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CLINICS IN MEDICAL EDUCATION

Docendo Discimus

[By Teaching We Learn]

Beth Israel Deaconess Medical Center
HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

Department of Anesthesia, Critical Care and Pain Medicine
Center for Education Research, Technology and Innovation

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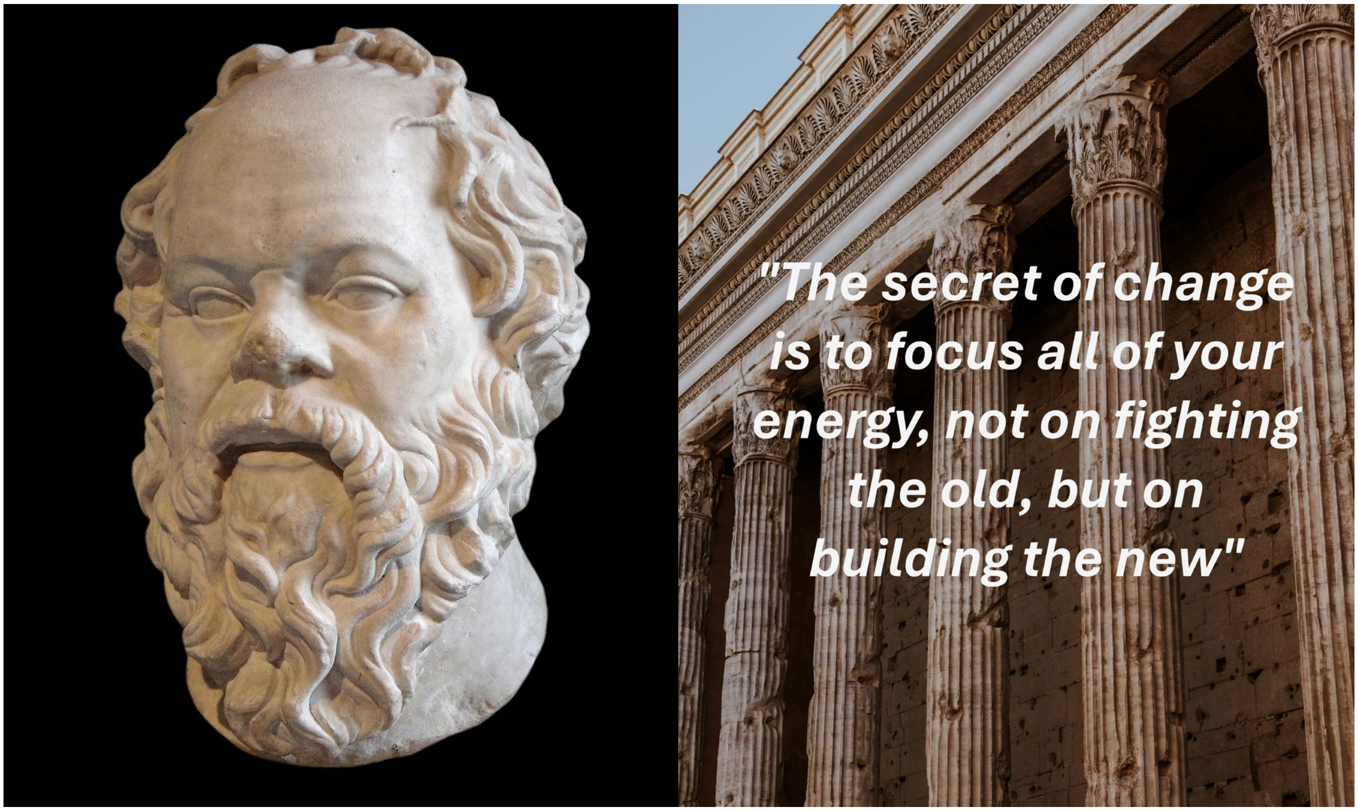

Socrates: Ancient Greek Philosopher or the 'Father of Western Philosophy.'

This quote by Socrates lays the foundational principle in education: meaningful learning and progress come not from resisting outdated methods, but from channeling energy into innovative, forward-thinking approaches.

https://en.wikipedia.org/wiki/Socrates

Nyansapo "Wisdom Knot": A symbol of wisdom, ingenuity, intelligence, and patience. The proverb associated with this Adinkra is "Nyansapo wosane no badwenma," to wit,"A wisdom knot is untied (only) by the wise."

https://www.adinkrasymbols.org/symbols/nyansapo/

New Website

Check us out online! medicaleducationclinic.com offers the latest updates in research, academia, and pedagogy from the anesthesia department at BIDMC. The site features extra content, interactive courses, quizzes, and a wide array of engaging resources. Click here to explore and enhance your learning experience!

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EDITOR'S WELCOME

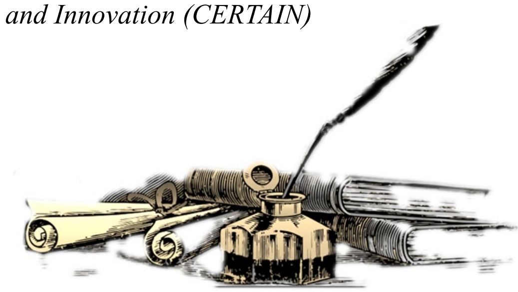
We are thrilled to share our seventh issue of *Clinics in Medical Education*! This is an interactive anesthesia education journal that will deliver a summary of clinical and medical education directly to your mobile devices, ipads and computers. We have recently launched our website (https://medicaleducation-clinic.com/) and look forward to hearing your feedback and suggestions for future content. Our aim is to provide unlimited educational resources to our residents and faculty. Each month, we present complex and unique cases to enhance your expertise featuring embedded live lectures, quizzes and rich visual aids including ultrasound images, CT scans, X-rays and interpretation of invasive and non-invasive monitoring.

We hope you enjoy our seventh issue!

Robina Matyal, MD
Vice Chair, Education
Director of Center for Education Research, Technology and Innovation (CERTAIN)
Director of Vascular Anesthesia
Beth Israel Deaconess Medical Center

Leonard S. Bushnell MD, Chair in Anaesthesia
Beth Israel Deaconess Medical Center

Professor of Anaesthesia, Harvard Medical School



Feroze Mahmood, MD, FASE
Division Director, Cardiac Anesthesia

Professor of Anaesthesia, Harvard Medical School

Mark E. Comunale Chair in Anaesthesia, Beth Israel Deaconess Medical Center

Daniel S. Talmor, MD, MPH
Chairman, Department of Anaesthesia, Critical Care, and Pain Medicine
Beth Israel Deaconess Medical Center

Edward Lowenstein Professor of Anaesthesia, Harvard Medical School

OUR MISSION

- Empowering scholarly dialogue and advancing knowledge through rigorous research and insightful perspectives.
- Advancing medical education through effective teaching practices and ongoing mentorship.
- Fostering excellence in medical teaching through continuous innovation and professional growth.

PEDAGOGY IN EDUCATION

Operating Room as a Stage and Classroom: Intraoperative Learning in Anesthesiology

Robina Matyal, MD

In fields like aviation, about 90% of training occurs in controlled practice environments, with approximately only 10% of learning in real-time execution. In medicine, especially in anesthesia, the balance is reversed: 10% of training occurs in a practice setting, while 90% unfolds in live execution. The operating room functions as a dynamic stage where clinicians apply technical and communication skills in real time, learning and teaching simultaneously. This creates an environment of continuous micro-teaching: guiding procedures, anticipating next steps, managing high-stress moments, and reinforcing critical points in the moment of care. Experiential learning is the primary modality of instruction for both anesthesia practice and broadly in medical education.

Defining Practice and Execution in Clinical Anesthesia

Practice in anesthesiology involves deep understanding of basic sciences such as physiology, pharmacology, and anatomy. It comprises of theoretical knowledge of anesthetic agents, along with their mechanisms of action, dosages, side effects, and interactions. Further, it includes familiarity with techniques, protocols, and standards of patient care. This knowledge is usually gained through formal education, simulation training, reading literature, and case discussions.

Execution, by contrast, represents the real-time application of this knowledge. It includes technical skills like airway management, vascular access, regional blocks, and intraoperative monitoring. More critically, it requires real-time clinical judgment, such as responding to sudden hypotension, unexpected allergic reactions, or difficult airways. The practitioner must synthesize information and make critical decisions under pressure in a dynamic clinical situation.

Phase	Actions
Before the case starts	Pre-op huddle to discuss patient-specific considerations, goals for the resident, expected and potential unexpected events
At induction and key intraoperative moments	Real-time micromanagement and "microteaching" during critical manipulations, such as airway management or major hemodynamic shifts
At case conclusion	Focused debrief that reflects on what went well, what could be improved, and lessons to carry forward

These touchpoints are not just teaching moments; they are opportunities to ensure patient safety while optimizing resident development. Transfer of knowledge through the clinical practice experience is essential for supporting the progression of residents to independent practitioners.

Creating a Structured Learning Environment in the OR

Despite the unpredictable and high-pressure nature of the OR, we can create structured opportunities for learning:

• Use the case itself as the foundation for problem-based learning. Build discussions around physiological responses, pharmacologic decisions, and unexpected developments.

• Encourage residents to anticipate and plan responses to possible outcomes both typical and atypical.

• Reinforce decision-making frameworks rather than rote memorization, fostering flexible, adaptive thinking.

This approach transforms the OR into a dynamic classroom, rooted in real-world physiology and pathology. It ensures that the resident is not a passive observer but an active participant in patient care and clinical reasoning.

A Different Training Model

Unlike aviation, where trainees simulate for thousands of hours before touching a real aircraft, anesthesiology residents are learning on the job. While simulation and didactics are valuable, the OR remains the core site of skill acquisition and judgment formation.

Given this reality, we must maximize the learning potential of the OR:

- Normalize microrunning commentaries during surgery: short, focused guidance that keeps the resident engaged without overwhelming.
- Build a culture of immediate, respectful, and constructive feedback.
- Debrief with intent: not just what happened, but why, and how to do better next time.

Fig 1. *An attending teaching medical students and residents in the operating room*

The Contrast with the Aerospace Industry

In industries like space and aviation, training prioritizes exhaustive simulation and theoretical preparation, with pilots spending thousands of hours in simulators before ever operating a real aircraft, devoting roughly 90% of their time to practice and only a small portion to actual execution. This model minimizes risk and prepares individuals for rare, high-stakes events through meticulous rehearsal. In contrast, anesthesiology, embedded in the real-time clinical environment, reverses this approach: execution itself becomes the primary platform for learning, while practice is integrated through structured training sessions, mentorship, and ongoing education. Given the high stakes and relentless pace, anesthesiology demands a continuous cycle of learning, application, reflection, and adaptation.

Conclusion

In anesthesiology, the operating room is both the stage and the classroom. It is where residents perform, learn, and grow under the direct guidance of experienced faculty. Through structured feedback, problem-based teaching, and active participation, the intraoperative setting becomes the most authentic and powerful learning environment available.

To train safe, thoughtful, and adaptive anesthesiologists, we must invest in teaching during care, not after. That means embracing intraoperative teaching as a deliberate act, even in the face of production pressure. Only then can we ensure that our learners are prepared—not just to practice medicine, but to execute it with excellence.

Enhancing Intraoperative Teaching in Anesthesiology: Theory, Strategies, and Practical Implementation

Mona Hedayat, MD

Intraoperative teaching is one of the most powerful, yet often underutilized, tools in anesthesiology education. The operating room offers real-time decision-making, evolving physiology, and critical moments that are ripe for learning, but the demands of clinical care, documentation, and time pressures often push teaching to the background. This article explores the principles behind effective intraoperative teaching, shares ideas for making these teaching moments more visible to residents, and offers practical strategies to integrate it seamlessly into workflow.

The Theory Behind Intraoperative Teaching

Intraoperative teaching lives at the intersection of clinical care and experiential learning. Unlike classroom-based education, the operating room provides a high-stakes, high-fidelity environment where decisions are made in real time. This makes it a prime setting for applying situated learning theory, which emphasizes learning that occurs in context through observation, participation, and collaboration.

Framework	Core Concepts	Application to Teaching
Situated Learning & Legitimate Peripheral Participation	Residents start on the periphery and gradually gain responsibility	Faculty must verbalize reasoning and make learning opportunities explicit to guide progression
Cognitive Apprenticeship	6 strategies: • Modeling • Coaching • Scaffolding • Articulation • Reflection • Exploration	Go beyond modeling—ask learners to articulate their thinking and reflect on decisions to deepen learning
Cognitive Load Theory	OR has limited cognitive bandwidth for both learners and teachers	Use microteaching and short, targeted questions to integrate education without disrupting workflow
Making Thinking Visible	Externalize expert decision-making by narrating thought processes	Say things like: "Here is why I'm doing this…" to turn routine actions into teachable content

Making Teaching Moments Visible

In the OR, teaching often goes unnoticed when clinical decisions aren't explained. Faculty may believe they're teaching through role modeling, but without verbalizing their reasoning, residents miss the learning opportunity. A simple fix: signpost teaching with cues like "*Let me explain why I'm doing this…*" or "*Quick teaching point*…". These phrases highlight key moments and prompt residents to engage. Micro-reflection prompts like "*What if the pressure hadn't improved?*" or "*What surprised you?*" take seconds but deepen learning and reveal thought processes. Teaching doesn't require more time rather just intentional language to make it visible.

Using EBM at the Point of Care

Evidence-based medicine can feel distant in the OR, but real-time tools like OpenEvidence make it accessible. Faculty can model how to quickly find and apply evidence during cases, reinforcing critical thinking and lifelong learning. Even brief references to guidelines or studies help residents understand clinical reasoning. Asking them to follow up on a question post-op extends the learning. Incorporating EBM in real time fosters a culture where decisions are data-driven, not just based on intuition.

Bringing PBLD-Style Teaching into the OR

PBLDs (structured, case-based discussions) can be adapted for the OR to encourage active learning. Treat each case like a living PBLD by asking scenario-based questions, e.g., "If this patient had a difficult airway, how would your plan change?"

Even short prompts stimulate critical thinking beyond the current case. Faculty can keep a mini-bank of case scenarios to use pre-, intra-, or post-op (e.g., "How would you manage Eliquis in a 70-year-old for lap chole?"). One PBLD-style question a day can shift intraoperative teaching from passive observation to active participation, without adding time.

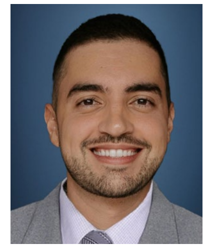
Practical Tips for Faculty: Making Intraoperative Teaching Part of the Routine

Theme	Strategy	Details
🧭 **Setting the Stage for Teaching**	Set an Intention Early	Check-in: "Is there anything you would like to focus on today?"
	Identify a Theme	Airway management, fluid therapy, crisis resource strategies
	Reframe the Case	"Let us make this a teaching case"
	Know Your Audience	Tailor teaching depth to resident's training level Junior Residents: Benefit from guided instruction Senior Residents: Require greater autonomy and complex decision-making
🧠 **Thinking Aloud and Making Reasoning Visible**	Narrate Your Reasoning	"I am choosing phenylephrine in this context because..."
	Transform Decisions	Make intuitive decisions transparent educational moments
	Demonstrate Real-Time Answers	Show how clinical questions can be addressed in real time
	Leverage Technology Thoughtfully	Utilize OpenEvidence for timely, relevant questions
🎯 **Intentional Teaching Moments**	Use Teaching Signposts	"Here is something I would like you to take away from this case"
	Normalize Teaching Cues	Brief but intentional teaching cues
	Use Downtime Wisely	Initiate scenario-based discussion during setup or stable portions
	Integrate PBLD-Style Thinking	Incorporate into everyday clinical moments
	Create a Teaching Habit	Aim for at least one teachable moment per day
	Small, Consistent Teaching	Contribute to a sustained culture of education
💬 **Encouraging Learner Engagement**	Engage with Open-Ended Questions	"What is your thought process for induction in this patient?"
	Allow Articulation	Let resident articulate their thinking before input
🔄 **Reflection and Feedback**	Post-Case Reflection	Ask: "What did you learn today?" or "What surprised you about this case?"
	Provide Feedback	One reinforcing and one constructive piece of feedback
	Ask for Feedback	"Did anything we discussed today help clarify a concept for you?"
	Model Reflective Practice	Helps refine individual teaching approaches

Conclusion: Shaping a Culture of Teaching

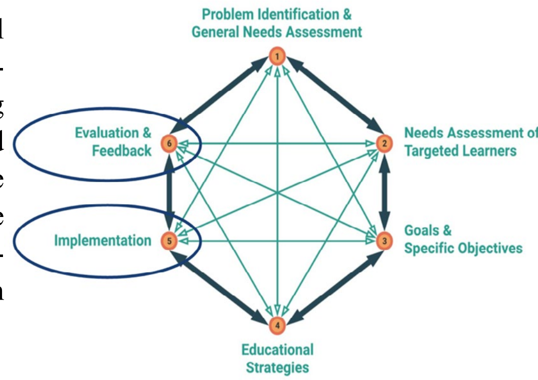
Intraoperative teaching does not need to be formal, lengthy, or disruptive to clinical care. When approached intentionally, it can be woven seamlessly into the operative workflow, transforming routine cases into valuable educational experiences. Some of the most effective teaching occurs in brief, unscripted exchanges: a narrated rationale, a thoughtfully posed question, or a moment of guided reflection.

Curriculum Development in Medical Education – Part III: Laying the Foundation with Kern's Framework



Federico Puerta Martinez, MD
Dario Winterton, MD

In the previous two parts of this series, we explored the foundational elements of curriculum development using Kern's six-step framework. We began by identifying educational problems and assessing learner needs, and then moved on to crafting goals, objectives, and strategies to meet those needs. In this final installment, we turn to the last two steps: Implementation and Evaluation & Feedback. These steps are essential to ensuring that the carefully designed curriculum becomes a dynamic, sustainable educational experience that can adapt and improve over time.



Step 5: Implementation

Turning a curriculum plan into reality involves more than just following a checklist; it requires a thoughtful and strategic approach. Effective implementation depends on adequate resources, broad-based support, structured administration, and a readiness to anticipate and manage barriers.

The first priority is identifying and securing the necessary resources. This includes assembling the right personnel such as trained faculty, administrative staff, simulation specialists, or standardized patients. Time must be allocated not only for teaching but also for preparation, coordination, and feedback. Physical resources, including clinical spaces, labs, and educational platforms, should be evaluated and prepared in advance. Budget planning is a crucial component and often involves seeking internal institutional support or external funding from professional societies or grants.

Support from stakeholders is a foundational aspect of implementation. Internally, curriculum developers must gain the endorsement of faculty, departmental leaders, and learners. Highlighting the curriculum's alignment with institutional goals and demonstrating its potential to improve learner outcomes and patient care can be persuasive strategies. Externally, aligning with accreditation standards and leveraging grants can enhance legitimacy and provide vital resources.

An effective administrative structure should clearly define roles and responsibilities. Communication strategies must be robust and include mechanisms for sharing the rationale, goals, implementation plans, and eventual results with all stakeholders. Operational workflows should ensure smooth scheduling, distribution of materials, and collection of evaluation data. If dissemination of results is planned, the curriculum team should engage early with the Institutional Review Board to ensure ethical standards and research approval are met.

Barriers to implementation are common and can arise from limited finances, resistance to change, or logistical challenges such as conflicting schedules. These can be mitigated through effective communication, early pilot testing, and collaboration with stakeholders. Demonstrating feasibility and early successes through a pilot or phased approach often builds momentum and reduces resistance.

Introducing the curriculum ideally begins with piloting critical components with a smaller group of learners. Phasing in the curriculum gradually allows for iterative refinement and promotes stakeholder buy-in. In cases where urgency or scope requires full implementation from the outset, it is advisable to treat the initial cycle as a pilot, using evaluation data to inform ongoing adjustments. Ultimately, implementation should be viewed as an ongoing process, continuously refined through feedback and experience.

Step 6: Evaluation and Feedback

Evaluation and feedback are the final but equally vital steps in Kern's framework. They close the loop by determining whether the curriculum has met its goals and identifying areas for improvement.

Evaluation involves assessing both learner performance and the overall effectiveness of the curriculum. This can include formative assessments, which are conducted during the implementation to guide real-time improvements, and summative evaluations, which assess the curriculum's overall success after completion. Both quantitative and qualitative methods should be employed, such as performance tests, surveys, focus groups, and reflective writing.

The process begins by identifying the stakeholders who need the evaluation results—learners, faculty, departmental leadership, or accrediting bodies. Clear evaluation questions should be articulated, such as whether learners are achieving the desired competencies or how effective the teaching strategies have been. Appropriate methods must be selected based on these questions, and the results should be analyzed and reported in a way that is actionable and relevant to each stakeholder group.

Challenges in this step include limited time and resources for faculty to conduct evaluations, potential bias in data collection, and variable stakeholder engagement. These challenges can often be addressed by leveraging existing institutional tools, training faculty in objective assessment methods, and designing concise, meaningful evaluation instruments.

Curious about Kern's 6-Step Approach? Click here to explore how it's applied in anesthesia education.

Conclusion

Implementation and evaluation represent the culminating phases of curriculum development. They ensure that a well-conceived plan translates into an effective learning experience and that continuous improvement remains at the heart of the educational process. By thoughtfully executing these steps, educators can ensure their curricula not only meet their intended goals but also evolve to meet future needs. With these final steps, the cycle of curriculum development becomes not just complete, but dynamic and enduring.

Missed earlier sessions on curriculum development? Catch up by reading previous issues on our website.

Prefer to listen instead? Watch the recorded CME session.

Informed Consent in the OR: The Ethics of Patient Disclosure Regarding Medical Student Involvement in Surgical Procedures

Rabya Hasnain, BS, MBE

Acknowledgement: Dr. Shahla Siddiqui, HMS MBE Capstone Mentor

The Current Preoperative Informed Consent Process: The informed consent process is one of the most crucial components of conducting surgical procedures, as it carries implications for the patient-doctor relationship and risks undermining ethical tenets of patient-centered care, such as developing mutual trust and encouraging voluntary decision-making. Surgical providers must relay the risks and benefits of an operation, its overall nature, possible alternatives to the operation, risks and benefits of the alternatives, and assess the patient's understanding of each component.(1) Federal legislation provides more guidance on what information to deliver to patients preoperatively, such as generating and sharing a "roster of practitioners specifying the surgical privileges of each practitioner."(2) However, in practice, the specific actions that medical students will take remain at the discretion of the surgical staff and are difficult to precisely disclose. This produces several ethical concerns, as surgeons must estimate the extent of information to deliver regarding medical students' participation. This ongoing issue warrants a rigorous moral analysis using relevant ethical paradigms and applicable solutions that maintain medical education standards and high-quality care provision.

Stakeholder Perspectives: Many patients have expressed their approval of students' intraoperative participation, as they acknowledge the potential academic benefits to the students' future careers.(3,4) Patients also vocalized their right to give consent to surgeries, especially when medical students are present and wish to participate intraoperatively. In one study, only 42% of patients were actually asked to consent to students participating in their surgery.(5) The informed consent process when a medical student aims to participate demands moral attention in order to address the current gap in transparency and increase patient awareness and understanding.

A core experience of many students at accrediting medical schools across the U.S. is the ability to have a hands-on role in their third or fourth-year surgery rotations. Most medical schools and partnering teaching hospitals adopt a general surgery clerkship curriculum that supports students to acquire competencies, such as mastering surgical techniques, understanding principles of perioperative care, and acknowledging the roles of each provider, that are necessary for being a skilled clinician.(6) Despite the desired educational outcome for students in their general surgery rotation, most third and fourth-year students engage in their surgery clerkships for an average of 4-8 weeks and are left with novice skills to conduct the elements of pre, intra, and postoperative care.(7) Studies have illustrated that medical students largely feel unprepared to lead informed consent discussions, with 75% reporting that they have received little to no formal training.(8) While patients expect medical students to be more involved with the informed consent process, current curricula leave little space for students to observe and practice facilitating informed consent discussions and building patient trust preoperatively.

Surgeons express their desire to share information on medical students' intraoperative participation to patients, but they routinely claim that time constraints make it challenging for them to achieve this goal.(9) Surgeons are also conflicted with their attempts to avoid overwhelming patients with too much detail while making sure that patients are fully aware of what students might be assisting with. Some surgeons even worry that patients might be less willing to agree to student participation if they knew that a medical student would be intubating them; students' academic opportunities would be limited as a result.(10) Practical barriers and moral conflicts appear to greatly impede surgeons' abilities to uphold complete disclosure of students' intraoperative participation to patients.

Relevant Ethical Frameworks: Virtue ethics can be used to unpack this ethical issue. This moral theory is grounded in Greek philosophy and encourages moral actors to cultivate virtues, or morally praiseworthy qualities, to overcome ethical obstacles. Under this theory, most ethical courses of action are ones that virtuous agents would perform.(11) By being equipped with virtues like integrity, honesty, and compassion, agents can discern ethical problems and perform behaviors that reach favorable resolutions.

Kantian deontology, a duty-based ethical paradigm promulgated by Immanuel Kant, states that right conduct is classified as categorical imperatives that are unconditionally assigned to each moral agent.(12) One important formulation of the categorical imperative is that actions must be universalizable to be considered permissible; rational individuals ought to act in ways that would not be contradicted if every agent began performing those behaviors.(13) For instance, if surgeons were to continue withholding information regarding medical students' roles during surgery, then patients would learn that surgeons were not being completely truthful about medical students' involvements, potentially leading to mistrust in the medical team and restricted academic opportunities for students. Using Kantian deontology, continuous nondisclosure of medical students' intraoperative roles would not be sustainable long-term and would be morally impermissible.

Clinical ethics principles, such as autonomy, voluntary decision-making, and truth telling, are central to delivering high-quality, ethical care. Patient autonomy in particular carries a lot of weight in the U.S. healthcare system and is entrenched within the practice of informed consent. Nondisclosure of necessary information can undermine patients' ability to make self-governed decisions of their own healthcare. In order to elevate patients' agency to make self-regulated health decisions, surgeons should disclose information about how medical students might be participating in a procedure. Prioritizing truth telling can increase patient awareness and allow them to make fully informed and autonomous choices that carry implications for medical students' educational opportunities.

Recommendation: One recommendation would be to provide patients with a preoperative consent form or pamphlet that lists all possible steps that students might be involved in intraoperatively. Mentioning potential intraoperative actions can serve to promote patient autonomy, as they will be more aware of potential actions taken by the medical student.(14) Patients can consider whether they want medical students to take part in some steps of their surgical procedure. Not only would a preoperative pamphlet be informative for patients, it could also spark a more comprehensive and transparent conversation between surgeon and patient. Surgeons can more openly work with patients to fully comprehend medical students' potential roles, and they can avoid the hardship of over-disclosing and causing unnecessary discomfort to patients who would now be empowered to inquire about the roles specifically listed in the pamphlet.

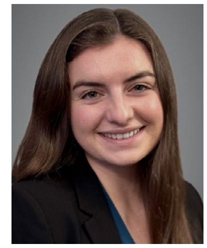
It could also be beneficial to broaden medical students' surgical training by exposing and incorporating them into the informed consent discussions. Medical students can grow their confidence to lead informed consent conversations with patients.(15) As surgeons primarily answer patients' questions and lead the preoperative dialogue, medical students should be encouraged to take a more present and active role in the conversation by maximizing clear communication and working with patients to establish mutual trust and respect - humanistic competencies that future clinicians should acquire. Establishing a triadic relationship between surgeon-student-patient could bolster patients' trust in students and their comfort in consenting to students' participation in the surgical procedure.(16)

A broader recommendation to resolving this issue could be to conduct pedagogical reform of the current surgery clerkship curriculum. Implementing a more structured curriculum with a focus on advancing medical students' surgical skills and practicing ethically grounded behaviors could optimize the surgical clerkship for students' academic needs while maintaining key ethical principles of high-quality patient care.(17) While this suggestion might seem overwhelming, incremental reform of the surgical environment can also be impactful. Surgeons may find it helpful to reasonably allocate more attention to the preoperative informed consent discussion, providing space to exemplify virtuous qualities and uphold universalizable moral duties to patients. Medical students may benefit from a surgical rotation curriculum that has a greater focus on maximizing their current and future educational opportunities while leaning on moral frameworks that uphold patients' ethical rights.

References:

Conclusion: Patients, medical students, and surgeons are important stakeholders in this pressing ethical dilemma. Pertinent moral frameworks, such as virtue ethics, Kantian deontology, and clinical ethics principles, suggest that patients deserve full transparency from their surgeons, especially about the tasks medical students could be assisting with during the procedure. To balance medical education standards with patient awareness and overcoming structural obstacles, stakeholders should rely on apt ethical paradigms to inform reasonable recommendations that reduce patients' perceived lack of consent and promote ethically grounded behaviors.

The Use of Hand Motion Metrics and Eye Tracking for Objective Evaluation of Procedural Skills Development in Ultrasound-Guided Procedures



Jacqueline Hannan, PhD

Ultrasound-guided procedures are core competences in anesthesiology, but their technical complexity can pose challenges for training and introduce patient safety threats [1,2]. All ultrasound-guided procedures have common motion and require needle tracking in the three-dimensional space for precision and to avoid causing structural harm. Currently, training in these procedures relies on subjective assessment and remains highly variable, leading to inconsistent performance and increased complication rates. Additionally, common educational approaches focus on a time-based learning model with an assumption of proficiency after a specific amount of exposure, failing to account for the diverse learning trajectories of each trainee. An alternative competency-based approach with repeated practice in a safe setting ensures a more equal skill level among trainees when compared to a time-based approach [3].

Table 1. Hand and eye motion metrics used for performance evaluation in training and clinical practice.

Metric	*Definition*
Path Length (needle and probe) (cm)	Total distance traveled by each sensor throughout the procedure.
Translational Motions (probe) (#)	Number of increases in linear velocity (>0.05cm/s) followed by deceleration.
Rotational Sum (probe) (deg)	Total rotational displacement by each sensor during the procedure.
Distance-Time Offset (probe) (cm)	Sum of the difference between the expert distance vs. time graph and the novice distance vs. time graph at each timepoint.
Gaze Fixations (% time)	Percentage of time spent fixating on a specific area of interest (AOI).
Number of Visual Visits	Number of times gaze was fixated on a given AOI during the procedure.

In teaching a variety of anesthesia procedural skills, adding simulation training has resulted in improved performance, a reduction in needle passes, and decreased complications [4,5]. However, these skills are often trained with a fixed number of practice sessions in a calm setting, neglecting the need to perform the procedure with divided attention in an environment with distractions, such as beeping alarms, talking, and multitasking [6]. In surgical programs, overtraining residents beyond proficiency has enhanced trainee performance and multitasking ability [7,8]. These results from training laparoscopic surgery skills provide evidence for conducting extensive pre-clinical training to support patient safety and effective learning experiences in the clinical environment, along with improved retention of trained skills. Pairing this training approach with the implementation of objective measures to quantify proficiency can help track the advancement of trainees' procedural skills towards expert-level performance.

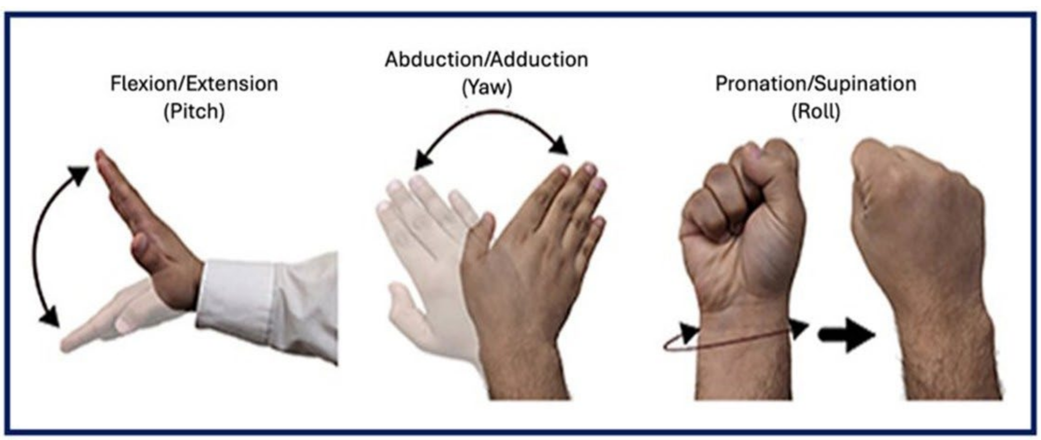


Fig. 1 *Hand motion can be defined and quantified using aircraft principal axes, measuring the angular motion along the cartesian coordinate frame as pitch, yaw, and roll* [9].

Biomechanical analysis of hand motion has emerged as a promising method for objectively evaluating procedural skill, and results show that improving hand motion metrics (reduced path length, fewer movements, and continuous needle tip tracking) correlate with higher visual assessment scores across various procedures [9–13]. At Beth Israel Deaconess Medical Center (BIDMC), researchers have demonstrated the feasibility of using hand motion metrics to differentiate between novice and expert operators and evaluate for improvement in echocardiography procedures and radial artery access [12,13]. In addition to hand motion analysis, eye tracking has been leveraged in medical training to provide context about the operator's attention, giving a first-person perspective to support technique improvement [14]. By leveraging these technologies, objective measures can be derived to perform anesthesia procedural skills with expert-level competency.

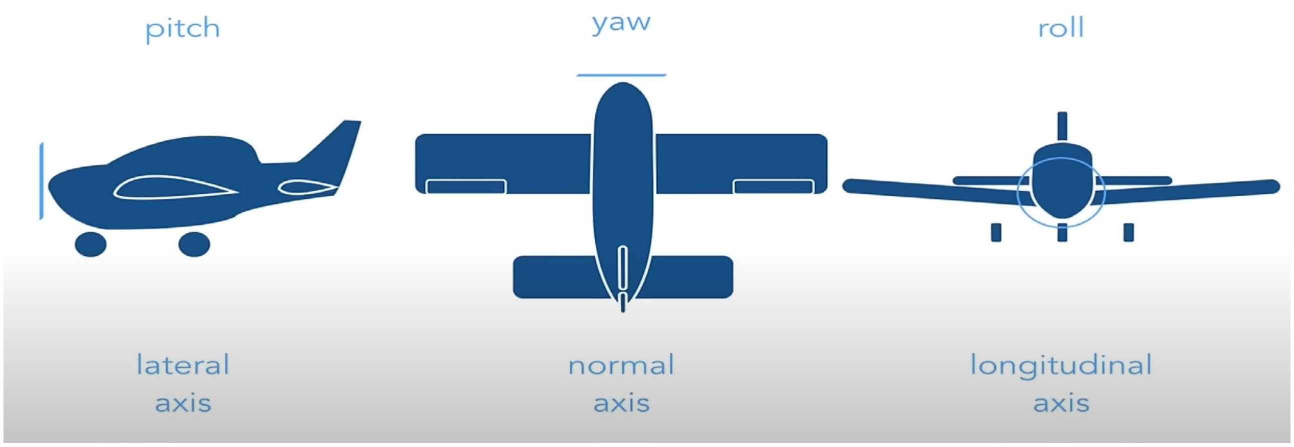


Fig. 2 *Aircraft principal axes*

Click here to read to learn more about "Axes of Movement"

Scan this QR code to access the references!

Foundation in Digital Education and AI

Lior Levy, MD

AI is such a vast and fast evolving topic that the available tools at the beginning of the class were no longer the most relevant tools by the end. For instance, advanced OpenAI o3 and o4-mini were made available in April 2025 as advanced reasoning models, allowing for a level of deep thinking and complex problem solving that was just not around earlier that year. In 2024, OpenEvidence was probably one of the most used AI platforms for clinical decision support and has somewhat fallen out of favor. More on that later.

How Can AI Help

While we try to keep up with a field advancing at lightning speed, today we can focus on how AI can help us with medical education and what its current limitations and dangers are. Generative AI (GAI) aka AI capable of generating new content can be a powerful assistant for us medical teachers. It can help, for instance, in:

1- Creating content that is adjusted by level of difficulty (interns vs PGY4, or adjusted based on performance) or tailored to certain ACGME milestones

2- Creating or organizing high-quality content in a fraction of the time (lectures, journal clubs, slide creation from a word document you created)

3- Generating pictures, graphs for teaching

4- Generating quizzes, MCQs for concept checks or repetition

5- Quickly making difficult content we created more digestible for our learners

6- Standardizing or automating assessments and feedback

7- Expanding teaching modalities (podcasts, VR, etc.)

8- Supporting faculty in curriculum development and delivery

9- Providing 24/7 platforms for learners to practice differential diagnosis, step-by-step clinical reasoning practice and safe exploration without fear of judgment

10- Analyzing audio or video of simulation sessions to provide neutral feedback (technology has a way to go there)

11- Coaching faculty for simulation debriefings depending on the type of the debriefing chosen

12- Increasing access to a more diverse group of learners (ie. with disabilities, ESL needs)

Think of GAI not as a teacher (no one can replace you) but more as a supercharged teaching assistant that, when supervised wisely, can make medical education more efficient, more learner-centered, and also more equitable.

The Presence of AI

A 2025 HEPI survey of 1,041 undergraduates (not specifically med students) found that 92% are now using AI tools in some form, up from 66% in 2024. For medical students (though data is a year old) the number was reported to be 48.9%, likely much higher now, estimated closer to 80%. AI is no longer emerging; it is here, and we must start meeting learners where they are and guide its use. More specifically, our learners need guidance on accuracy, ethical use, data privacy, and when not to rely on AI.

Hallucinations

AI tools are known to hallucinate content or lack accuracy, which can be particularly critical in the field of medicine. Whether it is outdated guidelines, or purely inaccurate information, we must cross-check content with current guidelines. Dr. Rodman often brings up a recent case study he uploaded onto OpenEvidence, which recommended a treatment that would have been life-threatening for a patient with the condition he was describing. Moreover, AI has a tendency to be sycophantic (overly flattering, agreeable with all your opinions), which can then lead the learner to erroneously think they are on the right track with a flawed clinical reasoning.

Ethical Concerns

Using AI to write an entire QI project for instance or a learner who copies an AI-generated answer into a take-home assessment without disclosure, would undermine reflection as a professional development tool and may even breach the honor code of academic integrity.

Data Privacy

Public AI tools (ChatGPT, Claude, Gemini etc) are not designed for clinical use or protected data. Even "de-identified" data can be become identifiable when rare diagnoses, institutional references, or timeline events are included. This creates a very real HIPAA violation risk. In a context I am familiar with, simulation, we must be very careful when uploading transcripts or videos from simulation sessions into an AI tool for summarization or feedback generation. If the material contains names of trainees or specific performance behaviors, it can raise ethical concerns of educational data privacy. Learners need to have consented to having their performance data processed by external AI systems.

The Danger of Cognitive Deskilling

Cognitive deskilling is the decline in human abilities; like reasoning, decision-making, and memory due to over-reliance on tools such as AI or automation. In medicine, this could mean clinicians losing diagnostic intuition or judgment by deferring too much to technology. Evidence from various fields shows that interaction with generative AI can lower critical thinking through cognitive offloading.

As AI transforms medicine and education, we face both tremendous opportunity and real responsibility. From content creation to clinical decision support, generative AI is already a powerful tool in classrooms and at the bedside. But alongside its benefits come risks: hallucinations, ethical concerns, data privacy issues, and cognitive deskilling. Human-AI collaboration is complex, but promising studies (some from our own institution) are helping us navigate this space. Leading medical schools, including Harvard, are also integrating AI into curricula early.

The real question isn't whether to use AI, but how to learn and teach it: intentionally, ethically, and effectively. The future of medical education isn't humans versus machines, but humans empowered by them and guided by educators who still know how to think.

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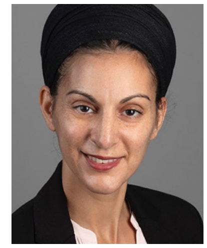
INNOVATION IN EDUCATION

Implementation of VR Training for Neuraxial Pain Procedures among Anesthesia Interns, Residents and Pain Fellows

Adil Al-Karim Manji, MD

Shiri Savir, MD



Reimagining Neuraxial Training in the Age of Immersive Technology

In the hands of an anesthesiologist, a neuraxial needle demands both precision and deep anatomical knowledge. From epidurals to spinal blocks and pain procedures, these techniques are central to our field—but they come with a steep learning curve, especially in the high-pressure OR. Despite years of apprenticeship-style training and advanced manikins, something crucial has been missing: the ability to truly "see" and "feel" spinal anatomy before working on real patients. Virtual Reality (VR) is changing that. Already proven in surgery, radiology, and regional anesthesia, immersive VR enhances spatial understanding and builds confidence. For neuraxial training, it may be a game-changer allowing learners to explore 3D spinal anatomy from every angle, safely and interactively.

But VR alone isn't enough. What if we could bring live mentorship, peer discussion, and real-time Q&A into the virtual space? That's exactly what our team set out to do.

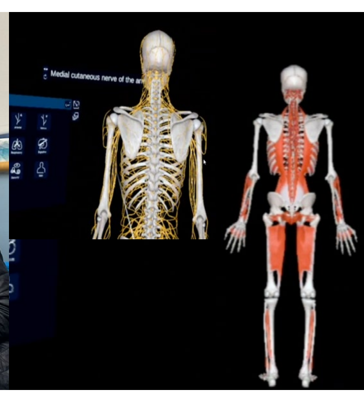
The Neuraxial Masterclass: A Shared Virtual Classroom

To address this gap, we developed a multi-institutional, instructor-led VR "neuraxial masterclass" for anesthesiology residents and fellows. Using the 3D Organon platform and Meta Quest headsets, learners entered a shared virtual space to explore spinal anatomy and practice procedures together. Guided by faculty in real time, participants identified landmarks, observed demonstrations, and received immediate feedback during hands-on virtual practice. The result was a fully immersive experience that combined the realism of simulation with the interactivity of traditional teaching. The masterclass began with a guided walkthrough of the spine. Trainees examined vertebrae from cervical to sacral levels, isolated structures like the ligamentum flavum and interlaminar space, and used cross-sectional views to visualize the epidural and subarachnoid compartments. They compared lumbar to thoracic anatomy and explored pathological variations like stenosis or hypertrophy, details often difficult to appreciate in cadavers or textbooks.

Click here to see the virtual classroom!

Needle to Virtual Skin

Next, participants used VR controllers to practice midline and paramedian approaches for thoracic and lumbar epidurals, and cervical interlaminar injections. They observed peers, received real-time feedback, and repeated procedures safely and risk-free.The session concluded with a debrief and Q&A, where instructors reinforced key concepts and encouraged reflection on real-world experiences.



Measuring Impact

Participants completed pre- and post-session assessments focused on core anatomy and procedural principles. They also filled out satisfaction surveys evaluating usability, realism, and educational value. Open-ended feedback captured their impressions of the instruction, visual-spatial immersion, and peer interaction within the virtual operating room.

Table 1. Survey results

Survey Question	1(Strongly Disagree)	2(Disagree)	3(Neutral)	4(Agree)	5(Strongly Agree)
Interaction with teacher/classmates in VR	0 (0%)	3 (17.6%)	2 (11.8%)	3 (17.6%)	9 (52.9%)
VR headset and controls were intuitive	0 (0%)	0 (0%)	2 (11.8%)	5 (29.4%)	10 (58.8%)
Demonstrations on 3D model were clearly visible	0 (0%)	0 (0%)	1 (5.9%)	6 (35.3%)	10 (58.8%)
3D model improved understanding of spinal anatomy	0 (0%)	0 (0%)	0 (0%)	2 (11.8%)	15 (88.2%)
3D model better than standard training for anatomy	0 (0%)	0 (0%)	0 (0%)	2 (11.8%)	15 (88.2%)
3D model improved understanding of technical considerations	0 (0%)	0 (0%)	0 (0%)	5 (29.4%)	12 (70.6%)
3D model better than standard training for technical aspects	0 (0%)	0 (0%)	1 (5.9%)	4 (23.5%)	12 (70.6%)
Attention fully dedicated during standard lecture	3 (17.6%)	3 (17.6%)	4 (23.5%)	2 (11.8%)	5 (29.4%)
Attention fully dedicated during VR masterclass	0 (0%)	0 (0%)	0 (0%)	5 (29.4%)	12 (70.6%)
Overall enjoyment of VR masterclass	0 (0%)	0 (0%)	0 (0%)	2 (11.8%)	15 (88.2%)
Gained practical knowledge from VR masterclass	0 (0%)	0 (0%)	0 (0%)	5 (29.4%)	12 (70.6%)

A total of 34 participants attended the VR masterclass across three sessions (one excluded due to technical issues), including 6 medical students/interns, 17 residents, 7 fellows, and 4 attending physicians. Of these, 21 participants (3 medical students/interns, 12 residents, and 6 fellows) completed both pre- and post-session knowledge assessments. The average pre-test score was 53.2%, which increased to 77.1% post-session, reflecting a mean knowledge gain of 23.9%. Eighteen participants (90%) demonstrated improvement, with several achieving gains of over 40%. Only two showed a decline in post-test scores. In addition, 17 participants completed the post-session survey, which included a mix of learners across all training levels.

From Pilot to Platform

This pilot shows the feasibility and potential of multi-user VR as a scalable, engaging tool for teaching complex spatial skills in anesthesiology. By combining immersive visualization with instructor-led guidance, we preserved the human element of learning while enhancing anatomical understanding. As VR evolves, so must our teaching. It's more than simulation. It's a new, social and spatial way to learn. Next steps include expanding access, developing assessments, and exploring how VR can improve clinical performance and patient safety.

In neuraxial education, the future is immersive and it's already here.

GUEST SUBMISSION

Aortic Occlusion in an Adolescent Male Resulting in Intraoperative Multiorgan Failure and Subsequent Death: A Case Report

Jenna N. Littmann, MD, CA-3 Resident
Christa N. Grant, MD, Attending Surgeon
Bianca S. Jambhekar, MD, MPH, CA-2 Resident
Ailan Zhang, MD, PhD; CA-2 Resident
Tara M. Doherty, DO, Attending Anesthesiologist
Affiliation: Westchester Medical Center





Brief Summary:

We present a case report detailing the challenging management of a healthy teenage male who developed an aortic thrombus that progressed to ischemic multiorgan failure and mortality. Management of this patient included an emergent surgical embolectomy that required intraoperative massive blood transfusion, inotropic support for unstable hemodynamics, and the rare use of emergent, intra-operative continuous hemodialysis for severe hyperkalemia and metabolic acidosis.

Full Case Description:

Our patient was a 15-year-old 70 kg male with celiac disease who presented with acute chest, back, and abdominal pain with decreased sensation in his lower extremities. This pain developed while he was exercising, following a week of bloody diarrhea ostensibly attributed to celiac disease. Pertinently, the patient's mother reported that he had sustained a recent trauma to the abdomen during martial arts practice four weeks prior to admission.

Clinical assessment unveiled a picture of lethargy, pallor, tachypnea, tachycardia, and diaphoresis with lower limb mottling extending caudally from the umbilicus. He had diminished sensory and motor function in his lower extremities and absent femoral and distal pulses. Initial lab results were significant for leukocytosis, mildly elevated creatinine, and low bicarbonate. The pan-computed tomography (CT) scan with contrast revealed an abnormality within the lining of the left ventricle and an approximate 6.5cm abnormality in the aorta (both suspicious for thrombus), concern for ischemia of the spleen, kidneys, and bowel.

He was hemodynamically stable at the time, but as a result of the initial evaluation, he was brought emergently to the operating room (OR) for an exploratory laparotomy with aortic thrombectomy. A cardiologist was present soon after induction of anesthesia to perform a transesophageal echocardiogram which revealed a hyperechoic structure along the left ventricular septal wall consistent with an intraluminal thrombus (Figure 1,2) and mildly depressed left ventricular function. Massive transfusion protocol was instituted early via a rapid transfuser in anticipation of significant blood loss and coagulopathy, and blood product administration was guided with the use of thromboelastogram technology. First intraoperative arterial blood gas revealed pH and potassium values of 7.01 and 5.6mEq/L, respectively, that were initially attempted to be pharmacologically managed. However, the patient's overall clinical status rapidly deteriorated, and the decision was then made to emergently initiate continuous veno-venous hemodialysis (CVVHD) intraoperatively. Emergent, intraoperative CVVHD is not often utilized in non-liver transplant operations, making this a unique aspect of the anesthetic management in this case report.

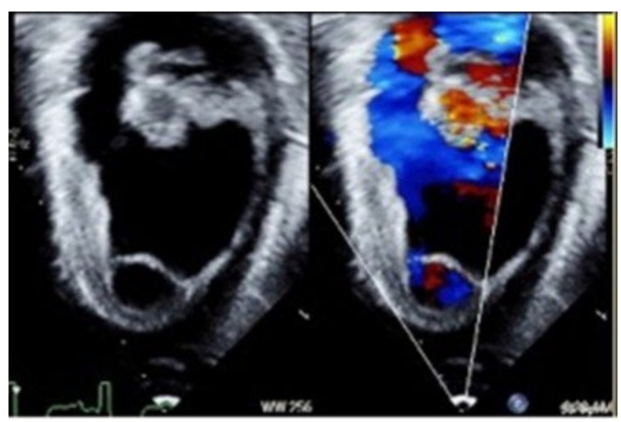


Figure 1. *A mid-esophageal 2-chamber view of the left ventricle with a hyperechoic structure (likely thrombus) on transesophageal echocardiography.*

A total of 22 units packed red blood cells, 15 units of fresh frozen plasma, 7 bags of platelets, and 2 bags (20 units) of cryoprecipitate were administered over the 12-hour surgical period. The combination of hemorrhage, hypotension, metabolic acidosis (with significantly elevated lactate), and hyperkalemia were challenges throughout the case and could not be corrected with maximal interventions in the setting of prolonged lower extremity and multiorgan ischemia.

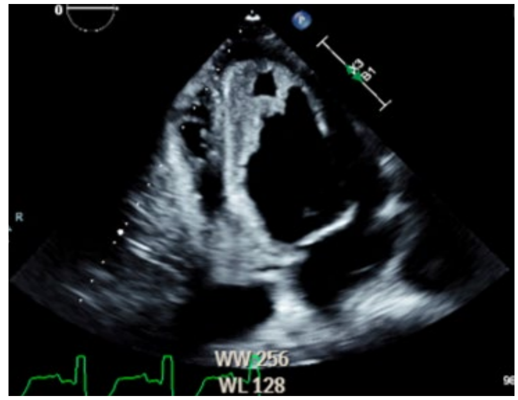


Figure 2. *Mid-esophageal four chamber view of left ventricle, with hyperechoic structure (likely thrombus) towards the apex.*

Intraoperative ultrasound confirmed the presence of a densely adherent thrombus in the supraceliac aorta extending down to and obstructing the branches of celiac and superior mesenteric arteries. Thrombectomy and endarterectomy were performed with primary aortic closure. Frozen section of the specimen (Figure 3) revealed organized (chronic) thrombus. During the initial surgery, there was no obvious bowel necrosis, and therefore no resection was performed. At the completion of surgery, a temporary abdominal wall closure was placed, and the patient was taken to the intensive care unit (ICU) in critical condition. Almost 24 hours later, the patient was taken back to the OR for a subsequent exploratory laparotomy which revealed frankly necrotic small bowel, patchy large bowel necrosis, and no detectable pulses in the infra iliac aorta. Despite the ongoing interventions, these findings were deemed incompatible with life by the surgical team, and the patient's condition continued to deteriorate. After the patient's parents were counseled on the findings, the decision was made to pursue comfort measures only. The patient was returned to the ICU and declared deceased later that morning. His parents declined an autopsy.

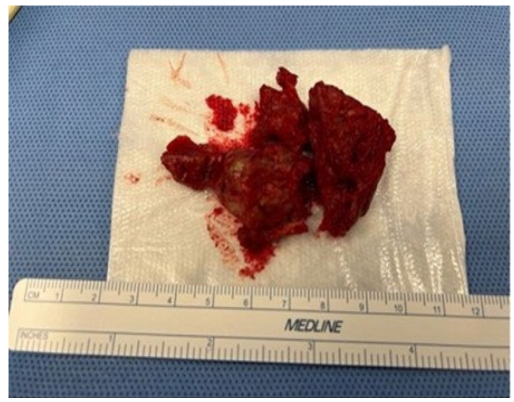


Figure 3: *Piece of the surgically resected aortic thrombus specimen after embolectomy*

As the use of intraoperative CVVHD is primarily seen in adult liver transplant literature, the emphasis for this case is the management of acute, refractory hyperkalemia and severe acidosis that necessitated emergent initiation of renal replacement therapy. Our patient's anticipated hyperkalemia due to lower limb ischemia was unable to be medically managed and caused significant hemodynamic instability. Thus, intraoperative CVVHD was a crucial temporizing measure in this case and required an emergent, multidisciplinary discussion to get the proper equipment prepared in the operating room.

GLOBAL HEALTH

LMA Management in Neonates and Infants: Clinical Considerations and Case Insights

Charles Kpaheyea, CRNA, Lofa County, Liberia
Eileen Lyons, MSN, CRNA, BIDMC, Boston
Huma Syed Hussain, MD


Each month, the Boston Africa Anesthesia Collaborative (BAAC) hosts grand rounds to promote case-based learning and knowledge exchange in anesthesia practice across resource-limited settings in Liberia. The April session focused on best practices for managing neonates and young patients with a laryngeal mask airway (LMA).

Case Summary

A 10-day-old neonate weighing 3.5 kg was brought to the operating room for excision of a sacrococcygeal teratoma, located at the lower spine near the anus.The vitals were: respiratory rate of 43 breaths per minute, oxygen saturation (SpO_2) of 96%, heart rate of 145 bpm, and a temperature of 36.7°C. Airway assessment showed a small mouth and large tongue, but with a full range of neck motion and normal temporomandibular joint (TMJ) mobility. The patient was classified as ASA I. Laboratory results indicated a hemoglobin level of 15 g/dL and a negative HIV status. Systemically, the patient had no abnormalities, was passing urine normally, and exhibited no signs of jaundice. Preoperative management included administration of Dextrose 5% (100 ml over 2 hours) and Ampicillin 175 mg IV.

A laryngeal mask airway (LMA) size 1 was used. The patient underwent total intravenous anesthesia (TIVA) with supplemental oxygen at 2 L/min. Induction was achieved using Thiopental 20 mg, followed by isoflurane, intravenous paracetamol (PCM) 70 mg, and pentazocine 1 mg. Maintenance anesthesia included isoflurane at 1.6%, PCM 70 mg, and 50 ml of normal saline. Continuous monitoring was maintained throughout the procedure, with all vital signs remaining within 20% of baseline values. The surgery lasted 45 minutes. Postoperatively, the patient was fully awake and transferred to the NICU for continued care.

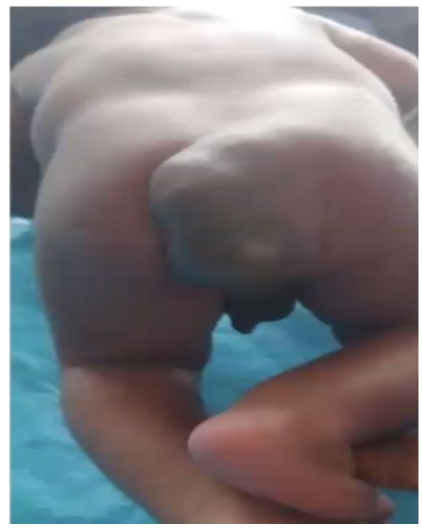


***Fig 1**. Mass at lower spine near the anus*

LMA Use in Neonates and Young Patients

Laryngeal mask airways have proven to be an effective alternative to endotracheal intubation, especially for short, routine procedures. Their ease of use, lower potential for airway trauma, and favorable safety profile make them particularly appealing in pediatric anesthetic practice.

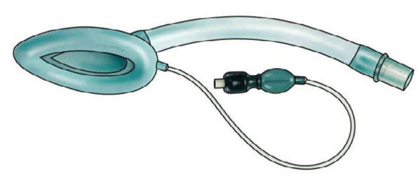


***Fig. 2** Laryngeal Mask Airway. This illustration is by Scott Dulebohn, MD*

Anatomical Considerations in Pediatric Airway Management

Neonates and young children have unique airway anatomy that increases the risk of obstruction. They have a relatively large tongue, a high and anterior larynx (C3–C4), a floppy, omega-shaped epiglottis, and subglottic narrowing at the cricoid cartilage—the narrowest part of their airway. Reduced pharyngeal space further complicates airway management, requiring careful technique and planning.

Click here to read more about "Airway Management"

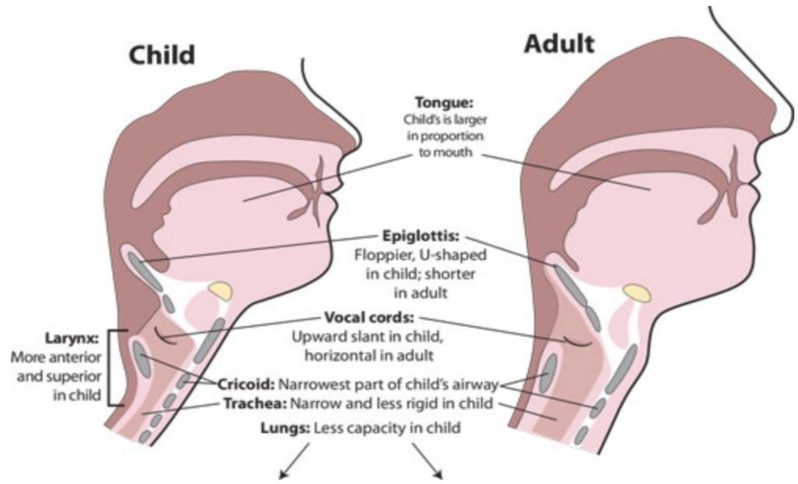


Fig 3 This illustration is from Roberts and Hedges' clinical procedures in emergency medicine, 6th ed. Saunders: Philadelphia, 2013.

[Check out American Society of Anesthesiologists Practice Guidelines for Management of the Difficult Airway]

Benefits of LMA Use in Pediatrics

Laryngeal mask airways (LMAs) offer several advantages over endotracheal intubation, particularly in neonates and in resource-limited settings. They are generally easier to insert, reducing the technical challenge and time required for airway management, an important consideration in fragile neonates. LMAs also cause less trauma to airway structures, such as the vocal cords, and are better tolerated, enhancing overall patient comfort. Their use is associated with lower anesthetic requirements and quicker recovery times, making them a valuable option in both elective and emergent neonatal procedures.

Potential Risks and Considerations

While laryngeal mask airways (LMAs) are generally considered safe and effective in neonatal anesthesia, complications can still arise. Improper placement or poor patient selection can lead to airway obstruction or even aspiration. Laryngospasm remains a significant risk, especially if the depth of anesthesia is inadequate during particularly stimulating portions of the procedure. In neonates with abnormal airway anatomy, LMA insertion can be technically challenging. Additionally, excessive cuff pressure may cause mucosal injury, emphasizing the need for careful monitoring. In certain surgical or emergent situations, conversion to endotracheal intubation may become necessary if the LMA fails to provide a secure airway.

Tips for Safe LMA Use in Neonates

Tips	Details
Correct size selection	LMA size 1 is standard for neonates <5 kg
Cuff inflation	Should be minimal and monitored to prevent pressure injuries
Insertion technique	Insert with partially inflated cuff or use 180-degree rotation method to reduce malposition
Tongue depression	Use laryngoscope or tongue depressor to improve placement success
Spontaneous breathing	Do not allow during stimulating phases unless adequately anesthetized — risk of laryngospasm is high
Intubation preparation	Always be prepared to intubate if LMA fails or complications arise

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Anesthesia For Neonate with Encephalocele Repair

K. Theophilus James, CRNA – J.J. Dossen, Liberia
Bettina Tassone, DNP, CRNA – BIDMC, Boston
Huma Syed Hussain, MD

Each month, the Boston Africa Anesthesia Collaborative (BAAC) hosts grand rounds to promote case-based learning and knowledge exchange in anesthesia practice across resource-limited settings in Liberia. The May session focused on best practices for managing neonates with encephalocele.

Encephalocele is a congenital neural tube defect characterized by incomplete closure of the cranial vault, leading to the herniation of brain tissue through a defect in the skull. It is typically classified based on its location into anterior and posterior types. The clinical presentation of encephalocele varies depending on the size and location of the defect. Symptoms may include headache, visual disturbances, muscle weakness, microcephaly (small head size at birth), ataxia, facial malformations, nasal obstruction, and cerebrospinal fluid (CSF) leakage from the nose or ear Long-term complications associated with encephalocele can include developmental delays, cognitive impairment, vision problems, growth retardation, and seizures.

While encephalocele is primarily congenital, some cases arise secondary to trauma or tumors. Associated syndromes include Walker-Warburg syndrome, Knobloch syndrome, Roberts syndrome, and Amniotic band syndrome. Risk factors include a family history of neural tube defects and inadequate maternal folic acid intake before and during pregnancy. Prenatal ultrasound and/or MRI can identify encephalocele in utero. Postnatal imaging assists in surgical planning and assessment of associated brain anomalies. Surgical intervention involves repair of the skull defect and excision of herniated brain tissue to prevent infection and further neurological compromise.

Anesthetic Considerations for Tracheal Intubation in Neonates with Encephalocele

Consideration	Details
Positioning	Extend the head carefully, supporting with a shoulder roll or pillow as needed to optimize airway alignment without compromising the encephalocele sac.
Laryngoscope Blade	Straight blades such as Miller or Guedel are preferred for neonates due to the anterior larynx and floppy airway structures.
Neonates (0–1 month)	Miller size 0–1
Infants (1–12 months)	Miller size 1
ETT Size (Full-term neonates)	3.0–3.5 mm uncuffed
ETT Size (Infants)	3.5–4.0 mm uncuffed
ETT Depth	Typically estimated as three times the ETT size (in cm).

Click here to read more about managing difficult airway in pediatric patients

Uncuffed vs. Cuffed Endotracheal Tubes: Traditionally, uncuffed endotracheal tubes (ETTs) were recommended for children under the age of eight, based on the belief that they exerted less pressure on the cricoid cartilage and thus lowered the risk of post-extubation edema. However, recent evidence has demonstrated no significant difference in post-extubation complications between cuffed and uncuffed tubes. In fact, cuffed ETTs offer several advantages: they often require fewer laryngoscopies and intubation attempts to achieve the correct size, reduce subglottic pressure, and minimize operating room anesthetic pollution and associated costs. Additionally, cuffed tubes help decrease the risk of aspiration, allow for more precise control of carbon dioxide levels (PCO_2), enable the delivery of higher airway pressures in cases of restrictive lung disease, and permit controlled cuff pressure without increasing the likelihood of post-extubation stridor.

Optimal Air Leak Assessment: After endotracheal tube (ETT) placement, the adjustable pressure-limiting (APL) valve should be set to 25 cmH_2O to apply an inflation pressure of 20–25 cmH_2O. Auscultation should be performed to detect an audible air leak at the glottic level. If no leak is heard at this pressure, it suggests that the ETT may be too large and should be replaced with one that is 0.5 mm smaller in diameter.

The presence of an air leak at 20–25 cmH_2O closely approximates tracheal capillary pressure and is important for preventing mucosal ischemic injury.

Case Report

A 20-day-old female neonate weighing 3.5 kg presented for surgery. Preoperative laboratory evaluation revealed a hemoglobin level of 16 g/dL. Anesthesia was induced with 7 mg of ketamine. Tracheal intubation required two attempts: the first, using a Miller size 0 blade and a 3.5 mm uncuffed endotracheal tube (ETT), was unsuccessful due to absent chest rise and an audible air leak. The second attempt, with a Miller size 1 blade and a 4.0 mm uncuffed ETT, was successful, providing effective ventilation. Anesthesia was maintained with 0.5–1 MAC of isoflurane, 1.75 mg of atracurium, and 70 mg of paracetamol. Intravenous fluids included 10% dextrose and 0.9% normal saline. The patient was positioned in the left lateral decubitus position for the procedure, with an estimated blood loss of 30 ml. At the conclusion of surgery, neuromuscular blockade was reversed with 0.2 mg of neostigmine and 70 mcg of atropine. Postoperatively, the patient remained stable and was monitored in the post-anesthesia care unit (PACU) for one hour before being transferred to the neonatal intensive care unit (NICU).

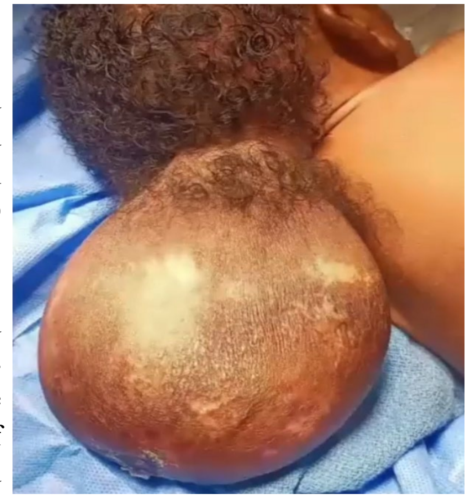
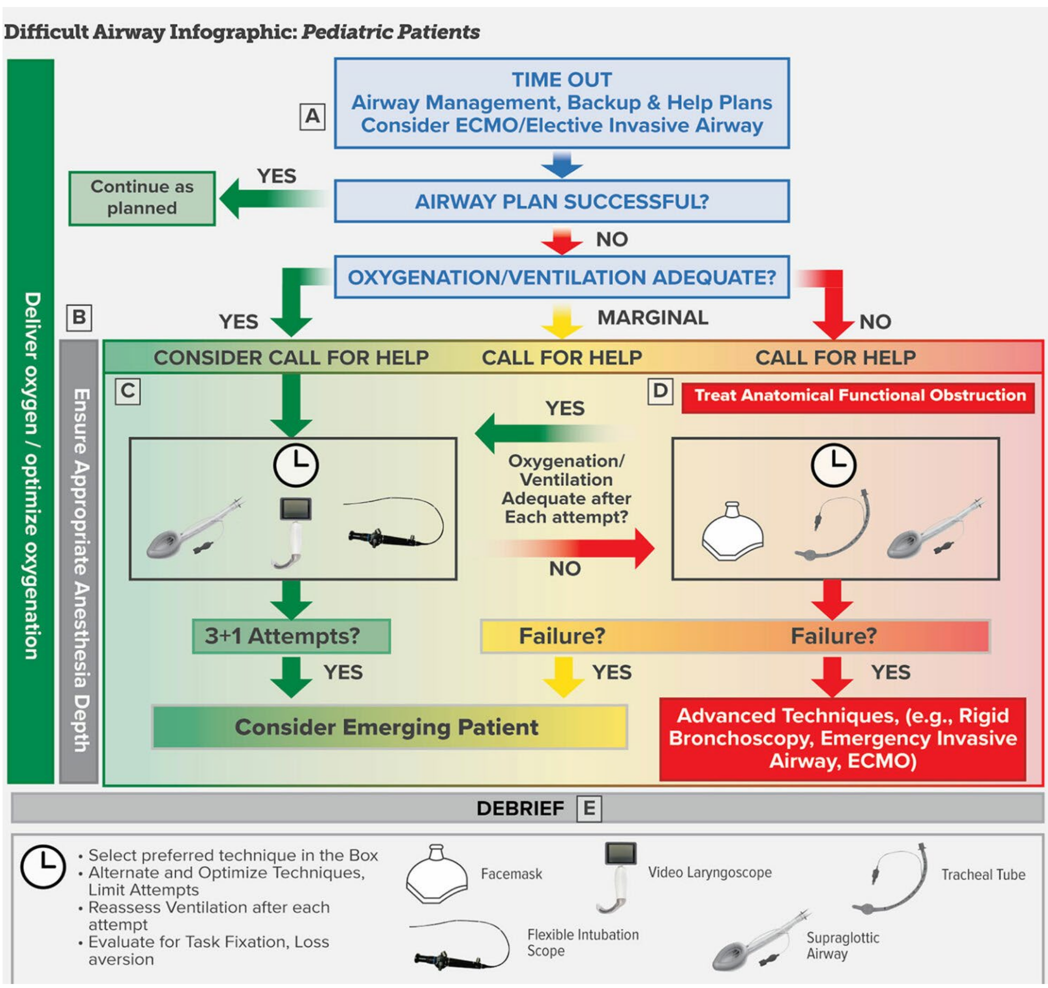


Fig. 1 Bulge at the base of skull



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Ultrasound Curriculum for Anesthesiologists in India

Shweta Yemul Golhar, MD
Huma Syed Hussain, MD

The Global Health Initiative at Beth Israel Deaconess Medical Center (BIDMC) has officially launched the second cohort of its Point-of-Care Ultrasound (POCUS) curriculum, which began in May 2025. This structured program continues BIDMC's commitment to advancing clinical education and diagnostic capacity in global health settings.

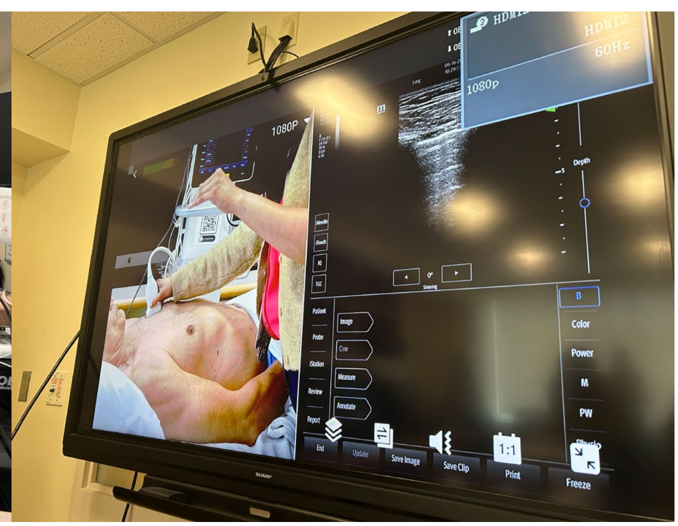
Participants are currently engaged in foundational and systems-based modules, including ultrasound physics, lung, cardiac, gastric, and trauma-focused protocols such as RUSH and FAST. These modules are designed to strengthen clinical decision-making and enhance bedside diagnostic skills, particularly in resource-limited environments.

On June 16, 2025, a virtual session was conducted by Dr. Shweta Golhar, focusing on lung ultrasound. The session began with an introduction to key concepts, followed by a live demonstration of the lung ultrasound exam using interactive clinical scenarios. Later, Dr. Golhar presented a series of case-based images, prompting discussion and application of principles in real-world contexts. Images submitted by participants were anonymously reviewed, allowing for constructive feedback and group learning in a supportive environment.

The session was well-received and reflects BIDMC's dedication to high-quality global medical education, emphasizing practical skills, peer engagement, and ongoing mentorship.

Click here to view the live demonstration of the lung POCUS exam.

Click here to view the lung POCUS presentation featuring case discussions and imaging examples.




The Global Health Curriculum at BIDMC Anesthesia

Shweta Yemul Golhar, MD
Edward Clune, MD

At Beth Israel Deaconess Medical Center (BIDMC), the Department of Anesthesia, Critical Care, and Pain Medicine is advancing a dynamic and structured Global Health Curriculum to train the next generation of globally minded, equity-driven physician leaders. Rooted in the principle that health is a human right, the program aligns with the department's mission to enhance perioperative care in resource-limited settings through education, ethical practice, and international collaboration.

The curriculum is led by Dr. Edward Clune and Dr. Shweta Golhar, and is part of a broader institutional commitment to global health. The anesthesia program's goal is to improve global health equity by developing sustainable educational models and fostering resident engagement across clinical, research, and academic domains.

The Global Health Scholar Track is a multi-year pathway tailored for anesthesiology residents (CA1–CA3) interested in global health. It introduces residents to key topics such as ethical frameworks, health equity, JEDI (Justice, Equity, Diversity, Inclusion), and implementation strategies. Each resident is paired with a mentor and is expected to lead a global health project, engage in journal clubs, and participate in at least four core lectures. Informal meet-ups and peer mentorship foster community and idea exchange. Participants may also pursue international rotations or research projects in global contexts and are recognized with a Global Health Scholar Certificate upon completion.

BIDMC's global initiatives are far-reaching:

Liberia: Through the Boston-Africa Anesthesia Collaborative (BAAC), the department supports nurse anesthesia education and transnational teaching.

Botswana: Since 2017, BIDMC has supported clinical training and research through Botswana Harvard AIDS partnership. .

Bolivia: The team has contributed to ICU POCUS education and maternal health research at high altitudes.

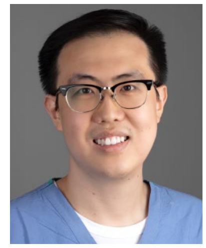
India: A growing POCUS training initiative includes online modules, virtual sessions, and in-person workshops for faculty.


Residents also have access to external opportunities such as the SEA-HVO Traveling Fellowship and the ASA Resident International Anesthesia Scholarship Program. In a world where healthcare challenges transcend borders, BIDMC's anesthesia global health curriculum exemplifies a commitment to ethical engagement, academic rigor, and sustainable global partnerships.

DIVISION CORNER

Perioperative Stroke

Sumeeta Kapoor, MD
Yifan Bu, MD
Rae Allain, MD


Perioperative stroke is defined as a new cerebrovascular event that occurs intraoperatively or within 30 days of surgery. These strokes may be either overt or covert. The incidence of perioperative stroke varies depending on the type of surgery: in carotid endarterectomy (CEA), it is approximately 1–1.4% in asymptomatic patients and 2.3–4.3% in symptomatic patients, with higher rates in those with a recent history of stroke or transient ischemic attack (TIA). In non-cardiac, non-neurological surgeries, the incidence ranges from 0.1–0.7%. Perioperative strokes are associated with increased morbidity, mortality, and long-term neurocognitive decline.

Timing and Recommendations for Carotid Endarterectomy (CEA)

Current recommendations advise that CEA for symptomatic carotid stenosis should be performed as soon as the patient is neurologically stable, ideally within 14 days of symptom onset but not within the first 48 hours following a stroke. Multiple large cohort studies and meta-analyses have shown that performing CEA within 3–14 days after the index event offers the best balance of efficacy and safety. In contrast, very early CEA (within 48 hours) is associated with a higher perioperative risk, particularly in patients who have experienced a disabling stroke. For patients with mild symptoms such as a TIA or minor stroke, early intervention within 3–7 days is associated with improved neurological outcomes and long-term durability, though the risks increase if surgery is performed too soon.
Contraindications to early CEA include disabling stroke (modified Rankin Scale ≥3), large infarcts involving more than 30% of the ipsilateral middle cerebral artery territory, altered consciousness, and neurologically unstable conditions such as fluctuating or worsening neurological deficits. Major strokes within the preceding 48 hours also warrant delayed intervention.

CEA After Intravenous Thrombolysis (IVT)

CEA following intravenous thrombolysis (IVT) for acute ischemic stroke or TIA should generally be delayed for at least 5–7 days. This delay is necessary to minimize the risk of intracranial hemorrhage and neck hematoma, as the risk of hemorrhagic complications is highest within the first 48 hours after IVT.

CEA vs Carotid Artery Stenting (CAS): Stroke Risk Comparison

Procedure	Symptomatic Stroke Risk	Asymptomatic Stroke Risk
CEA	3.8%	1.3%
Carotid Artery Stenting (CAS)	6.2%	2.6%

Choice of Anesthesia

Both local or regional anesthesia (LA) and general anesthesia (GA) are acceptable for carotid surgery. Large randomized trials such as the GALA trial, as well as Cochrane reviews, have demonstrated no significant difference in the rates of perioperative stroke, death, or myocardial infarction between the two anesthetic approaches. While some registry and observational studies suggest that LA may be associated with lower rates of perioperative cardiac complications, these findings have not been consistently confirmed. Therefore, the choice of anesthesia should be individualized based on patient factors such as age and comorbidities, as well as the experience and expertise of the surgical and anesthesia teams.

Perioperative Medications

Aspirin, statins, and antihypertensive agents, including beta-blockers, should be continued throughout the perioperative period for carotid surgeries. Dual antiplatelet therapy (DAPT) and anticoagulation require individualized assessment based on each patient's specific risk factors and indications. For patients undergoing TCAR or transfemoral CAS (TFCAS), continuation of DAPT is generally recommended.

Intraoperative Monitoring (for Awake Patients)

Modality	Sensitivity	Specificity	Notes
NIRS	74%	82%	Easy to use; evaluates cortical areas only; use trend from pre-induction
EEG	46–52%	86–96%	Affected by many factors; needs tech support; evaluates cortex
Stump Pressure	75%	88%	Shunting if < 40 mmHg; variable cutoff (25–70 mmHg)
TCD	56–81%	73–92%	Limited by poor acoustic window (80% cases)
SSEP	58%	91%	Evaluates deeper structures; low sensitivity; can be combined with EEG

Key Takeaway Points

Successful management of patients undergoing carotid surgery requires strong multidisciplinary team coordination, preoperative risk stratification, and optimization of comorbidities. Careful management of perioperative anticoagulation is critical, and elective surgical procedures should be delayed when feasible—typically for 3 to 6 months in patients undergoing non-cardiac, non-neurological surgery. Intraoperative hemodynamics should be closely monitored and maintained within 10% of preoperative levels. Maintaining effective, closed-loop communication with the surgical team and establishing clear postoperative hemodynamic goals are also essential for minimizing complications and ensuring optimal outcomes.

Click here to do review some cases on perioperative stroke!

References:

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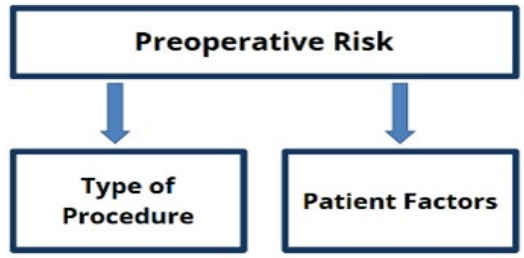
Optimizing Preoperative Evaluation for the Vascular Surgery Patient: A Structured Approach

Shirin Saeed, MD
Sumeeta Kapoor, MD
Xiaohan Xu, MD



Vascular surgery patients present a complex clinical challenge due to the interplay of procedural risk and extensive patient comorbidities. Despite the shift toward endovascular techniques that lower procedural risk, these patients often carry a high systemic burden commonly due to comorbidities including hypertension, diabetes, hyperlipidemia, renal impairment, and cardiovascular disease. This evolving surgical landscape necessitates a nuanced preoperative evaluation strategy to reduce perioperative morbidity and mortality.

A dual-axis approach categorizing risk by both procedure and patient factors is essential for perioperative risk assessment. Procedures such as EVAR, peripheral stenting, and carotid interventions are generally considered intermediate-risk. However, high-risk patients undergoing even these procedures require meticulous assessment. Key to this evaluation is a structured cardiac risk assessment informed by tools like the Revised Cardiac Risk Index (RCRI) and the National Surgical Quality Improvement Program (NSQIP) calculator, functional capacity (via DASI or METs), and the identification of frailty, particularly in patients over 65. Patients with a MET score of less than 4 should be considered high risk.



Routine testing protocols include obtaining a 12-lead ECG within three months of surgery or with new symptoms, bedside transthoracic echocardiography (TTE) for all patients, and stress testing reserved for those with poor functional capacity and symptoms suggestive of active cardiac conditions. Cardiac biomarkers, such as cTnI and NT-proBNP, and CT angiography may be considered on a case-by-case basis. (Table 1)
Renal risk is another critical factor, given the prevalence of chronic kidney disease in this population and the frequent use of contrast. Preoperative renal function, hematologic parameters, and electrolyte levels should be assessed especially for endovascular procedures.

In conclusion, comprehensive and patient-specific preoperative evaluation using structured tools and institutional best practices is essential to improving outcomes in vascular surgery patients. Integrating multidisciplinary input, particularly for those at high cardiac or renal risk, ensures safe perioperative management in this vulnerable population.

Click here to view [“Pre-operative Evaluation of Patients Undergoing Vascular Surgery”]

Click here to view the [“Reference Guidelines”]

Key Take Away Message

1. **Assess functional capacity with DASI or METs.**
2. **Calculate risk using NASQPI/RCRI if possible.**
3. **Order 12 lead EKG if not done in three months or if new abnormality seen based on patient profile.**
4. **Perform bedside TTE in all patients.**
5. **Order a stress test if patient has poor functional status and worsening symptoms or if the results will influence preoperative management.**
6. **Cardiac biomarkers and CT angiography – based on procedure risk, patient profile, multidisciplinary decision.**
7. **Preoperative Medications – continue statins, beta blockers, stop ACE inhibitors 24 hours prior ideally but prepare for hypotension in case seeing patient on day of surgery.**
8. **Baseline renal function tests should also be performed, especially when the patient is having an endovascular procedure with contrast or high-risk cases.**
9. **PFTs not indicated except in specific circumstances.**

ECHO CORNER

Use of Ultrasound in Evaluation and Management of Hemodynamically Unstable Patient



Ruma Bose, MD
Shirin Saeed, MD
Huma Syed Hussain, MD

As part of a four-part workshop series focused on the use of ultrasound in the evaluation and management of hemodynamic instability, a hands-on Grand Rounds workshop was recently conducted for attending anesthesiologists. This session offered a comprehensive, case-based approach to perioperative ultrasound training, integrating clinical scenarios with real-time imaging and guided interpretation.

The workshop featured six stations, each designed around high-yield cases including pneumothorax, aortic dissection, Takotsubo cardiomyopathy, pulmonary embolism and undifferentiated hemodynamic instability. Participants engaged directly with both live models and high-fidelity manikins, performing bedside ultrasound examinations under faculty supervision. Ultrasound modalities used included transthoracic echocardiography (TTE), transesophageal echocardiography (TEE), lung ultrasound, and gastric ultrasound, with hands-on experience. Each station emphasized image acquisition, interpretation, and the integration of findings into real-time clinical decision-making.

At the conclusion of each station, brief faculty-led discussions highlighted key diagnostic features, differential diagnoses, and appropriate management strategies for each condition. These debriefs reinforced practical applications of ultrasound in critical perioperative scenarios. To optimize learning, participants received preparatory materials prior to the session, including a curated case library and didactic modules designed to build foundational knowledge and enhance the hands-on experience.

This workshop demonstrated the essential role of point-of-care ultrasound in the rapid diagnosis and management of perioperative complications. Through a blend of simulation, live scanning, and case-based discussion, attendees deepened their ultrasound proficiency and clinical acumen; essential skills in modern anesthetic and critical care practice. Ultrasound is a rapid, non-invasive bedside tool that aids in the assessment of hemodynamic instability by identifying causes such as hypovolemia, cardiac dysfunction, tamponade, or obstructive pathology. It allows real-time evaluation of cardiac function, volume status, and intrathoracic pathology, guiding targeted management decisions in critically ill patients.

Causes	Echocardiographic Key Points
Tamponade	Systolic RA collapse, diastolic RV collapse, deviated septum, dilated IVC, hypoechoic fluid collection
RV dysfunction	Dilated RA, deviated septum towards LV, TR, apical sparing (McConnell's sign), TAPSE < 1.6 cm
LV dysfunction	Eyeballing (shape, size, squeeze), Longitudinal shortening < 1cm, ↓ wall segment thickening, ↓ FAC, MAPSE < 1cm,
Pulmonary Embolism	Enlarged RV, apical sparing, TR, thrombi identification(hyperechoic shadow), hyper dynamic LV
Hypovolemia	Subjective assessment, 'kissing papillary muscles' sign, Decreased EDA and ESA, IVC diameter <2 cm and inspiratory collapse > 50%
Sepsis	Early (satisfactory LV performance, normal EDA, ↓ ESA), late sepsis(myocardial performance reduced, ↓ EDA and ESA)
Tension Pneumothorax	Fixed and dilated IVC, hyperdynamic RV, Lung ultrasound (Absent lung sliding, Absent B-lines, Prominent A-lines, Lung point, Absent lung pulse on left)

Click here to review a case on "Hemodynamic Instability"

COAGULATION CORNER

Open Repair of Infrarenal Abdominal Aortic Aneurysm in a High-Risk Patient with Cardiovascular and Renal Comorbidities

Sumeeta Kapoor, MD

A 66-year-old male (height: 63", weight: 88 kg, BMI 34, IBW: 56 kg) with no known drug allergies presented for elective open repair of a 6.2 cm infrarenal abdominal aortic aneurysm (AAA), discovered incidentally during evaluation for cellulitis complicated by septic shock and acute renal failure three months prior. His medical history was notable for coronary artery disease (CAD) with PCI to the RCA (May 2024) and LAD (July 2024), preserved left ventricular ejection fraction (64%), and normal functional capacity. Additional comorbidities included type 2 diabetes mellitus (HbA1c 7.5%) on insulin and SGLT2 inhibitors (held pre-op), hypertension, hyperlipidemia, chronic kidney disease (baseline creatinine 2.2, likely stage III–IV), suspected obstructive sleep apnea (undiagnosed, with snoring and witnessed apnea), and prior alcohol use. Medications included aspirin, statin, fibrate, metoprolol, nifedipine, glargine, metformin, losartan, and Plavix (held for 7 days pre-op).

Preoperative Evaluation

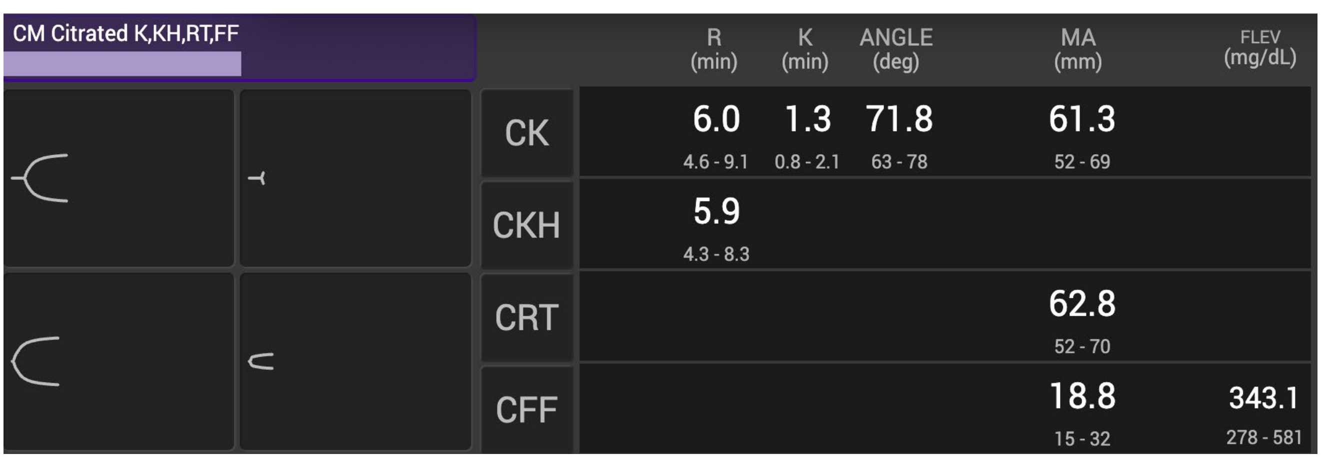
Transthoracic echocardiography (April 2025) showed mild mitral regurgitation, severely dilated left atrium, aneurysmal atrial septum without shunt, and normal right ventricular function. Electrocardiogram demonstrated sinus rhythm with left anterior fascicular block and findings consistent with pulmonary disease. Based on cardiac and renal risk, the anesthesia team opted for a combined general and regional approach with advanced intraoperative monitoring.

Anesthesia and Intraoperative Management

A thoracic epidural catheter was placed at the T7–T8 level, with test and loading doses of lidocaine and ropivacaine confirming sensory block to T8. Standard ASA monitors were applied, and a right radial arterial line, right internal jugular central venous line, and an additional 14G PIV were inserted under ultrasound guidance. Monitoring also included TEE and SedLine for depth of anesthesia. The patient was induced with fentanyl, lidocaine, propofol, and rocuronium, and intubated with a 7.5 ETT via McGrath video laryngoscopy. Maintenance included sevoflurane in oxygen/air, with phenylephrine and norepinephrine infusions as needed.

Fluids were restricted before cross-clamping. Renal protection included IV sodium bicarbonate (50 mEq), furosemide (10 mg), and mannitol (7 g) prior to clamping. Heparin was administered with ACT maintained >250 seconds. Aortic cross-clamp time was approximately 65 minutes.

In anticipation of unclamping, the patient received IV albumin, PRBCs, and balanced crystalloids. Ongoing fluid and transfusion therapy was guided by ABGs and TEG analysis, particularly in response to postoperative oozing despite heparin reversal with protamine.



CM Citrated K,KH,RT,FF	R (min)	K (min)	ANGLE (deg)	MA (mm)	FLEV (mg/dL)
CK	6.0 4.6 - 9.1	1.3 0.8 - 2.1	71.8 63 - 78	61.3 52 - 69	
CKH	5.9 4.3 - 8.3				
CRT				62.8 52 - 70	
CFF				18.8 15 - 32	343.1 278 - 581

***Fig 1.** First TEG analysis*

Click here to view the "[Intra-Op Hemodynamics and TEG!](#)

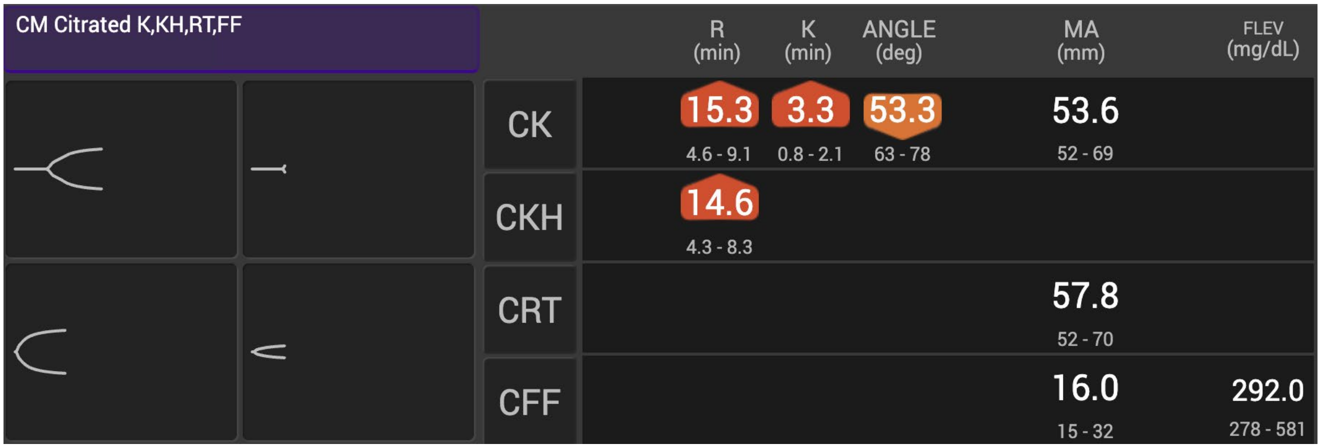


Fig 2. *Second TEG analysis*

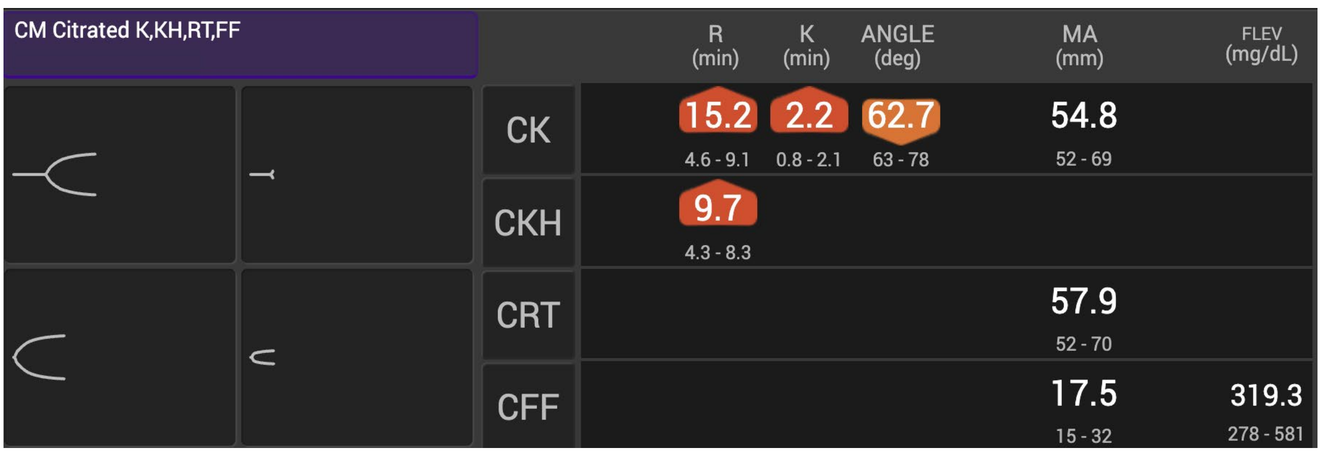


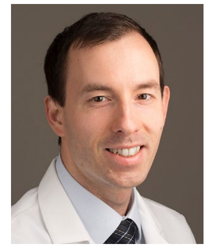
Fig 3. *Third TEG analysis*

Intraoperative Resuscitation and Outcome

Estimated blood loss was approximately 1500 mL. The patient was resuscitated with: 5000 mL of Plasmalyte A, 750 mL of albumin, 700 mL of PRBCs, 330 mL of cell saver blood, 250 mL of platelets, and 200 mL of cryoprecipitate. He was successfully extubated in the operating room after full neuromuscular reversal with sugammadex. Postoperative pain control was managed with epidural infusion and IV analgesics. His recovery was uneventful, and he was discharged home on postoperative day five.

REGIONAL CORNER

Basics of Scalp Block

Robina Matyal, MD
Rakalin Andrey, MD

Scalp block is a simple, straightforward technique that can be helpful in providing anesthesia in awake craniotomy or analgesia for postoperative neurosurgical pain. Although ultrasound is not currently used to perform the blocks, it is a must to describe them due to their clinical relevance and for completion.

Pain after neurosurgical procedures with craniotomy presents a challenge for pharmacologic management. Greater than 2/3 of patients undergoing craniotomy report moderate to severe postoperative pain. Intense pain in the post-operative period is associated with hemodynamic instability (with hypertension and tachycardia), psychomotor agitation, increased oxygen consumption, and activation of the stress response.

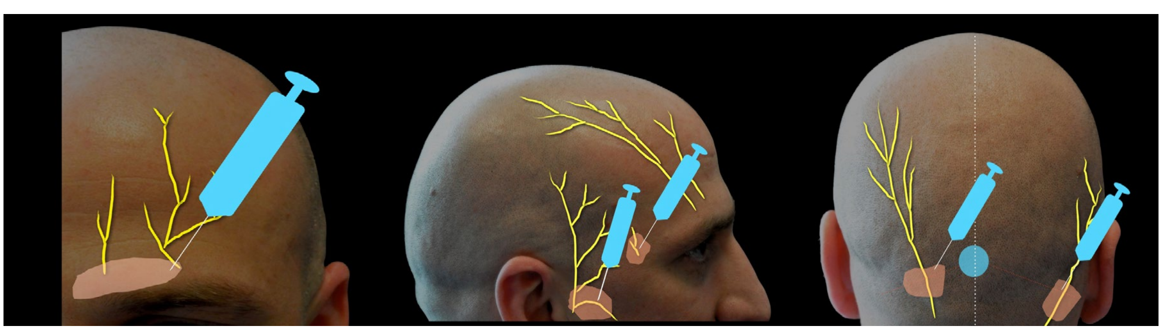
Non-steroidal anti-inflammatory drugs alter normal platelet function and prolong bleeding times. They are relatively contraindicated in neurosurgical procedures, especially in patients at high risk of bleeding (aneurysm repair, arteriovenous malformation resections, hematoma evacuation, etc.). On the other hand, opioids are effective in managing post-craniotomy pain, but present additional problems in the neurosurgical patient.

Opioid drugs are associated with postoperative nausea and vomiting, which can increase intracranial pressure. Additionally, they can produce respiratory depression, with lowering of the respiratory rate and possible hypoxemia and hypercapnia; this in turn can lead to sustained increases in intracranial pressure. Further, awake craniotomy is being performed more and more frequently, and these procedures require the anesthesiologist to administrate lower doses of sedating agents.

Advantages of Scalp Block:

The advantage of scalp block when compared with surgical incision infiltration with local anesthetic is its longer duration of action and better attenuation of the hemodynamic responses associated with pinning and surgical incision. Scalp block has also been shown to decrease the amount of rescue pain medication required and increase the time between the end of surgery and the first request for postoperative analgesics. When compared to standard analgesic management, scalp block has demonstrated lower pain scores for up to 48 hours after surgery.

Region	Nerve Source	Branches / Nerves	Areas Supplied
Anterior Scalp	Trigeminal Nerve (CN V)	**Ophthalmic (V1)** → Frontal nerve→ Supratrochlear→ Supraorbital	Forehead and anterior scalp. Supraorbital also supplies frontalis muscle
		Maxillary (V2) → Zygomaticotemporal nerve	Cheeks to zygomatic prominence
		Mandibular (V3) → Auriculotemporal nerve	Auricle and skin in front of the auricle
Posterior Scalp	Spinal Nerves	**C2 and C3**	Posterior scalp



Preparation:

This block can be performed on the awake patient in a sitting or supine position. On an anesthetized patient the supine position is more commonly used. The head may be rotated to provide better access for injection of the auriculotemporal, lesser occipital, and greater occipital nerves. The block is associated with moderate discomfort due to the multiple injections required, so sedation and analgesia can be administered, preferably with short acting agents. This is particularly important in the patient who will undergo awake craniotomy. The skin is disinfected with chlorhexidine solution. Be careful to prevent the solution from contacting the patient's eyes, as this may cause injury.

Technique

• Start: Prepare Equipment and Patient

• Gather syringes (2-5 ml) with local anesthetic, 25G needles

• Choose local anesthetic (e.g., 0.25-0.5% Bupivacaine with epinephrine 1:200 000)

• Anesthetized, supine patient; disinfect skin (avoid eyes)

Nerve	Procedure
Supraorbital Nerve	Palpate supraorbital notch, insert needle perpendicular, contact bone, withdraw slightly, inject, redirect medially for supratrochlear nerve, inject
Auriculotemporal Nerve	Locate 1–1.5 cm anterior to tragus, palpate temporal artery, insert needle perpendicular to skin, contact bone, withdraw, inject
Zygomaticotemporal Nerve	Infiltrate supraorbital margin of posterior zygomatic arch, inject both superficial and deep
Greater Occipital Nerve	Identify occipital protuberance and mastoid process, move ~2.5 cm lateral to protuberance (find occipital artery), inject medial to artery at this level
Lesser Occipital Nerve	Block 2.5 cm lateral to the greater occipital nerve block site, inject as previously described

Complications:

Intravascular injection and local anesthetic toxicity are the most common complications associated with this block. To avoid these, use the lowest effective dose of local anesthetic and identify the temporal and occipital arteries prior to injection. Hematoma can also occur due to injury of these arteries. Subarachnoid injection of local anesthetic has been reported during lesser occipital nerve block on a patient that underwent previous retromastoid craniotomy. Facial nerve paralysis has not been reported, although the proximity of the facial nerve to the sensory nerves of the scalp could theoretically make this complication possible.

Contraindications:

Scalp block is not recommended if there is a bone defect in the cranium, for example resulting from prior craniotomy. As with other block techniques, coagulopathy and infection at the needle insertion site are contraindications to this procedure. Identify the occipital and temporal arteries before injection, in order to minimize the risk of unintentional intravascular injection or hematoma formation. When cleaning the intended injection site, take care to avoid depositing cleaning solution in the patient's eyes. Intravascular injection or absorption of local anesthetic with epinephrine could cause hypertension. Please monitor accordingly. Avoid overly sedating or long- acting drugs in patients undergoing awake procedures.

References:

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Mindray Course on Simulation at CMS Charlestown

From May 12–15, 2025, the BIDMC Simulation Team comprising of Nadav Levy, Lior Levy, Dario Winterton, Federico Puerta Martinez, and Ryan Ricciardelli partnered with Mindray to conduct a comprehensive simulation training course at the Center for Medical Simulation (CMS) in Charlestown. The four-day program was tailored for visiting physicians from Panama and focused on equipping them with the tools and strategies needed to implement simulation-based training in their own institutions using available resources.

LVAD Education Day at Abbott Facility in Burlington

On May 21, 2025, LVAD Education Day was held at the Abbott facility in Burlington, organized by Dr. Maurizio Bottiroli. The full-day session was attended by 13 BIDMC fellows from the cardiac, vascular, and ICU programs, along with perfusionists. The program featured a comprehensive overview of various LVAD models, a guided tour of the Abbott manufacturing plant, and interactive clinical case presentations by Dr. Bottiroli and Dr. Mark Robitaille. Attendees also heard from Abbott engineers on pump parameters and engaged in a hands-on session using pig hearts to practice LVAD placement.

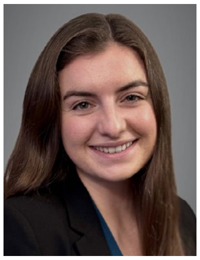
Community Simulation at BIDMC Milton and New England Baptist

On May 29, 2025, the BIDMC Simulation Team—Nadav Levy, Lior Levy, and Dario Winterton—conducted a community simulation session at the BIDMC Milton campus for the Anesthesia Department. Organized with support from Dr. Victoria M. Derevianko, Chief of Anesthesia at Beth Israel Deaconess Milton, the session focused on the management of Local Anesthetic Systemic Toxicity (LAST), with hands-on participation from 14 physicians and CRNAs. As part of ongoing community outreach, the team also conducted a second simulation session on June 18, 2025, at New England Baptist Hospital.

Echo Lab Fellows Present at Surgery Grand Rounds

On June 11, 2025, Echo Lab research fellows Drs. Shirin Saeed, Adil Manji, and Usman Ahmed presented their ongoing projects during Surgery Grand Rounds to Dr. Douglas R. Johnston, Chief of Cardiac Surgery at Northwestern University. Their presentation covered basic science studies on purinergic signaling, mitochondrial metabolism, and miRNA profiles in cardiac surgery patients, as well as advances in 3D mitral valve modeling. They also highlighted outcomes research using large datasets (STS, NSQIP, VQI, NRD), and innovations in echocardiographic imaging and ultrasound education, including VR platforms and a comprehensive educational website.

Congratulation to Dr. Jacqueline Hannan!



We are thrilled to congratulate our Research Scientist, Dr. Jacqueline Hannan, on being awarded a T32 grant for her project titled *"Objective Evaluation of Automaticity in Ultrasound-Guided Procedures: From Simulation to Clinical Translation."*
This work will be conducted under the primary mentorship of Dr. Robina Matyal, with additional support from Dr. Feroze Mahmood, Dr. John Mitchell, and Dr. Cullen Jackson. Dr. Hannan's project represents a step forward in advancing procedural training and assessment, and we are proud to see her dedication and excellence recognized.
Congratulations, Dr. Hannan!

Combined Education and Q&S Grand Rounds Faculty Workshop

The department hosted a hands-on, interactive workshop on June 18, 2025, combining Education and Quality & Safety Grand Rounds. Faculty rotated through five simulation-based stations addressing key safety and quality topics identified from real cases and M&M reviews. Topics included pEEG monitoring, TOF and neuromuscular blockade management, blood product safety in the OR, PACU handoffs using tools like iPASS, and anesthesia considerations for Impella patients. Pre-workshop readings and multimedia materials supported active, case-based learning.

Quiz Yourself

Audio & Visual Lesson

Check out case seven here.
We have compiled cases for quick review of ***ECG and rhythm interpretations*** *for efficient learning and skill enhancement.*

ECG and Rhythms Interpretation