SOAP
Society for Obstetric Anesthesia and Perinatology
NEWSLETTER

www.soap.org

Winter 2019

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President's Message

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Our Future Starts Now

Thank you for all your contributions and hard work on behalf of SOAP, our sub-specialty and our patients. As SOAP achieves our strategic objectives and expands into new horizons, we are setting the foundation for our future.

SOAP Mission

The mission of this Society is to improve the pregnancy-related outcomes of women and neonates through the support of obstetric anesthesiology research, the provision of education to its members, other providers, and pregnant women, and the promotion of excellence in clinical anesthetic care.

SOAP: The Big Picture

Congratulations: we have come a long way in the last 6 months! Our website has been revamped, we are creating more content than ever for SOAP.org (Meets strategic objectives: SOAP as the premiere educator for obstetric anesthesia, membership, member value). Committees have grown in size and sub-committees have been created to more effectively manage work flow, develop concepts, and increase net output (Meets strategic objectives: member engagement, governance). SOAP has traditionally picked meeting sites and meeting formats without due economic considerations, and that has caused some financial issues. Now, we have undertaken a deeper financial analysis of our meetings, taking steps to better reduce variability and improve profitability. Led by Klaus Kjaer, the SOAP Ad Hoc Growth and Development Committee, created a strategy and plan for SOAP's financial future and created a Fundraising Policy. Updated methods of choosing the SOAP meeting

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site, host and bylaws changes are being proposed, led by Ted Yaghmour (Meets strategic objectives: Governance, finances). Our involvement in other societies and placing SOAP representatives on committees has never been higher, thanks to Lisa Leffert SOAP President-Elect, the Inter-Society Task Force and others (Meets strategic objectives: Inter-society relations, reach of SOAP). I have also invited presidents of our sister organizations to contribute to the SOAP newsletter. Many more people have contributed to our success.

Foundation for the Future

SOAP governance activities have been improved with structure, transparency and communication. We must continue to build our foundation – both the SOAP Endowment and organizational functioning. We have met most of our strategic goals from the 2017 Strategic Planning Meeting and it's time to retire these and rethink new ones. The SOAP 2019 Budget allows for a similar one-day strategic planning meeting this spring. Our future is bright, but challenges remain. SOAP membership and budget are relatively small compared to other organizations, yet your volunteerism allows us to have a big impact. To stay relevant, we must grow – our membership, our reach to educate all health care professionals about obstetric anesthesia and the effectiveness of our website; The SOAP Mission – improving pregnancy-related outcomes, education, research and the promotion of excellence in clinical anesthesia care demand it. A successful organization must evaluate its activities against its mission and strategic goals. Please donate to the SOAP Endowment Fund – it's tax deductible as a charitable contribution (https://soap.org/donation-form/).

Membership Value

Why belong to SOAP? We continually seek to improve membership value for you. Many of the **SOAP 2018 Annual Meeting main session lectures were recorded and are available on the website under the SOAP members section** (requires membership and login to view). Videos include the panel Innovations for Obstetric Hemorrhage (Drs. Butwick, Carusi, Farber, Katz and Mhyre), The Gerald Ostheimer Lecture – What's New in Obstetric Anesthesia? (Dr. Habib), Opioids in Pregnancy and the Postpartum (Drs. Bateman, Landau, Miller), and the panel on the Future of Obstetric Anesthesia 2028 (Drs. Gaiser, Nixon, Zakowski), SOAP's 40th Anniversary Gertie Marx Education Lecture (Drs. Baysinger, B. Carvalho, Richard Clark founding member SOAP, Zakowski), and more! The expanded Educational Committee will be producing more content to be under the members section. Podcasts are available – links are on the SOAP website. Our Media Committee has worked to engage members and non-members on social media.

A **SOAP ERAS Cesarean template** will be posted on the member's area of our website around the beginning of the year encompassing prenatal, in-hospital, and post hospital care. As a SOAP member, you will be able to bring this back to your department/hospital, start the inter-disciplinary conversation and implement – to improve outcomes, reduce opioid usage, and decrease length of stay. Become a SOAP ERAS Cesarean champion!

A **SOAP Sugammadex Statement** will also be up on the SOAP website around the new year. This statement can help guide your decision(s) on use of sugammadex in women of childbearing age.

A SOAP statement regarding the recently FDA approved Sufentanil 30 mcg sublingual tablet (Dsuvia) and advising against any potential use in peripartum women will also be completed around the new year and will be posted to the SOAP website.

Please renew your membership and ask three other people in your department to join as well. Together we are stronger!

Fellowship in Obstetric Anesthesiology

SOAP helps promote ACGME fellowship in obstetric anesthesiology. Leadership in the field helps raise the value of all practitioners of obstetric anesthesiology. Demand for fellowship trained obstetric anesthesiologists has been projected to be very good for at least the next several years, in a recent article in Anesthesia & Analgesia by Katie Gelber et al., **Obstetric Anesthesiology in the United States: Current and Future Demand for Fellowship-Trained Subspecialists**, Anesth Analg 2018:127:1445-7.

Governance Improvement

SOAP will have bylaws changes for approval by membership this year. As SOAP has grown, so has the complexity and difficulty of managing the Annual Meeting. The current process of site and host selection prevents optimal long term contracting at favorable rates, producing variable financial results. SOAP needs better reliability of financial results and reduced wasteful time and effort re-inventing the yearly program at a new venue with unique aspects. The SOAP Board of Directors hope you will give the bylaws proposal serious consideration for the next business meeting.

Ostheimer Lecture

The Ostheimer nomination process was opened up to the entire SOAP Board of Directors and Committee Chairs, producing a large group of qualified candidates. The Board of Directors reviewed all candidates' CVs and we are pleased to announce the selection of the SOAP 2020 Gerard W. Ostheimer Lecture: "What's New in Obstetric Anesthesia?" lecturer will be Dr. Ron George, our 2020 Annual Meeting Host.

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SOAP Committees

Thank you to all those who volunteered for SOAP committees – almost all requests were granted. The larger committees (e.g. Education) have been subdivided into smaller sub-committees to provide not only more functional working groups, but to provide more leadership opportunities. Leadership development within a professional organization has been a goal of mine. The SOAP website will be updated to reflect current positions. Thank you for your volunteerism! Remember the requirements – participation and good SOAP citizenship.

Critical Care in Obstetric Anesthesiology

The future includes critical care of the parturient. While we have made some progress reducing maternal morbidity/mortality from hemorrhage, preeclampsia, and embolism, other problems like cardiovascular disease and sepsis have relatively increased. Melissa Bauer MD, double trained in critical care and obstetric anesthesiology, leads the Ad Hoc Committee on critical care education. SOAP will be having more opportunities to learn new aspects of caring for the peri-partum woman.

Editor's Corner

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I hope you all enjoy this edition of the SOAP Winter Newsletter! My name is Kathleen Smith, and I have transitioned into the role of chair of the Newsletter subcommittee to the SOAP Media committee. Dr. Heather Nixon has done a wonderful job as editor, and I hope to continue to deliver a high quality newsletter to the members of the SOAP community.

This newsletter features several pieces from the Education Committee, as well as the Patient Safety Committee. Dr. Nixon gives us a preview of the SOAP 2019 meeting in Phoenix, Arizona. Dr. Felicity Plaat, President of the Obstetric Anaesthetists' Association, updates us on Obstetric Anesthesia care in the UK and beyond. Lastly, new to the Newsletter starting with this edition, we feature a 'Pioneers in Anesthesia' piece, focusing on an individual who has made a major impact in the field of Obstetric Anesthesia. This year's 'Pioneer' is Dr. John J. Bonica.

We are constantly striving to deliver educational and meaningful content to our membership. To that end, if there is something you want to learn about, bring your idea to any SOAP committee for exploration. Thank you!

Annual Meeting: Host's Message for Arizona 2019

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This year I am delighted to be your host as the Society for Obstetric Anesthesia and Perinatology heads to the J.W. Marriott Desert Ridge and Spa in Phoenix, Arizona for the 51st Annual Meeting from May 1st-5th, 2019 themed **Improving Maternal Outcomes: High Impact Strategies for Change**. We have an amazing educational program designed for you, but we hope you also enjoy the amenities, events and activities we have planned for your stay.

The J.W. Marriott Desert Ridge and Spa is a sprawling hotel with luxurious amenities that will satisfy any conference goer. For those of you inclined, the property has five pools including a lazy river and waterslide, with food and drinks available within steps. Golf enthusiasts will enjoy the ***Wildfire Golf Club*** which has two professional golf courses including the Palmer Signature Course and the Faldo Championship both of which are surrounded by mountain views. Be sure to register for our Friday afternoon tournament. Then, let the pampering begin at the 28,000 square foot ***Revive Spa*** which boasts 41 treatment rooms, two stories and private outdoor bistro and sanctuary pool area with a backdrop of the majestic mountains of the Sonora Desert. Facilities include full spa services and has been rated "One of America's Best Spas" by Mobil Travel Guide. A state of the art fitness center hosts a variety of classes including cycling, yoga, strength training and Tai Chi that will help you stay balanced and energized during your stay. Outdoor tennis courts, jogging, fitness trails and bike rentals are also available to enjoy. While you are there, experience **Pickleball**, a sport that combines badminton, tennis and table tennis at their multiple courts. Bring the kids - the property has a **JW kids camp** daily that offers arts and crafts, desert adventures, sports and trivia. Bring the whole pack to enjoy ***Family Leisure Time*** in the complimentary family lounge and then do some creative crafting with the staff. Of course, plan dinner at one of the six on-site restaurants including ***Roy's Pacific Rim*** and ***Meritage - an urban bistro***.

Explore local attractions including nearby ***Scottsdale*** or ***Cave Creek*** where you can find western style and goods with great dining options. ***The Desert Ridge Marketplace***, within walking distance from the hotel also offers great shopping and dining options. Take some time and visit the amazing ***Musical Instruments Museum***, which is North America's largest collection of musical instruments and just 5 min from the hotel.

Of course, don't miss our opening reception at the hotel on **Wednesday, May 1st, 2019** which will take advantage of the gorgeous facilities and sunny weather. This year, we are also offering many ***Lunch and Learn*** sessions and even a ***Lunch Around*** where you can come to network with SOAP board members. For our trainees, take advantage of our ***"Find a Mentor"*** program where residents can network with SOAP leadership to learn more about our wonderful specialty.

More information about the Annual Meeting will be available on the SOAP website (www.soap.org).

We look forward to seeing you in Phoenix!

Guest Spotlight: Update form the Obstetric Anaesthetist's Association (OAA)

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The Obstetric Anaesthetist's Association has had another busy year promoting education and training of anaesthetists and other health professionals to ensure the delivery of excellent care to mothers and their babies.

In the last twelve months, we have awarded a number of bursaries to assist obstetric anaesthetists from Nigeria, Nepal, and India to attend the OAA's Three-day Course on Obstetric Anaesthesia & Analgesia. The OAA has also provided financial support for an educational course for 'anaesthesia clinical officers' in Uganda. Anaesthesia clinical officers are non-doctor anaesthetists and are responsible for a significant proportion of obstetric anaesthesia in Uganda.

Research Fellowships for major and medium financial awards are evaluated and awarded annually through the National Institute of Academic Anaesthesia and further grants are awarded by the OAA's Research and Grants subcommittee. Projects that have been supported in the last twelve months include an evaluation of platelet function in preeclampsia, an assessment of the accuracy of lumbar ultrasound for spinal anaesthesia in obese obstetric patients and a randomised controlled trial of prilocaine for spinal anaesthesia in cervical cerclage.

In 2017 work commenced on a project to develop quality indicators in obstetric anaesthesia. There is increasing emphasis on 'Quality' in medicine and obstetric anaesthesia is no exception, with ways to measure and improve quality being a burgeoning area of interest. The Quality and Outcomes Working Group has recently completed work on a major multidisciplinary project to develop quality indicators. The team is working with the National Perinatal Epidemiology Unit to identify indicators in obstetric anaesthesia that can be used in a practical and meaningful way to examine practice in individual units and to compare practice between units.

A major aspect of the communications strategy of the OAA is the work of the Information for Mothers Subcommittee (IFMSC). The IFMSC leads on one of the main aims of the OAA and is a key aspect of its work for public benefit: to provide credible information to mothers, in a format that is accessible and that can be easily and regularly updated. The provision of this 'information for mothers', is now hosted as a separate domain (accessible through the OAA portal) called 'labourpains.com.' Translations of the various types of information are now available in the twenty most commonly spoken languages in the UK, this work being supported by the charity organisation, 'Translators Without Borders.' A major innovation, the development of which was supported by an OAA grant, is the provision of information videos available in several different languages.

Finally an important aspect of OAA future strategy is the development of OAA guidance in clinically relevant areas, not covered by other national guidelines. The first topic chosen as the subject for OAA specific guidance is post dural puncture headache, which was highlighted by the 2014 MBBRACE-UK Report as an area that lacks a uniform national approach. The Guideline Development Group has been chaired by Dr Robin Russell who has co-ordinated an extensive literature review of the subject to facilitate the development of evidence based/consensus recommendations. Publication of the first guideline is anticipated in early 2019.

Education Committee: Maternal Critical Care: Where Should We Manage Critically Ill Parturients?

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The best location to manage critically ill peripartum patients is difficult to decide. Two options exist, and neither is optimal: the intensive care unit (ICU) or the labor unit. Intensive care beds are an expensive and limited resource which are often utilized on patients who require close monitoring but not necessarily critical care interventions. The labor floor provides care for laboring patients and those having cesarean delivery. When a complicated pregnancy occurs requiring higher attention, a decision needs to be made on where to care for the patient.

A checklist of specific criteria to decipher if a peripartum patient meets criteria for ICU admission does not exist. The Society of Critical Care Medicine published guidelines for the ICU admission of nonpregnant patients which offer vital sign and laboratory values along with imaging, electrocardiography, and other physical findings that would prompt a clinician to consider an ICU admission.[1] For pregnant patients, different hemodynamic, respiratory, and laboratory values exist, and clinicians should understand normal versus abnormal physiology in the peripartum period.[2,3,4] However, absolute cutoffs do not exist to prompt a clinician to transfer a parturient to an ICU. Decisions to escalate care can also be guided by the Maternal Early Warning criteria[5], Acute Trauma Life Support stages of hypovolemic shock[6], and specific physiologic aberrations that would support the initiation of continuous and possibly invasive monitoring.[7]

The two most common reasons for postpartum ICU admission are obstetric hemorrhage and hypertension.[8] Both of these problems can be safely treated in the labor and delivery unit. Depending upon hospital-specific resource and staff considerations, continued management in the labor and delivery unit should be considered, potentially in a recovery room bed with continuous monitoring. The National Partnership for Maternal Safety has published Consensus Bundles for both hemorrhage and severe hypertension, guiding practitioners through treatment algorithms to successfully manage patients with these morbidities.[9,10] Since clinicians and nurses in labor and delivery units are knowledgeable about physiology specific to pregnancy and surrounding the peripartum period, and are educated and trained to treat obstetric hemorrhage and hypertension, patients with these morbidities may be better cared for by multidisciplinary teams of obstetricians, anesthesiologists, and nurses with escalated care on the labor unit rather than in an ICU, which may be physically separated from these specialized practitioners. If the patient has other morbidities necessitating ICU admission, the multidisciplinary teams on the obstetric ward must know how to mobilize resources and initiate critical care, with invasive monitoring, aggressive resuscitation or airway management, while transport to an ICU is being arranged.

A five-step approach has been proposed for management of critical illness in pregnancy.[11] Step 1 is to differentiate between medical and obstetric disorders with similar presentations. Even if a patient is managed in the labor and delivery unit, an intensivist may need to be consulted to review the clinical course, expand the patient's differential diagnosis, and discuss treatment options. The involvement of the ICU physician also begins the discussion of the patient's management with the ICU team so if treatment endpoints are not being met and the patient's clinical status worsens, the intensivist can quickly facilitate transfer or assume a primary rather than consulting role in the patient's care. Steps 2-5 include identification and treatment of maternal organ dysfunction, and if the patient is still pregnant, assessing maternal and fetal risk of continuing the pregnancy. If delivery will improve outcomes, the preferred mode of delivery to minimize morbidity needs to be chosen, while optimizing maternal organ functions. If the patient is pregnant in the ICU, emergency equipment for a bedside cesarean delivery, neonatal resuscitation, and maternal ACLS and airway management must be available.

A practice bulletin on critical care in pregnancy (American College of Obstetricians and Gynecologists, 2016)[12] acknowledges that the choice to admit a patient to an ICU depends on the level of care available at the local level. However, the bulletin states that need for airway management including endotracheal intubation, and cardiovascular support with vasopressors should be treated in an ICU. Readiness in all locations is imperative, however, as a patient may need these interventions on the labor and delivery unit prior to ICU transfer. Regardless of where a critically ill peripartum patient

Maternal Critical Care *continued on next page*

is managed, a multidisciplinary approach with involvement of the obstetrician, anesthesiologist, intensivist, nursing, and neonatology if the patient is still pregnant, should guide the clinical decision-making for maternal and fetal monitoring, mode and timing of delivery, and medical management for the best maternal and fetal outcomes.

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Education Committee: *Sugammadex Administration in Pregnant and Non-Pregnant Women*

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Despite a decade of clinical use, evidence regarding safety of sugammadex administration in pregnant women remains sparse. Four primary categories of surgical patients are of concern to the obstetric anesthesiologist: 1) women undergoing cesarean delivery; 2) pregnant women undergoing non-obstetric procedures; 3) breast-feeding mothers; and 4) non-pregnant women of reproductive potential.

Women Undergoing Cesarean Delivery

Several series[1-3] and two trials[4,5] (totaling 168 parturients) describe effective sugammadex antagonism of neuromuscular blockade (NMB) following cesarean delivery, including intense block in most cases.[2-5] Rocuronium (0.6-1.2 mg/kg) was the relaxant used at induction to facilitate tracheal intubation in most patients. Succinylcholine has long been the NMB drug of choice during rapid sequence induction (RSI) of general anesthesia in pregnant patients. Although unexpected severe airway difficulty ("cannot intubate, cannot ventilate", CICV) is rare, rapid succinylcholine metabolism and resolution of NMB makes resumption of spontaneous ventilation an option in the event of CICV after succinylcholine administration. Availability of sugammadex now provides an effective means of reversing deep neuromuscular blockade minutes following administration of 1 mg/kg rocuronium in the event of unexpected CICV,[6,7] including, theoretically, in pregnant women undergoing CD.[8] However, such a patient would still be pregnant, and thus far, neither placental transfer of maternally administered sugammadex nor potential fetal effects have been reported, and sugammadex administration in gravid patients has thus far not been reported. Furthermore, although rocuronium (1 mg/kg) was reported to be non-inferior to succinylcholine (1 mg/kg) for time to achieve intubating conditions during RSI for cesarean delivery,[4] and sugammadex antagonism is effective following post-intubation dose rocuronium administration,[1-5] there is currently insufficient evidence to support its preference over succinylcholine for RSI in cesarean delivery.

Pregnant Women Undergoing Non-Obstetric Surgery

Approximately 1-2% of pregnant women undergo anesthesia for non-obstetric surgery.[9,10] Despite non-specificity for acetylcholinesterase at the neuromuscular junction, significant autonomic effects, and inability to fully antagonize intense NMB, neostigmine has long been the NMB antagonist of choice, for lack of an alternative. Pharmacologically clean and fast-acting sugammadex obviates the need for co-administration of anticholinergic drugs and has reduced the need to meticulously monitor NMB intensity. However, there is currently no published evidence regarding three vital questions about the use of sugammadex in the pregnant patient: 1) Does it cross the placenta? 2) What are its fetal effects? and 3) What are its effects on pregnancy maintenance?

Placental Transfer—Unknown

The physicochemical properties of sugammadex—immense molecular weight (2,178 g/mol), hydrophilicity, polarity—predict no placental transfer without facilitated or active transport. Although there are claims of little or no placental transfer,[11,12] no authors cite an evidence source. Furthermore, the current Bridion® package insert states that there are no data to inform drug-associated risks in pregnancy,[13] and this remains true today.[14]

Fetal Effects—Unknown

Despite limited, recent preclinical studies that suggest a possible link between sugammadex and neuronal apoptosis,[15-17] fetal effects of sugammadex are unknown. Clinically relevant concentrations of sugammadex were observed to induce cell death in primary cultures of cortical neurons from rat cerebral cortex, possibly due to alterations in neuronal cholesterol homeostasis.[15] The same investigators demonstrated prevention of cell death by addition of rocuronium or vecuronium, presumably by limiting unbound sugammadex levels.[17] A different group studied the potential of sugammadex to induce neuronal damage in neonatal mice.[16] Sugammadex alone caused no ultrastructural abnormalities or neuroapoptosis, while sevoflurane exposure for 6 hours produced hippocampal blood brain barrier abnormalities and neuroapoptosis, both of which were significantly greater when sugammadex was co-administered.

Sugammadex Administration *continued on next page*

Maintenance of Early Pregnancy

There is no evidence regarding potential effect of sugammadex administration on maintenance of early pregnancy. A single study that exposed 1st trimester pregnant rats to high dose sugammadex (30 mg/kg) failed to demonstrate any changes in either endogenous progesterone levels or in live birth or stillbirth rates.[18] However, interactions between sugammadex and progesterone components of hormonal contraceptives (see below) suggest that evidence is specifically needed in human gravid models, before definitive comments can be made on sugammadex's safety for maintenance of pregnancy.

Lactation

Although the amount of sugammadex in human breastmilk is predicted to be very low, and infant enteral absorption unlikely,[19] no published evidence exists regarding presence of sugammadex in human breastmilk following maternal administration, nor on potential effects of drug ingestion by infants.[13,19] The manufacturer describes a single unpublished study in 9-day postnatal rats that demonstrated peak sugammadex milk levels 30 minutes after systemic administration (20 mg/kg), with no detectable survival, physical, or behavioral developmental effects in feeding offspring exposed via milk.[13]

Women of Reproductive Potential

Finally, sugammadex not only binds rocuronium and vecuronium with extreme affinity, but the manufacturer refers to unpublished *in vitro* binding studies that indicate that it may bind progesterone, reducing hormone levels to an extent that is equivalent to "missing dose(s) of oral contraceptives."[13,14] They warn that women using either oral or non-oral hormonal contraception must use an additional, non-hormonal contraceptive method or back-up contraceptive method for 7 days following sugammadex exposure,[13] and many appear to heed this theoretical warning.[20-23] Interestingly, despite availability of neostigmine, a NMB reversal agent devoid of this risk, some appear to place the onus of managing the risk of unintended pregnancy on the patient after the fact, during patient discharge counseling.[20-22] Some have questioned the ethical acceptability of this *ex post facto* approach.[23,24]

In summary, sugammadex antagonism of deep neuromuscular block in postpartum women at the end of cesarean delivery appears to be effective. However, there is little available data to inform the decision to administer sugammadex in women who are pregnant, lactating, or of reproductive potential. Current pressing research gaps include placental sugammadex transfer, safety of fetal exposure, and the nature of the risk of unintended pregnancy incurred by sugammadex administration in women using progesterone-containing contraception.

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Education Committee: *Sphenopalatine Ganglion Block for Management of the Postdural Puncture Headache*

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Since the beginning of neuraxial anesthesia with Bier and Hildebrandt, post dural puncture headache (PDPH) has plagued its use. Young women are at increased risk, and thus parturients, who routinely get neuraxial blocks, become most at risk. The gold standard for treatment of PDPH remains the epidural blood patch (EBP) because its success rate is 70-98%.[1,2] This procedure carries its own risks, including nerve irritation or palsy, arachnoiditis, or even subdural hematoma. Given these risks, some patients opt for a range of conservative management therapies that are much less efficacious and rarely treat the underlying cause of the headache. Recently, there has been a resurgence in the use of the transnasal sphenopalatine ganglion block (SPGB) for treatment of PDPH due to its easy application, limited complication profile, and quick relief of symptoms.

The SPGB was first described in 1908 for nasal headaches. Since then its application has expanded to include postoperative analgesia for sinus and nasal surgery, treatment of chronic migraines, trigeminal neuralgia, and most pertinent to obstetric care—post dural puncture headaches.[3] The sphenopalatine ganglion has parasympathetic innervation from the greater petrosal nerve and sensory innervation from the maxillary branch of the trigeminal nerve, and is located in the pterygopalantine fossa (Figure 1). Although the mechanism of its long acting relief remains unclear, it is most likely related to inhibition of parasympathetic associated cerebral vasodilation.[4]

For PDPH, the transnasal approach for SPGB has become the most popular because it is the least invasive technique. For this block the patient is positioned supine in the sniffing position. A bupivacaine or lidocaine soaked cotton-tipped applicator is then placed in the bilateral posterior nasopharynx. Advancement of the applicator should be parallel to the zygomatic arch and directed towards the middle turbinate. The swab is left there for 10 minutes, removed, and then a new local anesthetic covered swap is placed for an additional 20 minutes.[5,6] The block can be repeated as needed if efficacious. Of the small number of studies utilizing SPGB for PDPH, most have used either 2% or 4% lidocaine repetitively to achieve analgesia.[5] A meta-analysis of SPGB for endoscopic sinus surgery, showed no difference in post-operative morbidities with different local anesthetics, indicating the medication used may be of lesser importance than the block itself.[7]

In the recently published small retrospective review comparing EBP and SPGB by Cohen et al., the SPGB patients had no complications, faster headache recovery, and fewer returns to the emergency room for PDPH.[8] In addition, many patients with SPGB experienced complete headache resolution, even beyond the expected duration the local anesthetic.[5] The technique for the block can even be taught to patients so they can repeat the block as necessary. Although the incidence of complications is unknown, they can include epistaxis, hematoma formation, and infection.[4]

Evidence for the routine use of SPGB is still lacking; its use in obstetric patients has been primarily described in small case series and only recently one retrospective study. More prospective randomized trials are needed before SPGB can be

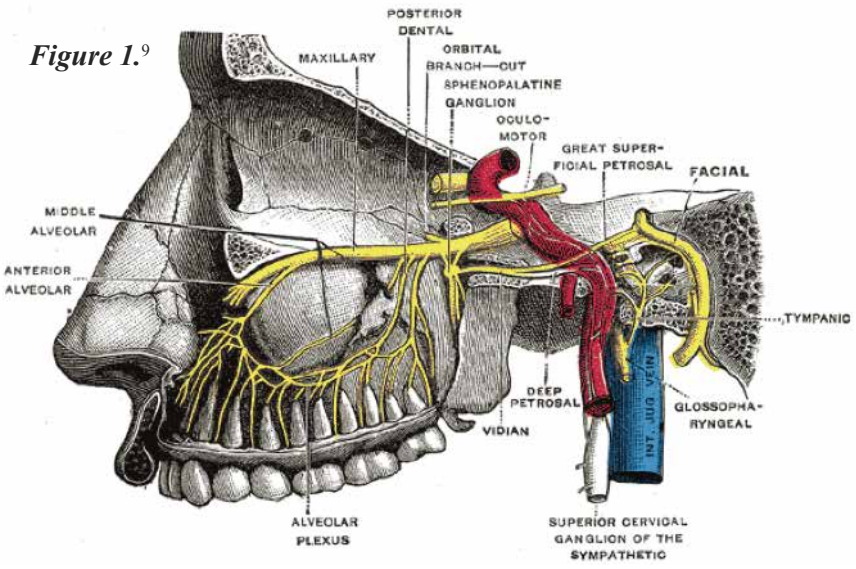

Figure 1.[9]

Sphenopalatine Ganglion Block *continued on next page*

considered a first line treatment for PDPH. In the meantime, SPGB may be a viable option for PDPH management for those patients who decline or have contraindications to EBP, such as those with coagulopathy or a history of very difficult neuraxial block.

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Patient Safety Committee: *How We Do It: Utilization of the Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) Device*

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The Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) has been utilized for decades as a tool during traumatic hemorrhagic shock. It provides a similar physiologic response as applying an external cross-clamp to the aorta by producing proximal control of hemorrhage through occlusion, and contributing to hemodynamic stability through afterload augmentation. The ultimate location of the balloon can be in (1 of 3) zones (Figure 1), depending on the suspected source of arterial bleeding. REBOA placement is typically performed by trauma or acute care surgeons, interventional radiologists, or interventional cardiologists. It can be deployed emergently in the trauma bay or operating room through manual guidance, or prophylactically under direct visualization using fluoroscopy.

More recently, REBOA has gained recognition as a valuable adjunct for obstetric cases with high risk for hemorrhage or active hemorrhage. Its use has been described for patients with suspected morbidly adherent placenta (MAP), severe and refractory uterine atony, cesarean hysterectomy, and bleeding from coagulopathy. For obstetric hemorrhage, REBOA is typically deployed in zone 3 beneath the renal arteries, where inflation of the balloon will occlude the majority of uterine blood flow, or zone 1 to include coverage of the collateral vessels. Our understanding of REBOA complications is evolving; reported complications in the general or obstetric population include aortic rupture, hematoma, infection, limb ischemia and thrombosis. With new refinement in technique including improved equipment, strategic prophylactic placement, appropriate utilization in select high-risk patients, and post-procedural monitoring, these complications may be lessened.

Study	Size	Design	Results	Complication Rates
Ordoñez 2018 J of Trauma and Acute Care Surg	n=441 REBOA: 313 Control: 128	Meta-analysis: *Placenta accreta CD*	↓ EBL (p<0.001) ↓ Transfusion (p<0.0001)	0.6% (2/313) Iliac artery thrombosis x1; Femoral hematoma x1
Wang 2017 J Matern Fetal Neonatal Med	n=43 REBOA: 10 Control: 33	• Prospective cohort: *Previa increta/percreta CD*	↓ EBL (p<0.05) ↓ Hemorrhagic shock (p<0.05) ↓ Transfusion (p<0.05) No difference: hysterectomy, fetal outcomes	None
Xie 2017 J Obstet Gynaecol	n=71 REBOA: 30 Control: 41	Case-control: *Placenta accreta CD*	↓ EBL (p=0.01) No difference: transfusion, hysterectomy, OR time	3.3% (1/30) Femoral hematoma x1
Cui 2017 Int J Gyn Ob	n=69 REBOA: 38 Control: 31	Case-control: *Previa accreta CD*	↓ frequency of EBL > 1L (p=0.009) No difference: OR time, transfusion, Hgb change, hysterectomy, LOS, EBL	2.6% (1/38) Iliac artery thrombosis x1
Wu 2016 Cardiovasc Intervent Radiol	n=268 REBOA: 230 Control: 38	Case-control: *Previa accreta CD*	↓ EBL (p<0.0001) ↓ Hysterectomy (p=0.003) ↓ ICU LOS (p=0.001) ↓ OR time (p<0.0001) No difference: fetal outcomes	0.87% (2/230) Leg thrombosis (resolved spont) x2
Panici 2012 J Matern Fetal Neonatal Med	n=33 REBOA: 15 Control: 18	Prospective cohort: *Previa accreta/increta CD*	↓ EBL (p<0.001) ↓ Transfusion (p<0.001) ↓ Hysterectomy (p=0.034) ↓ ICU admission (p=0.021) ↓ Hospital LOS (p<0.001)	None

The full risk versus benefit ratio of REBOA for obstetric hemorrhage management is unknown. A tabular summary of available literature is shown below, and the personal experience with REBOA for obstetric hemorrhage at the University of Arkansas and Vanderbilt University are described.

University of Arkansas for Medical Sciences

I am growing accustomed to our new approach to MAP cases at UAMS. Thus far, approximately six REBOAs have been placed, and about half of those were deployed due to hemorrhage during the cesarean

***Resuscitative Endovascular Balloon** continued on next page*

delivery. The goal of REBOA deployment is to decrease active blood loss and improve the surgical field, allowing surgeons to efficiently proceed with surgical repair.

There are many benefits of REBOA placement, not the least of which is having our trauma surgeons immediately present in the OR during these hemorrhage-inducing procedures. I am always happy to have a second attending surgeon present. With the gravid uterus losing about 700mL/minute, even a rapid-infuser running at full speed cannot keep up with the rate of output that can occur in cesarean hysterectomies. The ability to decrease flow to the uterus when bleeding is uncontrolled has multiple obvious benefits including decreased blood loss and improved surgical c onditions. Even used for a brief time, REBOA deployment can help the anesthesia team catch up with resuscitation and allow surgeons to expedite the procedure. The side effects and complications are not to be minimized, and when they occur, they can be serious. At this time, we have our patients go to the ICU to lay flat and receive close nursing care including assessment of site after REBOA and after sheath removal, and scheduled pulse checks. This time in the ICU is time away from their newborn, although we do have video monitors where they can see their baby. While maternal-newborn separation is not ideal, the goal is to minimize the risk for maternal morbidity and mortality. Overall, we will have to investigate the complications and side effects and compare those to benefits of REBOA use. At this point, I believe it is a very worthwhile endeavor to trial it in high-risk cases.

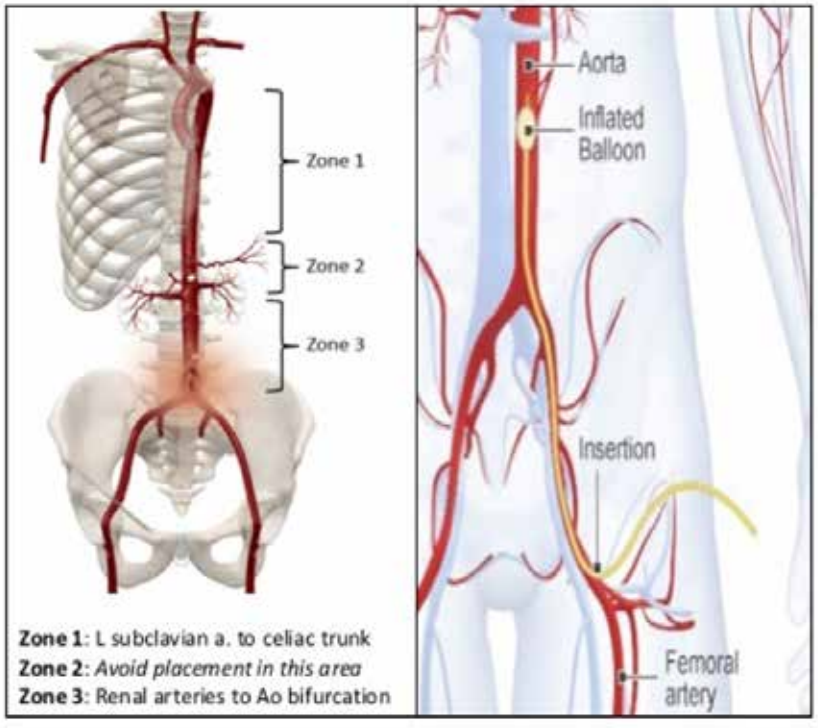
Vanderbilt University Medical Center:

We began using the REBOA in 2017 after two deaths due to massive hemorrhage in percreta cases. For both cases, the trauma surgeons were called in to the operating room to cross-clamp the aorta while the obstetricians performed hysterectomy. Upon multidisciplinary debriefing, the trauma surgeons suggested placing a REBOA sheath prophylactically for known cases of percreta in the future (they routinely place them in the trauma bay for our level 1 traumas). We have adopted this practice and created a 'percreta protocol' that includes use of the REBOA as outlined below:

<u>For known percreta cesarean deliveries</u>: After induction of GETA, general surgery (EGS) places the REBOA sheath (not catheter) in the femoral artery while the anesthesiologist obtains arterial and central venous access. Placement of the femoral sheath is confirmed via transduction of pressure and arterial waveform, and serves as a secondary measurement of blood pressure through the case. After line placement, the cesarean delivery proceeds. In the event of massive hemorrhage, general surgery is immediately available to float the catheter and inflate the balloon.

Details of use:

- REBOA should be deployed no later than halfway through the first round of OB-MTP, if ongoing blood loss is expected. The decision for REBOA deployment will be based on a critical communication among Anesthesia, EGS, and Gyn-Onc Attendings. If not already scrubbed, EGS will scrub for deployment of REBOA.
- Prior to REBOA deployment, EGS will communicate readiness for REBOA deployment with the Gyn-Onc and Anesthesia Teams. Once the REBOA is deployed, surgery is in **RESCUE PHASE**. Circulating nurse will announce elapsed time every 5 minutes. Ideally, maximal time for deployment of REBOA in Zone 1 is 60 minutes and the goal is to minimize the REBOA deployment time to reduce peripheral ischemia, end organ damage, and reperfusion injury on deflation of REBOA. Once the REBOA is deployed, all members of the surgical team will work together to complete the hysterectomy and obtain hemostasis as quickly as possible.
- At the end of the case, the REBOA sheath is removed by the general surgeons and pressure applied. Vanderbilt's removal protocol includes: completely supine position for 6 hours immediately post-op; palpate distal pulses for 6 hours post-removal (q15 min x 4, then q30min x 2, then hourly x 4); ultrasound the insertion site 24 hours post-removal to assess for vascular damage.



Patient Safety Committee: *How We Do It: Isobaric Bupivacaine for Cesarean Delivery*

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www.visiblebody.com; https://londonsairambulance.co.uk

Medication shortages are a persistent reality in anesthesia. Over the past 10 years there have been shortages in opioids including fentanyl and preservative-free morphine, succinylcholine, chloroprocaine, oxytocin, magnesium and nalbuphine, as well as many others[1]. Recently, severe shortages in local anesthetics have affected many clinicians who practice obstetric anesthesiology.

Most standard spinal kits include 0.75% hyperbaric bupivacaine, and it is common for obstetric anesthesiologists to use this as part of their intrathecal injection for cesarean delivery. However, in response to Pfizer's announcement of a shortage of hyperbaric bupivacaine due to manufacturing delays, many obstetric anesthesiologists needed to consider an alternative approach.

SOAP released an advisory statement recommending that an acceptable substitution for 0.75% hyperbaric bupivacaine for cesarean delivery is 12-13 mg of 0.5% isobaric preservative-free bupivacaine (2.4-2.6 mL), with the same supplemental opioid additives[2]. While some anesthesiologists have raised concerns that the nature of isobaric bupivacaine could lead to an increased rate of complications or inadequate anesthesia, a 2016 Cochrane Review of 10 RCTs was unable to find evidence to suggest that the risk for conversion to general anesthesia and need for supplemental analgesia differed between isobaric and hyperbaric bupivacaine.[3] This review also found no difference in the rates of adverse effects, including nausea, vomiting or headache.[3]

Given the variety of experiences and opinions on the topic, we asked members of the SOAP Patient Safety Committee to share their personal experiences with the use of intrathecal 0.5% isobaric preservative-free bupivacaine for cesarean delivery. We share those experiences with our readership here:

I have used isobaric bupivacaine for CS for several years- bupivacaine 0.5% 12-15mg with additional epinephrine. Less high block compared to tetracaine but more compared to hyperbaric bupivacaine. No position change needed to achieve block level and since volume is greater versus hyperbaric bupivacaine, the speed of injection during the block is very important to prevent a high spinal block.

I used it once for a C-section- I used 2.5 cc and it worked great. For orthopedic surgery, it gives a longer lasting block and sets up more slowly than hyperbaric bupivacaine - especially the motor component. Even though the extent of the block is less dependent on position, the level does change slowly with position, so if the level is too high, the patient can be put in Trendelenburg safely and the block will probably recede, and if the level is too low, the patient can be put in reverse Trendelenburg. But the patient needs to be watched carefully if put in a head elevated position, even post-operatively.

When we were in low supply, we used 0.5% isobaric bupivacaine 2.6 ml for our spinals/CSEs. We add fentanyl 15 mcg and PF-morphine 150 mcg to all our spinals/CSEs. Pros of isobaric were: prolonged block, more cardiovascular stability observed (less phenylephrine used, but I don't have actual documented evidence of this). Cons of isobaric were: A few reported inadequate/ patchy blocks.

We tended towards 14 or 15mg of isobaric bupivacaine. Failure rate was not all that different; however, onset of isobaric seemed to be somewhat longer (more cases had to 'wait' to start).

***Isobaric Bupivacaine** continued on next page*

We used isobaric bupivacaine for a short period. We started with 12 mg but had numerous high spinals and one total spinal. When we cut back to 10 mg, we had a number of failed spinals.

For repeat CS, we did use 0.75% isobaric bupivacaine (dose between 1.4-1.6 cc) with the following additives; 100 mcg PF Morphine, 10 mcg Fentanyl and sometimes 50-100 mcg epinephrine. We noticed a high level of spinal anesthesia in multiple cases and sometimes incomplete/inadequate block that required GA.

When we were out of hyperbaric bupivacaine and using isobaric 0.5% over the summer we used 12mg isobaric bupiv, 10mcg fentanyl, 0.15mg duramorph and adjusted the dose if under 5'2" to 10mg. We did find that the isobaric took longer to set up than the hyperbaric (2-5 minutes). We often threaded a catheter via CSE technique and we pulled back 1-2 mls of CSF to mix prior to injecting the intrathecal dose. No high spinals were seen.

Due to shortage of hyperbaric 0.75% bupivacaine we created a guideline recommending a CSE technique with plain 0.75% bupivacaine and our standard opioid additives (fentanyl 15mcg and morphine PF 150mcg) for all non-urgent cesarean deliveries. A dose of 1.2 ml (9mg) for the plain 0.75% bupivacaine was recommended and because the concentration is the same with hyperbaric bupivacaine, the idea was that it would hopefully reduce errors in calculation of dose to be administered. A CSE was recommended because of concern of inadequate anesthesia and therefore could be used to supplement anesthesia if required. Our guideline also emphasized the need to quickly reposition the patient in a supine position as soon as possible to avoid a high spinal block. We have had a few incidences of high spinal (T1/T2) but none requiring ventilatory support and a few inadequate blocks that were rescued with 2% lidocaine via the epidural catheter.

During the shortage of hyperbaric 0.75% bupivacaine, we used 0.5% isobaric bupivacaine for non-emergent CS with a dose of 9-12.5 mg with our standard opioid additive, 150 mcg PF morphine and 15 mcg fentanyl. We had at least 8 documented cases of high level of spinal anesthesia (T1 level or higher), including a case of total spinal when using 12.5 mg of 0.5% bupivacaine at the beginning of the shortage, leading some faculty to feel that a reduced dose would be preferable. Towards the end of the summer, we found a dose of 10-11 mg of 0.5% bupivacaine (with PF morphine & fentanyl additive) was the best "happy medium" between inadequate block and excessively high spinal level. Of note, not all faculty experienced this issue and continued to use 12.5 mg without a problem and report they would continue to do so. Due to the experiences with excessively high levels of spinal anesthesia, some faculty transitioned from using single-shot spinal technique to dural puncture epidural and epidural techniques (especially in parturients with high BMI or difficult airway exam).

Given the heterogeneity of the above experiences, it appears use of isobaric bupivacaine for cesarean delivery is not a "one-size fits all" situation. While the Cochrane review shows no overall difference in efficacy or risk, all of the included sub-analyses had relatively small composite number of patients. Interestingly, Richardson and colleagues previously demonstrated that 0.5% bupivacaine with 200 mcg preservative-free morphine had properties that were hypobaric rather than isobaric.[4] This is an important point because a "low level" after an isobaric spinal could be corrected with placing the patient in the reverse Trendelenburg position and a high level may be at least partially alleviated with Trendelenburg position. This kind of nuance when using isobaric bupivacaine is important to understand and can lead to increased comfort with use of the drug.

Drug shortages are nothing new in obstetric anesthesia and, unfortunately, they are not likely to abate anytime soon. The shortages of hyperbaric bupivacaine and other medications we consider critical for safe and effective obstetric anesthesia, although challenging, can be seen as an opportunity to learn a new technique and gain (and share) knowledge to help advance the specialty.

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Past President's Committee: Legacy Subcommittee: *John J. Bonica, M.D. – Pioneer in Obstetric Anesthesia (1917-1994)*

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I first met John in October 1960 while I was an Obstetric Anesthesia Fellow at Columbia Presbyterian in New York. We remained friends and collaborators until his death 34 years later. It was he who appointed me Chair of the Obstetric Anesthesia Committee of ASA, and he who appointed me to become the World Federation of Societies of Anesthesiologists Professor in Residence at the Universidad Nacional in Caracas. John was the most thoroughly engaging, energetic and productive person I have ever met.

His historic contributions to the field of obstetric anesthesia and analgesia were in many instances critical to the ultimate emergence of our specialty into the powerful movement it has become worldwide. This is particularly true in the organizing and launching of SOAP. Powerful groups within ASA opposed the formation of any specialty organization related to anesthesia, because such groups might divide ASA or dilute its resources. (SOAP became the first subspecialty society related to ASA and the first to have a delegate to the ASA House of Delegates). John Bonica became President of ASA just at this time and very effectively cleared the path for the Founders of SOAP through any ASA opposition.

John's father was an opponent of the Mussolini Fascisti, and he was, therefore, forced to emigrate with his family from Sicily to Brooklyn in 1928. When his father died four years later, 15 year-old John became the family breadwinner. He worked his way through high school, and Long Island University. An unusual source of income was professional wrestling. In a professional wrestling career from 1934 to 1950, John had 1,485 "legitimate" matches (several in Madison Square Garden) and over 2000 shorter matches as "The Masked Marvel" for Ringling Brothers Circus. He became Canadian Light Heavyweight Champion in 1939, and was World Champion for 7 months in 1941! He is in the Professional Wrestlers' Hall of Fame.

John graduated from Marquette Medical School in 1942 and began his half century of marriage with Emma. After internship and anesthesiology training at St. Vincent's in New York, he became Chief of Anesthesiology at Madigan Army Hospital in 1944. It was here that John developed his lifelong interest in obstetric anesthesia and in pain syndromes. After his Army service, he became the second anesthesia physician in private practice in Washington State. His hospital became one of the first in the U.S. to offer "24/7/365" obstetric anesthesia by physicians. His classic text "The Management of Pain" was first published in 1953. It was the first textbook on the diagnosis and treatment of pain in the world and is again in print. His monumental text "Principals and Practice of Obstetric Anesthesia and Analgesia" was published in 1967.

He was Chairman of the Department of Anesthesiology at the University of Washington from 1960 to 1978, President of ASA in 1967- 1968, President of the World Federation of Societies of Anesthesiology in 1980 - 1984, and President of the International Association for the Study of Pain. He was an invited visiting professor in 110 universities in 72 countries. In addition to innumerable honorary degrees and titles from around the world, he was elected Honorary Fellow of the Faculty of Anaesthetists of the Royal College of Surgeons, which is limited to 20 members worldwide.

In 1969, he became a Grand Officer of the Knights of the Order of Merit of the Republic of Italy - the highest award given by the President of Italy to foreign nationals. Later he was made a hereditary Baronet of Sicily. Finally, in 1990 Pope John Paul II personally honored him "for his contribution to the improvement of the welfare of people worldwide".

John and Emma were inseparable. They expired only three months apart. Members of SOAP should never forget their names and legacy!

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Announcements

SOAP/Kybele International Outreach Grant

The Society for Obstetric Anesthesia and Perinatology (SOAP) is pleased to announce that it is seeking applications for the SOAP/Kybele International Outreach Grant. The application deadline will be March 29, 2019 with expected funding of the grant in spring/summer 2019.

The goal of this program is to provide funding needed to get involved with international outreach projects and encourage research in collaboration with host countries with the goal of enhancing the practice of obstetric anesthesia in those countries.

Information regarding the 2019 SOAP/Kybele International Outreach Grant application process can be found at: https://soap.org/grants/soap-kybele-international-outreach-grant/

Call for Nominations: Teacher of the Year, Media Award

The deadline for nominations for SOAP Teacher of the Year and SOAP Media Award is fast approaching February 8, 2019. Don't miss out on your opportunity to acknowledge someone special who has contributed to the world of obstetric anesthesia. The categories and criteria are:

SOAP Teacher of the Year Award

- **Over 10 Years of Experience Award**
- **Less than 10 Years of Experience Award**

The SOAP Teacher of the Year Award was created to recognize outstanding practitioners of obstetric anesthesiology who have demonstrated superior teaching primarily of anesthesiology residents and fellows, and secondarily of obstetricians, nurses, midwives, and the lay public.

The SOAP Education Awards Subcommittee is charged with the task of evaluating candidates and would like nominators to consider the following attributes of the candidates: clinical teaching, mentoring, and the advancement of obstetric anesthesia outside of our own community. Any SOAP member may nominate a candidate. Please forward your nominations to Joy Schabel, joy.schabel@stonybrook.edu. Nominees will be contacted by the SOAP Awards Committee and will be asked to provide the following: CV and/or teaching portfolio, teaching evaluations and a letter of recommendation from their department chair.

SOAP Media Award

The goal of the SOAP Media Award is to acknowledge the contribution of a member of the media in furthering public awareness of the important role obstetric anesthesiology plays in the care of the parturient.

Journalists, photographers, producers, directors and any other media professionals involved in the development and advancement of the above content will be considered. All relevant media genres including but not limited to print, radio, television and the Internet are eligible. The award is given for merit, and may not be awarded every year. Any SOAP member wishing to submit a candidate for consideration should send relevant information to Joy Schabel, joy.schabel@stonybrook.edu.

Board Nominations

SOAP is calling for nominations for the elected positions of 2nd Vice President and Treasurer. Interested members should send a short statement and picture to kelli@soap.org for posting to the SOAP website.

If you have any questions, please do not hesitate to contact SOAP headquarters at (414) 389-8611.

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