



Summer Meeting

Legacy Lodge at Lake Lanier Islands
July 12-14

Syllabus



Activity Directors:
Nerlyne Jimenez, MD
Tina Shah, MD

Jointly Provided by...



American Society of
Anesthesiologists

ASA: Working for You

Ronald L. Harter, MD, FASA | President

July 13, 2024



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Disclosures & Objectives

- Nothing to disclose
- Objectives: Participants will learn
 - How ASA is working nationally and in the states to address current challenges
 - Key trends facing the specialty in the marketplace, legislative, and regulatory arenas
 - ASA's increased focus on delivering value for members

We are ASA: Leaders in Patient Safety

Mission: Advancing the practice and securing the future

Vision: A world leader improving health through innovation in quality and safety

Values: Patient safety, physician-led care and scientific discovery

Strategic Pillars

1. Advocacy
2. Patient Safety, Quality & Practice Advancement
3. Educational Resources
4. Member Engagement
5. Leadership & Professional Development
6. Research & Scientific Discovery
7. Stewardship of the Society & Specialty

Special "Thank you" to...

ASA Director & Alternate Director



William Robert Lane Jr., MD,
MBA, FASA
*Director, Georgia Society of
Anesthesiologists*



Steven Sween, MD, FASA
*Alternate Director, Georgia
Society of Anesthesiologists and
Past Speaker, ASA House of
Delegates*

ASA Past Presidents

- 1965 – Perry P. Volpitto, MD
- 1970 – John E. Steinhaus, MD, FACA
- 1999 – John B. Neeld Jr., MD, FACA

Anesthesiologists of Note

- Michelle Au, MD, Georgia House of Representatives (District 50)

Special "Thank you" to...

State Component Officers

- Korrin Scott Ford, MD, FASA, President
- Rachel Steckelberg, MD, President-Elect
- Stephen Anderson, MD, Vice President
- Shaun Williams, MD, FASA, Secretary/Treasurer
- Keith Johnson, MD, FASA, Immediate Past President

ASA Committee Chairs

- Matthew A. Klopman, MD, FASA, Committee on Occupational Health

In Memoriam



John B. Neeld Jr., MD, FACA
Past President
American Society of Anesthesiologists
(1999)

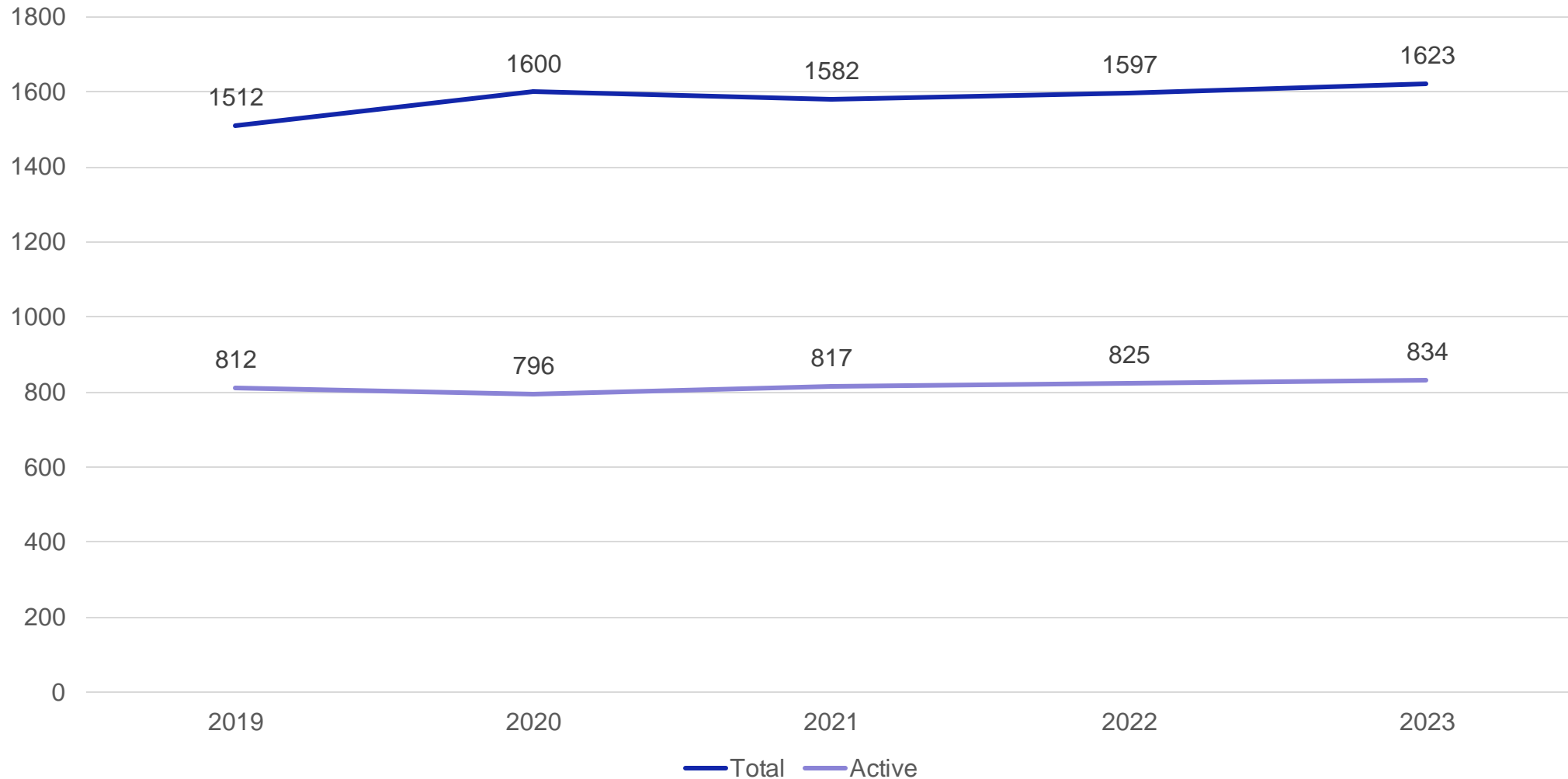
Membership



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Georgia Society 5-Year Member Count



Early-Career Membership Program

- Aimed at retaining and building loyalty after training
- Customized for graduating residents and fellows
- Offers simple no-fuss discounted three-year ASA membership
- Wealth of educational and professional development resources designed for newly minted anesthesiologist


Learn more about the program:
asahq.org/ecmp

Clinical and career resources showcased monthly, along with courses from their Early-Career (EC) Education Package

EC year 2 most engaged, followed by year 1 and 3

SIMPLIFY. STREAMLINE. ACCELERATE. ENJOY THESE RIGHT-FOR-RIGHT-NOW RESOURCES.

YOUR EARLY-CAREER MEMBERSHIP PROGRAM



APRIL SPOTLIGHT

May the malpractice odds be ever in your favor

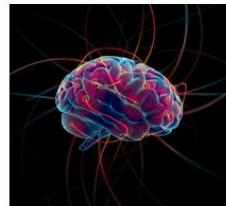
1 in 14 anesthesiologists will face a malpractice claim this year. This surprisingly easy-to-read guide can help you understand the law, reduce your risk, and navigate a lawsuit.

[DOWNLOAD NOW →](#)

Do you know your value proposition?


A term borrowed from marketing, your value proposition lays out how you demonstrate clinical, leadership, and strategic excellence. Ideal for responding to requests for proposals, it's best developed before you need it. See how. [Craft your value proposition.](#)

BRAIN BITES



Give your mind a workout

Don't miss the chance to try out anesthesiologists' favorite CME on us. Your early-career membership includes top ASA titles, including ACE. Answer 100 multiple choice questions (complete with detailed discussion) to keep your knowledge sharp. [View your dashboard.](#)



Be a mentor. Get mentored.

[CREATE YOUR PROFILE](#)

Diversity, Equity, and Inclusion



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DEI Goals

ASA will strive to:

1. Meet the interests, maximize the contributions, and advance the professional development of all members
2. Strengthen engagement by ensuring that all members are encouraged to express their views and share their experiences
3. Treat all members with fairness, respect, and dignity
4. Be recognized as a diverse, equitable, and inclusive organization
5. Ensure that this culture of inclusion is integrated throughout the strategic pillars and initiatives of ASA

ASAPAC Update



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Special "Thank you" to...

Georgia 2024 (YTD) ASAPAC Contributors

- Stephen Anderson
- Mary Arthur
- Laurie Barone
- Ashley Bartels
- Brandon Bowman
- Caitlin Bradley
- Kurt Briesacher
- Andrea Corujo Rodriguez
- William Daniel
- Melissa Darlington
- Heather Dozier
- Justin Ford
- Korrin Ford
- Gregory Foster
- Maurice Gilbert
- Ryan Goldsmith
- Matthias Grube
- Kimberley Haluski
- Julius Hamilton
- Judith Handley
- Anne Hartney-Baucom
- Darren Hyatt
- Kenneth Ike
- Keith Johnson
- Philip Kalarickal
- Ryan Kissinger
- Matthew Klopman
- John Lane
- William Robert Lane Jr.
- Jason Lemons
- Monique Lotner
- Grant Lynde
- Christa McCurry
- Anne McKenzie-Brown
- Catherine Meredith
- Jefferey Mills
- Phillip Mills
- Katie Monroe
- Kathleen Nissman
- Chinedu Okpukpara

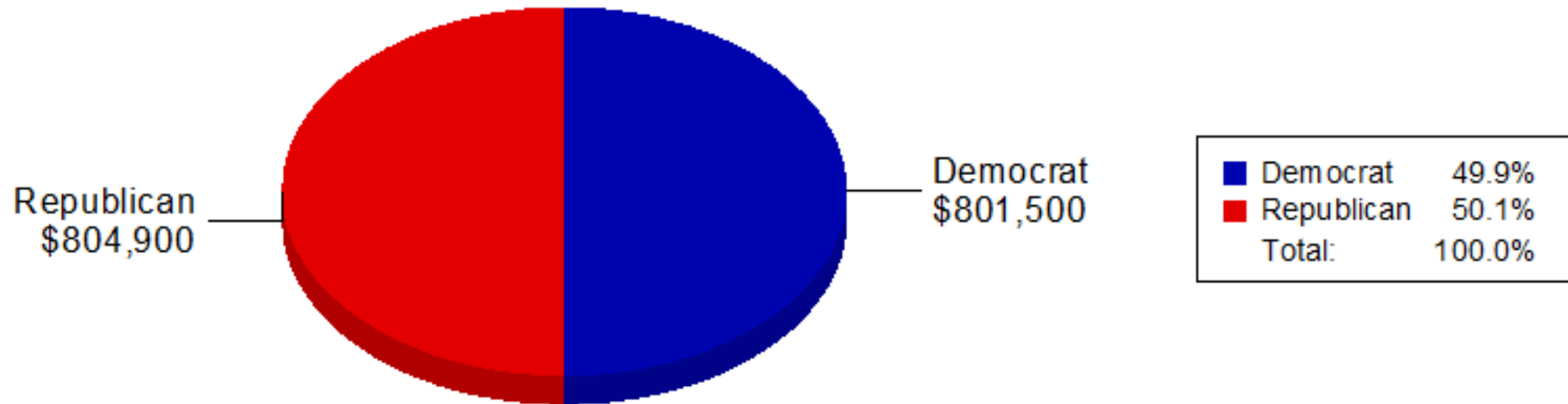
Special "Thank you" to...

Georgia 2024 (YTD) ASAPAC Contributors (*continued*)

- Oluwatosin Oladipupo
- Isaac Osei
- Chhaya Patel
- Gaurav Patel
- Manish Patel
- Paras Patel
- Vijal Patel
- Ravi Pathak
- Keith Phillippi
- Melissa Rader
- David Reehl Jr
- Madelinn Rice
- Benz Sawhney
- Joanna Schindler
- Lingesh Sivanesan
- Rachel Steckelberg
- John Stephenson
- Jennifer Stever
- Jeffrey Sugarman
- Lindsay Sween
- Steven Sween
- Kristine Tindol
- Jordan Wetstone
- Shaun Williams
- Robert Winham
- Stacie Wong
- Jason York

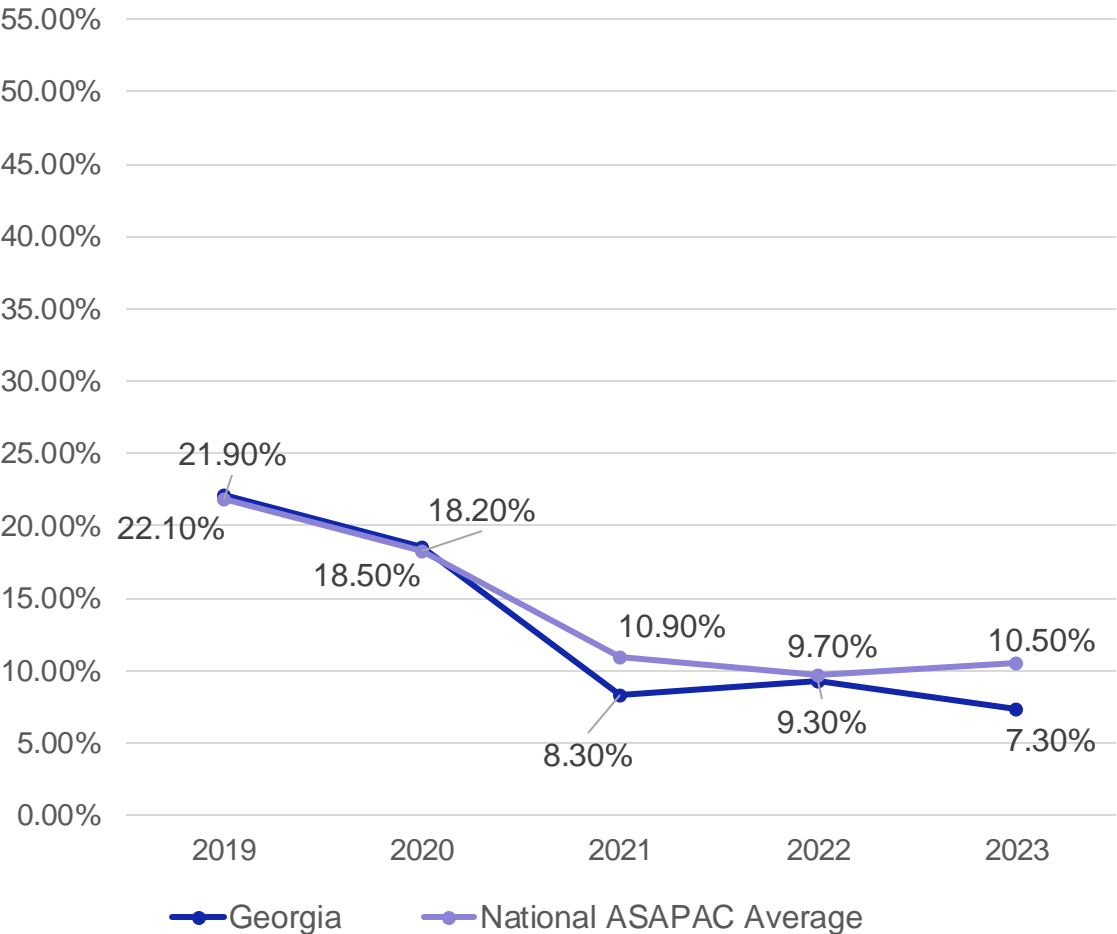
ASAPAC's Balanced Giving Continued in 2022

Total Expenditures by Party



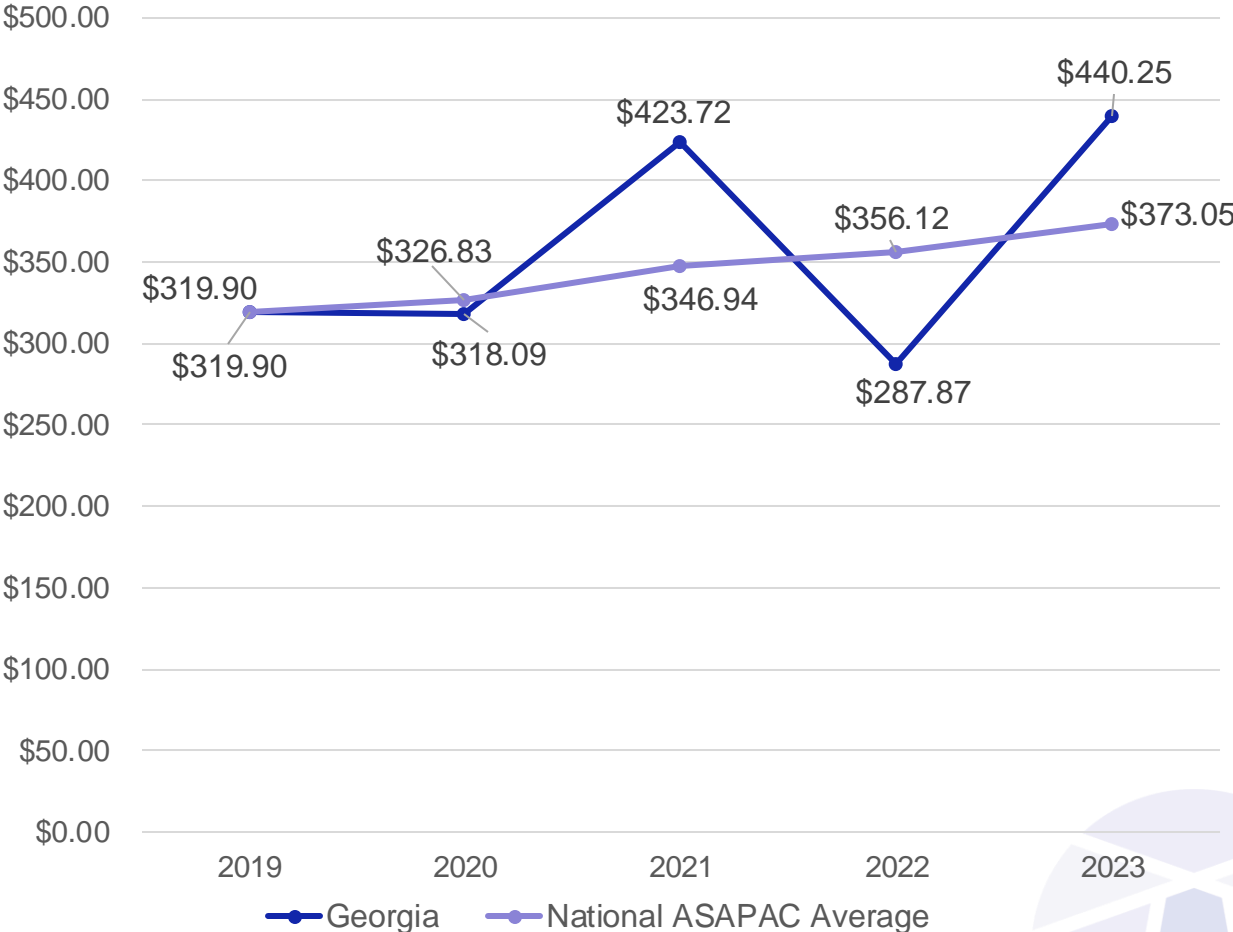
Georgia ASAPAC Member Averages vs. National ASAPAC Averages

% of Members Who Contributed



ASAPAC's Fiscal Year 2024 national average participation rate is 4.2%, as of May 31, 2024. (Fiscal Year 2024 runs from October 1, 2023 – September 30, 2024).

Average Contribution



ASAPAC's Fiscal Year 2024 national average contribution is \$354.42, as of May 31, 2024. (Fiscal Year 2024 ran from October 1, 2023 – September 30, 2024).

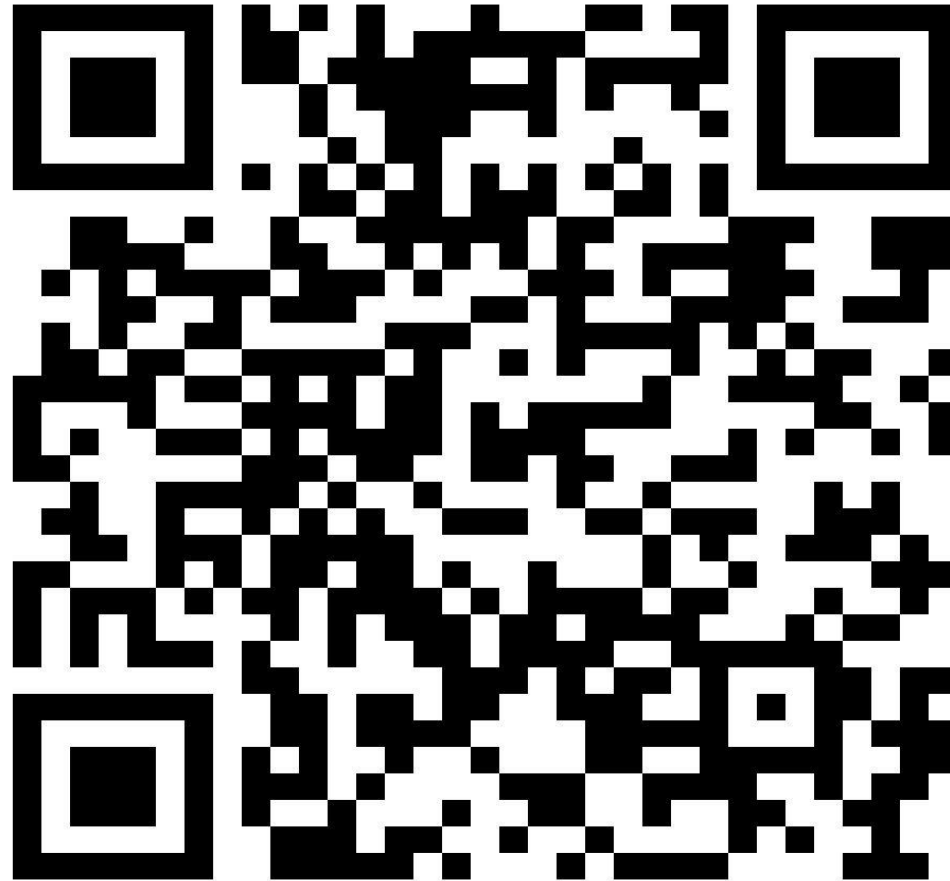
Fiscal Year 2023 Participation: Residency Programs

Platinum Status Residency programs who achieve 100% ASAPAC participation	Gold Status Residency programs who achieve at least 75% ASAPAC participation	Silver Status Residency programs who achieve at least 50% ASAPAC participation	Bronze Status Residency programs who achieve at least 25% ASAPAC participation
<ul style="list-style-type: none">• Baylor Scott and White• Cleveland Clinic Florida• Mayo Clinic Arizona• Mayo Clinic Florida• Mount Sinai• Ochsner Health• Tulane University• University of Louisville• University of Miami Medical Center/Jackson Health System• University of Nebraska Medical Center	<ul style="list-style-type: none">• Medical College of Wisconsin• University of Mississippi	<ul style="list-style-type: none">• University of Buffalo	<ul style="list-style-type: none">• Cleveland Clinic South Point• Riverside University Health System• University of Connecticut

2022 Election Cycle – ASAPAC is #1 again!

Organization	Dollar Amount	
American Society of Anesthesiologists PAC	\$3,950,530	Blue Cross Blue Shield
American Association of Orthopaedic Surgeons PAC	\$2,167,926	\$3,731,753
American Dental Association PAC	\$2,143,337	
American College of Radiology PAC	\$1,935,074	
American College of Dermatology PAC (SKINPAC)	\$1,792,866	American Medical Association
American College of Emergency Physicians PAC	\$1,677,334	\$1,780,757
American Academy of Ophthalmology	\$921,776	
American College of Ob-Gyns	\$830,418	
American Academy of Family Physicians	\$684,730	
American College of Surgeons Professional Assn PAC	\$664,357	
American College of Cardiology PAC	\$646,194	
American Osteopathic PAC	\$590,037	

ASAPAC QR Code – Don't Leave Home Without It!



ASA Grassroots Network



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***Join the
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Network***

Advocacy Update



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2023: Year in Review



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2023 Review

- **Federal Scope of Practice**
 - ✓ Defeated AANA national Medicare “opt-out” campaign
- **State Scope of Practice**
 - ✓ Defeated 18 CRNA scope bills
 - ✓ Defeated 7 APRN Compacts
- **Opt-Outs**
 - WY (partial)*, DE (full), CO (full)*
- **New Medical Title Protection Laws (3)**
 - ✓ GA, ND (Truth in Advertising only), OR (FL, *Governor vetoed*)
- **New Certified Anesthesiologist Assistants Practice Laws (2)**
 - ✓ NV, NM



2023 Review *(continued)*

- Other accomplishments

- ✓ ASA/Bonnie Milas, MD, advocacy for OTC naloxone
- ✓ Joint amicus briefs in support of winning Texas Medical Association (TMA) No Surprises Act lawsuits
- ✓ Medicare anesthesiology teaching rule – more than \$600 million

FDA NEWS RELEASE

FDA Approves First Over-the-Counter Naloxone Nasal Spray

Agency Continues to Take Critical Steps to Reduce Drug Overdose Deaths Being Driven Primarily by Illicit Opioids

Judge Rules Against No Surprises Act Implementation in Texas Medical Association Lawsuit

2024: News Impacting Anesthesiology



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Massachusetts BCBS Colonoscopy

Home // Local Coverage // Health

Blue Cross halts controversial colonoscopy changes after backlash from doctors

Updated January 25, 2024

By [Priyanka Dayal McCluskey](#)

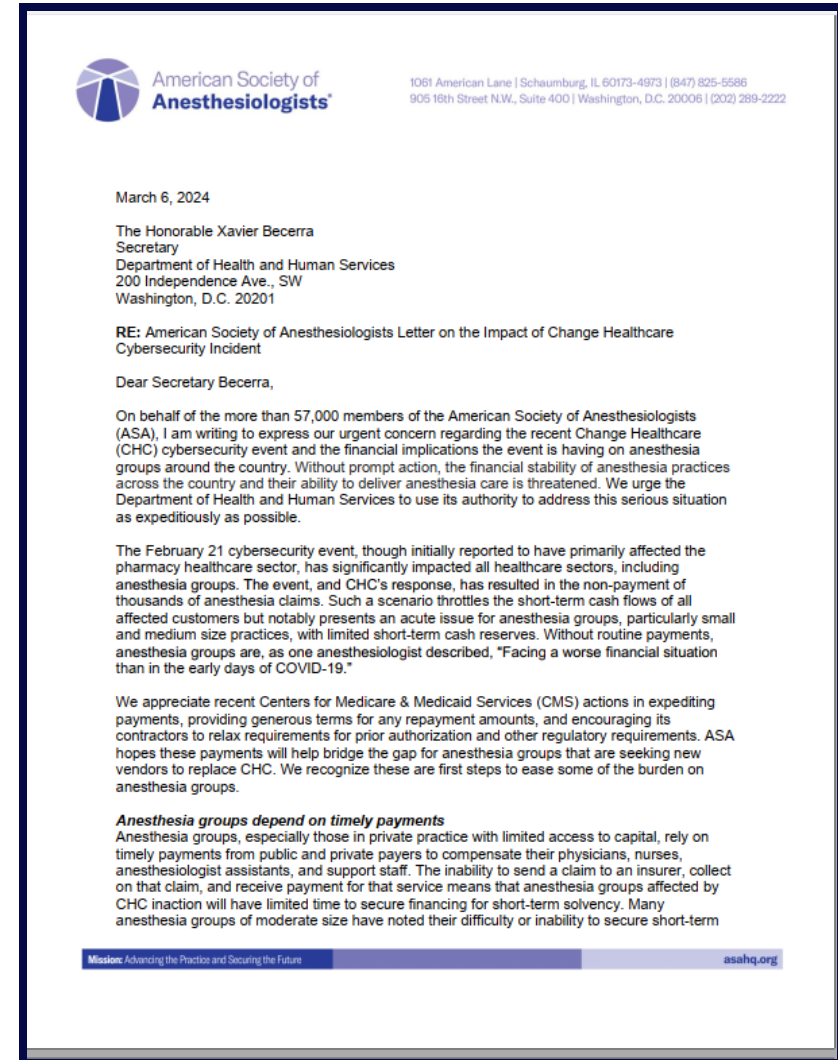


“The policy took effect Jan. 1, drawing outrage from doctors who worried it would slow their productivity and discourage patients from getting a potentially life-saving procedure over fears of discomfort and pain. Doctors had lobbied Blue Cross officials to reconsider the changes, [WBUR reported earlier this month](#).”

Change Healthcare Shutdown

“Without prompt action, the financial stability of anesthesia practices across the country and their ability to deliver anesthesia care is threatened. We urge the Department of Health and Human Services to use its authority to address this serious situation as expeditiously as possible.”

ASA President Ronald L. Harter, MD, FASA, to HHS Secretary Xavier Becerra on March 6, 2024



Physical Status Modifiers Change

- In April, Blue Cross Blue Shield (BCBS) state affiliates announced they will no longer provide additional payment for physical status modifiers III, IV, and V
- Aetna announced they are eliminating similar payments for physical status modifiers as well
- **ASA Action**
 - ASA strongly opposes this policy change and is actively pursuing its reversal
 - Contacted BCBS and Aetna to express vehement opposition
 - Supporting state component societies
 - Encouraging states to express concern to insurance commissions, state hospital associations, and legislators

Physical Status Modifiers Change

- **Private Insurance is going against good medicine and current trends**
- Medicare is increasingly recognizing patient complexity as an important factor for patient-centered care:
 - G2211 Code recognizes complexity in primary care
 - Patient complexity a factor in MIPS Performance Category Scores
 - Social Determinants of Health may be used to risk adjust several hospital-based measures

If you have been notified by your BCBS state affiliate or another payer implementing this policy change, ASA can assist your efforts. **Contact our Department of Payment and Practice Management: ppm@asahq.org**

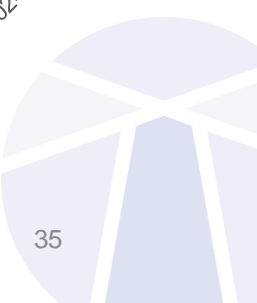
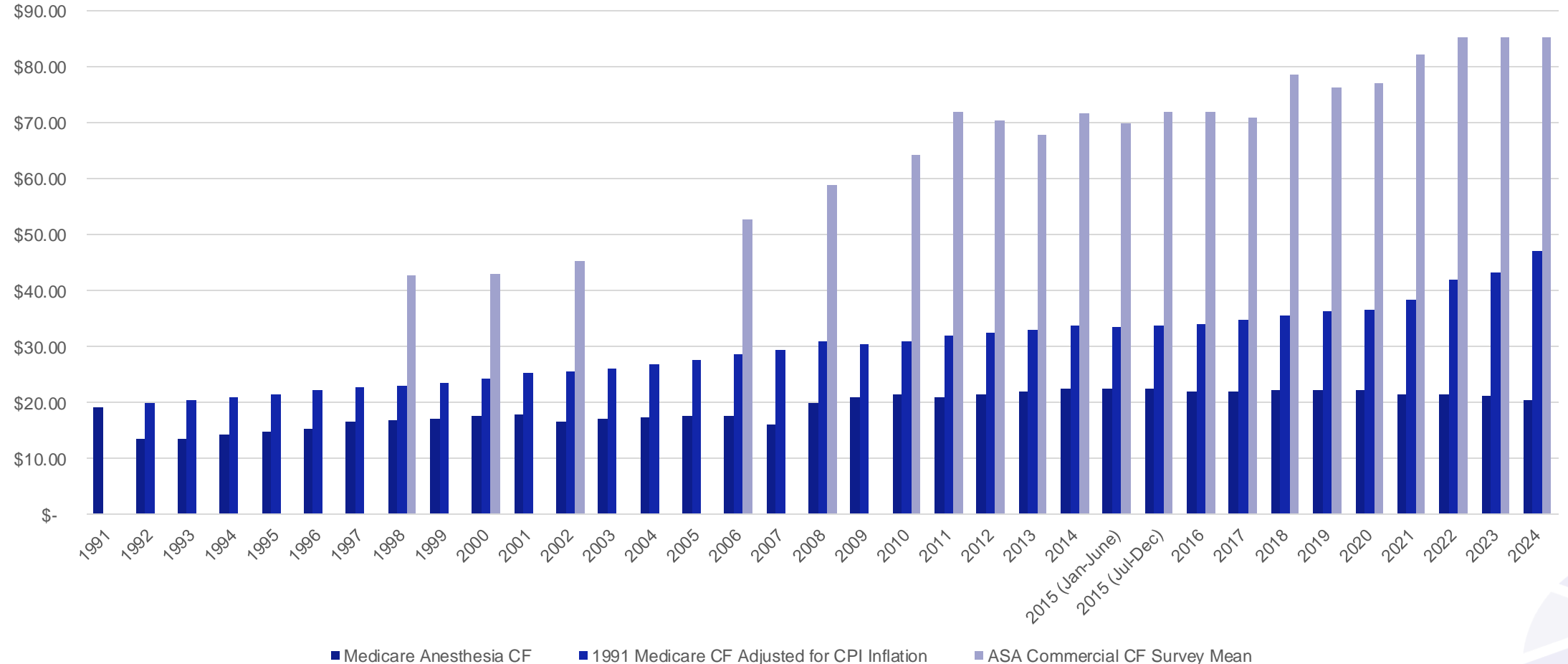
Medicare: Broken Payment System



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Medicare Anesthesia Payment Trends

Medicare Anesthesia Payment Trends



Medicare Payments – 2024 Rates

Some “doc fix” relief - but nowhere near enough

- Offset of 1.66% of the 3% plus cut included in March government funding package
- No retroactive fix included
- CMS announced new official conversion factors, effective March 1, 2024: Anesthesia conversion factor is \$20.77 and the RBRVS conversion factor is \$33.29

Final 2024 Medicare Fee Schedule Rule

	2023 CF	Proposed 2024 CF	Final 2024 CF	Percent Change (2023 to 2024)
Anesthesia	\$21.12	\$20.44	\$20.77	-1.68%
RBRVS	\$33.89	\$32.75	\$33.29	-1.76%

Breaking News - 2025 Medicare Physician Fee Schedule Proposed Rule

- The Centers for Medicare and Medicaid Services (CMS) released the 2025 Medicare Physician Fee Schedule proposed rule on July 10, 2024
 - **Anesthesia Conversion Factor reduction of 2.1%, to take effect Jan. 1, 2025**
 - **The resource-based relative value scale unit rate, used for payment of pain, critical care, and other physician services, will face a 2.8% cut**

	2024 CF	Proposed 2025 CF	Percent Change
Anesthesia	\$20.77	\$20.33	-2.10%
RBRVS	\$33.29	\$32.36	-2.80%

- CMS also announced that they are accepting the new Fascial Plane Block codes that **ASA worked to create and accepted our recommendations for their valuation.** Effective Jan. 1, 2025, CMS will pay for the performance of these blocks.

Medicare Payment – Fundamental Reforms Needed

Issue:

- Current CMS Medicare physician formula:
 - Lags annual inflation
 - Includes budget neutrality mechanism
 - Causes cuts or freezes every year



ASA Action:

- *Strengthening Medicare for Patients and Providers Act* (H.R. 2474) – add mandatory annual inflation adjustment
- *Provider Reimbursement Stability Act of 2023 (H.R. 6371)*
 - reforms budget neutrality mechanism

No Surprises Act Implementation



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No Surprises Act (NSA): Regulatory Update

- Regulation pending (expected September 2024)
 - Possible content
 - Insurers required to provide more information, including codes to more clearly identify if claim is eligible for federal or state dispute resolution process
 - Permits batching by anesthesia body part CPT range
 - Shortens 90-day cooling-off period
 - Key ASA requests
 - Batching by insurer conversion factor (CF)
 - Enforcement mechanism for post-independent dispute resolution (IDR) 30-day payment requirement

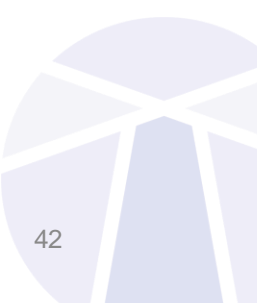
No Surprises Act: New Data

- Key findings from data release of June 13, 2024
 - Provider initiated disputes
 - 2023 Q3 - 63,395 of 69,295 (78% win rate)
 - 2023 Q4 - 279,492 of 313,314 (85% win rate)
 - Dispute by health plan type - partial or fully self-insured
 - 2023 Q3 - 43,379 of 69,294 (63%)
 - 2023 Q4 - 187,841 of 313,314 (60%)
 - NSA fees
 - 2023 Q3 - \$27M (adm) and \$21M (IDR)
 - 2024 Q4 - \$21M (adm) and \$36M (IDR)

No Surprises Act: New Data (continued)

CPT Range	Specialty	Median Prevailing offer as % of QPA	Total Number of Payment Determinations	Total Number of Items or Services
99281 - 99288	Emergency Department Services	227%	27,496	35,385
70010 - 79999	Radiology	532%	6,311	20,372
N/A	Air Ambulance	242%	3,326	3,356
10004 - 69990	Surgery	830%	2,483	2,665
95700 - 96020	Neurology and Neuromuscular Procedures	964%	1,960	2,292
100 - 1999	Anesthesia	199%	1,497	2,061
99291 - 99292	Critical Care Services	299%	1,288	1,458
	Inpatient Neonatal Intensive Care Services and Pediatric and Neonatal Critical Care Services			
99466 - 99480	Hospital Inpatient Services	538%	276	1,404
99221 - 99239	Hospital Inpatient Services	249%	334	640
	Non-Invasive Vascular Diagnostic Studies			
93880 - 93998	Pathology and Lab	1,075%	251	484
80047 - 89398	Pathology and Lab	238%	29	326
	Hospital Observation Services			
99217 - 99226	Cardiovascular Procedures	217%	221	251
92920 - 93799	Cardiovascular Procedures	211%	91	95
99460 - 99463	Newborn Care Services 29	536%	10	48
	Moderate (Conscious) Sedation			
99151 - 99157	Moderate (Conscious) Sedation	305%	15	46
	Hydration, Therapeutic, Prophylactic, Diagnostic Injections and Infusions, and Chemotherapy and Other Highly Complex Drug or Highly Complex Biologic Agent Administration			
96360 - 96549	Hydration, Therapeutic, Prophylactic, Diagnostic Injections and Infusions, and Chemotherapy and Other Highly Complex Drug or Highly Complex Biologic Agent Administration	100%	22	27

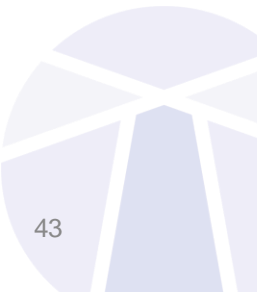
Prevailing Offers Relative to Qualifying Payment Amount (QPA) by Specialty, 2023 Q3



No Surprises Act: New Data (continued)

CPT Range	Specialty	Median Prevailing offer as % of QPA	Total Number of Payment Determinations	Total Number of Items or Services
99281 - 99288	Emergency Department Services	224%	42,716	43,393
70010 - 79999	Radiology	559%	9,996	11,234
10004 - 69990	Surgery	967%	4,650	4,665
95700 - 96020	Neurology and Neuromuscular Procedures	1,262%	4,219	4,222
100 - 1999	Anesthesia	219%	3,232	3,284
N/A	Air Ambulance	229%	2,462	2,466
99291 - 99292	Critical Care Services	328%	2,388	2,403
93880 - 93998	Non-Invasive Vascular Diagnostic Studies	779%	500	530
99221 - 99239	Hospital Inpatient Services	216%	264	277
99466 - 99480	Inpatient Neonatal Intensive Care Services and Pediatric and Neonatal Critical Care Services	475%	185	256
99217 - 99226	Hospital Observation Services	217%	170	172
92920 - 93799	Cardiovascular Procedures	294%	120	120
99151 - 99157	Moderate (Conscious) Sedation Prophylactic, Diagnostic Injections and Infusions, and Chemotherapy and Other Highly Complex Drug or Highly Complex Biologic Agent Administration	553%	70	70
96360 - 96549	Pathology and Lab	100%	67	67
80047 - 89398	Delivery/Birthing Room Attendance and Resuscitation Services	100%	47	48
99464 - 99465		547%	15	15

Prevailing Offers Relative to QPA by Specialty, 2023 Q4



No Surprises Act: Legislative Update

- Coming soon
 - Legislation to add civil monetary penalties for insurers who do not comply with post-IDR 30-day payment requirement
 - Bipartisan: Lead will be Rep. Greg Murphy, MD (NC)

Center for Anesthesia & Perioperative Economics (CAPE)

Purpose:

- Elevate ASA's profile of payment strategy and serve as a point of interaction with CMS, the insurance industry, and other stakeholders
- Serve as a resource for policy development
- Focus members and staff resources on a comprehensive strategy
 - Medicare
 - Medicaid
 - Commercial payment



Safe VA Care



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VA National Standards of Practice

Issue

- Block VA Office of Nursing Services (ONS) initiative to dismantle team-based care and move to CRNA-only model

ASA action

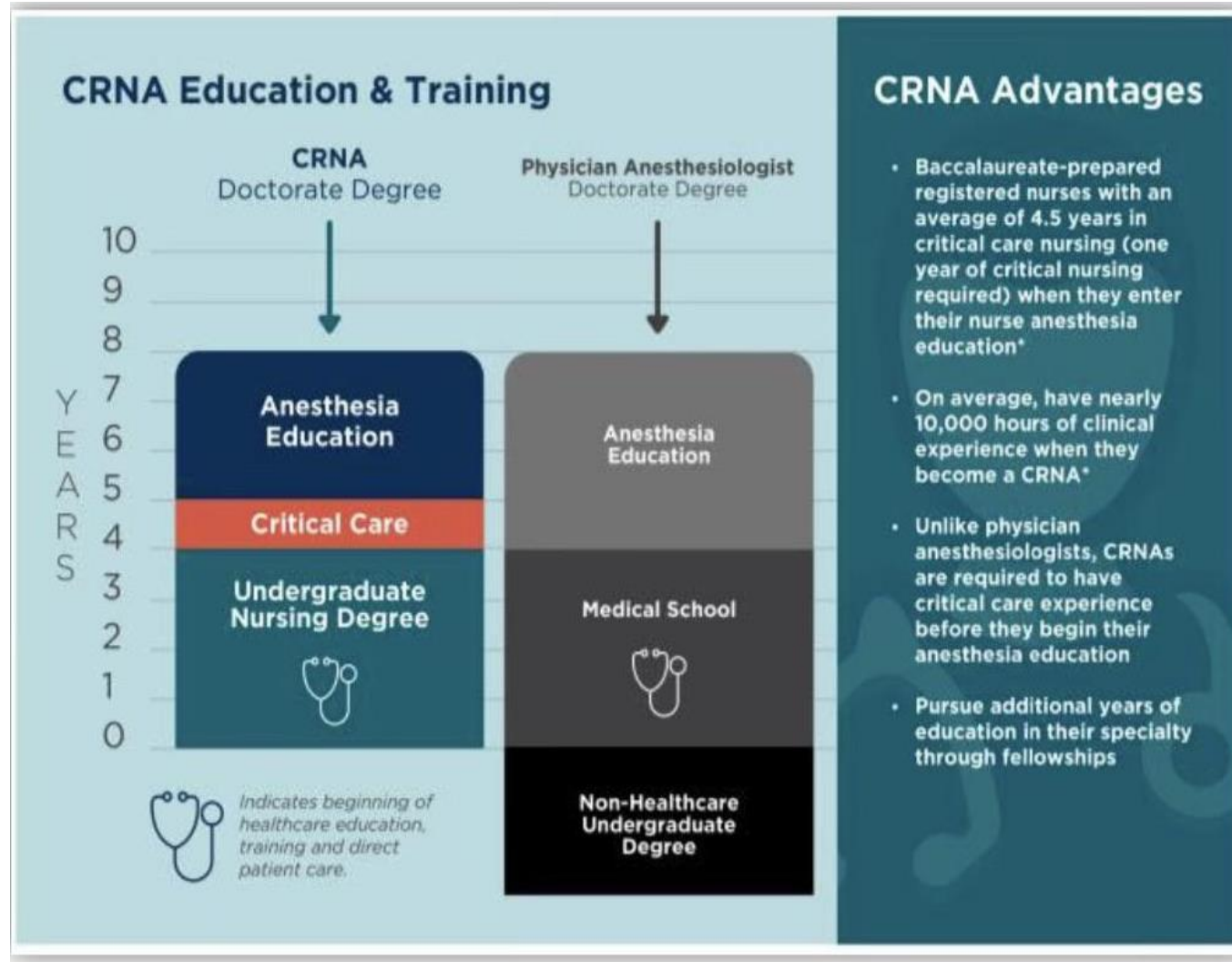
- Partnership with AVAA
- Congressional engagement
- Veteran Service Organizations (VSO)
- High-level VA officials



“We strongly believe that VA’s proposed move to a nurse-only model of anesthesia care is a solution in search of a problem. A solution that could risk Veterans’ lives, especially toxic exposed Veterans.”

- Dr. Ronald L. Harter on Sept. 19, 2023, speaking at congressional hearing

AANA Testimony to House Health Subcommittee



In the States



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Other Initiatives in the States

- **Opt-Outs**

- ✓ Monitoring for at-risk states

- **CRNA Legislation**

- ✓ Defeated 12 AANA-led scope efforts
 - ✓ Florida: 25th straight year
 - ✓ West Virginia: 6th straight year

- **Proactive Medical Title Protection**

- ✓ Tennessee: new law enacted

- **Proactive Certified Anesthesiologist Assistants (CAA)**

- ✓ Washington state: new law enacted

Additional Advocacy Initiatives



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New “Pain Medicine Coalition”

- **Pain Medicine Coalition (previously called the Pain Care Coalition)**
 - Participants: Founding members are ASRA PM and ASA; additional members to be added by invitation
 - Why regroup now? Reconvening as the Pain Medicine Coalition to work together on issues of interest to the pain community
- **Goals**
 - To develop, monitor, and advocate for responsible health care policy on behalf of individuals with pain and the professionals who support them through clinical care, education by addressing quality of care, access to care, public and professional education, and research

Workforce



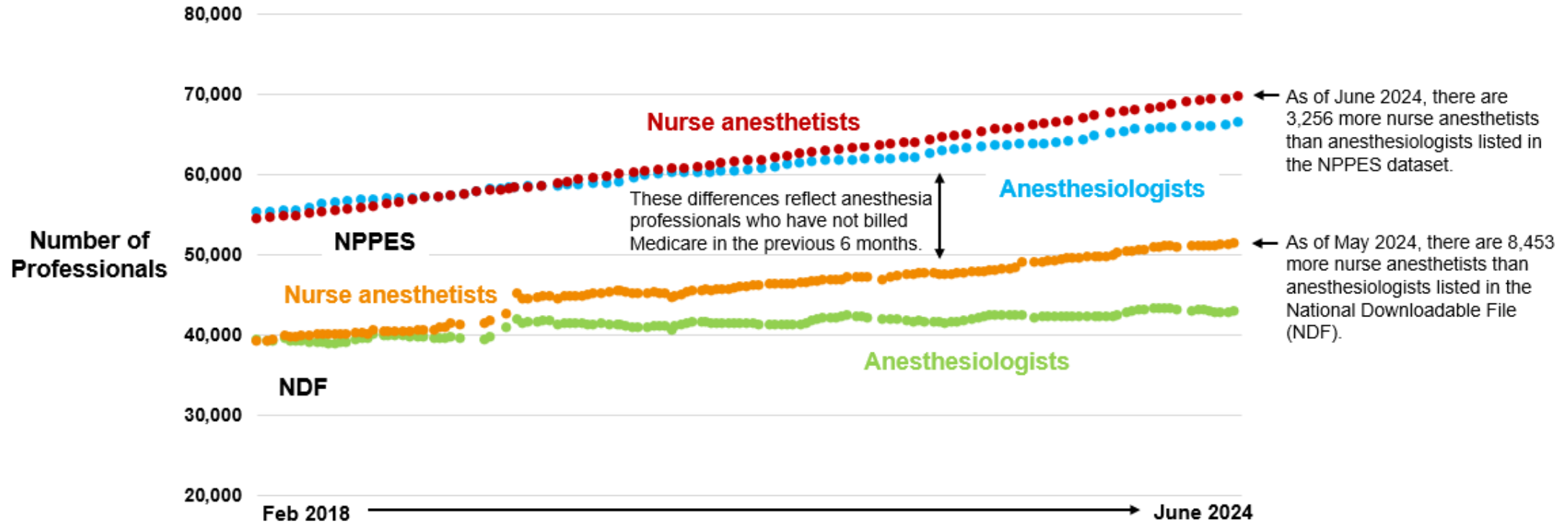
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ASA Workforce Initiatives

- **ASA Workforce Summits – June 2022 and November 2023**
- **Endorsements and Support**
 - **H.R. 2389 / S. 1302, the Resident Physician Shortage Reduction Act**
 - Funding for 14,000 additional residency positions (through 2031)
 - **H.R. 1202 / S. 704, the Resident Education Deferred Interest (REDI) Act**
 - Permits residents to qualify for interest-free deferment on their student loans while serving in a medical or dental internship or residency program
 - **H.R. 2761 / S. 705, the Specialty Physicians Advancing Rural Care (SPARC) Act**
 - Authorizes a loan repayment program to encourage specialty medicine physicians to serve in rural communities experiencing a shortage of specialty medicine physicians

How Many Anesthesiologists and Nurse Anesthetists Are There? Feb 2018–Jun 2024



Source: NPPES/NPI Datasets, 2/15/2018–06/09/2024 and CMS Provider Data: Doctors and Clinicians, National Downloadable File (NDF). Updated 05/30/2024. Available at <https://data.cms.gov/provider-data/dataset/mj5m-pzi6> Referred as the CMS Physician Compare National Downloadable File prior to May 2021.

ASA Anesthesia Workforce Summit II

- ASA convened a second Anesthesia Workforce Summit November 2023
- **Purpose:** Build upon the work from the first Summit and obtain additional perspectives and priorities to help guide ASA initiatives concerning:
 - Advocacy to expand residency programs and facilitate use of internationally-trained physicians
 - Anesthesiology "ownership" of NORA and procedural sedation services
 - Involvement of anesthesiologists in health system leadership and communication of the anesthesiology value proposition
- Workforce data, communications, and education regarding workforce issues and potential solutions
- Development of toolkits and case examples to assist practices and hospitals
- Collaboration with other organizations with aligned interests

Supply and Demand

Supply

- 1) Increase pipeline for anesthesiologists
- 2) Decrease attrition

Demand

- 3) Create better OR/NORA efficiencies
- 4) Consider what can be done by other professionals under the guidance of the anesthesia department to decrease demand for anesthesia professionals

Education and Science



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the
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annual meeting

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PHILADELPHIA | OCTOBER 18-22, 2024

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Stimulating research.
Extensive CME.**

Attendees say: "I can't imagine a better way to interact with my profession."

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The Anesthesiology
Business Event

JANUARY 31–FEBRUARY 2, 2025 | ATLANTA, GA

Sign up to be the first to know when registration opens for next year's event: asahq.org/ADVANCE2025



ASA Education Portfolio

- ACE
- Anesthesia SimSTAT
- Summaries of Emerging Evidence (SEE)
- Diagnostic Point-of-Care Ultrasound Certificate Program
 - New Gastric POCUS Certificate Program
- Fundamentals of Patient Safety
- PeRLS: Perioperative Resuscitation and Life Support Certificate
- Patient Safety Highlights
- Anesthesia Toolbox
- Anesthesia Complimentary Education
- Procedural Sedation

Diagnostic Point-of-Care Ultrasound Certificate Program

Diagnostic Point-of-Care Ultrasound Certificate 2024 released with incremental credit claiming for anesthesiologists to claim up to 60 CME and 10 MOCA® Part 4 points



Part 1:
Complete a QI Action Plan
(optional)



Part 4:
Perform and acquire
images for mentor review



Part 2:
Provide evidence of past
POCUS education/training



Part 5:
Take the final exam



Part 3:
Identify and interpret
online cases



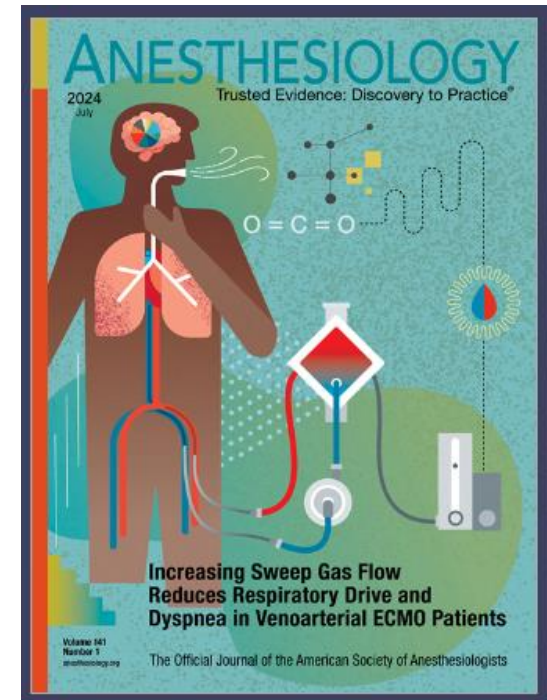
**Achieve your certificate
of completion**

Find out more: asahq.org/POCUS

Official Peer-Reviewed Journal of the ASA

Mission: promoting scientific discovery and knowledge in perioperative medicine, critical care, and pain medicine to advance patient care.

- **Enduring Importance and Foundational Value:**
Impact factor 9.1
- **Publication Speed:** averages 3 days to online publication after acceptance for original research articles
- **Rich Multimedia:** Podcasts, video abstracts, and visual abstracts enhance issue content
- **Online Readership:** Over 2.8 million visits in 2023 (46% United States, 54% International)
- **Member Satisfaction:** 85% satisfied/extremely satisfied



Official News Publication of the ASA

- Leading source for objective, fact-based reporting, and thoughtful dialogue for the perioperative health care community
- Columns: In the Know, Trends & Technology, Facility Spotlight, Career Connection, Your Patient's Brain, Ask the Expert, The Curious Economist, Committee News, Dr. Gearhead, The Pulse
- Central Line: Inside the Monitor monthly podcasts focused on the special theme of the issue

ASA Monitor+ Supplement – available online May 9

- New Frontiers in Patient Safety

The screenshot displays the ASA Monitor website interface. At the top, there are navigation links for "Leadership Perspectives: An Open Letter to ASA Non-Members" (5), "Meet Anesthesiology's New Editor-in-Chief" (26), and "Residents' Review: Malignant Hyperthermia ... Crisis Averted" (33). The main header features the ASA logo and the title "ASA Monitor" with the tagline "THE LEADING SOURCE FOR PERIOPERATIVE HEALTH CARE NEWS".

The featured article is "Shared Perspectives: A Tale of 2 MOCA Stories" by Alex Macario, MD, MBA and David P. Martin, MD, PhD, FASA. The article discusses the American Board of Anesthesiology (ABA) and ASA's joint efforts to demonstrate how the two organizations work together to support anesthesiologists throughout each stage of their careers. It also mentions the importance of lifelong learning and a growth mindset.

Other articles include "Our Vision: Empowering You to Provide World-Class Anesthesia Care" by Brian Reilly, MBA, CAE, and "Plagiarism Is Ubiquitous" by Steven L. Shafer, MD, FASA, Editor-in-Chief.

At the bottom, there is a preview for the "ASA Monitor+ Supplement" titled "New Frontiers in Patient Safety", which includes articles such as "Advancing Patient Safety in OR Research", "Hard Budget Threats to Patient Safety", and "Medication Errors in Pre-Op".

Leadership and Professional Development Resources

- ASA Leadership Academy
- ASA Career Development Workshop **NEW**
 - Curriculum Vitae Review Session
- Be the Solution: Sell Your C-Suite on the Value and Leadership of Anesthesiologists
 - Toolkit to engage with your hospital administrators and offers resources on topics important to them
- ASA Legislative Conference
 - Leadership Spokesperson Training Program



Anesthesia Toolbox

- 120+ residency programs subscribed; each with a private learning community
- Faculty can share and assign content to residents as well as medical students rotating at their program
- Editor-in-Chief Dr. Christina Spofford and the Editorial Board for Anesthesia Toolbox oversee content review and development



asahq.org/toolbox

ASA and Well-Being



American Society of
Anesthesiologists[®]

asahq.org

What ASA is Doing for Physician Well-Being

- In 2019, ASA created the Committee on Physician Well-Being
- The committee impacts through working groups on:
 - ASA Outreach
 - Clinician Mental Health and Suicide Prevention
 - Systems and Policy Impacting Well-Being
 - Education and Endeavors



ASA Resources

<https://www.asahq.org/in-the-spotlight/wellness-resources>

ASA Well-Being Resources
Advocating for You: Focus on ASA's efforts to promote physician well-being

The complexity of medical care today contributes to a high prevalence of physician stress and burnout.

Anesthesia providers face many challenges and pressures in their daily lives. Anesthesiologists make life-and-death decisions every day, often in very difficult emergency situations and for long shifts at a time. The resulting stress can take its toll over time, resulting in difficulty sleeping, lack of appetite, clinical depression and other serious issues.

INDIVIDUAL RESOURCES FOR WELL-BEING

ORGANIZATIONAL/CULTURAL RESOURCES FOR WELL-BEING

COMMITTEE WORK PRODUCTS AND ASA STATEMENTS

COVID-19 WELL-BEING RESOURCES

RELEVANT ARTICLES

SUICIDE PREVENTION

SUBSTANCE USE DISORDERS

OTHER INSTITUTIONAL/ PARTNER SITES

Get Involved

Should you want to be involved in the ASA's efforts to promote physician well-being, we would love to hear from you! Please contact Amy Vinson, Chair of the Committee on Physician Well-Being.

Each month we will highlight a well-being initiative by our ASA members. Please stay tuned!

The resources listed here have been identified by the ASA Committee on Physician Well-Being. These resources are a representative selection and by no means exhaustive of all resources available. We offer these as options for a wide range of well-being needs and do not necessarily carry the endorsement of the ASA. This material is provided only for informational purposes and does not constitute medical or legal advice.

Individual Resources for Well-Being

988 Suicide & Crisis Lifeline
The 988 Suicide & Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) offers 24/7 call, text, and chat access to trained crisis counselors who can help people experiencing suicidal, substance use, and/or mental health crisis, or any other kind of emotional distress. People can also dial 988 if they are worried about a loved one who may need crisis support. Call or text 988 or chat 988lifeline.org.

Emotional PPE Project
A directory that provides contact information of volunteer mental health practitioners to healthcare workers whose mental health has been impacted by the COVID-19 crisis. All services provided through the Emotional PPE Project are free of charge. No personal data is collected by the Emotional PPE Project.

Physician Support Line
A national, free, and confidential support line service made up of 600+ volunteer psychiatrists, joined together to provide peer support for their physician colleagues.



Clinician Well-Being Resources

- The new SafeHaven™ program offers confidential:
 - Peer coaching
 - Concierge services
 - Behavioral health resources
 - 24/7 Crisis Hotline
- ASA and the Charitable Foundation are partnering with VITAL WorkLife to deliver program services
- Resources are for clinicians and family members for a reduced rate
- Enrollment opened June 1
- As of early July, 70 enrollees



asahq.org/safehaven

Foundations



American Society of
Anesthesiologists[®]

asahq.org

Make a Difference: Donate Today!



The Anesthesia Foundation
ASA Charitable Foundation
Anesthesia Patient Safety Foundation
Foundation for Anesthesia Education and Research
Wood Library-Museum of Anesthesiology

Questions?



American Society of
Anesthesiologists[®]

asahq.org



EMORY
UNIVERSITY
SCHOOL OF
MEDICINE

Department of Anesthesiology



A Rational Approach to Intraoperative EEG

Philip Kalarickal, MD, MPH
**Divisions of Cardiothoracic and Liver
Transplantation Anesthesiology**
July 13, 2024



Disclosures

- None
- Will be discussing processed EEG
- Emory currently uses Sedline monitors



Anesthesia

- One of the greatest breakthroughs in modern science, yet still one of the greatest mysteries
- Anesthesia = “without sensation”



LIST of EXAMINED and APPROVED SURGEONS

- | | |
|-------------------------------------|-----------------------|
| SIR DREARY DROPSICAL | SIR VALIANT VENERY |
| DOCTOR GLISTERPIPE | DOCTOR PETER PUTRID |
| Doc ^r S | ABRAHAM ABCESS |
| SIR LAUNDICE JOLLOP | DOCT. GLEET |
| BALLOON TRICKSKULL Esq ^r | LAUNCELOT SLASHMUSCLE |
| BENJAMIN BOWELES | GABRIEL CLANDS |
| PAUL PURGE | FREDERICK FISTULA |
| DAVID PUKE | CRISTOPHER CUTGUIT |
| DOCT | SAMUEL SAWBONE |
| Nr. NERVOUS | DOCTOR SCROTUM |
| SCURVY SCRUBBER | DR. PRUDLESK |
| TWISTUM TRUIST | ROGER ROWELL |





Anesthesia

- One of the greatest breakthroughs in modern science, yet still one of the greatest mysteries...
- Greek – “without sensation”
- Characteristics
 - Unconsciousness
 - Amnesia
 - Analgesia
 - Akinesia
- > 60k GA cases/d in US



Anesthesia

- Black Box
 - You go under and you come out
 - “Losing time”
 - Awareness??
 - Source of great anxiety for patients
- How do we monitor the adequacy of anesthesia?
 - Indirectly
 - CV
 - Movement, tearing
 - ETAG
 - Directly
 - Electroencephalogram



Objectives

- Review electroencephalography in historical and clinical context
- Provide framework for modern use of intraoperative EEG
- Review EEG indices and clinical implications



Monitoring

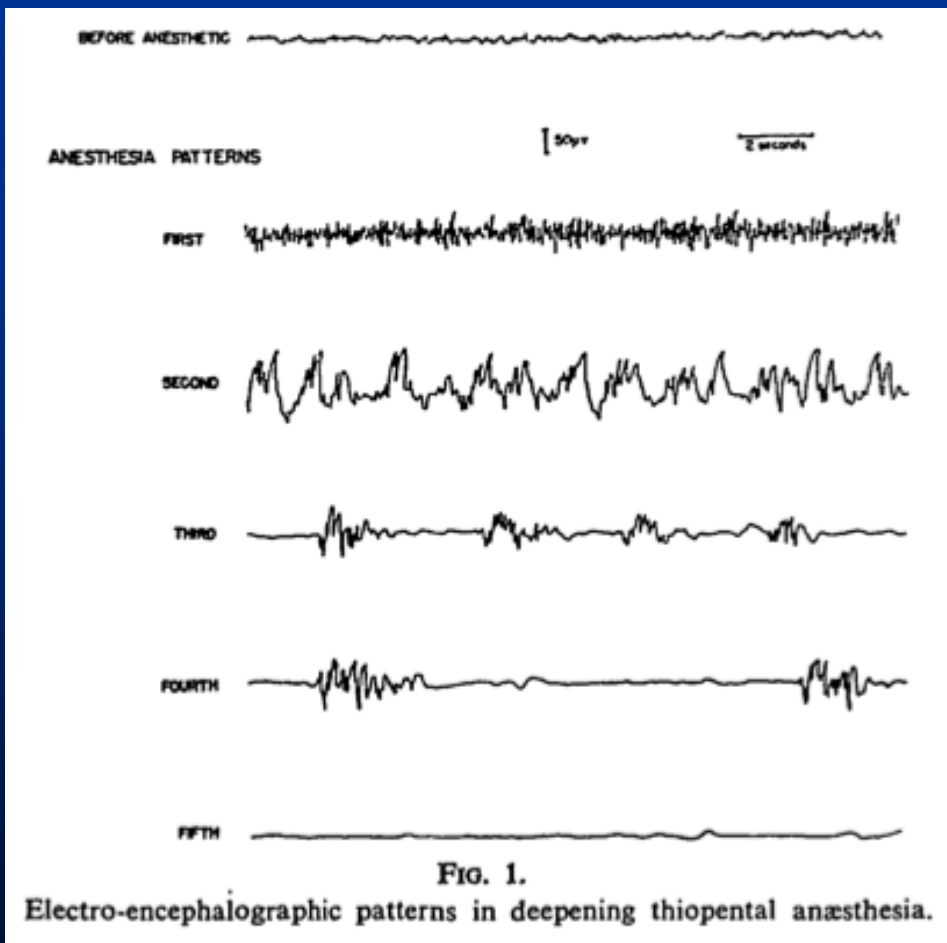
- ASA Standard Monitors
- Monitoring the brain is not one of them
- Monitors of the brain exist
 - Functional MRI
 - PET
 - Electroencephalogram



**ELECTRO-ENCEPHALOGRAPHIC PATTERNS
PRODUCED BY THIOPENTAL SODIUM
DURING SURGICAL OPERATIONS:
DESCRIPTION AND CLASSIFICATION**

*By DONALD K. KIERSEY, REGINALD G. BICKFORD and
ALBERT FAULCONER, JR.*

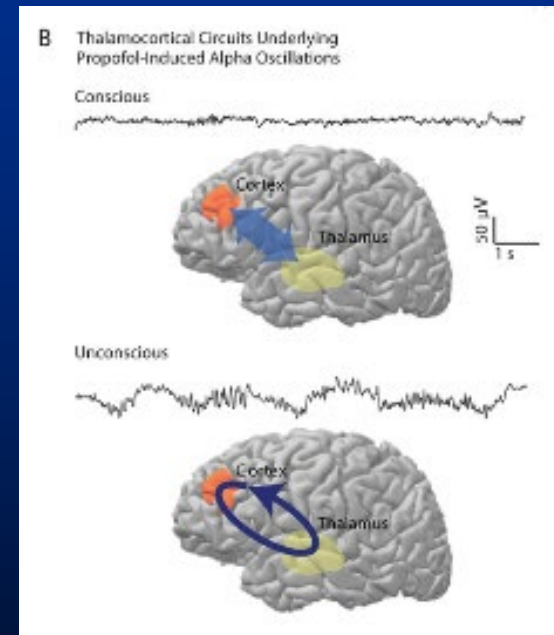
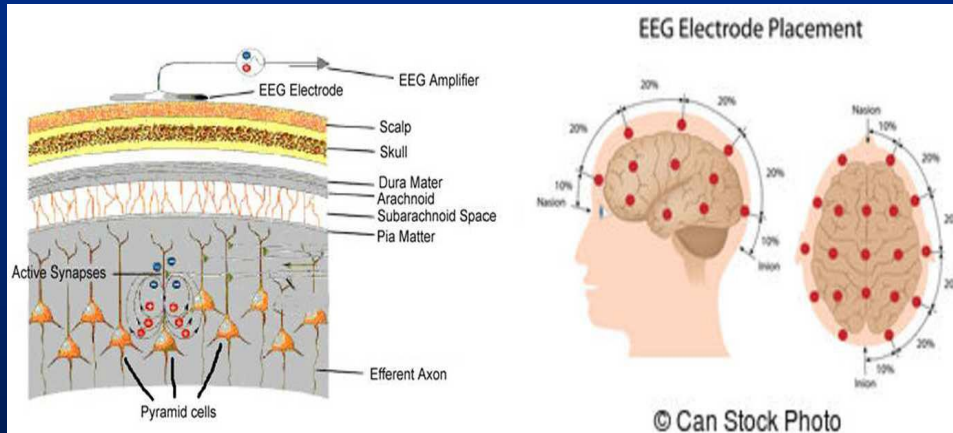
BJA, 1951



Kiresy, BJA, 1951



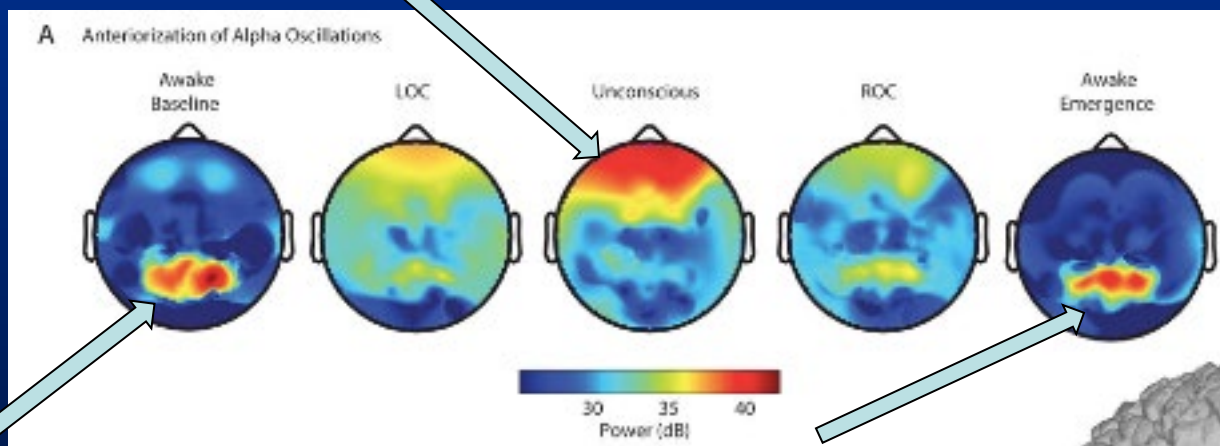
EEG- Basics



- EEG measures cortical electrical activity.
- Cortex and deeper structures are richly interconnected...
 - Cortical signals are a good surrogate for brain state of deeper structures.



EEG - Basics

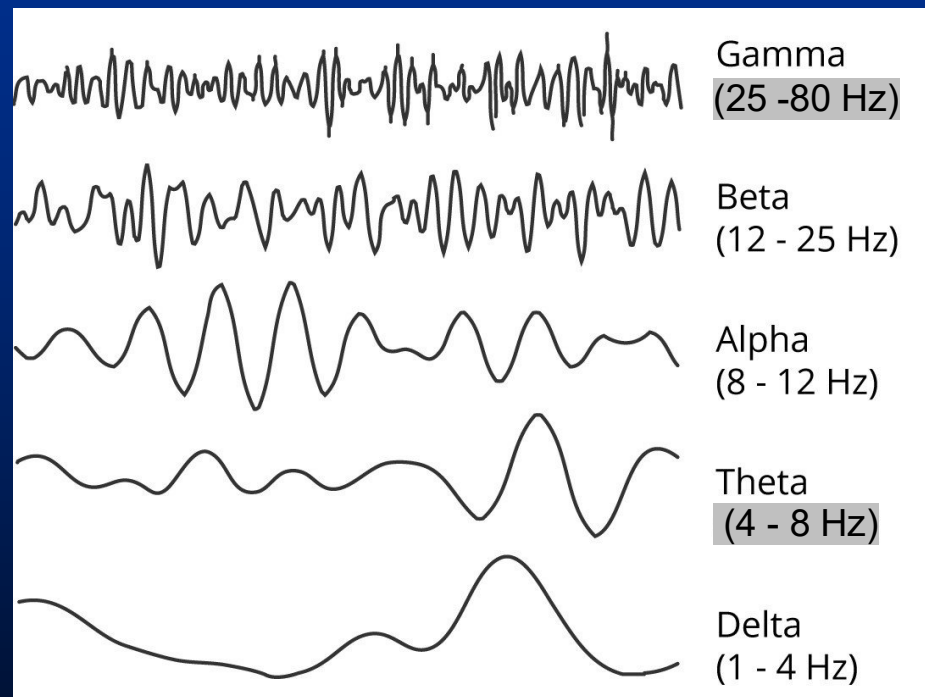


Purdon, Anesthesiology, 2015



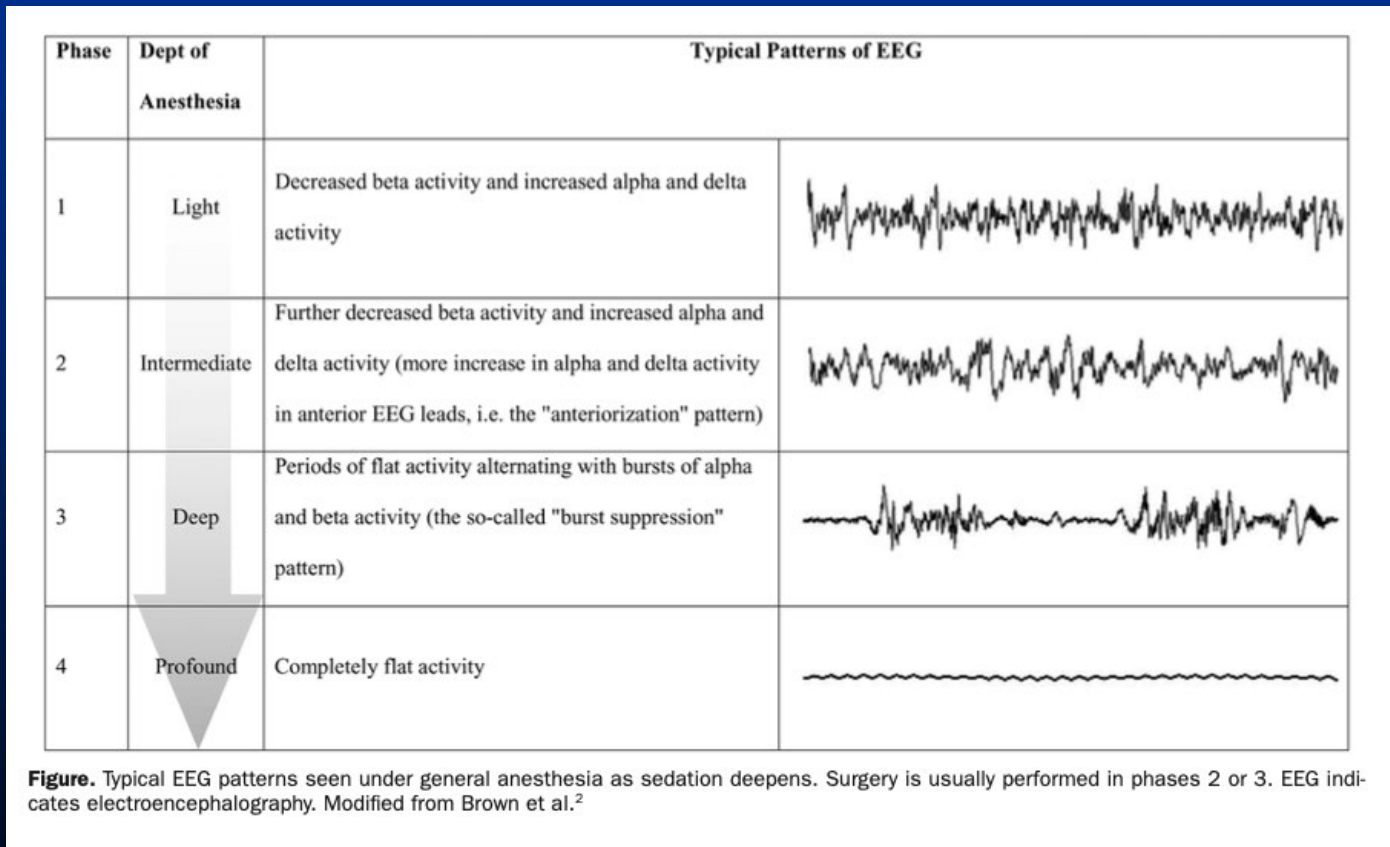
EEG Basics

- Frequency – Hz
- Power- microvolts.
- Typically 4 or 5 main waveform types
- Combinations of waveforms are seen in any given condition





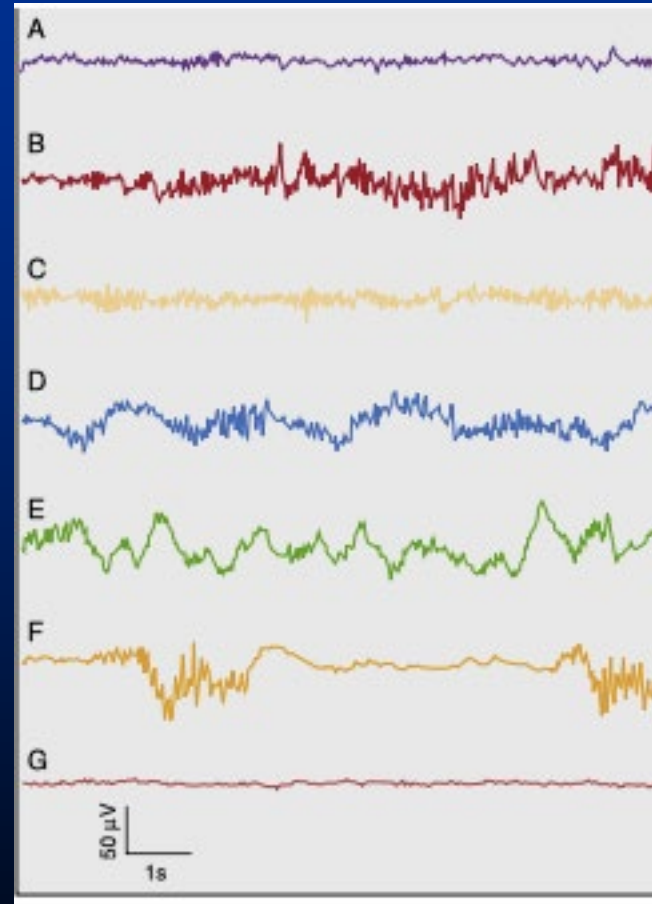
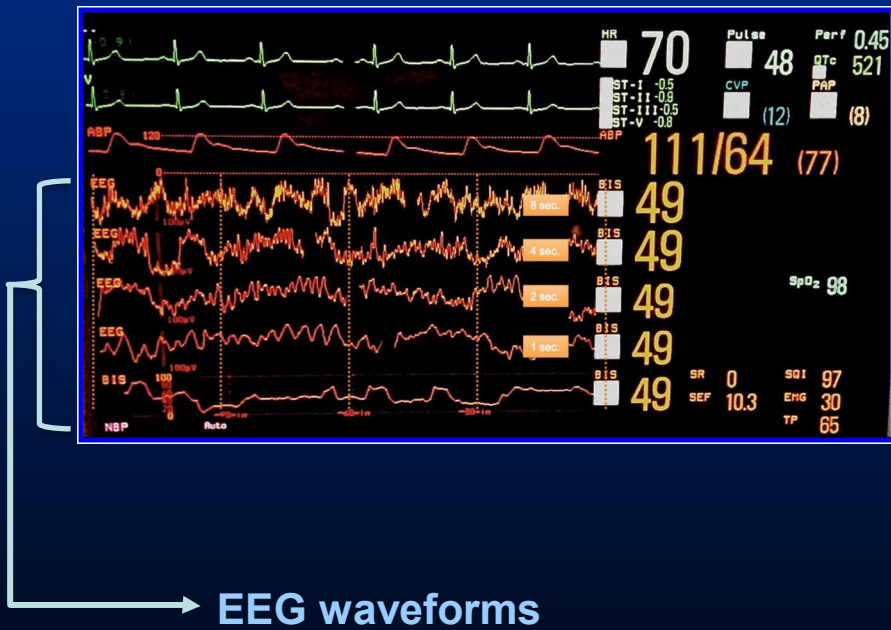
EEG under anesthesia





Intraoperative EEG

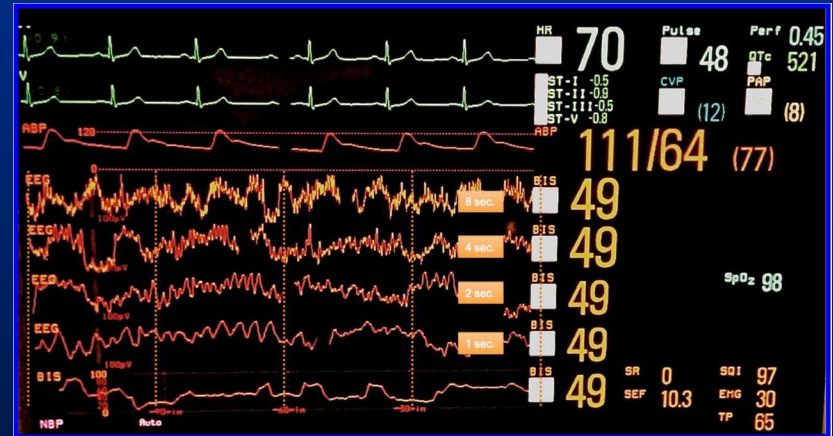
- Easier said than done...





Intraoperative EEG

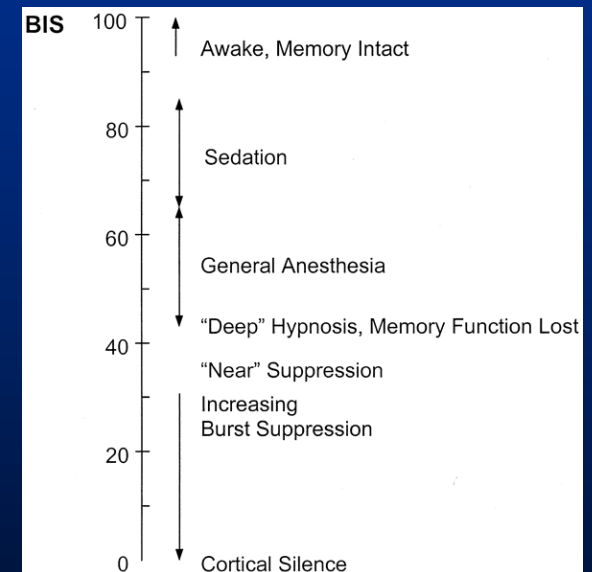
- EEG waveform interpretation can be complex
- Difficult to perform in perioperative environment by non-experts.
- Has not been widely adopted in Anesthesia practice





Processed EEG

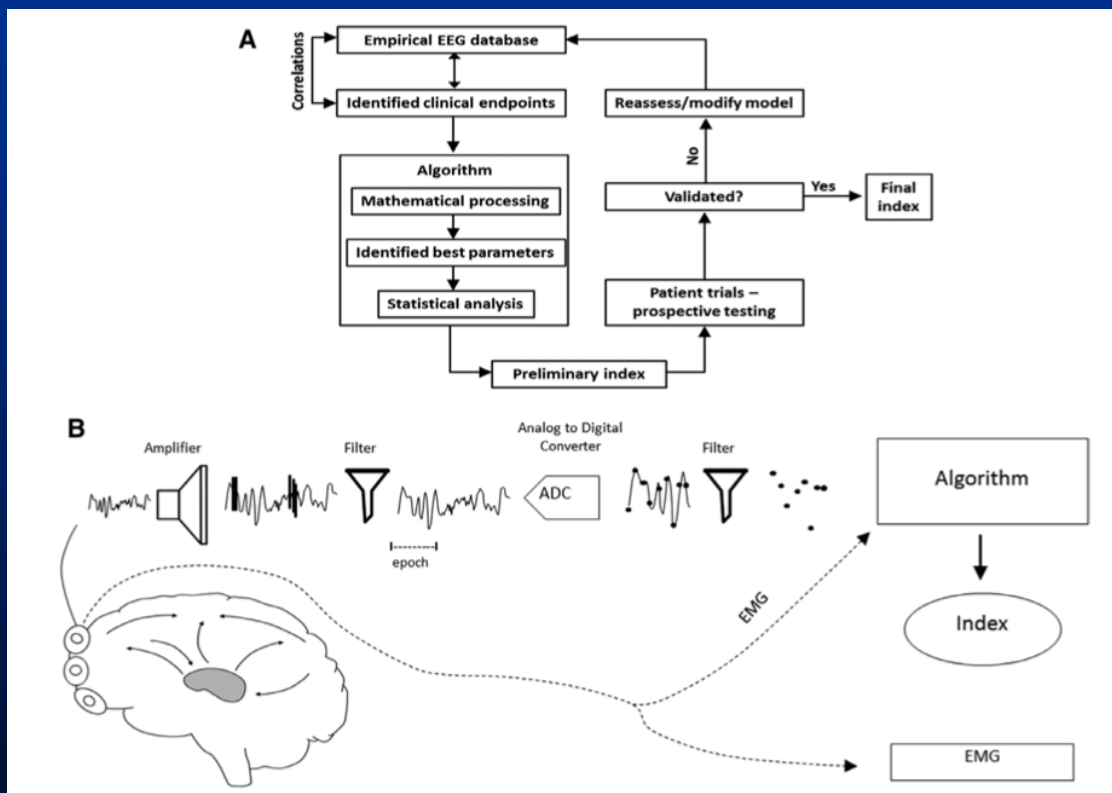
- Not much interest in routine use of EEG until 1990's
- Development of processed EEG (pEEG)
 - Using few channels (1-4) rather than full montage
 - Frontal location for ease of use
 - Signal is filtered and processed through proprietary algorithm to give a unitless dimension of depth of anesthesia and awareness.
 - Most common of these is the BIS monitor.
- Benefit of much simpler interpretation



Johansen & Sebel, Anesthesiology 2000



pEEG



Fahy and Chau, Anesth Analg, 2018



pEEG

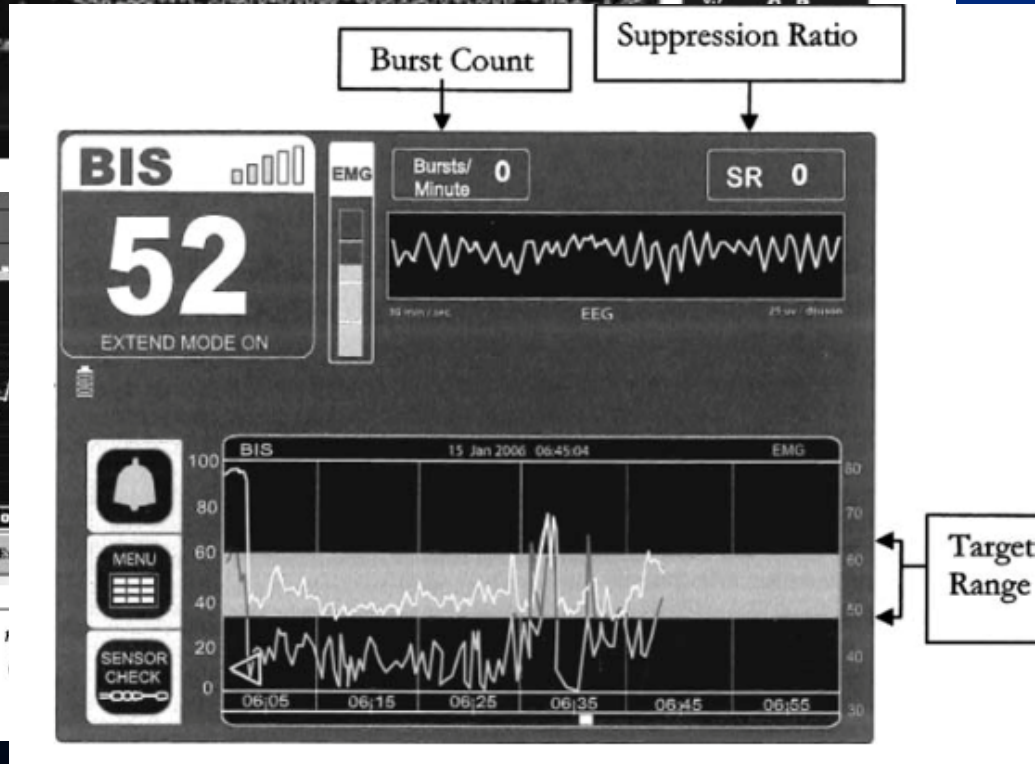
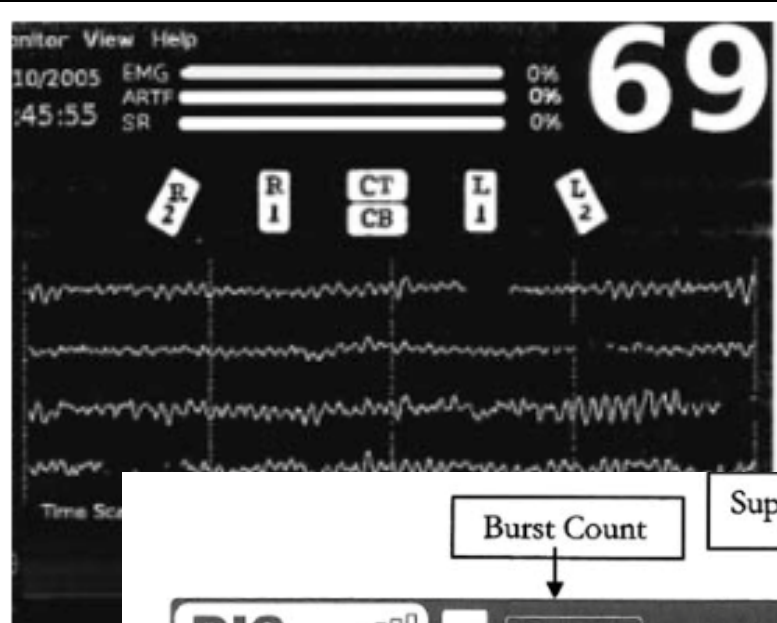
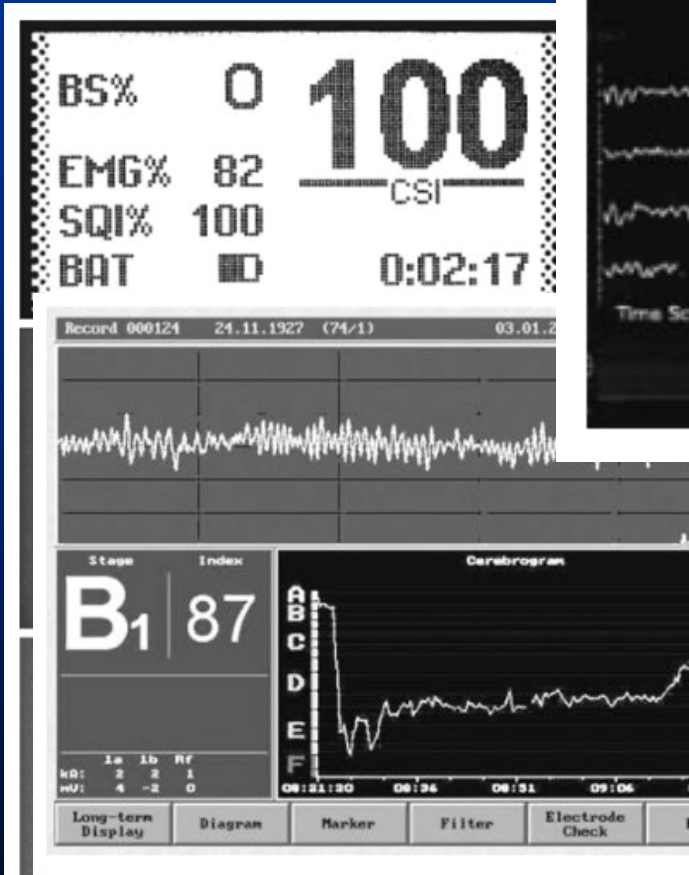


Fig. 17. Depiction of the screen display of the Narcotrend *1*.
 Reproduced from the Narcotrend website with permission
 (www.narcotrend.de/home_e.htm#Screen%20display).



Body Text

Processed EEG Depth-of-Anesthesia Monitoring

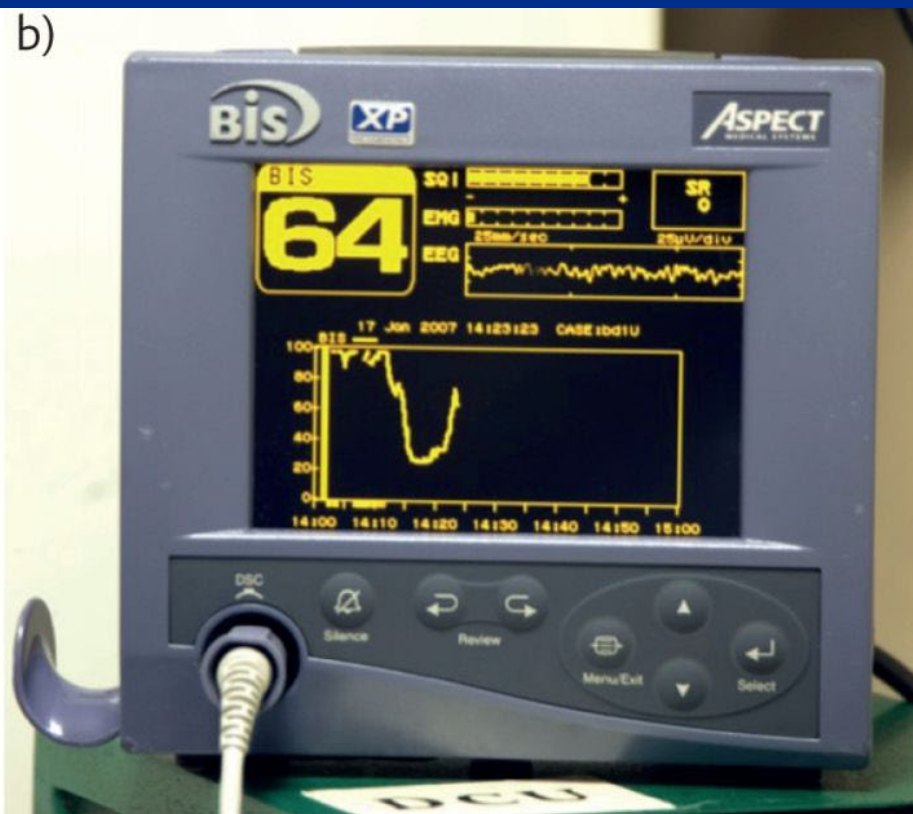
Table. Brief Description of Currently Available Processed EEG-Based Monitors in Alphabetical Order

Monitor	Features
AEP Monitor/2 (Danmeter A/S, Odense, Denmark)	The AEP Index, the AAJ, is an index relying on MLAEP and EEG signals. Bilateral click stimuli are delivered through headphones. The EEG signals after the stimuli are discerned from the background EEG noise and processed for MLAEPs, reflecting neural activity within the thalamus and primary auditory cortex. When the AEP signals are low in quality, the AAJ is derived mainly from EEG-based spectral parameters. Burst suppression ratio and EMG data are also displayed. Two index scales: 0-80 and 0-100. ⁹
BIS Monitor (Medtronic, Minneapolis, MN)	It utilizes an algorithm based on power spectral analysis, bispectral analysis, and burst suppression data. The derivation of the BIS index is achieved through a weighted sum of relevant subparameters. The BIS index scale is from 0 to 100. In addition to a single-channel EEG, it also offers a bilateral sensor for assessment of asymmetry. Density spectral arrays and spectral edge frequencies can be displayed as well as EMG activity and burst suppression information. ³
Cerebral State Monitor (Danmeter A/S, Odense, Denmark)	The algorithm for the cerebral state index utilizes frequency domain analysis and burst suppression ratio processed with fuzzy logic methodology for inference of the index. It uses a single-channel EEG with an index scale of 0 to 100. In addition to the index, it also provides measures of burst suppression percentage and EMG activity. ¹⁴
Entropy Module (GE Health care Technologies, Helsinki, Finland)	The algorithm uses spectral analysis to produce 2 main parameters for overall assessment of depth of anaesthesia: the SE, for depth of hypnosis (index scale, 0-100), and RE, for indirect assessment of nonception/responsiveness to stimuli (derived from the frontal EMG; index scale, 0-91). A widening difference between SE and RE is deemed a likely indicator of inadequate anaesthesia. In addition to the waveform display of SE and RE, a burst suppression ratio is also displayed. It uses a single-channel EEG. ⁷
Index of consciousness monitor (Morpheus Medical, Barcelona, Spain)	The index of consciousness is derived via symbolic dynamics, a time domain method that divides the EEG signals into partitions and labels each partition with symbols of 1 and 0, depending on mathematical determination. It is conceptually similar to entropy. This approach can detect nonlinear EEG characteristics and assess levels of signal complexity. The algorithm also includes frequency domain methods and burst suppression analysis. A fuzzy logic inference system is used in index derivation. Burst suppression and EMG information are also displayed. Single-channel EEG with an index scale of 0 to 99. ¹¹
Narcotrend Monitor (MonitorTechnik, Bad Bramstedt, Germany)	The Narcotrend index is derived from a system developed for the visual classification of the EEG patterns associated with stages of natural sleep. It uses burst suppression, time, and frequency domain analysis to extract the relevant EEG parameters, which are then classified through plausibility testing into a total of 14 possible substages: A (awake) to F (deep) with further subdivisions. The most recent version also provides an index from 0 to 100. Uses 1- or 2-channel EEG. Also displays EMG information. ¹⁰
NeuroSENSE Monitor (NeuroWave Systems Inc, Cleveland Heights, OH)	The WfWns index is calculated via wavelet analysis of the EEG signals in the gamma frequency band, using a deterministic approach (a method that always produces the same output for a given EEG interval). This monitor was purposefully developed for use in anesthesia closed-loop delivery systems. It uses bilateral brain monitoring for derivation of index with a scale of 1 to 100. ¹²
SEdline Monitor (Masimo, Irvine, CA)	The patient state index is calculated by a 4-channel EEG with an algorithm incorporating high heterogeneity of variance at different levels of sedation/hypnosis, taking into account anterior-posterior relationships in the brain and coherence between bilateral brain regions. Burst suppression data and plausibility analysis are applied for final index derivation. It also displays bilateral density spectral arrays, and bilateral 4 channels of raw EEG waveforms. Scale consists of 0-100, with optimal depth between 25 and 50 (in contrast to other monitors with similar scale and recommended anesthetic depth between 40 and 60). ¹³
SNAPii Monitor (Stryker Inc, Kalamazoo, MI)	The SNAP index is based on calculations involving power spectral analysis in the 0 to 18 and 80 to 420 Hz frequency ranges, called the low-frequency index and high-frequency index, respectively, for the derivation of the single index. It claims an algorithm that minimizes artifacts and a shorter lag time to detect patient awakening. It uses a single-channel EEG and an index scale of 0 to 99. ¹⁵
qCON 2000 monitor (Quantum Medical, Barcelona, Spain)	The qCON index is derived from spectral analysis and burst suppression rate and processed through an artificial neural network and fuzzy logic system. Conceptually, it has similarities to the entropy approach. The qCON index is a measure of hypnosis, whereas the qNOX index is a measure of nonception, each similarly derived through different frequencies. Both indexes range from 0 to 99. The qNOX reference scale was derived through EEG signals in patients moving in response to nalbupressure. Single-channel EEG. Also displays EMG and burst suppression data. ¹⁶

This list is not intended to be all inclusive. Abbreviations: AEP auditory-evoked potential; EEG, electroencephalogram; EMG, electromyogram; MLAEP middle-latency AEP; RE, response entropy; SE, state entropy.



pEEG = BIS





pEEG -BIS

- Combination of power spectrum, bispectrum and suppression ratio with unknown weights to produce the unitless BIS value
- Initial studies demonstrated decreased awareness with use
- FDA approved device to be marketed as a depth of anesthesia and awareness monitor.
- Marketing heavily emphasized it could prevent awareness if used...



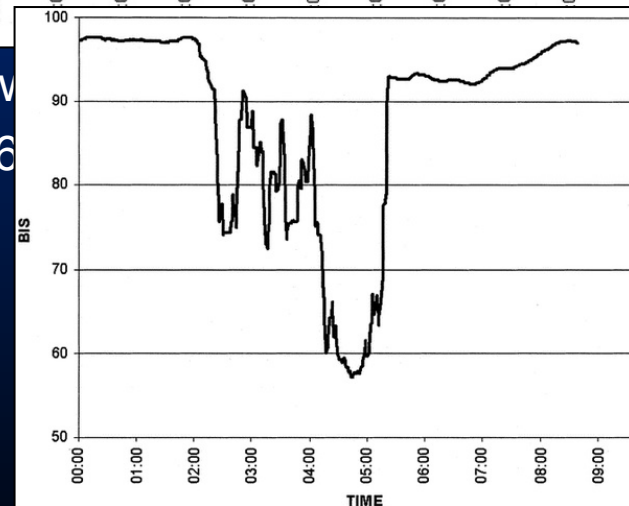
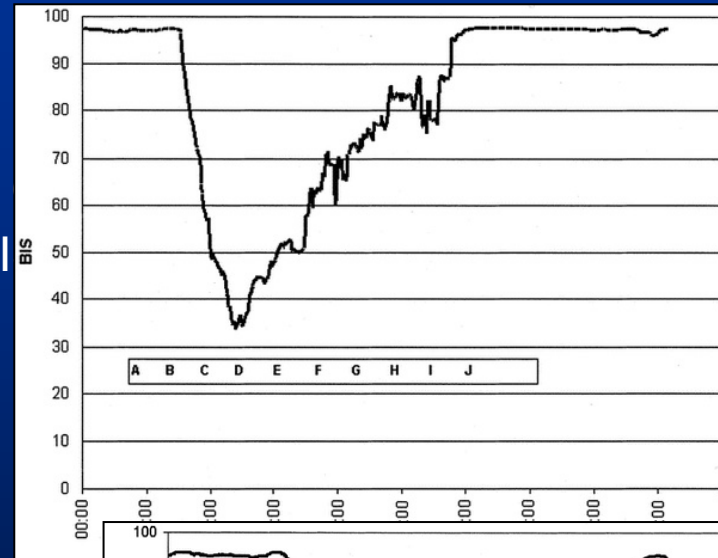
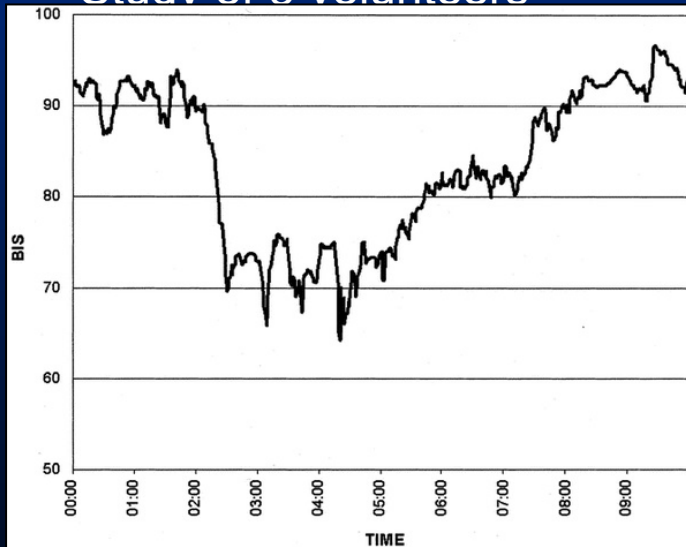
pEEG- BIS

- B-Aware
 - Myles et al, Lancet 2004
 - Prospective, double-blind, multicenter trial of awareness
 - 2463 patients at high risk for awareness randomized to
 - BIS guided group - BIS scores between 40-60
 - Usual care group – BIS sensor placed but not turned on
 - Awareness assed by blinded assessors at 6h, 24-36h, 30d
 - 2 reports of awareness in BIS group and 11 in usual care group (p= 0.022)



BIS – flaws?

- Several case reports of awareness
- Some studies demonstrating low BIS
- Messner et al, Anesth Analg, 2003
- Study of 3 volunteers



only
 ss by follow
 less than 6
 arm.



pEEG – limitations

- One size fits all algorithm
 - Unknown components?
 - EMG
 - Assumption that mechanism of anesthesia and EEG changes are the same for:
 - All agents
 - All patients
 - All ages
- Values lag 1-2 minutes behind EEG values.



pEEG - BIS

- B-Unaware
 - Avidan et al, NEJM 2008
 - Prospective, randomized trial of 1,941 patients at high risk of anesthesia awareness comparing
 - BIS guided group – BIS scores between 40-60
 - ETAG guided group – maintain ETAG 0.7 MAC – 1.3 MAC
 - Awareness assessed by blinded assessors with Brice questionnaire
 - 24 hrs, 24-72 hrs, 30 days
 - Results: 2 incidents of definite awareness in each group
 - Conclusion: With ether based inhalational anesthetics, using BIS guided protocol was not superior to ETAG based protocol.
 - Several criticisms of this trial, however...



pEEG -BIS

- B Unaware criticized for sample size, single center and patient selection
- Avidan et al – BAG-RECALL, NEJM 2011
 - Prospective, randomized, single-blinded, multicenter trial of patients at high risk of awareness
 - BIS guided vs. ETAG guided
 - 6041 patients randomized, 5713 evaluated
 - 7 patients in BIS group and 2 patients in ETAG group had intraop awareness.
 - Superiority of BIS not demonstrated compared to an inexpensive ETAG driven protocol for awareness

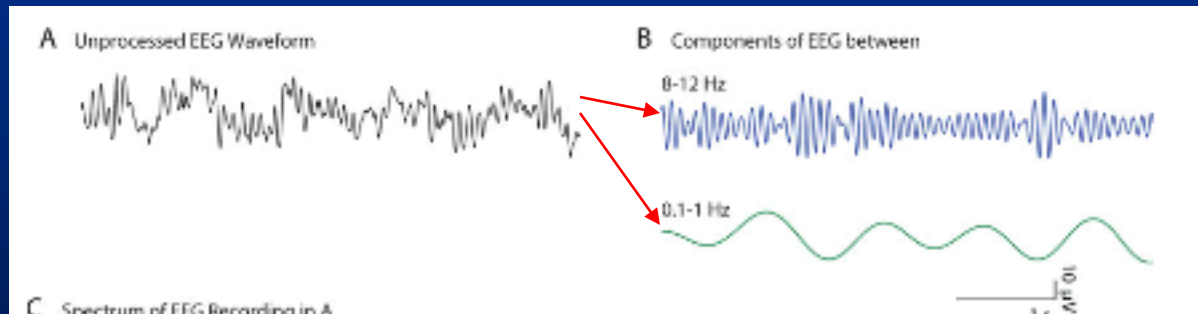


pEEG vs. EEG

- Following B-Unaware and other studies demonstrating shortcomings for use in Awareness, interest in processed pEEG depth of anesthesia values diminished
- Processed EEG's still have value
 - Low BIS scores associated with poor outcomes
 - Useful for TIVA with propofol with wide dose ranges
- More emphasis placed on ease of use of unprocessed EEG components and potential clinical utility
- More to monitoring EEG than just awareness.
 - Depth of anesthesia
 - Specific outcomes
 - Increased understanding of underlying mechanisms of anesthetics

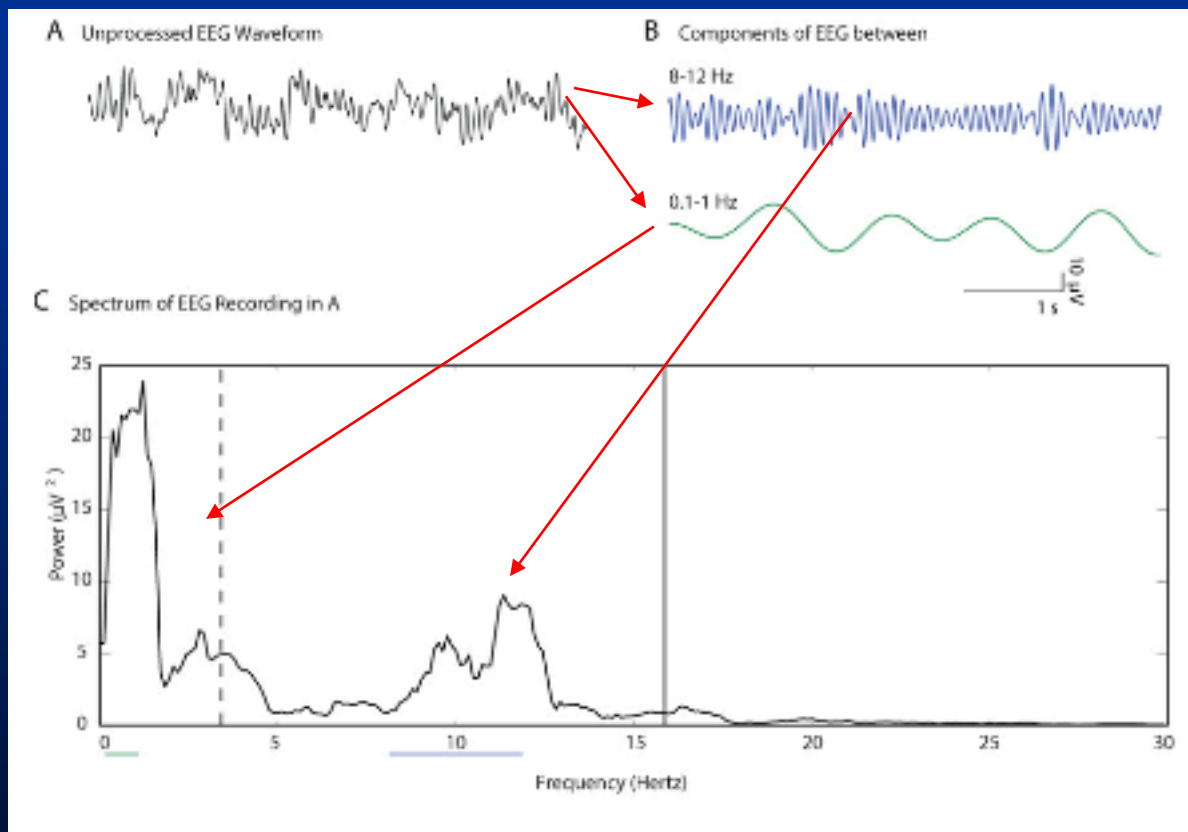


EEG – a modern approach



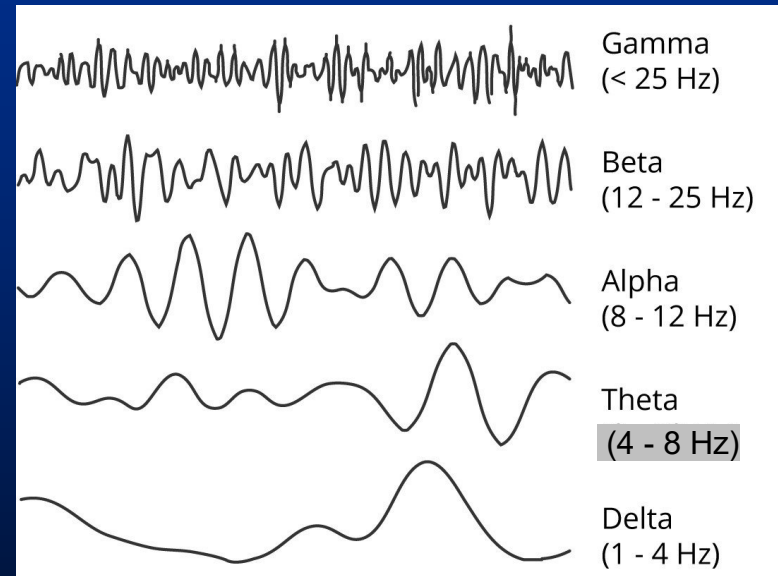
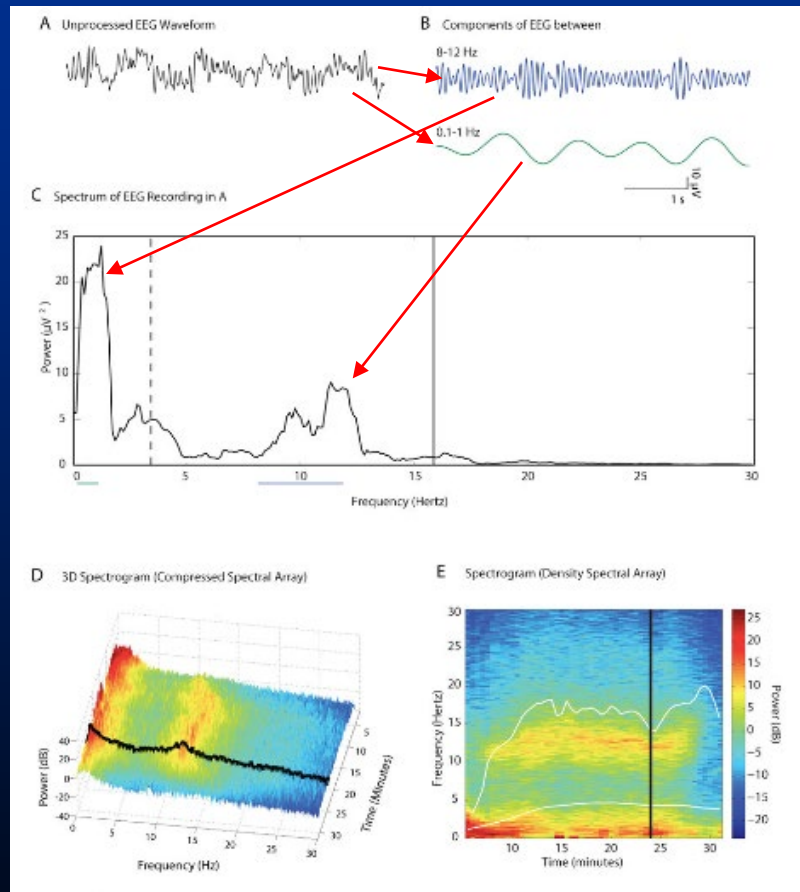
Purdon, Anesthesiology 2015

- Raw EEG waveforms are difficult to read – multiple frequencies exist.
- Helpful to decompose the EEG into its component waves





Spectrogram





Spectrogram

- Simple
- Reflects true state of EEG for the practitioner
- Does not rely on proprietary algorithms



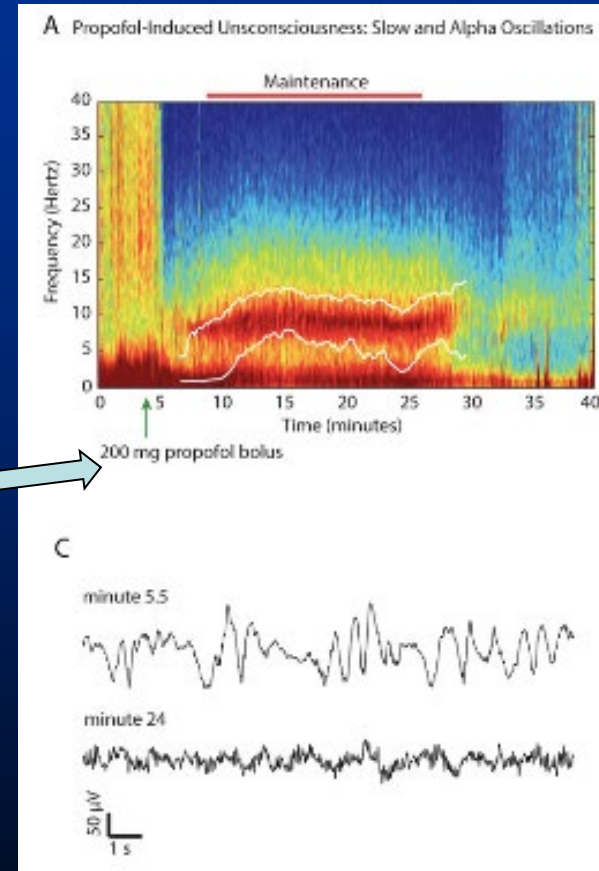
Additional unprocessed EEG values

- Suppression ratio (SR) - % of time that the EEG was suppressed.
Correlates with Burst Suppression
- Spectral Edge Frequency (SEF) – the frequency below which 95% of total power of EEG exists
- Signal Quality Index (SQI) – proportion of EEG data used in calculation of unitless indices
- Electromyograph (EMG) – measurement of muscle activity that can interfere with EEG signal



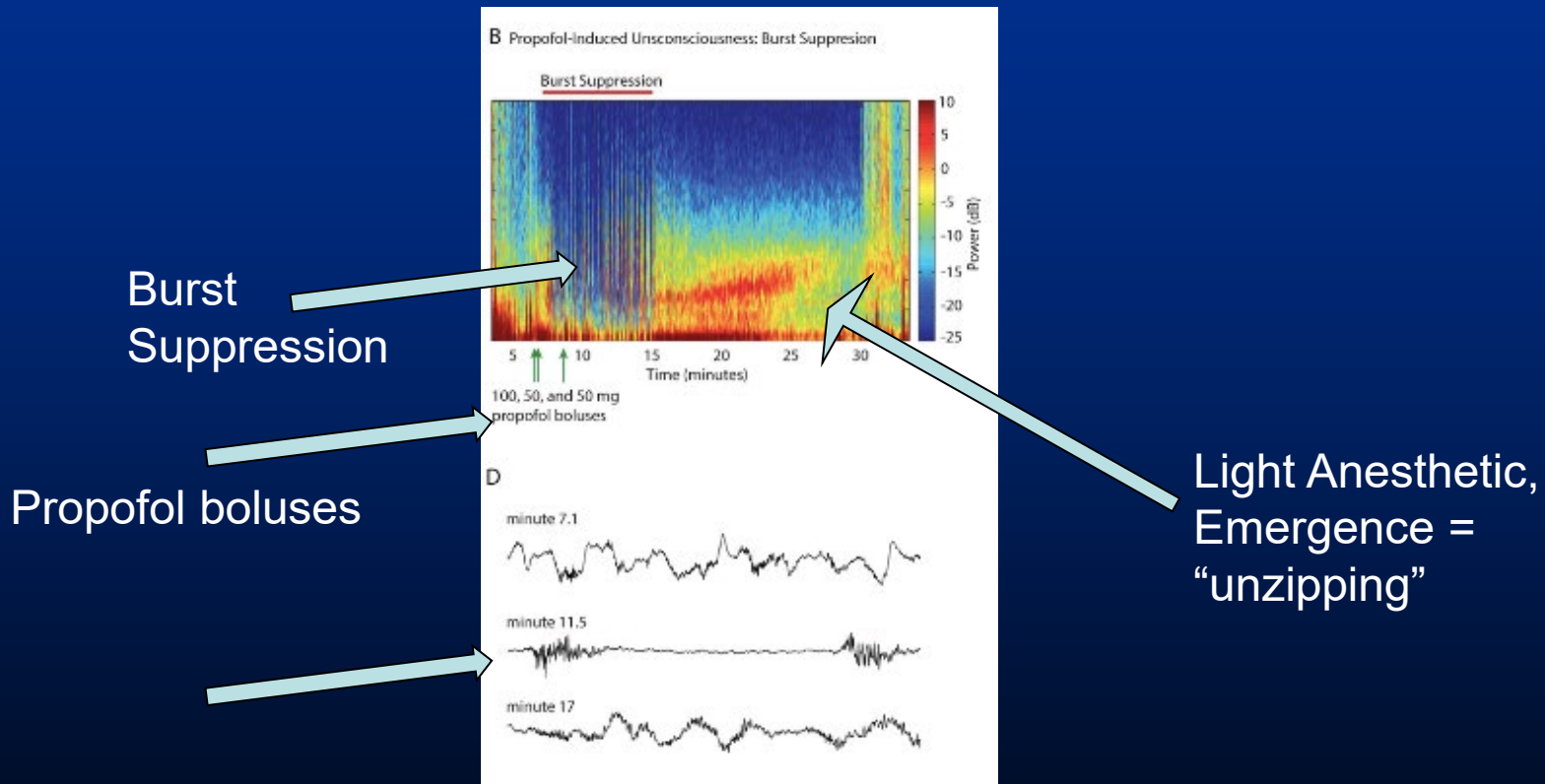
Propofol Spectrogram

- EEG moves from high frequency, low power to lower frequency, higher power
- Primarily 2 oscillation ranges
 - Delta
 - Alpha
- Mechanism of action
 - Enhance GABA inhibition in cortex, thalamus





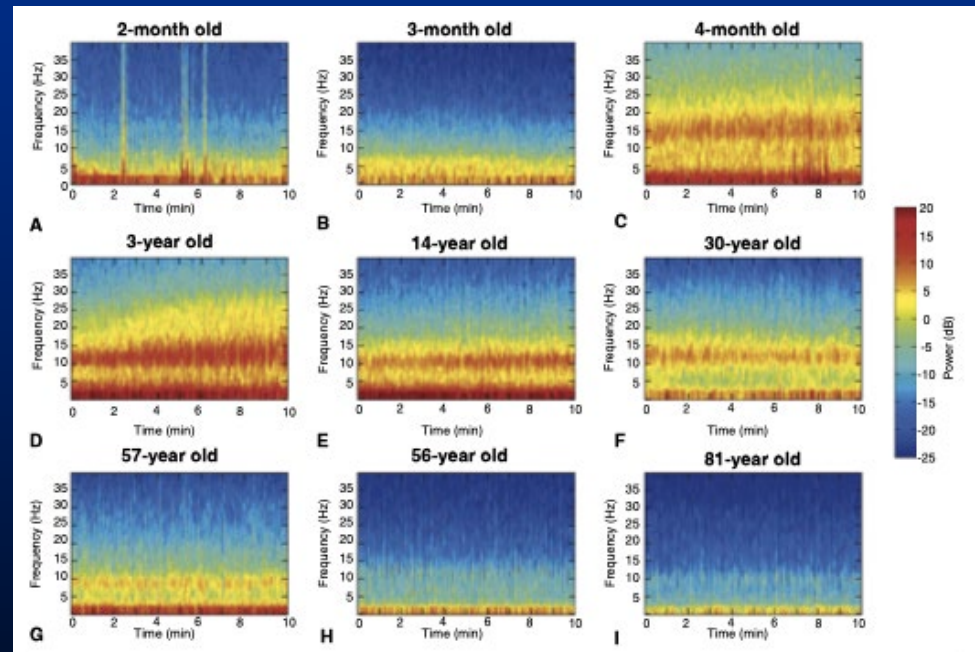
Propofol Spectrogram





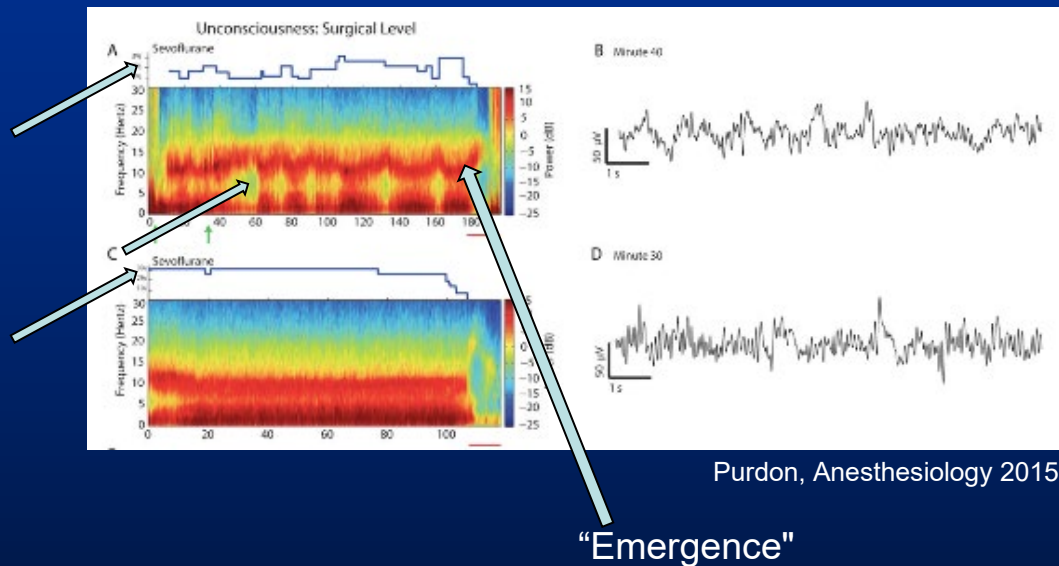
Impact of age on propofol

- Age can impact spectrogram
- Infants up to 4 mos appear to only demonstrate slow delta
- Alpha seen in youth and adults up until ~ age 55
- Alpha power noticeably decreases after 55.





Potent Inhaled Anesthetics

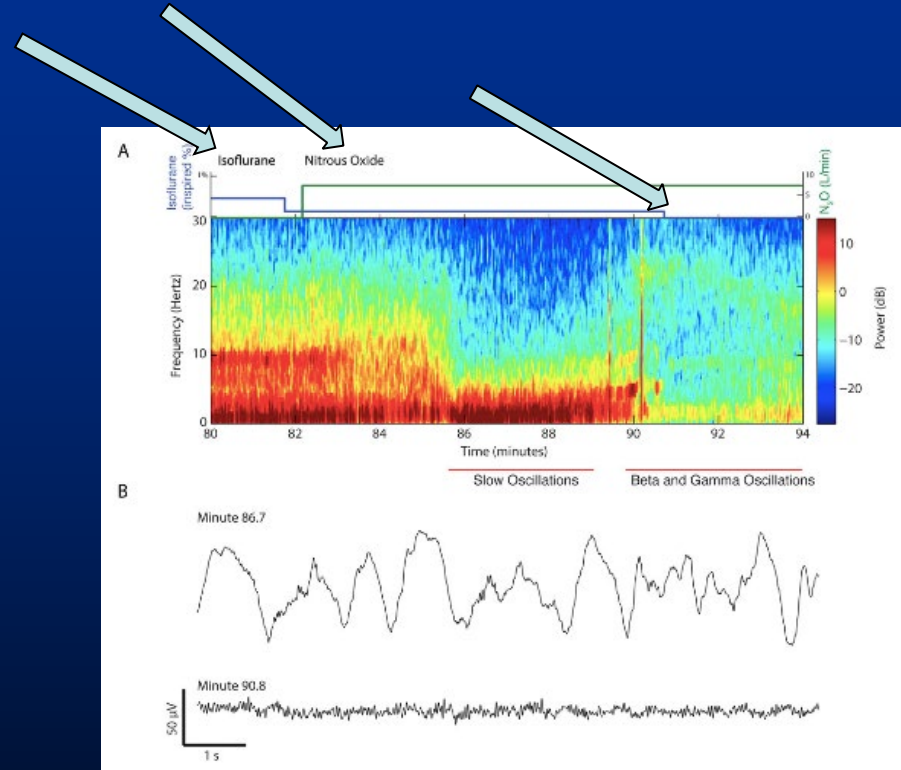


- Power at slow delta and alpha oscillations
- Mechanism – partly GABA mediated
- With increasing MAC, increased power of theta oscillations



Nitrous oxide

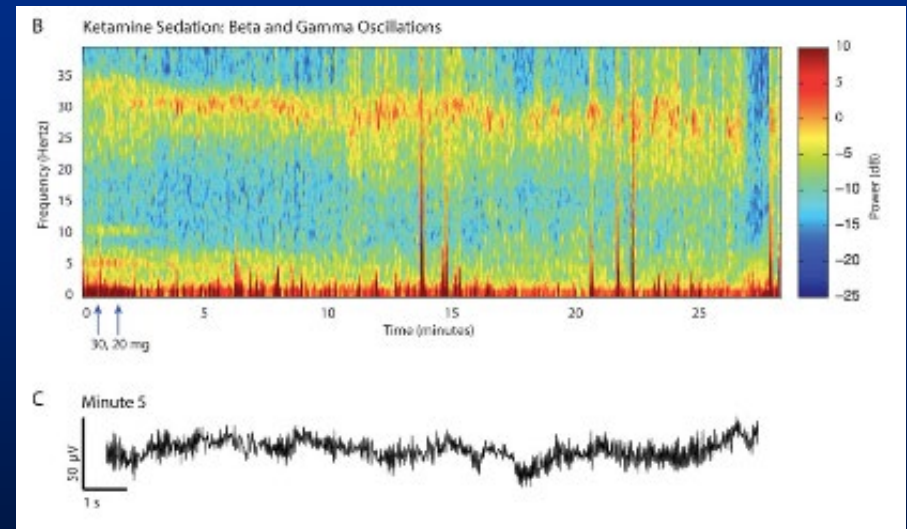
- Predominant beta and gamma oscillations
- Maybe related to a NMDA mechanism





Ketamine

- Predominant high beta, low gamma oscillations
- May see delta oscillations
- Traditionally thought to produce falsely elevated BIS scores
- NMDA inhibition
 - Increased neuronal activity and altered state



Purdon, Anesthesiology 2015



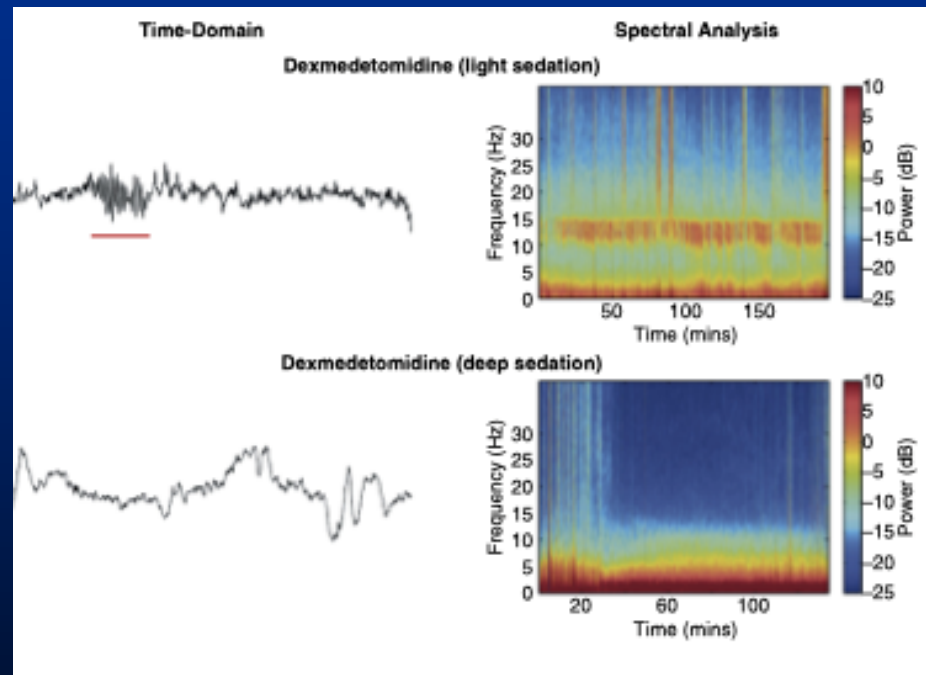
Spectrogram takeaway lessons

- Various anesthetic agents have distinct signatures
- Those signatures may not be well accounted for in pEEG
- The signatures may be related to mechanism of action
- pEEG also does not account for age
- Knowledge of signatures can aid in providing a more tailored anesthetic
 - Must apply in the clinical context
- Concordant with a scientific approach to clinical care.

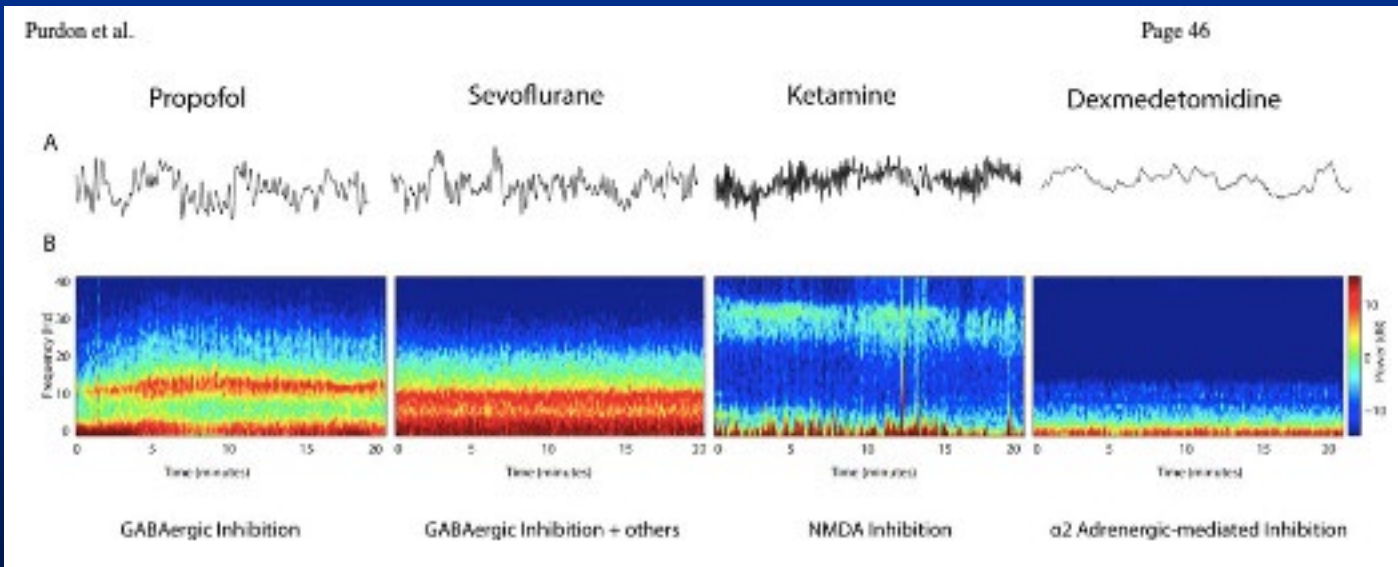


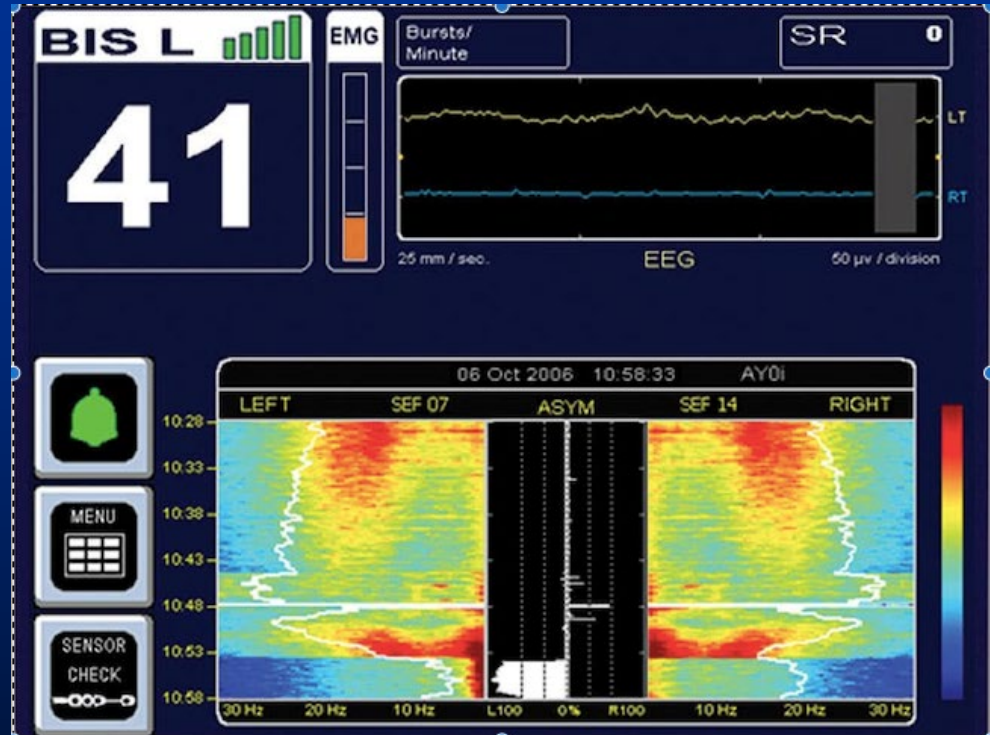
Dexmedetomidine

- Predominantly delta at higher doses. Some alpha at lower doses
- Traditionally produces low BIS scores although patient is easily arousable.
- Alpha 2 adrenergic agonist



Purdon, Anesthesiology 2015

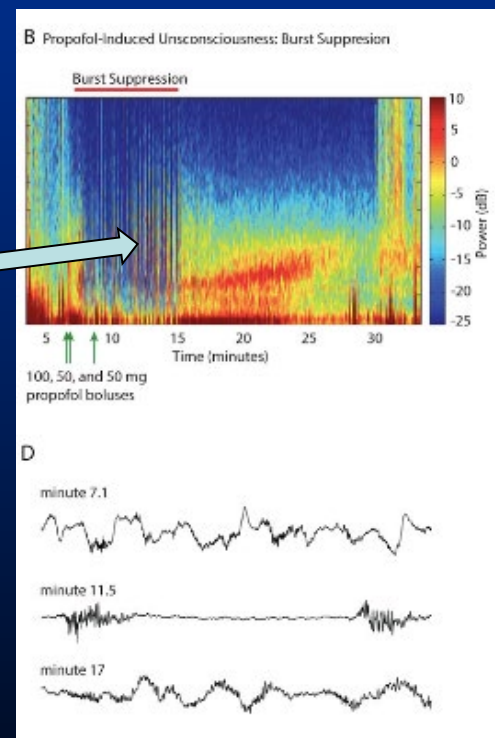






Unprocessed EEG- clinical applications

- Burst suppression (BS)– periods of EEG suppression alternating with short bursts of high-amplitude activity.
- SR - % of past minute EEG was suppressed
- BS associated with:
 - Deep anesthesia
 - Coma
 - Brain injury
 - Not seen during sleep
- Prior, small, mostly retrospective studies demonstrate association between BS and poor outcome
 - Mortality
 - Delirium





Delirium

- State of Impaired cognition
- Associated with poor outcomes
 - Poorer functional recovery
 - Prolonged ICU LOS
 - Increased HC costs
 - Potentially \$100b/yr
- Incidence after surgery – 10-70%



Intraoperative Electroencephalogram Suppression Predicts Postoperative Delirium

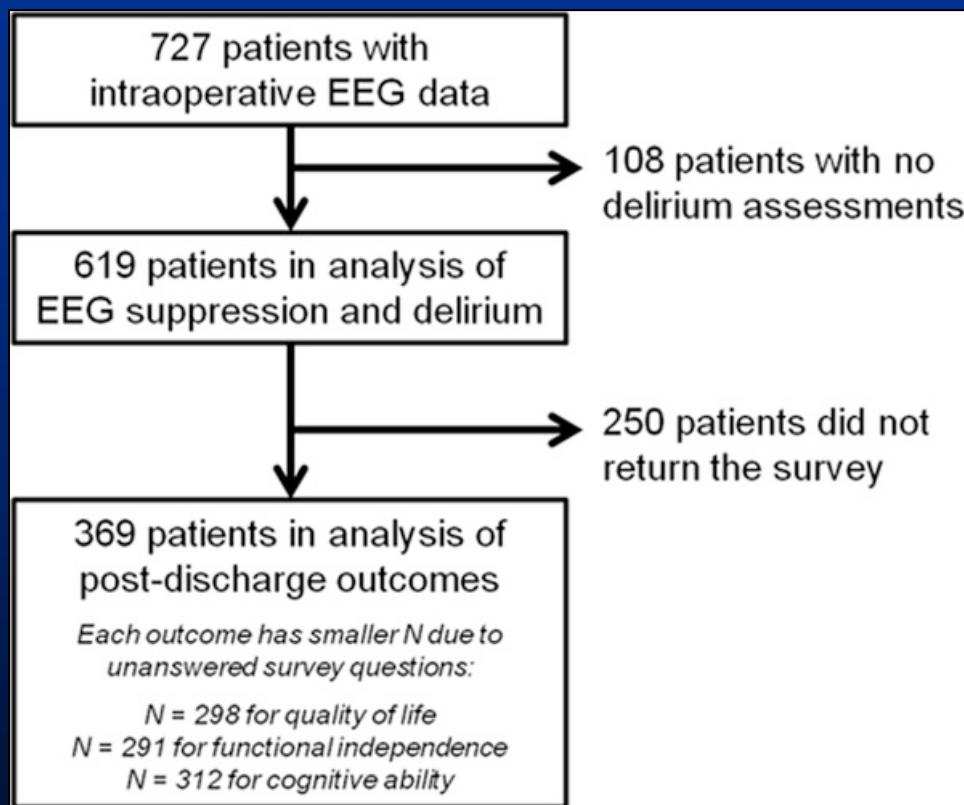
Bradley A. Fritz, MD,* Philip L. Kalarickal, MD,* Hannah R. Maybrier, BS,* Maxwell R. Muench, BS,*
Doug Dearth, MD,* Yulong Chen, BA,* Krisztina E. Escallier, MD,* Arbi Ben Abdallah, PhD,*
Nan Lin, PhD,† and Michael S. Avidan, MBBCh*

Anes Analg, 2016



Delirium and Burst Suppression

- Primary Aim – determine if duration of intraoperative EEG burst suppression is associated independently with postoperative delirium
- Secondary aims:
 - Identify RF for prediction of delirium
- Methods:
 - Prospective observational cohort study
 - Usual anesthetic with volatile agents
 - Suppression ratio data from BIS sensor
 - Collected from monitors, EMR
 - Delirium assessment via CAM-ICU

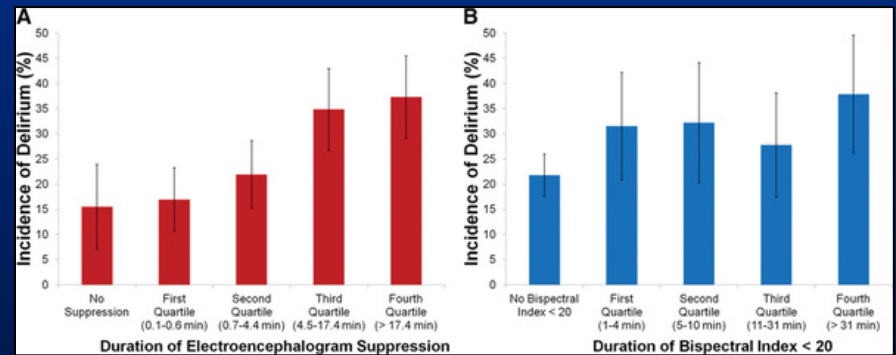


Fritz, Kalarickal et al, Anesth Analg, 2016



Results

- Patients divided into quartiles
- Of 727 patients, 619 were assessed for delirium
- 26% overall experienced delirium
- Duration of SB correlated with likelihood of delirium
- 3rd Quartile: > 4.5 mins of burst suppression
 - 35% incidence of delirium



Fritz, Kalarickal et al, Anesth Analg, 2016



Results

Variable	Non-transformed model		Transformed model ^a	
	Odds ratio (99% CI)	P	Odds ratio (99% CI)	P
Age (per year)	1.01 (0.98–1.03)	0.37	1.00 (0.98–1.03)	0.69
Male sex	0.92 (0.69–1.23)	0.46	0.89 (0.67–1.19)	0.31
ASA physical status >3	0.81 (0.60–1.11)	0.08	0.80 (0.58–1.08)	0.06
Age-adjusted Charlson index (per unit)	1.10 (0.93–1.30)	0.15	1.09 (0.92–1.30)	0.18
Sensory impairment	1.04 (0.63–1.70)	0.83	1.03 (0.62–1.74)	0.85
Alcohol use >5 drinks per week	1.02 (0.62–1.66)	0.93	1.02 (0.62–1.68)	0.91
Surgery type				
Noncardiac	Reference		Reference	
Coronary artery bypass grafting	1.12 (0.62–1.66)	0.57	1.26 (0.76–2.11)	0.24
Open cardiac	0.95 (0.60–1.51)	0.77	1.03 (0.65–1.62)	0.89
Length of surgery (per minute)	1.00 (1.00–1.00)	0.65	1.00 (1.00–1.00)	0.61
Intraoperative ketamine use	0.70 (0.38–1.29)	0.13	0.71 (0.39–1.30)	0.15
Intraoperative opioid dose (per 1 morphine equivalent/kg increase)	1.08 (0.71–1.64)	0.65	1.05 (0.69–1.61)	0.76
Blood transfusion (dichotomous) ^b	—	—	1.82 (0.83–4.00)	0.05
Blood transfusion (per unit) ^b	1.29 (1.14–1.46)	<0.0001	1.77 (1.07–2.94) ^a	0.004
Mean end-tidal anesthetic concentration (per 0.1 MAC unit)	0.66 (0.50–0.87)	0.0001	0.66 (0.50–0.88)	0.0002
Duration of electroencephalogram suppression (in minutes) ^c	1.05 (1.003–1.103) ^b	0.0065	1.22 (1.06–1.40)	0.0002

MAC = minimum alveolar concentration.

^aNatural logarithm transformation was used to obtain linearity with the logit for blood transfusion and duration of electroencephalogram suppression. In addition, a dichotomous variable for blood transfusion was added because of the large number of patients who received no blood transfusion.

^bIn the untransformed model, odds ratio is for a 5-minute increase in duration of electroencephalogram suppression.

Fritz, Kalarickal et al, Anesth Analg, 2016



Results

- Greater ETAG more likely to experience EEG suppression

Variable	Odds of non-zero suppression ratio		Value of suppression ratio (gamma regression)	
	Odds ratio (95% CI)	P	Location coefficient (95% CI)	P
Age (per year)	1.0 (1.0, 1.0)	0.05	-0.01 (-0.02, 0.01)	0.23
Male sex	0.8 (0.6, 1.0)	0.08	-0.04 (-0.33, 0.24)	0.77
ASA physical status >3	1.2 (0.8, 1.6)	0.39	-0.01 (-0.29, 0.28)	0.96
Coronary artery disease	1.2 (0.9, 1.6)	0.32	-0.24 (-0.53, 0.05)	0.11
Chronic obstructive pulmonary disease	1.1 (0.8, 1.7)	0.52	0.05 (-0.31, 0.41)	0.77
Malignancy, excluding skin cancer	0.9 (0.6, 1.4)	0.71	0.03 (-0.36, 0.43)	0.88
Home sedative, opioid, or alcohol use	1.0 (0.7, 1.3)	0.80	0.01 (-0.27, 0.28)	0.97
Midazolam dose >2 mg	1.1 (0.8, 1.6)	0.58	0.09 (-0.26, 0.44)	0.61
Intraoperative opioid dose (per 1 morphine equivalent/kg increase)	0.5 (0.4, 0.6)	<0.0001	0.16 (-0.03, 0.36)	0.11
Nitrous oxide use	1.0 (0.6, 1.6)	0.89	0.01 (-0.47, 0.47)	0.99
Cardiac surgery	0.8 (0.5, 1.2)	0.28	0.21 (-0.22, 0.64)	0.33
End-tidal anesthetic concentration (per 0.5 MAC unit)	1.5 (1.5, 1.6)	<0.0001	0.45 (0.41, 0.47)	<0.0001

MAC = minimum alveolar concentration.

*Suppression ratio (SR) was predicted using a 2-part nonlinear mixed-effects model. The first part used a logistic likelihood function to predict the odds of a non-zero SR. The second part used a generalized gamma regression to predict the value of the SR.

Fritz, Kalarickal et al, Anesth Analg, 2016



Conclusions

- Increased duration of EEG suppression associated with increased incidence of postop delirium
 - Increased concentrations of ETAG was a risk factor for burst suppression.
- Implications/ hypotheses
 - Suppression may indicate an excessive depth of anesthesia
 - Suppression may occur more often in patients with preop subclinical neural pathology
 - Suppression may be related to surgical factors
- Future studies should look adjusting anesthetic to reduce burst suppression and assess delirium.



JAMA | **Original Investigation**

Effect of Electroencephalography-Guided Anesthetic Administration on Postoperative Delirium Among Older Adults Undergoing Major Surgery The ENGAGES Randomized Clinical Trial

Troy S. Wildes, MD; Angela M. Mickle, MS; Arbi Ben Abdallah, PhD; Hannah R. Maybrier, BS; Jordan Oberhaus, BS; Thaddeus P. Budelier, MD, MSF; Alex Kronzer, BA; Sherry L. McKinnon, BS; Daniel Park, BS; Brian A. Torres, DNP; Thomas J. Graetz, MD; Daniel A. Emmert, MD, PhD; Ben J. Palanca, MD, PhD; Shreya Goswami, MBBS, DNB; Katherine Jordan, BS; Nan Lin, PhD; Bradley A. Fritz, MD; Tracey W. Stevens, MD; Eric Jacobsohn, MBChB, MPHE, FRCPC; Eva M. Schmitt, PhD; Sharon K. Inouye, MD, MPH; Susan Stark, PhD; Eric J. Lenze, MD; Michael S. Avidan, MBBCh; for the ENGAGES Research Group

- Patients randomized to usual care vs EEG guided care.
- Usual care – utilized BIS dimensionless index
- EEG guided care- used waveforms, SEF, SR EMG, BIS index to decrease anesthetic to avoid excessive depth
- Anesthetic adjusted to minimize Burst Suppression



QUESTION Does EEG-guided anesthetic administration decrease postoperative delirium incidence in older patients undergoing major surgery?

CONCLUSION This randomized clinical trial of older adults undergoing major surgery found that EEG-guided anesthetic did not reduce the incidence of postoperative delirium.

POPULATION

669 Men
563 Women



Adults aged ≥ 60 years
undergoing major surgery
under general anesthesia

Median age: 69 years

LOCATIONS

1
Hospital in
St Louis, MO



INTERVENTION

1232 Patients randomized

614

EEG-guided anesthesia

Anesthesiologists and nurse
anesthetists viewed display
of EEG waveforms
of anesthetic depth



618

Usual anesthesia

Anesthesiologists and
nurse anesthetists
blinded to EEG waveforms
of anesthetic depth



PRIMARY OUTCOME

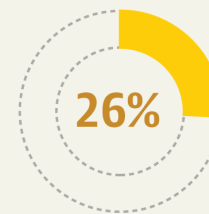
Incidence of delirium during postoperative days
1 to 5 as assessed by validated instruments
or through chart review

FINDINGS

Delirium during postoperative days 1 to 5

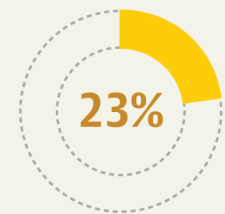
EEG-guided anesthesia

Delirium occurred in
157 of 604 patients



Usual anesthesia

Delirium occurred in
140 of 609 patients



Between-group difference:

3.0% (95% CI, -2.0% to 8.0%)

© AMA

Wildes TS, Mickle AM, Abdallah AB, et al, for the ENGAGES research group. Effect of electroencephalography-guided anesthetic administration on postoperative delirium among older adults undergoing major surgery: the ENGAGES randomized clinical trial [published February 5, 2019]. *JAMA*. doi:10.1001/jama.2018.22005

Original Investigation

June 10, 2024

Electroencephalography-Guided Anesthesia and Delirium in Older Adults After Cardiac Surgery

The ENGAGES-Canada Randomized Clinical Trial

Alain Deschamps, MD, PhD¹; Arbi Ben Abdallah, PhD²; Eric Jacobsohn, MD, ChB³; Tarit Saha, MD⁴; George Djaiani, MD⁵; Renée El-Gabalawy, PhD⁶; Charles Overbeek, MD¹; Jennifer Palermo, MD¹; Athanase Courbe, MD¹; Isabelle Cloutier, PhD⁷; Rob Tanzola, MD⁴; Alex Kronzer, BA²; Bradley A. Fritz, MD, MSCI²; Eva M. Schmitt, PhD⁸; Sharon K. Inouye, MD, MPH⁸; Michael S. Avidan, MBBCh²; for the Canadian Perioperative Anesthesia Clinical Trials Group

» [Author Affiliations](#) | [Article Information](#)

JAMA. 2024;332(2):112-123. doi:10.1001/jama.2024.8144

JAMA[®]

QUESTION Among older patients undergoing cardiac surgery, does electroencephalography (EEG)-guided anesthetic administration to minimize EEG suppression decrease the incidence of postoperative delirium.

CONCLUSION EEG-guided anesthetic administration to minimize EEG suppression, vs usual care, did not decrease the incidence of postoperative delirium among older adults undergoing cardiac surgery.

POPULATION

858 Men
282 Women



Adults 60 years or older
undergoing cardiac surgery

Median age: 70 years

LOCATION

4 Hospitals
in Canada



INTERVENTION



1140 Patients randomized
1131 Patients analyzed

573

EEG-guided anesthesia

EEG waveforms and derived parameters were shown and clinicians were encouraged to minimize EEG suppression

569

Usual care

General anesthesia was administered without EEG monitoring

PRIMARY OUTCOME

Delirium during postoperative days 1 through 5

FINDINGS

Postoperative delirium incidence

EEG-guided
anesthesia

18.15%

(102 of 562 patients)

Usual care

18.10%

(103 of 569 patients)

Difference was not statistically significant:

Between-group difference, **0.05%**

(95% CI, -4.57% to 4.67%)

© AMA

Deschamps A, Ben Abdallah A, Jacobsohn E, et al; for the Canadian Perioperative Anesthesia Clinical Trials Group. Electroencephalography-guided anesthesia and delirium in older adults after cardiac surgery: the ENGAGES-Canada randomized clinical trial. *JAMA*. Published online June 10, 2024. doi:10.1001/jama.2024.8144



ENGAGES - Results

Table 2. Perioperative Care Measures

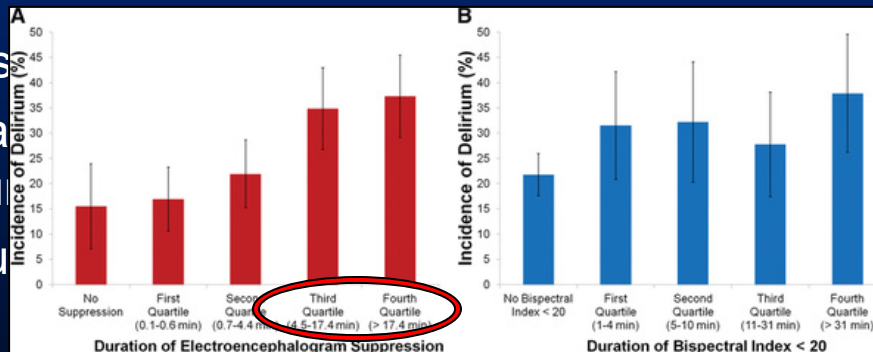
Measure	Median (IQR)		Difference (95% CI) ^a
	Guided	Usual Care	
Perioperative medications of interest			
Received midazolam, No./total (%)	306/614 (49.8)	328/618 (53.1)	-3.2 (-8.9 to 2.5)
Received nondepolarizing neuromuscular blocker, No./total (%)	570/614 (92.8)	560/618 (90.6)	2.2 (-1.0 to 5.5)
Intraoperative neuromuscular blocker dose, mg/kg ^b	0.82 (0.55 to 1.22)	0.78 (0.50 to 1.15)	0.03 (-0.04 to 0.11)
Intraoperative opioid dose, mg/kg ^c	0.65 (0.39 to 1.02)	0.58 (0.34 to 1.02)	0.06 (-0.02 to 0.13)
Fentanyl dose, µg	400 (250 to 750)	350 (250 to 750)	50 (-4.45 to 104.45)
Hydromorphone dose, mg	0.20 (0 to 1.50)	0.23 (0 to 1.25)	0 (-0.18 to 0.18)
Intraoperative phenylephrine dose, mg	1.37 (0.20 to 5.14)	2.02 (0.30 to 5.90)	-0.63 (-1.22 to -0.03)
Intraoperative measures			
Duration of anesthesia, min	264.5 (192 to 344)	264.0 (186 to 349)	0.5 (-16.7 to 16.7)
End-tidal volatile agent concentration, MAC ^d	0.69 (0.62 to 0.77)	0.80 (0.71 to 0.86)	-0.11 (-0.13 to -0.10)
Duration of BIS <40, min ^e	32 (9 to 81)	60 (19 to 132)	-28 (-38.0 to -18.0)
Time with SR >1%, min ^f	7 (1 to 23)	13 (2 to 58)	-6 (-9.9 to -2.1)
MAP, mean (SD), mm Hg	81.2 (8.26)	79.6 (7.68)	1.5 (0.63 to 2.42)
Duration of MAP <60 mm Hg, min	7 (2 to 19)	7 (1 to 19)	0 (-1.7 to 1.7)
Postoperative measures			
Admitted to PACU from OR, No./total (%)	326/614 (53.1)	339/618 (54.9)	-1.8 (-7.5 to 3.8)
Time spent in the PACU, min	143 (103 to 183)	147 (109 to 186)	-3 (-12.4 to 6.4)
Admitted to ICU, No./total (%)	322/614 (52.4)	297/618 (48.1)	4.4 (-1.3 to 10.0)
Time spent in the ICU, d	3 (2 to 5)	3 (2 to 5)	0 (-1 to 1)
Time spent intubated, min	237.0 (175 to 317)	231.5 (173 to 305)	5.5 (-23.0 to 16.0)
Hospital length of stay, d	7 (5 to 11)	7 (5 to 11)	0 (-1 to 1)



ENGAGES

- These results do not support that reducing burst suppression via decreased anesthetic has an impact on delirium
- Additional trials in progress
- Duration of Burst suppression was long in both groups...
 - Deep vs. deeper groups?

- Perhaps
 - Patients with burst suppression
 - Su



anesthesia have more

A&A, November 2020

Technology, Computing, and Simulation

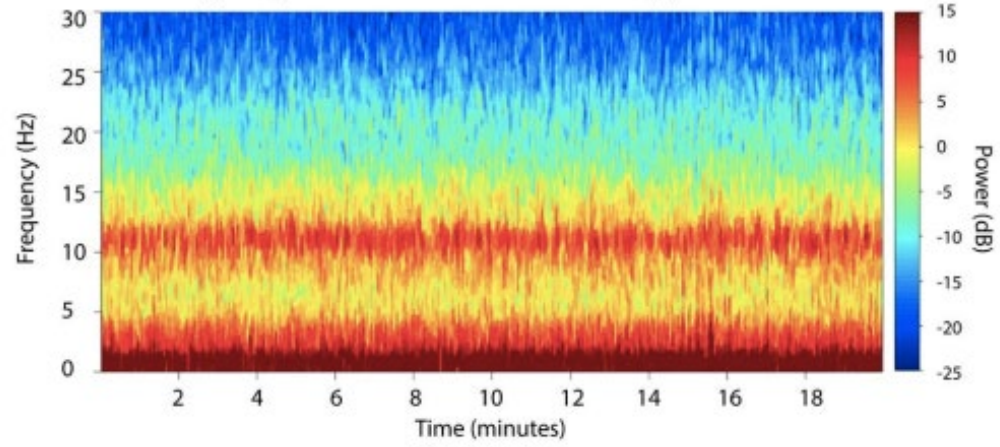
■ ORIGINAL CLINICAL RESEARCH REPORT

Low Frontal Alpha Power Is Associated With the Propensity for Burst Suppression: An Electroencephalogram Phenotype for a “Vulnerable Brain”

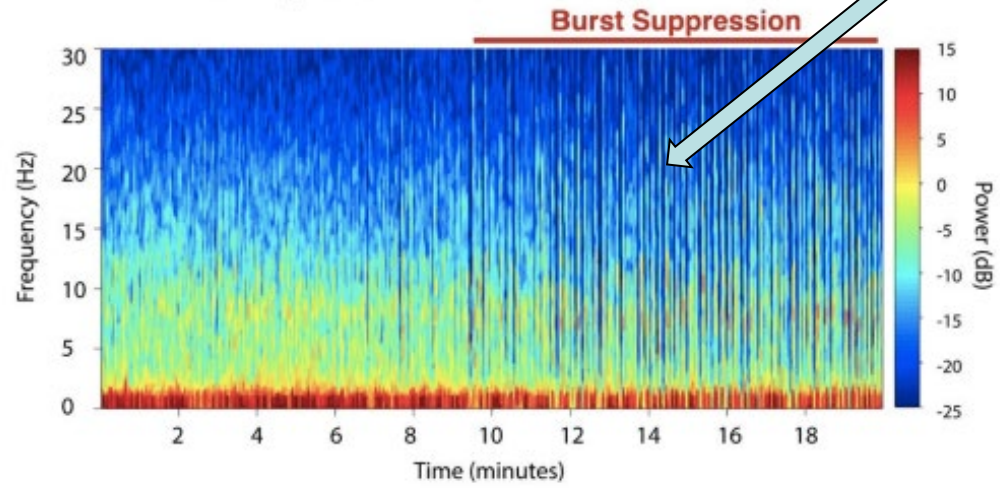
Yu Raymond Shao, MD, PhD,* Pegah Kahali, MD,†‡ Timothy T. Houle, PhD,† Hao Deng, MD, MPH,†
Christopher Colvin, MHSc,† Bradford C. Dickerson, MD, PhD,§ Emery N. Brown, MD, PhD,†‡||¶
and Patrick L. Purdon, PhD†

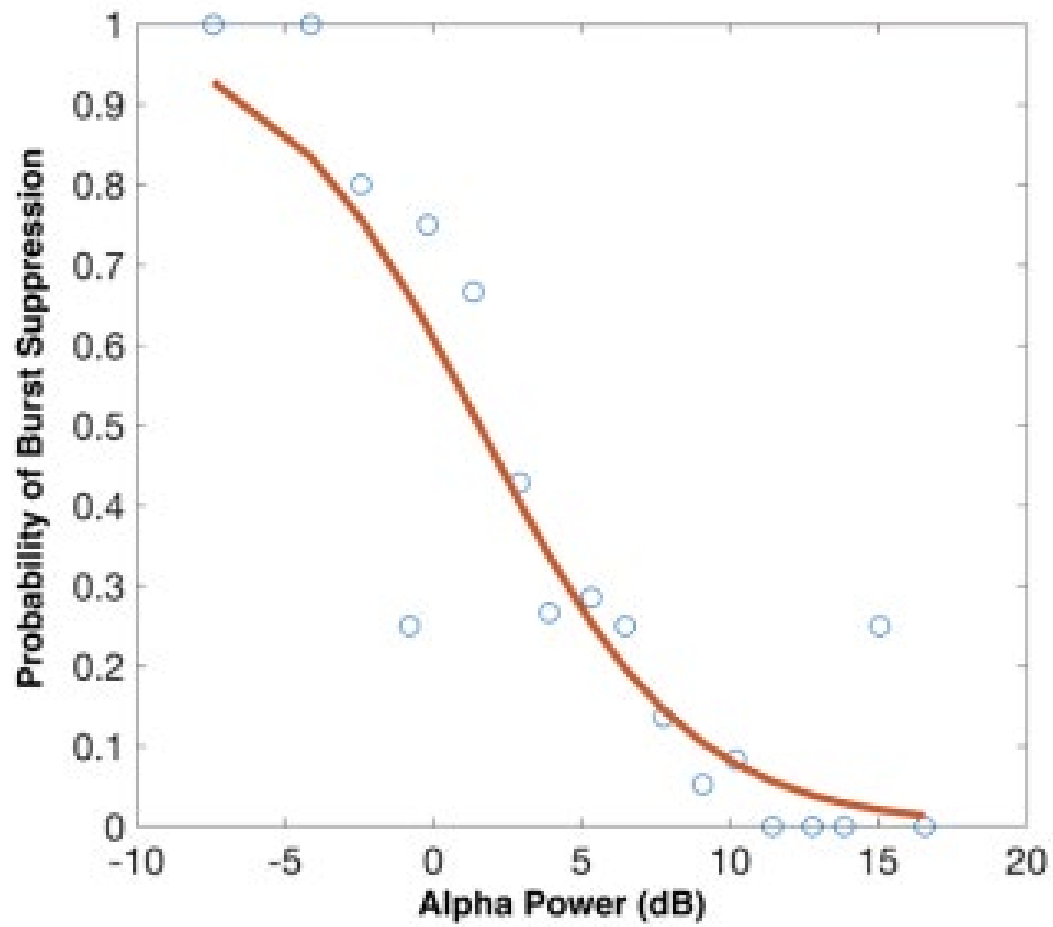


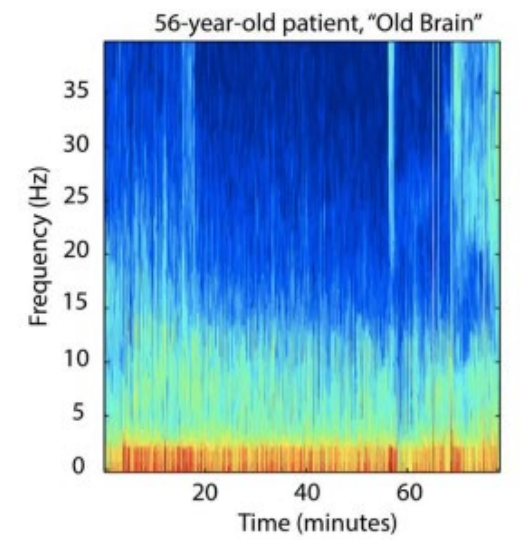
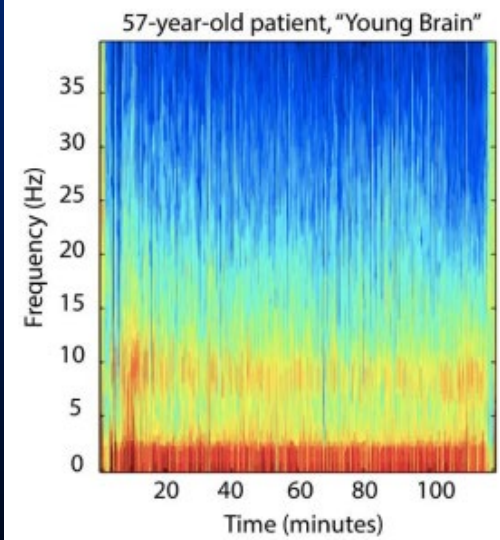
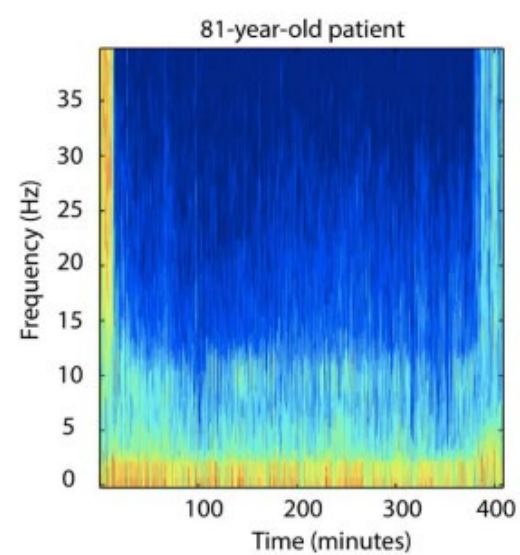
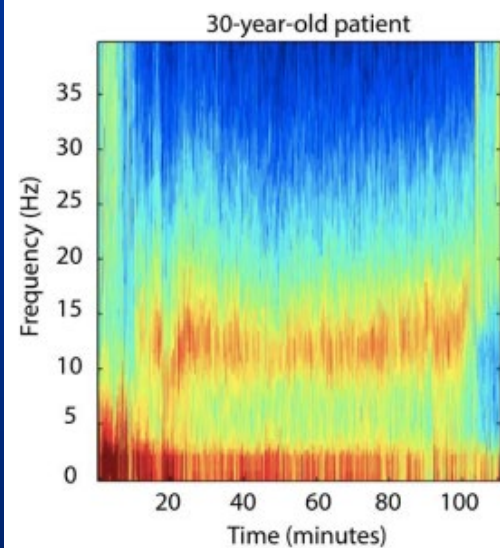
High Alpha Power Without Burst Suppression



Low Alpha Power With Burst Suppression







Hemispheric Asymmetry on the Electroencephalogram during General Anesthesia Responsive to Blood Pressure Manipulations

Bryan Nycz MD, Andrew Chalhoub MD, Cassandra Dean MD, & Alexander Papangelou MD

Emory University, Department of Anesthesiology, Atlanta, Georgia, USA

BACKGROUND

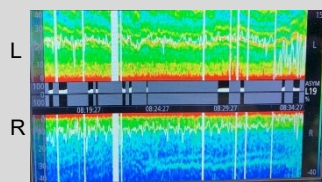
- Electroencephalography (EEG) utility in anesthesiology
- Monitor depth of anaesthesia
- Reducing excessive depth of anaesthesia
 - Minimize post-operative cognitive dysfunction and delirium
- Evaluate pain signals
- Detection of ischemia
 - Loss of fast background frequencies, low-voltage irregular delta activity, and/or total absence of activity
 - Slowing begins at CBF less than 25-35 mL/100g/min
 - Ischemic (18 mL/100g/min) and infarction (10-12 mL/100g/min) thresholds

CASE DESCRIPTION

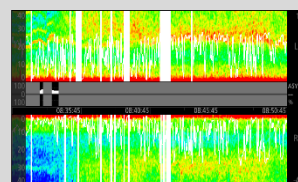
65-year-old man, with history of severe vascular disease including complete left carotid occlusion, severe right carotid stenosis (70-99%), and ruptured abdominal aortic aneurysm status-post repair, who presented for left first rib resection and left central venous angioplasty

- Frontal EEG (Root with SedLine; Masimo Corporation, Irvine, California) demonstrated hemispheric asymmetry
- Anesthetic maintenance with a stable level of volatile anesthesia
- No new neurologic deficits post-operatively

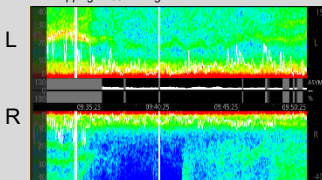
A) Post-induction snapshot



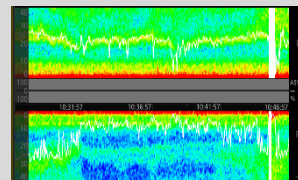
B) Addition of NE to maintain MAP ≥ 95 mmHg



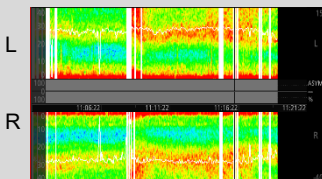
C) Cessation of vasoactive support with MAPs dropping to 65 mmHg



D) MAP drop to 75 mmHg



E) Immediately prior to and following extubation



Frontal EEG with Density spectral array. The top portion of the images represents the left frontal EEG output and the bottom portion represents the right frontal EEG output in a mirrored orientation. The x-axis is time (minutes) and y-axis is EEG frequency (Hz). Red colors correspond to the highest frequency (delta) power and blue represents little to no power with a color gradient defined on the far right of the image. The middle of the images depicts quantification of asymmetric brain activity (%). The white horizontal line within the spectrograms represent the spectral edge frequency where below 95% of the EEG power exists.

DISCUSSION

- Focal spectrographic ischemia captured by the EEG in the setting of severe internal carotid artery (ICA) stenosis
- Discordance coincided with decreased systemic pressures and corrected with elevated pressures at a constant level of volatile anesthesia
- Dynamic cerebral autoregulation is impaired in severe ICA stenosis
 - Higher likelihood of CBF dropping below critical thresholds
- Multiple tools to monitor cerebral ischemia EEG, evoked potentials, near infrared spectroscopy (NIRS), transcranial doppler
- Gold standard approach is debated
- Utilization of NIRS could have helped corroborate EEG findings
 - Measure of brain tissue oxygenation/perfusion

CONCLUSION

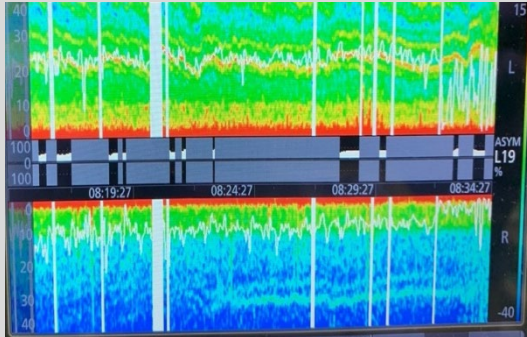
- The recognition, interpretation, and reaction to atypical spectrographic patterns could help minimize poor outcomes in high-risk patients
- DSA with quantitative EEG data may simplify interpretation and utility by anesthesiologists to detect and guide management of hypoperfusion

REFERENCES & COI

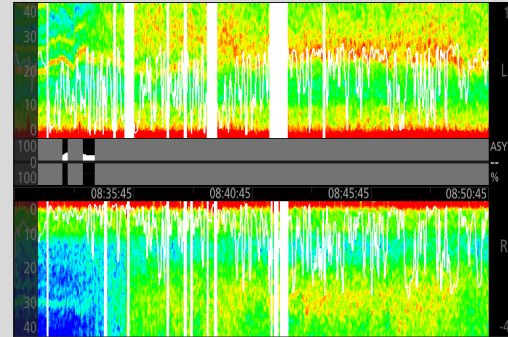
1. Pottier TH, Davidson A, Pavoni KJ, Brown EN. Clinical Electroencephalography for Anesthesiologists. Part 1: Background and Basic Signatures. *Anesthesiology*. 2015;122(4):937-959.
 2. Sun Y, Ye Y, Wang J, et al. Electroencephalography-guided anesthetic delivery for preventing propofol-induced delirium in adults: an updated meta-analysis. *Anaesthesia*. 2019;74(10):1170-1179.
 3. Garcia PS, Kessler M, Hight D, Singh JN. Effect of rocuronium stimulation on the electroencephalogram during general anesthesia: a narrative review and approach to emergent intubation. *BJA Advances*. 2021;13(2):448-453.
 4. Foreman B, Clewley A. Quantitative EEG for Wilson TS, Motta AM, Ben Abdallah A, et al. Effect of Electroencephalography-Guided Anesthesia Administration on Postoperative Delirium Among Older Adults Undergoing Major Surgery: The BRIDGE-2 Randomized Clinical Trial. *JAMA*. 2019;321(15):174-182.
- *No authors were compensated for preparing this journal. This study was not supported in part by any grants or scholarships, nor did Masimo Corporation participate in manuscript preparation. We have no conflicts of interest.

with permission, A Papangelou, 2021

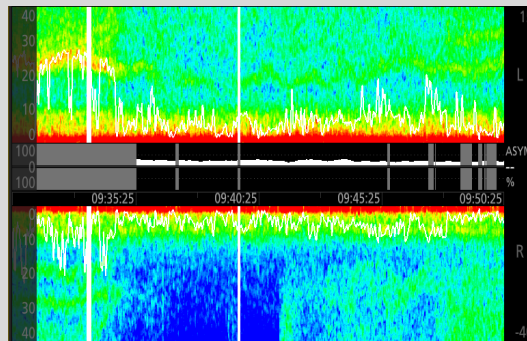
Post Induction low power on right (bottom spectrogram)



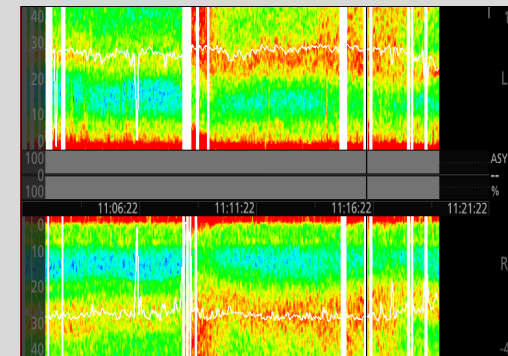
Addition of NE to maintain MAP \geq 95 mmHg



Cessation of vasoactive support with MAPs dropping to 65 mmHg

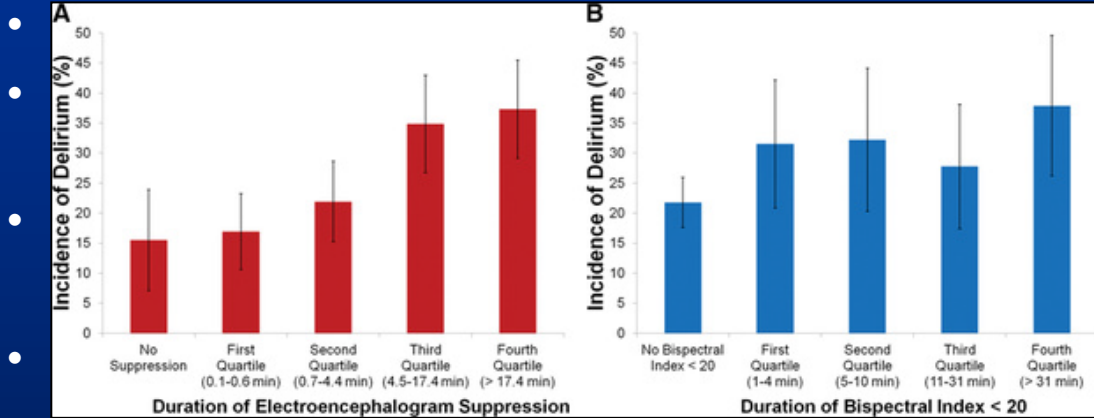


E) Immediately prior to and following extubation





Conclusions



FINDINGS

Delirium during postoperative days 1 to 5

EEG-guided anesthesia

Delirium occurred in 157 of 604 patients



Usual anesthesia

Delirium occurred in 140 of 609 patients

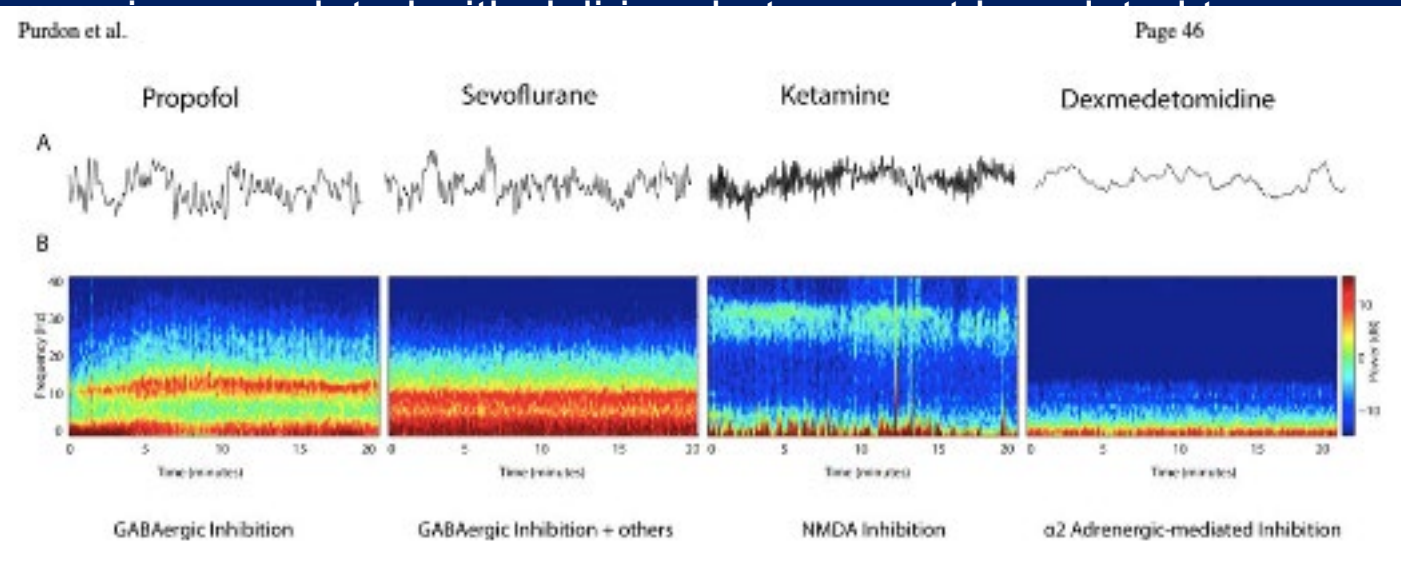


Between-group difference:

3.0% (95% CI, -2.0% to 8.0%)

© AMA

- appropriate clinical interpretation
- Burst Suppression
- anesthetic
- Our understanding
- evolve.
 - EEG
 - Use
 - Place
- We are continuing to
- important





Further Learning

- eegforanesthesia.iars.org
- icetap.org
- Questions?



July
2024

Fostering a Positive Learning Environment

Teaching and Learning in the Clinical Environment

Lara Zisblatt, EdD, MA, PMME

University of Michigan, Department of Anesthesiology

What is a Learning Environment

We all work in learning environments.

Dynamic, co-constructed perceptions, experiences and behaviors

Tone of the educational climate or culture, and the *routine way people interact.*

Gruppen, L., Irby, D. M., Durning, S. J., & Maggio, L. A. (2018). Interventions designed to improve the learning environment in the health professions: a scoping review. *MedEdPublish*, 7.

Why do we talk about Learning Environment

1920

- Classroom climate research -Thomas

1936

- Behavior as a function of person and environment -Lewin

1950

- Learning happens in the context of the person and their psychological environment

2000

- Clinical Learning environment focus
- CLER established in 2012

Fraser, B. J. (2014). Classroom learning environments: Historical and contemporary perspectives. In Handbook of research on science education, volume II (pp. 104-119). Routledge.

Learning Environment

Key Characteristics

Negative

- *Power imbalance*
- *Shame & humiliation*
- *Mistreatment*
- *Fear*

Positive

- *Speak freely and honestly*
- *Vulnerability*
- *Treated fairly*
- *Trust*

Bynum, W. E., & Haque, T. M. (2016). Risky business: psychological safety and the risks of learning medicine. *Journal of graduate medical education*, 8(5), 780-782.
Hsiang-Te Tsuei, S., Lee, D., Ho, C., Regehr, G., & Nimmon, L. (2019). Exploring the construct of psychological safety in medical education. *Academic Medicine*, 94(11S), S28-S35.

<https://www.youtube.com/watch?v=o3uf6xhfh-U>

Learning Environment

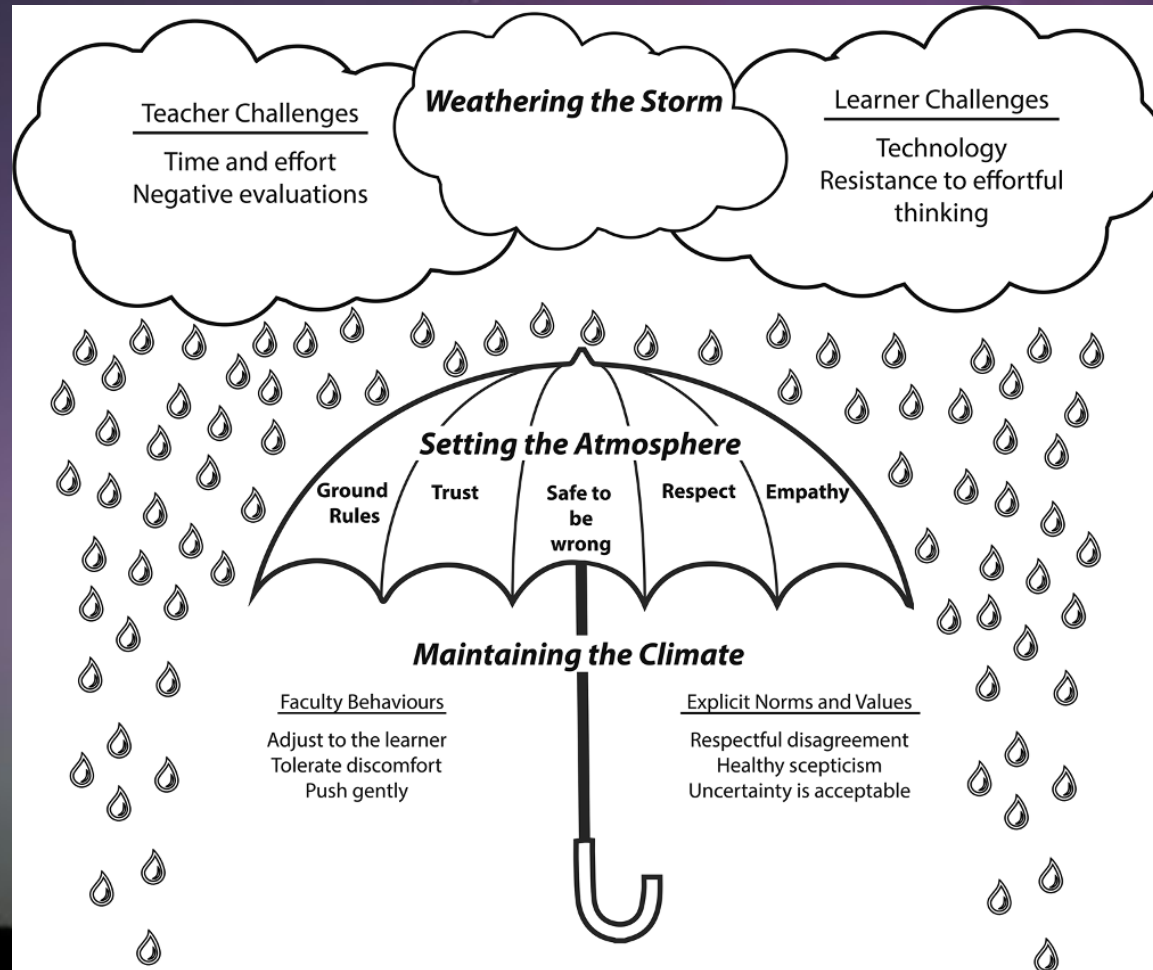


Clinical Environment



Jaffe, L. E., Lindell, D., Sullivan, A. M., & Huang, G. C. (2019). Clear skies ahead: optimizing the learning environment for critical thinking from a qualitative analysis of interviews with expert teachers. *Perspectives on medical education*, 8(5), 289-297.

Optimizing Learning Environment



Jaffe, L. E., Lindell, D., Sullivan, A. M., & Huang, G. C. (2019). Clear skies ahead: optimizing the learning environment for critical thinking from a qualitative analysis of interviews with expert teachers. *Perspectives on medical education*, 8(5), 289-297.

Nordquist, J., Hall, J., Caverzagie, K., Snell, L., Chan, M. K., Thoma, B., ... & Philibert, I. (2019). The clinical learning environment. *Medical teacher*, 41(4), 366-372.

Optimizing LE

Setting atmosphere

- Ground Rules:
 - Structure for learners
 - Clear expectations
- Trust
 - Patience is key
 - Time to respond and not react (Need a poker face!)
- Process not answers
 - Critical thinking process
 - How did you come to decision

Optimizing LE

Maintaining the climate

- Pushing Learners
 - Give them a chance
 - Ask higher order questions
- Tolerate Discomfort
 - Sit on your hands!
 - Prioritize learning over production pressures
- Learner Level
 - Where is your learner, not where you think they should be

Optimizing LE

Weathering the storm

- Challenges
 - Time and Effort
 - Effortful thinking
 - Model it
 - Grant grace
- Negative evaluations
 - Stick to observations
 - Avoid assumptions

Jaffe, L. E., Lindell, D., Sullivan, A. M., & Huang, G. C. (2019). Clear skies ahead: optimizing the learning environment for critical thinking from a qualitative analysis of interviews with expert teachers. *Perspectives on medical education*, 8(5), 289-297.

Psychological Safety

Modern workplace research has shifted to examine how to maximize PS and consequent benefits rather than just minimizing harmful activities.

Empowering Risk-taking

Psychological Safety

1844:

- Creativity as generative and destructive force that produces anxiety – Kierkegaard

1943

- Belongingness needs as necessary for growth – Maslow

1960

- Nonphysical “security needs” – McGregor

1965

- Climate "which encourages provisional tries and which tolerates failure without retaliation, renunciation, or guilt. - Schein and Bennis

1990

- For employees to feel engaged at work, they must feel safe to express themselves – Khan

1999

- Psychological safety is a shared experience, and that means it's a shared responsibility – Edmonson

Unsafe Environment

Anxiety, Shame, Inadequacy

Decreased engagement.

Easier to stay unnoticed

Psychologically Safe vs Learning Environment

Are they at odds??

Psychologically Safe Environment

- *Lack of expectations and assessment*
- *Focus on the self*
- *Trust is implicit*

Learning Environment

- *Needs goals and assessments*
- *Comparison with others*
- *Entrustment as earned*

Jung, K. B., Kang, S. W., & Choi, S. B. (2020). Empowering leadership, risk-taking behavior, and employees' commitment to organizational change: The mediated moderating role of task complexity. *Sustainability*, 12(6), 2340.

Expectations and Assessment

Observation without Judgement

I define judgments—both positive and negative—as life-alienating communication.

-Marshall B Rosenberg

Relationship Building

Curiosity about the person and not just
the work

Long term view to preserve the
relationship

Where do we find the energy?

The background of the slide is a photograph of a sunset or twilight sky. The sky is a mix of purple, blue, and green hues. A full moon is visible in the center of the sky. In the foreground, there are silhouettes of trees and a building, suggesting an outdoor setting at dusk.

Focus on the Self

Minimize Comparison

Show confidence in their ability
I know you will be able to get this!

Trust

How can you convey trust without
entrustment?

Trust is maintained through honest
interactions and openness to learn

Modeling Fallibility

I might mess this up! I need your help.
Can you watch me?

Positive Learning Environments Psychological Safety

Origins of these concepts allow us to apply them to the work of teaching and learning in the healthcare setting with discernment

THANK YOU!

Lara Zisblätt

Email

Lzisblat@med.umich.edu

LOCUM TENENS IN THE ANESTHESIA MARKETPLACE

PRESENTED BY RAD ZAMANI, CAA, MPH

OBJECTIVES

- Define locums tenens
- Outline history of locum tenens
- Discuss market trends
- Outline pros and cons of locum tenens

WHAT IS LOCUM TENENS?

-
- Latin phrase “to take the place of”
 - A **locum** is a person who temporarily fulfills the duties of another
 - Providers contract with agencies to perform services for a healthcare organization over a certain period of time
 - The provider works as a 1099 independent contractor and is paid through the staffing agency (pay rate), which is in turn paid by the healthcare facility (bill rate)



HISTORY OF LOCUM TENENS

- **1861-1865** Civil war doctors provide community care
- **1911** Native American Health
- **1971** West African War and Doctors Without Borders
- **1970** HSRI (Health System Research Institute) for rural health
- **2001** NALTO
- **2015** VA locum tenens utilization
- **2017** The Interstate Medical Licensure Compact
- **2020** Locum tenens provider & COVID



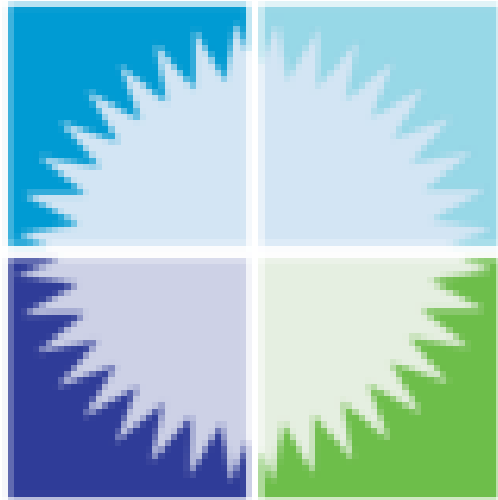
THE NATIONAL
ASSOCIATION OF
LOCUM TENENS
ORGANIZATIONS
(NALTO)



The National Association of
Locum Tenens Organizations



INTERSTATE MEDICAL LICENSURE COMPACT



Interstate Medical Licensure Compact

Helping Physicians Since 2017

■ <https://www.imlcc.org/>



PRN LOCUM VS FULL TIME LOCUM

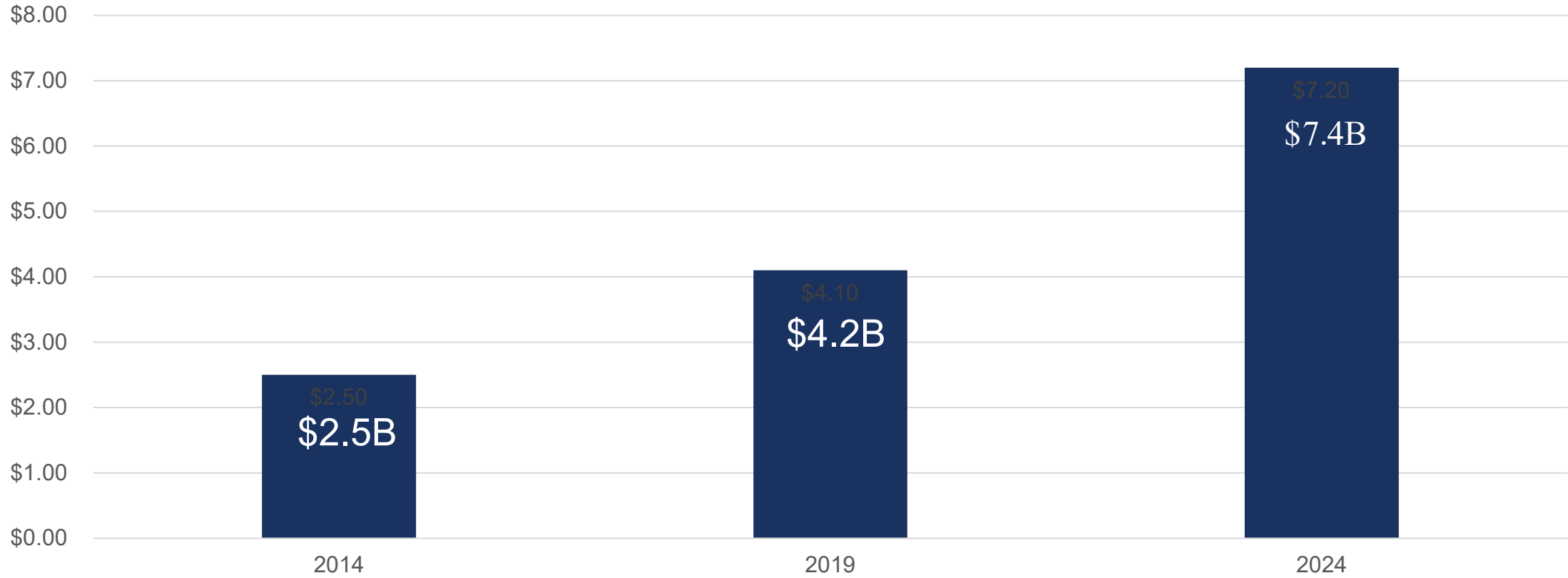
PRN provides the most flexibility, but also has no weekly guarantees and less premium pay

FT Locum provides less flexibility, but also provides weekly guarantees and more premium pay



LOCUM TENENS MARKET SIZE

Market Size (Billions)



Source: Staffing Industry Analyst, Health Staffing



PERFECT STORM

DEMANDS

NORA
AGING
POPULATION

COVID
CRNA program
doctorate
requirement
EMR
Private Equity

SUPPLY

PROVIDER DEMOGRAPHICS

- MDA
- CRNA
- CAA

#1 recruited healthcare professional





LOCUM
MARKET
TRENDS

Source: March 23,
2023, CHG

Healthcare's *2023*

State of Locum

Tenens Report



90% Utilization
7% of US Physicians



PROS & CONS OF LOCUM TENENS

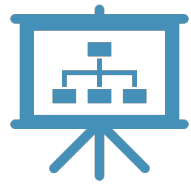
PROS

- Freedom from practice bureaucracy
- Scheduling autonomy
- Practice setting variety
- Financial rewards
- Tax advantages
- Increased retirement contributions
- Travel
- Explore permanent placement opportunities without the commitment

CONS

- Temporary, contract based role
- No benefits
- Does not count towards PSLF Qualification
- Travel
- Exhausting application and credentialing process

ATTRIBUTES OF A “GOOD” LOCUM PROVIDER



Organization



Communication



Flexibility



Experience



ATTRIBUTES OF A “GOOD” LOCUMS AGENCY

Access

Experience

Support

Opportunities

Vetting of sites

NALTO member

CHOOSING A LOCUM TENENS FIRM

1. Does the agency belong to NALTO®?

All members are held to an ethical code so you can be sure they'll follow the highest standards of service.

2. Does the agency provide malpractice insurance for the physicians they place?

Are they concerned with whether the client has coverage?

3. What is the agency's payroll history?

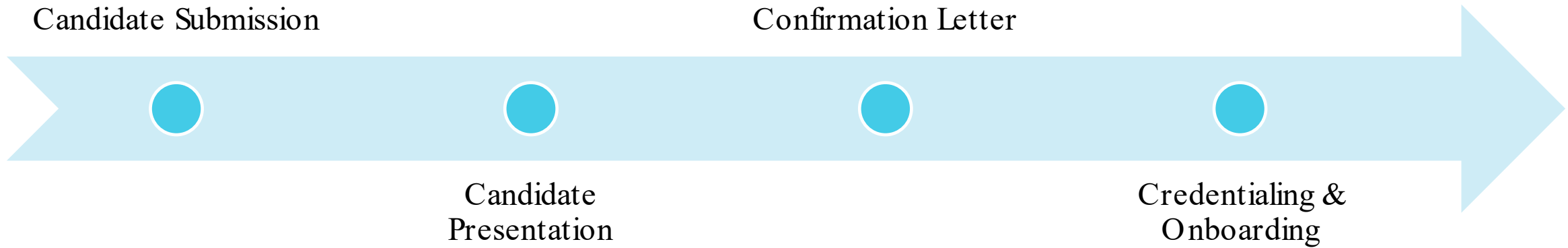
Do they have the financial resources to pay their physicians regularly?

4. Is your recruitment representative accessible and available to answer your questions and help you through the locum tenens process?

5. Does the agency offer services to ensure that all details are taken care of when you arrive to work on day one? (ie, licensure, credentialing, hospital privileges, proper travel and housing arrangements)



AGENCY PROCESS FOR CANDIDATE PRESENTATION





AGENCY CONTRACTS



RESTRICTIVE
COVENANTS



RELEASE
LETTERS



CONVERSION
FEES



SHARING CV

Rad Zamani
6360 River Chase Cir NW, Atlanta, GA 30328 - 678-523-4544 - radzamani@gmail.com

QUALIFICATIONS

- Strong analytical skills with healthcare applications
- Proven leadership and organizational abilities
- Exceptional written and interpersonal communication skills
- Creative problem solver and effective team player

EDUCATION

Emory University School of Medicine Atlanta, Georgia
Masters of Medical Sciences Program, 6/04 - 8/06

Rollins School of Public Health at Emory University Atlanta, Georgia
M.P.H, Health Policy and Management, 8/01 - 12/02

Emory University Atlanta, Georgia
Bachelor of Science in Neuroscience and Behavioral Biology, 8/96-5/00
(Dean's List)

EXPERIENCE

Harmony Anesthesia, LLC 11/14-Present Atlanta, Georgia
Founder/Independent Contractor
Responsibilities: Develop relationships with Anesthesia practices providing quality and innovative staffing solutions while also providing personal professional anesthesia services for obstetric, cardiothoracic, thoracic, orthopaedic, general, urological, and pediatric subspecialties.
Accomplishments: 100% client retention and 100% business growth each year for the past 5 years.

Medical Center of Central Georgia 11/09-10/14 Macon, Georgia
Staff Anesthetist
Responsibilities: Provide anesthesia care to patients before, during, and after their surgical experience in the following surgical subspecialties: OB/GYN, neonatal, pediatrics, orthopedics, cardiothoracic, ophthalmology, neurology, and general surgery.
Accomplishments: Received positive feedback from annual evaluations each and every year. Became member of LOD (Lead Anesthetist of the Day) team with responsibility of managing operating room schedule and staff once a week. Developed competency in spinal and epidural anesthetics.

Anesthesia Associates of Macon 07/07-11/09 Macon, Georgia
Staff Anesthetist
Responsibilities: Provide medical care to patients before, during, and after their surgical experience in the following surgical subspecialties: OB/GYN, pediatrics, orthopedics, cardiothoracic, ophthalmology, neurology, and general surgery.
Accomplishments: Increased competency in anesthesia practice with coverage spanning two hospitals, an ambulatory care center, and a birthing unit. Became a frequently requested anesthetist among surgical staff members.

Anesthesia Associates of Macon 07/07-11/09 Macon, Georgia
Staff Anesthetist
Responsibilities: Provide medical care to patients before, during, and after their surgical experience in the following surgical subspecialties: OB/GYN, pediatrics, orthopedics, cardiothoracic, ophthalmology, neurology, and general surgery.
Accomplishments: Increased competency in anesthesia practice with coverage spanning two hospitals, an ambulatory care center, and a birthing unit. Became a frequently requested anesthetist among surgical staff members.

Q & A





UPDATES IN PERIPARTUM HEMORRHAGE

Tailoring best practices to patient physiology
and hospital resources

Elizabeth M. S. Lange, MD
Associate Professor of Anesthesiology
Obstetric Anesthesiology Section Chief – EUHM
Emory University School of Medicine



LEARNING OBJECTIVES

Review epidemiology of obstetric hemorrhage

Review the efficacy of second line uterotonics

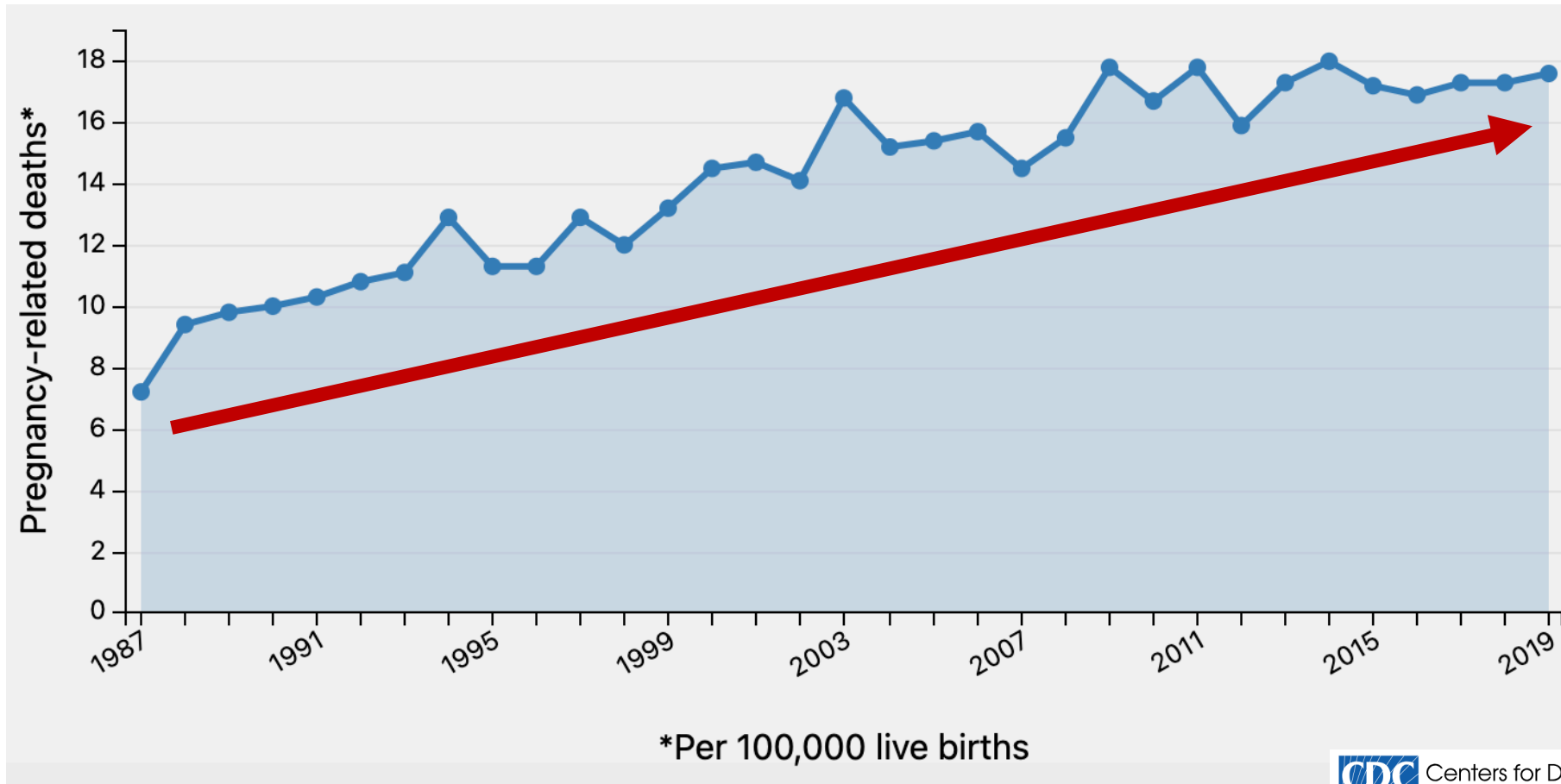
Analyze the evidence for tranexamic acid to treat postpartum hemorrhage and its use as a prophylactic agent

Understand pregnancy related changes in fibrinogen concentration

Identify common etiologies of obstetric hemorrhage associated with hypofibrinogenemia

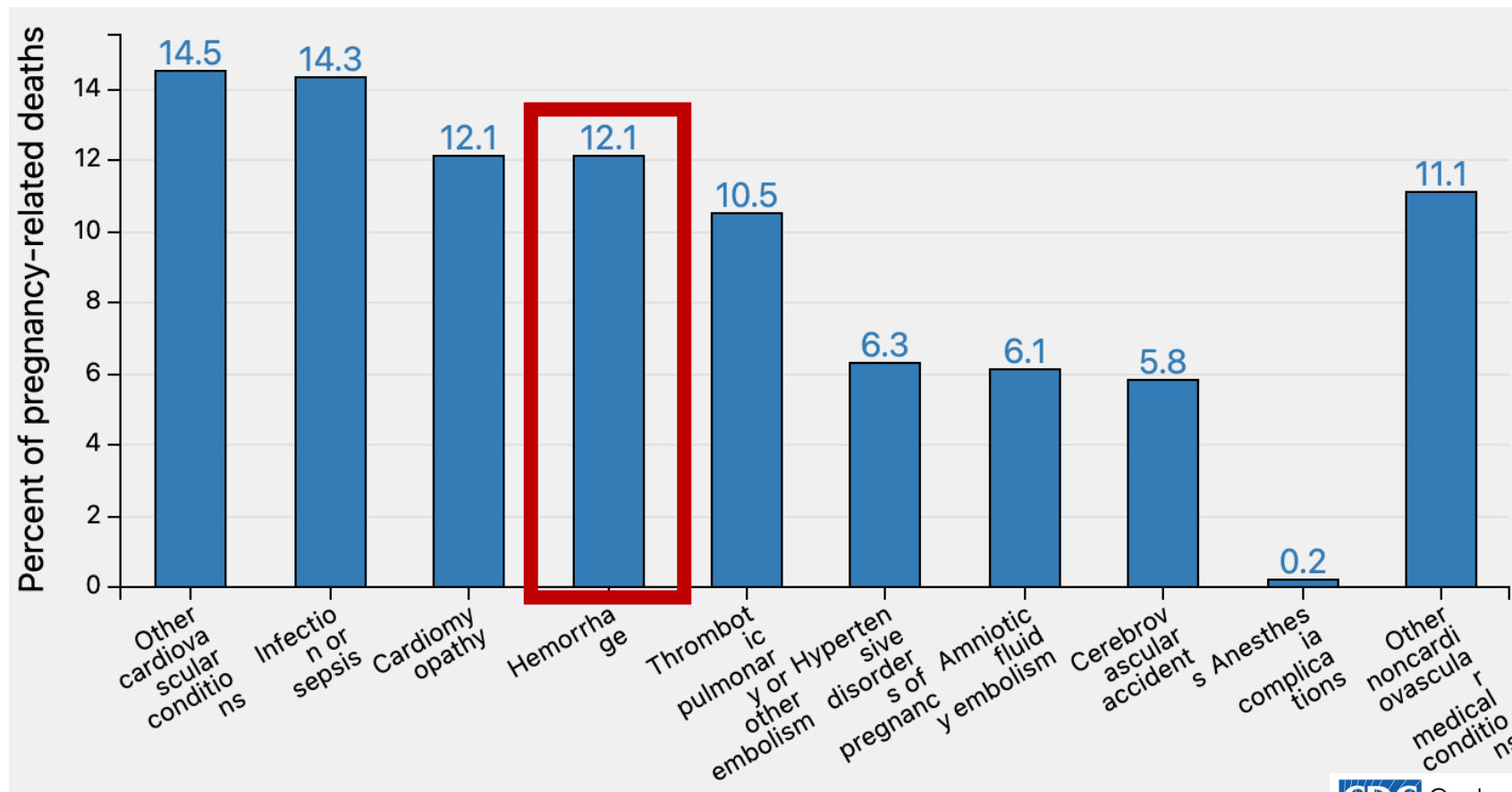
Choose an optimal PPH response and resuscitation strategy

TRENDS IN PREGNANCY-RELATED MORTALITY RATIOS IN THE US



*Per 100,000 live births

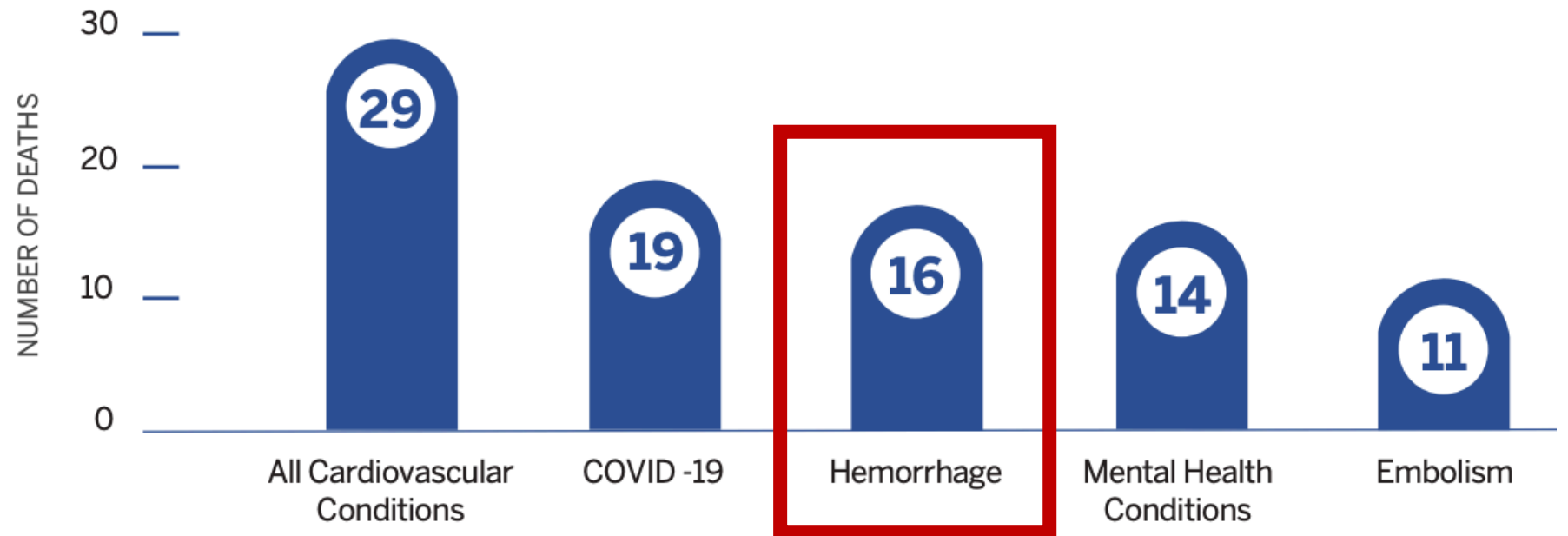
CAUSES OF PREGNANCY-RELATED DEATHS IN THE US: 2017 - 2019



MATERNAL MORTALITY IN GEORGIA: 2019-2021

PREGNANCY-RELATED MORTALITY RATIO

35.69 pregnancy-related deaths
per 100,000 live births.



PPH DIAGNOSIS



ACOG PRACTICE BULLETIN

Clinical Management Guidelines for Obstetrician–Gynecologists

NUMBER 183, OCTOBER 2017

(Replaces Practice Bulletin Number 76, October 2006)

Blood loss of $\geq 1000\text{mL}$ or signs/symptoms of hypovolemia

- Tachycardia
- Hypotension
- Tachypnea
- Oliguria
- Pallor
- Dizziness
- Altered mental status

TABLE 1. Signs and Symptoms of Hypovolemic Shock⁶

Estimated Blood Loss (mL)	Percent Blood Volume Lost (%)	Physiologic Changes	Heart Rate	Blood Pressure	Urine Output	Mental Status	Likelihood of Transfusion
0-750	10-15	↑ circulating catecholamines and fluid shifts usually compensate for blood loss	NC or mildly elevated	NC	NC	NC or mildly anxious	Transfusion usually not necessary
750-1500	15-25	↑ circulating catecholamines, peripheral vasoconstriction	< 100 bpm	NC or ↓ pulse pressure	Slight ↓ (20-30 mL/h)	Anxiety, fright, or hostility	Transfusion possible
1500-2500	25-40	Hypoperfusion, moderate shock	100-120 bpm	SBP 80-100 mm Hg; ↓ pulse pressure	↓ (5-15 mL/h)	Anxiety, confusion	Transfusion almost always necessary
> 2000	> 40	Extreme hypoperfusion; severe shock	> 120-140 bpm	SBP < 80 mm Hg, may be undetectable via noninvasive blood pressure cuff	↓↓ Possibly complete anuria	Lethargy, loss of consciousness frequently observed	Massive transfusion possible

bpm indicates beats per minute; NC, no change; SBP, systolic blood pressure.



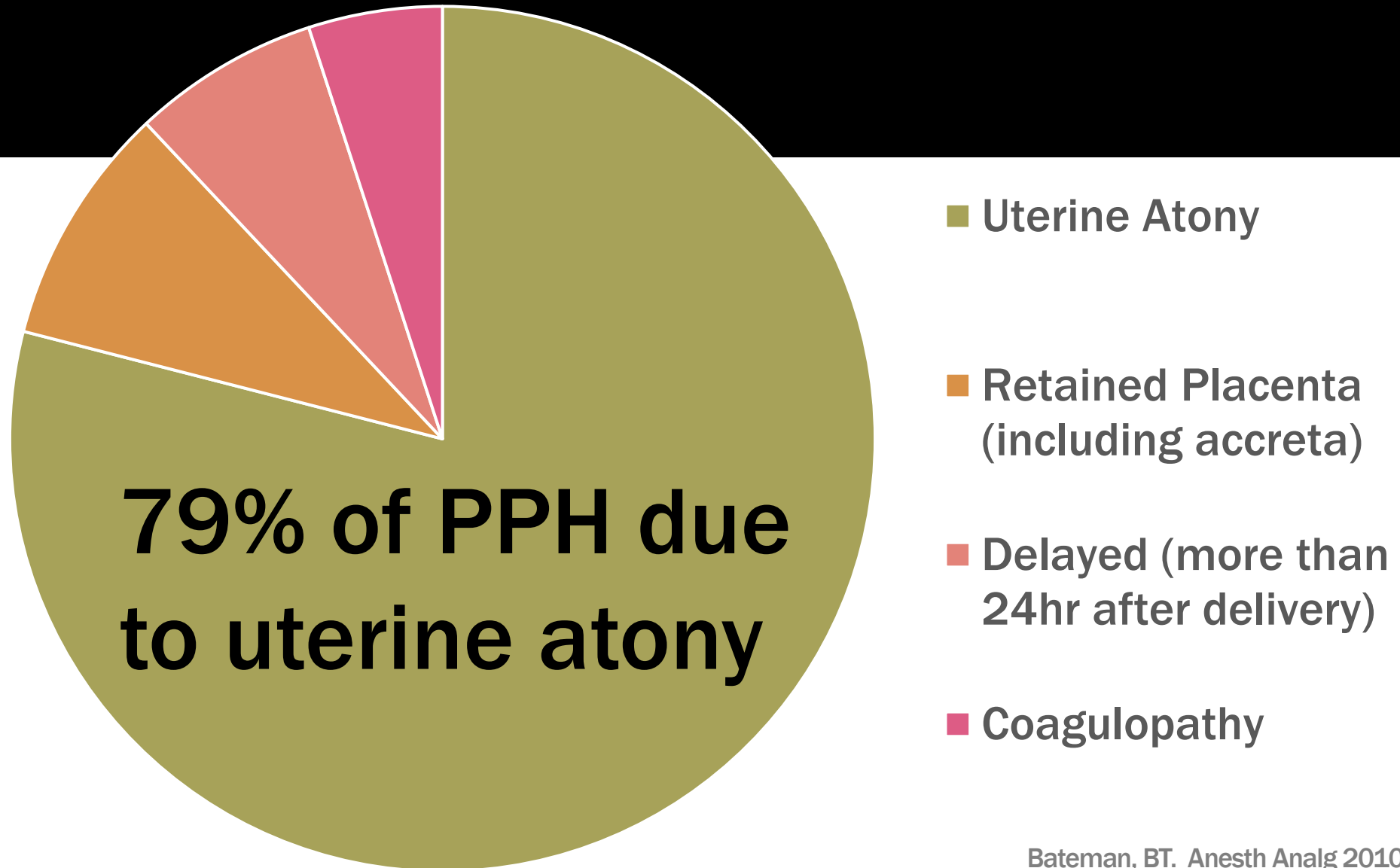
CMQCC

California Maternal
Quality Care Collaborative

PPH PREPAREDNESS

ADMISSION & LABOR RISK FACTORS		
MONITOR FOR HEMORRHAGE <i>Routine obstetric care</i>	NOTIFY CARE TEAM <i>Personnel that could be involved in response are made aware of patient status and risk factors</i>	NOTIFY CARE TEAM MOBILIZE RESOURCES <i>Consider anesthesia attendance at delivery</i>
Low	Medium	High
No previous uterine incision	Prior cesarean(s) or uterine surgery	Placenta previa, low lying placenta
Singleton pregnancy	Multiple gestation	Suspected/known placenta accreta spectrum
≤ 4 vaginal births	> 4 vaginal births	Abruption or active bleeding (> than show)
No known bleeding disorder	Chorioamnionitis	Known coagulopathy
No history of PPH	History of previous postpartum hemorrhage	History of > 1 postpartum hemorrhage
	Large uterine fibroids	HELLP Syndrome
	Platelets 50,000 - 100,000	Platelets < 50,000
	Hematocrit < 30% (Hgb < 10)	Hematocrit < 24% (Hgb < 8)
	Polyhydramnios	Fetal demise
	Gestational age < 37 weeks or > 41 weeks	2 or more medium risk factors
	Preeclampsia	
	Prolonged labor/Induction (> 24 hrs)	
If low risk: <input type="checkbox"/> Specimen on Hold in Blood Bank	If medium risk: <input type="checkbox"/> Order Type & Screen <input type="checkbox"/> Review Hemorrhage Protocol	If high risk: <input type="checkbox"/> Order Type & Crossmatch 2 units PRBCs <input type="checkbox"/> Review Hemorrhage Protocol <input type="checkbox"/> Notify OB Anesthesia

UNDERLYING ETIOLOGY OF PPH



UTEROTONICS

Agent	Dosing	Contraindications	Side Effects	
Oxytocin <i>Pitocin</i>	Infusion 6-36U/hr <i>Protocols vary</i>	None	1. ↓SVR/↓BP 2. Nausea/vomiting 3. ST-segment depression 4. Free water retention	1 st line agent
Methylergonovine <i>Methergine</i>	200 mcg IM <i>*May repeat x1 after 1h</i>	-HTN -Preeclampsia -CAD	1. HTN (arteriolar constriction) 2. Nausea/vomiting 3. Coronary vasospasm	2 nd line agent
15-Methylprostaglandin F 2 α <i>Hemabate</i>	250 mcg IM or IU <i>*May repeat Q15 min up to 2mg</i>	-Reactive airway disease (relative CI) -Pulmonary HTN -Hypoxemic pt	1. Bronchoconstriction 2. Nausea/vomiting 3. Diarrhea 4. Shivering	2 nd line agent
Misoprostol <i>Cytotec</i>	800-1000mcg per rectum	None	1. ↑Temperature 2. Diarrhea 3. Shivering	Least effective 2 nd line agent

OXYTOCIN ERRORS

Table 1. Identified Risks Associated with Oxytocin Use

Inappropriate/unnecessary use in labor induction in low-risk patient populations
Lack of a standardized dosing regimen
Confusion with look-alike and sound-alike medications
Inappropriate use of brand names or unsafe abbreviations
Non-standardized or non-centralized preparation of oxytocin infusions
Use of multiple oxytocin infusion concentrations/preparations
Insufficient monitoring of beyond-use dates of pre-prepared solutions
Reliance on manually programmed infusion pumps without automated safeguards in place
Mix-ups with infusion tubing
Mix-ups with dosing/infusion rates
Use/availability of oxytocin in the direct patient care area without appropriate orders and communication among healthcare providers

BEST PRACTICE 17:

Safeguard against errors with oxytocin use.

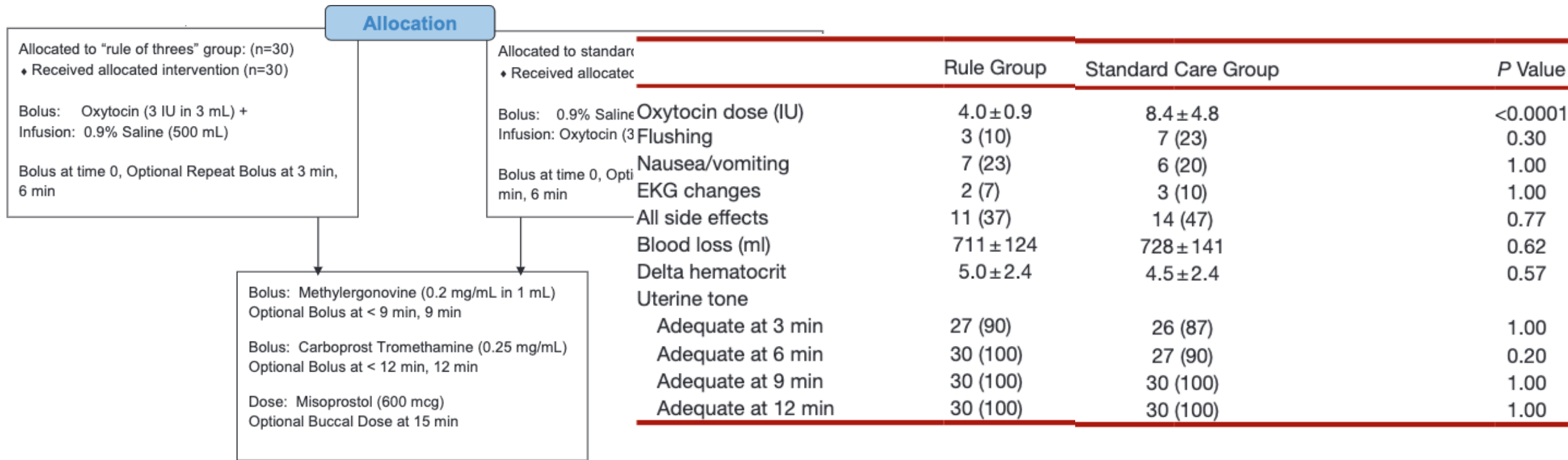
- a) Require the use of standard order sets for prescribing oxytocin antepartum and postpartum that reflect a standard clinical approach in your organization for labor induction/augmentation and to control postpartum bleeding.
- b) Standardize to a single concentration and bag size for both antepartum and postpartum oxytocin infusions (e.g., 30 units of oxytocin in 500 mL Lactated Ringer's solution).
- c) Standardize how oxytocin doses, concentration, and rates are expressed. Communicate orders for oxytocin infusions in terms of the dose rate (e.g., dosage/time) and not by volume rate (volume/time) and align with the smart infusion pump dose error-reduction system (DERS).
- d) Provide oxytocin in a standard ready-to-administer form. Boldly label both sides of the infusion bag to differentiate oxytocin bags from plain hydrating solutions and magnesium sulfate infusions.
- e) Avoid bringing oxytocin infusion bags to the patient's bedside until it is prescribed and needed.

PROPHYLACTIC OXYTOCIN INFUSION FOR THE THIRD STAGE OF LABOR

	Pre-implementation (n = 483)	Post-implementation (n = 418)	P value
Total amount of oxytocin infused (U)*	20 [20–30]	12.5 [9–18]	<0.001
Intraoperative postpartum hemorrhage	21%	24%	0.21
Estimated blood loss (mL)	800 [700–900]	800 [750–900]	0.03
Methylergonovine administered dose (µg)			0.38
15-methyl prostaglandin dose (µg)			0.39
Misoprostol administered dose (µg)			0.74
Any vasopressor administered			0.74
Phenylephrine administered dose* (µg)	100 [0–200]	0 [0–200]	0.31
Ephedrine administered dose* (mg)	16%	11%	0.72
Epinephrine administered dose* (µg)	0 [0–0]	0 [0–0]	0.15
	1%	0%	0.33
	0 [0–0]	0 [0–0]	0.35
			0.01
			0.02
			0.09
			0.09

Oxytocin infusion protocol decreased total amount of intraoperative oxytocin administered without increasing the rate of PPH or need for 2nd line uterotonics

RULE OF THREES





First-line drugs

Oxytocin

Elective caesarean section

Bolus 1 IU oxytocin; start oxytocin infusion at 2.5–7.5 IU.h⁻¹ (0.04–0.125 IU.min⁻¹).

If required after 2 min, give a further dose of 3 IU over ≥ 30 s.

Consider second-line agent early in the event of failure of this regimen to produce sustained uterine tone.

Review the patient's clinical condition before discontinuing the infusion; this will usually be between 2 h and 4 h after commencement.

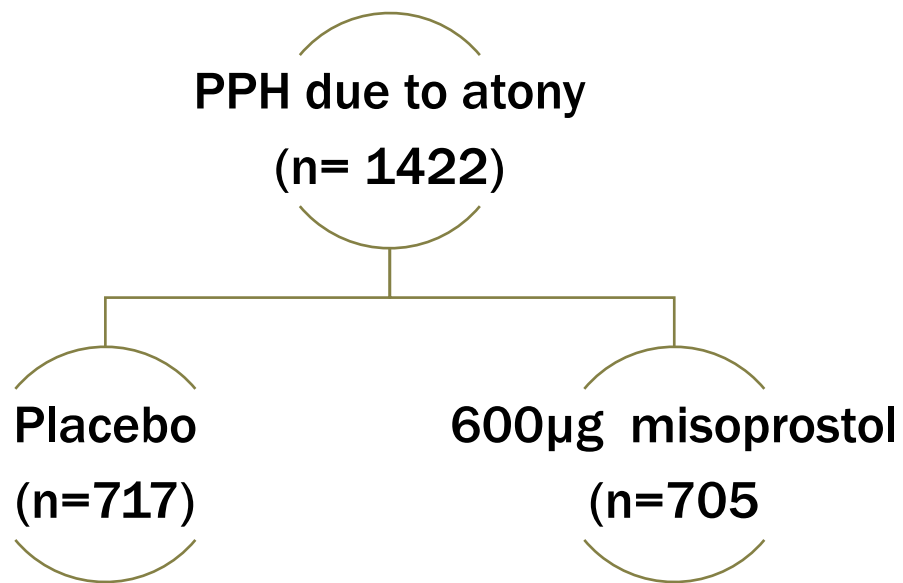
Intrapartum caesarean section

3 IU oxytocin over ≥ 30 s; start oxytocin infusion at 7.5–15 IU.h⁻¹ (0.125–0.25 IU.min⁻¹).

Time after delivery	Vaginal Delivery	Cesarean Delivery without Labor	Cesarean Delivery with Labor
First hour (prophylaxis)	18units/hr	18units/hr	36units/hr until fascia closed, then 18units/hr
Second hour (prophylaxis)	9units/hr	9units/hr	9units/hr
If no IV (prophylaxis)	10U oxytocin IM		
If uterine atony (treatment)	↑ rate to 36units/hr for 1 hr, followed by 9units/hr for 1 hour	↑ rate to 36units/hr for 1 hr, followed by 9units/hr for 1 hour	↑ rate to 36units/hr for 1 hr, followed by 9units/hr for 1 hour

9units/hr = 150ml/hr, 18units/hr = 300ml/hr, 36units/hr = 600ml/hr. Oxytocin infusion standard as 30 units in 500mL of 0.9% saline

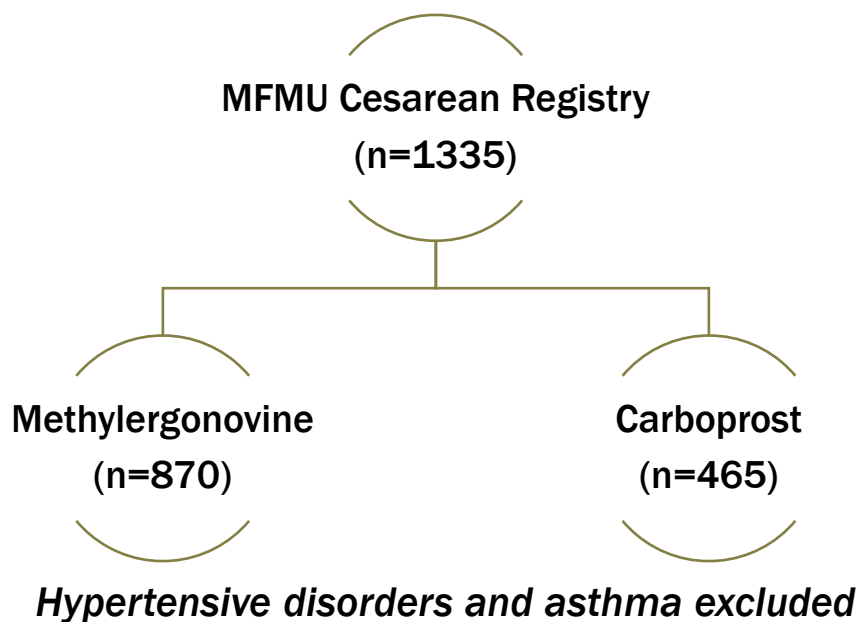
MISOPROSTOL AS 2ND LINE UTEROTONIC



Misoprostol offered no benefit for treatment of PPH.

	Misoprostol (n=705)	Placebo (n=717)	Relative risk (95% CI)
Primary outcome			
Blood loss of ≥ 500 mL within 60 min after randomisation	100 (14%)	100 (14%)	1.02 (0.79 to 1.32)
Secondary outcomes			
Blood transfusion after randomisation	103 (15%)	117 (16%)	0.89 (0.70 to 1.14)
Haemoglobin concentration of < 80 g/L within 24 h post partum or need for blood transfusion*	121 (18%)	139 (20%)	0.89 (0.72 to 1.11)
Blood loss after randomisation			
Within 60 min (mL)	200 (100–306)	200 (100–340)	0 (0 to 0)†
≥ 1000 mL	9 (1%)	9 (1%)	1.02 (0.41 to 2.55)
Within 90 min (mL)‡	250 (120–440)	250 (120–450)	0 (-40 to 20)†
≥ 500 mL	149 (21%)	162 (23%)	0.93 (0.77 to 1.14)
≥ 1000 mL	17 (2%)	22 (3%)	0.78 (0.42 to 1.47)
Any uterotonic after randomisation	188 (27%)	203 (28%)	0.94 (0.79 to 1.11)
Maternal death	2 ($< 1\%$)	0	NA
Severe morbidity§	8 (1%)	10 (1%)	0.81 (0.32 to 2.00)

METHYLERGONOVINE VS. CARBOPROST AS 2ND LINE AGENT

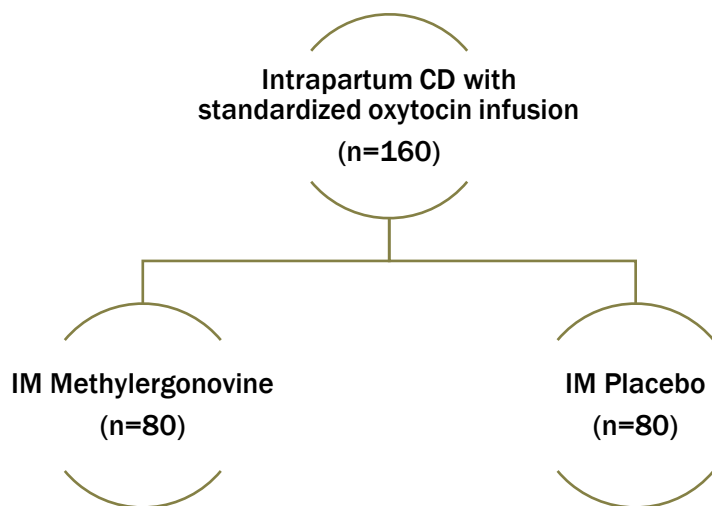


Hemorrhage-related morbidity: transfusion, uterine artery ligation or hysterectomy

	Carboprost n (%)	Methylergonovine n (%)	Relative Risk * (95% CI)
Hemorrhage-related morbidity:			
Unadjusted	81 / 465 (17.4%)	76 / 870 (8.7%)	2.0 (1.5 – 2.7)
Propensity score matched	59 / 369 (16.0%)	34 / 369 (9.2%)	1.7 (1.2 – 2.6)
Sensitivity Analysis:			
Women who underwent IOL or spontaneous labor			
Unadjusted	46 / 310 (14.8%)	45 / 530 (8.5%)	1.7 (1.2 – 2.6)
Propensity score matched	31 / 237 (13.1%)	19 / 237 (8%)	1.6 (0.9 – 2.8)

Methylergonovine preferred 2nd line uterotonic in absence of contraindications.

PROPHYLACTIC METHYLERGONOVINE



Outcome	Oxytocin and Methylergonovine (n=80)	Oxytocin (n=80)	RR	Mean Difference	95% CI
Primary					
Administration of additional uterotonic agents	16 (20)	44 (55)	0.4	—	0.2–0.6
Methylergonovine	0	39 (49)			
15-methyl prostaglandin _{F2α}	14 (18)	29 (36)			
Misoprostol	8 (10)	5 (6)			
Secondary					
Satisfactory uterine tone* [†]	64 (80)	33 (41)	1.9	—	1.5–2.6
Postpartum hemorrhage* ^{††}	28 (35)	47 (59)	0.6	—	0.4–0.9
Blood transfusion [†]	4 (5)	18 (23)	0.2	—	0.1–0.6
Quantitative blood loss (mL) ^{†§}	967±429	1,315±915.1	—	348	124–572
Difference in preoperative and postoperative day 1 hemoglobin levels (g/dL) [†]	2.4±1.1	2.9±1.0	—	0.6	0.2–0.9

Data are n (%) or mean±SD unless otherwise specified.

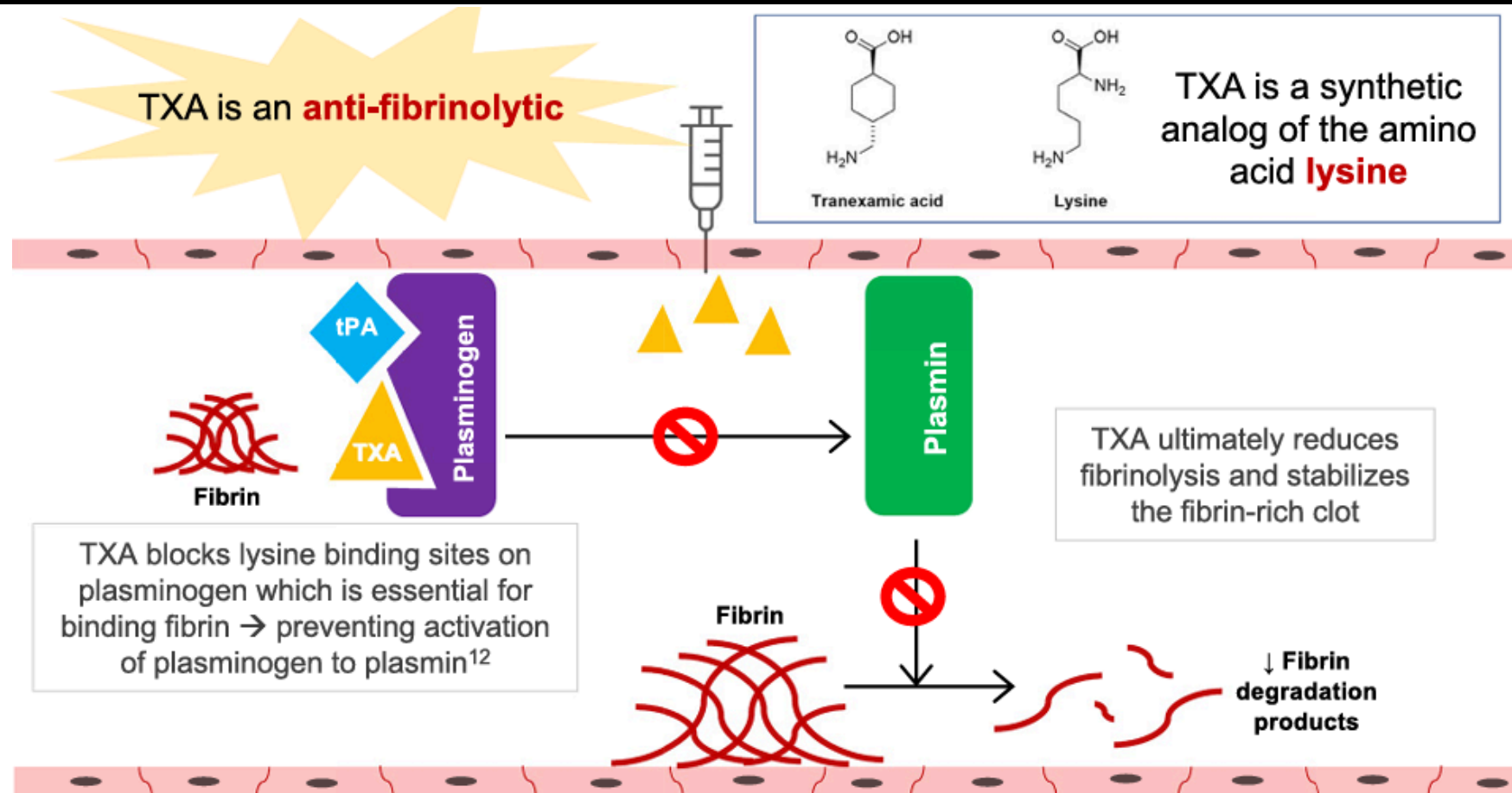
* Assessed by delivering physician 4 minutes after placental delivery.

Prophylactic methylergonovine in addition to oxytocin reduces the need for additional uterotonics and PPH.



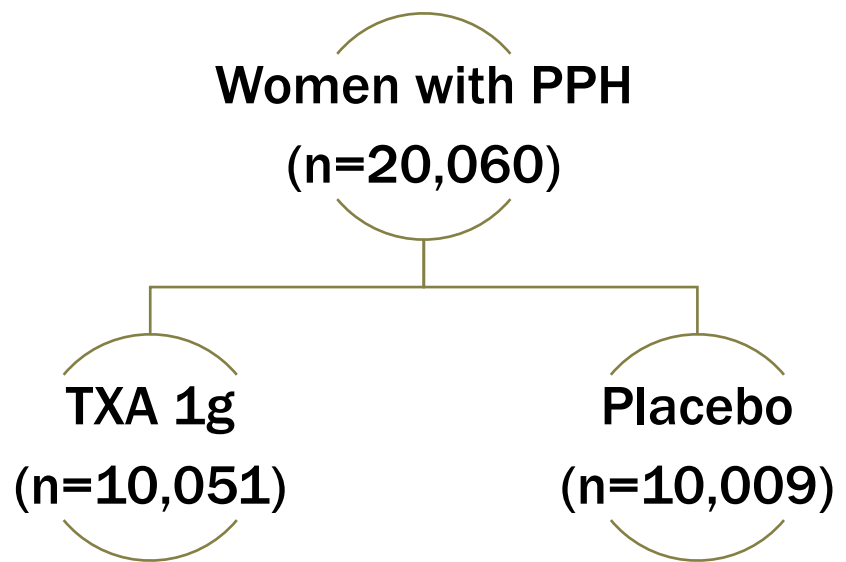
CALCIUM

TRANEXAMAMIC ACID: MECHANISM OF ACTION





World Maternal Antifibrinolytic Trial



PROPHYLACTIC TXA

TX RELATED DEATH

SEVERE PPH

DEFINITION

- **4g ↓ HgB**
- **≥ 4U PRBCS**
- **Require hemostatic interventions**
- **Death**

ACTION PLAN

- **Call for help**
- **Wide bore IV access**
- **Fluid resuscitation**
- **Vital signs monitoring**
- **Labs/POC testing/ABG**
- **Massive transfusion protocol**

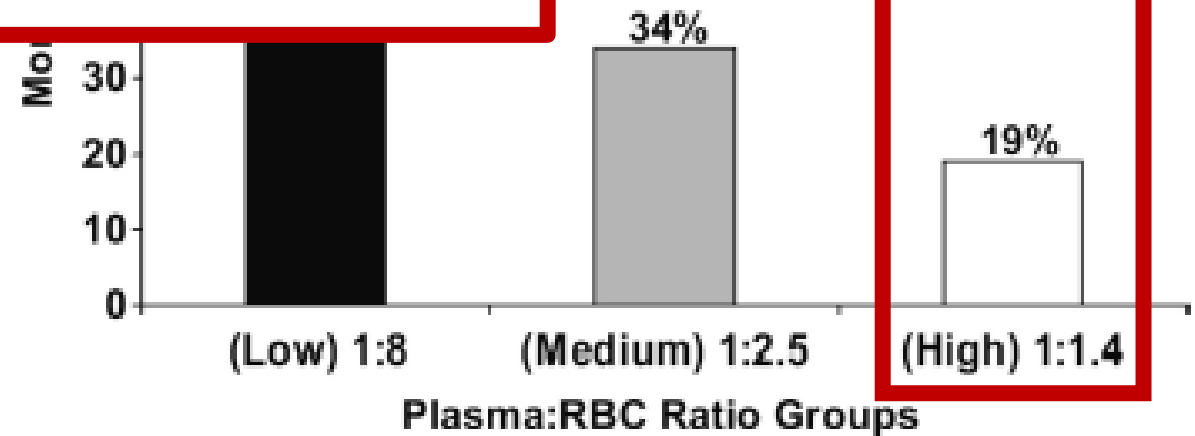


MASSIVE TRANSFUSION FIXED RATIO STRATEGIES

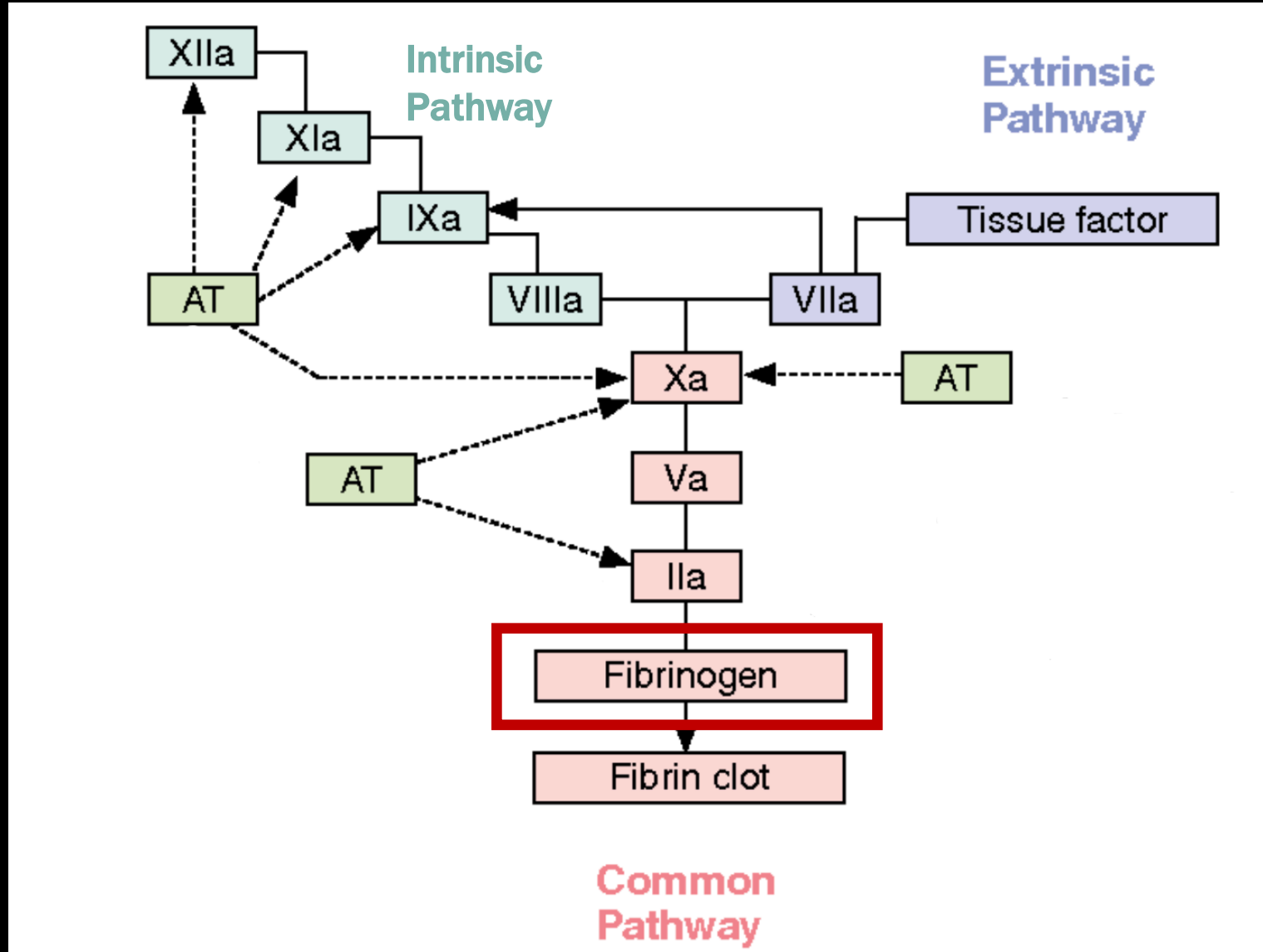
The Ratio of Blood Products Transfused Affects Mortality in Patients Receiving Massive Transfusions at a Combat Support Hospital

Matthew A. Borgman, MD, Philip C. Spinella, MD, Jeremy G. Perkins, MD, Kurt W. Grathwohl, MD, Thomas Repine, MD, Alec C. Beekley, MD, James Sebesta, MD, Donald Jenkins, MD, Charles E. Wade, PhD, and John B. Holcomb, MD

TRAUMA



COAGULATION CASCADE

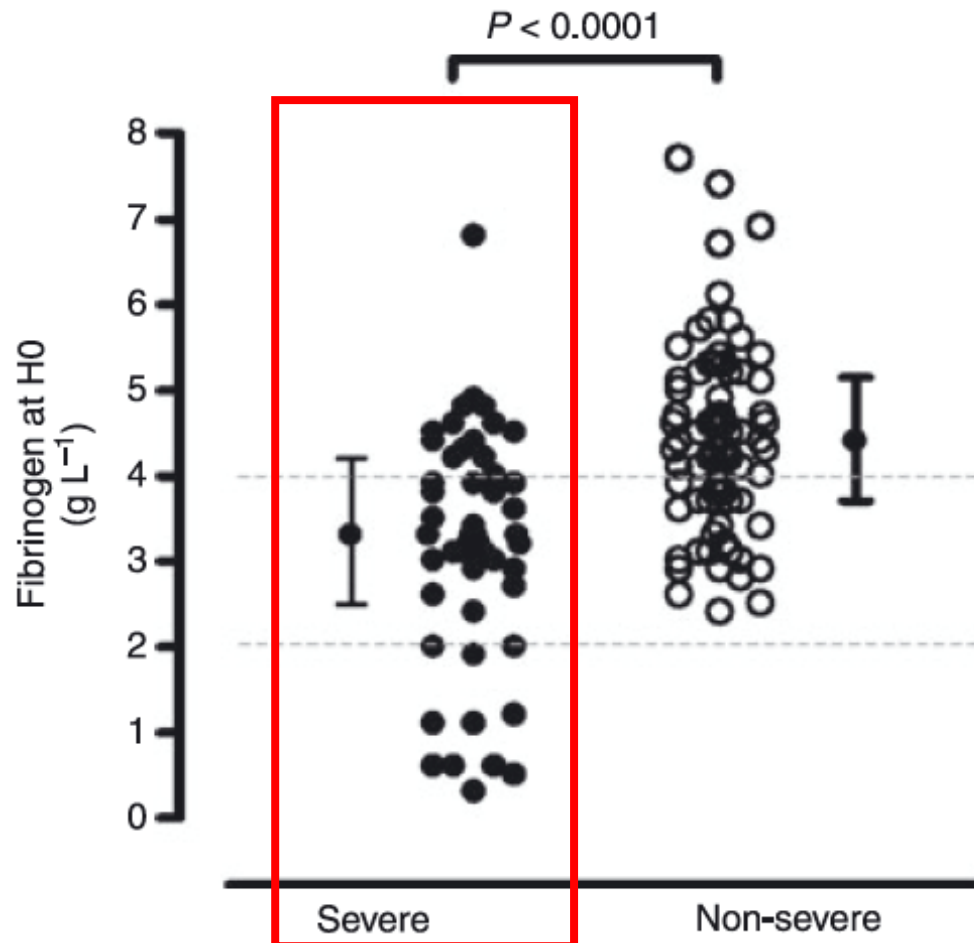


FIBRINOGEN IN PREGNANCY

	Non-pregnant controls	1 st trimester	2 nd trimester	3 rd trimester
	Fibrinogen concentration (g/l)			
Huissoud et al.[41]	3.3 [3.1–4.6]	4.0 [3.7–4.3]	4.6 [4.3–4.8]	5 [4.4–5.8]
Adler et al.[42]	2.2 (0.4)	NA	NA	3.79 (0.78)
Uchikova et al.[43]	2.6 (0.6)	NA	NA	4.7 (0.7)
Cerneca et al.[44] ^a	3.7 (0.8)	4.1 (0.7)	4.6 (0.8)	5.6 (1.1)
Oliver et al.[45] ^a	NA	2.6 (0.3)	3.0 (0.2)	3.5 (0.2)
Manten et al.[46] ^b	NA	3.5 (NA)	3.79 (NA)	5.1 (NA)
Choi et al.[47]	3.3 (0.5)	3.3 (0.5)	3.8 (0.5)	4.4 (0.5)

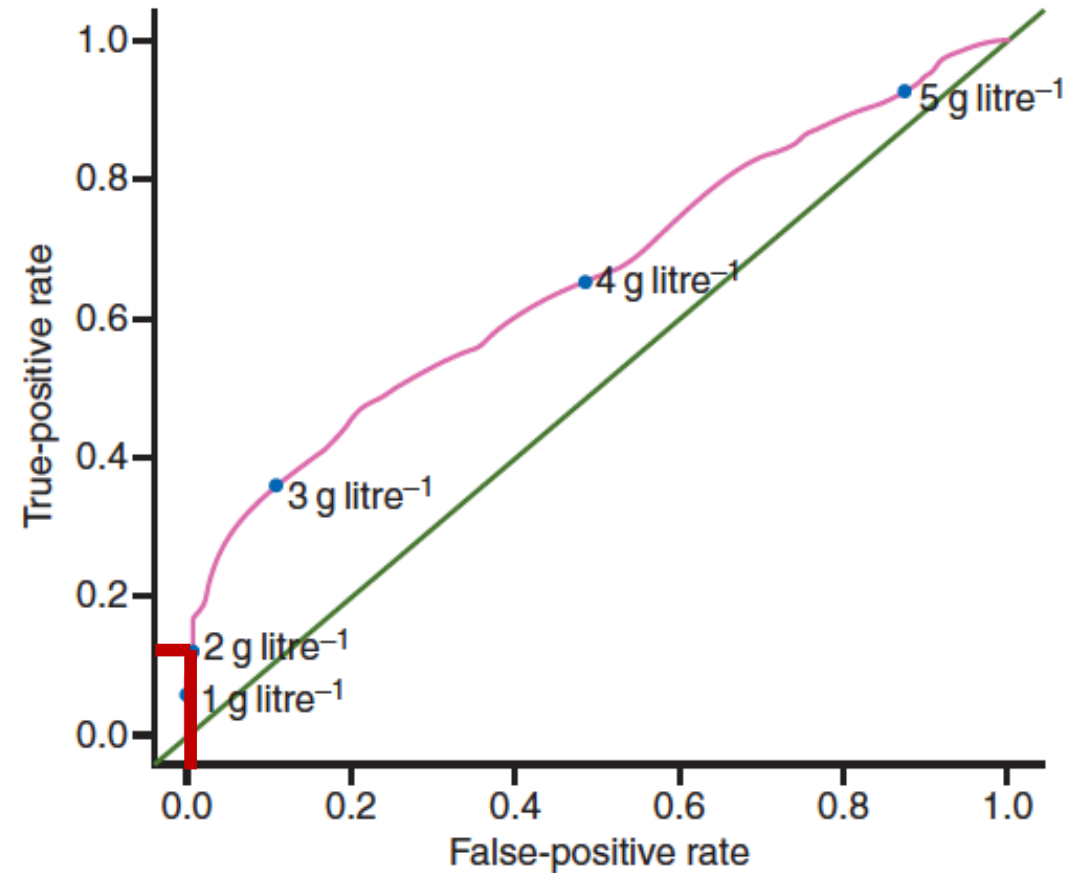
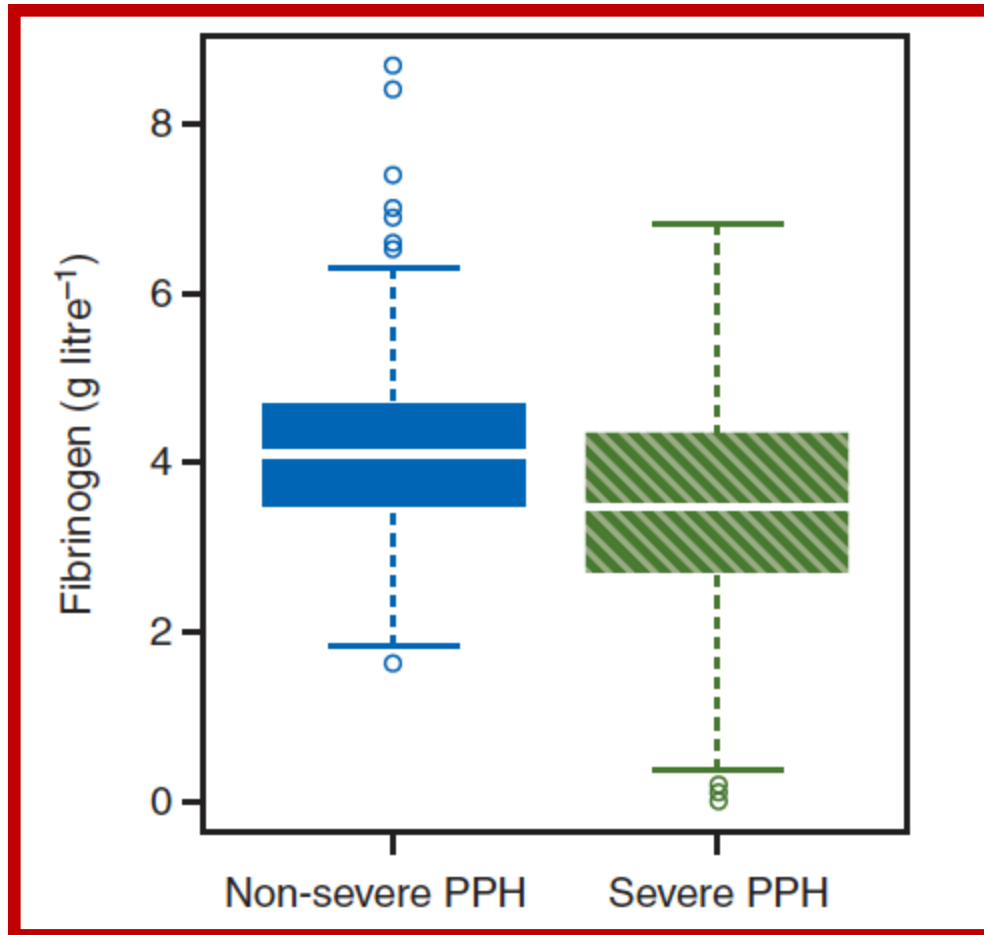
Steady increase in fibrinogen through pregnancy from baseline.

FIBRINOGEN AS A MARKER OF SEVERE PPH

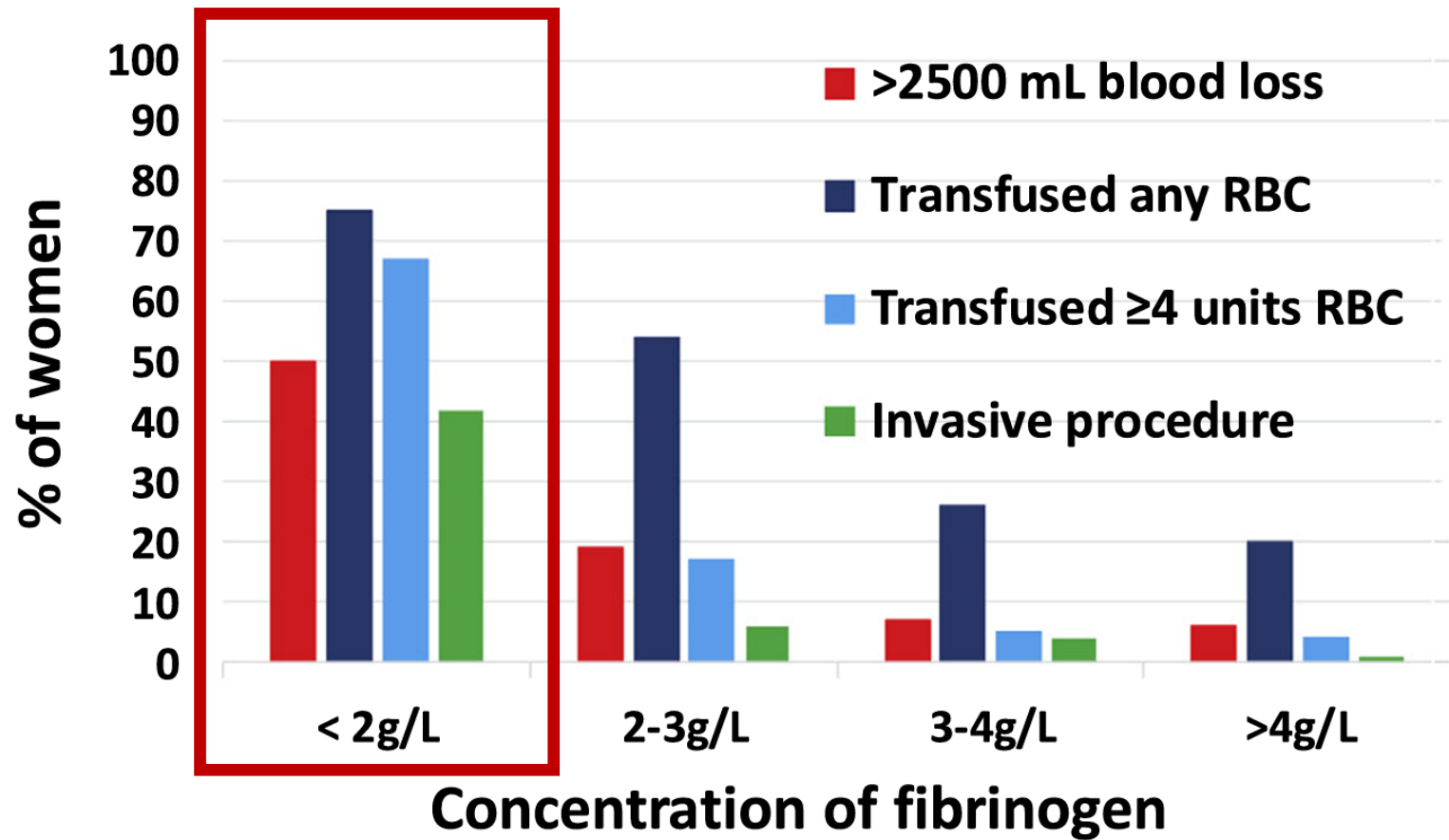


A 1g/L decrease in fibrinogen, had a 2.6-fold increased odds of severe PPH

IS THERE A MAGIC FIBRINOGEN VALUE?



DECREASED
FIBRINOGEN
ASSOCIATED
WITH
INCREASED
MORBIDITY

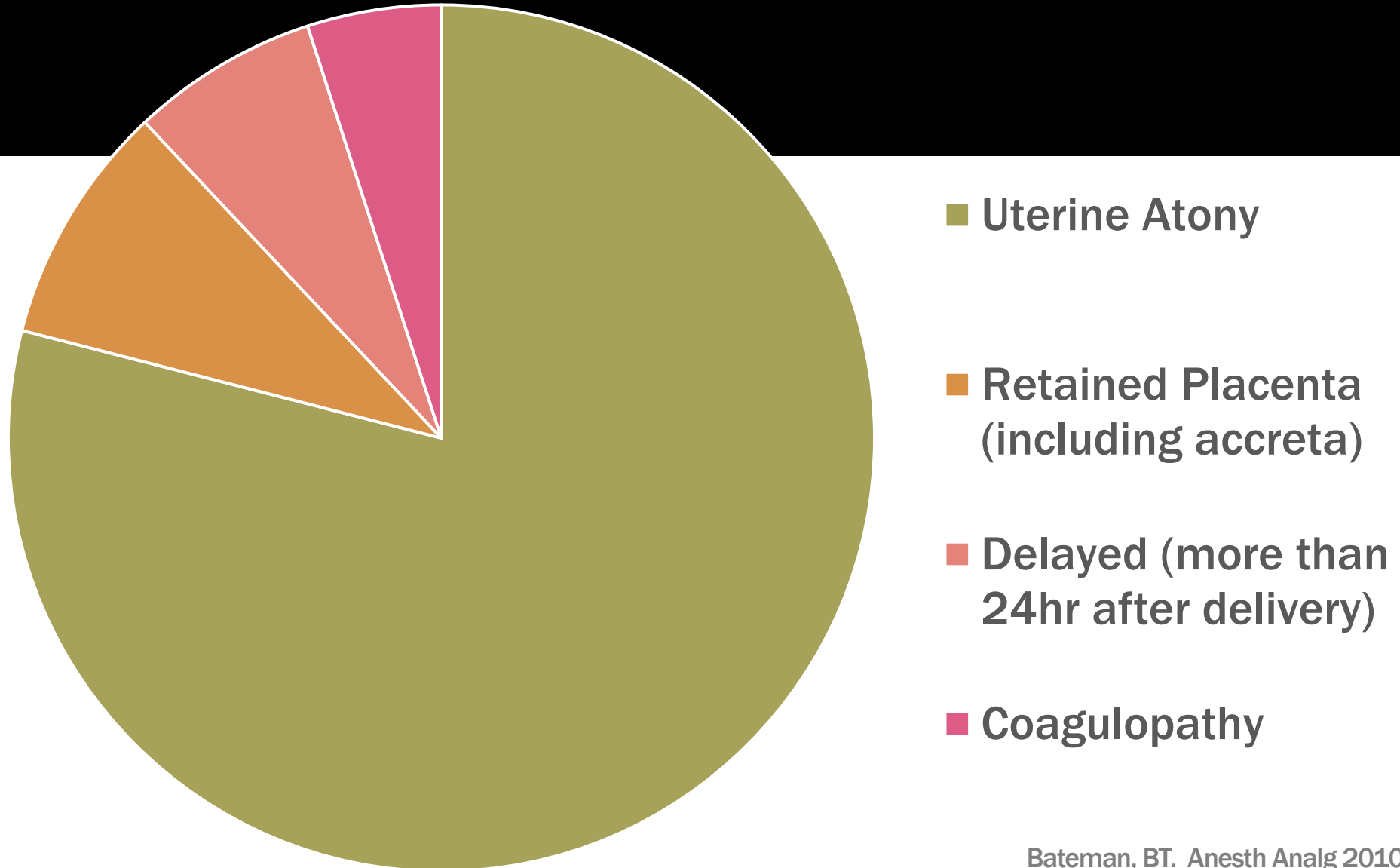


FIBRINOGEN IN OBSTETRIC HEMORRHAGE

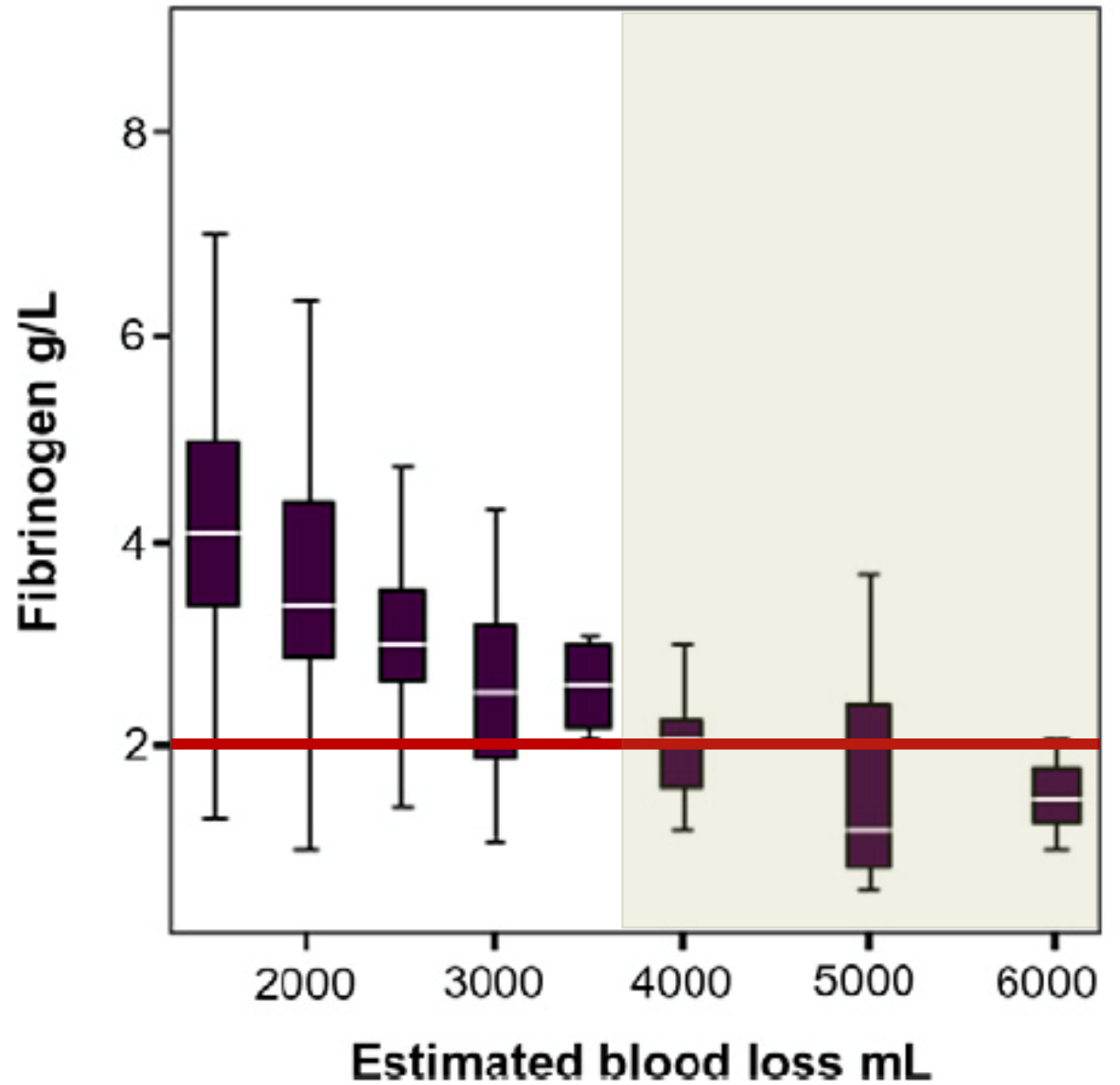
Table 1 Studies investigating the association between fibrinogen and progression of postpartum haemorrhage

Study	N	Study design			Fibrinogen g/L		ROC AUC (95% CI)
		Time of fibrinogen assay	Outcome defining progression of PPH	Descriptive statistic reported	No progression of PPH	Progression of PPH	
Charbit ³¹	129	Infusion of uterotonic after manual exploration of uterus	Invasive procedure to control bleeding, fall in Hb ≥ 4 g/L or ≥ 4 units RBC	Median (IQR)	4.4 (3.7–5.1)	3.3 (2.5–4.2)	0.75 (CI NR) p <0.0001
Cortet ³²	738	Diagnosis of PPH	Invasive procedure to control bleeding, fall in Hb ≥ 4 g/L, ≥ 4 units RBC or admission to ITU	Mean (SD)	4.2 (1.2)	3.4 (0.9)	0.66 (0.64–0.68)
Poujade ⁵⁵	98	Variable time before embolisation	Success of radiological embolisation	Mean (SD)	2.9 (1.3)	1.8 (0.9)	NR
Gayat ³⁴	257	Variable time before procedure	Invasive procedure to control bleeding	Median (IQR)	2.7 (2.1–3.5)	1.8 (1.1–2.5)	0.83 (± 0.03)*
de Lloyd ³³	240	First clinical concern during PPH	≥ 2500 mL blood loss	Mean (SD)	4.4 (1.1)	3.1 (1.0)	0.85 (0.78–0.93)
Collins ¹⁴	346	1000–1500 mL blood loss	Transfusion of ≥ 8 units allogeneic blood products	Median (IQR)	3.9 (3.2–4.5)	2.1 (1.8–3.4)	0.82 (0.72–0.92)
Simon ³⁵	797	Before bleeding started	PPH requiring manual uterine exploration, RBC transfusion or fall in Hb ≥ 2 g/L	Mean (SD)	4.9 (1.0)	4.3 (1.3)	NR

UNDERLYING ETIOLOGY OF PPH



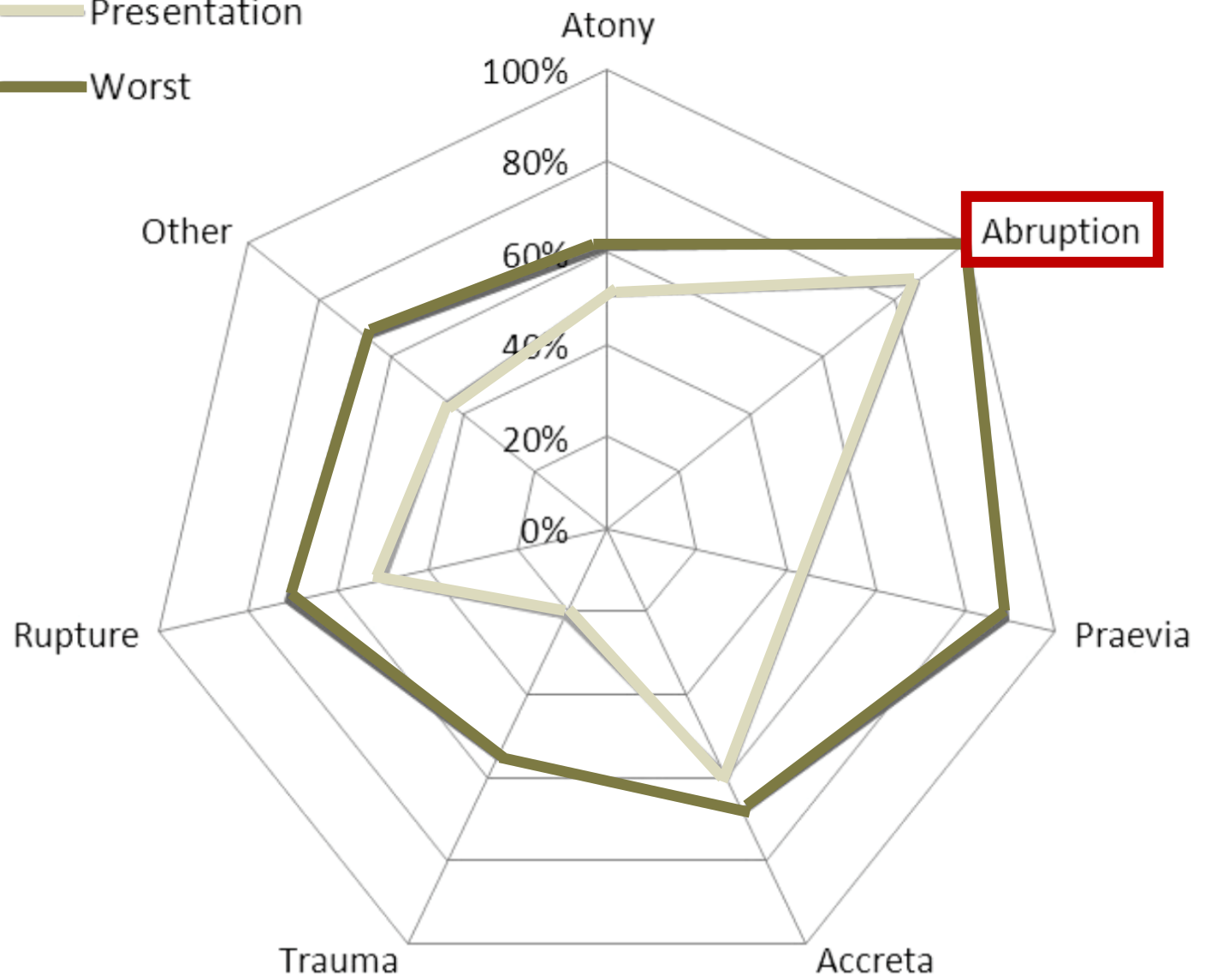
FIBRINOGEN AND BLOOD LOSS



NOT ALL
HEMORRHAGE
IS A LOW
FIBRINOGEN
STATE

Fibrinogen <2 g/l

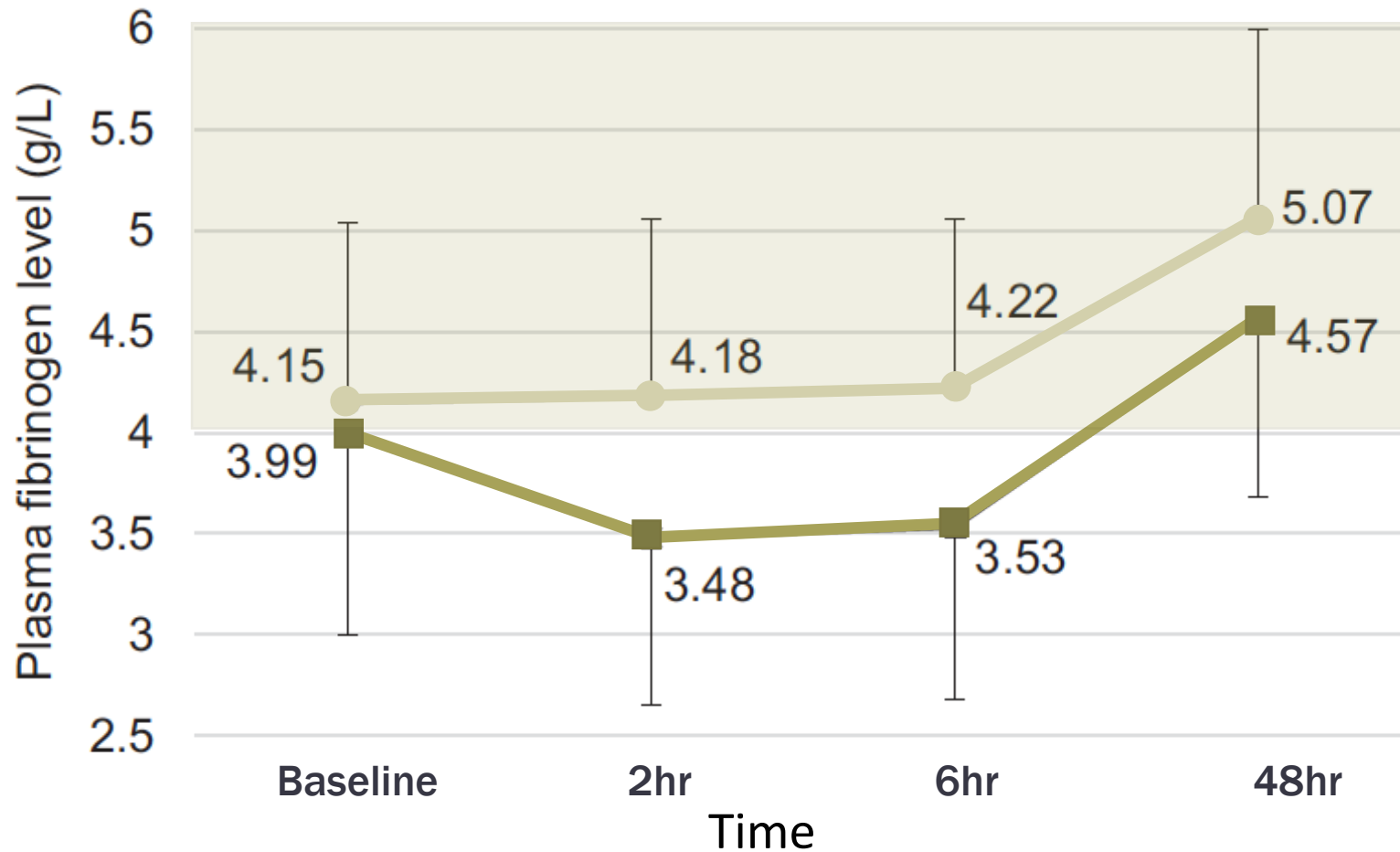
— Presentation
— Worst





WHEN SHOULD
FIBRINOGEN
REPLACEMENT
BEGIN?

AT TIME OF ADDITIONAL UTEROTONICS



No benefit at time of additional uterotonics

No difference in thromboembolic events between groups

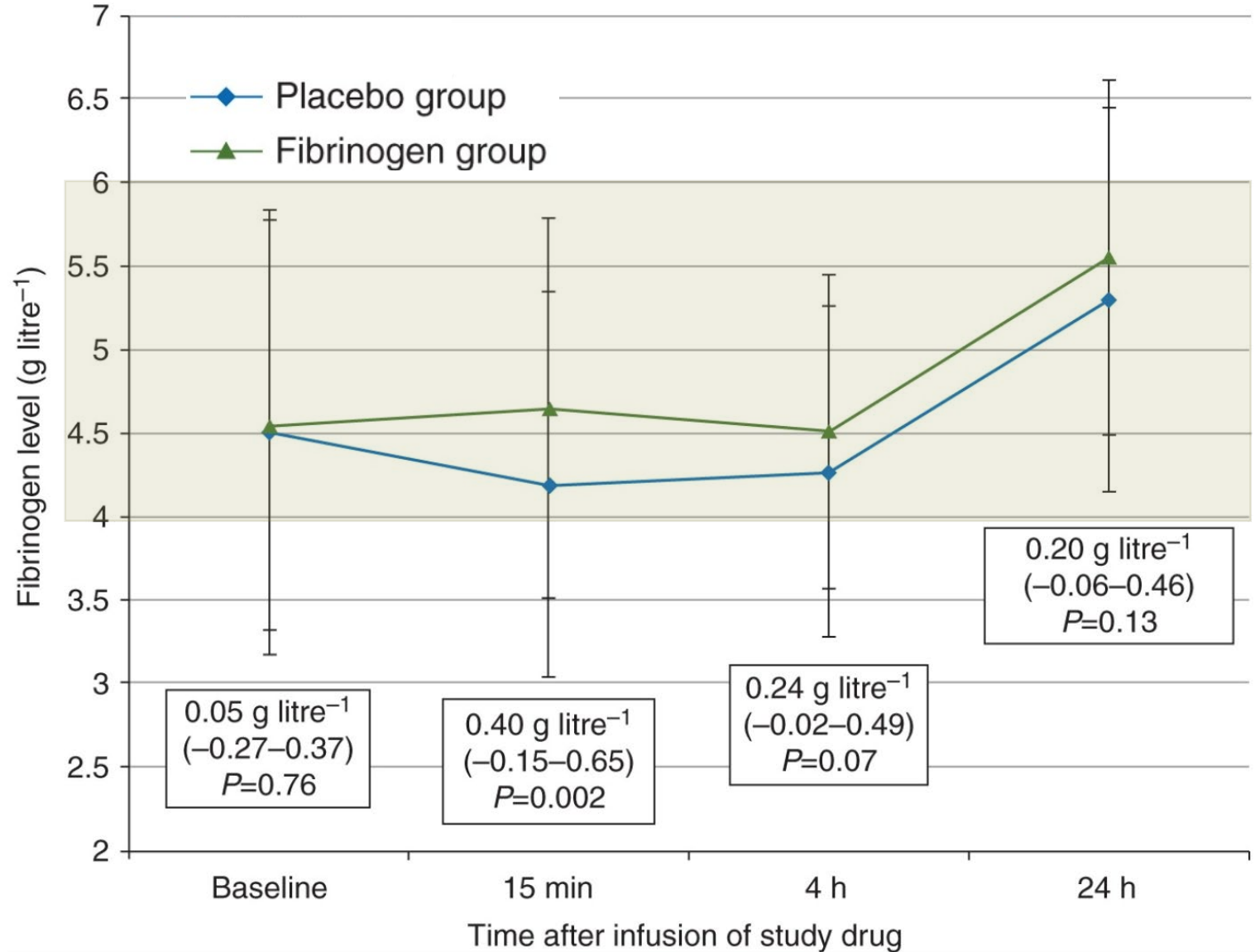
● Fibrinogen (N=220)

■ Placebo (N=210)

AT TIME OF HEMORRHAGE

No evidence for pre-emptive
treatment with fibrinogen in
PPH to reduce transfusion

No difference in
thromboembolic events

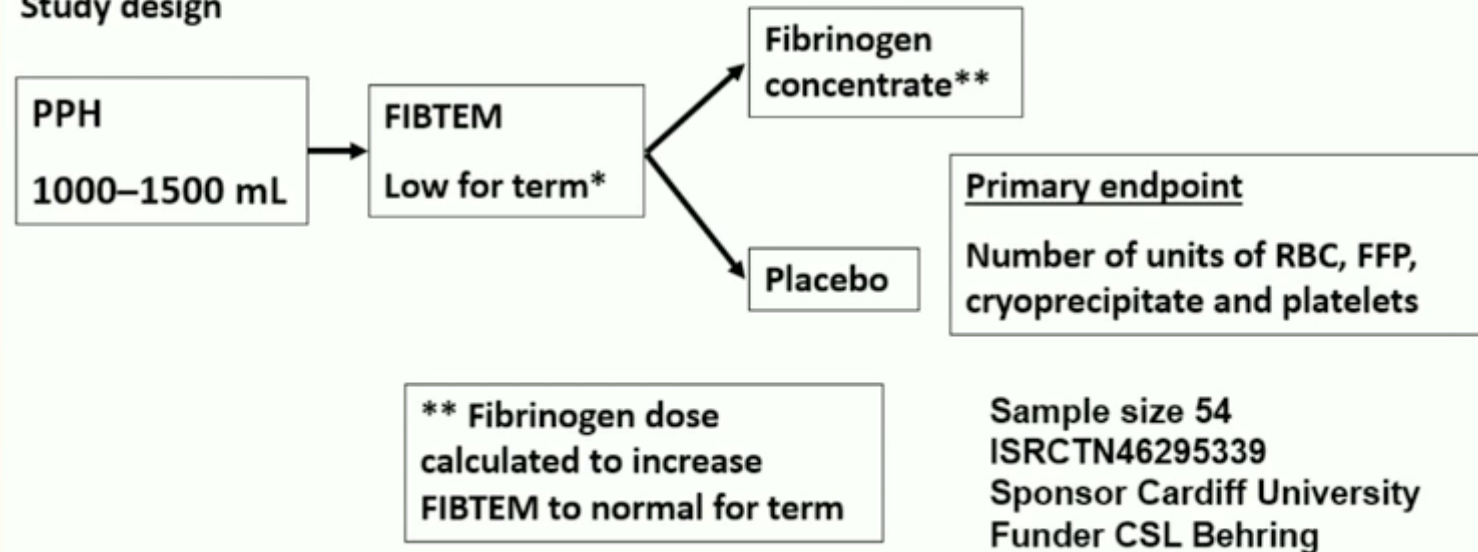


AT TIME OF HEMORRHAGE WITH DEFINED POC VALUE



Fibrinogen concentrate versus placebo for treatment of postpartum haemorrhage:
A multicentre, prospective, double blind randomised control trial

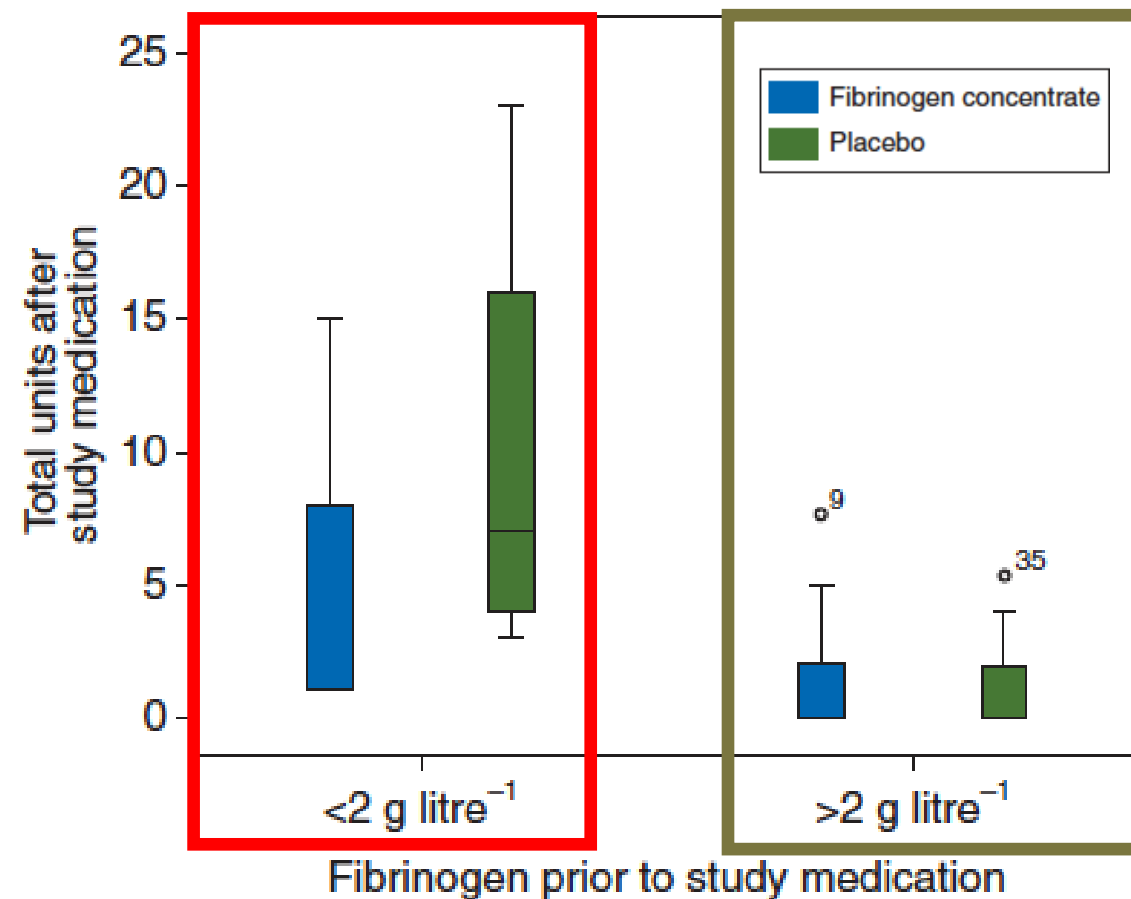
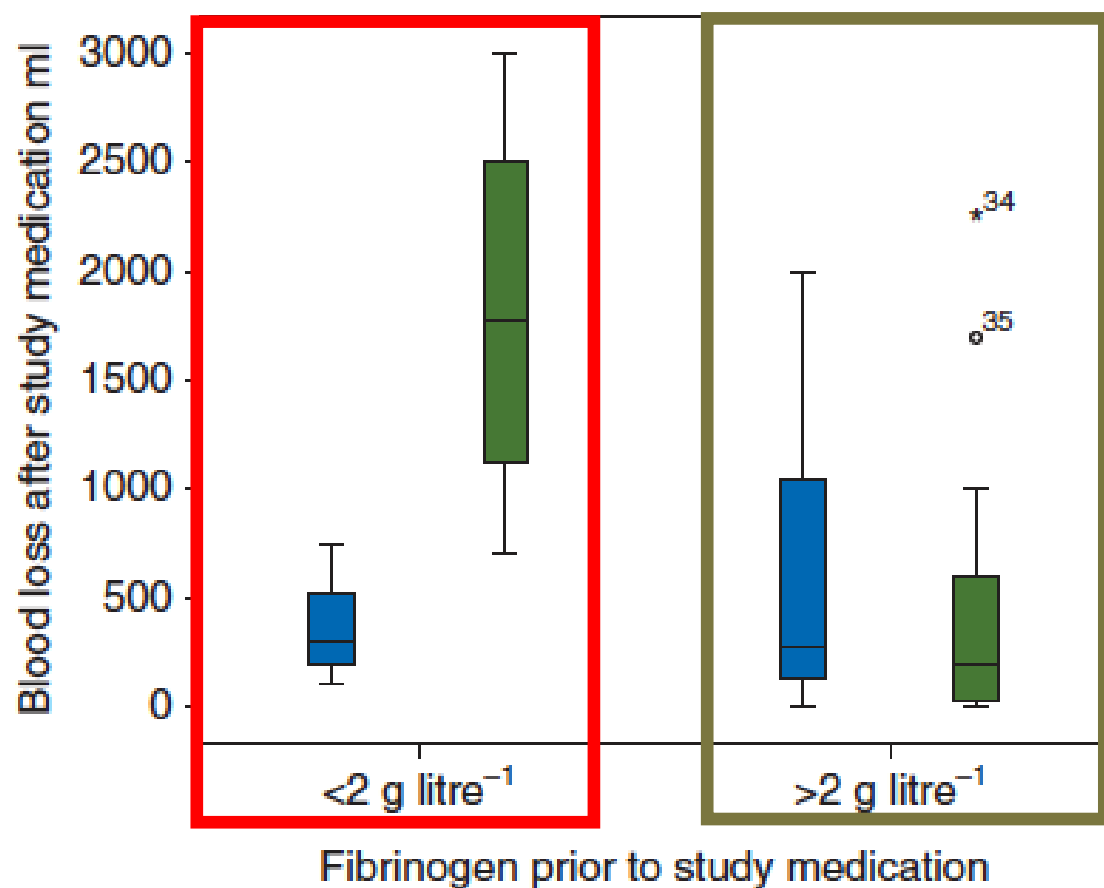
Study design



AT TIME OF HEMORRHAGE WITH DEFINED POC VALUE

	Fibrinogen (n=28)	Placebo (n=27)	Unadjusted* treatment effect estimate (95% CI)	P-value
Allologenic blood products transfused between study drug completion and date of discharge				
No allogenic products transfused, n (%)	13 (46.4)	12 (44.4)	0.92 [†] (0.32–2.67)	0.88
RBC transfusions				
Total number	37	38		
Mean transfusion rate (total transfusions/n)	1.32	1.41	0.94 [‡] (0.44–2.02)	0.87
Median (25th–75th centile)	1 (0–2)	1 (0–2)		
Range	0–9	0–8		
No RBC transfused, n (%)	13 (46.4)	13 (48.1)		
FFP transfusions				
Total number	18	33		
Mean transfusion rate (total transfusions/n)	0.64	1.22	0.53 [‡] (0.13–2.16)	0.37
Median (25th–75th centile)	0 (0–0)	0 (0–2)		
Range	0–4	0–8		
No FFP transfused, n (%)	22 (78.6)	19 (70.4)		
Platelet transfusions				
Total number	2	3		
No platelets transfused, n (%)	27 (96.4)	24 (88.9)	NA	
Cryoprecipitate transfusions				
Total number	1	1		
No cryoprecipitate transfused, n (%)	27 (96.4)	26 (96.3)	NA	

REPLACEMENT IN SETTING OF HYPOFIBRINOGENEMIA



FIBRINOGEN REPLACEMENT STRATEGIES

Fresh Frozen Plasma	Cryoprecipitate	Fibrinogen Concentrate
Liquid portion of whole blood	Concentrated plasma product	Pasteurized concentrate
Non-pregnant donor	Pooled donor	From pooled human plasma
Contains all clotting factors	Contains fibrinogen, VIII, XIII, vWF	Contains fibrinogen
[Fibrinogen] 2g/L	[Fibrinogen] 15g/L	[Fibrinogen] 1g / 50mL
Must be ABO compatible	Not type specific	NA
Can be defrosted in 2-3 min	Defrosted 20-30 min	Mixed in 5-8 min
Used for coagulopathy	Used for fibrinogen deficiency	Congenital hypofibrinogenemia
Commonly employed in fixed ratio transfusion	Widespread use in US, shortages in COVID pandemic	Used any may European centers for fibrinogen replacement in PPH

SHOCK PACK VS. POC WITH FIB CON

Prospective observational study

Inclusion Criteria:

EBL > 1500

AND

FibTEM A5 < 12 mm

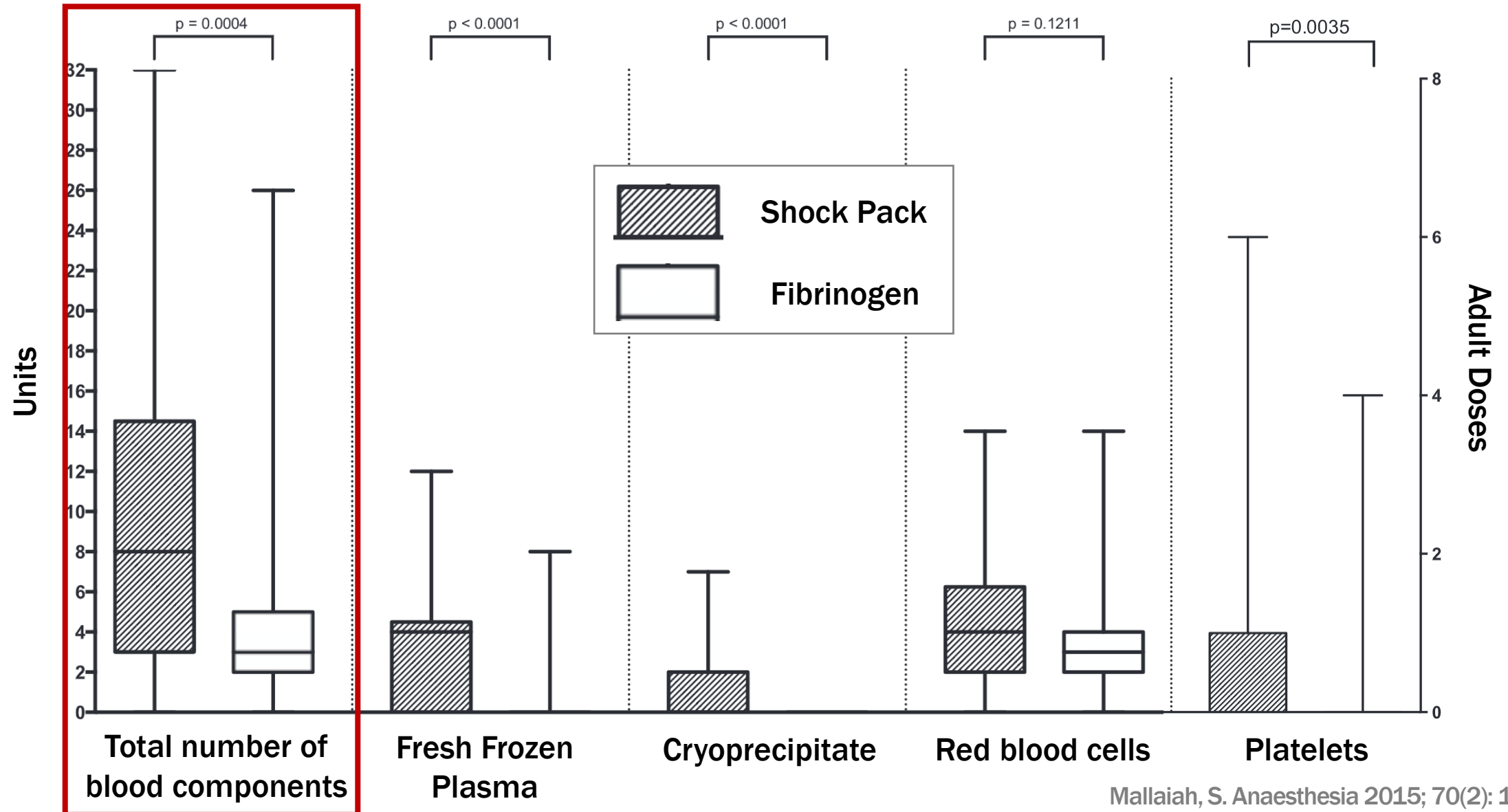
“Shock Pack” Phase (n=42)

- Early resuscitation with:
 - 4U PRBC
 - 4U FFP
 - 1U platelets
 - 2U cryoprecipitate if fibrinogen < 2g/dL

“Fibrinogen” Phase (n=51)

- Rotem guided hemostasis correction using fibrinogen concentrate instead of cryoprecipitate

COMPARISON OF TRANSFUSION STRATEGIES



COMPLICATIONS OF TRANSFUSION

	Shock Pack (n = 42)	Fibrinogen (n = 51)	p value
ICU admission	4 (9%)	1 (2%)	NS
TACO	4 (9%)	0	0.0367
TRALI	0	0	NS
Postpartum hysterectomy	6 (14%)	3 (6%)	NS
Death	0	0	NS

RECOMMENDATIONS FOR TREATMENT OF PPH

- Obtain early coagulation studies
- Consider use of point of care coagulation testing
- Early plasma administration is unnecessary
- Fibrinogen of $<2\text{g/L}$ is high risk of severe PPH and coagulation product replacement is vital.

QUESTIONS FOR THE FUTURE

What is the best fibrinogen replacement strategy?



VS.



What is the ideal resuscitation strategy during PPH?

Early involvement of anesthesia colleagues

Team Alert: Maternal pulse rate of >120 bpm -OR- systolic blood pressure < 90mmHg

- Select **Vital Sign Changes** via Responder Net in order to alert nursing, OB residents and Anesthesia
- If uterine atony present double the oxytocin rate and secure additional uterotonics

Tier 1: EBL at 500mL for vaginal delivery or 1,000mL for cesarean delivery and continued clinically significant bleeding

Primary Direct Care Nurse	Command/Lead Nurse	Resource Nurse	Obstetric Service Actions	Anesthesia Service Actions
Start Time: _____ RN Initials: _____ <ul style="list-style-type: none"> Announce initiation of protocol Initiate PPH Flow sheet Monitor vital signs and PP assessment Manage IV lines, pumps, medication administration for vaginal delivery Maintain strict intake & output record Apply warm blanket Weigh clots and pads, inspect surgical drapes and report findings to Command/Lead RN Insert Foley catheter with urometer if EBL >1000 mL and continued bleeding 	Start Time: _____ RN Initials: _____ <ul style="list-style-type: none"> Select Emerg: Hemorrhage-Postpartum via Responder Net to alert nursing, OB and anesthesia residents Name of OB MD present: _____ @ _____ Name of Anes MD present: _____ @ _____ Write on white board with at least each 500 ml additional blood loss: Time and EBL Retrieve additional uterotonics if uterine atony Bring scale into the room Convert draw & hold to T&S if active order does not exist - tube to #702 (Blood Bank) Order CBC if EBL >1000ml 		Fellow/Resident: <ul style="list-style-type: none"> Notify OB attending of the clinical situation and review plan of care with nurse and Anesthesia service. Incorporate BLEED principles into communication Document notification of attending OB Conduct BLEED time out OB Attending: <ul style="list-style-type: none"> En route or at bedside if EBL >1000mL 	Fellow/Resident: <ul style="list-style-type: none"> Notify Anesthesia attending of the clinical situation and plan of care with nurse and OB service. Incorporate BLEED principles into communication Document notification of attending anesthesiologist

B: Background/Blood product availability
L: Lab data / time drawn
E: EBL total / increase in past hour
E: Extra people / team needed
D: Decision

Escalate blood product availability

Primary Direct Care Nurse
Start Time: _____
RN Initials: _____

- If in LDR, continue Tier 1
- Administer blood products
- Document on PPH Flow sheet

 Note: if patient is in the OR managed by Anesthesia, assist the Command/Lead RN

Tier 2: EBL >1,000mL and continued clinically significant bleeding

Primary Direct Care Nurse	Command/Lead Nurse	Resource Nurse	Obstetric / Gyn Onc Service Actions	Anesthesia Service Actions
Start Time: _____ RN Initials: _____ <ul style="list-style-type: none"> Communicate with family Assist in OR as needed Verify blood products for administration 	Start Time: _____ RN Initials: _____ <ul style="list-style-type: none"> Request BLEED time out Activate OB Critical Blood loss protocol by calling Blood Bank (2513). Identify yourself as primary clinical contact for blood products Page Gyn-Onc Fellow (5-3345) so that case may be discussed by OB Attending and Gyn-Onc If Gyn-Onc MDs report to L&D call-in Gyn scrub team -Daytime: Vocera 6-4693, say "OR charge nurse" -After 5pm & wknd: Call OR Control Desk 6-5150 Send FYI page to OB Pharmacist at 1-773-435-2222 -From: Your Name -Callback #: _____ -Callback priority: FYI -Enter name of patient in division -Text: Postpartum hemorrhage, patient name, DOB, EBL 	<ul style="list-style-type: none"> Obtain placement with PTC or HOA Obtain blood products from blood refrigerator 	Attending/Fellow/Resident: <ul style="list-style-type: none"> Consider transferring patient to OR Attending: <ul style="list-style-type: none"> Conduct BLEED time out Discuss case with Gyn-Onc Fellow using BLEED principles Consider use of Interventional Radiology. OB Attending MD to IR MD communication must occur if transfer warranted -Daytime: Call 6-5200 -After 5pm & wknd: Page 5-6394 	Attending/Fellow/Resident: <ul style="list-style-type: none"> Continue resuscitation Draw superstat labs - at a minimum - with every 1 liter of blood loss

Early consideration of consultant services

Tier 4: EBL >3,000mL and continued clinically significant bleeding

Primary Direct Care Nurse	Command/Lead Nurse	Resource Nurse	Obstetric / Gyn Onc Service Actions	Anesthesia Service Actions
Start Time: _____ RN Initials: _____ <ul style="list-style-type: none"> Communicate with family Assist in OR as needed Verify blood products for administration 	Start Time: _____ RN Initials: _____ <ul style="list-style-type: none"> Request BLEED time out Page Gyn-Onc Fellow (5-3345) and Attending to bedside If Gyn-Onc MDs report to L&D call-in Gyn scrub team -Daytime: Vocera 6-4693, say "OR charge nurse" -After 5pm & wknd: Call OR Control Desk 6-5150 	<ul style="list-style-type: none"> Continue to support team Retrieve blood products sent by Blood Bank via tube system 	Attending/Fellow/Resident: <ul style="list-style-type: none"> Transfer patient to OR if not already in OR Request Gyn-Onc assistance using BLEED principles If applicable, request Trauma Surgery's assistance using BLEED principles Conduct BLEED time out Gyne/Onc: <ul style="list-style-type: none"> En route or at bedside 	Attending/Fellow/Resident: <ul style="list-style-type: none"> Continue resuscitation

Early and frequent laboratory assessment

Nursing Roles and Responsibilities
Primary Direct Care RN - Responsible for activities related to direct patient care.
Command / Lead RN - Communicate with responders, delegate tasks, computer order entry, wear red hat
Resource RN - Obtain supplies and resources

B: Background/Blood product availability
L: Lab data / time drawn
E: EBL total / increase in past hour
E: Extra people / team needed
D: Decision

RACIAL DISPARITIES IN PPH RESPONSE

RESOURCES



HEMORRHAGE



Quick Stats

- Defined as cumulative blood loss of at least 1000mL or blood loss accompanied by signs/symptoms or hypovolemia within 24 h following the birth process
- Mortality is often deemed preventable
- Structured based team response improves outcomes

What Can We Do?

- Design/implement a stage based hemorrhage plan with other disciplines
- Provide early and aggressive management
- Examine effectiveness of laboratory-guided transfusion for improved maternal outcome

WHAT CAN #OBANESTHES DO?



Quick Stats

- Sixth leading cause of maternal mortality
- Uncontrolled hypertension is the most important risk factor for stroke in patients with preeclampsia
- Hypertensive crisis and failed airways are more common in women with preeclampsia

What Can We Do?

- Consider developing a Severe Pre-eclampsia-Eclampsia Box with emergency medications
- Use neuraxial analgesia when possible
- Research pathophysiologic mechanisms of disorders and their physiologic effects

VENOUS THROMBOEMBOLISM



Quick Stats

- Cause specific mortality ratio has increased by 50% over the past 20 years
- DVT is 15 times more likely to occur in the postpartum period than in pregnancy
- Thromboprophylaxis is the most important modifiable strategy to reduce death

What Can We Do?

- Collaborate with care team to develop strategies for prophylaxis that do not impede the use of neuraxial analgesia/anesthesia
- Provide invasive monitoring and critical care support when needed
- Investigate the hematologic effects of anticoagulants in pregnancy and postpartum

ANESTHESIA RELATED



Quick Stats

- Most cases occur in cesarean deliveries
- Most airway disasters occur in the peri-extubation period and in the recovery unit
- Often deemed preventable: medication error, miscommunication, inadequate supervision, and inadequate monitoring as root causes

What Can We Do?

- Identify latent safety threats; participate in multidisciplinary performance improvements
- Ensure optimal communication between personnel by using techniques such as check backs and closed loop communication
- Evaluate monitoring strategies and decision tree algorithms for post-partum care

Quality indicators in Anesthesiology and Perioperative Medicine

Akbar Herekar, MD

Medical Director of Quality for Perioperative and Adult Critical Care

Wellstar MCG Health System



“The secret of quality is love. You have to love your patient, you have to love your profession, you have to love your God.”

- Avedis Donabedian, M.D., M.P.H.





Financial
aspect

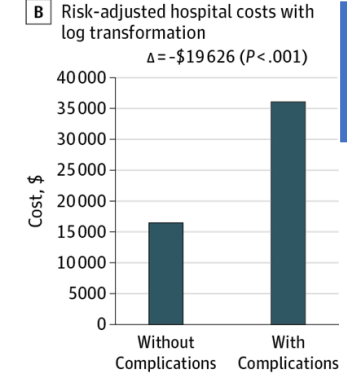
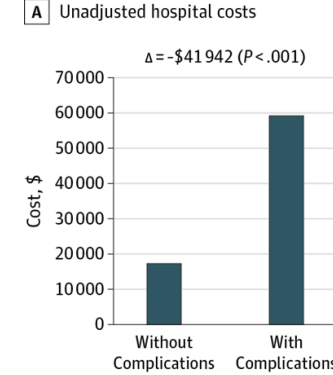
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graph TD; A[Financial aspect] --> B[Cost-saving/Value]; A --> C[Reimbursement];
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Cost-saving/Value

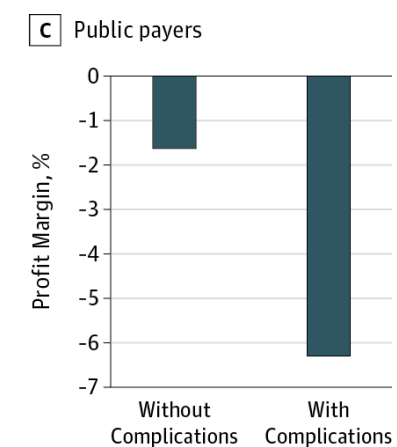
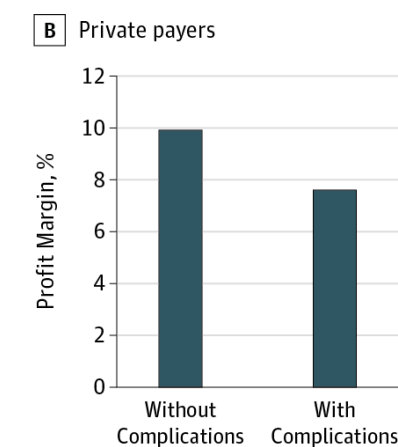
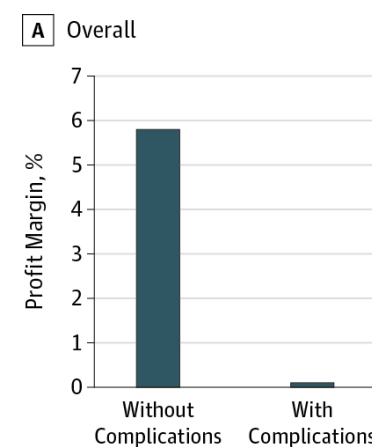
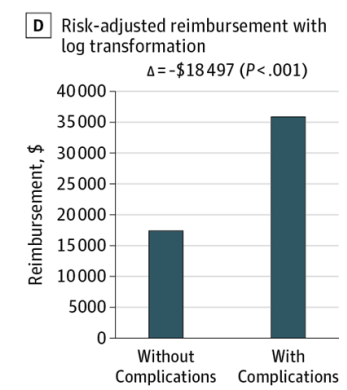
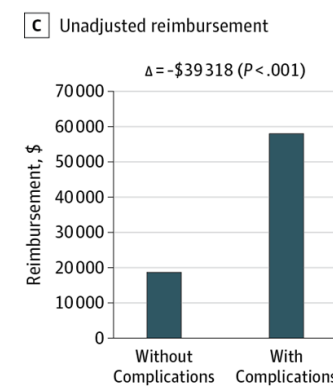
Reimbursement

Table 3. Changes in Risk-Adjusted Hospital Costs, Profit, and Reimbursement With Complications for Selected Complication Types

Complication	Costs in Resources Used by the Hospital	Reimbursement Amount Paid to the Hospital		Hospital Profit Margin, %
		\$	%	
Pneumonia				
No complication	18 939	19 771	NA	6
With complication	49 060	44 899	NA	-8
Increase in reimbursement	NA	25 129	127	NA
UTI				
No complication	19 048	19 833	NA	6
With complication	27 166	27 606	NA	3
Increase in reimbursement	NA	7773	39	NA
Superficial incisional SSI				
No complication	18 851	19 611	NA	5
With complication	28 180	29 236	NA	5
Increase in reimbursement	NA	9625	49	NA
Deep incisional SSI				
No complication	19 178	19 954	NA	5
With complication	32 973	33 615	NA	3
Increase in reimbursement	NA	13 661	69	NA
Organ space SSI				
No complication	18 990	19 688	NA	5
With complication	35 477	40 423	NA	13
Increase in reimbursement	NA	20 735	105	NA
Sepsis				
No complication	18 499	19 352	NA	6
With complication	45 361	43 518	NA	-3
Increase in reimbursement	NA	24 166	125	NA
Pulmonary embolism				
No complication	19 215	19 998	NA	5
With complication	31 405	30 674	NA	-2
Increase in reimbursement	NA	10 676	53	NA



Cost-saving/Value



Abbreviations: NA, not applicable; SSI, surgical site infection; UTI, urinary tract infection.

Potential savings by reducing post operative unplanned intubation by smoking cessation	Cost-saving/Value
Total number of cases	10000
Complication rate	1.85%
Cost of intervention	\$60,000.00
Complication reduction	19%
Risk reduction	0.352%
New complication rate	1.499%
Cost of complication	\$46,400.00
Number of complications	185
Percentage of patients with complications who smoke	41%
Potential number of complications reduced	14.4115
Current cost of complications	\$8,584,000.00
Potential cost	\$669,603.60

A little bit of history

Sustainable growth rate introduced in 1997

- designed to control Medicare spending on physician services by setting annual targets for expenditure growth

Medicare Access and CHIP Reauthorization Act (MACRA) signed in to law on April 16, 2015

- The law aimed to repeal the SGR formula and establish a new framework to reward healthcare providers for delivering high-quality care.

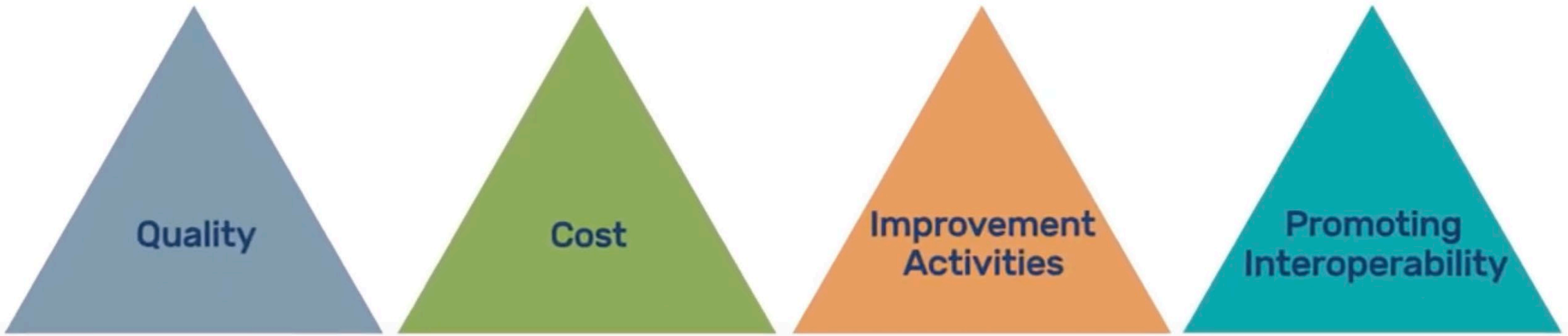
Quality Payment Program started on January 1, 2017

The Quality Payment Program Has 2 Payment Tracks





Current Structure of MIPS



6+

Measures

1+

Measures

2-4

Activities

5-6

Measures

MVPs: MIPS Value Pathway

Future State of **MIPS**







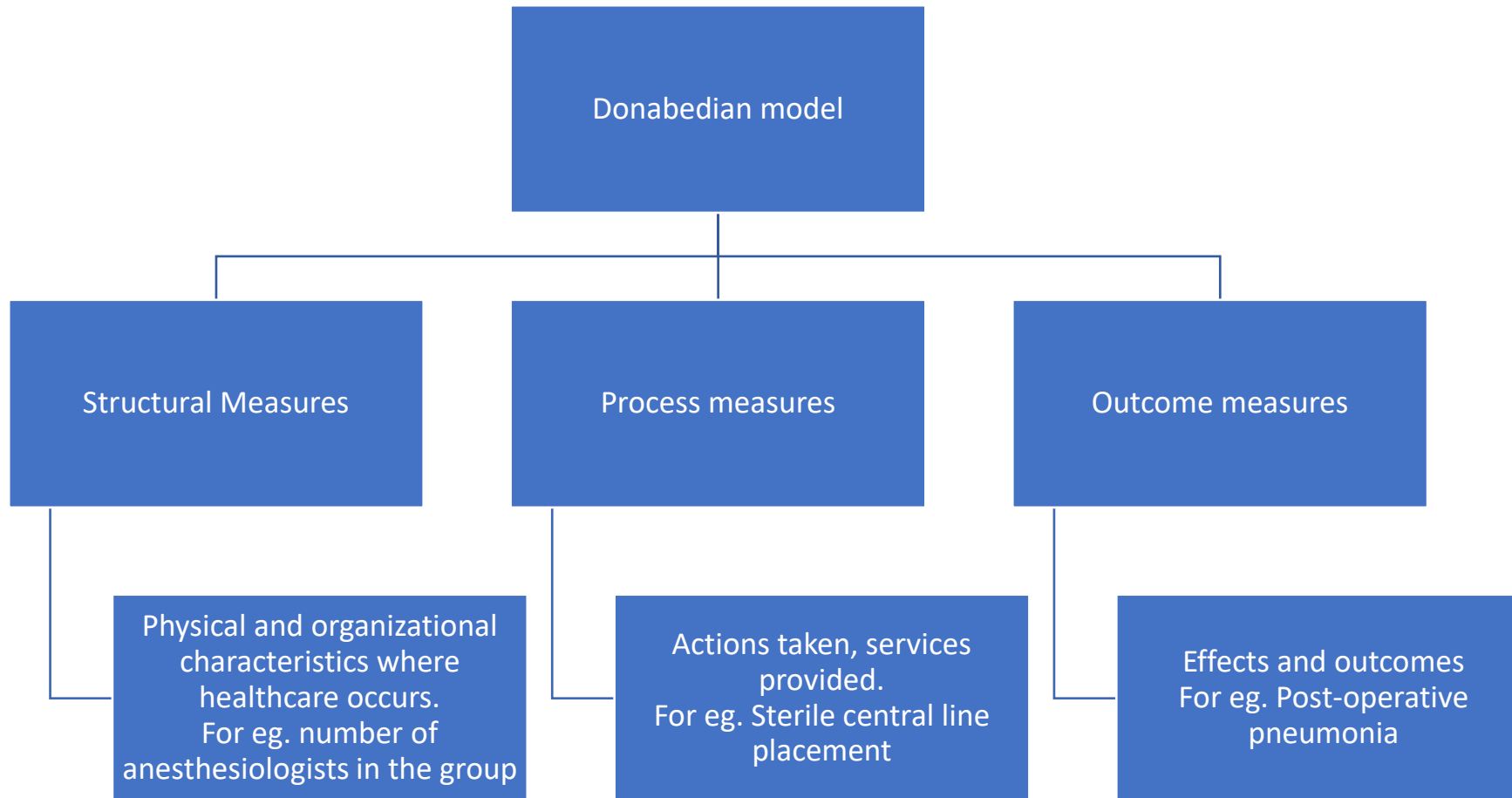
PUBLIC
PUBLIC HEALTH

Understanding Quality Metrics



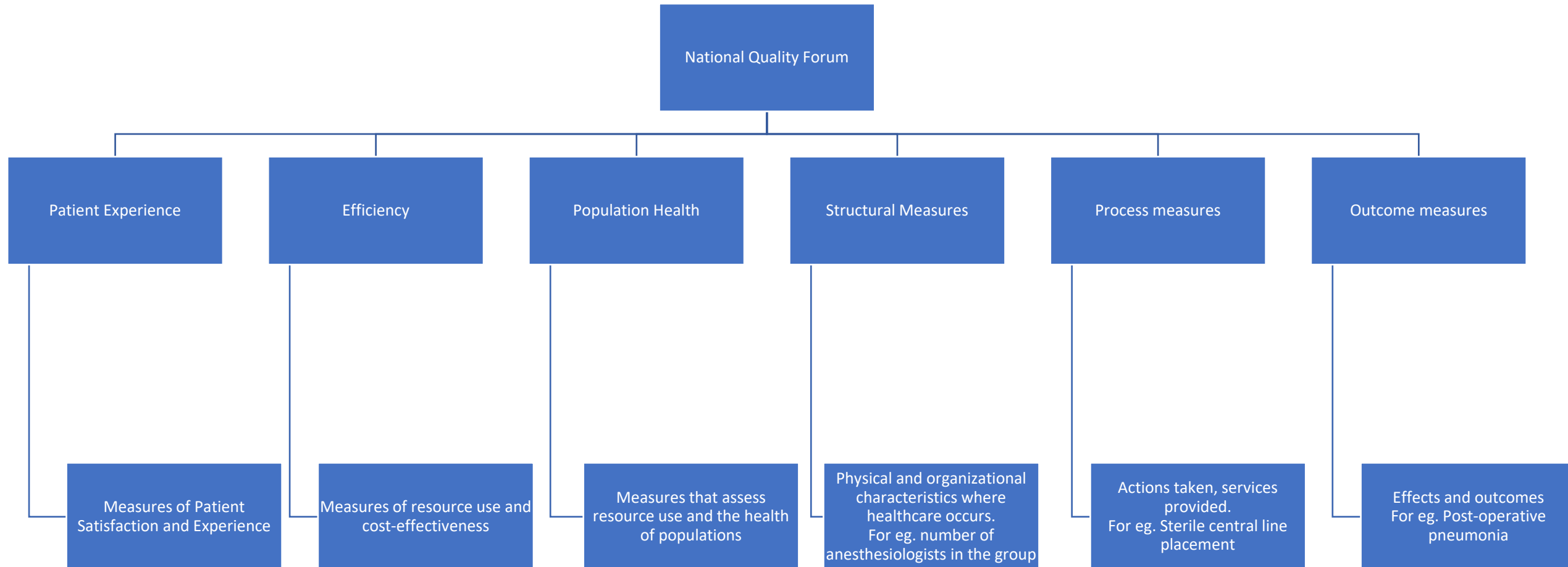


Models of quality of care





Models of quality of care





AQI - Previous Measures

Measures Removed from 2024 AQI NACOR QCDR Measure Set

Please note the following measures have been removed or retired from the AQI NACOR registry for QCDR reporting.

Measure ID	Measure Title	Reason for Removal
AQI56	Use of Neuraxial Techniques and/or Peripheral Nerve Blocks for Total Knee Arthroplasty (TKA)	CMS rejected this measure due to being considered topped-out.
AQI68	Obstructive Sleep Apnea: Mitigation Strategies	CMS rejected this measure due to being considered topped-out.
AQI69	Intraoperative Antibiotic Redosing	CMS rejected this measure due to being a process-based measure and doesn't focus on a quality action or outcome.
AQI73	Prevention of Arterial Line-Related Bloodstream Infections	CMS rejected this measure due to being considered topped-out.
ABG41	Upper Extremity Nerve Blockade in Shoulder Surgery	CMS rejected this measure due to being considered topped-out.
ABG43	Use of Capnography for Non-Operating Room Anesthesia Measure	CMS rejected this measure due to being considered topped-out.

Current state

2024 QCDR Measures Available for Reporting through AQI NACOR

Clinicians and groups reporting via Qualified Clinical Data Registry (QCDR) measures to fulfill requirements for the MIPS Quality component.

Measure ID	Measure Title	Measure Type
AQI18	Coronary Artery Bypass Graft (CABG): Prolonged Intubation	Inverse Measure – High Priority
AQI48	Patient-Reported Experience with Anesthesia	Process – High Priority
AQI49	Adherence to Blood Conservation Guidelines for Cardiac Operations using Cardiopulmonary Bypass (CPB)	Composite
AQI65	Avoidance of Cerebral Hyperthermia for Procedures Involving Cardiopulmonary Bypass	Outcome – High Priority
AQI67	Consultation for Frail Patients	Process – High Priority
AQI71	Ambulatory Glucose Management	Process
AQI72	Perioperative Anemia Management	Process – High Priority
ABG44*	Low Flow Inhalational General Anesthesia	Process – High Priority
ePreop31**	Intraoperative Hypotension among Non-Emergent Noncardiac Surgical Cases	Intermediate Outcome – High Priority

*ASA LICENSED THIS MEASURE FROM ABG

**ASA LICENSED THIS MEASURE FROM Provation

2024 MIPS Measures Available for Reporting through AQI NACOR

Clinicians and groups reporting via Qualified Registry or Qualified Clinical Data Registry (QCDR) can report Merit-based Incentive Payment System (MIPS) measures to fulfill requirements for the MIPS Quality component. [Download full MIPS measure specifications from CMS](#). The naming convention for MIPS measures is “Quality ID XXX” or “QID XXX”.

Measure ID	Measure Title	Measure Type
QID 047	Advance Care Plan	Process – High Priority
QID 130	Documentation of Current Medications in the Medical Record	Process – High Priority
QID 155	Falls: Plan of Care	Process – High Priority
QID 182	Functional Outcome Assessment	Process – High Priority
QID 226	Preventive Care and Screening: Tobacco Use: Screening and Cessation Intervention	Process
QID 317	Preventive Care and Screening: Screening for High Blood Pressure and Follow-Up Documented	Process
QID 404*	Anesthesiology Smoking Abstinence	Intermediate Outcome – High Priority
QID 424*	Perioperative Temperature Management	Outcome – High Priority
QID 430*	Prevention of Post-Operative Nausea and Vomiting (PONV) – Combination Therapy	Process – High Priority
QID 463*	Prevention of Post-Operative Vomiting (POV) – Combination Therapy (Pediatrics)	Process – High Priority
QID 468	Continuity of Pharmacotherapy for Opioid Use Disorder (OUD)	Process – High Priority
QID 477*	Multimodal Pain Management	Outcome – High Priority
QID 487	Screening for Social Drivers of Health	Process – High Priority

Measures with an asterisk () are included in the CMS-recommended Anesthesiology Measure Set. Eligible clinicians and groups are not required to report these measures towards the six measures required for the MIPS Quality Component but may find them applicable to their practice.



Patient Safety and Support of Positive Experiences with Anesthesia

MVP ID: G0059

Most applicable medical specialty(s):

Anesthesiology

The Patient Safety and Support of Positive Experiences with Anesthesia MVP focuses on increasing quality of anesthesia care, improving postoperative outcomes, promoting patient safety, and enhancing satisfaction for patients receiving anesthesia. The measures are used for a variety of surgical procedures that anesthesiologists deliver care for, and are broadly applicable to anesthesiologists practicing within ambulatory, outpatient, and inpatient hospital settings.

Current state

2024 QCDR Measures Available for Reporting through AQI NACOR

Clinicians and groups reporting via Qualified Clinical Data Registry (QCDR) measures to fulfill requirements for the MIPS Quality component.

Measure ID	Measure Title	Measure Type
AQI18	Coronary Artery Bypass Graft (CABG): Prolonged Intubation	Inverse Measure – High Priority
AQI48	Patient-Reported Experience with Anesthesia	Process – High Priority
AQI49	Adherence to Blood Conservation Guidelines for Cardiac Operations using Cardiopulmonary Bypass (CPB)	Composite
AQI65	Avoidance of Cerebral Hyperthermia for Procedures Involving Cardiopulmonary Bypass	Outcome – High Priority
AQI67	Consultation for Frail Patients	Process – High Priority
AQI71	Ambulatory Glucose Management	Process
AQI72	Perioperative Anemia Management	Process – High Priority
ABG44*	Low Flow Inhalational General Anesthesia	Process – High Priority
ePreop31**	Intraoperative Hypotension among Non-Emergent Noncardiac Surgical Cases	Intermediate Outcome – High Priority

*ASA LICENSED THIS MEASURE FROM ABG

**ASA LICENSED THIS MEASURE FROM Provation

2024 MIPS Measures Available for Reporting through AQI NACOR

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Measures with an asterisk () are included in the CMS-recommended Anesthesiology Measure Set. Eligible clinicians and groups are not required to report these measures towards the six measures required for the MIPS Quality Component but may find them applicable to their practice.

- Hospital-Wide, 30-Day, All-Cause Unplanned Readmission (HWR) Rate for the Merit-Based Incentive Payment System (MIPS) Groups

The outcome for this measure is any unplanned readmission to a non-federal, short-stay, acute-care or critical access hospital within 30 days of discharge from an index admission.

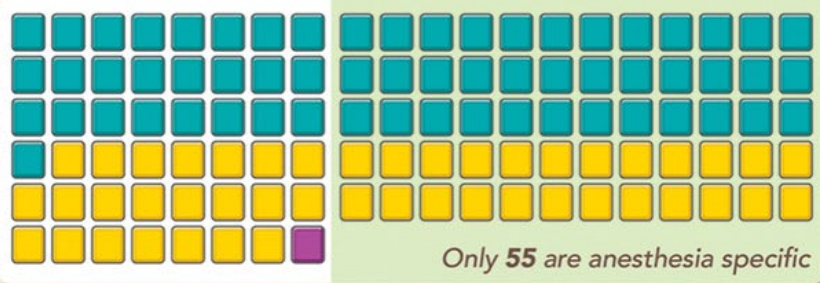
- Clinician and Clinician Group Risk-standardized Hospital Admission Rates for Patients with Multiple Chronic Conditions

The outcome for this measure is the number of acute unplanned admissions per 100 person-years at risk for admission during the measurement period.

METRICS
WANTED

Assessing the Quality of Anesthesia Quality Metrics

108 anesthesia quality metrics have been described¹ and classified as **outcome**, **process**, or **structure of care indicators**.



VALIDITY

Face	100% of those measures had face validity
Content	40% had construct or content validity
Construct	38% had high levels of supporting evidence

Patient-reported postoperative outcomes could be measured. However, they have **poor to moderate (0 to 58%) positive agreement** with chart review outcomes,² undermining construct validity.



Of the National Quality Forum's **637 endorsed metrics**,³ **only 6 are anesthesia quality metrics**.

39 are **surgery specific**, and 67 are **shared**.

The rest are not applicable.



By 2021, metric performance will alter CMS reimbursement by at least 9%.⁴

Additional efforts to develop and validate anesthesia quality metrics **are needed**.



Are process measures enough?

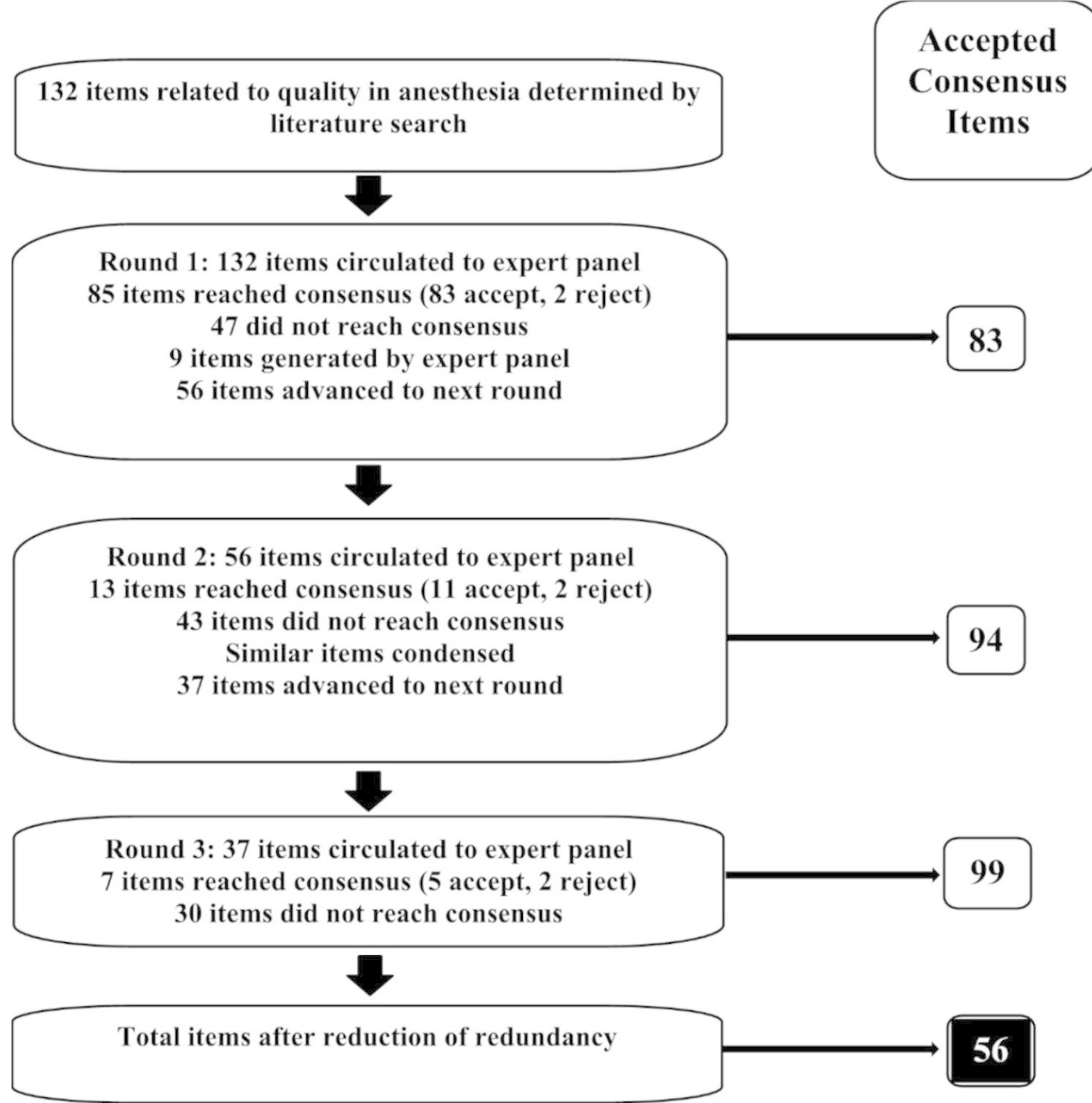
Can we do better?

Anesthesia quality indicators to measure and improve your practice: a modified delphi study

[May-Sann Yee](#) & [Jordan Tarshis](#)

BMC Anesthesiology **23**, Article number: 256 (2023) | [Cite this article](#)

2373 Accesses | [Metrics](#)



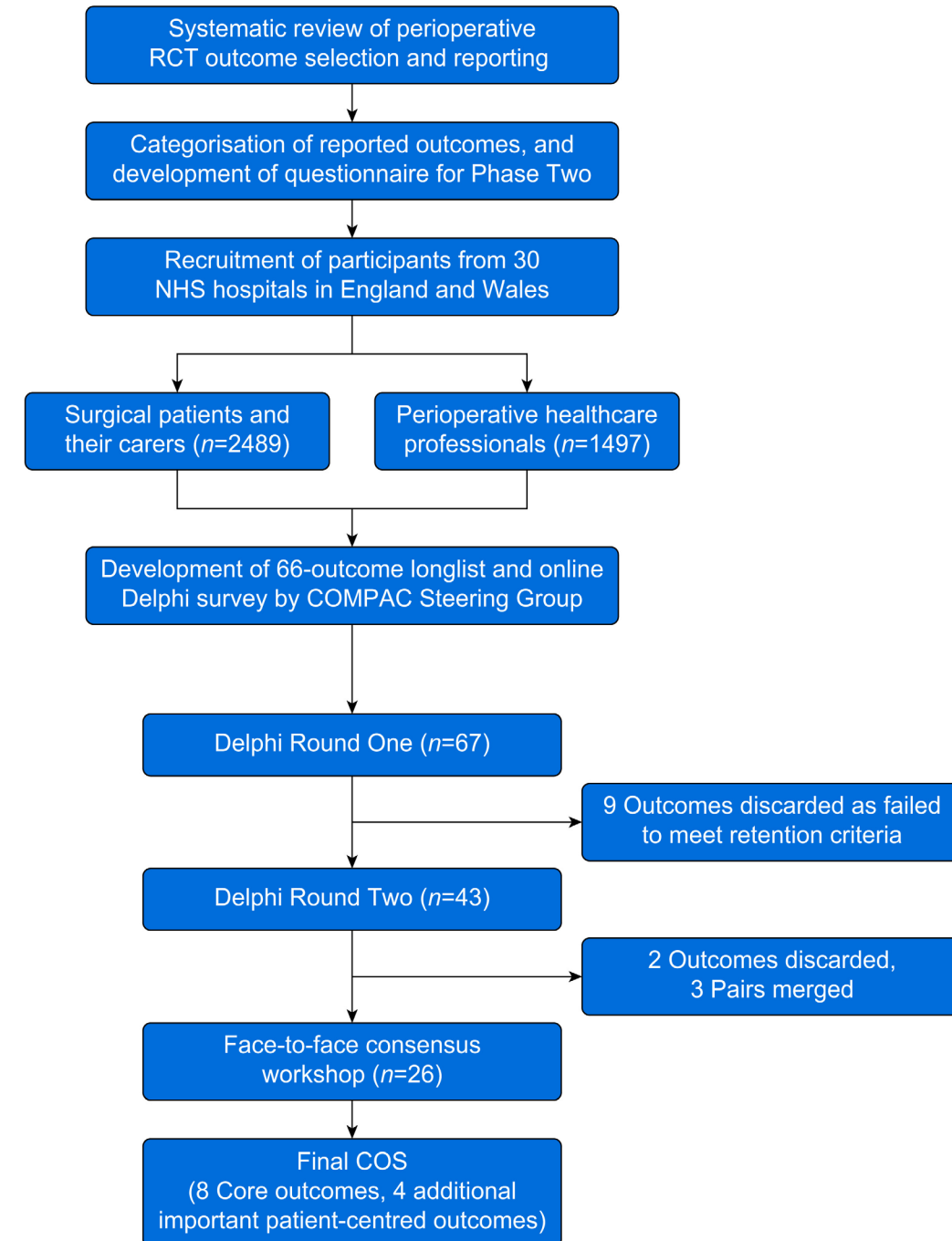
Indicators	Type	% agreement
Airway complications (greater than 3 attempts at intubation, cannot intubate/cannot ventilate, laryngospasm, hypoxia, dental/soft tissue injury)*	Process and outcome	93
Incidence & duration of perioperative adverse events including hypoxia, hyper/hypocarbica, hyper/hypothermia, hyper/hypoglycemia, anesthetic, overdose	Outcome	86
Number of medical errors (patient receiving wrong drug, drug dose, wrong surgical site, wrong blood product etc)	Process	79
Degree & duration of hypotension on induction (SBP < 80) *	Outcome	71
Patient satisfaction (composite patient experience)	Outcome	79
Medication error with wrong medication or wrong dose given	Process	71
Postoperative residual neuromuscular blockade (ToF < 0.9 measured 15 min after arrival to PACU, clinical residual weakness) requiring intervention by an anesthesiologist to treat inadequate reversal of neuromuscular blockade*	Outcome	71
Temperature less than 35.5 Celsius on arrival to PACU*	Outcome	71
Complications of neuraxial block (failed block, inadvertent dural puncture, high block, infection, neurologic	Outcome	64
Incidence of severe PONV (2 or more episodes of severe nausea/vomiting over 6 hours apart OR requiring more than 2	Outcome	64

QUALITY AND PATIENT SAFETY

Core Outcome Measures for Perioperative and Anaesthetic Care (COMPAC): a modified Delphi process to develop a core outcome set for trials in perioperative care and anaesthesia

Oliver Boney^{1,2,*}, S. Ramani Moonesinghe^{1,2}, Paul S. Myles³, Michael P. W. Grocott^{4,5}, and the StEP-COMPAC group

- Mixed methods study
- Qualitative then quantitative – modified Delphi Process
- Round 1 & 2
 - $\geq 65\%$ of respondents from either stakeholder group scored the outcome ≥ 4 (i.e. ‘important’ or ‘very important’), AND
 - $< 20\%$ of respondents from that stakeholder group scored the outcome ≤ 2 (i.e. ‘not very important’ or ‘not at all important’).
- Round 3
 - Face-to-face consensus workshop
 - Small group discussions + plenary discussion
 - Outcomes scored as 2 – core
 - Outcomes scored as 1 – desirable
 - Outcomes scored as 0 - excluded

Phase One:
Systematic reviewPhase Two: P-CoMMaS
stakeholder consultationPhase Three:
Delphi process

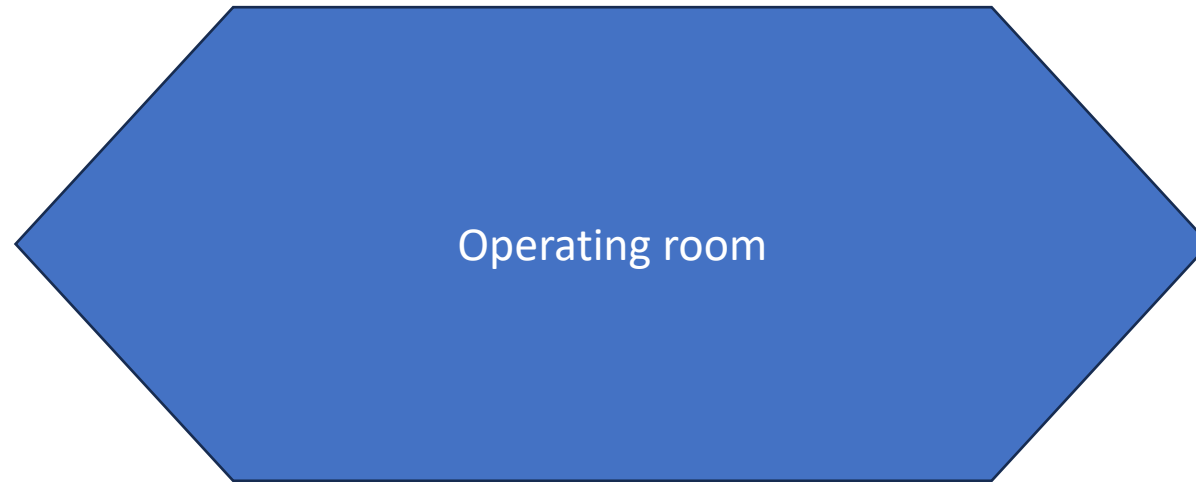
Outcome domain	Core outcome(s)	Corresponding StEP endpoints
Mortality/survival	Overall mortality (death rate) after an operation	Organ failure and survival
	Overall long-term survival (e.g. after a cancer operation)	Cancer and long-term survival ²⁹
Perioperative complications	Major (serious) postoperative complications and adverse events (using accepted, validated definitions of major and minor complications)	Various ^{26–28,30,31}
	Complications and adverse events causing permanent disability or harm	
Resource use	Total number of days spent in hospital for the operation	Health resource use
	Unplanned hospital readmission within 30 days of operation	
Short-term recovery after surgery	Discharge destination from hospital (e.g. own home/rehab facility/care home), level of dependence (need for carers), or both	Patient comfort ³²
Longer-term recovery after surgery	Overall health-related quality of life (using a validated scoring tool)	Patient-centred outcomes ²⁵
Additional important patient-centred outcomes to be considered for inclusion		
Short-term recovery after surgery	Pain (incidence/severity/duration)	Patient comfort ³²
	Nausea with or without vomiting (incidence/severity/duration)	
	Mental, emotional, and psychological wellbeing	
Overall success/failure of surgery	Patient satisfaction with their operation, willingness (with hindsight) to choose the same again, or both	Patient-centred outcomes ²⁵

Table 3. Level of Scientific Evidence on Which Prescriptive Indicators (Recommendations) Are Based

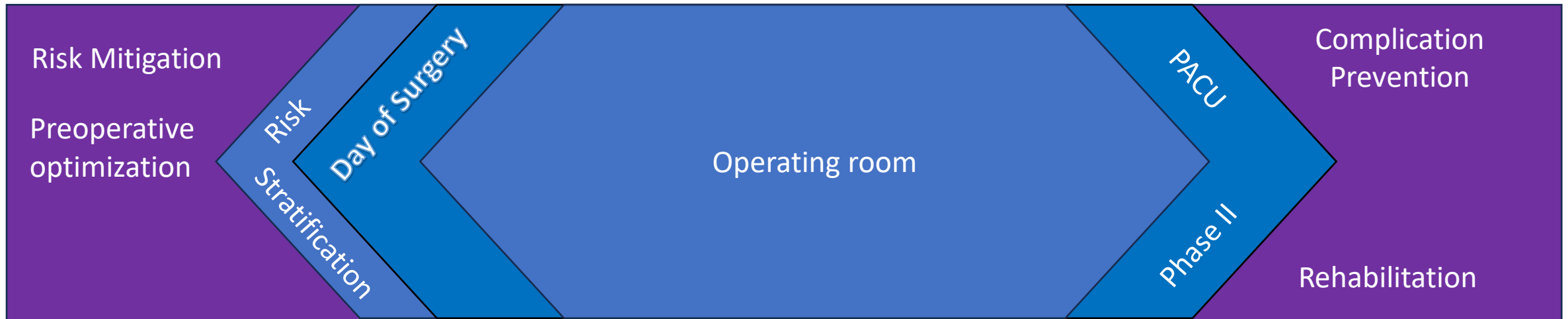
Indicators	Evidence Score for Prescriptive Measures (Oxford Center for Evidence Scale)
Documented preanesthetic patient consultation (nine indicators)	5
Electrocardiographic tracing according to departmental or other established protocols	5
Procedure with an anesthesiologist in attendance where the anesthesia record substantially comply with Australian and New Zealand College of Anaesthetists requirements	5
Patients who have received a preanesthesia assessment before the day of surgery	5
Patients receiving a blood transfusion in accordance with National Health and Medical Research Council guidelines during the procedure with an anesthesiologist	5
Patients who undergo a procedure with an anesthesiologist in attendance where there is an assistant to the anesthesiologist	5
Adequate perioperative management of patients' current medications	1b-5
Patients undergoing a procedure with an anesthesiologist who have documented evidence of a postanesthesia review/other process	5
Patients with a history of postoperative nausea and vomiting to whom a prophylactic antiemetic has been administered	1b-4
Patients with analgesia adequate enough to allow acute rehabilitation	5
Patients with pain intensity scores regularly recorded by nursing staff	5
Patients receiving prescribed antiemetic treatment when nausea and vomiting are present during acute pain management	4
Nurse reading acute pain protocols	5
Comprehensive planning for pain management	5
Surgical patients having an order for an antibiotic to be given within 1 h (2 h if fluoroquinolone or vancomycin) before the surgical incision	1a-2b
Surgical patients with administration of a prophylactic antibiotic within 1 h (2 h if fluoroquinolone or vancomycin) before the surgical incision (two indicators)	1a-2b
Surgical patients for whom first- or second-generation cephalosporin prophylaxis is indicated and who had an order for cefazolin cefuroxime	1a-2b
Noncardiac surgical patients who received prophylactic antibiotics and have an order for discontinuation within 24 h of surgical end time (two indicators)	1a-2b
Cardiac surgical patients who received prophylactic antibiotics and who have an order for discontinuation within 48 h of surgical end time	5
Surgical patients who had an order for venous thromboembolism prophylaxis to be given within 24 h before incision/after surgery end (two indicators)	1a-2b
Patients for whom central venous catheter was inserted with all elements of sterile barrier technique followed	1a
Patients for whom active warming was used intraoperatively or one body temperature $\geq 36^{\circ}\text{C}$ recorded within 30 min before or after anesthesia end	1b-3b
Prophylactic antibiotic selection for surgical patients according to current recommendations	1a-2b
Cardiac surgery patients with controlled 6 μM postoperative serum glucose	1b
Colorectal surgery patients with immediate postoperative normothermia	1b
Surgery patients on a β blocker before arrival who received a β blocker during the perioperative period	1a-1b
Patients with isolated coronary artery bypass graft documented to have received preoperative β blockade	1a-1b
Surgery patients who received appropriate venous thromboembolism prophylaxis within 24 h before surgery to 24 h after surgery	1a-2b

- Process indicators offer great promise as quality improvement tools as they often define targets that have to be reached. They reflect the care that clinicians are delivering day to day and can be incorporated into routine data collection. Clinicians feel accountable for them, rather than for outcome measures that may be affected by other variables.[39](#)
- However, they have to be used cautiously, even if links to causal outcomes have been demonstrated. A clinician may perform well in one process but not in another. If the indicators do not cover all the processes that can affect outcomes, they may be misleading.[39](#)

Can anesthesiologists affect outcomes?



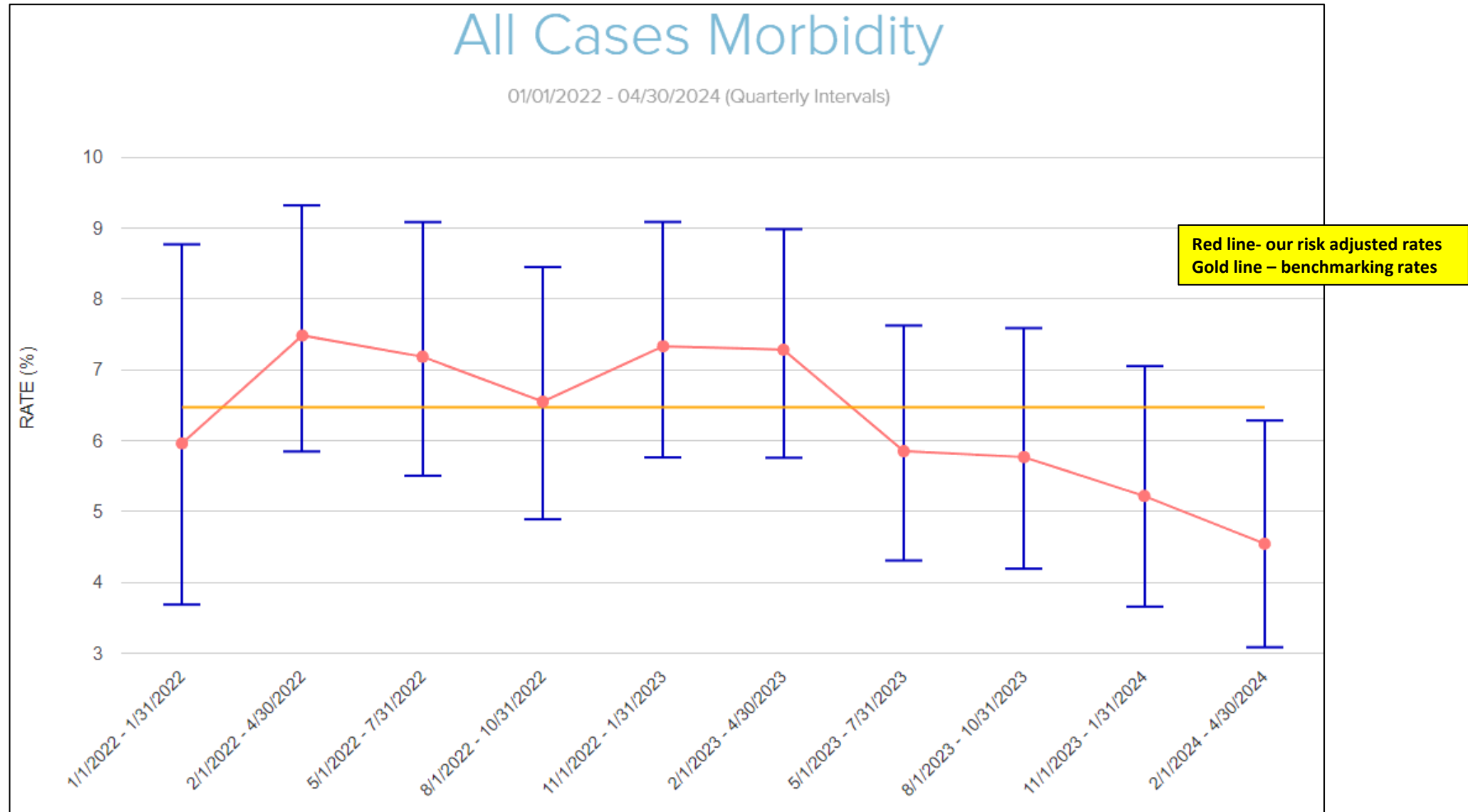
Can anesthesiologists affect outcomes?



Adult NSQIP Real Time Risk Adjusted Reports

Postop Morbidity Occurrences

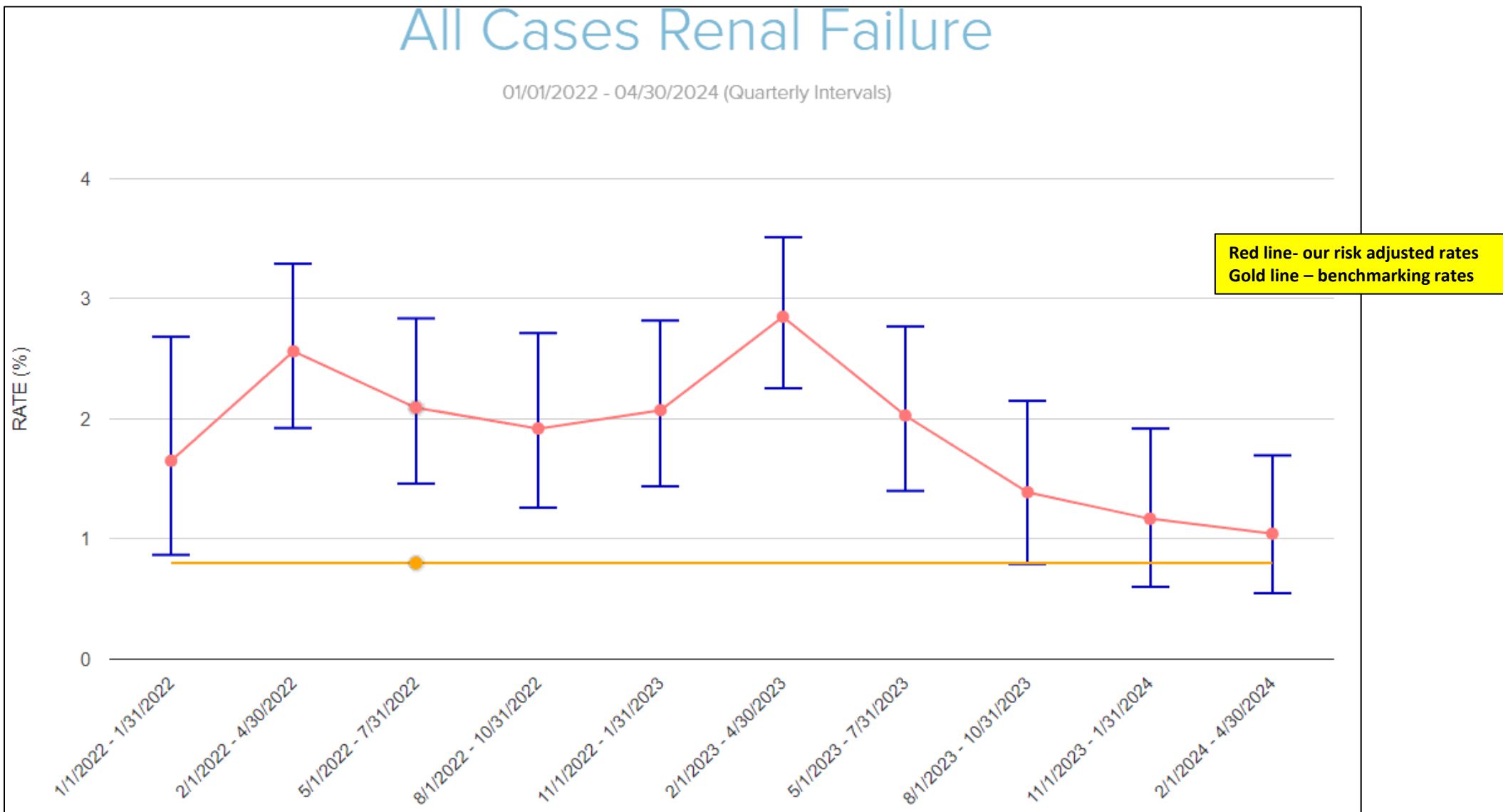
January 1, 2022 to April 30, 2024 (quarterly)



Adult NSQIP Real Time Risk Adjusted Reports

Postop Renal Failure Occurrences

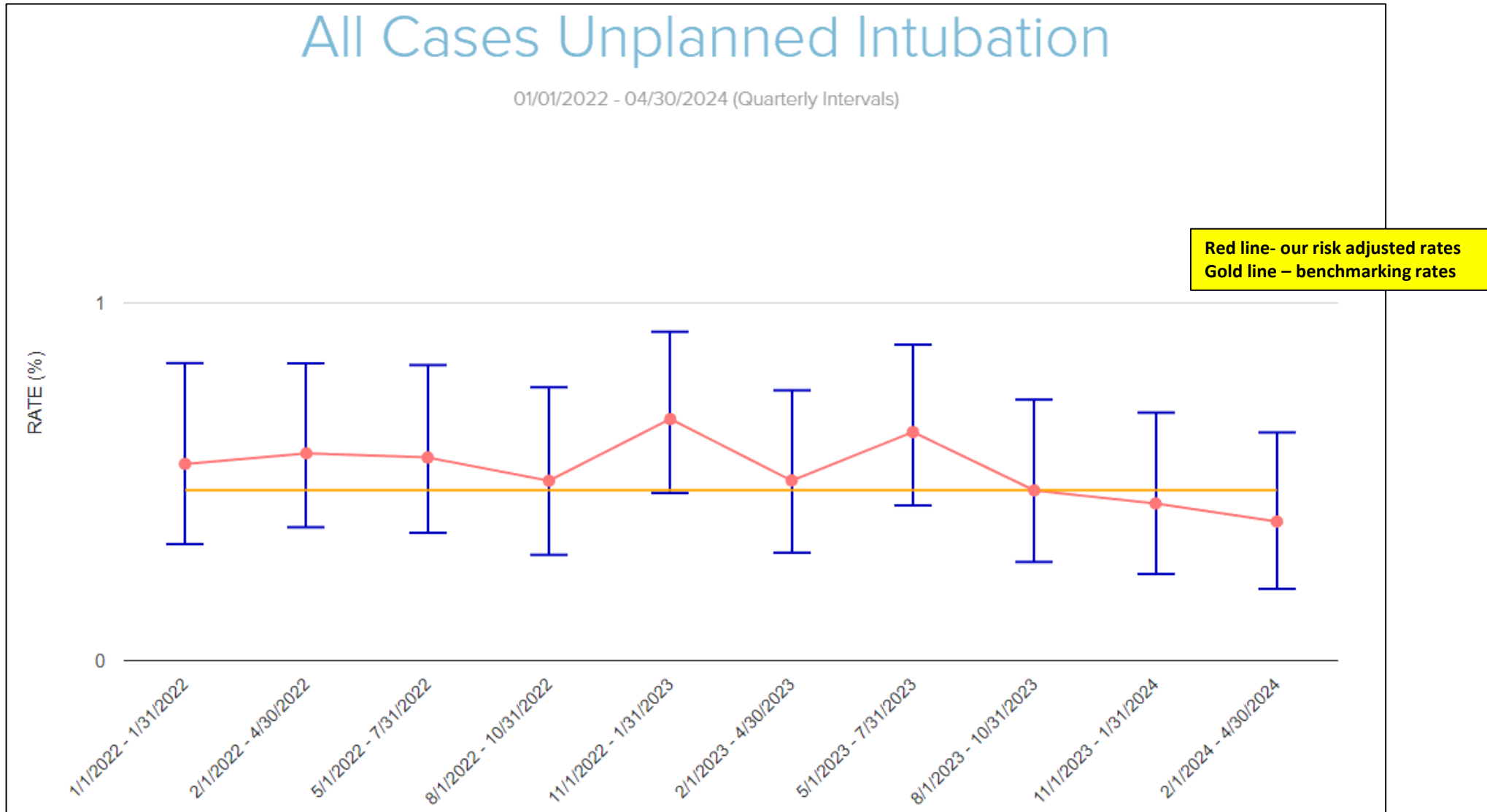
January 1, 2022 to April 30, 2024 (quarterly)



Adult NSQIP Real Time Risk Adjusted Reports

Postop Unplanned Intubation Occurrences

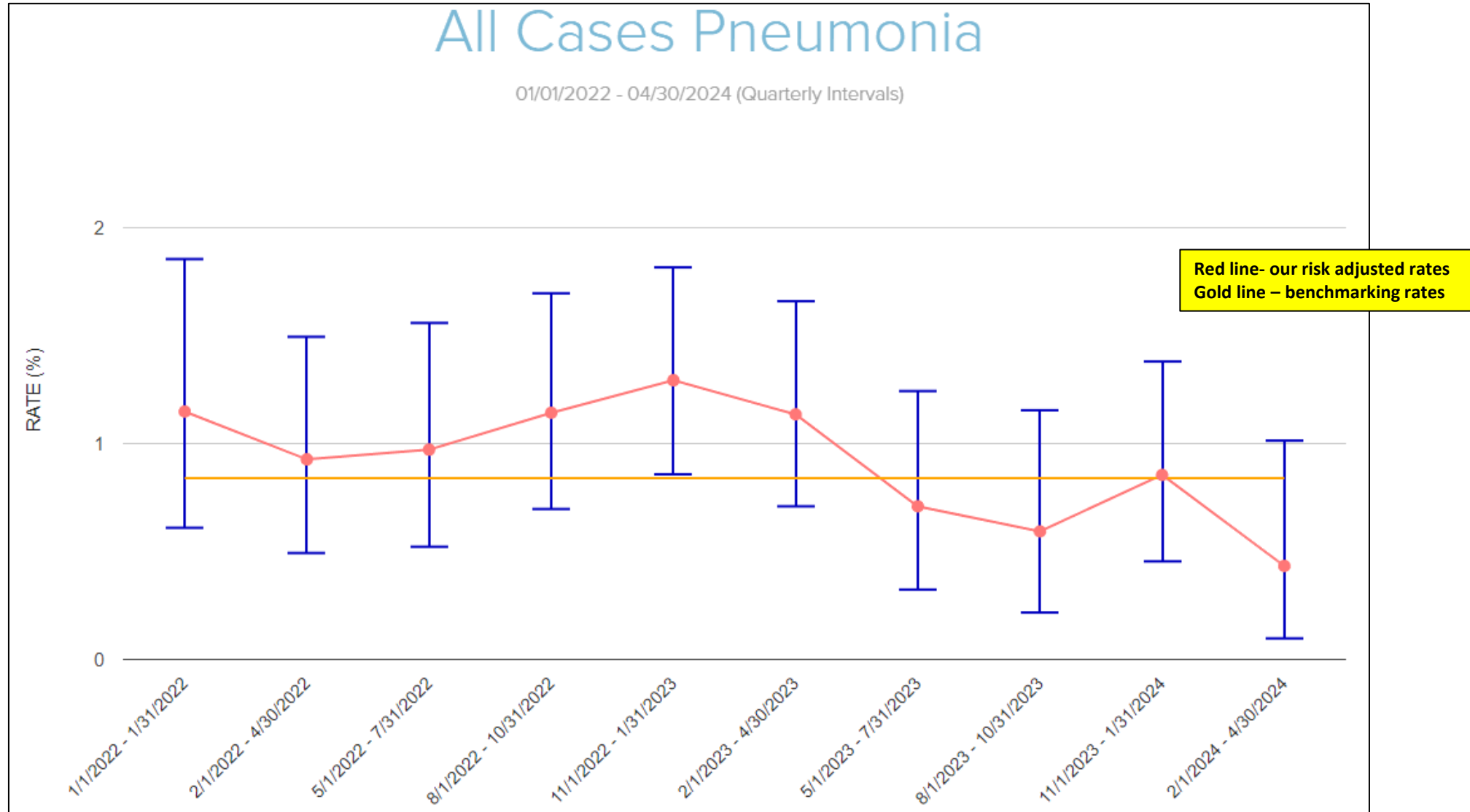
January 1, 2022 to April 30, 2024 (quarterly)



Adult NSQIP Real Time Risk Adjusted Reports

Postop Pneumonia Occurrences

January 1, 2022 to April 30, 2024 (quarterly)



Pulmonary Improvement Journey

1

December 2022

Repositioning of patient's heads in PACU Bays (Head First)

2

January 2023

ETCO2 Education for PACU Team Members

3

April 2023

Added cardiac service line to the standardized ERAS program which now includes CT, EGS, COLO, Ortho, Bariatric, & GYN surgeries

4

June 2023

Follow up Audits performed on ETCO2 compliance

July 2023

RN Allocation for Patient Call Backs
PEEP Adjustments to Adult OR Anesthesia Machines

5

August 2023

ICU to OR Vent Transport Education

Preoperative CHG Mouthwash Implemented for all patients

Preoperative Jet Nebs for patients with respiratory conditions

Nurse Residency Education

Ventilated Patient Mobility Initiated

6

September 2023

Perioperative Website for Patient Instructions Developed

November 2023

Implemented Intrapercussive Ventilation (IPV) Equipment with education and SOP

7

In Progress

SAT/SBT Order Sets
Inpatient Unit White Board Refresh
ICough Measures for inpatient units with focus on oral care and mobility
Population Health Partnership for high risk patients
Nurse driven pulmonary orderset

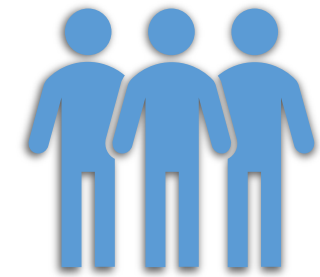
Moving forward



Modified Delphi Study for U.S. based metrics focused on outcomes



Focus on extractability rather than self-reporting



Consider establishment of a Georgia collaborative for anesthesia and perioperative medicine quality metrics and outcomes

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Thank you!

MEDICAL MALPRACTICE

How to stay out of the Courtroom.

Joscelyn Hughes
Bendin Sumrall & Ladner, LLC
July 14, 2024

What is Medical Malpractice?

Medical malpractice is when a doctor or other health care provider treats a patient in a manner that deviates from the medical standard or care, and the patient suffers harm as a result.



What is the standard of care in Georgia?

- The degree of care and skill ordinarily employed by the profession generally under similar conditions and like surrounding circumstances. O.C.G.A. § 51-1-27.

- This is a NATIONAL standard



O.C.G.A. § 9-11-9.1 – Expert Affidavit

- In any action for damages alleging professional malpractice the plaintiff shall be required to file with the complaint an affidavit of an expert competent to testify, which affidavit shall set forth specifically at least one negligent act or omission claimed to exist and the factual basis for each such claim.



How do you explain reasonableness to a jury?

- The Medicine
- Medical Record Documentation
- Expert Reviews
- You. Your presentation.



Common Reasons Anesthesiologists end up in the Courtroom.

- Poor pre-operative evaluation.
- Errors in the operating room.
- Code Response.
- Rare outcomes that are catastrophic.
- Same-day surgery.

Medical as of 6/22/2018

Medical last reviewed by [REDACTED] on 6/22/2018

Past Medical History

Diagnosis	Date	Comments
Anesthesia complication	—	reso distress after extubation
Asthma	—	mother states not asthma "asthmaic symptoms only", mother states it is controlled now, no issues for 2 months

Relevant Problems

No relevant active problems

Anesthesia Plan

ASA 2

Anesthesia Plan: **General** (Former premi 24 weeks on vent for a while Now with some reactive airway hx clear today)

ED Quick Updates - Mon June 18, 2018

Row Name	0350
Quick Updates	
Quick Updates - Free Text	Pt presents to the ER with mother with c/o fever with associated n/v since earlier today. Pt also with nasal congestion, but mother states pt is always congested which is associated with him being premature at birth. Mother states pt's fever was 103F at home, but she gave him Motrin prior to arrival to ER. No active n/v noted at this time. Flu swab sent. Will continue to monitor. -JB

It is a departure from the standard of care for physicians caring for pediatric patients presenting for an elective surgical procedure requiring general anesthesia who have a medical history of reactive airway disease, post extubation respiratory distress, asthma, prolonged ventilator dependence at birth, sleep apnea and a recent diagnosis of upper respiratory infection, to allow such patients to undergo general anesthesia.

Pre-Op Evaluation

Vital Signs: Temp 36.5 B/P 190/63 Pulse 74 RR 16 SpO2 100%

CNH _____ PFTS: _____
ASA Risk Status: 1 (4) (3)

Systolic BP - AN	<input type="checkbox"/>	208	237
Diastolic BP - AN	<input type="checkbox"/>	97	98
Mean BP - AN	<input type="checkbox"/>	139	140

209	173	105	96	91
88	79	55	53	55
127	114	77	72	70

2 Q. Do you remember if the anesthesiologist came by
3 after your mom had received the three medications or
4 before, do you recall?

5 A. I believe it was after.

6 Q. And do you believe you told the
7 anesthesiologist that your mom was having complaints of
8 right visual changes, blurriness, unable to see?

9 A. No. I told the nurses.

10 Q. So you do not believe that you told the
11 anesthesiologist about your mom having visual
12 disturbances before the procedure on February 2nd --

13 A. No.

14 Q. -- is that correct?

15 A. That's correct.

- a) Failing to postpone the 2/2/18 elective surgery due to the patient's elevated blood pressure and symptoms of neurological change;
- b) Failing to appropriately manage the patient's blood pressure intraoperatively to prevent severe hypotension.

Error in the Operating Room

EKG	SR	ST	ST	ST	SR
SpO2	100	100%	100%	100%	100%
FiO2	1.0	0.3	1.0	0.3	.21
CO2	36	33	40	+	+
Temp	avail.				

Time:	13:00	15	30	45
O ₂ L/M (FiO ₂)	N.P.	3		

Violations: [REDACTED] likely violated the standard of care by failing to lower the FiO₂ level from 100% to 30% or less prior to the activation of the Bovie. As overwritten, the anesthesia record shows that [REDACTED] dropped the FiO₂ level from 1.0 (100%) to .03 (30%) at around the time of the fire. But the 0.3 figure has been written over the original entry, so that the original number is unreadable. That change, moreover, has been made without initials or other annotation to call out and verify the change—conduct that itself violates the standard of care. Based on these facts, [REDACTED] likely failed to drop the FiO₂ level from 100% to 30% in the first place, in violation of the standard of care.

Even assuming that [REDACTED] did lower the FiO₂ level to 30%, she violated the standard of care by failing to preclude the use of the Bovie for least 3-5 minutes, to allow the oxygen-rich air to dissipate.

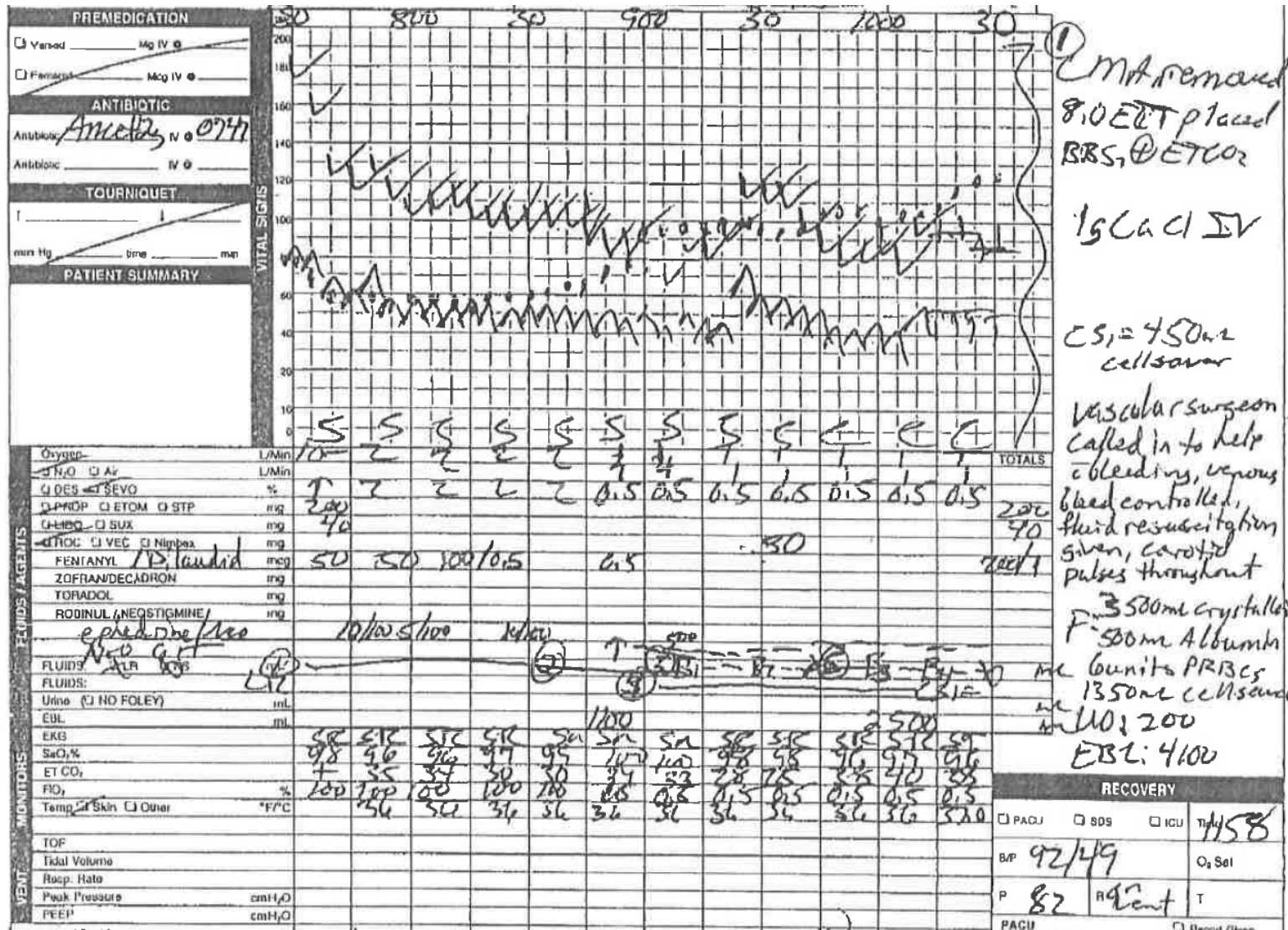
The requirements [REDACTED] violated applied with particular force here, because [REDACTED] herself controlled and had introduced the oxygen-rich air, and because she knew or should have known that the Bovie could be used.

(a) The Plaintiff did not need supplemental oxygen, and the Defendants should not have administered it.

(b) If the Plaintiff had needed supplemental oxygen for some reason not documented in the medical records, the Defendants should not have placed the Plaintiff on supplemental oxygen in a high fire risk procedure without using a closed oxygen delivery system.

(c) The Defendant physicians failed to communicate during the procedure to ensure that no oxygen was flowing when electric cauterization devices were used and that any accumulated oxygen be allowed to dissipate prior to the use of any electric cauterization equipment.

Error in the Operating Room



- (1) failed to take adequate measures to resuscitate her during her total hip replacement surgery after she experienced blood loss following the injury to her superficial femoral vein.
- (2) failed to take earlier and more frequent arterial blood gases and complete blood counts during the total hip replacement surgery.
- (3) failed to use additional peripheral intravenous lines to resuscitate her during her total hip replacement surgery.
- (4) failed to stop the surgery until the patient had been satisfactorily resuscitated and her metabolic status returned to approaching normal values.

Code Response

History of events prior to arrest:

Time	1618	1618	1619	1617	1619	1620	1623	1625	1627	1629	1631	1637	1638
CPR/3 ECG progress	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Spontaneous pulse present	○	○	○	○	○	○	○	○	○	○	○	○	✓
Cardiac Rhythm	PEA	PEA	PEA	PEA	PEA	PEA	PEA	AS	AS	AS	AS	AS	SR
Heart Rate/min	170	170	120	40	30	30	50	0	0	0	0	0	80
Mode of Respiration (See Resp. Key)	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV	BV
BP													96/62
ETCO ₂													
AED Shock (in joules)													
Defib in joules:													
Transcutaneous pacing													
Amlodarone 300 mg IV push													
Amlodarone 160 mg IV push													
Atropine 1 mg IV Up to maximum of 3 mg													
Atropine 0.5 mg IV Up to maximum of 3 mg													
CaCl 10% 1Gm IV				✓									
Epinephrine 1 mg IV	✓	✓		✓			✓						
Lidocaine # of mg IV Up to maximum of 3mg/kg													
NaHCO ₃ # of amps (50 mEq/50 ml) IV				✓									
Aspirin													
30,000 UNITS													
Procedures/Labs/ABOs IV fluids/Comments													

Open chest prepared for cannulation

Code Response

History of events prior to arrest:

Time	1642	1647	1650	1655	1700	1702	1705	1710	1712	1714
Spontaneous pulse present	+	+	+	+	+	+	+	+	0	0
Cardiac Rhythm	SR	SR	SR	SR	SB	SB	SR	SR	SB	-
Heart Rate/min	80	80	80	69	55	30	84	79	34	-
Mode of Respiration (see Resp. Log)	BV	BV	BV	BV	BV	BV	BV	BV	-	-
BP	100/62	124/81	133/55	117/69	89/48	148/40	129/72	88/60	-	-
ETCO ₂										
AED Shock (in joules)										
Defib in joules:										
Transcutaneous pacing										
Amiodarone 300 mg IV push										
Amiodarone 150 mg IV push										
Atropine 1 mg IV Up to maximum of 3 mg										
Atropine 0.5 mg IV Up to maximum of 3 mg										
CaCl 10% 1Gm IV										
Epinephrine 1 mg IV										
Lidocaine 5 mg IV Up to maximum of 3mg/kg										
NaHCO ₃ 8 amp (50 mEq/50 ml) IV										
Procedures/Labs/ABGs IV Fluids/Comments	Canulation for ECMO	Canulation for ECMO	Canulation for ECMO	Canulation for ECMO	MTP initiated	Canulation for ECMO	Canulation for ECMO	Canulation for VA-ECMO	VA ECMO Flow 1	VA ECMO Flow P-5

Backing up from the time he was pronounced dead, this means CPR started at no later than 16:10. Based on the information available during my review, CPR was not indicated at this time, and should not have been performed given the likelihood of injury to the SVC. Instead, the standard of care required that the nurses and physicians provide escalating interventions until he was hemodynamically stable. This would include interventions potentially including positional changes, fluids, transfusions, pacing, and VA ECMO. Based on the information currently available, providing CPR when it was initiated was a breach of the standard of care by Dr. [REDACTED] and any other physicians or nurses who responded and constitutes negligence.

Code Response

Assessment:				Interventions:										Evaluation:								
Time	Spont. Resp. Rate	HR	Cardiac Rhythm (post strips on back)	BP	SpO2	Pulse	Capniox	Compressions	BVM w/ 100% O2	Inflator/ Cardiovac (boles)	Pacing /TCP Rate /mA (int/EOL)	Drug: Atropine (Dose/ Route)	Drug: Epinephrine (Dose/ Route)	Drug: Calcium (Dose/ Route)	Drug (Dose/ Route)	Drug (Dose/ Route)	Drug (Dose/ Route)	Drug (Dose/ Route)	Fluid (Rate / Dose)	Fluid (Rate / Dose)	Comments: Response to interventions, Procedures, Labs, ABGs, other comments.	
1309	26	93	NS	88/58	94	N	✓	✓														
1310	85	50	NS	88/58	94	N	✓	✓														
1314						N	✓	✓														
1315						N	✓	✓														
1317						Y	✓	✓														
1319	30	70	NS	88/58	98	Y	✓	✓														
1321	40	79	NS	88/58	101	Y	✓	✓														
1323	34	72	NS	88/58	101	Y	✓	✓														
1326				88/58		N	✓	✓				0.1mg IV										
1338				88/58		N	✓	✓				0.1mg IV										
1342						N	✓	✓				0.1mg IV										
1343						N	✓	✓				0.1mg IV										
1344						N	✓	✓				0.1mg IV										
1345						N	✓	✓				0.1mg IV										
1349						N	✓	✓				0.1mg IV										

Assessment:				Interventions:										Evaluation:								
Time	Spont. Resp. Rate	HR	Cardiac Rhythm (post strips on back)	BP	SpO2	Pulse	Capniox	Compressions	BVM w/ 100% O2	Inflator/ Cardiovac (boles)	Pacing /TCP Rate /mA (int/EOL)	Drug: Atropine (Dose/ Route)	Drug: Epinephrine (Dose/ Route)	Drug: Calcium (Dose/ Route)	Drug (Dose/ Route)	Drug (Dose/ Route)	Drug (Dose/ Route)	Drug (Dose/ Route)	Fluid (Rate / Dose)	Fluid (Rate / Dose)	Comments: Response to interventions, Procedures, Labs, ABGs, other comments.	
1350						N	✓	✓														
1353				107/46		N	✓	✓														
1356				107/46		N	✓	✓														
1357						N	✓	✓														
1359						N	✓	✓														
1401		87				Y	✓	✓														
1400				87/46		N	✓	✓														
1410						Y	✓	✓														
1411						Y	✓	✓														
1412						N	✓	✓														
1413						N	✓	✓														
1415						N	✓	✓														
1418						N	✓	✓														
1423						N	✓	✓														
1424						Y	✓	✓														

and [REDACTED] departed from the standard of care in the care and treatment of [REDACTED] a pediatric patient presenting to the Pediatric Intensive Care Unit with a past medical history of reactive airway disease and an immediate history of post-operative respiratory distress and difficult intubation by failing to appropriately monitor his respiratory status, including his end tidal CO₂, and intervene appropriately to prevent cardiac arrest.

Rare Outcomes that are Catastrophic

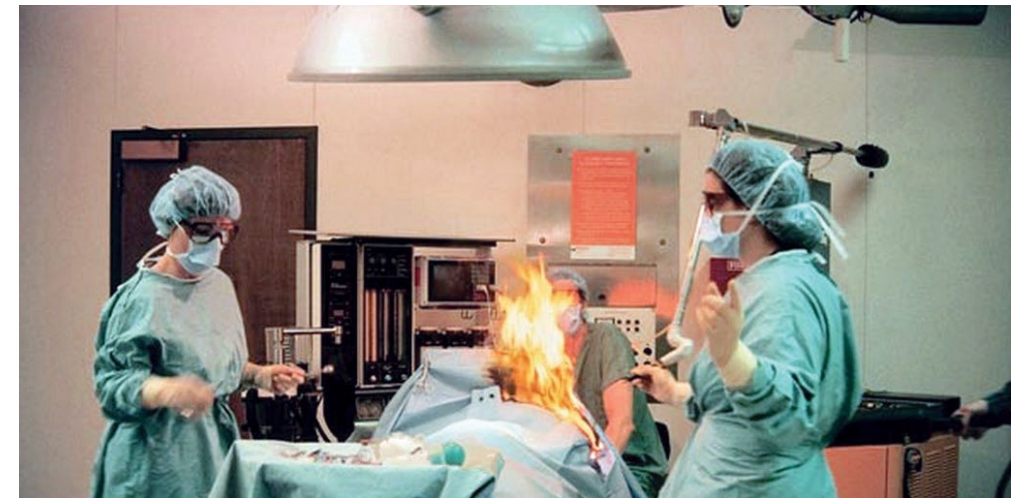
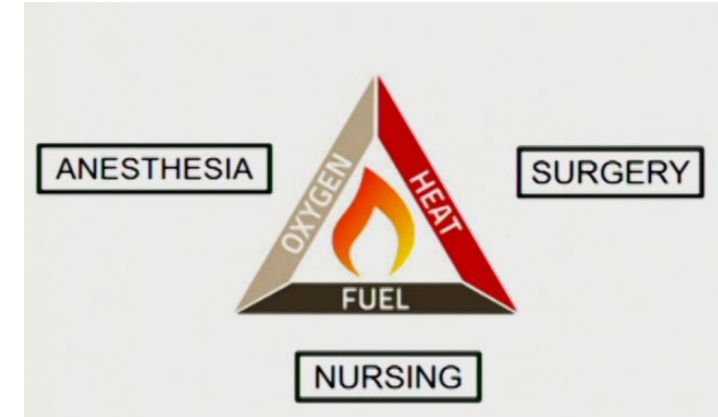
Don't panic.

Think medicine first.

Document thoroughly, but do not alter the medical records.

1359 Flash fire on
the field sec to
cautery immediately
controlled & sterile water,
drape removed, O2 OFF,
VSS. O2 sat 99%,
Topical

Smooth IV induction & propofol, easy mask ventilation. Maintained & sevoflurane + 30% FiO₂. Drapes over mask. Surgeon began procedure + excised lesion, surgeon attempted to use cautery & resulting fire + burning of mask. Mask removed + area of face doused with saline + water. No airway compromise noted. After a few minutes, pt. & laryngospasm broken & propofol + positive pressure without difficulty. Pt. emerged with no further incident. IV removed while patient was combative while emerging. Pt. was conversive, protecting airway with no difficulty breathing + SpO₂ 100% prior to transporting to PACU. Report given to PACU RN.



Medical Records

Document
FACTS

Bleeding
occurred
at 19:05

Stay Away
from
Adjectives

Large.
Excessive.
Massive.

Do not
accuse
others.

Surgeon
caused injury.
vs.
An injury
occurred.

Do not
guess.
Do not
assume.

Copy and Paste
With CAUTION



Right IJ was attempted and wire would not pass smoothly. Decision was made to put in a left IJ.
Comment @ 18:45
Trying to enter the chest, the LVAD graft was severed with the redo saw, exanguination was abrupt, cardiac
Transportation @ 6:43

Anesthesiologist

he was on anticoagulation PTA, admitted to EUH on 11/2/17 for heart transplant. He underwent heart transplant on 11/2, which was complicated intra-operatively by transection of the LVAD inflow cannula and massive bleeding/hypotension and requirement of emergent VA-ECMO, which he remains on today. He has required

Surgeon

What can you testify about in a lawsuit?

- 1) Your personal knowledge.
- 2) Your routine practice.
- 3) Refresh your recollection by reviewing the medical records.

What is privileged?

Attorney – Client

Husband – Wife

Clergyman (Priest/Rabbi)

Psychiatrist/Psychologist – patient

Peer-Review – O.C.G.A. 31-7-133

(a) Except in proceedings alleging violation of this article, the proceedings and records of a review organization shall be held in confidence and shall not be subject to discovery or introduction into evidence in any civil action; and no person who was in attendance at a meeting of such organization shall be permitted or required to testify in any such civil action as to any evidence or other matters produced or presented during the proceedings or activities of such organization or as to any findings, recommendations, evaluations, opinions, or other actions of such organization or any members thereof.

What is privileged?

This is my pt. Very disappointing.

It's really really sad. Such a nice family. I really feel like this death was avoidable.

TT3 transfer
EC 33
Pottery to the neck
Intubated lol

Those fuckin' pots

Fuck. [REDACTED] just got here. I'll go see him but gotta meet [REDACTED] in ED.

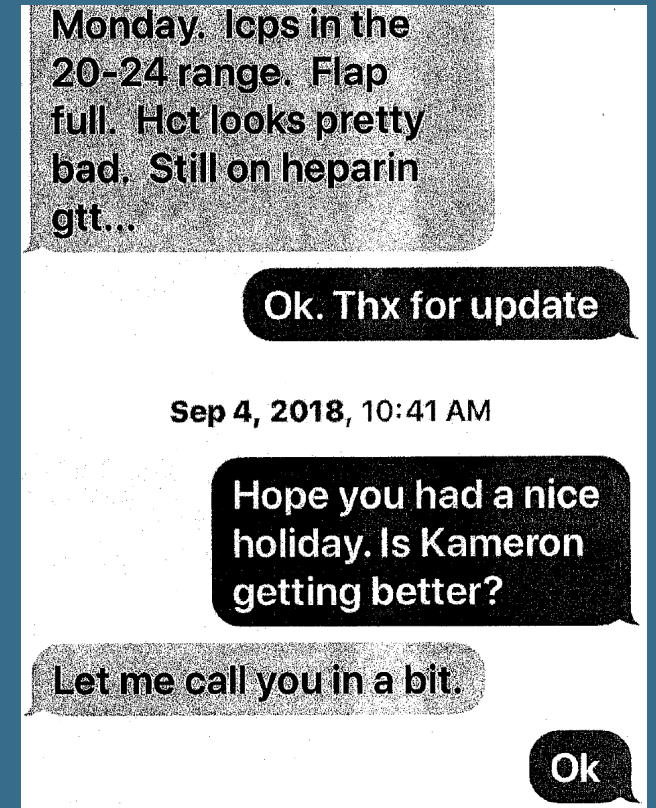
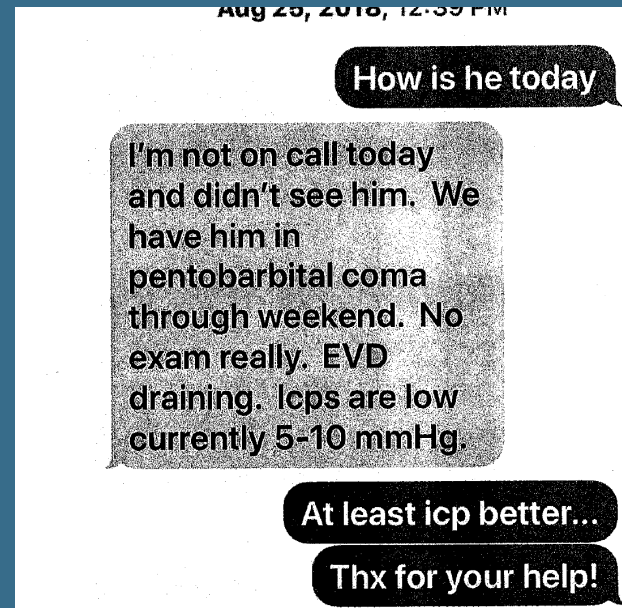
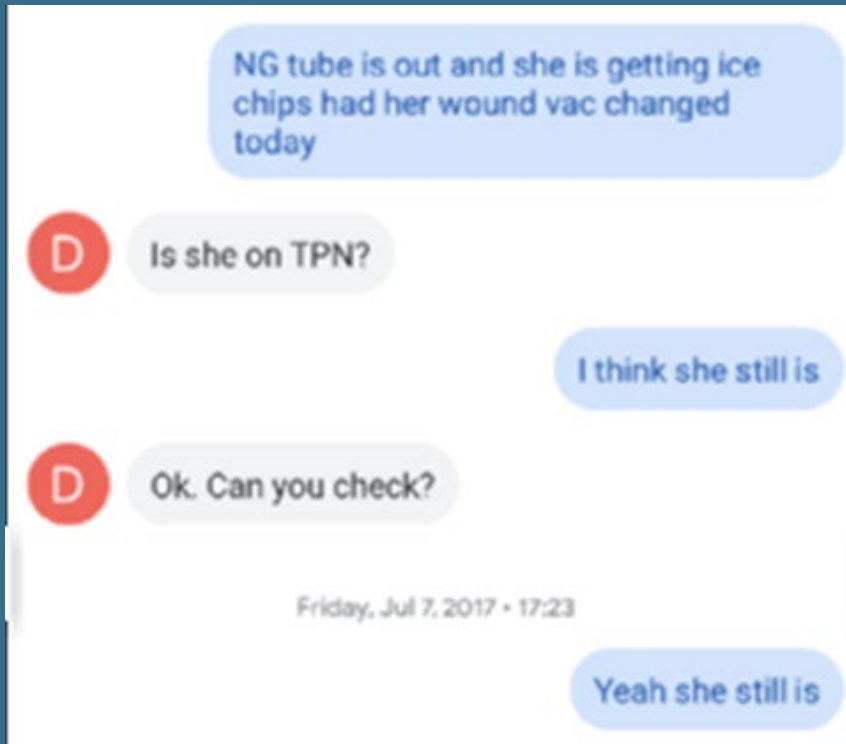
Northside has no surgical records for the big lady

No way that guy hasn't perf'd.

[REDACTED]
Totally. He has peritonitis

[REDACTED]
We just reordered Abx for stat and sending urine and blood

What is privileged?



Georgia Composite Medical Board

Executive Director
LaSharn Hughes, MBA



Chairperson
J. Jeffrey Marshall, MD, FACC
Vice Chairperson
Ronnie Wallace, MBA

2 Peachtree Street, NW • 6th Floor • Atlanta, Georgia 30303 • (404) 656-3913 • www.medicalboard.georgia.gov

Re: [REDACTED]

Dear Dr. [REDACTED]:

The Georgia Composite Medical Board has received a formal complaint against you. At this time, we are at the information-gathering stage of our investigation into this complaint and have not initiated formal proceedings in this matter. The complaint concerns the following:

- Alleged physician [REDACTED]

The Board respectfully requests that you provide a written response to the allegations of this complaint within fifteen (15) days of the receipt of this letter. Additionally, please provide a certified (notarized) copy of the patient's records. **SEND ORIGINAL CERTIFICATION FORM ONLY, COPIES CANNOT BE ACCEPTED BY THE BOARD.** A subpoena is attached to facilitate the release of the records. If you no longer have access or are no longer custodian of the records, please call to inform of such so that arrangements can be made to properly obtain them. A records certification form is also enclosed for your convenience. Please return the original notarized certification along with the records. Upon receipt of your response to the complaint, a review of the investigative file will be made by the Board as to whether further action is warranted.

Thank you in advance for your cooperation in this matter. You will be advised of any Board action when a final decision has been rendered. If you have any questions, please contact Alexis Nelson at 404-463-8903 or by email at alexis.nelson@dch.ga.gov.

Sincerely,

Patricia Sherman
Enforcement Supervisor
PS/an

§ 43-34A-6. Right to file grievance with state board; display of declaration of rights in waiting rooms; board review of complaints; inclusion in physician profile

"The patient has the right to file a grievance with the Georgia Composite Medical Board concerning the physician, staff, office, and treatment received. The patient should either call the board with such a complaint or send a written complaint to the board.

The board must review every complaint received to determine if there is sufficient evidence to warrant an investigation according to a procedure established by board regulation. Only investigated complaints upon which the board has taken disciplinary action shall be included in a physician's profile.

THIS IS CONFIDENTIAL; IT IS NOT PUBLIC KNOWLEDGE.

GA Composite Medical Board Discipline

Close the matter

Letter of concern

Private Consent Order

Public Consent Order

Thank you

CME Claiming

Please follow the directions below to complete the meeting evaluation and claim credits. Once you are enrolled for the activity an email is sent to the email address that is listed on your ASA account. **Don't try and claim until you receive an email from the ASA.** If you experience difficulties logging in or no longer have access to that email, don't hesitate to contact jpmeetings@asahq.org, and we will be happy to assist you.

Please do not create a duplicate account, your credit will not track to duplicate account.

NO ASA ACCOUNT

If you do not have an account with ASA, an email will be sent to you to create a free account.

ACCESSING THE WEBPAGE

Click the link below and log in using the email on your ASA account and password.

<https://education.asahq.org/course/view.php?id=4179>

RETRIEVING YOUR PASSWORD

You can retrieve or set a new password by entering your email address at: <https://www.asahq.org/member-center/forgot-password>

CLAIMING CREDIT

Please complete the steps below to evaluate the activity and claim CME.

1. Complete the evaluation.
2. Click on the certificate, enter the credit you are claiming.
3. Print your certificate or save it as a PDF for your files.

Please note you must claim your credits for this course by December 31, 2024. You will NOT be able to claim credits after this date.

Jointly Provided by...



American Society of
Anesthesiologists™