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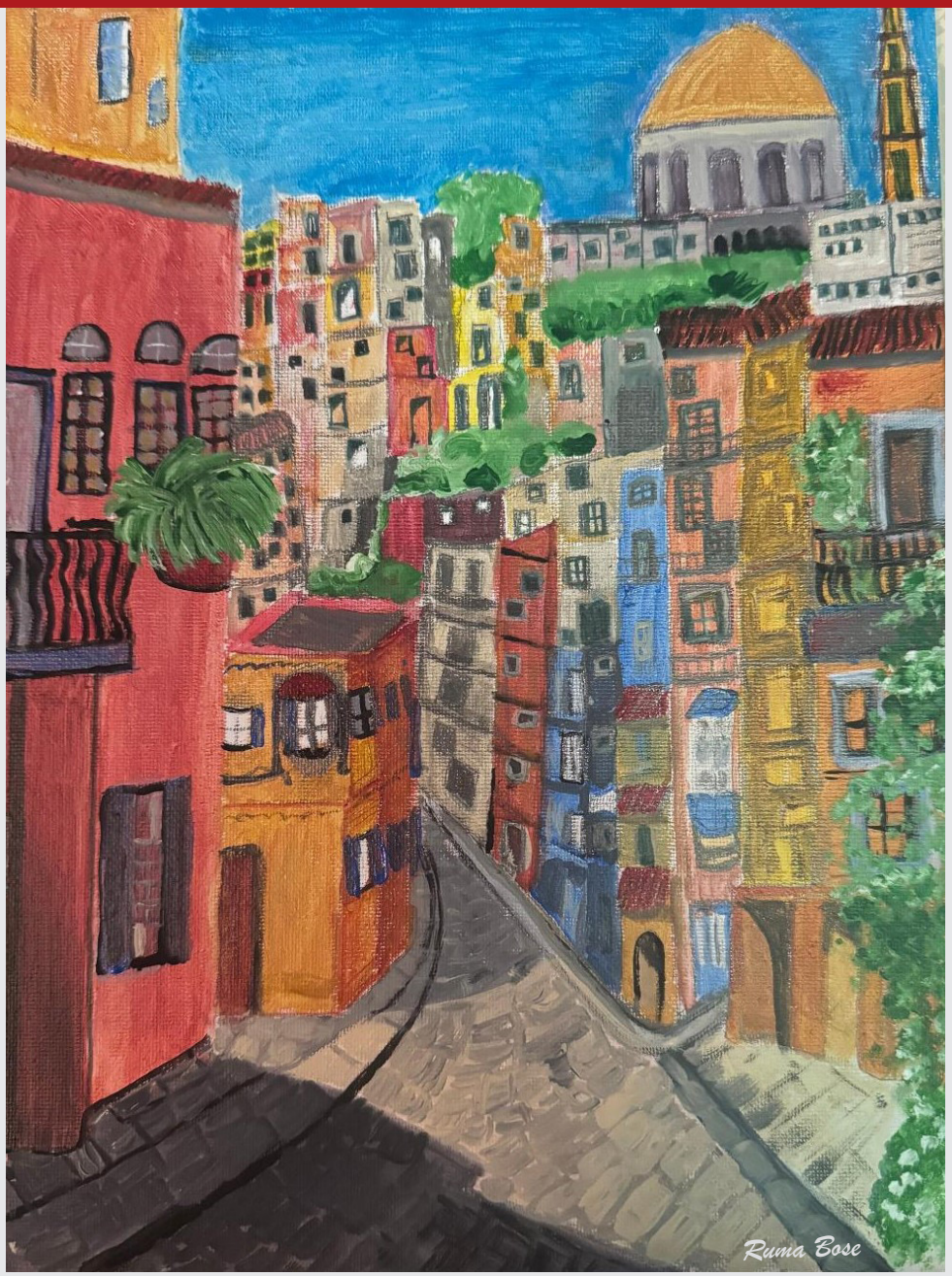
CLINICS IN MEDICAL EDUCATION

Docendo Discimus

[By Teaching We Learn]



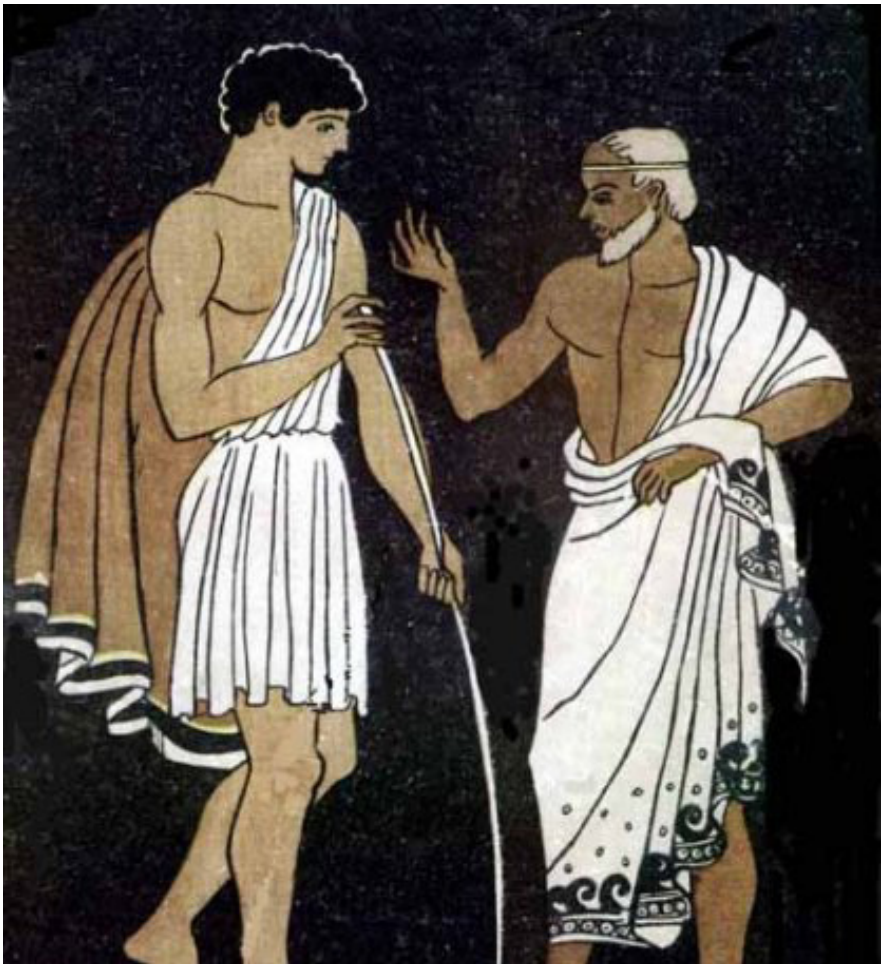
INSIDE

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



Mentor
Pablo E. Fabisch, illustration for Aventuras de Telémaco by François Fénelon (1651-1715). In the Odyssey, Mentor was the son of Alcimus. In his old age Mentor was a friend of Odysseus. When Odysseus left for the Trojan War, he placed Mentor in charge of his son Telemachus, and of Odysseus' palace. Because of Mentor's relationship with Telemachus, the personal name Mentor has been adopted in Latin and other languages, including English, as a term meaning someone who imparts wisdom to and shares knowledge with a lessexperienced colleague.
http://paesmem.stanford.edu/html/proceedings_4.html

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/

COVER: Painting by Dr. Ruma Bose.

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CLINICS IN MEDICAL EDUCATION
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EDITOR'S WELCOME

We are thrilled to share our second 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 will be launching our website with this issue and look forward to hearing your suggestions and articles. Our aim is to provide unlimited educational resources to our residents and faculty.

Each month, we will 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 second issue!

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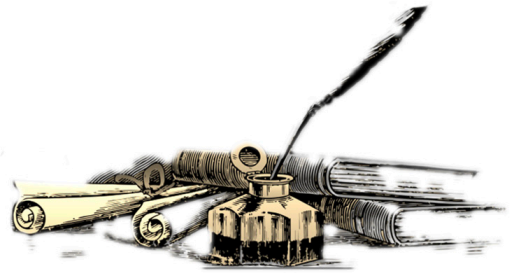

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OUR MISSION

- 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.

"Great mentors don't just guide you they light the path,, inspire you to walk it, and help you discover the leader within yourself."

PEDAGOGY IN EDUCATION

The Odyssey of Mentorship: Shaping Tomorrow's Anesthesiologists Today

Robina Matyal, MD

In the Ancient Greek Epic Poem by Homer, *The Odyssey*, Mentor-–the sage advisor to Telemachus–exemplifies the transformative power of guidance and support. This ancient archetype of mentorship highlights its enduring significance, a concept that is profoundly relevant in contemporary settings such as anesthesia training. In modern academic health centers, mentoring has long been recognized as a cornerstone for professional and personal development. This role extends beyond mere instruction; it encompasses giving guidance, sharing knowledge, and imparting wisdom, much like Mentor did for Telemachus.

The mentorship means gradually and imperceptibly make the mentee discover their strengths and interests and make them stronger and achieve what they want through their own inner strength, hard work and excellence. Develop grit and ability to get up after each stumble and failure. Mentor achieves the goals by listening, sharing experiences, develop insight through self reflection and encourage to stand up and take action to achieve self driven goals. Mentorship is thus a core component of career advancement, based on mutual understanding and agreement between mentor and mentee. However, the rate of mentorship in medicine is often lower than ideal. Studies have shown that trainees who receive effective mentorship are more likely to advance in their academic careers and have higher retention rates. **We are presenting a series of educational material and interactive sessions to go in depth in this topic and built up a strong mentorship program for our trainees and faculty.**

Our mentorship program is designed to address these needs through a comprehensive approach. It includes educational workshops and seminars, which will cover essential aspects of mentorship, such as communication skills, setting expectations, and providing constructive feedback. Additionally, we will provide guides and toolkits for both mentors and mentees, outlining best practices and offering practical advice on managing the mentoring relationship. Interactive sessions will be a key component of the program, featuring a mentor-mentee matching process that pairs individuals based on shared interests and goals. Regular check-ins will ensure that these relationships remain productive and aligned with the mentee's professional aspirations. We will also encourage peer mentoring, where junior faculty can mentor trainees, fostering a culture of continuous learning and mutual support. The program will include both formal and informal mentoring opportunities, allowing relationships to develop naturally while providing a structured framework for support. A mentorship agreement will outline the expectations and commitments of both parties, including goals, meeting frequency, and confidentiality. Regular evaluation and feedback will be integral to the program's success, allowing for ongoing improvements based on participant experiences.

To ensure that mentors are well-equipped for their roles, we will offer training sessions focused on skills development, covering topics such as leadership, emotional intelligence, and conflict resolution. Mentors' contributions will be recognized through awards, certificates and opportunities for further professional development.

"Knowledge knows no bounds—transform your life through the power of adult learning."

The Dynamics of Adult Learning: Theoretical Insights and Applications

Dario Winterton, MD

Before diving into the specifics of medical education and teaching, it is valuable to first understand the foundational concepts of adult learning theory, which addresses how adults learn, and how these differ from traditional theories focused on school-aged children.

Pedagogy

The term "pedagogy" originates from the Greek words παῖς (pais, meaning child) and ἀγωγός (agogos, meaning leader), highlighting its inherent association with teaching children. Developed from monastic schools and later adopted by public education systems, the pedagogical model was historically the primary framework for instruction. This model was even utilized when establishing adult education programs in the U.S. after World War I, resulting in adults being taught as if they were children until relatively recently.

The pedagogical model is based on several key assumptions:

1. Need to Know: Learners are primarily motivated by the requirement to learn what is necessary to pass a course, with little emphasis on how the knowledge applies to their lives
2. Learner's Self-Concept: In this model, learners are viewed as dependent individuals, which is appropriate in early childhood but becomes increasingly less suitable as they mature. This mismatch grows as the model is applied to older students and adults.
3. Role of Experience: The learner's own experiences are not considered valuable resources for learning; instead, the experiences of the teacher and textbook authors are prioritized. Thus, teaching techniques focus on the transmission of knowledge from teacher to student.
4. Readiness to Learn: Learners are deemed ready to learn when the teacher determines they are prepared, rather than when they feel personally ready.
5. Orientation to Learning: Learners have a subject-centered approach, viewing education as the acquisition of specific subject matter, often disconnected from real-world applications.
6. Motivation: External factors, such as grades and approval, are the primary motivators for learning.Andragogy

Androgogy

In contrast to pedagogy, andragogy—from the Greek Ἀνδρος (andros, meaning man)—is the theory and practice of teaching adults, developed by Malcolm S. Knowles in the 1970s.

Before exploring andragogy further, it is important to define what is meant by "adult." There are four primary definitions:

1. **Biological**: The age at which an individual is capable of reproduction.
2. **Legal**: The age at which one can vote, obtain a driver's license, marry legally, etc.
3. **Social**: The age at which an individual assumes adult roles, such as full-time employment, marriage, or parenting.
4. **Psychological**: The age at which an individual develops a self-concept of being responsible for their own life and decisions—this aspect is particularly critical in the application of adult learning theory.

"Feedback is information describing an individual's performance in a given activity that is intended to guide their future performance."

The assumptions of the andragogical model include:

1. **Need to Know**: Adults need to understand the relevance and benefits of learning something before engaging in the process. Significant effort is invested in comprehending the positive outcomes of learning and the drawbacks of not learning. Teachers and facilitators should help.
2. **Learner's Self-Concept**: Adults see themselves as self-directed individuals responsible for their own decisions, and they resist situations where they feel others are imposing their will on them.
3. **Role of Experience**: Adults bring a wealth of diverse experiences to the learning environment, making adult learning groups more heterogeneous in terms of background and needs. Since adults' self-identity is closely tied to their experiences, any learning situation that disregards these experiences is likely to be rejected.
4. **Readiness to Learn**: Adults are ready to learn when they recognize that the knowledge or skill is necessary for their personal or professional development. This readiness can be encouraged through exposure to superior performance, counseling, simulation, and other methods.
5. **Orientation to Learning**: Adults prefer a life- or task-centered approach to learning, where information is presented in a real-world context, making it more relevant and applicable to their lives.
6. **Motivation**: Adult learners are motivated by both external factors (such as promotions or salary increases) and internal factors (such as job satisfaction and self-esteem).

Table 1. Assumptions of learning models	Pedagogy	Andragogy
Need to know	Decided by teacher	Innate – need to know benefits of knowing and consequences of not
Learner's self-concept	Dependent	Responsible of own decisions
Role of experience	Not important	Essential in defining learner and source of learning
Readiness to learn	Directed by teacher	Due to awareness and progression in development stages
Orientation to learning	Subject-centered	Life-/task-centered
Motivation	External	External and Internal

Conclusion

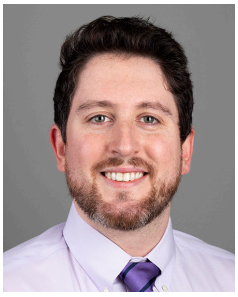
Table 1 provides a summary and comparison of the assumptions underlying these two educational models. It is essential to recognize that pedagogy and andragogy are not mutually exclusive but exist on a continuum, with different techniques being more appropriate at various stages of education. Evaluating the assumptions for each educational scenario can help create more effective learning experiences, particularly when working with adult learners.

Reference:

Malcolm S. Knowles, Elwood F. Holton III, Richard A. Swanson - The Adult Learner (7th Edition), Elsevier, 2011.

Cracking the Code: How Problem-Based Learning Transforms Education

Matthew Gao, MD
John Bellamente, MD



"Next time you experience awkward silence with a resident, remember to pull up one of the many PBLDs available and get to teaching."

As part of the Education Scholarly Program, "Train the Trainers", Drs. Matthew Gao and John Bellamente anesthesiologists at BIDMC Anesthesia, Critical Care and Pain Medicine delivered a presentation to introduce Problem Based Learning (PBLs) and their approach to incorporate PBL into anesthesiology education. With the widespread use of internet-based services, new approaches to post-graduate medical education are becoming available. In PBL, learners are challenged with a real-world problem and concepts are introduced as the solution takes shape. Through this form of active learning, several educational objectives can be achieved compared to more traditional teaching methods, i.e. lecture-based learning (see table 1). Since PBL is learner-centered, the role of the teacher is that of a moderator/facilitator to direct the learning process. In these sessions, teachers tailor discussions in a welcoming environment to encourage learners to raise questions and explore ideas. Learners can then investigate, collaborate, build on prior knowledge, and become motivated for self-directed learning at each session's end. Teachers play a crucial role in PBL, so proper training is paramount to a successful session.

Educational Method	Description	Likelihood of Meeting Educational Objectives			
		SCC	CRP	SDL	MOT
Lecture-based	Information presented as lectures, then cases are used to emphasize significant points	1	1	0	1
Case-based lecture	Cases are presented prior to lecture, then lecture covers relevant areas	2	2	0	2
Case-based discussions	Cases are presented prior to class discussion, then facilitated by a tutor	3	3	3	4
Modified-case based	Learners given some information, then decide on plan – more information given at conclusion	4	3	3	5
Problem based	Learners are presented with new patient problem and allowed to free inquiry	4	4	4	5
Closed loop	After problem solving, learners return to original problem for reevaluation and self-reflection	5	5	5	5

Table 1. Teaching methods, their descriptions, and how likely they are to meet educational objectives. 1 = unlikely to meet, 5 = very likely to meet. SCC: structured clinical context; CRP: clinical reasoning process; SDL: self-directed learning; MOT: motivation for learning.

The role of faculty in PBL is pivotal, serving as facilitators rather than traditional instructors. Faculty members guide students through the problem-solving process by providing support, posing probing questions, and helping them navigate complex clinical issues without directly supplying answers.

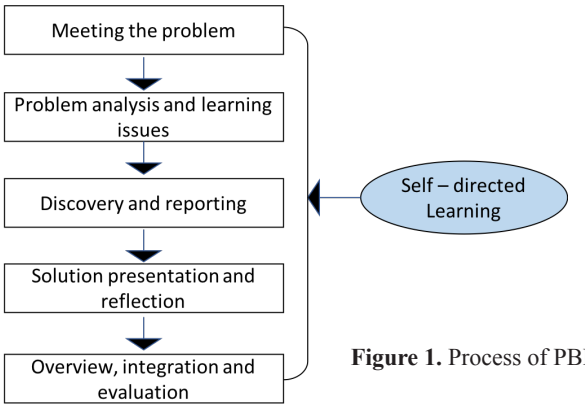


Figure 1. Process of PBL

"Master the art and science of imaging with oour ultrasound training course - where every lesson turns complexity into clarity and precision into practice."

From Concept to Reality: A Pathway to Certification in Ultrasound

Daniel McGrail, MD
Shirin Saeed, MD
Christina Short, BS
Yifan Bu, MD

We are excited to announce the launch of our comprehensive certification program in ultrasound, designed to enhance both knowledge and practical skills through a hybrid learning approach. The program begins with an online component featuring interactive knowledge tests, didactic materials, and a digital library of cases.

This virtual phase is done in parallel to in-person workshops and bedside teaching that integrates a cloud based software QPathe for secure storage and review of studies by expert mentors. This ensure continuous longitudinal learning and feedback. Upon successful completion of the program, participants will receive certification in ultrasound, affirming their expertise and readiness to excel in the field. Participants in the certification program are coached by a large cohort of local mentors to guide them through case review and provide tailored feedback. The curriculum is continually updated to reflect the latest advancements and best practices in ultrasound technology, ensuring that participants are always learning the most current techniques. Additionally, our program emphasizes a multidisciplinary approach, incorporating insights from medicine and emergency medicine to provide a well-rounded perspective. This dynamic combination of theory, practice, and mentorship prepares participants to not only master ultrasound but also to apply their skills effectively in diverse clinical settings.

Steps to Certification

[How to access Qpath and Docebo]

➢ Both Qpath and Docebo can be accessed from the Anesthesia Portal here.

[How to login to Qpath]

➢ Use your BIDMC portal login credentials to log onto Qpath.

If you have trouble logging in, please contact Christina Short (cshort1@bidmc.harvard.edu) or Shirin Saeed (ssaeed1@bidmc.harvard.edu).

A Bioethics and Professionalism Curriculum Framework for Anesthesiology Training Programs - PART ONE

Shahla Siddiqui, MD
Altan Marvi

According to Plato, the best medicine 'is practiced when the scientific and technical aspects of care are placed in the context of a personal and professional relationship in which the physician strives to win the patient's support and trust'[1]. In the pursuit of such holistic and timely medical care, or 'kairos' as Plato envisioned, there arise conflicting issues that can lead to ethical and moral dilemma. Healthcare professionals, including anesthesiologists face a multitude of such ethical dilemma daily[2]. With advances in medical technology and an increasingly diverse patient population, the field's need for clear ethical reasoning and ability to navigate complex situations is more critical than ever. Anesthesiologists have a wide area of representation in practice including the perioperative areas, operating rooms, such as the intensive care units, chronic pain centers, hospital floors for acute care and emergency rooms[3]. Additionally, we play an important role in academic research, medical education, medical boards, administration, leadership, journal review boards, etc. Difficult professional, ethical and communication issues may arise in each of these areas of work and place a moral challenge to our decision making[4]. The decisions we make based on our definition of "right or wrong" may affect the well-being of our patients, their families, our colleagues, and ourselves. The American Board of Anesthesiology (ABA) has set 'milestones' for competency assessment in ethical practice, as well as questions in the ABA board exams. In order to receive board certification, the resident has to display competence in these 'Ethics and Medico-legal issues'[5]. These skills include promoting the basic standards of practice for all residents so they can practice independently after graduation. **In order to master these core competencies, a formal ethics curriculum is essential in underpinning and understanding the issues and principles of ethical practice.**

In addition to training programs, the practice of ethics and professionalism is a life long requirement. Dealing with difficult decisions require skill, sensitivity and training. Unfortunately, our training programs lack any formal curriculum that incorporate such cognitive and communication training. The need for formal instruction in bioethics and professionalism is felt at all levels of practice; in a recent survey of trainees and program directors, less than half of the respondent (48%) reported any formal ethics training in their programs, at an average of only 3.8 +- 1.6 hours per year[6]. It is a well-known fact that communication gaps and lack of conflict resolution skills are one of the foremost causes of not just poor patient-physician relationships and trust bonds, poor patient satisfaction and outcomes, but also a leading cause of burnout. In the same survey, only 58% of respondents agreed that their residents were capable of managing ethical dilemmas upon graduation.

Barriers to coping with difficult ethical and moral scenarios in clinical practice include a lack of a structured curriculum, lack of experienced faculty, comfortable in teaching the basic values and principles of ethics and professionalism, application in day-to-day patient care, and lack of devoted time for such training[7]. Although most medical school curricula have integrated formal ethics training, such a format is also important in residency training programs[8].

Clinical scenarios and need for ethics training

Many of the underlying reasons of ethical problems encountered in everyday healthcare work are multifaceted, unfold over time, and are caused by factors such as a lack of resources, insufficient communication, hierarchical organizational structures, chaotic work environments, or a lack of

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"Ethics training: Where knowledge meets conscience to guide responsible action."

training. Ethical problems and value conflicts are inherent in clinical practice and commonly seen in the perioperative period. A common scenario is around code status change prior to surgery or intervention whereby a patient who are deemed 'do not resuscitate' (DNR) have their code status reversed to 'full'. This is commonly seen as breaching patient right to self-determination. Another issue arises in the case of brain-dead patients in the ICU, and the grief management, communication and acceptance by families and loved ones. Whatever the cause, ethical problems can lead to conflicts between patients, families and clinicians. Often these are directly impacted by conflicts in principles, values, communication and practice. This, in turn, might lead to compromised moral integrity and generate moral distress, as these reactions result from manifesting on the basis of one's own sense of right and wrong. Moral distress is a "negative emotional response that occurs when one knows the morally correct action but is prevented from taking it because of internal or external constraints." Moral distress in turn can lead to moral injury, which occurs as a result of "witnessing human suffering or failing to prevent outcomes that transgress deeply held beliefs".

Articles/Reviews/Guidelines

Virtual Reality Training for Central Venous Catheter Placement: An Interventional feasibility Study Incorporating Virtual Reality Into a Standard Training Curriculum of Novice Trainees

This study assess the feasibility of integrating virtual reality (VR) simulation into the central venous catheter (CVC) placement training curriculum. Novice trainees showed high satisfaction and perceived usefulness with VR training, particularly in understanding procedural steps and developing spatial awareness. Pilot integration of VVR training into the curriculum demonstrated comparable training times and emphasized structured stepwise training modules to ensure completion of vital procedural steps. This study underscores the potential of VVR simulation as a complementary training tool for CVC placement rather than a substitution of standard manikin training. VVR is offering immersive experiences and addressing limitations of traditional manikin-based training methods. The integration of VVR into training curricula warrants further exploration to optimize procedural proficiency and patient safety in clinical practice.

Association of Body Surface Area Versus Body Mass Index on Outcomes in Peripheral Arterial Disease

Numerous studies have indicated that increased obesity in patients with established peripheral artery disease (PVD) is inversely associated with disease prognosis, a phenomenon coined as the "obesity paradox". Major cause of criticism in studies investigating the obesity paradox is the use of body mass index (BMI) as a surrogate marker in defining and quantifying the degree or severity of obesity. We conducted a retrospective review to verify whether the obesity paradox persists in patients with PPVD when using body surface area (BSA) as an alternative anthropometric measure. Our data suggests that the obesity paradox persists in patients with PPVD when using either BBMI or BSAAas anthropometric measures. Future studies with a prospective design and utilizing newer anthropometric indices should be conducted to fully verify the presence of this phenomenon.

"Discovering new horizons in medical education through the lens of innovation."

INNOVATION IN EDUCATION

Routine In Situ Simulation Training

Lior Levy, MD,
Shirin Saeed, MD,
Peva Gbagornah, MD
Dario Winterton, MD
Adil Al Karim Manji, MD
Nadav Levy, MD

In situ simulation training in anesthesia involves conducting simulated scenarios within the actual clinical environment, allowing anesthesia providers to practice and refine their skills in a setting that closely mirrors real-world conditions. This approach enhances the relevance and immediacy of training by integrating simulations into the existing workflow and infrastructure of the operating room or anesthesia suite.

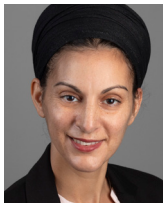
Once a week, we conducted in-situ, high-fidelity simulations in an operating room. Residents scheduled to our operating room during their workday were temporarily reassigned from their regular duties by their covering attending. Each resident participated in a 15-minute session featuring a tailored, focused simulated scenario designed to align with their training level. These scenarios were carefully crafted to emulate high risk situations to corresponding to each resident's training level. They encompassed skills ranging from basic airway management to the handling of patients in cardiac surgery, thoracic surgery and advanced procedures, necessitating quick and intricate decision making. These cases followed a specific order from l low complexity to high complexity in the following sessions to evaluate progress in each area. Over the last 11 months, we successfully conducted 520 individual sessions with an average of 10 sessions for each resident.

Literature Corner

Implementation of Routine In Situ Simulation in Residency Curriculum Targeting Competency in Technical and Decision Making Skills

"Precision training when you need it: Enhancing stellate ganglion block techniques on the spot."

DIVISION CORNER



Just In Time Training (JITT) for Stellate Ganglion Blocks (SGB) from the Arnold - Warfield Pain Center

Shiri Savir, MD
Sanjeet Narang, MD
Jyostna Nagda, MD

Click here to view SGB - Basic Anatomy

Click here to view SGB- Clinical Procedure

Click here to view JIT SGB Refresher Card

Quiz Yourself

Background: Stellate ganglion block is a technically Click here to view SGB - Basic complex procedure that requires precise anatomical knowledge and advanced ultrasound (US) skills. The complexity arises from the need to accurately identify the target point for injection, which is located near critical structures such as the vertebral artery, carotid artery, jugular vein, and esophagus. Additionally,the procedure demands meticulous needle placement and real-time visualization to avoid complications and ensure effective nerve blockade. SGB is indicated for multiple elective chronic pain syndromes such as complex regional pain syndrome, vasospastic disorders such as Raynaud's phenomenon, and symptoms of post-traumatic stress disorder (PTSD). Urgently, SGB is used to manage refractory ventricular tachycardia (VT) in patients that do not respond to medical management and/or ablation. Since SGB is not performed frequently, in addition to standard teaching during fellowship, it is crucial to train the trainee as well as faculty JITT to ensure the provider maintain proficiency in this technically complex intervention.

Methods: This was a quality improvement project to enhance trainee proficiency in performing a SGB for inpatients with refractory VT. An US guided SGB JITT was conducted including a basic knowledge and basic Technique- module together with quick refresher reference card summarizing key point and safety measurements of the procedure. Four residents and fellows on the Acute Pain Service (APS) in the main campus of our academic center, and were asked to perform an urgent SGB for refractory VT were asked to review the video, perform ultrasound guided examination on a live model for demonstrating ergonomic considerations, positioning and probe placement as well as identification of key structures of the block. The refresher card was reviewed before performing the procedure. The measurements including capability of identification of structures by trainee, number of attempts for block, amount of verbal and "hands on" faculty intervention were captured.

Results: The JITT was implemented among four trainees on the APS (two fellows and two residents). All trainees didn't have any experience in performing the block in a time interval of at least 4 months prior to performing the procedure. Following the implementation of JITT among four trainees, the identification of the anatomy was fast without the need for any guidance from attending. First attempt of injection was successful, no "hand on" intervention of faculty was required during the procedure. Some verbal guidance was required for 2 out of 4 procedures.

Conclusions: The implementation of Just-in-Time Training (JITT) significantly enhanced trainee proficiency in performing ultrasound-guided stellate ganglion blocks (SGB) for refractory ventricular tachycardia (VT). The focused training modules and refresher cards ensured that trainees could quickly and accurately identify critical anatomical structures, resulting in successful first-attempt injections. This quality improvement initiative demonstrates the importance of JITT in maintaining procedural competency for infrequently performed but high-stakes interventions like SGB, ultimately improving patient outcomes in urgent clinical scenarios.

DIVISION CORNER

Case Presentation from Vascular Division

Kaavya Mahajan, MD,
Riccardo Pinciroli, MD

50 y/o M (BMI 27) with PMHx HTN, ESRD 2/2 NSAID Toxicity and Primary HTN (Last Dialysis: 1 day prior to surgery), anemia, s/p L Brachial-Basilic AV fistula creation presenting for second stage of procedure to superficialize the fistula.

PSHx: L Brachial-Basilic AV fistula Creation (3/9/24 - MAC anesthesia & supraclavicular & intercostal brachial nerve block, nasal cannula, pre-op midazolam, propofol infusion, intermittent fentanyl boluses, procedure time - 2 hours)

Home Medications: amlodipine, carvedilol, epoetin alfa, calcium carbonate, B complex-folic acid

Allergies: NSAIDs"and peanuts

Labs: Access to pre-procedure labs limited, as patient reports receiving dialysis at the prison

Preoperative Evaluation:

- ➢ Medical history, allergies and NPO status confirmed
- ➢ Cardiopulmonary history was unremarkable, with a functional capacity >4 METS
- ➢ Patient denies overt symptoms of delayed gastric emptying at baseline
- ➢ No complications with anesthesia in the past
- ➢ Consented for MAC with regional anesthesia, GA as a back-up plan
- ➢ Supraclavicular Nerve block placed by APS
- ➢ Pre-op TTE, Gastric Ultrasound performed by primary anesthesia team

Click here to see preoperative ultrasound

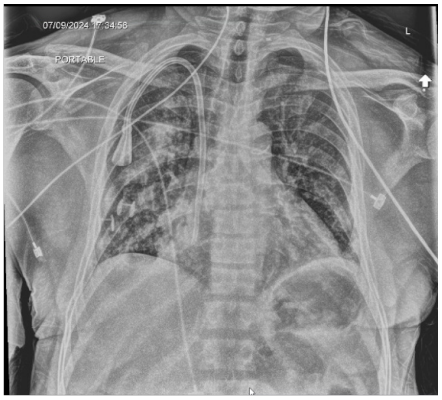
Intraoperative:

Uncomplicated induction of MAC anesthesia, with simple face mask → Maintained on propofol infusion 60-80 mcg kg min; received 2mg midaz, 100 mcg fentanyl, 20 mg ketamine, 20mcg dexmedetomidine → Episode of 30-50 ccs bilious emesis, with gradual desaturation to 85% on simple mask with 8L/min O2 ↓

Vascular surgery team notified, patient immediately suctioned with yankauer and passively oxygenated with 15L min O2 via anesthesia circuit → Saturation improve to 90%; anesthesia attending and floor manager on bedside to assist with emergent intubation due to concerns for aspiration → Bedside bronchoscopy and therapeutic BAL of the RUL and R Bronchus Intermedius performed; bilious emesis removed in corresponding areas

Hour 4
Bedside bronchoscopy re-performed with evidence of patent upper and lower airways → OGT placed and stomach suctioned with 50 ccs billious secretions → **Hour 5**
Patient extubated fully awake, in upright position to simple face mask 6L min O2, with recovery in the PACU

"Scientific advancements in regional anesthesia: Pioneering targeted interventions for refined pain management."



CXR in PACU concerning for new R midlung and lower lung airspace consolidation suggestive of pneumnia

Transferred from PACU to the med-surg wards on nasal cannula 2L/min O2

CXR on POD #4 with decreased patchy opacities in lower lung fields, resolved vascular congestion

Gradually weaned from nasal cannula 2-3L/min O2 during this admission to room air by POD #4

Started on IV Ampicillin-Sulbactam

Despite adequate fasting intervals, patients with a history of CKD are at high risk for aspiration due to delayed gastric emptying. In CKD, there is a clear underreporting of digestive pathologies due to the lack of knowledge of the mechanisms that lead to a wide range of symptoms.[1] Presence of peripheral neuropathy should alert providers about the possible risk of co-existent autonomic neuropathy and delayed gastric emptying. Pain, trauma or stress can precipitate transient gastroparesis in patients undergoing surgery. Risk of aspiration is increased with induction and emergence of anesthesia. Aspiration of gastric acid content and bacteria from oropharyngeal areas can lead to chemical pneumonitis, aspiration pneumonia, airway obstruction and ARDS.

Anesthetic Considerations for Patients with Renal Failure to Minimize Aspiration Risk

1. All patients with chronic renal failure should be treated as if they have an increased risk for aspiration[2], irrespective of pre-operative gastric ultrasound findings.
2. Gastric aspiration prophylaxis can be achieved using preoperative sodium citrate, metoclopramide, HH2 blockers, rapid induction of GA.
3. Sedative and anesthetic doses should be reduced 30 to 50% to minimize intra-operative respiratory depression and loss of protective airway reflexes.[2]
4. If patient undergoing GETA, maximize pre-oxygenation time, avoid bag mask ventilation, perform rapid sequence intubation with cricoid pressure
5. Access to functional suction irrespective of anesthetic modality used
6. Consider immediate intubation after vomiting event given risk of repeat emesis
7. Low threshold to perform bronchoscopy to suction aspirated contents
8. Consider the use of nasogastric or orogastric tube to decompress the stomach prior to wake-up
9. Plan for awake extubation after restoration of airway reflexes in right lateral positioning
10. Continue to monitor for aspiration in the postoperative period

References:

1. Shivraj S, Venugopal K. Gastrointestinal manifestations in patients with chronic kidney disease. AcademiaJ Med. 2019;2:54-59.
2. Sladen RN. Anesthetic considerations for the patient with renal failure. Anesthesiol Clin North Am. 2000Dec;18(4):863-82, x. doi: 10.1016/s0889-8537(05)70199-1. PMID: 11094695.

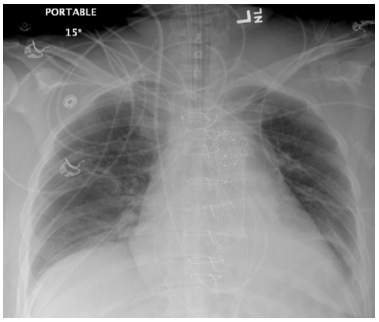
"Echo Corner: Transforming Echo Insights into Clinical Mastery."

ECHO CORNER

Case by Case Insights into Advanced Echocardiographic Diagnostics

Feroze Mahmood, MD

A 55 year old male underwent coroanry artery bypass grafting and had an uneventful recovery in ICU. On post operative day 2, the pacing wire was removed.



Two hours after removal, the following are seen.

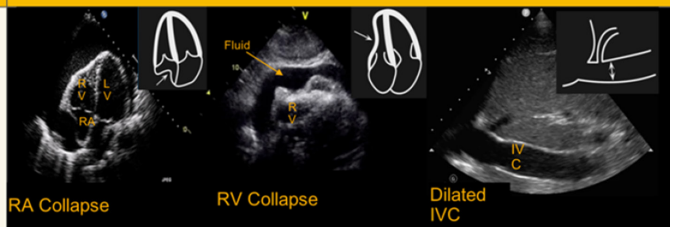
Vital Signs: SpO2 95% on FIO2 100%, HR 96, BP 85/44 on levo-phed 0.04 mcg/kg/min

Physical Examination: Jugular venous distension, muffled heart sounds and bilateral crackles on auscultation

Labs:Arterial blood gases: 6.9/66/57/ base excess -17 on FIO2 100%, mixed venous oxygen 21

Click here to view Transthoracic Echocardiography Imaging and Generate Report

Click here to view an interactive module on evaluation of pericardial effusion and tamponade!

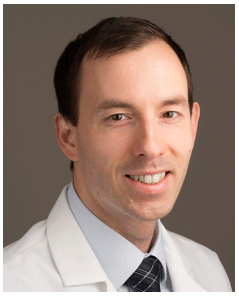
Pathology	Key points	View
Tamponade	• Systolic RA collapse • Diastolic RV collapse • Dilated IVC • Deviated septum • Hypoechoic fluid in pericardial cavity	

Causes of hemodynamic instability

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), hyperdynamic LV
Hypovolemia	Subjective assessment, 'kissing papillary muscles' sign, decreased EDA and ESA, IVC diameter <2 cm and inspiratory collapse > 50%

"Scientific advancements in regional anesthesia: Pioneering targeted interventions for refined pain management."

REGIONAL CORNER



Optimization of Supraclavicular Block for Upper Extremity Anesthesia: Evidence-Based Approaches

Andrey Rakalin, MD

A 35-year-old male presents with a distal radius fracture, as confirmed by X-ray. His vital signs are as follows: blood pressure 120/80 mmHg, heart rate 80 beats per minute, respiratory rate 16 breaths per minute, and oxygen saturation 98% on room air. Given these stable vital signs and the need for effective analgesia, which regional block would be most appropriate for this case?

Introduction

The supraclavicular block is useful for upper extremity surgery on the arm, elbow, forearm, wrist, and hand. The higher success rate and quicker onset of block has led to its name as "the spinal of the arm". The bony and prominent clavicle and the curved contour can make imaging a challenge at the level of the base of the neck.

Anatomy

1. The subclavian artery crosses over the first rib between the insertions of the anterior and middle scalene muscles, at mid-point of the clavicle.
2. The brachial plexus can be seen as a bundle of hypoechoic round nodules just lateral and posterior to the artery.
3. By changing the angle of the probe, the brachial plexus can appear as oval or flattened structure. It is usually 1-2cm deep. The first rib has echogenic shadow. Medial to the first rib there is echogenic pleura.
4. The neurovascular bundle passes underneath the middle third of the clavicle.
5. The brachial plexus at this level is usually located postero-lateral to the subclavian artery.
6. The three trunks of the brachial plexus carry the entire sensory, motor and sympathetic innervation of the upper extremity, with exception of the uppermost part of the medial side of the arm (T2).
7. . This block is performed in the distal trunks and proximal divisions where the brachial plexus is most compact.It results in anesthesia of C5 to T1 dermatome. Both rib and pleura appear as hyperechoic linear area, but they can be differentiated as follows:

There is a dark anechoic area under the first rib (acoustic shadow) and there is no movement with respiration. In contrast, the hyperechoic pleural surface is a brighter shimmering area that moves with respiration.

Position

1. The patient can be placed in a semi-sitting or supine position with their head turned slightly away from the side in which the block will be placed.
2. The arm is in neutral position with the shoulders relaxed.
3. The patient can also be placed in the semi-fowlers position where the patient is lying supine but with the head of the bed raised at about 30o.
4. Again, the head should be rotated away from puncture site and arm resting in a neutral position on the side with wrist supinated.

Preparation

Clean the injection site with chlorhexidine or iodine

Equipment

Typically, a 22G 50mm insulated needle is the most appropriate. Use a high frequency (>10MHz) linear probe to image the site.

Transducer

Place the probe in a transverse orientation on the neck, just superior to the clavicle at midpoint. It should point caudally.

Click here to view ultrasound anatomy and illustration of supraclavicular block.

Technique

For scanning above the clavicle, a linear probe is placed parallel to the clavicle and the needle is introduced laterally towards the midline, in-plane. The brachial plexus can be scanned and followed across the cervical region from its supraclavicular position and then cephalad to the interscalene groove. The transducer is tilted slightly inferiorly rather than perpendicular to the shin. Your Position: Next to the patient, close to the shoulder. To perform the block, advance the needle from lateral aspect via in-plane approach. After negative aspiration inject 20-25cc of local injection. Avoid high resistance to injection to reduce the risk of intraneural injection. The mean anesthetic volume used is 20-30 mL for single injection. The local anesthetic spreads around brachial plexus, lateral and superficial to the subclavian artery. This is adequate for anesthesia or the upper limb below the shoulder.

Complications

Phrenic nerve block

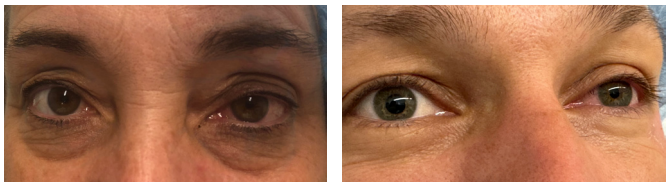
Horner's syndrome

Recurrent laryngeal nerve paralysis

Vascular puncture

Pneumothorax

Neurological deficits



Horner Syndrome

Relative Contraindications

Relative contraindications include coagulopathy or respiratory compromise because of the risk of pneumothorax and phrenic nerve paralysis.

Absolute Contraindications

Absolute contraindications include patient refusal, allergy to local anesthetics, and infection or cellulitis at the injection site.

Clinical Pearls

When the needle is introduced under ultrasound guidance, the artery must be visible at all times. Identify the first rib and differentiate it from the pleural surface before needle advancement Needle tip should not disappear below the clavicle and should not be advanced medial to the artery. It is nece sary to make small readjustments of needle tip position to ensure local anesthetic spread to the 3 trunks. Injection of local anesthetic will result in swelling of the sheath and separation of the nerves. The medial skin of the upper arm (intercostobrachial, T2) is not anesthetized and therefore it may need to be blocked separately. The musculocutaneous nerve is blocked to cover the medial skin of the upper limb.

Quiz Yourself

Audio & Visual Lesson

Check out case one here.

We have compiled cases for quick review of ***ECG and rhythm interpretations*** for efficient learning and skill enhancement.

ECG and Rhythms Interpretation

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