



University of California  
San Francisco



MICHIGAN MEDICINE  
UNIVERSITY OF MICHIGAN



MPOG  
MULTICENTER PERIOPERATIVE  
OUTCOMES GROUP

# VEGA<sup>2</sup>

Norepinephrine vs Phenylephrine to Prevent AKI

**MPOG Retreat - October 10, 2025**

**Clinical Coordinating Center (UCSF)**

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Michael Bokoch, MD PhD (Study Director)  
Niel Panchal (CRC)  
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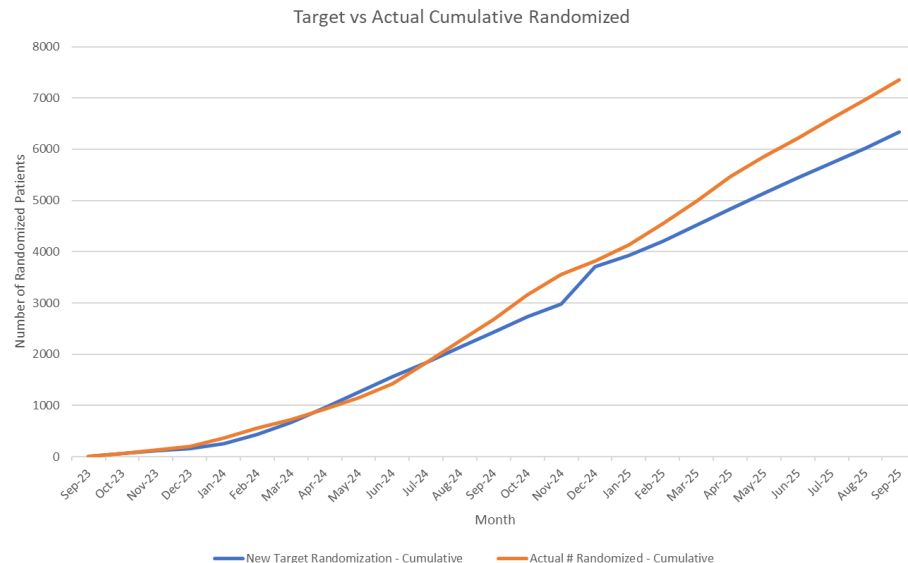
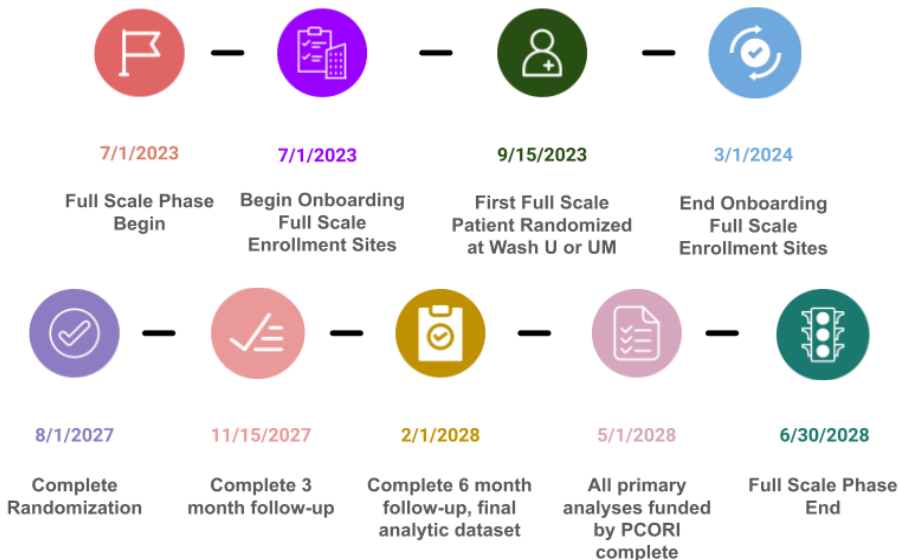
**Data Coordinating Center (Michigan/MPOG)**

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Douglas Colquhoun, MD (Study Director)  
Rebecca Pantis (Project Manager)

# Disclosures

- No personal consulting, financial, or board membership with any related company
- I am a PI or Co-I on projects that receives or has recently received grant funding from:
  - PCORI
  - NIH
    - NHLBI K23 - K23HL166685
    - NHLBI - R01HL167790
    - National Library of Medicine - 1R01LM01389401
    - NIDDK - R01DK133226
    - **NIDDK - R01DK139484**
    - NIH NIGMS T32 Research Fellowship Grant – 5T32GM103730-07 (concluded)
  - Haisco-USA Pharmaceuticals, Inc.
  - Bio Intellisense, Inc.

# THRIVE (brief) Update



# Precision Feedback (brief) Update

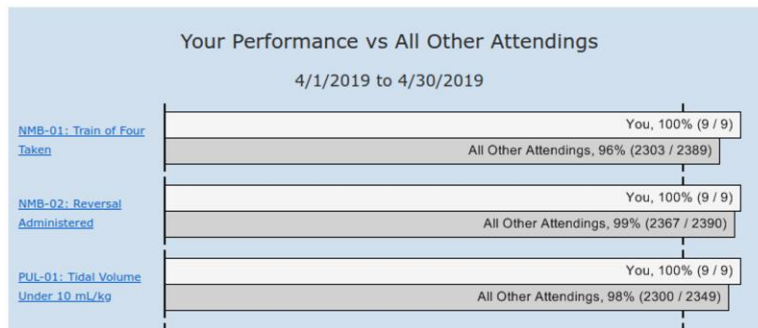
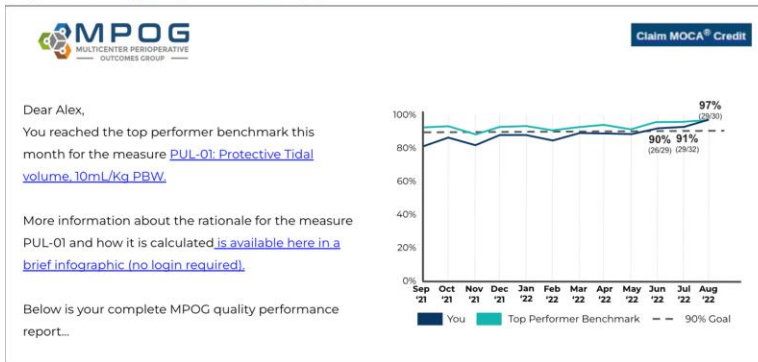
- Control: Standard “one-size-fits-most” performance feedback email
- Intervention: “Precisionized” message
- Outcomes: care quality for improvable measures and email engagement (click-through and dashboard login rates)
- 48 MPOG sites participated between the pilot study and full trial
  - Thank you!!!
- Data collection is complete and currently analyzing the data

From: [mpog-quality@med.umich.edu](mailto:mpog-quality@med.umich.edu) <[mpog-quality@med.umich.edu](mailto:mpog-quality@med.umich.edu)>

Sent: Wednesday, May 22, 2019 12:04 PM

To:

Subject: MPOG Quality Personalized Performance Report





Norepinephrine vs Phenylephrine to Prevent AKI

**The choice of vasopressor to prevent postoperative acute kidney injury after major non-cardiac surgery: a multicenter pragmatic cluster cross-over randomized trial**

- NIH-funded 10-center pragmatic cluster cross-over randomized trial
- Aim to recruit >18,000 patients over 120 center•months
- Compares phenylephrine to norepinephrine
- Primary outcome: Acute Kidney Injury

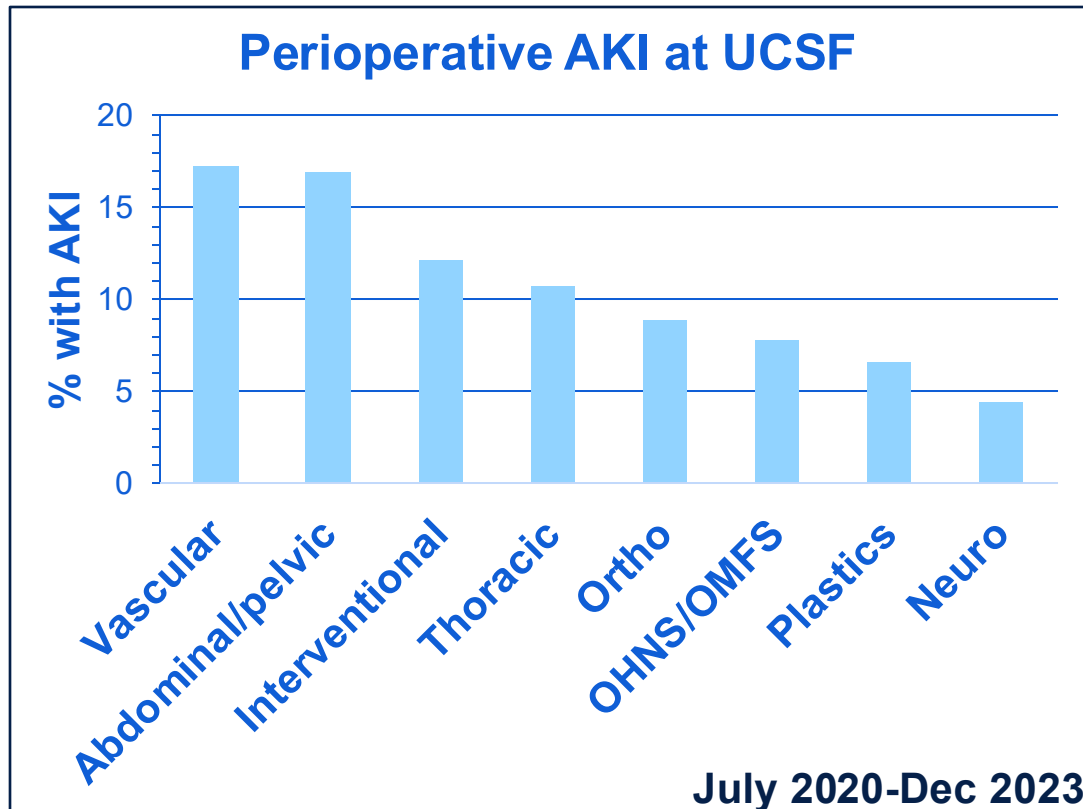
# Thank you for engagement across MPOG!

- Invited sites include:

- Duke University
- Henry Ford Health System
- University of California San Francisco
- University of Maryland
- University of Michigan
- University of Texas Southwestern
- University of Toronto
- University of Virginia
- University of Washington
- Wake Forest

# Background and VEGA-1

# Acute Kidney Injury (AKI) after major non-cardiac surgery



- **UCSF overall 10.5%**
- **MPOG centers overall 9.0%**  
(range 6.8 to 12.3%)

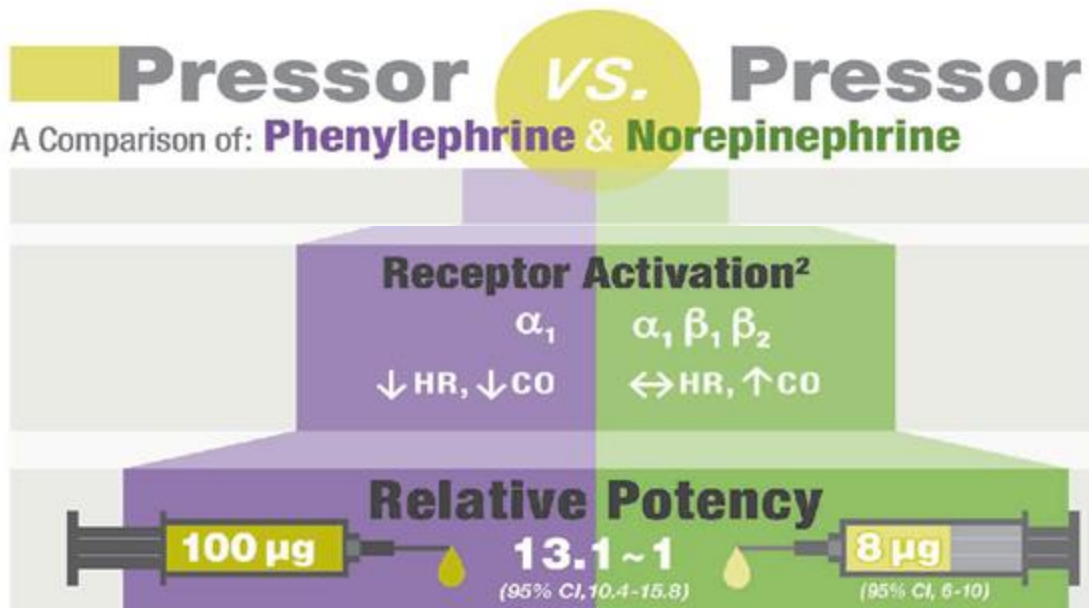
**Key knowledge gap:**

*“Can the choice of vasopressor reduce postoperative AKI?”*



# Two 1<sup>st</sup>-line vasopressors with different pharmacodynamics

- NE improves renal blood flow & outcomes in septic shock
  - One RCT has directly compared these in *non-cardiac*, non-obstetric surgery
- **VEGA-1 Trial**
- **UCSF + UCLA 2021**



Wanderer JP and Rathmell JP (2017) *Anesthesiology*

# “Vasopressor of the Month” Trial



**norepinephrine 8 mcg/mL**

DATE: Feb. 4, 20 INIT:

TIME: 1 2 3 4 5 6 7 8 9 10 11 12 AM PM

**VS.**

**phenylephrine 100 mcg/mL**

DATE: Nov. 4, 20 INIT:

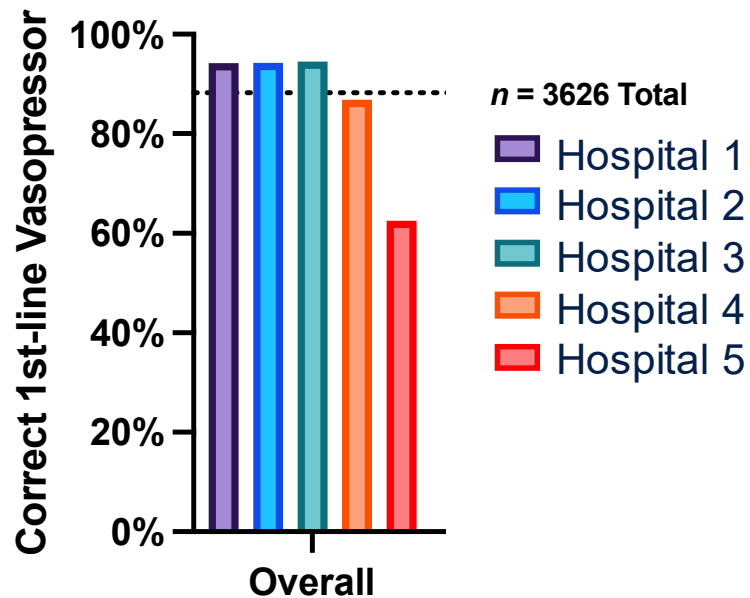
TIME: 1 2 3 4 5 6 7 8 9 10 11 12 AM PM



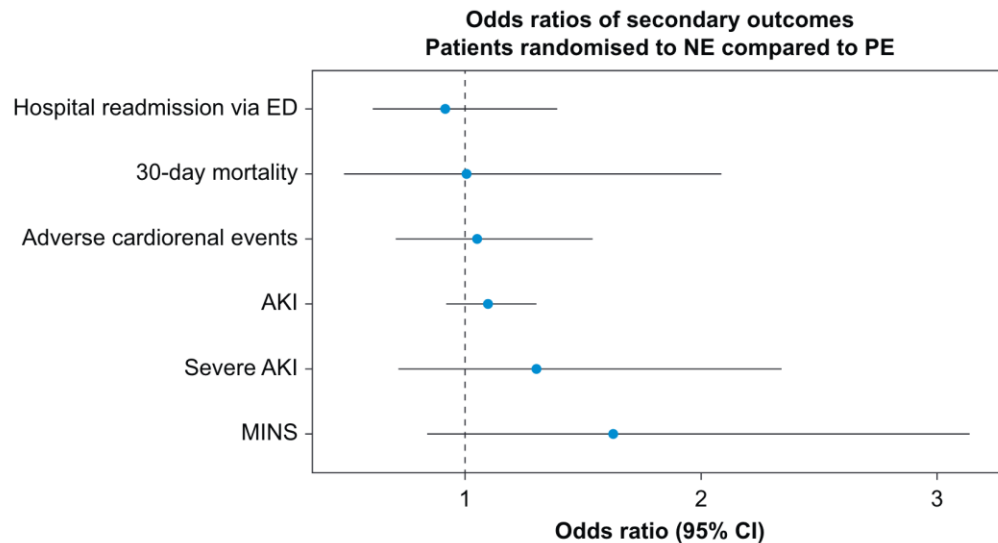
Legrand M *et al.*, British Journal of Anaesthesia, 130 (5): 519-527 (2023)

# VEGA-1 Results

## Primary Outcome (Compliance)



## Secondary Outcomes



# The question remains...

- Recent trials and observational studies validate interest and a continued gap that VEGA-2 will address

The image displays three overlapping covers of the British Journal of Anaesthesia (BJA). The most prominent cover on the right is the March 2025 issue (Volume xxx, Issue xxx, Page xxx-xxxx). It features a blue header with the BJA logo and the text 'PERIOPERATIVE MEDICINE'. The main title of the featured article is 'Continuous versus bolus norepinephrine administration to treat hypotension after induction of general anaesthesia in low-to-moderate risk noncardiac surgery patients: a randomised trial', categorized as a 'CLINICAL INVESTIGATION'. The authors listed are Kristen K. Thomsen<sup>1,2,\*,†</sup>, Finn Külls<sup>1,†</sup>, Christina Vokuhl<sup>1</sup>, Linda Krause<sup>3</sup>, Dominik Müller<sup>1</sup>, Max Bossemeyer<sup>1</sup>, Mirja Wegge<sup>1</sup>, Alina Kröker<sup>1</sup>, Alina Bergholz<sup>1</sup>, Christian Zöllner<sup>1</sup>, Daniel I. Sessler<sup>2,4</sup>, and Bernd Saugel<sup>1,2</sup>. The journal's website, doi: 10.1016/j.bja.2025.03.017, and the advance access publication date (xxx) are also noted.

The middle cover shows a similar layout with the title 'Continuous versus bolus norepinephrine administration to treat hypotension after induction of general anaesthesia in low-to-moderate risk noncardiac surgery patients: a randomised trial'.

The leftmost cover shows the title 'Association of norepinephrine administration with outcomes in patients with hypotension after induction of general anaesthesia: a randomised trial'.

# The VEGA-2 trial

<https://clinicaltrials.gov/study/NCT06802224>

R01DK139484

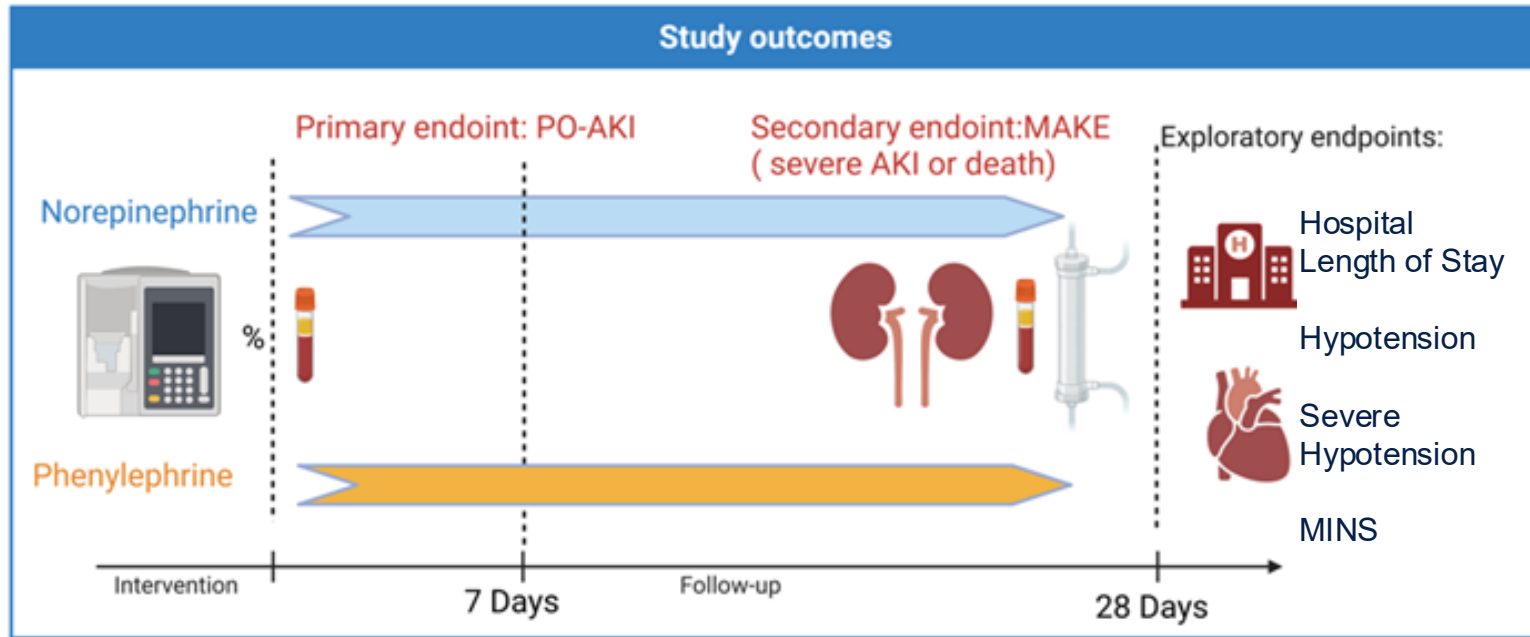
# VEGA-2 trial overview

- Aim to recruit 18,000-36,000 patients over 120 center•months
- 10 centers (MPOG sites) across North America, 14 months each (2 months run-in)
- 90% power to detect a 1.5% absolute difference in AKI
- Intervention:
  - Use 1 of 2 first-line vasopressors for INFUSIONS and BOLUSES in major non-cardiac surgery
    - Norepinephrine (4-16 mcg/mL)\*
    - Phenylephrine (100-200 mcg/mL)\*

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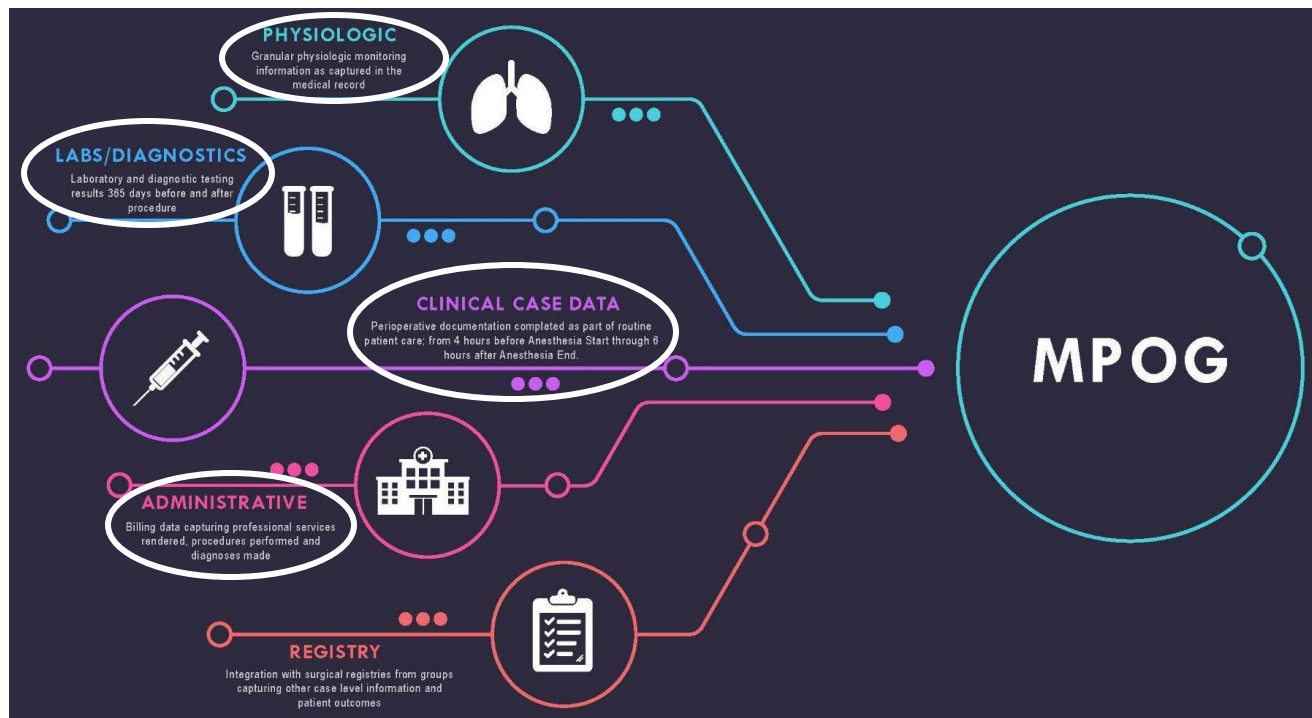
\* Flexible to comply w/ local pharmacy practices

# VEGA-2 Trial Outcomes



- AKI as defined by KDIGO (creatinine-based) criteria

# VEGA-2 Data Flow & Processing





# VEGA-2: broad eligibility

- **Inclusion criteria**

- Age  $\geq 18$
- Surgery > 2 h under General Anesthesia

UCSF IRB #23-39683

<Central IRB>

Approved waiver of  
individual consent!

- **Exclusion criteria**

- Cardiac, ECMO, obstetric, transplant, or procedures on the kidney
- Outpatient procedures
- ASA status 5 or 6, end-stage renal disease, or on vasopressors prior to surgery
- *Local protocol at your Center that recommends a specific vasopressor*

- Eligibility automatically determined from EMR afterwards

- *You don't have to worry about eligibility of any individual patient*

# VEGA-2: Cluster Randomized Cross-over Design

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	...	Month 14
UCSF	NE	PE	NE	PE	NE	PE	NE		PE
Univ. of Michigan	PE	NE	PE	NE	PE	NE	PE		NE

NE, norepinephrine; PE, phenylephrine

# VEGA-2: Cluster Randomized Cross-over Design

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	...	Month 14+
UCSF	NE	PE	NE	PE	NE	PE	NE		PE
Univ. of Michigan	PE	NE	PE	NE	PE	NE	PE		NE
Center #3			NE	PE	NE	PE	NE		PE
...									
Center #10					NE	PE	NE		PE

NE, norepinephrine; PE, phenylephrine

# VEGA-2: Cluster Randomized Cross-over Design

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	...	Month 14+
UCSF	NE	PE	NE	PE	NE	PE	NE		PE
Univ. of Michigan	PE	NE	PE	NE	PE	NE	PE		NE
Center #3			NE	PE	NE	PE	NE		PE
...	Run-in Period (1 <sup>st</sup> two months)								
Center #10					NE	PE	NE		PE

NE, norepinephrine; PE, phenylephrine

# VEGA-2 Current Status

# VEGA-2 trial status update

- Funding awarded September 2024
- As of October 2025:
  - 4/10 sites active
    - UCSF, University of Michigan, University of Virginia, University of Maryland
    - Adherence is excellent due to the hard work of site PIs and MPOG community
  - 2 sites “going live” on 11/1/2025
    - University of Texas Southwestern, Wake Forest
  - Actively onboarding the 4 remaining sites
  - 12/120 center•months underway (10% by the end of October!)
  - > 6,000\* patients included (\*this includes pilot months)

# VEGA-2 trial status update

Monthly emails at time of vasopressor change

Emails on the 1<sup>st</sup> Monday of each month for vacations the prior week

Morning page the day of the vasopressor change

Badge cards

Posters (ORs, lounges, tech rooms, pharmacy and pharmacy anterooms)

MiChart reminders in the side panel

Reminder cards in OR anesthesia cart clear bins

Reminder cards on the Pyxis

Bin of the “vasopressor-of-the-month” on the pharmacy window ledge

Anesthesia monitor displays

Reminder treats!



# VEGA-2 trial status update

- Adherence *estimates* are outstanding
  - >84% “vasopressor of the month” adherence across active sites\*
    - \*includes pilot months and washout days at the beginning of each month
- Intended to include 10 centers (MPOG sites) across North America, 14 months each (2 months run-in) with staggered “go-live”
  - Last pair of sites “go-live” by May 2026
  - Intervention period will continue through June 2027



Thank You and Questions?