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In This Issue

Advancing the science and practice of regional anesthesiology and pain medicine to improve patient outcomes through research, education, and advocacy

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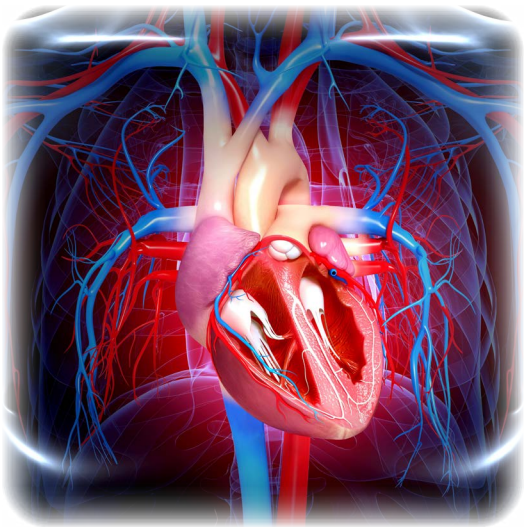

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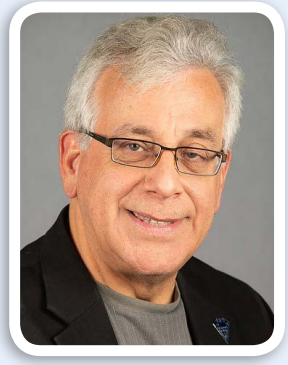
Inclusivity, Diversity, and ASRA's Celebration of the Year of Women in ASRA

During the June 2019 ASRA Board of Directors meeting, we passed a resolution of inclusivity acknowledging a long-held position: ASRA unequivocally embraces an inclusive environment and supports diversity of thought, gender, appearance, orientation, physical ability, and practice. Issuing a statement such as this changes the equation. In doing so, ASRA's leadership acknowledges that it will "walk the walk" of diversity, making a conscious effort to achieve appropriate representation of qualified and interested individuals, including women, racial or ethnic minorities, and other individuals in our ranks.

Women are underrepresented in our specialty, and ASRA is committed to improving mentorship and support. The 18th Annual Pain Medicine Meeting represents an effort to better balance the representation of women. Andrea Nicol, MD, chair of this November's meeting, has done an amazing job virtually eliminating "manels," or men-only panels. For the first time, you will see women-only panels! Andrea has done so with incredibly talented individuals, some who are new but, we hope, no longer strangers to ASRA. We are truly "stronger together," which is our theme for the fall meeting.

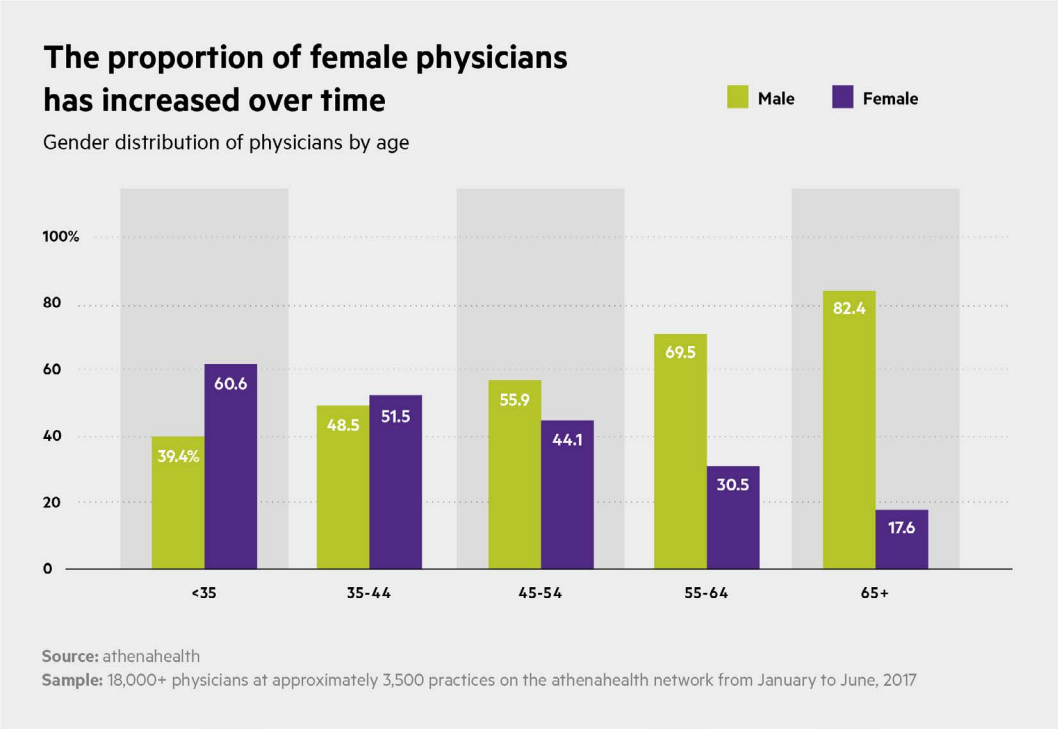


Eugene R. Viscusi, MD
ASRA President

Diversity is a current conversation in medicine and specifically in anesthesia. Very recent studies specifically demonstrate that women will continue to represent a growing force in the future practice of anesthesiology and research.[1,2]

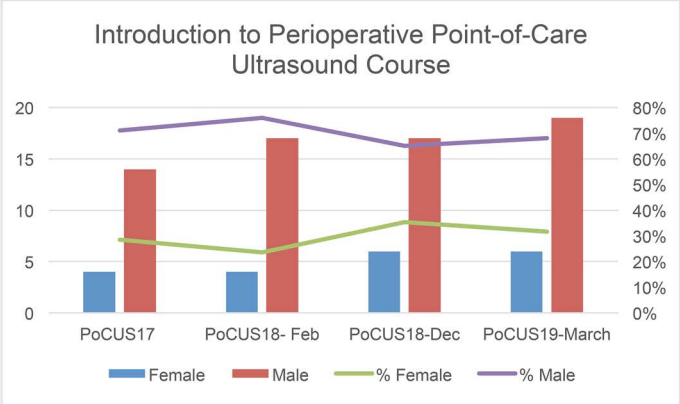
We see that here at ASRA as well. Of the 68% of ASRA members who report their gender, 25% are female and 75% are male, and therefore reflect the percentage of currently practicing anesthesiologists reported in the literature.[3] The American Society of Anesthesiologists reports that 18% of their 4,551 board-certified pain medicine anesthesiologists are female. However, younger anesthesiologists are estimated to represent a higher percentage of women, with 38% being female.[3] One 2016 study reported that 35% of anesthesiologist trainees are women and that the proportion of female physicians in any specialty is now larger than that of males.[4] Although we are doing well in reflecting our profession, ASRA can do better (Figures 1-3).

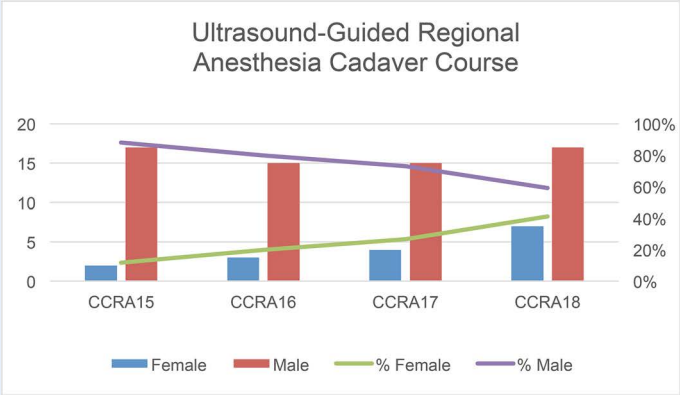
Figure 1: *The proportion of female physicians has increased over time.*

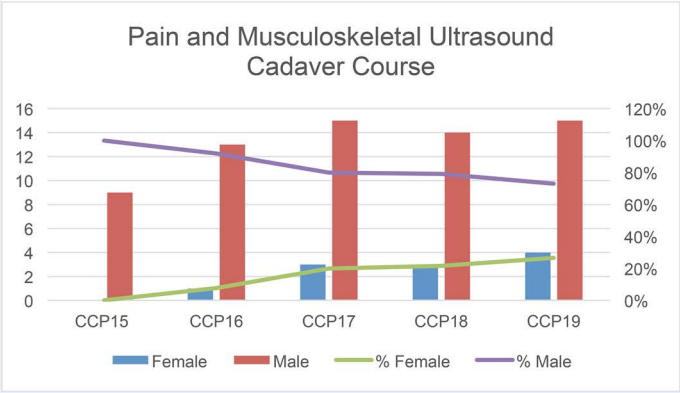


From: Johnson M. The healthcare future is female. AthenaInsight. https://www.athenahealth.com/insight/health-care-future-female. Updated February 14, 2018. Accessed September 25, 2019. Used with permission.

Figure 2: *The proportion of female faculty members has increased for freestanding courses.*



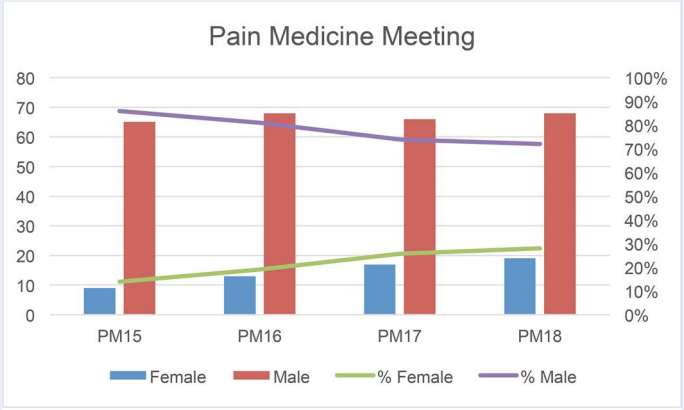


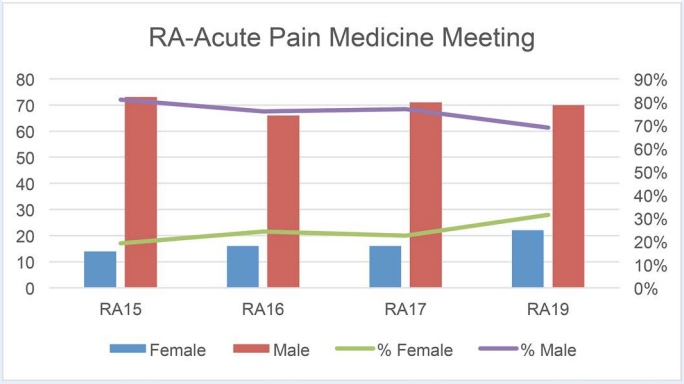


The Society can also do better as we consider meeting faculty and award recipients. Of the 460 ASRA annual meeting faculty members since 2015, we have had 354 male (77%) and 106 female (23%) faculty. Further evaluation reveals that as ASRA leadership has become more aware of equity issues, our commitment to gender diversity has improved. As of this writing, 3 of our 11 board members are women in 2020.

ASRA has done best with gender representation at our freestanding courses. Currently, women represent 30% of faculty for the

Figure 3: *The proportion of female faculty members has increased at annual meetings.*





Introduction to Perioperative Point-of-Care Ultrasound course, 41% of faculty for the Ultrasound-Guided Regional Anesthesia Cadaver Course, and 27% of the faculty for the Musculoskeletal and Pain Ultrasound Cadaver Course (Figure 2).

We have and will continue to improve faculty gender diversity at our annual meetings. Specifically, for the 17th Annual Pain Medicine Meeting in 2018, 19% of faculty were women. At the Annual Regional Anesthesiology and Acute Pain Medicine Meeting in 2019, 22% of faculty were women (Figure 3).

ASRA has become more intentional with ensuring diversity while maintaining the highest educational quality. Although we have openly discussed the need to avoid “manels” or men-only panels, we will strive to maintain the highest-quality faculty. If that requires a single-gender faculty (male or female), we will move forward and select the faculty that represent the highest level of expertise and teaching ability. The contemporary difference is that final decisions will now occur following significant conscience consideration and exhaustive investigation.

We also recognize imbalances with the awards process. In 2019, only 3 of the 35 Distinguished Service Awards (DSAs) recipients

were women; only 2 of 33 John Bonica Awards were given to women, and only 3 of 46 Gaston Labat Award recipients were women. Neither of the two Presidential Scholar awards were given to women. Recognizing some implicit bias in the process, we have relaxed the timeframe requirements on some awards and grants to allow for career breaks for significant life events such as caring for family and maternity or paternity leave. We also point out the importance of members nominating women for the awards. Moving forward, the Board also has agreed that the DSA could be awarded up to two times a year to allow for additional recognition of deserving members.

ASRA leadership is significantly diverse and a source of future optimism. Women represent 30% of all committee members and 35% of all resident section members. Even more specifically, 33% of those who applied and were appointed for committee positions for 2019 were women. Women hold 42% of all special interest group (SIG) leadership roles. A recent study of *ASRA News* authorship found that 48% of authors in 2018 were women.[5]

ASRA has taken the unprecedented step to identify 2020 as the Year of Women in ASRA to recognize the achievements of women in the Society and the specialties of acute and chronic pain and regional anesthesia. We particularly want to acknowledge women who have not or may not have achieved recognition in the past. Many are true trailblazers, and we hope to celebrate those who made unique contributions with an ASRA Trailblazers Award during 2020.

Do not look at these steps as patronizing or negative; rather, they serve to recognize where we are today and show by our actions our commitment to being more inclusive and engaging moving forward. The initiative's ultimate outcome is broadened opportunities for all ASRA members.

Recognizing the need for inclusivity is really just a start. It must be a grassroots effort also taken up by committees, SIGs, and membership to encourage and mentor a more diverse specialty. The Women in Regional Anesthesia and Pain Medicine SIG has taken a lead to support and mentor women striving to develop a career in acute and chronic pain and regional anesthesia. Making ASRA a more diverse and inclusive society will depend on a long-term plan, bringing new and bright young people to the Society, mentoring them, and providing an opportunity for them to demonstrate the value of a diverse and balanced society. For now, let us recognize and celebrate the achievements of women in ASRA and, most of all, personally thank them for being trailblazers.

Note: The ASRA Trailblazer Awards, recognizing female leaders in regional anesthesia and pain medicine, is now accepting nominations at www.asra.com/trailblazers. The deadline to apply is January 15, 2020.

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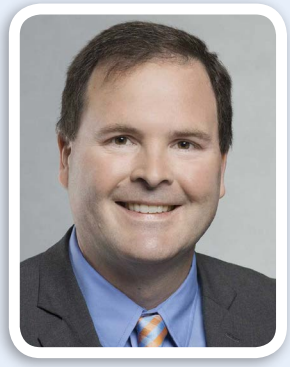
This Fall, Have a Heart

We've seen a tremendous focus on regional anesthesia procedures that might be useful in the setting of cardiac surgery or in terminating aberrant arrhythmias in the August and November issues of *ASRA News,* and our authors should be commended for their attention and dedication to this often-overlooked patient group. The creation of the Regional Anesthesia Cardiothoracic Enhanced Recovery Special Interest Group is further evidence of the resources that ASRA has devoted to the provision of regional anesthesia services for cardiac surgery patients.

Despite some impressive advancements, mustering the "heart" we once had for the practice of medicine or provision of sympathetic and empathic care for particularly challenging patient populations can be difficult, especially when pain- and opioid-related issues are involved. Those patients may be incredibly complex to medically manage, consume considerable time and material resources, and negatively affect a physician's ability to maintain empathy for patients' medical or social conditions, ultimately increasing the risk of burnout.



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WHY EMPATHY MATTERS

Empathy represents an understanding of or sharing the feelings or perspective of another person and is core to developing a therapeutic relationship.[1] Alternative definitions have called empathy the ability to "see the world as others see it, be nonjudgmental, understand the feelings of others, and communicate the understanding."[2] Empathy is also described as being at "the heart of patient care and without it, physicians cannot meet the expectations of our calling, measured or not."[3] Unfortunately, there is a growing sentiment that the ability of providers to deliver health care in an empathic manner is under attack and may be significantly responsible for the increase in physician job-related burnout.[4]

"It is imperative that we recognize our patients' vulnerability and strive to retain or rebuild our dedication to providing empathic patient care."

Certain specialties (obstetrics-gynecology, pediatrics, psychiatry, and thoracic surgery), female gender, and those with a doctor of osteopathic medicine degree appear to possess increased levels of empathy for their patients.[5] Unfortunately, a lack of perceived empathy can be associated with a number of potential adverse consequences for both patients and providers. When patients sense a lack of physician empathy, they may be significantly more likely to be noncompliant with medical advice.[6] In contrast, providers with higher levels of perceived empathy may be more likely to score higher on patient satisfaction surveys.[5] Within anesthesia, delivering information in an empathic manner to women presenting for gynecologic surgery was shown to improve their perception of the anesthesiologist's attitude and quality of the information.[7]

BUT WHAT ABOUT BURNOUT?

Burnout is described as feelings of physical depletion; helplessness; negative self-concept; negative attitudes toward work, life, and others; emotional exhaustion; depersonalization; and negative personal accomplishment.[1,8] Although any career has the potential to result in burnout symptoms (13–27% in the general population), physicians appear to be particularly susceptible, with rates reported to approach 70%. High degrees of job-related burnout have been associated with decreases in quality of patient care and increases in patient dissatisfaction, medical errors, lawsuits, employment attrition, and the number of workdays lost to illness.[1,6]

The interplay between burnout and empathy appears to be fairly complex. Alternating theories have proposed that high levels of burnout may result in a diminished ability to demonstrate empathy. However, diminished empathy might be a self-protective mechanism to minimize the development of burnout. Empathy and burnout may also have an inverse relationship: as empathy increases, burnout symptoms decrease, or vice versa.

Although the provision of compassionate and empathic patient care seems like a simple concept, it might be incredibly difficult at times. We collectively suffer from job-related stress and burnout from many angles: electronic medical record requirements, burgeoning clinical demands, increasingly complex patients, legislative issues, or others minimizing our expertise and value; all are a constant source of background job-related stress. Given their own struggles, physicians may find it challenging to reflect on the difficulties and stressors that others encounter. In certain circumstances, physicians may intentionally depersonalize patients as an act of self-preservation when they find that the collective emotional burden of patient suffering is too much to shoulder.

STRATEGIES FOR EMPATHIC PATIENT CARE

So, what can be done? As providers of analgesia (acute and chronic), it is imperative that we recognize our patients' vulnerability and strive to retain or rebuild our dedication to

providing empathic patient care. As I've outlined, this might be an incredibly challenging proposition, but it may pay profound dividends for you (improved provider well-being, decreased burnout, improved patient satisfaction scores) and your patients (improved outcomes, improved adherence). A few strategies might improve our collective ability to provide empathic patient care. Previous research demonstrated that brief empathy training sessions might have a significant impact on patient perceptions of physician empathy.[9] Being mindful of barriers to empathic care or seeking out opportunities to learn the struggles patients are encountering may help to improve patient care.

Likewise, working on being empathic toward other people in your life can have benefits. First, try to consider how your long hours might affect your family and the sacrifices they made to buoy your career (thank you, Carrie, Cora, Rose, and Evie). Consider the difficulties that the nurses that you work with encounter and the impact that the physical demands of their job and increasing regulations might have on their career satisfaction. Consider how your anesthesia colleagues are experiencing the same work-related stress as you and how you might be able to improve their day by providing them with a break or pitching in when their clinical demands become overwhelming. Perhaps even take a little time to consider why a surgeon might seem so unreasonable. Is he or she stressed, knowing that an operating room delay prevents him or her from attending a patient-family conference or will make a whole clinic of patients upset over appointment delays or cancellations?

We have no easy answers. However, this fall I encourage you to be mindful of your ability to practice medicine and interact with colleagues while providing empathy to those who cross your path. Improving your ability to do so will improve your relationship with patients, the care that they receive, and your career satisfaction.

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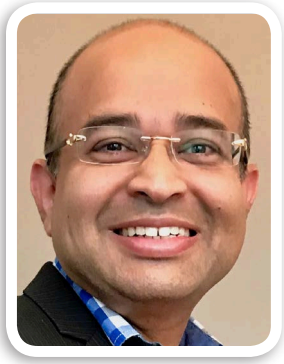
Curb Your Enthusiasm: Erector Spinae Plane Block—"Because It Is Easy" Is Not a Good Reason to Do It!



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Since the erector spinae plane (ESP) block was first described for the treatment of thoracic neuropathic pain by Forero et al[1] in 2016, more than 200 articles have been published about the procedure. Most are positive case studies or case series reporting its analgesic efficacy for clinical indications ranging from tension headache to transfemoral knee amputation.[2,3] This is reminiscent of the enthusiasm that initially existed with the introduction of the transversus abdominis plane (TAP) block.[4,5] The TAP block emerged amid a plethora of encouraging case reports and case series. However, after randomized, controlled trials (RCTs) and systematic reviews were conducted, its efficacy was found to be moderate at best.[6] Based on clinical experience and medical literature reports, clinical indications remain for the provision of TAP but the widespread application has certainly diminished.[7]

The advantage of most, albeit not all, interfascial plane blocks is their superficial nature, which makes them a popular option for patients who are coagulopathic or those with a high chance of requiring postoperative anticoagulation. Therefore, they can be offered as a rescue when the gold standard (epidural analgesia) cannot be used. In those scenarios, an interfascial plane block may be somewhat superior in terms of analgesic efficacy than no regional technique. One such example would be for an obese individual with a history of pulmonary embolism on anticoagulant therapy who presents with multiple rib fractures and respiratory compromise. In this situation, the patient could be offered an ESP as part of a multimodal analgesic regimen that aims to reduce opioid doses as well as oxygen requirements and intensive care unit admission.

Providers may have a false sense of security that interfascial plane blocks are safer than potential alternative procedures, but bowel puncture,[8] rectus sheath hematoma,[9] and pneumothorax[10] have all been described in TAP, rectus sheath, and ESP blocks, respectively. The risks of associated adverse events tend to be underreported.

Nonetheless, ESP blocks may be useful in certain situations in the era of minimally invasive surgery. Laparoscopic bowel surgery may be less painful than open laparotomy; therefore, when analyzing the risk-benefit ratio, the risk of performing an epidural may outweigh the benefit of its superior analgesic effect. Despite the possible risks with ESP blocks, they are likely less detrimental when compared to potentially catastrophic neurologic side effects from an epidural. Perhaps there is such a thing as "minimally invasive" regional anesthesia.[11]

However, any novel intervention should be rigorously tested for efficacy prior to widespread application and adoption into clinical practice. Diminished risks of adverse outcomes or complications are not a good indication for use of novel techniques as an alternative to more time-tested interventions. In the setting of limited efficacy evidence, clinicians should question whether an intervention is necessary at all, considering that each intervention is associated with some risk and economic impact. In the case of ESP blocks, the cost may be in the form of valuable operating or block room time, staffing, equipment, and follow-up. ESP blocks are still an invasive procedure.

"Any novel intervention should be rigorously tested for efficacy prior to widespread application and adoption into clinical practice."

The gold standard for testing the efficacy of an intervention is a well-conducted RCT.[12] RCTs are challenging to conduct with ever-increasing regulatory requirements necessitating abundant personnel resources and funding. Further, ethical considerations are associated with randomization if patients might be randomized to placebo. However, a clinical equipoise should justify those efforts. Unfortunately, the scientific community sometimes gets carried away and accepts weaker levels of evidence such as cadaver studies, case reports, and observational studies when RCTs are possible and justified. Cadaver studies can provide proof of concept, case reports are associated with high publication bias, and observational studies suffer from confounding issues.

A literature search of key databases MEDLINE, Embase, and Cochrane CENTRAL for ESP block in July 2019 yielded 526 citations. Most were cadaver studies, case reports, and case series. However, we identified 16 RCTs investigating ESP block published

Table 1: *Randomized, controlled trials of erector spinae plane (ESP) block.*

Study	Population	N	Intervention	Control	Findings	Analgesic benefit
Aksu et al, 2019[13]	Pediatric lower abdominal surgery	60	ESP block at L1 level using 0.5 mL/kg 0.25% bupivacaine (max 20 mL)	QLB transmuscular approach was performed preoperatively using 0.5 mL/kg 0.25% bupivacaine (max 20 mL)	No difference was seen in Face, Legs, Activity, Cry, and Consolability scores at 0, 1, 3, or 6 hr postoperatively. No significant difference was determined in times to first analgesia between the groups ($p > .05$).	No difference
Aksu et al, 2019[14]	Laparoscopic cholecystectomy	46	ESP block with 20 mL 0.25% bupivacaine	No block	Mean morphine consumptions at 24 hr postoperatively were 7.5 mg in the ESP group and 13.2 mg in the control group. The groups also had a significant difference for NRS scores at 12 and 24 hr.	Marginal reduction in opioid use and NRS score in the short term
Altlparmak et al, 2019[15]	Mastectomy	42	ESP block with 0.375% bupivacaine	ESP block with 0.25% bupivacaine	The mean tramadol consumption at 24 hr was lower in the 0.25% group. In the 0.375% group, the NRS scores were significantly lower at every time point than in the 0.25% group.	Favors 0.375% bupivacaine
Altlparmak et al, 2019[16]	Radical mastectomy	38	ESP block	Modified PECS	Postoperative tramadol consumption was lower in the PECS group than the ESP group. Median NRS scores were significantly lower in the PECS group at 1, 2, 12, and 24 hr postoperatively than in the ESP group.	Favors PECS block
Altlparmak et al, 2019[17]	Laparoscopic cholecystectomy	68	ESP block	ScTAP	Postoperative tramadol consumption was lower in the ESP group (mean difference 60.29 mg). Integration of area under the curve revealed no timewise difference between groups even though NRS scores by themselves and timewise linear area-under-curve scores were higher in the ScTAP group than in the ESP group.	Marginally favors ESP block
Ciftci et al, 2019[18]	Video-assisted thoracic surgery	60	ESP block	No block	Opioid consumption at 1, 2, 4, 8, 16, and 24 hr postoperatively and the active and passive VAS scores at 0, 2, 4, 8, 16, and 24 hr were statistically lower in the ESP block group.	Favors ESP block
Gaballah et al, 2019[19]	Video-assisted thoracoscopy	60	ESP block	SPB	The ESP group showed significantly lower VAS pain scores (rest and movement) than the SPB group from 4–6 hr postoperatively. The time for first required analgesic was significantly longer in the ESP group.	Favors ESP block
Gurkan et al, 2018[20]	Breast surgery	50	ESP block with 20 mL 0.25% bupivacaine at the T4 level	No block	24-hr postoperative morphine consumption was lower in the ESP group. No statistically significant difference was seen between the groups in terms of NRS scores.	No difference in pain scores; marginal reduction in opioid use with block
Krishna et al, 2019[21]	Adult cardiac surgery	106	ESP block at T6 level with 3 mg/kg of 0.375% ropivacaine	No block	The ESP group had better pain control, lower opioid requirement, and earlier time to extubation.	Favors ESP block
Oksuz et al, 2019[22]	Reduction mammoplasty	44	ESP block	Tumescent anesthesia (local anesthetic infiltration)	At 1, 2, 4, 6, 12, and 24 hr postoperatively, the pain scores and additional analgesic requirement were lower in the ESP group.	Favors ESP block

Table 1: *Continued*

Study	Population	N	Intervention	Control	Findings	Analgesic benefit
Singh et al, 2019[23]	Lumbar spine surgery	40	ESP block	No block	Pain scores (and morphine consumption) immediately after surgery ($p = .002$) and at 6 hr after surgery ($p = .040$) were lower in the ESP block group than in the control group.	Favors ESP block
Singh et al, 2019[24]	Modified radical mastectomy	40	ESP block	No block	Postoperative morphine consumption and first 8-hr pain scores were significantly less in patients receiving ultrasound-guided ESP block.	Favors ESP block
Tulgar et al, 2018[25]	Laparoscopic cholecystectomy	40	ESP block	ScTAP	No difference in NRS score between the block groups at any time point. Rescue analgesia requirements during the first 12 hr were statistically significantly higher in the control group.	No difference in pain scores; marginal reduction in opioid use
Tulgar et al, 2018[26]	Laparoscopic cholecystectomy	36	ESP block	No block	No difference was seen in NRS scores at any time points (except 3 hr). Tramadol consumption was lower in the block group during the first 12 hours.	No difference in pain scores; marginal reduction in opioid use in the short term block
Tulgar et al, 2018[27]	Hip and proximal femur surgery	60	ESP block	QLB	ESP block and QLB have similar analgesia.	No difference
Yayik et al, 2018[28]	Lumbar discectomy	60	ESP block at L3 with 20 mL of 0.25% bupivacaine	Sham block	Postoperative fentanyl consumption and VAS scores were lower in ESP group. Time to first analgesic request was longer in the ESP group.	Favors ESP block

NRS, numeric rating scale; PECS, pectoral nerve block; QLB, quadratus lumborum block; ScTAP, subcostal transverse abdominal plane; SPB, serratus plane block; VAS, visual analog scale

in the past 5 years. The RCTs were fairly heterogeneous in terms of surgical population, ESP technique, dose and type of local anesthetic used, and the comparator. Table 1 shows the RCTs' key findings.

To summarize the RCT findings, the ESP block has been compared with either no block or another fascial plane block, such as pectoralis nerve (PECS) block, serratus plane block, subcostal TAP block, or quadratus lumborum block, for postoperative analgesia following various surgical procedures. All of the studies used a single injection technique. Most of the RCTs were single centered, had a small sample size, and had an uncertain or high risk of bias.

As with all new techniques, the possibility of publication bias cannot be ruled out. Studies with positive findings are more likely to be published and are likely to be published earlier than the studies with negative findings. When interpreting results, it is important to focus on patient-centered outcomes. Although a reduction in pain and opioid-related adverse effects are important outcomes from a patient perspective, reduction in short-term opioid use is a surrogate and should be considered less important. Smaller studies either tend to poorly report opioid-related adverse effects or are not powered to detect a difference between the groups for that outcome. In terms of analgesic efficacy, ESP blocks appeared to provide marginal analgesic benefit when compared to no block. The results of comparison of ESP block to other fascial plane blocks were somewhat mixed: some studies favored ESP block, others showed no difference, and one study favored PECS block. The efficacy data in comparison to epidural or paravertebral analgesia were lacking.

Recently, an interesting concept regarding an ESP block's ability to affect the integrity and support of the spine has been proposed. Researchers suggested that large volumes of local anesthetic might spread across six to eight spinal levels, induce paraspinal muscle and interspinous ligament relaxation, and increase the risk of significant spinal instability.[29]

Following a thorough evaluation of all the available literature, we recommend caution prior to offering an ESP block as an alternative for pain management when well-established and highly effective techniques such as epidural analgesia or paravertebral blocks are available. The limited documented efficacy of fascial plane blocks should be considered and disclosed to patients if a planned surgical

procedure is known to be associated with moderate to severe pain. Furthermore, some of the fascial plane blocks like PECS, serratus plane, and subcostal TAP blocks are more conveniently performed with the patient in a supine position following the induction of general anesthesia, whereas ESP requires access to the back (ie, lateral or sitting position).

"You win some, you lose some" appears to be very true in ESP block efficacy, especially when comparing ESP to traditional modes of analgesia with a better presence in the published literature. Patient preference and planned surgical approach are crucial to maximize the potential benefits of ESP blocks. Patients scheduled to undergo minimally invasive surgeries expected to produce minimal postoperative pain or patients interested in receiving an ESP as a last resort rescue block may still benefit from an ESP block. Multimodal analgesic regimens are still required with ESP blocks in most case reports or case series and may represent the etiology for reported block efficacy. The mechanism of action of ESP blocks remains unknown, and the uncertainty extends to the pharmacodynamics of deposited local anesthetics. Could the marginal analgesic of ESP blocks be simply related to systemic absorption of local anesthetic? Therefore, caution is advised when determining the dosage of local anesthetic, especially for patients at elevated risk for the development of local anesthetic systemic toxicity (eg, patients with hepatic failure, low cardiac output).

As clinicians, we like to practice evidence-based medicine. We urge pain physicians to "stop before the block" and evaluate the risk-benefit ratio prior to performing an ESP block. Is less risk a justifiable reason to perform a block if it has little evidence of benefit? Just because it is easy to do, is not a good reason to do it!

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Transversus Thoracic Plane Block: How I Do It

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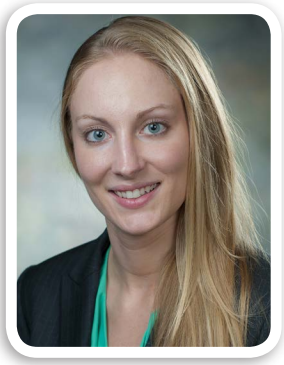

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The opioid crisis currently threatening the health of the global population has compelled health care providers to reconsider appropriate analgesic options. Massive efforts have been made to maximize multimodal analgesia and regional anesthetic techniques in an attempt to reduce pain and the need for opioid analgesics. These efforts have been associated with improvements in ultrasound imaging technology and a renewed interest in anatomical study that has resulted in a proliferation of fascial plane blocks to assist in the provision of perioperative analgesia.

Although the notion of pain as the fifth vital sign now appears misguided, postsurgical pain continues to limit recovery and may increase the risk of perioperative morbidity. Poorly managed chest wall pain can contribute to an increased incidence of pulmonary complications through increased splinting. Restricted postoperative breathing can result in hypoventilation, atelectasis, pneumonia, and an increased length of hospital stay. Thus, treating surgical chest pain adequately and in a manner that minimizes the requirement for significant opioid administration is important.

Midline chest wall pain can be iatrogenic from median sternotomy and pacemaker placement or pathologic from sternal and medial rib fractures. Chronic pain can develop following poor management of acute pain, contributing to additional physiologic and psychologic stress and consuming disproportionate physical and financial resources.

"Treating surgical chest pain adequately and in a manner that minimizes the requirement for significant opioid administration is important."

The transversus thoracic plane block (TTPB), formerly known as the parasternal plane block, is a newer regional anesthesia technique that provides analgesia to the medial anterior chest wall and may consequently decrease pulmonary morbidity and the need for large-dose opioids. Its indications include the following[1]:

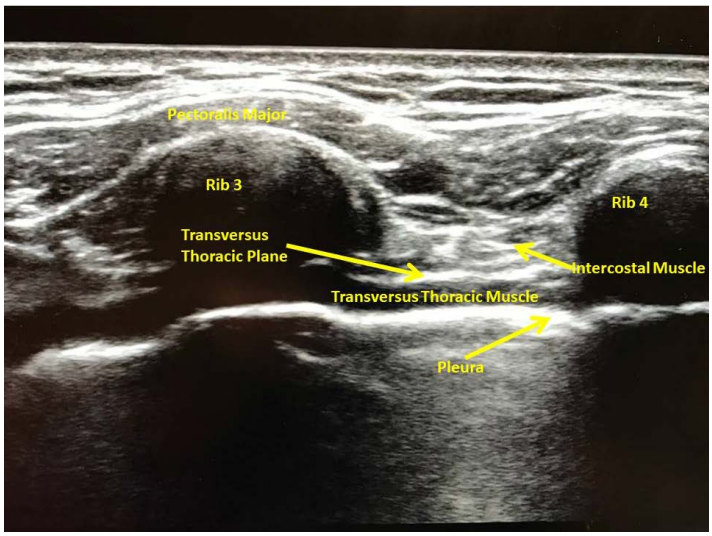
- Sternotomy,
- Sternal fractures,
- Medial rib fractures,
- Medial coverage for breast surgery,
- Medial coverage for placement of tunneled pacemaker or implantable cardioverter-defibrillator.

SONOANATOMY

Muscles. A high-frequency linear probe is best used to scan in a parasagittal fashion medial to the mid-clavicular line over ribs 3 and 4. In this approach, the pectoralis major muscle can be appreciated beneath subcutaneous tissue and overlying the ribs. The intercostal muscles lie between the ribs and superficial to the transversus thoracic muscle (TTM), a hypoechoic band that overlies the pleura (Figure 1). The transversus thoracic plane (TTP) can be found between the internal intercostal muscle and the TTM (Figure 1) and is the target for the TTPB.

Organs. While scanning the chest wall, the pleura is evident bilaterally as hyperechoic lines with clear lung sliding between the ribs and deep to the intercostal muscle. The pleura should move in coordination with respiratory efforts or ventricular contraction, and a lack of movement should illicit concern for pneumothorax or other pulmonary pathology. During ultrasonography of the left anterior chest wall, the pericardium appears deep to the intercostal muscles. Because of these critical organs' proximity, care must be

Figure 1: *Ultrasound image of transversus thoracic plane with ultrasound held in longitudinal fashion over medial anterior chest wall.*



taken to visualize the needle tip at all times. If the block cannot be performed safely, use an alternative technique.

Vessels. The internal thoracic artery runs between the internal intercostal muscles and TTM (Figure 2), and should be visualized prior to block placement. In addition to identifying the artery via longitudinal orientation of the ultrasound, placing the ultrasound in the transverse orientation over the plane of interest offers further confirmation of the arterial presence with the goal of avoidance of this vasculature.[2] Again, constant visualization of the needle tip is vital (Figure 3). Once the TTP has been accessed, aspirate every 3 to 5 mL to ensure that intravascular placement of the needle tip has not occurred. Although ASRA has neuraxial guidelines for deep plexus and deep peripheral nerve blocks, it has no defined rules for more superficial nerve blocks. However, the guidelines do advise that vascularity, compressibility, and bleeding consequences be taken into consideration.[3] We therefore recommend evaluating ease of block placement, type of anticoagulation, and vascularity of the site prior to proceeding.

Nerves. The sternum's body derives its innervation from the anterior cutaneous branches of intercostal nerves 2–6 and the sympathetic plexus around the internal thoracic artery. The nerves lie between the internal intercostal muscle and the TTM within the TTP (Figure 4). In addition, a collateral branch also aids in supply and runs along the upper border of the rib.[4] The TTPB anesthetizes the nerves via injection of local anesthetic between the two aforementioned muscles (Figure 3). One injection into this plane on each side of the sternum between ribs 3 and 4 will spread to cover the entire sternum; multiple injections on one side of the sternum are unnecessary if the correct plane is used. Performing the block preoperatively under ultrasound guidance and appreciating

Figure 2: *Artistic rendering of anterior chest wall depicting the relationship between the internal thoracic artery and transversus thoracic muscle.*

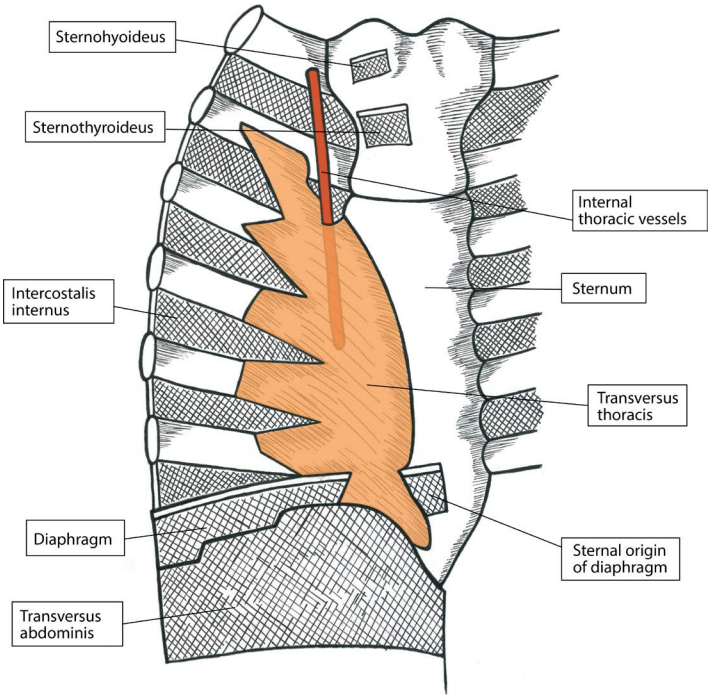


Figure 3: *Ultrasound-guided transversus thoracic plane block.*

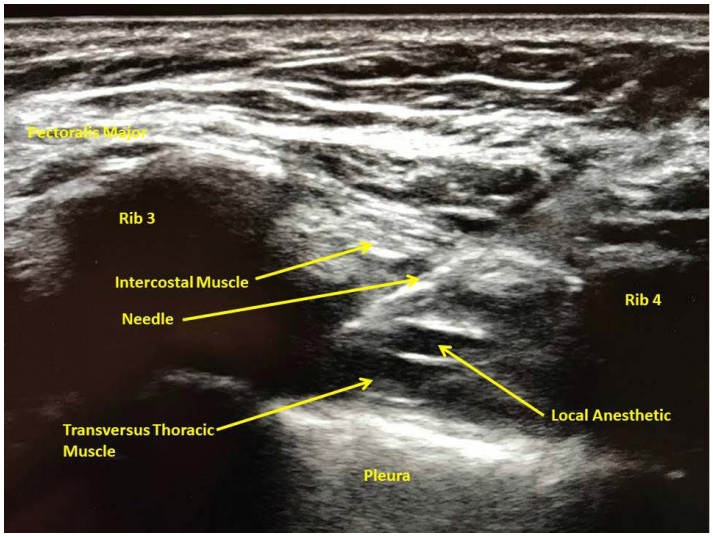
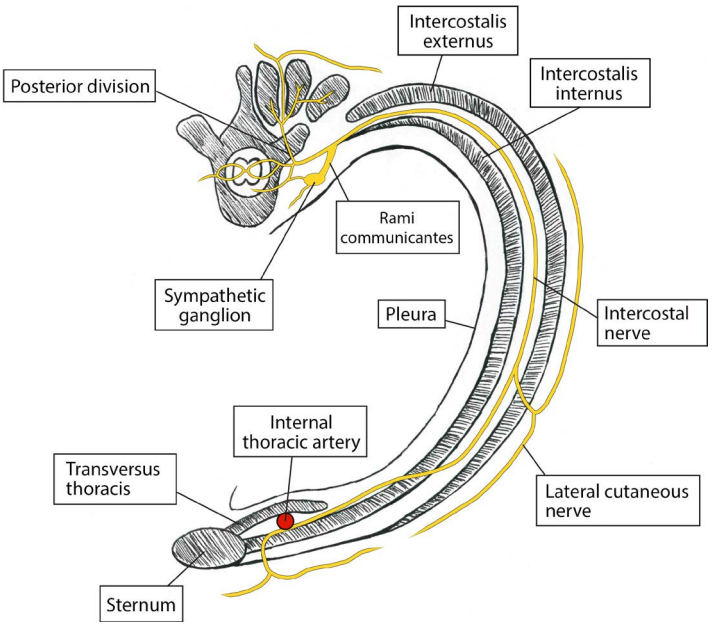


Figure 4: *Artistic rendering of transverse view depicting nerve supply of anterior chest wall.*



no hemodynamic derangements during median sternotomy intraoperatively confirm appropriate block placement.

Osseous Structures. Ideally, ribs 3 and 4 are targeted and should be visible on the ultrasound screen with an accompanying posterior acoustic shadow. Simultaneously visualize the entirety of the needle and direct it at a steep enough angle to avoid being directed beneath a rib where visualization would be obscured (Figure 3). Excessive needle insertion may result in pleural puncture or pneumothorax bilaterally or pericardial injury on the left side of the chest.

PATIENT POSITIONING AND EQUIPMENT SELECTION

Needle. Use a 21-gauge, 5- or 10-cm blunt tip echogenic needle. Determine the needle length by clinical judgement based on patients' body habitus and relevant anatomy.

Scanning Technique. Patients can be positioned either supine or with their head up to aid with respiratory status if needed. Place a 50-mm, high-frequency linear ultrasound probe on the chest in the parasagittal plane in the midclavicular line and identify the third or fourth rib space, ribs, pleura, pectoralis major, and intercostal muscles (Figure 1). Scan in a lateral to medial fashion to visualize the hypoechoic TTM lying deep to the intercostal muscle and superficial to the pleura. The needle target will be the plane between the internal intercostal muscle and the TTM (Figure 3). Care must be taken because the internal thoracic artery also runs in this plane and can be identified in cross section via an ultrasound scan in the transverse plane.[1] If a pulsatile structure is seen, place color flow Doppler over the structure to confirm the presence of the artery; if the presence of vascular structures is uncertain, probe placement over an adjacent rib space to evaluate for arterial presence is recommended.

Medication Selection.

Local anesthetic. Use bupivacaine 0.25% or ropivacaine 0.25% (10–20 mL on each side). A patient's weight, type of surgery, location of artery, and risk of vascular puncture should be considered when determining both volume and concentration of local anesthetic.

Adjuvants. Preservative-free dexamethasone (1–3 mg on each side) has anti-inflammatory properties and limits ectopic discharge in neural membranes.

Clonidine (0.5 mcg/kg with a maximum dose of 150 mcg) allows for prolongation of block via vasoconstriction secondary to hyperpolarization of gated channels. However, it has conflicting data on block duration and carries a risk of hypotension with higher doses or intravascular injection.

Epinephrine (5–10 mcg/ml) can prolong block duration via vasoconstrictive activity when used with lidocaine and mepivacaine but not ropivacaine. It has neurotoxic potential because of vasoconstriction, and hypertension and tachycardia could alert the regional team to vascular injection.

Buprenorphine can block voltage-gated sodium channels. It has antihyperalgesic properties and can prolong blocks but carries a risk of postoperative nausea and vomiting.

Limited data exist for liposomal bupivacaine, but it has not proved to be more effective or longer lasting than bupivacaine with preservative-free dexamethasone.

Nerve block catheters should be placed postoperatively to avoid surgical field contamination. Adjuvants are not required for block prolongation, but catheter migration and increased risk of infection are concerns.[5]

DESCRIPTION OF TECHNIQUE

The goal is to achieve blockade of the anterior cutaneous branches of intercostal nerves 2–6, which innervate the sternum as originally described by Ueshiema and Otake.[6] The chest is disinfected, and sterile ultrasound gel is applied. A 50-mm, high-frequency linear ultrasound probe is placed on the chest in a parasagittal plane over the third and fourth ribs at the midclavicular line. The pectoralis major intercostal muscles, ribs, and pleura are identified and traced medially toward the sternum until the TTM comes into view lateral to the sternum and deep to the internal intercostal muscle as a hypoechoic band (Figure 1).

The internal thoracic artery is identified in this plane between the intercostal muscle and TTM to avoid vascular puncture and intra-arterial injection. To ensure constant visualization of the needle and prevent pericardial puncture, a blunt-tip, 21-gauge, 5- or 10-cm echogenic needle is advanced in an in-plane approach from caudal to cranial direction. The needle tip is placed between the TTM and the intercostal muscle (Figure 3). After negative aspiration, correct placement in the TTP is confirmed with 1–3 mL of sterile saline via hydrodissection followed by injection of 10–20 mL of 0.25% bupivacaine hydrochloride or ropivacaine 0.25% with 1–3 mg of preservative-free dexamethasone in 5-mL aliquots. Downward displacement of the pleura during injection further confirms correct deposition of local anesthetic.

The maximum dose of bupivacaine hydrochloride and ropivacaine is 2.5 mg/kg of ideal body weight. In addition to the local anesthetic's analgesic component, hydrodissection of the TTP may allow for relief of entrapment of the terminal branches of the intercostal nerves, further alleviating pain.[7]

Approach. In our practice, we approach the plane of interest in a caudal to cranial fashion. Because the rib spaces can be small in this area of the chest, moving the ultrasound transducer cranially in the parasagittal plane can help to identify the target by moving the inferior rib off the screen. This ensures that the needle inserted in an in-plane approach is steep enough to enable the needle tip to reach the plane without bending or being inadvertently placed beneath the superior rib, where the needle tip cannot be visualized on ultrasonography because of an acoustic shadow (Figure 3).

If rib spaces are narrow, limiting the angle of the needle and appropriate visualization, an out-of-plane approach may be warranted. The high-frequency linear ultrasound probe is placed in the same parasagittal orientation between ribs 3 and 4, and the TTP is identified. Using a blunt-tip 21-gauge needle, approach the TTP in an out-of-plane fashion, using sterile saline for hydrodissection to further appreciate the tip of the needle. Given that the entirety of the needle cannot be appreciated via this approach and that the tip, even using hydrodissection, can be difficult to visualize, we do not recommend this technique because of the increased risk of pneumothorax, vascular puncture, and hematoma.

Dose and Volume of Local Anesthetic. We have performed this block successfully with 10–20 mL of 0.25% bupivacaine or 0.25% ropivacaine. If the patient is having no other blocks and no intravenous local anesthetic is administered, using a volume closer to 20 mL is preferable because it is a volume-dependent block. However, if the patient is of low body weight (less than 40 kg) or if other local anesthetics contribute to the total dose, 10 mL has provided effective analgesia in the past, anecdotally.

Block location and intercostal vasculature absorption influence its duration. It has the potential for biphasic absorption, with the initial phase occurring within 5 minutes because of the proximity of intercostal vasculature and the second slower phase resulting from the surrounding subcutaneous fat absorbing the highly lipid soluble local anesthetic.[8]

See Figure 5 for clinical pearls regarding the TTBP.

Potential Complications. Adverse events to consider include the following:

- Pneumothorax,
- Hemothorax,

Figure 5: *Clinical pearls.*

POSITIONING
- Patient can be positioned supine or head up.

SCANNING
- Scan laterally to medially within the third or fourth rib space toward the sternum. Identify the hypoechoic transversus thoracic muscle (TTM) deep to the intercostal muscle and inject between the TTM and intercostal muscle.
- Using an ultrasound transverse view, identify the internal thoracic artery, which also runs in the plane in cross section.

TECHNIQUE
- Move the probe cranially to ease needle manipulation.
- Visualize the needle and needle tip constantly.

MEDICATIONS
- Administer bupivacaine or ropivacaine 0.25% with a maximum dose of 2.5 mg/kg of ideal body weight.
- As a volume-dependent block, try to deposit 20 mL of local anesthetic on each side.
- If patient weight is less than 40 kg, adjust the volume of local anesthetic.
- If another block is performed, adjust the volume so that total dose of local anesthetic is less than 2.5 mg/kg

ANTICOAGULATION
- No strict guidelines require adjusting the anticoagulation regimen.
- Consider block difficulty and vascularity when determining the safety of block performance in the coagulopathy setting.

- Pericardial puncture, resulting in potential hemopericardium or pericardial injection,
- Intravascular injection,
- Local anesthetic systemic toxicity,
- Damage to the internal thoracic artery,
- Hematoma,
- Infection,
- Neural injury.

CONCLUSION

As reliance on opioids as the sole analgesic option wanes, new regional anesthesia techniques that focus on injection of local anesthetics into various fascial planes have gained prominence as critical components of multimodal analgesic regimens. Patients experiencing medial chest wall pain had not previously benefitted from regional anesthesia techniques and have largely depended on intravenous and oral opioids for pain control. Although techniques that block spinal nerves (paravertebral block) or proximal intercostal nerves (intercostal block) may also be effective at treating parasternal pain, they are limited by either the potential for sympathectomy with resulting hemodynamic changes or the need to perform multiple injections to properly anesthetize a large area.

Opioid consumption has known side effects, including nausea, vomiting, decreased bowel function, diminished ventilatory drive with hypercarbia, somnolence, and tolerance and can potentially lead to problems with physical dependence or addiction. Nonopioid multimodal analgesic regimens may result in incomplete analgesia and may not be tolerated in various patient groups secondary to intolerability or side-effect profile. Epidural and paravertebral blockade require strict timing of venous thromboembolism prophylaxis protocols and may be associated with spinal hematoma and neuraxial injuries. In the authors' experience, TTPB requires no alteration of the anticoagulant regimen, although vascularity and block difficulty should be taken into account when making a decision.

Poorly managed acute pain may ultimately result in the development of chronic pain and the need for costly and stressful additional medical or surgical intervention. "The reported incidence of chronic pain after cardiac surgery varies from 21% to 56% and is multifactorial in nature with a large neuropathic component."[9] Therefore, the cardiac surgery population may be particularly vulnerable and warrant additional perioperative analgesic efforts.

Regional anesthesia techniques contribute to analgesia, limit the reliance on opioid medications, treat neuropathic pain, and can prevent the development of chronic pain. With such a high incidence of chronic pain in the surgical population, TTPB proves to be a useful tool in the anesthesiologist's arsenal.

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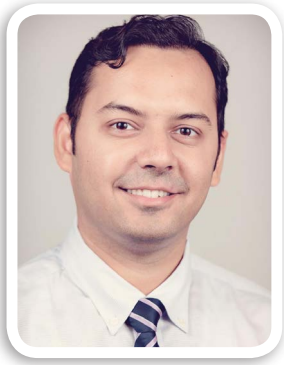
Stellate Ganglion Blockade for Ventricular Arrythmias: An Effective Tool for an Ineffective Rhythm



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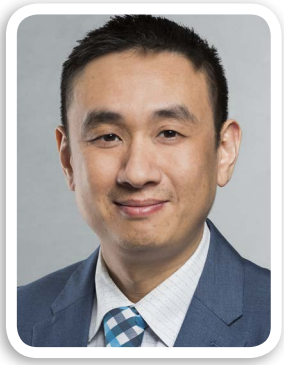

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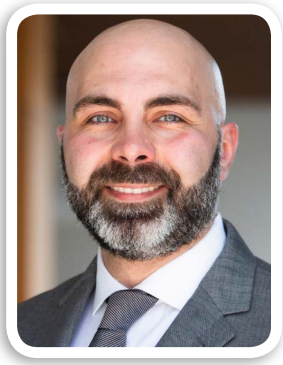

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Sympathectomy has been studied and used for centuries in the treatment of pain and currently has varied applications in pain management.[1] Sympathetic signals from the stellate ganglion (SG) contribute to the pathophysiology of multiple conditions, including complex regional pain syndrome (CRPS) of the upper extremities, postherpetic neuralgia, and arrythmias. During the early part of the 20th century, scientific theories emerged to explain the role of stellate ganglion blockade (SGB), including blocking adrenergic-induced hypersensitivity and reducing central hyperexcitability by interrupting the coupling of sympathetic noradrenergic neurons with primary afferent neurons.[1,2] During World War I, researchers investigated the SG's structure and function because soldiers with limb injuries manifested CRPS symptoms. By the end of World War II, SGB was commonly used to treat CRPS of the head, neck, and upper extremities.[3] As its use grew, the scope of treatment expanded to other pain syndromes, including intractable angina, phantom limb pain, postherpetic neuralgia, cancer pain, ischemic pain, hot flashes, and intractable cardiac arrythmias.

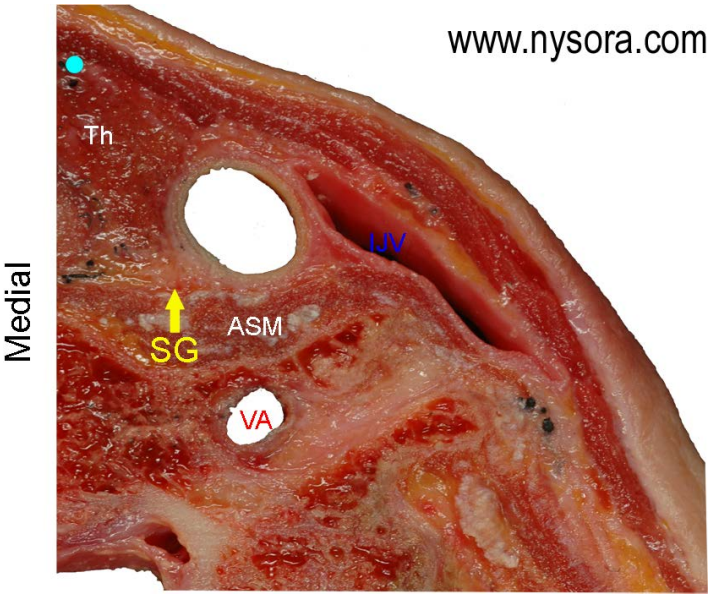
The sympathetic system arises from the thoracolumbar division of the spinal cord, where the sympathetic chain ganglia are positioned at the dorsal and ventral roots. Sympathetic nerve fibers exit the spinal cord through the ventral root and enter the sympathetic chain from the white rami. While in the sympathetic ganglia, some nerves may travel up or down spinal cord levels prior to synapsing, exiting through the gray rami before making their way to end organs. Cervical sympathetic chain ganglia are formed when nerves (preganglionic) from the thoracic spinal cord (predominantly T1–T6) communicate and synapse before innervating (postganglionic) portions of the head, neck, and upper extremities.[3,4] The cervical ganglion's three paravertebral ganglia (superior, middle, and inferior cervical) provide sympathetic innervation to the blood vessels, structures (eyes, larynx, pharynx, and trachea), and glands (lacrimal, salivary, and thyroid) in the head, neck, and upper extremities.[4] The cervical sympathetic chain also sends signals to the heart through the cardiac plexus.[4] In 80% of the population, the inferior cervical and the first thoracic ganglia fuse to form the cervicothoracic ganglion, which is named the *stellate ganglion* for its appearance.[4]

SGB can be a diagnostic, therapeutic, or even preventive tool. Sympathetic innervation to the head and neck and upper extremities comes from T1–T3 and T2–T6, respectively. Hence, SGB will abolish most sympathetic input to the head, neck, and ipsilateral upper extremities, in addition to blocking the cardiac accelerator fibers (T1–T4).[5] Cardiac sympathovagal imbalance via accelerated discharge from cardiac accelerator fibers can contribute to various arrythmias, including electrical storm (ie, multiple ventricular arrhythmias in a short period of time). Management strategies for ventricular tachycardia include drug therapy, implantable cardioverter defibrillators (ICDs), and cardiac radiofrequency catheter ablation. Refractory cases are highly challenging, especially when patients are deemed too sick for conventional ablation treatments.[6–8]

"SGB can be a diagnostic, therapeutic, or even preventive tool. . . . SGB will abolish most sympathetic input to the head, neck, and ipsilateral upper extremities, in addition to blocking the cardiac accelerator fibers."

Sympathetic supply plays a significant role in the initiation of ventricular arrhythmias, and sympathectomy has also been reported as a helpful tool. A meta-analysis of 22 unique case series since the 1970s, which included patients whose arrhythmias were not controlled by drug or mechanical support, showed reduction in arrhythmia burden and need for defibrillation after SGB.[9] Another study also supported the effectiveness of sympathetic blockade in electrical storm patients with recent myocardial ischemia when compared with standard arrhythmic therapy.[10] In cases of

Figure 1: *Cross-sectional anatomy of stellate ganglion.*



ASM, anterior scalene muscle; IJV, internal jugular vein; SG, stellate ganglion; Th, thyroid; VA, vertebral artery. Image courtesy of NYSORA.

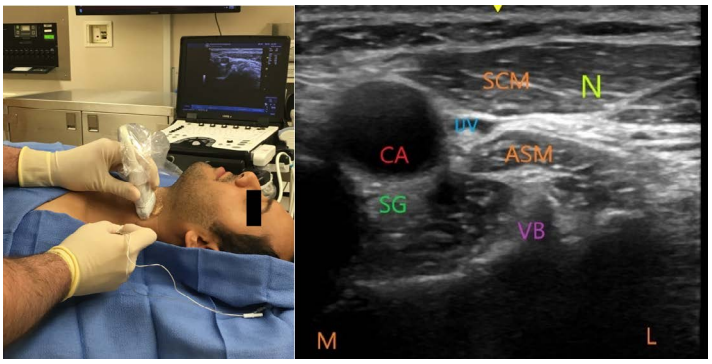
myocardial injury, the rationale for the use of SGB stems from animal studies, which have shown maladaptive remodeling of the autonomic nervous system and spinal cord neuronal pathways after myocardial insult.[11]

Sympathetic denervation has also shown its potential usefulness in the treatment of patients with long QT syndrome.[12] In the past year, we have successfully performed five SGBs in patients with uncontrolled ventricular arrhythmias and succeeded in decreasing their frequency. In one case, we achieved a silencing of ventricular arrhythmia for 6 weeks. We plan to publish our case series in the near future.

SG is surrounded by multiple structures, increasing the likelihood of iatrogenic complications during SGB. Hence, a good understanding of the anatomy is paramount prior to the block. SG lies at the C7 level in between the C7 transverse process and the neck of the first rib.[4] Anterior to the ganglion is the carotid sheath (carotid artery, internal jugular vein, vagus nerve) and apex of the lung (see Figure 1). The vertebral artery also crosses anteriorly to the SG before diving deep into the transverse foremen of C6 as it ascends superiorly. Posterior to SG lies the C7 transverse process, phrenic nerve, and brachial plexus.[4] Medial to SG are the C7 vertebral body, longus colli muscle, esophagus, and trachea and laterally are the scalene muscles.[2] Inferiorly lies the subclavian artery and the apex of the lung.

In a 2017 study, the most common complication noted was hoarseness and dysphagia, seen in 54% of patients.[13] Other less

Figure 2: *Patient positioning and ultrasound image of stellate ganglion block.*



ASM, anterior scalene muscle; CA, carotid artery; IJV, internal jugular vein; L, lateral; M, medial; N, needle; SCM, sternocleidomastoid muscle; SG, stellate ganglion; VB, vertebral body.

common complications included pneumothorax and contralateral Horner syndrome, both of which manifested in 3% of patients who underwent SGB.[13] Retropharyngeal hematoma, although rare with an incidence of 1 in 100,000 SGB, may require urgent intubation for airway protection.[14] A need to reduce complications has driven the standard of care away from the initial non–image-guided techniques toward approaches that employ various imaging modalities for localization.

For first SGBs, described during the early 20th century, physicians achieved localization with surface landmarks and palpation. SGB's target is the C6 tubercle (Chassaignac's tubercle), which is a level above the position of SG at C7. This allows for local spread to the ganglion and decreases the chances of accidental vertebral artery injury. Currently, ultrasound is the preferred imaging modality because it decreases the chance of intrathecal or intravascular injection and minimizes the possibility of injuries, including recurrent laryngeal nerve paralysis or esophageal perforation, to surrounding structures.[3] Other imaging modalities that can be used include fluoroscopy (C-arm) and computed tomography scan.

When performing SGB under ultrasound guidance, the patient is initially placed in the supine position with the neck in slight extension. The ultrasound probe is positioned at the level of the thyroid cartilage, which usually correlates to the C6 level. Local anesthetics can be used for patient comfort. Following a lateral, in-plane approach, a 22 G needle is directed to the prevertebral fascia between the carotid artery and the tip of C6 anterior tubercle (see Figure 2). Local anesthetic (8–10 mL) is injected in the prevertebral fascia plane. The patient should then be monitored for signs of a successful block, which include ipsilateral development of Horner's syndrome (ptosis, miosis, and anhidrosis), nasal congestion, facial flushing, or increase in temperature of the upper extremity.

Double-blinded, randomized trials and long-term patient follow-up to prove the efficacy of sympathectomy in patients with intractable ventricular arrhythmia are still lacking. Further research is required to investigate conventional or pulsed radiofrequency ablation of the SG as a potential tool for prevention of ventricular arrythmias. Current indications for SGB include chronic head and neck pain and CRPS, and some case reports have shown encouraging results for patients with ventricular arrthymias.[15] SGB can be a blessing in the debilitated cardiac patient population, many of whom suffer regularly from ventricular arrhythmias and associated distress of repeat ICD firing. Currently, SBG may be a valuable tool for pain physicians and cardiologists when treating patients with refractory ventricular arrhythmias who have failed conventional therapeutic and electrophysiological stimulation.

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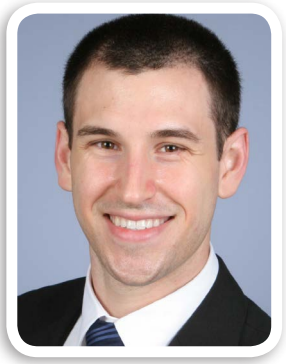
Neuromodulation Appropriateness Consensus Committee Guidelines Related to Dorsal Root Ganglion Stimulation

The realm of neuromodulation continues to grow both in its indications for use and the variety of therapies available. Dorsal root ganglion (DRG) stimulation represents a relatively new, more selective method of neuromodulation in the treatment of certain chronic pain states, especially those that respond suboptimally to traditional spinal cord stimulation (SCS). Providers, however, face learning curves with implantation technique, patient selection, and management of complications.

In response, the Neuromodulation Appropriateness Consensus Committee (NACC) has published several documents designed to guide best practices related to neuromodulation.[1–8] Its most recent publication is a set of guidelines specific to DRG stimulation[5] that provide pain physicians with a prototypical model on how to rationally incorporate therapies such as SCS and DRG stimulation into clinical practice.



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Disclosures: Dr. Lubenow has consulting agreements with Medtronic, Abbott, Boston Scientific, Inc, Halyard Medical, and Flowonix.

SCIENTIFIC RATIONAL FOR DRG NEUROMODULATION

The DRG houses a group of pseudounipolar afferent neurons, both somatic and sympathetic, residing under the pedicle in the epidural space. Rather than a passive facilitator, the DRG functions as an active relay terminal for all sensory information, blocking, propagating, or filtering action potentials traveling from the periphery to the brain via the spinal cord, including sympathetic information. Furthermore, glial cells in the DRG and spinal cord itself likely play an integral role in synaptic neurotransmission.[5]

In neuropathic pain states, the DRG contributes to central sensitization by demonstrating hyperexcitability and generating spontaneous, ectopic action potentials from the cell bodies of damaged peripheral nerves. This information is transmitted to neurons with a wide dynamic range within the dorsal horn of the spinal cord leading to wind up and central sensitization. In addition, abnormal firing of sympathetic neurons within the DRG can propagate a cycle of pathologic autonomic reflex arcs, clinically leading to some of the sudomotor and vasomotor signs seen in pain disorders such as complex regional pain syndrome.[1,5] That physiologic foundation has led clinicians to begin using DRG neuromodulation primarily for the treatment of focal neuropathic pain disorders that have an identified pathology as well as for some mixed neuropathic and nociceptive pain states.

Interestingly, the DRG demonstrates a somatosensory distribution that may overlap several dermatomes. In this way, stimulating the DRG located at one level may affect that specific dermatome as well as the levels adjacent to it. This increases the number of lead configurations that may be effective for any given pain pattern.[5]

DRG'S BENEFITS OVER SCS

Stimulating the DRG rather than the dorsal columns for the treatment of chronic pain confers several important benefits. First, relatively little cerebrospinal fluid surrounds the DRG, resulting in less current dispersion during electrical stimulation. This allows amplitudes typically less than 1 mA and pulse widths of less than 200–300 microseconds to be used effectively (compared with much higher energy requirements seen in conventional SCS), reducing or eliminating the need for recharging of the implantable pulse generator (IPG). Second, this property allows for paresthesia-free stimulation, which most patients prefer, and likely acts by a mechanism distinct from traditional tonic SCS. Third, stimulating the DRG

"Dorsal root ganglion stimulation represents a relatively new, more selective method of neuromodulation in the treatment of certain chronic pain states, especially those that respond suboptimally to traditional spinal cord stimulation. Providers, however, face learning curves with implantation technique, patient selection, and management of complications."

specifically targets the sensory afferent neurons and spares the motor efferent neurons, providing a more specific pattern of neuromodulation compared with SCS.[5]

KEYS TO SUCCESSFUL IMPLANTATION

The physician implanting SCS stimulators should ideally have undergone training in a recognized, appropriately credentialed, high-volume center and performed a minimum of 10 cases as the primary implanter. This same requirement should ideally be applied to DRG stimulation since DRG implantation is technically more challenging than conventional SCS. In addition, the Food and Drug Administration mandated that providers complete a specific training course sponsored by Abbott and proctored by leaders in the field of neuromodulation prior to implanting in clinical practice.[9]

Proper epidural needle positioning strongly predicts the ease and accuracy with which pain physicians implant DRG leads. Specifically, the proceduralist should position the needle such that the introducer enters the epidural space near the midline, with insertion of the lead into the dorsal superior aspect of the neural foramen. Most practitioners make superior and inferior S-shaped tension relief loops within the epidural space to buffer against lead migration that may occur with patient movement rather than using an anchoring device. Additional tension-relief loops should be made in the subcutaneous tissue to further minimize the potential for lead migration. The number of leads indicated will vary by pain pattern; however, the IPG can accommodate a maximum of four leads. As with traditional SCS, NACC recommended creating the IPG pocket in the posterolateral flank or buttock ipsilateral to the needle entry site for the leads.[5]

If applied thoughtfully, DRG stimulation can positively affect the lives of some of the most challenging patients who present to pain clinics worldwide. However, until recently a coherent framework for how new and existing neuromodulatory therapies might be intelligently implemented into clinical practice did not exist. NACC integrated the best available data with expert consensus distilled into a concise summary of recommendations. In addition to the most recent installation specific to DRG neurostimulation, NACC published several sets of guidelines addressing topics such as prevention and management of infection,[6] bleeding,[8] and neurologic injury[2,7] related to neuromodulation that can and should be applied to the implantation of DRG stimulators.

The indications for neuromodulation are growing at an incredibly rapid pace, and using the NACC model to implement those therapies represents a significant boon to young and experienced pain physicians alike.

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Regional Anesthesia for Subcutaneous ICD Placement

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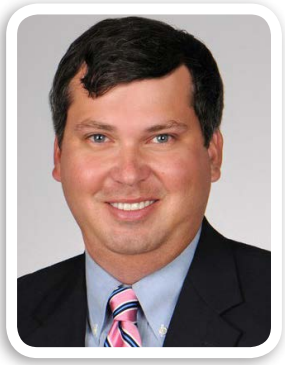

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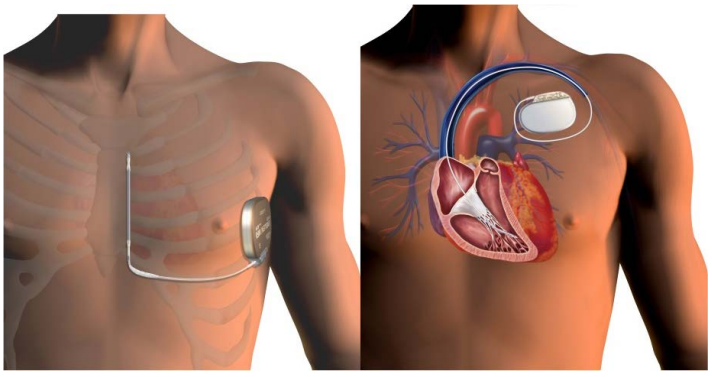
Implantable cardioverter defibrillators (ICDs) are useful for the prevention of sudden cardiac death. The subcutaneous ICD (S-ICD) is a relatively recent innovation, having received Food and Drug Administration approval in the United States in 2012. S-ICD may be superior to the more familiar transvenous ICD (TV-ICD) in patients who have abnormalities of their central venous circulation, patients who have experienced complications from TV-ICD therapy, and patients at increased risk for lead infection.[1,2]

S-ICD generators are larger than TV-ICD generators; the incision site for a TV-ICD generator is usually in the subclavicular region as opposed to the midaxillary line at the level of the fifth or sixth intercostal space for an S-ICD (see Figure 1). An electrode is tunneled subcutaneously from the generator to the xiphoid process and then superiorly along the sternal border to the second intercostal space. Tunneling a subcutaneous lead results in more periprocedural pain than transvenous lead placement, and local anesthetic infiltration is usually inadequate.[1,2]

Optimal anesthetic management for placement of these devices is evolving.[3] Patients presenting for S-ICD placement often have significant comorbidities in addition to cardiac disease, including obesity, obstructive sleep apnea, anticoagulation, or renal failure. Interventions to reduce opioid requirements, such as multimodal analgesics and regional anesthesia, should be incorporated in patients' periprocedural management.

Regional anesthesia for S-ICD placement requires coverage of the anterior chest wall, including the lateral border of the sternum, and laterally to the midaxillary line where the generator is placed, typically at the T4–T6 dermatomal level.[3] Cranial-caudad distribution from roughly T2–T6 is needed. Innervation of the chest wall originates at the anterior primary rami of spinal nerves T1–T11, which travel in the costal groove of the corresponding rib between the innermost intercostal and the internal intercostal muscles. At the level of the midaxillary line, the intercostal nerves split into anterior and lateral cutaneous branches. The anterior cutaneous branches innervate the sternum, skin, and subcutaneous tissues of the anteromedial chest wall. The lateral cutaneous branches innervate the skin and subcutaneous tissues of the anterolateral portions of the chest wall. The pectoral muscles are innervated by the lateral and medial pectoral nerves, which arise from the brachial plexus. The lateral pectoral nerve lies in a plane between the pectoralis major and minor; the medial pectoral nerve courses under the pectoralis minor before piercing it to also lie in the plane between the pectoralis major and minor. Finally, the long thoracic nerve arises from the ventral rami of C5–C7 and travels to innervate the serratus anterior; the thoracodorsal nerve arises from the posterior cord of the brachial plexus and innervates the latissimus dorsi.

Figure 1: *Subcutaneous versus transverse implantable cardioverter defibrillators.*



A subcutaneous implantable cardioverter defibrillator (S-ICD) is depicted on the left, and a transverse (TV) ICD is depicted on the right. S-ICD leads are tunneled subcutaneously to the xiphoid process and then superiorly along the left parasternal border, which can result in more periprocedural pain. TV-ICDs use the central circulation for lead placement. Image credit: ©Boston Scientific Corporation or its affiliates. All rights reserved.

Regional anesthesia techniques and combinations for S-ICD placement include transversus thoracic block, paravertebral block, and serratus plane block. The serratus plane block anesthetizes the lateral cutaneous branches of T2–T9, the long thoracic nerve, and the thoracodorsal nerve. The block is performed by placing a linear ultrasound probe in the midaxillary line at the level between the fourth and fifth rib and injecting in the plane between the latissimus dorsi and serratus anterior. Alternatively, inject in the plane deep to the serratus between the serratus anterior and the ribs if the plane is between the latissimus and serratus is difficult to identify.[4] Of note, results from a 2018 cadaveric study showed that using a higher volume of local anesthetic was more important for block spread than the plane selected for the block.[5]

"Additional parasternal coverage may be needed for S-ICD placement in the absence of general anesthesia."

Transversus thoracic plane blocks can anesthetize the parasternal area; they are performed by injecting local anesthetic in the plane between the internal intercostal muscle and transversus thoracic muscle, as described by Ueshima et al.[6] The anterior cutaneous branches of nerves T2–T6 can be anesthetized with this technique, which should provide coverage for the tunneling of the parasternal subcutaneous leads of an S-ICD. An alternative is the pectointercostal plane block, initially described by de la Torre et al,[7] which anesthetizes the anterior cutaneous branches by injecting local anesthetic in the plane between the pectoralis major muscle and the external intercostal muscle.

PEC blocks may also anesthetize the anterolateral chest wall. The PEC I block places local anesthetic in the plane between the pectoralis major and minor muscles to anesthetize the lateral and medial branches of the pectoral nerves, providing coverage over the anterior chest wall. PEC II is sited between the pectoralis major and serratus anterior muscles, which blocks the third through fifth intercostal nerves along with the intercostobrachial and long thoracic nerve. This provides a more extensive area of coverage of the anterior chest wall when combined with the PEC I block.[8,9] Thoracic paravertebral blocks may also be used for chest wall and parasternal coverage, but anticoagulation can be an issue. Also, the precise location of parasternal tunneling is somewhat variable. The distance between the lateral border of the sternum to the lead varies, and occasionally, the lead may be placed on the opposite side of the sternum.

The S-ICD is a relatively new device, and the body of literature supporting the use of regional anesthesia for its placement is limited. (See Table 1 for a summary.) Ueshima and colleagues have described several case reports in which S-ICDs have been implanted under transversus thoracic muscle plane blocks,

Table 1: *Studies supporting the use of subcutaneous implantable cardioverter defibrillators.*

Authors	Publication type	Block performed	Outcome	Comments
Ueshima et al[10]	Case report	Thoracic paravertebral Transversus thoracic plane	Patients avoided general anesthesia	Paravertebral block performed at left T5 with 20 mL of 0.375% levobupivacaine Transversus thoracic plane block performed between third and fourth ribs at sternum with 20 mL 0.375% levobupivacaine
Ueshima et al[11]	Case report	Transversus thoracic plane, serratus plane	Patients avoided general anesthesia	Technique successful with two patients
Miller et al[12]	Retrospective analysis	Transversus thoracic plane, serratus anterior plane	Deep sedation group's opioid consumption was significantly lower	Both groups received transversus thoracic and serratus plane block; 10 patients received deep sedation, and 10 patients received general anesthesia
Droghetti et al[13]	Retrospective analysis	Serratus anterior plane	11 of 12 patients avoided general anesthesia	30 mL of 0.75% ropivacaine used in block

thoracic paravertebral blocks, and serratus plane blocks. In one successful case report, an ultrasound-guided paravertebral block was performed with 20 mL of 0.375% levobupivacaine at the left T5 level, followed by transversus thoracic muscle plane block with another 20 mL of 0.375% levobupivacaine.[10] In two other cases, serratus plane block was performed with 30 mL of 0.25% levobupivacaine superficial to the serratus anterior muscle, followed by a transversus thoracic plane block between the third and fourth ribs with 20 mL of 0.25% levobupivacaine.[11]

A feasibility study investigated S-ICD placement with the use of regional anesthesia and deep sedation. Patients received general anesthesia or deep sedation with nonopioid analgesics for S-ICD placement. Both groups received serratus anterior plane blocks and transversus thoracic plane blocks. The deep sedation group used no opioids and reported better pain scores than the general anesthesia group, demonstrating that the use of regional anesthesia is feasible for S-ICD placement.[12]

A subsequent study evaluated 12 patients undergoing S-ICD placement with a serratus anterior plane block using 30 mL of 0.75% ropivacaine injected between the latissimus dorsi and serratus anterior. Patients underwent S-ICD placement and received sedation only immediately prior to defibrillation testing. One patient required conversion to general anesthesia because of pain during the procedure. Of note, the S-ICD was placed using a two-incision technique, which omitted a superior sternal incision and placed the generator between latissimus and serratus.[13]

At our institution, preoperative PEC 1 and serratus plane blocks serve as an adjunct to general anesthesia to improve pain control, reduce opioid requirements, and facilitate hospital discharge. Additional parasternal coverage may be needed for S-ICD placement in the absence of general anesthesia. Although our patients are currently hospitalized for pain management following S-ICD placement, improved postoperative pain management may allow these cases to be performed on an ambulatory basis and may ultimately significantly decrease the cost of care.

In summary, regional anesthesia may provide useful opioid-sparing analgesia or anesthesia during S-ICD placement. The selected regional anesthesia technique should provide coverage to the anterolateral chest wall and parasternal area. Use of regional anesthesia has the potential to avoid general anesthesia in a patient population that may be particularly sensitive to hemodynamic changes. More data are needed to solidify the optimal regional anesthetic technique for S-ICD placement, but initial data support a beneficial role for regional anesthesia for S-ICD placement.

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A Growing Demand for Cancer Pain Specialists

The current number of anesthesia-based pain physicians who specialize in the treatment of cancer pain appears to be inadequate to meet the demand of a growing cancer pain population. Of the approximately 2,300 American Board of Pain Medicine–certified physicians in the United States, most perform non–cancer-related procedures.[1] Furthermore, the number of anesthesiologists who are also certified in hospice and palliative medicine, a major contributor to the treatment of cancer patients, is less than 0.3% (or 125 of approximately 50,000 board-certified anesthesiologists).[2,3] Given the growing cancer patient population and the positive effect that anesthesiologists can have on outcomes and quality of life for cancer patients, the demand for cancer pain specialists will continue to be a priority.

An estimated 1.7 million new cancers were diagnosed in the United States alone in 2018. Although the percentage of new cases has fallen by 1.1% per year over the past 10 years, oncology's landscape has shifted such that the total number of patients living with cancer continues to increase, with an estimated 15.5 million cancer survivors in 2016.[4] As Levy et al[5] suggested, "What was once an explosive disease that led to a quick demise, cancer has now become a chronic disease."[5] With that shift, pain specialists will undoubtedly encounter an increasing number of cancer patients with chronic pain.

Current data suggest a 24% to 73% prevalence of pain in patients undergoing active treatment, 58% to 69% in those with advanced or terminal disease, and 21% to 46% in those in remission.[6] Although most cancer pain can be managed via the World Health Organization (WHO) stepladder approach, 10% to 25% remains refractory to conservative measures.[6] For that subset of patients, numerous studies suggest that an interdisciplinary approach is beneficial, with an increasing role for interventional pain specialists.[6–9] Interventional pain has even been proposed as the fourth step in the WHO stepladder.[10]

Anesthesia-based pain specialists are uniquely positioned to care for patients with cancer pain. Their knowledge of analgesia and pharmacology, ability to titrate high-dose opioids, proficiency in interventional techniques, and understanding of complex comorbidities in critically ill patients provides them with multiple tools to effectively treat cancer pain. For example, intrathecal pumps can provide systemic pain relief at reduced doses to a patient with worsening systemic disease, increasing opioid requirements, and increasing side effects from oral opioid pain medications. In addition, neurolytic blocks, such as plexus blocks and sympathetic system blocks, have resulted in improved pain scores and reductions in opioid requirements and side effects. The combination of those skills and knowledge helps improve patients' quality of life, ability to perform activities of daily living, and ability to tolerate treatment.

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Despite the positive evidence that supports an increasing role of interventional pain specialists in the care of cancer patients, work still needs to be done to encourage increased involvement in the field. Looking toward the future, current cancer pain specialists can help in several ways. Highlighting the growing cancer patient population and the need for more cancer pain specialists is the first step. We can accomplish this by educating our peers through conferences, professional interactions, editorials, and research studies. Simultaneously, we have a shared responsibility to encourage the next generation of pain specialists to consider a career in treating cancer patients.

"Given the growing cancer patient population and the positive effect that anesthesiologists can have on outcomes and quality of life for cancer patients, the demand for cancer pain specialists will continue to be a priority."

Treating cancer pain is rewarding: It offers the ability to improve quality of life for a vulnerable patient population as well as a technically and intellectually challenging career. Providing residents with opportunities to actively manage cancer pain may attract future colleagues to our field. Finally, it is important for interventionalists to improve their working relationship with other disciplines. Increasing participation in interdisciplinary patient care meetings, highlighting research that earlier intervention improves patient outcomes, and building better infrastructure for consultation will showcase our unique skillset to patients who could benefit from our expertise. As a future cancer pain specialist, I hope this article encourages you to join me in achieving these goals.

Join the Cancer Pain and Supportive Care Special Interest Group at https://members.asra.com/cancer-pain-and-supportive-care/.

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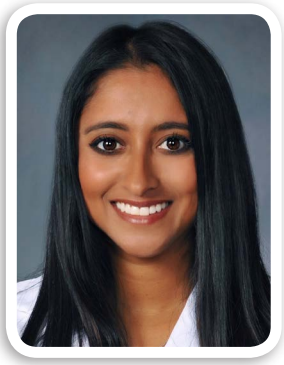
Welcome to the Electronic Era for Regional Anesthesia

As smartphones are becoming more ubiquitous, so too are the various applications designed for them. Smartphone apps provide an invaluable tool for quickly accessing medical information on medications, diseases, or interventions. Medical apps, particularly those pertaining to regional anesthesia, provide valuable information instantly to providers. However, evaluating the multitude of apps on the market allows us to assess which ones provide the most accurate, reliable, and easily accessible information to help physicians provide the best possible patient care.



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ASRA COAGS 2.1

Providers can quickly and easily review anticoagulation guidelines for specific medications and procedures in this user-friendly app. It combines information and guidelines from the ASRA publication *Regional Anesthesia in the Patient Receiving Antithrombotic or Thrombolytic Therapy; American Society of Regional Anesthesia and Pain Medicine Evidence-Based Guidelines* (fourth edition) and the 2018 Interventional Pain guidelines from the publication *Interventional Spine and Pain Procedures in Patients on Antiplatelet and Anticoagulant Medications* (second edition), as well as guidelines from ASRA, European Society of Regional Anaesthesia and Pain Therapy, American Academy of Pain Medicine, International Neuromodulation Society, North American Neuromodulation Society, and World Institute of Pain.

Pros:

- Has simple, user-friendly interface;
- Includes selections for medication (brand or generic name) and intervention (neuraxial block, deep plexus or peripheral block, superficial block, anticoagulated parturient neuraxial block);
- Has recommendations for both regional and pain procedures;
- Lists mechanism of action and limited duration or half-life information for each drug;
- Includes a PDF of ASRA's 2018 pain guidelines;
- Updated to reflect new anticoagulants.

Cons:

- Provides only minimal information for select medications. In certain cases, recommendations may be limited to "not recommended."
- Pharmacology descriptions may be brief.
- Cost is $3.99, but it can be bundled with ASRA's Local Anesthesia Systemic Toxicity (LAST) and Timeout apps for $7.99.

ASRA LAST 2.0

Get real-time, step-by-step guidance to assist in the treatment of local anesthetic systemic toxicity. The app also incorporates basic advanced cardiac life support protocols and provides weight-based calculations for all dosing and timing of lipid emulsions.

Pros:

- Has cyclically timed reminders for pulse recheck, cardiopulmonary resuscitation, drug dosing, and more;
- Includes quick-reference links to ASRA's LAST treatment checklist, ASRA.com, and LipidRescue.org;
- Generates a report of the information that was recorded on the app throughout the LAST event.

Con:

- Cost is $3.99, but it can be bundled with ASRA's Coags and Timeout app for $7.99.

REGIONAL ANESTHESIA AND PAIN MEDICINE

This app puts ASRA's official journal at your fingertips on your smart device. The journal is now published monthly and contains a magnitude of literature involving regional interventions and techniques in multiple fields such as intraoperative regional techniques, perioperative pain, chronic pain, obstetric anesthesia, pediatric anesthesia, outcome studies, and complications.

"Evaluating the multitude of applications on the market allows us to assess which ones provide the most accurate, reliable, and easily accessible information to help physicians provide the best possible patient care."

Pros:

- Is a great educational tool;
- Has peer-reviewed information;
- Contains full-text articles;
- Downloads and save any issues;
- Navigates easily through abstracts;
- Receives push notifications when new issues are available;
- Is compatible with iPads.

Cons:

- Is not an on-the-go guide;
- Involves more reading than other apps;
- Cost is $59.99 for nonmembers.

BLOCK BUDDY

Created by Western Reserve Anesthesia Education, Block Buddy is a mobile reference for performing ultrasound-guided peripheral nerve blocks. The nerve blocks section covers 21 blocks encompassing the entire body. Each includes a photo and description of the block distribution and indications, anatomy with ultrasound images and anatomical images, block technique guidance, a block video, clinical pearls, and current procedural terminology code. In addition, the app offers a nerve block video library; block IQ, including sonoanatomy-based quiz questions; nerve innervation information for the entire body; LAST guidelines; information on local anesthetics, including maximum dosages; information on all non-opioid medications; and an area for personal notes on each block.

Pros:

- Is available in Google and Apple app stores;
- Has a user-friendly interface with clearly labeled sections;
- Covers many blocks and is comprehensive;
- Has an extensive video selection;
- Has supplemental information, including medication details, local anesthetic maximum dosages, and LAST treatment, which most regional anesthesia apps do not include.

Cons:

- Cost is $14.99;
- Gears some content more toward residents and students (eg, sonoanatomy quizzes);
- Provides comprehensive information, which may be too much for someone who is looking for a quick reference;
- Lacks photos of cadaver anatomy, which would be useful for visual learners.

ANSO

AnSo is a comprehensive sonoanatomy resource app divided into sections for upper limb nerves; lower limb nerves; head, neck, and trunk nerves; vascular access; airway; basic transthoracic echo; and lumbar spine. Each section is further broken down into common sonoanatomy areas (eg, brachial plexus, interscalene sonoanatomy). Those subsections contain two or three ultrasound views with labeled structures, a video version of the ultrasound view, a sketch of the anatomy with labeled structures, and probe position shown on human surface anatomy.

Pros:

- Is an excellent sonoanatomy resource that covers more than just regional anesthesia blocks and anatomy;
- Has comprehensively labeled structures in different sonoanatomy views;
- Allows highlighting anatomy with labels or choosing anatomy with no labels to self-identify structures;
- Allows access without phone service or Internet access once downloaded to your phone.

Cons:

- Cost is $3.99;
- Covers only sonoanatomy and does not include techniques;
- Is a simple app with no extra features;
- Does not show cadaver anatomy.

OPIOID MANAGER

This point-of-care tool provides information and expert opinions from the *Canadian Guideline for Safe and Effective Use of Opioids for Chronic Non-cancer Pain*. It addresses four clinical areas: before you write the first script, how to conduct an opioid trial, how to monitor a patient on chronic opioid therapy, and when and how to stop opioids.

Pros:

- Has an electronic medical record platform available;
- Is available in French, Portuguese, Spanish, and Farsi;
- Provides an opioid-switching form with equivalents.

Cons:

- Requires registration;
- Cost is $7.99.

ACUTE PAIN MEDICINE OPIATE APPS

OpioidCalc and Opioid Calculator are free resources that calculate a patient's opioid dose into morphine milligram equivalents (MME) to help with acute pain patients already taking chronic opioids.

Pros:

- Is a free mobile app for both Android and iOS;
- Identifies patients at risk for overdose by calculating total MME (>100 results in alert);
- Is based on New York City Department of Health and Mental Hygiene opioid-prescribing guidelines.

Con: Lacks information regarding evidence-based content and peer review

DOXIMITY

Doximity is a social professional platform for medical professionals that offers a space where physicians can highlight aspects of their clinical practice. It was founded by Jeff Tangney, cofounder of Epocrates. One out of four physicians in the United States uses Doximity, and a recent American College of Physicians survey[1] listed Doximity as a top five app most used by its members. Physicians are able to earn continuing medical education credits on this platform.[1] The app combines their massive medical network with in-app features that attempt to streamline health care professionals' workflow. However, it cannot be accessed by health care professional outside the United States. The ultimate goal of this app is to address two of the biggest issues health care workers face: miscommunication and handoff errors.

Pros:

- Is free to use;
- Has a straightforward user interface;
- Encourages collaboration with colleagues;
- Has a secure HIPAA-compliant network communication for case discussion;
- Provides customer support;
- Can set up multiple "clinics" and allows selecting the one you want to use with each call;
- Allows calling patients without showing physicians' personal cell phone numbers;
- Allows HIPAA-compliant online faxing, e-mail, and text messaging, all from one inbox;
- Does not record or store any recordings of calls made with the app;
- Partners with the Cleveland Clinic to offer continuing medical education;
- Offers customizable medical literature alerts;
- Allows personalizing searches for published research and can send notifications when such publications have been cited.

Cons:

- Does not allow receiving return phone calls directly through the app;
- Requires a Doximity account;
- Is currently available only for verified health care professionals in the United States.

ANESTHESIA TOOLBOX

This learning tool for anesthesia residents and fellows enrolled at contributing institutions offers extensive material for every level and every subject in anesthesia, including resident curricula and study guides in the form of online modules and lectures. In addition, it contains problem-based learning discussions (PBLDs), mini PBLDs, and podcasts. The toolbox also includes quiz banks, wiki cases, clinical questions, and clinical pearls. Anesthesia Toolbox provides excellent resources for any level of anesthesia resident, fellow, or attending looking for specific learning tools.

Pros:

- Uses similar processes to develop curricula and resources for other anesthesia subspecialties;
- Provides a comprehensive anesthesiology curriculum.

Cons:

- Has a limited number of anesthesiology residency programs;
- Is not a fast, on-the-go reference or resource.

ONLINE RESOURCES

The following websites are not apps but may be accessed at the point of care or whenever quick access to information is desired.

- The American Society of Regional Anesthesia and Pain Medicine, www.asra.com
  - ▷ Provides the latest news from ASRA;
  - ▷ Links available to *ASRA News*, *Regional Anesthesia and Pain Medicine*, podcasts, blogs, patient information, upcoming courses, and practice guidelines.
- New York School of Regional Anesthesia, www.nysora.com
  - ▷ Provides evidence-based information on foundations of regional anesthesia, techniques and videos, educational tools, and meeting information;
  - ▷ Provides newsletter with subscription.
- Ultrasound for Regional Anesthesia, www.usra.ca: provides practical PDF guides for ultrasound-guided regional blocks as well as videos.
- *Military Advanced Regional Anesthesia and Analgesia Handbook*, www.dvcipm.org/clinical-resources/dvcipm-maraa-book-project: provides pain assessment screening tools and regional anesthesia techniques broken down into chapters that can be viewed on smart devices and e-readers.

CONCLUSION

Regional anesthesia continues to evolve with the introduction of new techniques and the emergence of experimental and

clinical evidence. Smart devices provide a convenient and all-encompassing platform to store and reference regional anesthesia guidelines. However, most apps and online resources are not peer reviewed, and we must therefore remain vigilant in terms of interpretation and application of information.

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How to Start an Outpatient Pain Practice

We have entered an era of medicine where business sense is just as important as anatomy and physiology knowledge. This era is especially needed in a start-up an outpatient pain practice. Whether as an independent private group or part of an employed model at a hospital system, a practice must have a solid business foundation. This article provides a high-level overview for how to build a strong outpatient pain practice.

BUSINESS PLAN

Creating a business plan is imperative to making sure all the important aspects of starting a pain practice are considered. Most doctors struggle with this, either for lack of knowledge, interest, or resources. A business plan establishes your practice's goals and outlines your plans to achieve them. It also helps establish a timeline for growth. Addressing milestones at the one-, five-, and 10-year marks will help with the long-term vision of the practice.

The first step is to create a mission statement to guide the program's development. The statement can be as simple or complex as you like. You also must define your product; for a medical practice, the definition includes determining the starting scope of your clinical practice (eg, type of patients you want to see, conditions you would like to treat). If you are unfamiliar with the business side of medicine, you should seek input from outside resources such as clinic managers, financial analysts, and billing specialists.

NEEDS ANALYSIS

The initial step in building a practice from an operational standpoint is determining needs in the area you are hoping to start a practice. Find out how many pain practices currently exist within a reasonable driving distance, the top insurance payors in the area, potential referral sources, and other community medical resources and programs. Some physicians prefer going to an area with little competition, whereas others find a way to carve out market share in an area that already has a significant presence. Also consider whether you will provide alternative treatment options compared with your competition. You may want to consult local medical device representatives to see what treatment options other physicians offer.

An additional early step is determining whether to have a privately owned practice or build a practice within a healthcare system. The two options have significant differences (see Table 1), so find the best fit for you before choosing a path.

MARKETING STRATEGIES

Create a plan to get the word out about your practice to the right audience. Defining your audience will speak to your scope of practice and the needs you wish to meet. Strategies include direct marketing to patients through educational programs at community centers, flyers, and ads, or marketing to physicians by setting up appointments to meet and discuss what you have to offer. Because pain management practices have so many variations, you need a clear plan of the services you will offer your referral base and patients.

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PITFALLS

For many internal and external reasons, a practice may not perform as expected. The most common struggle is lack of understanding of business principles and finances.

From a management standpoint, the most overlooked component is not having clearly delineated job descriptions and performance expectations for clinical and administrative staff. However, this component is easier to manage with a privately owned practice; it becomes more difficult with additional layers of hospital administration that control budget and staffing decisions. It also complicates matters if the practice's expectations are not clearly communicated or the administration changes them without direct involvement of the clinical team. Having regular meetings with your program's administrative sponsor will help decrease the impact that changing hospital system expectations and needs have on your practice performance.

"Whether as an independent private group or part of an employed model at a hospital system, a practice must have a solid business foundation."

CONCLUSION

Because most physicians do not have a background in business, you may wish to hire a business development advisor to create the right plan for you when starting an independent practice. Most hospital systems will have a business development department to assist with practice startup.

A strong plan does not guarantee success but goes a long way toward ensuring that you are prepared for the inevitable challenges of medical practice.

Table 1: *Considerations for creating a private practice vs a hospital- or system-based practice.*

	Independent private practice	Hospital- or system-based practice
Location	Self-owned or leased property	Usually a hospital-owned space either freestanding or within a hospital
Scope of practice	—	• Outpatient clinic and interventional only • Inpatient consults: If the hospital system desires inpatient consults, a separate plan should be developed • Must have commitments of clinical and financial support from the hospital administration prior to creating a program
Procedure suite	In-office fluoroscopy suite vs ambulatory surgery center licensed space	Ambulatory surgery center vs hospital procedure suite vs operating room
Staffing	• Office and clerical: business or practice manager, front desk, in-house (or outsourced) billing and coding • Clinical ▷ medical assistant or other clinical support staff ▷ Mid-level practitioners ■ Review state board guidelines for scope of practice: physician assistant vs advanced practice nurse ■ Set clear and specific job roles and expectations ■ Clarify opportunities for incident-to billing ▷ Nurses and technicians if interventional procedures are done in office	Various models are used; administrators need a clear understanding regarding how this will be done • Office and clerical: business or practice manager (may be offsite or cover multiple practices), front desk, centralized billing department • Clinical ▷ Medical assistant or other clinical support staff ▷ Mid-level practitioners ■ Review state board guidelines for scope of practice: physician assistant vs advanced practice nurse ■ Set clear and specific job roles and expectations ■ Clarify opportunities for incident-to billing
Overhead costs	• Rent and utilities • Salaries and benefits • Administrative and clinical supplies	Built into budget for hospital department • Rent and utilities • Salaries and benefits • Administrative and clinical supplies

Curriculum Design in Regional Anesthesia Education: Survey of United States Residency Programs

In 2005, ASRA published the first comprehensive guidelines for fellowship training in regional anesthesia[1] and subsequently updated them in 2010[2] and 2014.[3] The guidelines were created specifically for fellowship training, but the principles hold true for training at any level. Although the recommended curriculum may be prescriptive, training programs undoubtedly vary in their approach.

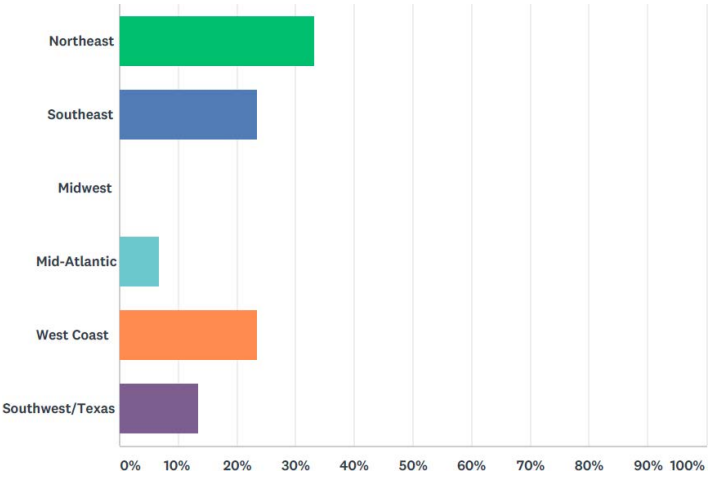
To better understand the current state of training for regional anesthesia and acute pain medicine (RAAPM), we recently conducted a survey of United States anesthesia residency programs. The 18-question survey encompassed a limited subset of content from ASRA guidelines to discern how residents are trained in RAAPM. We sent the survey to a random sample of 108 programs across the county, and 30 programs responding (response rate = 27.8%). Our goal was to survey a random sample of all anesthesia residency directors; however, because of a poor survey response rate, we refocused our attention to RAAPM fellowship directors. This likely biased our sample toward more RAAPM-centric programs.

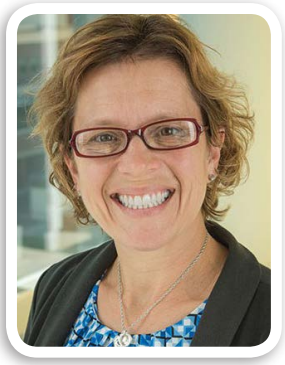
PROGRAM AND FACULTY INFORMATION

Geographic distribution of the responding programs is summarized in Figure 1.

Of the programs that responded, 90% also had a RAAPM fellowship at the institution, which was expected based on the survey sample. Most fellowship programs (75%) were not yet accredited by Accreditation Council for Graduate Medical Education (ACGME), but 33% have currently applied for ACGME approval. Most programs reported that 50% or more of their regional anesthesia faculty are fellowship trained, with a little more than half of the sample reporting that at least 75% of their faculty are fellowship trained (see Figure 2).

Figure 1: *Participants' geographic distribution.*





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"The survey results offer a glimpse of current approaches to resident training in RAAPM. As expected, great variability exists across residencies."

Curriculum Content: Block Exposure. Most programs reported scheduling 4-week blocks of dedicated training in RAAPM during either clinical anesthesia- (CA-) 1, CA-2, or CA-3 years (see Figure 3).

Figure 2: *Percentage of regional anesthesia faculty with RAAPM fellowship training.*

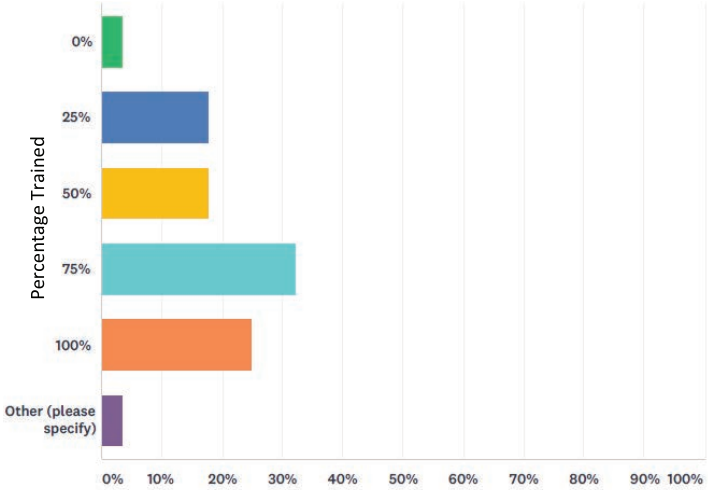


Figure 3: *Dedicated RAAPM training time during anesthesia residency. CA = clinical anesthesia.*

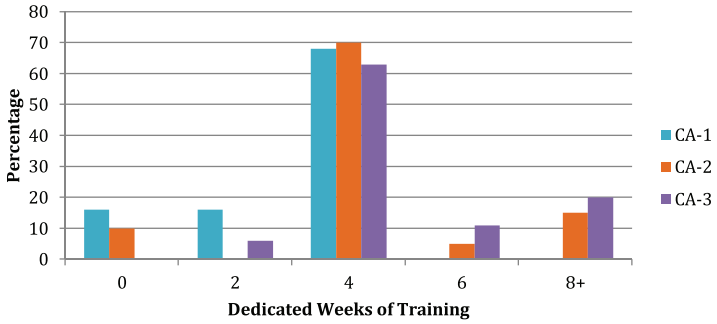


Figure 4: *RAAPM experience throughout residency.*

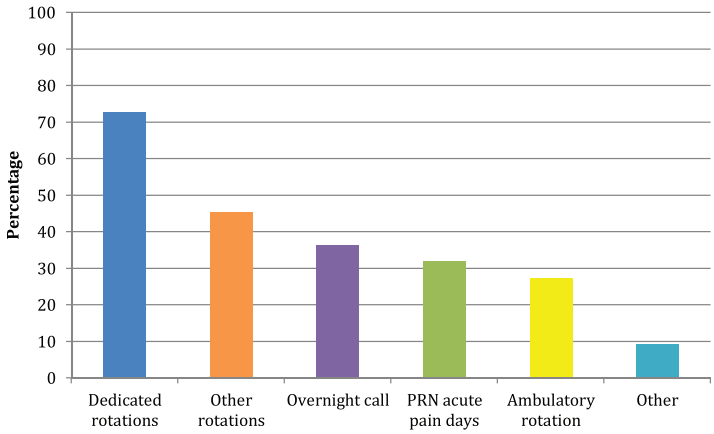


Figure 5: *RAAPM curriculum components.*

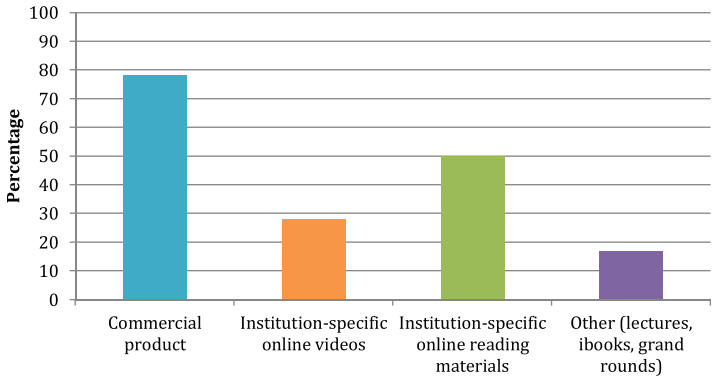
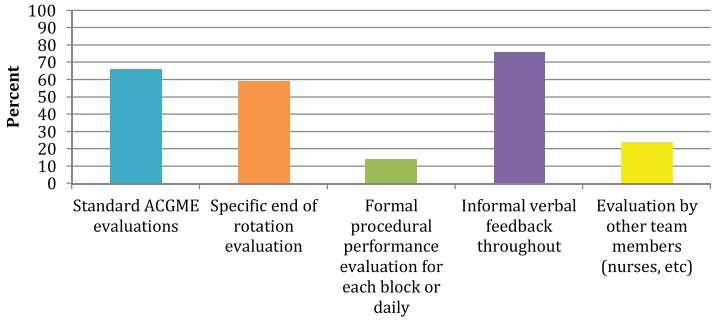


Figure 6: *Methods of trainee evaluation. ACGME = Accreditation Council for Graduate Medical Education.*



Residents were most likely to gain RAAPM experience during dedicated rotations, with some additional experience during non-RAAPM rotations, call duties, and ambulatory surgery rotations (see Figure 4).

Curriculum Content: Didactic and Simulation Exposure. A total of 74% of programs reported that residents have dedicated didactic time during RAAPM rotations, and 69% include simulation training in local anesthetic systemic toxicity as part of the RAAPM curriculum. Aside from didactics and simulation, most programs (62%) also use a commercially available RAAPM curriculum to guide trainee education (see Figure 5).

Although recognition of simulation's value for regional anesthesia training is growing, only 48% of programs required trainees to complete an ultrasound training curriculum prior to performing their first block; 52% of programs continued to use the "see one, do one, teach one" approach.

Trainee Evaluation. Programs used a variety of methods to evaluate trainees and provide feedback (see Figure 6). Most common were ACGME-relevant evaluations, usually at the end of the rotation, as well as informal feedback throughout the rotation.

DISCUSSION

The survey results offer a glimpse of current approaches to resident training in RAAPM. As expected, great variability exists across residencies. Most programs include at least a 4-week block rotation for dedicated training, with further experience gained in other rotations or during call shifts. Most programs use online training materials, either full curricula or supplemental written and video content. Interestingly, despite the growing awareness of the benefits of simulation in RAAPM training, approximately half the programs require trainees to complete formal ultrasound training before performing their first block and use a "see one, do one, teach one" approach to regional anesthesia training. Future educational research may better inform us which combination of training tactics is ideal for anesthesia trainees.

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Giving Feedback to Trainees

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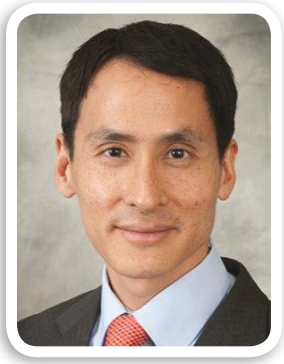

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Effective feedback is vital in clinical training. It allows trainees to reflect on their development, trainers to assess progress, and both to identify areas for development. In other words:

- "Where am I going?" (What are my goals?)
- "How am I going?" (What progress is being made toward the goal?)
- "Where to next?" (What needs to be done to make better progress?)

FEEDBACK AS A TOOL

Feedback, both positive and negative, can be a powerful educational tool.[1] Conversely, if given incorrectly, feedback can be destructive and should be avoided. Unfortunately, lack of feedback is one of the most serious deficiencies in current medical education practice.[2] The primary reasons are that educators may not fully appreciate the role of feedback as a fundamental clinical teaching tool and may not be skilled in the process of providing high-quality feedback.[3]

Levels of Feedback. Feedback can relate to the following levels[1]:

1. Task (eg, performing an interscalene block under ultrasound guidance);
2. Processing the task (eg, understanding the anatomy of the brachial plexus in the interscalene area);
3. Self-regulation or self-evaluation and the ability to engage further on the task (eg, "How do you think your block went, and how can we do it better in the future?");
4. Personal (eg, "Your needling technique is poor.").

Feedback about the person is often used instead of feedback relating to the first three levels. It usually contains little task-related information and rarely translates to more engagement, commitment to learning, self-efficacy, or understanding. Feedback that is directed at the personal level can improve learning only if it leads to changes in a trainee's effort, engagement, or feeling of efficacy.[1]

Timing of Feedback. Depending on the type of training, feedback can be delivered either immediately while the event is happening or later when reflecting on the event.

Task or Specific Skill. Immediate, informal feedback is likely to be more effective when relating to task performance, whereas delayed feedback may be more useful in discussing the processing of a task. The optimal timing of feedback may also depend on the complexity of the task at hand. Difficult tasks are likely to involve more processing, and delayed feedback provides an opportunity to analyze that in appropriate detail.[4] Drowning a trainee with information in the heat of the moment may be overwhelming and result in poor retention.[5]

Course or Rotation. A longer, formative feedback session should be scheduled midway through a course or rotation. If behavior requires correction, feedback should take place as soon as possible. This allows a learner time to remediate before the end of the course.[6]

"Feedback, both positive and negative, can be a powerful educational tool.[1] Conversely, if given incorrectly, feedback can be destructive and should be avoided."

FEEDBACK ENVIRONMENT

Setting. The feedback environment should be one of mutual trust and respect. The teacher and the trainee are partners in the process. Bing-You et al demonstrated that feedback given in a private setting might be more effective.[7] However, feedback may also be received differently, depending on the cultural background of the learner. Learners from collectivist cultures (eg, Confucian-based Asia, South Pacific nations) prefer more group-focused feedback. Learners from individualist cultures (eg, the United States) prefer more individual-centered feedback.[8]

Models for Giving Feedback. Different situations require different delivery methods for feedback. Several established models exist.

Table 1: *Role of feedback in performance development.*[12]

Stage	Learner	Role of feedback
1. Unconscious incompetence	Unaware of weaknesses	Helps learner recognize weaknesses
2. Conscious incompetence	Aware of weaknesses but lacks skills to improve	Helps learner define and refine skills
3. Conscious competence	Demonstrates competence but not fully integrated	Helps learner refine skills and encourages through positive feedback
4. Unconscious competence	Carries out tasks without conscious thoughts	Builds on strengths, identifies weaknesses

Replaying the event. This is the simplest of all models. A trainer takes the trainee chronologically through an event and gives feedback at every step, as required. This model is most suitable for one-on-one and short feedback sessions.[9]

Feedback sandwich. In this model, positive feedback is delivered both prior to and following constructive criticism of an area deficient in performance. This model may make a trainee more receptive to criticism and prevents them from feeling too disheartened at the end of the feedback. The biggest disadvantage of this model may be if the learner does not listen to the positives and may instead wait for the impending negative feedback.[9]

Pendleton's rule. Pendleton introduced the following model in 1984 to provide feedback in advanced life support training[10]:

- The trainee describes what went well.
- The trainer states what the learner did well.
- The trainee identifies what could be improved.
- The trainer recognizes areas for improvement and how to achieve this.

Pendleton's rule helps develop self-reflection and encourages two-way communication. It is most useful for providing feedback for practical skills but can be too systematic and rigid.

Agenda-led, outcome-based analysis. This model is based on identifying a learner's agenda from the outset and with what he or she needs help. In assessing performance, a trainer focuses on the outcomes the learner has chosen and then giving feedback. The model may be particularly suited to feedback related to a course or rotation or to theoretical learning. It can be adapted to specific tasks, especially with advanced trainees who are aware of their limitations and the demands of the task and who are seeking to refine certain aspects of their performance.[9]

Learner-centered model. In this model, the learner takes responsibility for the whole process of feedback, including seeking, preparing, and benefitting from the potential feedback. It is only suited for learners who are self-efficient (receptive, reflective, and responsive).[9]

PRINCIPLES OF GIVING EFFECTIVE FEEDBACK

Following these key strategies helps trainers offer the most successful feedback[11]:

- Feedback should be specific and based on direct observations (eg, "I noticed that . . ." or "I saw that . . .").
- Focus on performance of the task (eg, "You performed that block really well because you understand the anatomy"), not on the individual performing the task (eg, "Good girl").
- Language should be specific, neutral, and nonjudgmental (eg, "Before you perform the block, make sure you have identified the blood vessels and plan a path for your needle to avoid them" instead of "The way you performed the block was dangerous").
- Emphasize positive aspects and be descriptive rather than evaluative.
- Reinforce exemplary behavior, which will give learners confidence in their skills.
- Highlight areas and measures for improvement.
- Conclude with an action plan.

Effective Informal Feedback. The following questions may help trainers provide informal feedback about any educational activity[9]:

- Did the procedure go as planned? If not, why not?
- If you had to do it again, what would you do it the same or differently? Why?
- Did you feel tentative, confident, or out of your depth? How would you feel if you did the procedure again?
- How do you think the patient felt? What makes you think that?
- What did you learn from this?

Feedback on performance can help a learner to advance from beginner to an expert in four stages, as shown in Table 1.

Common Mistakes When Giving Feedback. Avoid pitfalls that make the feedback experience counterproductive for trainers and learners[9]:

- Giving feedback when it is not asked for or when a trainee is not receptive;

- Bringing up previous mistakes (unless the aim is to address a repetitive pattern of behavior);
- Focusing on personal issues, such as personality. Treat the criticism as an abstract problem, not a personality defect.
- Giving negative feedback in front of an audience instead of privately;
- Overloading the trainee;
- Giving feedback when angry;
- Providing immediate feedback for a situation that could have had serious adverse events. The first response should be to provide trainees with emotional support. Feedback for the purposes of learning from the incident should be deferred to a later debriefing session in a supportive environment.[13]

CONCLUSION

Delivering effective feedback is an essential part of medical education and can be rewarding for trainers. Learning to give effective feedback takes practice. Remember that in reflecting on your feedback skills, you can turn the tables on yourself and request feedback from your trainees on your performance as a teacher. Feedback should be part of institutional culture and is key to continued improvement in standards of care.[6]

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Disparities in Care for LGBTQ Patients

Recognizing the increasing disparities in care for lesbian, gay, bisexual, transgender, or queer (LGBTQ) individuals in several medical specialties is critical, especially in pain management. The percentage of American adults who identify as LGBTQ increased from 3.5% in 2012 to 4.5% in 2017.[1]

HIGHER LEVELS OF CHRONIC PAIN

Disparities in LGBTQ health care are not new and, unfortunately, have persisted over the years. A major contributor is a lack of understanding of the patient population's unique needs.[2] LGBTQ patients report higher levels of chronic pain,[3] higher degrees of functional limitations because of their pain,[4] and increased reports of multiple sites of pain compared to heterosexuals.[5] Other studies have described that LGBTQ individuals have a higher risk of developing headaches, abdominal pain, pelvic pain, and chronic pain than heterosexuals.[6] Katz-Wise et al found that mostly heterosexual women and gay men reported a higher incidence of headaches than same-gender completely heterosexual individuals, whereas mostly heterosexual and bisexual women were more likely to report muscle or joint pain than completely heterosexual women.[7] Alternatively, gay men tended to report less muscle or joint pain than heterosexual men, which may be attributable to generally lower body mass indexes in gay men versus heterosexual counterparts or greater societal and familial acceptance for gay men compared to other members of the LGBTQ community.[7]

A number of factors crucial to LGBTQ patients' overall pain management treatment may contribute to increased risk of chronic pain in this population. Discriminated LGBTQ youth have higher levels of depression and suicidality.[8] Katz et al indicated that in addition to chronic pain, sexual minorities reported more suicidal ideation and depression compared to the heterosexuals.[7] Other studies have indicated a possible link between depression and suicidality and increased reports of pain, which may factor into the higher incidence of chronic pain in LGBTQ patients. Furthermore, LGBTQ individuals have a greater incidence of internalizing symptoms (anxiety and depression), possibly because of discrimination and the subsequent stressors related to discrimination.[7] For example, LGBTQ patients often experience peer victimization and family rejection creating psychological stress. Additionally, LGBTQ youth are bullied more at school (34%), more likely to get in fights, and struggle with emotional stress more frequently than their heterosexual peers.[9] They also are at higher risk for harassment and injury with a weapon, further contributing to psychological traumas that can complicate their pain management.[9] Providers need to keep these comorbidities in mind while treating LGBTQ patients' chronic pain conditions.[3]

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LESS ACCESS TO CARE

Discrimination and its associated stressors not only contribute to an increased risk for chronic pain but also affect LGBTQ patients' access to health care, overall interactions with healthcare professionals, and possibly health-related treatment outcomes. One such challenge has historically been a lack of health care coverage. Luckily, lack of coverage has improved since 2014 now that most insurance companies cannot deny coverage to patients because of pre-existing medical conditions such as HIV, sexually transmitted diseases, depression, or substance abuse. Subsequently, the number of insured LGBTQ patients has increased significantly in recent years.[10]

DISCRIMINATION AND MISTREATMENT

Although coverage and care are improving for LGBTQ patients, a 2018 report indicated that LGBQT patients often encounter discrimination and mistreatment at the doctor's office.[11] In the Center for American Progress survey, 8% of LGBTQ patients reported that a health care provider refused to see them, 6% said the health care provider refused to give them care related to their actual or perceived sexual orientation, 9% indicated that the health care provider used harsh or abusive language, and 6% indicated that they encountered unwanted physical contact from the provider—and those numbers were almost doubled for transgender patients.[11] Because of such discrimination, LGBTQ patients may avoid or delay care, which can impact their health care outcomes. In the same survey, patients reported difficulty and challenges in finding different providers or health systems if they wish to change care.[11]

"LGBTQ patients report higher levels of chronic pain, higher degrees of functional limitations because of their pain, and increased reports of multiple sites of pain compared to heterosexuals."

CONCLUSION

In conclusion, evidence suggests that sexual minorities encounter discrimination and disparities in the health care system. They also have special needs and risks that need to be addressed by health care providers as they receive care for chronic pain or other disease conditions.

Health care providers should not let their beliefs influence the care they provide or how they treat unique or vulnerable patient populations. Patients have a fundamental right to receive compassionate and high-quality health care. Providers must not discriminate against patients for any reason but should instead seek opportunities to further understand the special needs of different patient populations.

In addition, increased provider awareness and educational content related to the special needs of the LGBTQ community are needed. Those efforts should better prepare health care providers to comprehensively care for this patient population.

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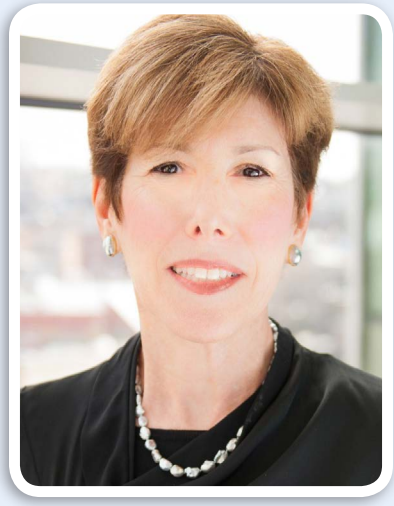
Dr Jeanine Wiener-Kronish: Women in Medicine and Progressing Toward a Healthier Working Environment

Medicine has come far in moving toward gender equality; however, we still have a long road ahead. ASRA recently created the Women in Regional Anesthesia Special Interest Group for like-minded practitioners to meet and collaborate. Other societies such as the International Anesthesia Research Society (IARS), the Association of University Anesthesiologists (AUA), and the American Society of Anesthesia are recognizing the need for more open discussion through panel sessions in their annual meetings. The American Medical Association also holds a Women in Medicine month in September, and this year's theme is "Celebrating Our Legacy, Embracing Our Future." *British Journal of Anaesthesia* is planning a special edition on women in anesthesia to foster openness and diversity.



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I recently had the opportunity to interview Dr Jeanine Wiener-Kronish and discuss how we can do more to promote a healthier environment in terms of gender equality. Dr Wiener-Kronish has served as the chief of anesthesia, critical care, and pain medicine at the Massachusetts General Hospital in Boston for many years. She has been in multiple leadership roles, including AUA president and founding member of the Academy of Anesthesia Mentors. She is also the recipient of the Elizabeth A. Rich Award from the American Thoracic Society, which recognized her dedication and contributions to the field of lung disease research and commitment to functioning as a female role model and mentor.

Vivian: You are recognized as a leader in anesthesia. Can you outline your role and your journey? What are the qualities of being a good leader?

Jeanine: I started out as the second female pulmonary fellow at the University of California, San Francisco. However, there were no salaried jobs for me in the Department of Medicine at the end of my fellowship and lab experience (4 years of research with funding). After doing further research into careers and interviewing with multiple anesthesiologists, including Dr Ronald Miller, I decided to do another residency in anesthesia. Dr Miller and my anesthesia colleagues were incredibly supportive of my goals. I think the choice of a job must include a supportive leader and staff. It was the best decision I ever made, except marrying my husband—that was equally a great decision.

For all of those reasons, my legacy had to include support and mentoring my residents and faculty, and I hope that is one of my recognized abilities as a leader. A good leader has to be transparent, fair, and supportive. Other important qualities are an ability to effectively communicate with all faculty and leaders and having kindness for all.

Vivian: What has been a defining moment for you in your career?

Jeanine: Having a mentorship award named after me.

Vivian: How do you gain support and recognition from your department and colleagues? Do you think male and female faculty have different levels of support or sponsorship?

Jeanine: Gaining support requires not only achievement but helping others. Many people help themselves. But leading a department or other entity requires generosity. Women are traditionally viewed as nurturing and supportive, and they sometimes need mentoring in developing traits like dealing with conflict and making unpopular decisions.

Vivian: Did you have a strong mentor? Any advice on seeking mentorship? What makes a good mentor-mentee relationship?

Jeanine: I had many mentors—both men and women. I think multiple mentors for different aspects of one's career is essential. Don't be afraid to ask for advice and help.

Vivian: Why do we need more women in medicine?

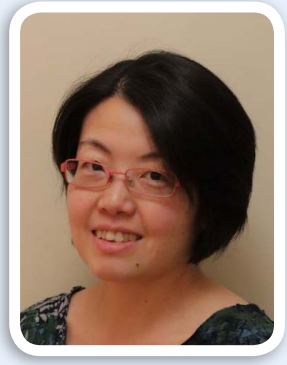
Jeanine: We need more female role models. My dream is a profession in which both men and women are free to achieve to the best of their ability. Unfortunately, we are not there yet.

Leadership requires time and the ability to accept some unpleasant tasks, such as sometimes telling friends they are not doing their job well enough.

Women need to plan to be leaders so they can acquire the skills and necessary support, including child support and familial support, to make it work. Like all positions, it takes planning and effort. Men often ask for support from their wives; women need to do the same. My husband has been the best mentor and supporter I ever had. My parents also helped with childcare, and now my husband and I help our daughter with her son.

Vivian: Why do you think the gender gap is lessened at medical school, yet leadership roles are still male dominant? The theme

for this year for International Women's Day is "Balance for Better" in support of gender balance. What do you think is the most effective way for an organization to foster all types of diversity and inclusion in our specialty and to embrace our differences and values?



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Jeanine: We need to constantly work to improve diversity in every way. During the 2019 AUA and IARS annual conferences, we had meetings on how to improve our diversity and leadership. Two female anesthesiologists, Dr Maya Hastie and Dr Megan Lane-Falls, will work with the Dean of diversity at Columbia University, Robert Whittington, on a survey of anesthesia organizations to identify what we can do to improve diversity in membership and in our leadership. This is a great step in fostering diversity.

Vivian: What are your thoughts about the #MeToo movement in medicine? Is it going to bring culture change? Should we have more in the way of wellness for women in medicine? How can we protect and support women and motherhood in the workplace? How do we say "no"?

Jeanine: The #MeToo movement is changing medical culture, perhaps faster than it ever has moved. That said, everyone in medicine needs to be devoted to patient safety—and that involves cooperation and collaboration, which has not always existed. This needs to be achieved without insults and harassment. Given the years of hierarchy and bad behavior in medicine, we also need to be aware that this process may take some time.

Also, total equality does not exist when patient care is involved—trainees should be aware of their lack of knowledge and be respectful to those with more training, including nurses, when patients' outcomes are at stake.

Women need to have paid maternity leave—but so do men. Saying "no" is okay and at times necessary; it is also helpful to let others complete tasks if they may benefit more from them. However, as mentioned previously, timing and getting support will also help more women become leaders. Female physicians in Sweden and Denmark leave work for a year or more for childcare and then may have trouble coming back and becoming leaders; sharing childcare responsibilities may be a solution. We cannot say "yes" to everything, so it is important to prioritize the many roles we all have: patient care providers, team members, academic mentors, and family members.

"Women need to plan to be leaders so they can acquire the skills and necessary support, including child support and familial support, to make it work."

Vivian: Any advice for our current trainees or junior faculty, especially women, to become more involved in national or international organizations and perhaps in leadership roles?

Because each person is different, no ideal answer exists. Finding the right support in a spouse, in a family, and at work is essential for success. Women at the 2019 AUA and IARS meetings stayed after the women's breakfast and did some networking—that is really a successful use of time. Reaching out to mentors, both men and women, is key. We all need to keep working on these issues to improve them.