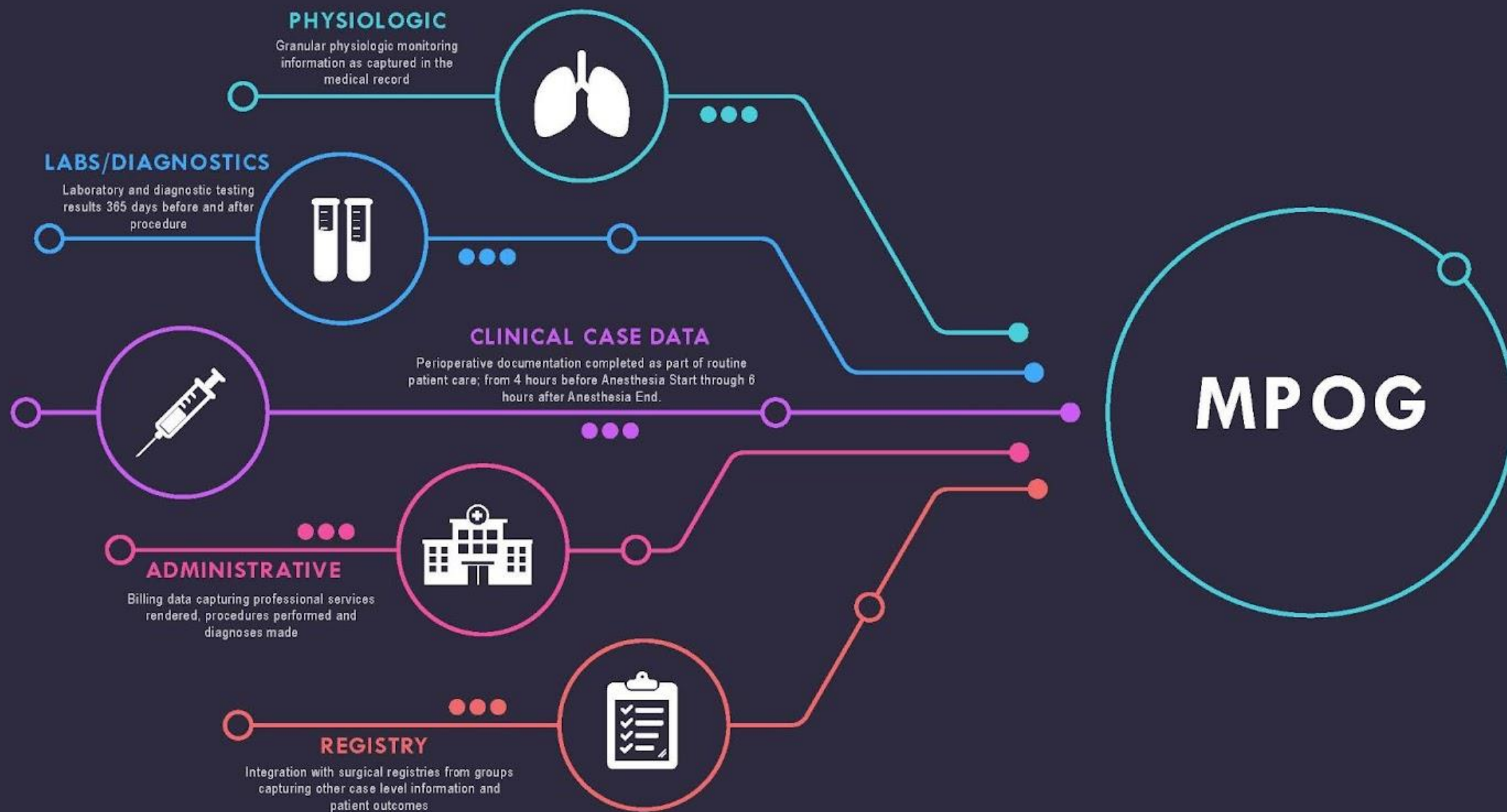
67 institutions, 5 EHR vendors

~26 million cases extracted,  
mapped, de-identified, and  
available for QI and research

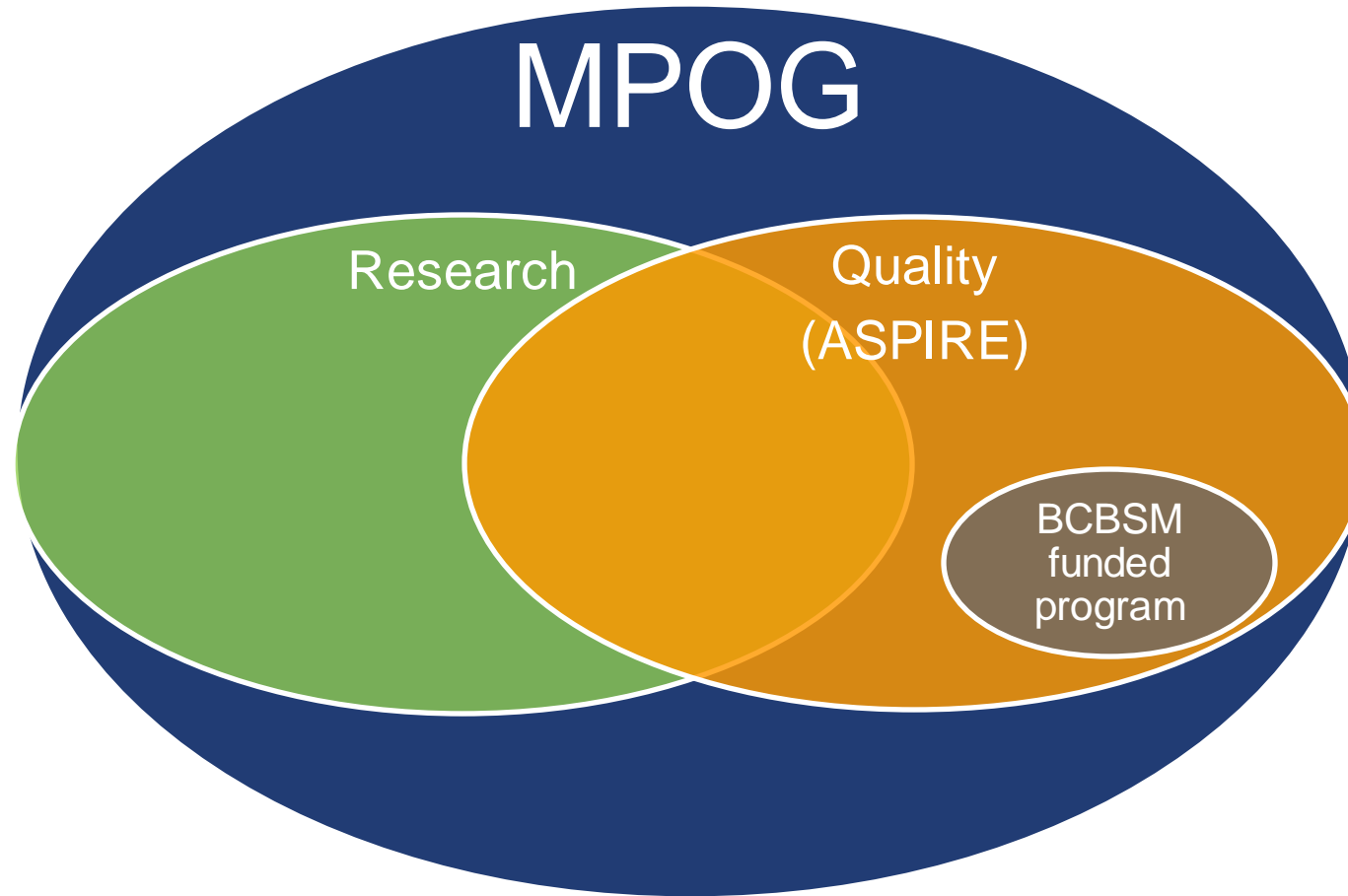
~452 million medication doses

58 BILLION vital signs





# Overlapping mission of QI and Research is the basis of MPOG as a Learning Health System



\*Not drawn to scale



Nonprofit corporations and independent licensees  
of the Blue Cross and Blue Shield Association



# MPOG Research

- Goal is to systematically transform real-world perioperative health data into actionable knowledge
- Governed by the Perioperative Clinical Research Committee (PCRC)
- Deep expertise in observational research, with extensive infrastructure for multicenter analyses
- Clinical trials platform, with MPOG Registry as data platform for multicenter pragmatic clinical trials



**MPOG**  
MULTICENTER PERIOPERATIVE  
OUTCOMES GROUP

About Sites Research Quality Tools Downloads News/Events

**Research Mission**

MPOG Research systematically transforms real-world perioperative health data into actionable knowledge through timely and innovative research projects. This work is facilitated by providing resources for research to be completed using the MPOG data registry. We seek to disseminate findings via high-impact journals and professional forums, and implement knowledge for improving patient care via our complementary Quality Improvement mission.

**Complete Patient Capture**  
Get data with "true denominators", through non-sampled capture of all anesthetics performed at participating sites.

**Data Granularity**  
Take advantage of minute-to-minute physiologic, medication, and ventilator data available within the most well-monitored of real-world health settings.

**Feedback**  
Benefit from reviews by high-impact journal editors and thought-leaders, during malleable, early design stages of research projects prior to manuscript submission.

**Integrated Surgical Registries**  
Link granular MPOG intraoperative process-of-care data with rigorously reviewed surgical registry outcomes data, to perform highly innovative and informative research.

**Academic & Community Hospitals**  
Leverage data obtained from both university-affiliated and community hospitals, reflective of care processes across a wide continuum of healthcare delivery systems.

**Comprehensive Research Tools**  
Use powerful, user-friendly research tools which democratize access to big data, including query design, curation, visualization, and analysis.

**MPOG**  
MULTICENTER PERIOPERATIVE  
OUTCOMES GROUP

# What does MPOG Research do?

- Collaboration through monthly PCRC meetings (tele-conference)
- Annual retreat before ASA
- High quality data
  - Complete patient capture
  - Data granularity
  - Integrated surgical registries
- Academic and community hospitals
- Comprehensive research tools
  - Use powerful, user-friendly research tools which democratize access to big data; including query design, curation, visualization, and analysis



# Submit a Proposal

- Only colleagues from active MPOG sites can submit a research proposal
- Steps to submit a proposal
  1. Determine feasibility
  2. Write research project specific IRB and draft proposal
  3. Data query specification
  4. Estimate MPOG cohort sample size / refine inclusion and exclusions
  5. Institutional PI preview and test data download
  6. Submit proposal to MPOG Coordinating Center
  7. PCRC Review
  8. Inspect and clean data, register study and perform analysis
  9. Create project manuscript

# MPOG Research Tools

- Access to research tools
  - MPOG DataDirect
    - Application that allows users to create queries using data submitted to MPOG
    - Contains multiple filters that can easily identify cohort of patients
    - Identify patient, case, and institutional counts
  - MPOG Concept Browser
    - Complete list of concepts in MPOG registry
  - MPOG Phenotype Browser
    - Sharable, reproducible algorithm (derived from EHR data) precisely defining a patient characteristic or clinical event

# Perioperative Clinical Research Committee (PCRC)

- Meets virtually once a month to review proposals
  - Benefit from reviewers by journal editors, thought leaders and anesthesiology colleagues during malleable, early design stages of research projects prior to manuscript submission
- PCRC Moderator Committee
  - Panel of clinical content and methods experts, serving to enhance the PCRC research review process via invited critiques of research proposals

# Tips & Tricks

- Videos created by MPOG team describing how to use research tools and processes for high-impact research
  1. MPOG research process overview
  2. Developing a research question and answerable with MPOG data
  3. Using DataDirect for self-serve access
  4. Developing a research proposal
  5. Transforming raw data into clinical inferences: Phenotypes
  6. Inspecting and curating MPOG data
  7. Big data management
  8. Statistics for large database research

## Tips & Tricks

See the video series from the MPOG central team below on how to use research tools and processes to their full potential for high-impact research.



### MPOG Research Process Overview

See the MPOG research machine from a “high-altitude” perspective, including a roadmap to tools and processes described in more detail in additional videos.

[Video Presentation](#)  
[Presentation Slides](#)

# MPOG QI / ASPIRE

- Anesthesiology quality improvement group
- Goal is to study unexplained variation in practice and determine best practices for anesthesia providers
- Governed by the MPOG Quality Committee which consists of members of each institution.
- Built on infrastructure of the Multicenter Perioperative Outcomes Group (MPOG)



The screenshot shows the MPOG Quality Improvement website. At the top is the MPOG logo (Multicenter Perioperative Outcomes Group) and navigation links: About, Join, Research, Quality, Tools, Downloads, and Events / News. There are also links for 'Dashboard (Refined)' and 'Dashboard Login'. Below the navigation is a large image of an operating room. Underneath the image is a dark blue banner with the text 'MPOG Quality Improvement'. Below this banner is a white section with three columns, each featuring an icon and a title: 'Methodology' (with a blue document icon), 'Data Granularity' (with a green database icon), and 'Experts' (with an orange group of people icon). Each column contains a paragraph of text describing the group's goals and data collection process.

**MPOG Quality Improvement**

MPOG QI (also known as the Anesthesiology Performance Improvement and Reporting Exchange [ASPIRE]) aims to improve the care of patients undergoing anesthesia by reducing unexplained variation in practice. Participating sites work together to build quality improvement measures, review best practices, and exchange ideas for improving patient outcomes.






























Methodology	Data Granularity	Experts
We include all cases requiring anesthetic care; no sampling. All data is reviewed and cleaned, and a limited dataset (no PHI, except date-of-service) is uploaded to the MPOG registry.	Includes physiologic, ventilator, medication, preoperative, and postoperative data; from 4 hours before Anesthesia Start to 6 hours after Anesthesia End.	The MPOG Quality Committee is comprised of anesthesia providers and quality experts from around the world to develop metrics and design initiatives to improve the way anesthesia care is delivered.


































# What Does MPOG QI do?

- Collaboration through monthly Quality Committee meetings (tele-conference)
- In person meetings 3x/year, including annual MPOG Retreat before ASA
- Builds Quality Measures based on feedback from Quality Committee and Subcommittees and data from MPOG Registry
- Shares performance data at practice and provider level through our QI Reporting Tool and Individual Provider Feedback emails
- Builds Toolkits to help sites implement QI Initiatives related to MPOG QI Measures
- Partnership with ABA to award MOCA IV credit through provider feedback program

# MPOG QI Measures

	Measures	Flowchart
<b>Acute Kidney Injury</b> 	AKI-01: Acute Kidney Injury	
<b>Antibiotic Usage</b> 	ABX-01-OB: Antibiotic Timing for Cesarean Delivery ABX-02-C: Antibiotic Timing, Open Cardiac ABX-03-C: Antibiotic Re-dosing, Open Cardiac	  
<b>Brain Health</b> 	BRAIN-01: Benzodiazepine use in the geriatric population	
<b>Blood Pressure</b> 	BP-01: Low MAP Prevention < 55 (20 minutes) BP-02: Avoiding Monitoring Gaps BP-03: Low MAP Prevention < 65 (15 minutes) BP-04-OB: SBP < 90 in Cesarean Deliveries BP-05: Low MAP Avoidance < 55, Induction BP-06: Low MAP Prevention < 55 (10 minutes)	     
<b>Fluids</b> 	FLUID-01-C: Minimizing Colloid Use, Cardiac FLUID-01-NC: Minimizing Colloid Use, Non-Cardiac FLUID-02-NC: Minimizing Colloid Use, Pediatrics (Non-Cardiac) FLUID-02-Peds-C: Minimizing Colloid Use, Pediatrics (Cardiac)	   
<b>Glucose Management</b> 	GLU-01: Hyperglycemia Management, Intraop (>200mg/dL) GLU-02: Hypoglycemia Management, Intraop (<60 mg/dL) GLU-03: Hyperglycemia Management, Periop (>200 mg/dL) GLU-04: Hypoglycemia Management, Periop (<60 mg/dL) GLU-05: Hyperglycemia Treatment, Periop (>200 mg/dL) GLU-06-C: Hyperglycemia Management, Open Cardiac (>180 mg/dL) GLU-07-C: Hypoglycemia Management, Open Cardiac (<70mg/dL) GLU-08-C: Hyperglycemia Treatment, Open Cardiac (>180mg/dL) GLU-09: Hyperglycemia Management, Intraop (>180mg/dL) GLU-10: Hyperglycemia Management, Periop (>180mg/dL) GLU-11: Hyperglycemia Treatment, Periop (>180 mg/dL) GLU-12: Hypoglycemia Management, Intraop (<70mg/dL) GLU-13: Hypoglycemia Management, Periop (<70mg/dL)	       

<b>Medication Overdose</b> 	MED-01: Avoiding Medication Overdose	
<b>Mortality</b> 	MORT-01: 30 Day In-Hospital Mortality Rate	
<b>Myocardial Injury</b> 	CARD-02: Myocardial Injury CARD-03: Myocardial Injury, High Risk Patients	 
<b>Neuromuscular Monitoring</b> 	NMB-01: Train of Four Taken NMB-02: Reversal Administered NMB-03-Peds: NMB Dosing, Pediatrics NMB-04: Variation in Sugammadex Administration	   
<b>Pain Management</b> 	OPIOID: Opioid Equivalency PAIN-01-Peds: Multimodal Analgesia, Pediatrics PAIN-02: Multimodal Analgesia PAIN-03: Opioid Reversal with Naloxone	  
<b>Postoperative Nausea and Vomiting</b> 	PONV-01: PONV Prophylaxis: Adults (Old) PONV-03: Postoperative Nausea or Vomiting Outcome PONV-04-Peds: PONV Prophylaxis: Pediatrics PONV-05: PONV Prophylaxis: Adults	   
<b>Pulmonary</b> 	PUL-01: Protective Tidal Volume, 10 mL/kg PBW PUL-02: Protective Tidal Volume, 8 mL/kg PBW PUL-03: Administration of PEEP	
<b>Smoking Cessation</b> 	SMOK-01: Smoking Tobacco Status Documentation SMOK-02: Smoking Tobacco Cessation Intervention	 
<b>Sustainability</b> 	SUS-01: Fresh Gas Flow, less than or equal to 3L/min SUS-02: Global Warming Footprint, Maintenance SUS-03: Global Warming Footprint, Induction SUS-04: Fresh Gas Flow, less than or equal to 2L/min SUS-05-Peds: Nitrous Avoided, Induction SUS-06-Peds: Low Fresh Gas Flow, Pediatric Induction	     

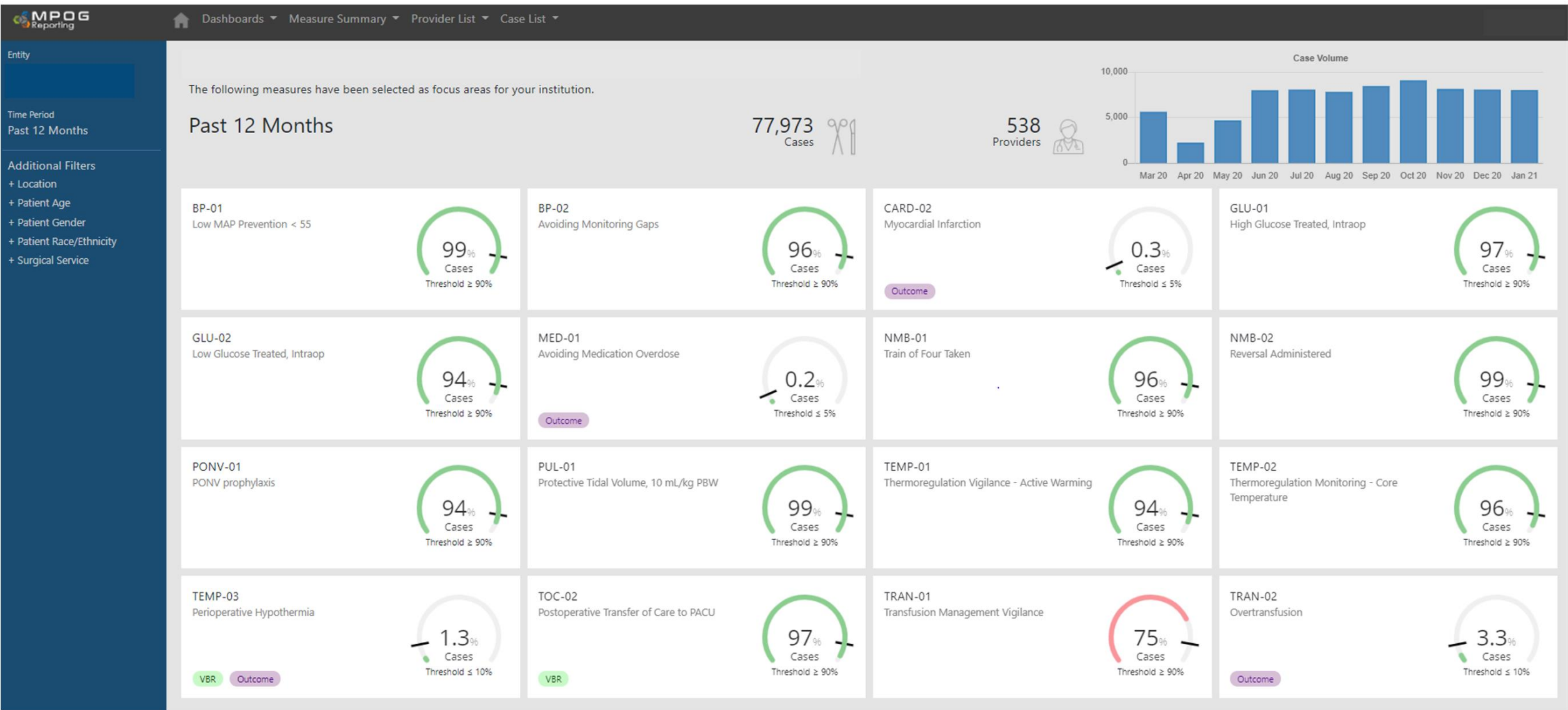
# MPOG QI Dashboards: Practice Level Feedback

# Individual Provider Dashboard Access

Go to MPOG Website: <https://mpog.org/> and click on blue Dashboard Login button:

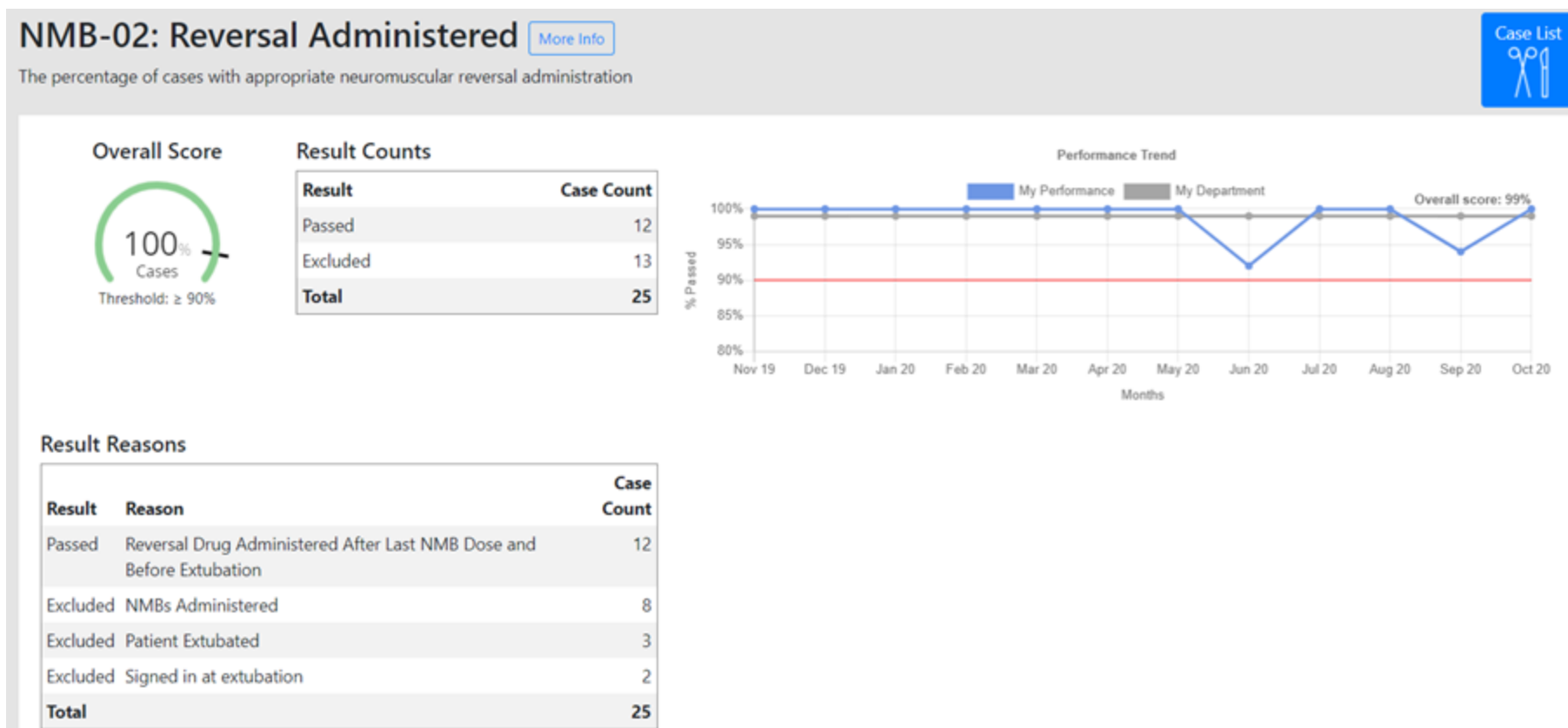


# Reporting Dashboard





Clicking on the measure will result in the specific measure overview, which will include overall performance, case counts, trend graph, and a detailed breakdown of primary cause.



By selecting the ‘Case Lists’ tab, all failed, passed, and excluded will appear for the specific measure.

### NMB-02: Reversal Administered Cases

More Info

Summary

The percentage of cases with appropriate neuromuscular reversal administration

Passed

Flagged

Excluded

Show 10 entries

Search:

View Case	Measure Result	Date of Service	Operating Room	Surgical Service	Procedure	Primary Anesthesia CPT	Measure Result Reason	Attributable Attendings	Attributable CRNA/Resident	MPOG Case ID
<div>View Case</div>	Passed	10/28/2020 3:00	U-OR 03	Otolaryngology	(Actual)NECK EXPLORATION	00100	Reversal Drug Administered After Last NMB Dose and Before Extubation: Yes			e43584db-e91c-eb11-910e-005056b4993c

Attribute	Value	Result
Reversal Drug Administered After Last NMB Dose and Before Extubation	Yes	Passed
At least 1 passing criteria met	Yes	Passed
Is Valid Case	Yes	Included
ASA Class	ASA Class 3	Included
Cardiac Surgery	No	Included
NMBs Administered	Yes	Included
Patient Extubated	Yes	Included
Only Defasciculating Doses	No	Included
Signed in at extubation	Yes	Included
Appropriate Time Passed	No	Info
High Acceleromyography Value Taken After Last NMB Dose and Before Extubation	No	Info
Patient Age (Years)	76	Info
Is Non-Operative Case	No	Included

# PONV-02: PONV prophylaxis, Pediatrics Cases [More Info](#)

The percentage of pediatric cases with appropriate antiemetic administration for postoperative nausea and

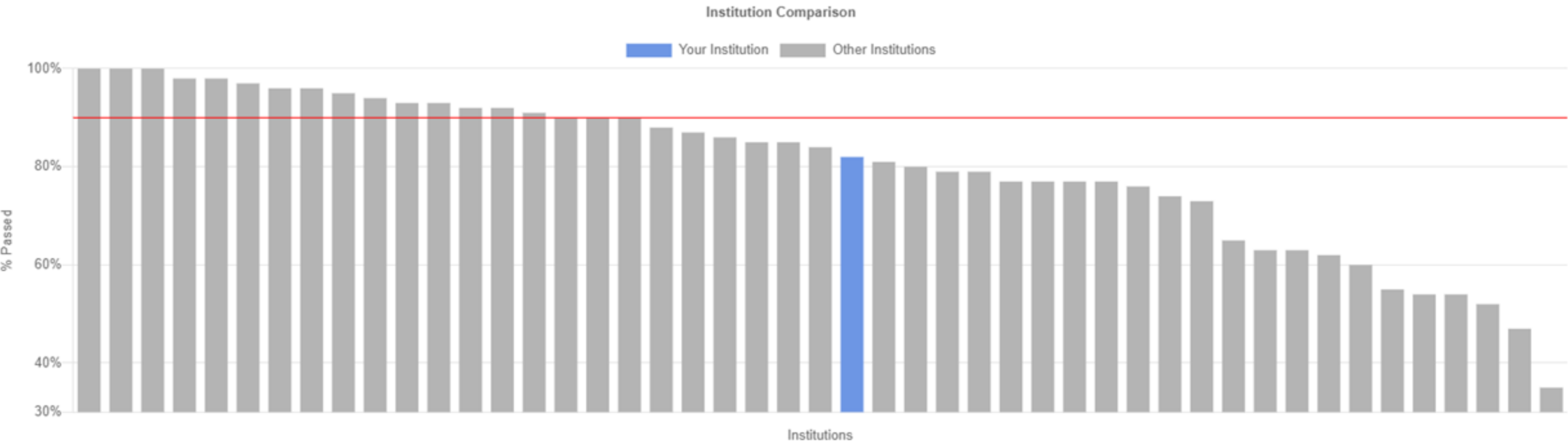
Case Report Download

Show 10 entries

View Case	Measure Result	Date of Service	Operating Room	Surgical Service	Procedure
<a href="#">View Case</a>	Passed		M-OR 14	Plastics	MIDLINE ORIF MANDIBLE, POSSIBLE ARCH BAR APPLICATION
<a href="#">View Case</a>	Passed		M-OR 13	Otolaryngology	RIGHT COCHLEAR IMPLANT
<a href="#">View Case</a>	Passed		M-OR 12	Otolaryngology	LEFT COCHLEAR IMPLANT
<a href="#">View Case</a>	Flagged				
<a href="#">View Case</a>	Passed		M-OR 14	Plastics	LEFT NEVUS, LESION, OR HEMANGIOMA EXCISION
<a href="#">View Case</a>	Passed		M-OR 13	Otolaryngology	RIGHT TYMPANOPLASTY AND MASTOIDECTOMY

View Case	Measure Result	Date of Service	Operating Room	Surgical Service	Procedure
<a href="#">View Case</a>	Flagged		M-MRI-BAY2	Surgical Service - Not specified	MR HEAD GENERAL ANESTHESIA
Attribute					
		Value		Result	
Anti-Emetic Class Count		1		Failed	
Is Valid Case		Yes		Included	
Transported to ICU		No		Included	
Patient Age		6		Included	
Labor Epidural		No		Included	
Liver Transplant		No		Included	
Lung Transplant		No		Included	
Labor Room		No		Included	
Medical Exception		No		Included	
Anesthesia CPT		01922		Included	
Received General Anesthetic After Induction		Yes		Included	
Risk Factor Count		2		Included	
Responsible Provider		Yes		Included	
Patient Transported to PACU		Yes		Info	
PONV Risk Factor: Patient Age		Triggered		Info	
Anti-Emetic Classes		Other: PROPOFOL		Info	
Is Non-Operative Case		No		Included	
PONV Risk Factor: History of PONV		Not Triggered [Missing]		Info	
PONV Risk Factor: Strabismus		Not Triggered [No]		Info	
PONV Risk Factor: Surgery Duration		Triggered [53]		Info	

# Performance Feedback Methods: Institutional Benchmarking



# Or access dashboard via feedback E-mail



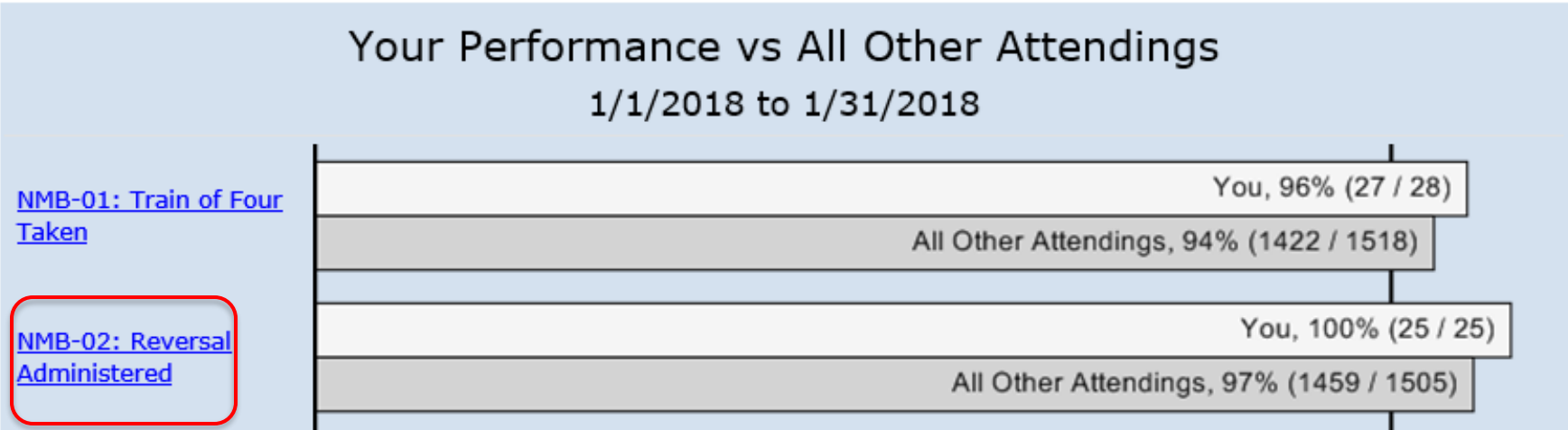
[Claim MOCA® Credit](#)

Hello John,

Below is your new MPOG Quality performance report. For a case-by-case breakdown of each measure's result, click on the graph's label and you will be taken to our reporting website (login required).

If you have any questions, please read our [FAQ](#) or send them to [QIChampion@example.org](mailto:QIChampion@example.org). Thank you for your participation in MPOG Quality.

Sincerely,  
The MPOG Team



Clicking on the measure title brings the provider to that measure in the individual dashboard





# Individual Performance Feedback Email

- Automated emails from central MPOG server
- Sent every month to ~3500 providers nationwide
- “Fresh” – last month’s patients
- Easy access to case review
- \*MOCA credit available

\*USA Only



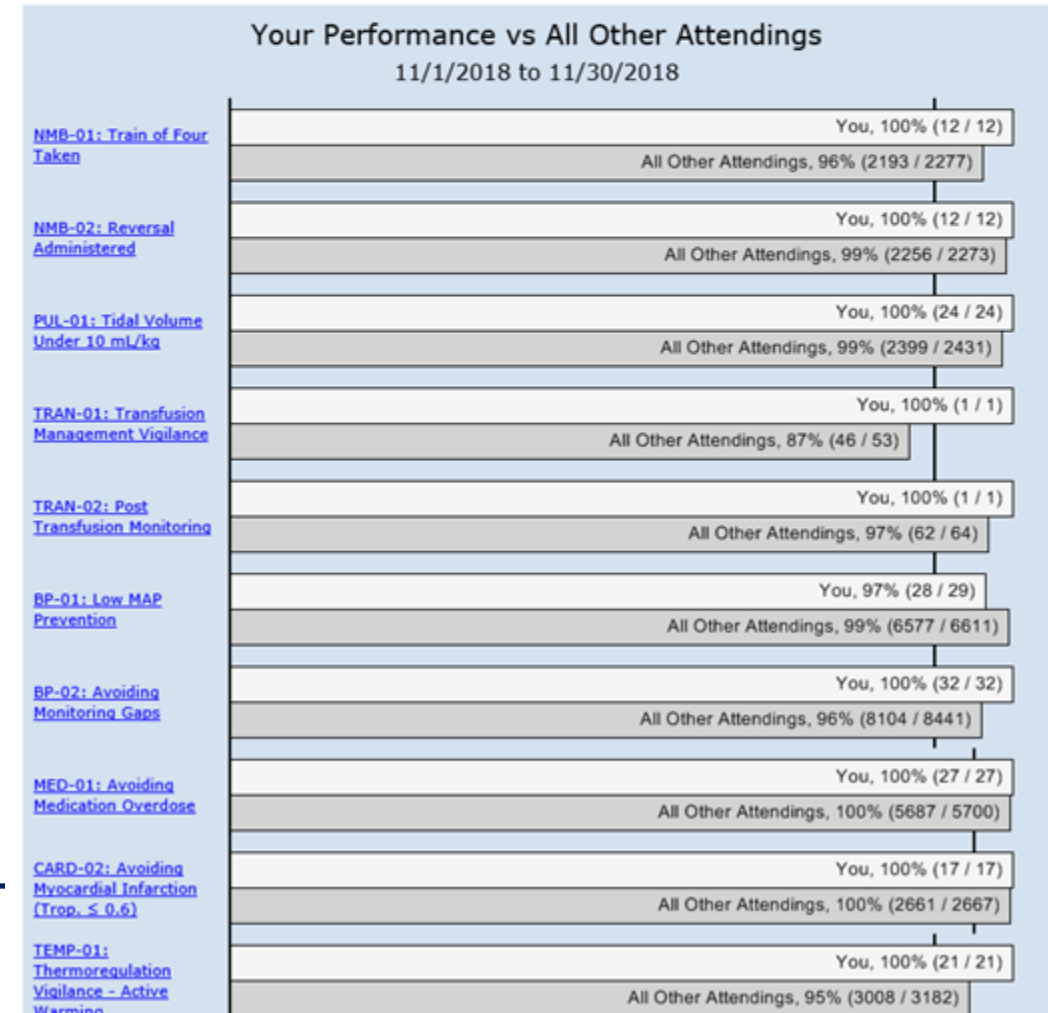
Claim MOCA® Credit

Hello Nirav,

Below is your new MPOG Quality performance report. For a case-by-case breakdown of each measure's result, click on the graph's label and you will be taken to our reporting website (login required).

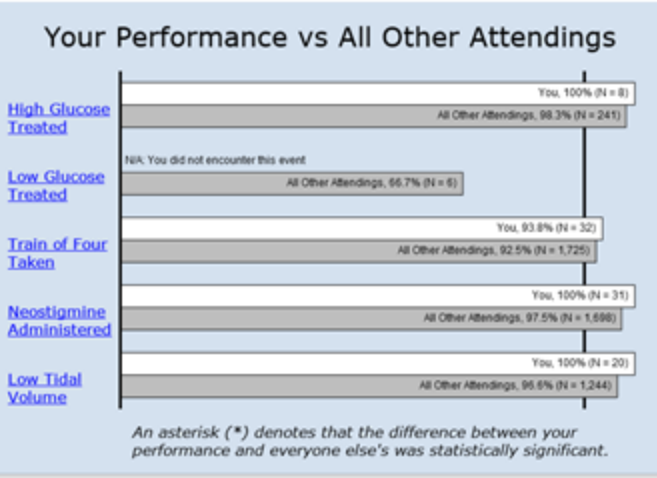
If you have any questions, please read our [FAQ](#) or send them to [meridith@med.umich.edu](mailto:meridith@med.umich.edu). Thank you for your participation in MPOG Quality.

Sincerely,  
The MPOG Team



# Our goal is to easily enable clinicians to understand why certain cases did not pass a measure.

1



2



View Case	Measure Result	Date of Service	Operating Room	Surgical Service	Procedure
View Case	Passed		M-OR 14	Plastics	MIDLINE ORIF MANDIBLE, POSSIBLE
View Case	Passed		M-OR 13	Otolaryngology	RIGHT COCHLEAR IMPLANT
View Case	Passed		M-OR 12	Otolaryngology	LEFT COCHLEAR IMPLANT



NMB	[-]	Train-of-four objective count	7 mg	4/4
		ROCURONIUM		
		SUGAMMADEX	15 mg	

# Case Report

BP-03: Low Map Prevention < 65 Cases

More Info

Percentage of cases where sustained intraoperative hypotension (MAP < 65 mmHg for 15 mins or more) was avoided

Summary

Passed

Flagged

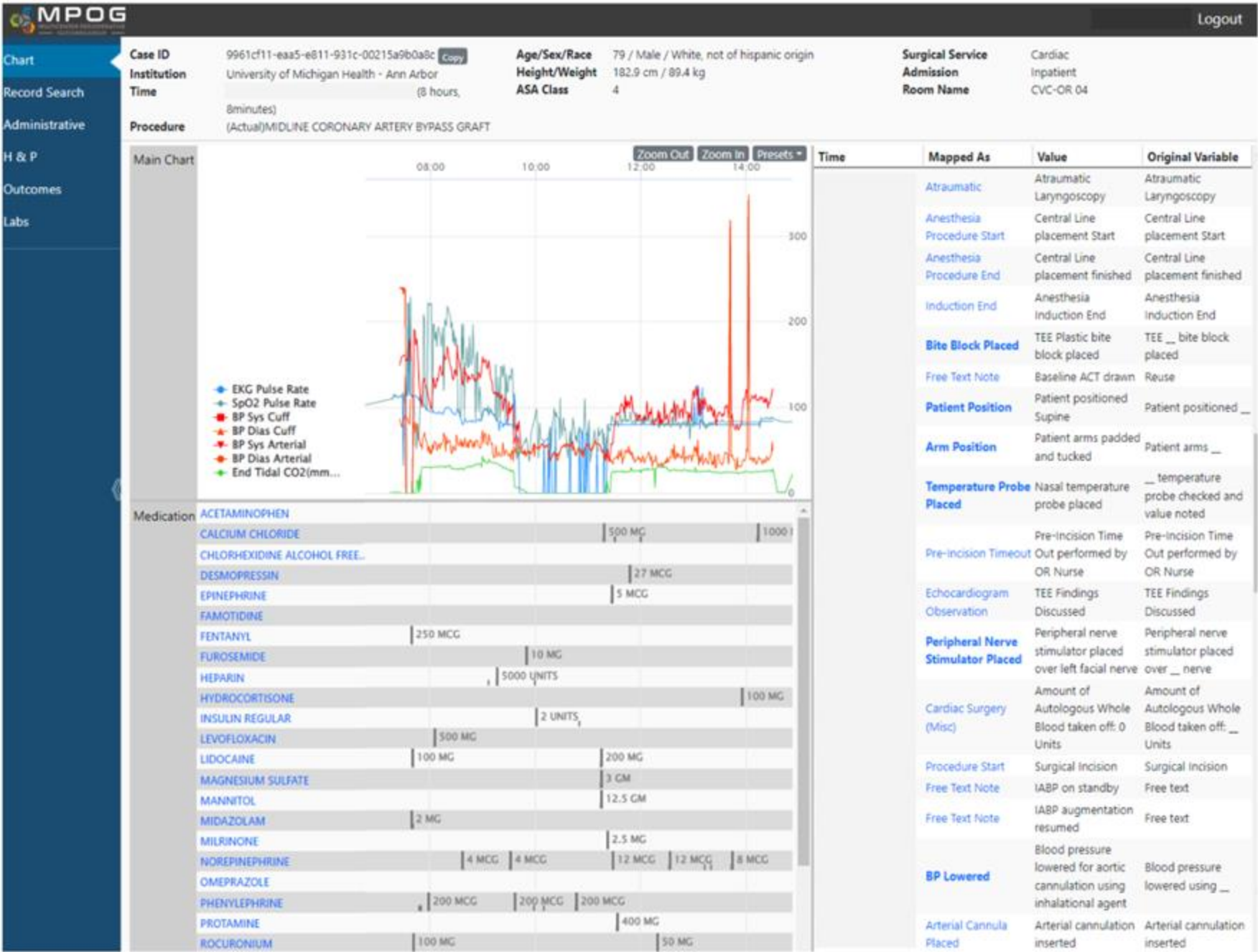
Excluded

Search:

Show 10 entries

View Case	Measure Result	Date of Service	Operating Room	Surgical Service	Procedure	Primary Anesthesia CPT	Measure Result Reason	Attributable Attendings	Attributable CRNA/Resident	MPOG Case ID
<a href="#">View Case</a>	Passed		U-OR 02	Otolaryngology	(Actual)MIDLINE CLOSURE/RECONSTRUCTION OF MOH'S DEFECT	00300	Minutes below 65: 0			2c1cb970-a2e1-ec11-9128-005056b4993c
<a href="#">View Case</a>	Flagged		U-OR 01	General	(Actual)THYROIDECTOMY	00320	Minutes below 65: 18			d31cb970-a2e1-ec11-9128-005056b4993c
<a href="#">View Case</a>	Passed		U-OR 10	Oral / Maxillofacial	(Actual)DENTAL - OBTURATOR ADJUSTMENT BILATERAL WLE W NECK DISSECTIO	00320	Minutes below 65: 0			f11cb970-a2e1-ec11-9128-005056b4993c
<a href="#">View Case</a>	Passed		U-OR 02	Otolaryngology	(Actual)MIDLINE CLOSURE/RECONSTRUCTION OF MOH'S DEFECT	00300	Minutes below 65: 0			221cb970-a2e1-ec11-9128-005056b4993c

Ability to review individual cases and measure performance through MPOG view of anesthetic record

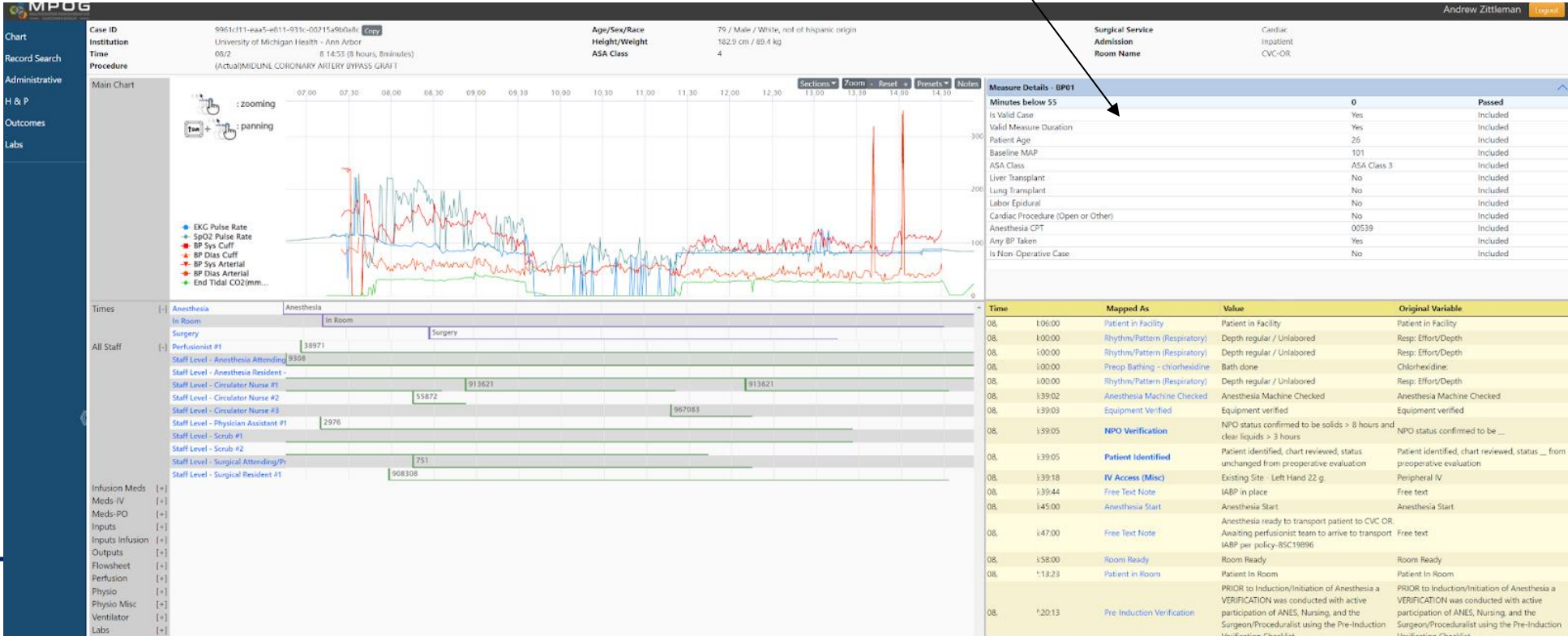


# Web Case Viewer

## Measure Details

The concepts used in the measure are brought to the top above the notes section for easy review

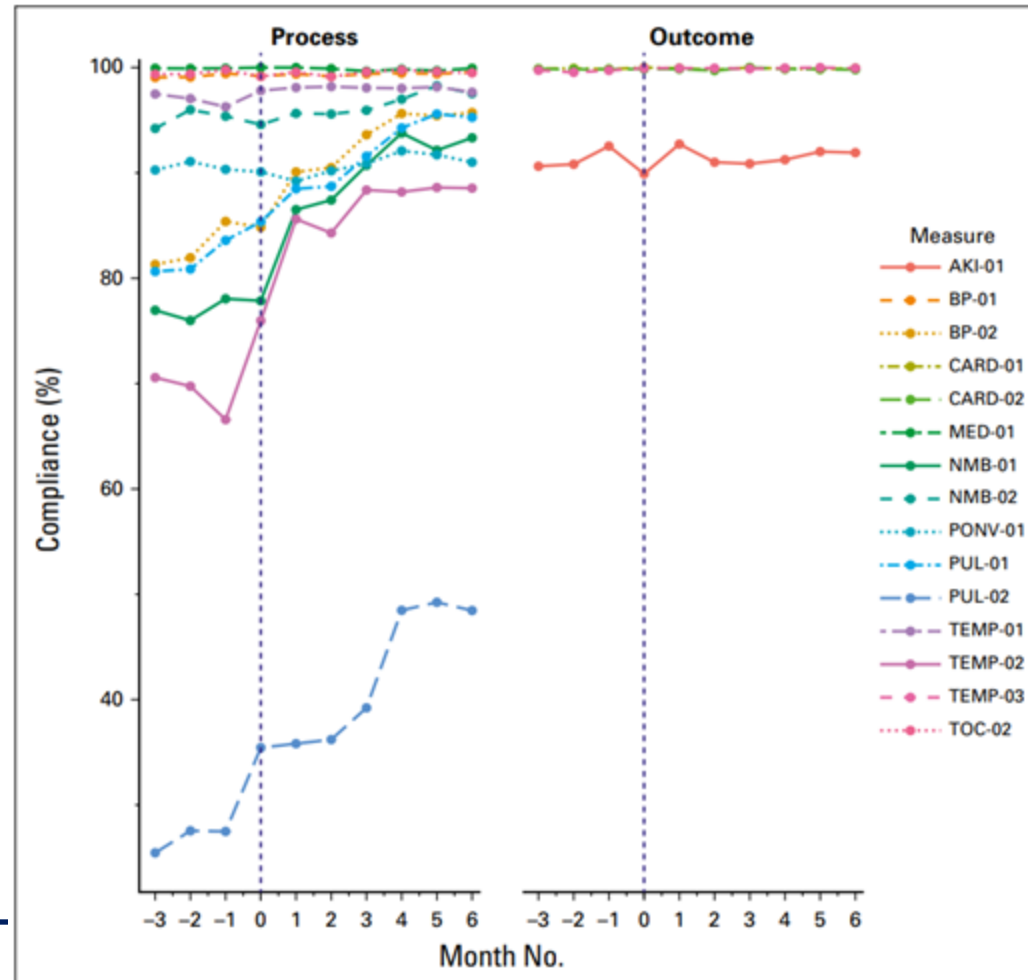
Measure Details - BP01			
Minutes below 55	0	Passed	
Is Valid Case	Yes	Included	
Valid Measure Duration	Yes	Included	
Patient Age	26	Included	
Baseline MAP	101	Included	
ASA Class	ASA Class 3	Included	
Liver Transplant	No	Included	
Lung Transplant	No	Included	
Labor Epidural	No	Included	
Cardiac Procedure (Open or Other)	No	Included	
Anesthesia CPT	00539	Included	
Any BP Taken	Yes	Included	
Is Non-Operative Case	No	Included	





# Improved Compliance With Anesthesia Quality Measures After Implementation of Automated Monthly Feedback

Patrick J. McCormick, MD<sup>1</sup>; Cindy Yeoh, MD<sup>1</sup>; Raquel M. Vicario-Feliciano<sup>2</sup>; Kaitlin Ervin<sup>3</sup>; Kay See Tan, PhD<sup>1</sup>; Gloria Yang<sup>1</sup>; Meghana Mehta, MS<sup>1</sup>; and Luis Tollinche, MD<sup>1</sup>





Thank you