We recently transitioned away from our paper newsletter to this electronic format. One of our motivations was a hope to have less of an environmental footprint. I remarked in my inaugural electronic editor’s message on the number of trees we will spare and how much smaller our carbon footprint will be by eliminating paper.

This segues into my topic for this edition: anesthesia’s impact on the environment.

A recent journal club at my institution reviewed an article on the global warming potential of inhaled anesthetics. Not only does this article remind us that inhaled anesthetics are greenhouse gases but that, because many consider them essential for medical practice (are they really?), they have not been as strictly regulated as many other airborne chemical compounds. How many of you are aware that the waste gases from your practice are simply vented into the atmosphere? Or the impact venting may have on our climate and ecosystem? Some simple changes in your practice may have a bigger effect on the environment than buying a hybrid automobile. I urge anyone who is concerned that the ice-cap is melting or who has been affected by the monster storms of the last few years to read this article.

Waste gases remain in our atmosphere for years (1.4-21.4 for sevoflurane and desflurane, respectively). Figure 1 shows the relative global warming impact and substantial differences of commonly used agents. Desflurane has a significantly larger effect than either sevoflurane or isoflurane, particularly if high fresh gas flows are used or for longer cases.

Figure 4 shows the carbon dioxide equivalent of inhaled anesthetics. Note that N₂O, if used as a carrier gas for volatile anesthetics or as a supplement to intravenous drugs, has a large effect. However, N₂O lowers the overall...
carbon dioxide equivalent of desflurane as shown in Figure 4. The result is realized only after several years, and N₂O, unlike other inhaled anesthetics, destroys the ozone.

In the European Union with its stricter emissions limits (typically 160 g/km), desflurane use for 1 hour is similar to driving 375-750 km (1-2 L FGF); driving 28 km, for sevoflurane (2L FGF); or driving 31-62 km, for isoflurane (1-2 L FGF).

So what can an environmentally responsible anesthesiologist do? This article makes several practical suggestions. First, avoid N₂O. Second, limit high gas flows, especially with desflurane. Because more CO₂ absorbent is used at very low flows, the savings from release of inhaled agents may be negated. Sodium hydroxide absorbents require special disposal because of their extreme alkalinity. And, absorbent containers are generally disposable plastics. Based on the authors’ calculations, sevoflurane at the recommended FGF of 2 L and 0.5-1 L if using desflurane or isoflurane are better for the environment. The authors also point out that the best environmentally preferable practices await development of systems that don’t release inhaled agents into the atmosphere.

The next time you arrive in an operating room after parking your hybrid and finishing that cup of coffee in your reusable mug think about how your choices for anesthesia care is impacting the air you breathe even after leaving the room.

President’s Message

SAMBA: Serving the Ambulatory Anesthesia Community

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SAMBA: “Not just a dance anymore.”

It is a new year and there are many changes at SAMBA. We have been managed by the American Society of Anesthesiologists (ASA) since 1985. Our executive director, Nicole Bradle, left ASA unexpectedly in January 2013, and the ASA does not have another director to take her place, a situation most unsettling for SAMBA. The ASA has decided that after 2013 it will not manage any sub-specialty anesthesia societies. The ASA has subcontracted SAMBA’s management to Smith Bucklin, one of the largest association management companies in the world. I anticipate that they will do a fine job, but I would appreciate your understanding in this transitional period. Meanwhile the search is on for a new company to manage SAMBA. Despite these changes, SAMBA’s leadership and expert membership make us the premier source for patient safety, satisfaction and outcomes associated with perioperative ambulatory care and practice management.

We are looking forward to our 28th annual meeting in Scottsdale, Arizona. The meeting, entitled Ambulatory Anesthesia: Future Proofing Your Practice, will be held at the JW Marriott Camelback Inn on April 11-14, 2013. Drs. Brian Parker and Mike Walsh have planned a thought-provoking meeting. The lectures will offer useful information to stay current with the ever evolving world of outpatient anesthesia care. One such session concentrates on production pressures, with strategies to facilitate patient selection that increases efficiency and overall productivity. Another session guides our use of mobile devices for information gathering and incorporation into patient care and the work place. Are you curious about social media and online communities for students to collaborate and learn together? All will be explained in another session. We also will be updated on the latest Centers for Medicare and Medicaid Services (CMS) regulatory issues and reimbursement for various sedation methods. We are continuously asked to do more with less and offered less reimbursement, so the panel that discusses burnout caught my eye. No, I am not burned out, but I plan to attend this session to learn how to avoid this serious problem. I hope to see you at all of the above mentioned sessions and more. Visit www.sAMBAhq.org for more information.

To assist in the care of the perioperative patient, SAMBA’s Committee on Consensus Guidelines has published their most recent work on obstructive sleep apnea (OSA) in Anesthesia & Analgesia. The group, led by Girish P. Joshi, published the Society for Ambulatory Anesthesia Consensus Statement on Preoperative Selection of Adult Patients with Obstructive Sleep Apnea Scheduled for Ambulatory Surgery. This meta-analysis advances our understanding of perioperative management of OSA patients and is a valuable update to the OSA guidelines published in 2006. The committee’s latest project is a systematic review of the obese patient, so look for that in the coming months. The consensus statements have been extremely well received and are some of the most viewed on Anesthesia & Analgesia's Web site. We remain committed to this important initiative and depend on your input for updating the statements to enhance the clinical care of the ambulatory patient. I encourage you to submit topics that you want the committee to consider to Celeste Kirschner (c.kirschner@asahq.org). A list of SAMBA’s statements can be found at www.SAMBAhq.org.

In addition to the guidelines, the Board of Directors commissioned Tong J. Gan to develop a consensus document on the management of postoperative nausea and vomiting (PONV). A group of experts in PONV (with industry support) have drafted a consensus document. It is important that input from SAMBA members be obtained and thoughtfully reviewed by these experts, so the document is posted on the Web site where members may review it. Send comments to Douglas G. Merrill at douglas.g.merrill@hitchcock.org.

The SAMBA Clinical Outcomes Registry (SCOR) project continues to sign up practices and accrue patient outcomes data. For those who have not signed up, SCOR has a specific dataset for pre-, intra-, and postoperative information that can be entered via Web interface, smart phone, or electronic linkages. ASA’s Anesthesia Quality Institute (AQI) has
agreed that SCOR will be the ambulatory arm of the anesthesia outcomes database. Through the SCOR registry members can obtain national benchmarks or specific benchmarks for “like practices”. SCOR defines the current status of the practice nationally. It is a tool to track performance measures and discover best practices for the problems that matter to them: PONV, delayed awakening, gastroesophageal reflux disease (GERD), and perioperative glucose management. The SCOR registry may be used to input data to AQI and is structured to include elements needed for national quality reporting initiatives such as the Agency for Healthcare Research and Quality (AHRQ), the National Quality Forum (NQF), and the Joint Commission (tJC). SAMBA has developed relationships with Epic, Plexus, iProcedures, and Shareable Ink to upload information to the SCOR database with minimal effort. After several years of operation, SCOR has a rich data set. Look for our abstracts at the ASA and publications in Anesthesia & Analgesia in the coming year. It has never been easier to join and submit SCOR data. We now have a company, the Center, which runs the SCOR project with SAMBA. You can sign up your practice and begin inputting data with ease. The Center has a knowledgeable, friendly staff to guide you through the process and handle any issues that arise along the way. For specific details regarding SCOR, visit www.sCoRdata.org.

At SAMBA, the combination of our leadership and expert membership makes us the premier source for patient safety, satisfaction and outcomes associated with perioperative ambulatory care and practice management.

We at SAMBA recognize the landscape in medicine is ever-changing. There are internal and external forces affecting the way we practice and the remuneration for our services. As most procedures of interest to our members are performed on outpatients, when initiatives arise that affect you, we will advocate for you at the local and national levels. We also are looking for members who may be interested in lobbying. To increase SAMBA’s influence, we have begun to form associations with other anesthesia and physician organizations to achieve better communication and representation across specialties where our interests align. One alliance is with the Confederation of Latin American Societies of Anesthesia (CLASA). The move to ambulatory procedures is just beginning in Latin America, and we are excited to be part of the transition. Kumar Belani and I attended a meeting of the Indian Association of Cardiovascular Thoracic Anaesthesiologists (IACTA) in Cochin, Kerala, India. We had a productive meeting with the Board of Directors and discussed ways to work together.

In the United States, we have met with the Ambulatory Surgery Center Association (ASCA). ASCA represents ambulatory surgery centers (ASCs) with advocacy and resources to assist ASCs in delivering high quality care. We have much in common with ASCA and complement each other in many ways. These collaborations create opportunities for SAMBA, increase our standing, and improve ambulatory and office-based practices in this country and abroad. When important issues arise we may join forces for a potent lobbying effort. As a result of this collaboration, the ASCA will have a panel session at our annual meeting, and we will make presentations at their annual meeting in Boston, Massachusetts.

SAMBA has always done a terrific job communicating with the membership. We have had printed and elec-
tronic newsletters and committees that prepare information for distribution. The printed newsletter was sent to our members quarterly and to ASA members, annually. As a member, I have enjoyed the printed version, although print is not eco-friendly. The Newsletter Committee has decided to remedy this failing by electronic distribution of the newsletter. To avoid duplication of effort, the Paper Newsletter Chair, BobbieJean Sweitzer, and the E-Newsletter Chair, Scott Springman, have combined committees. The proposed bylaw amendment for the establishment of the new committee will be voted on at the annual meeting in Scottsdale.

There are challenges in all of medicine, and ambulatory anesthesia is no exception. If you are not a member of SAMBA, we cannot represent your interest or opinions. Join SAMBA and be part of the discussion to affect the results.

We have an excellent and active Resident Sub-Committee in the SAMBA organization. They represent us well at the ASA annual meeting and other venues. The committee maintains numerous, exciting opportunities to assist residents with training and their future career plans. At the annual meeting in Scottsdale, an entire day is devoted to the interests of residents. The day includes presentations on contract negotiations, the future of health care, anesthesia billing, and an ultra-sound regional workshop. The sessions are a valuable opportunity, and we hope many residents will attend. Other Resident Committee activities include a Webinar offered each quarter. The most recent Webinar “Multimodal Analgesia in the Ambulatory Setting” was presented by Stephen A. Cohen of Harvard Medical School. Please make an effort to join us for the next Webinar and tell your associates about them. The committee has beefed up the content on the Web site and brought us up to speed on social networking, so join our social media circle: follow us on Twitter and like us on Facebook.

Office-based anesthesia (OBA) is the segment of anesthesia practice that has been growing the fastest, so we have increased OBA content in the annual and mid-year meetings. We continue to emphasize content that will benefit practitioners in OBA. The 2nd annual OBA meeting will be held in Philadelphia on September 21, 2013. The meeting will be entirely dedicated to OBA issues. The morning session will focus on anesthesia, including patient selection, anesthesia techniques, managing emergencies, and patient outcomes. The afternoon session will be devoted to practice management, quality assurance, accreditation, and billing. Please join us.

It has been an honor to serve as SAMBA president. We have been working on ways to increase the value of your membership in this Society.

In closing, it has been an honor to serve as SAMBA president. We have been working on ways to increase the value of your membership in this Society. We have always been a great source of educational material, and it is our goal to provide even more benefits. By increasing advocacy, and with the help of our associations, we will have a greater voice when issues affecting our membership arise, issues that can be pursued all the way to Washington, D.C. To benefit members, we will buy services to save our members money on goods and services. Content from our meetings is always available online. Members may gain CME credits to satisfy the Maintenance of Certification in Anesthesiology (MOCA) requirements without attending the meetings. There are challenges in all of medicine, and ambulatory anesthesia is no exception. If you are not a member of SAMBA, we cannot represent your interest or opinions. Join SAMBA and be part of the discussion to affect the results.

References:


Professor Beverly K. Philip, MD, delivered a presentation on the timely topic of “What’s New in CMS Regulations” at the SAMBA mid-year meeting in Washington DC. Dr. Philip is Professor of Anesthesia Harvard Medical School, Founding Director, Day Surgery Unit at Brigham and Women’s Hospital, Chair of the ASA Committee on Quality Management and Departmental Administration and past President of SAMBA.

Dr. Philip first discussed two sets of regulations that were enacted by the Centers for Medicare and Medicaid Services (CMS) in May 2012, (both are included in CMS-9070). One of these deals with the requirements for emergency equipment for ambulatory surgery centers (ASCs). An older regulation detailing a list of specific equipment has been removed and the new regulation calls for the ASC medical staff and governing body to coordinate, develop, and revise ASC policies and procedures to specify the types of emergency equipment required for use in the ASCs’ operating rooms (ORs). Thus, a degree of discretion has been provided to ASCs, and local decisions now govern emergency equipment. The new regulation states that the equipment must meet the following requirements:

» Be immediately available for use during emergency situations.
» Be appropriate for the facility’s patient population.
» Be maintained by appropriate personnel.

This change applies only to ASCs and not to hospital outpatient surgery ORs which are still subject to the previously existing hospital regulations detailing specific emergency equipment.

The second provision relevant to ASCs in regulation CMS-9070 deals with infection control. Here, CMS has removed an older requirement that an ASC must establish a program for identifying and preventing infections, maintaining a sanitary environment, and reporting the results to the appropriate authorities. However, there are provisions for infection control that are part of conditions for coverage that remain in effect. These were first adopted in 2008, and this regulation specifically calls for:

1. **Standard: Sanitary environment.** The ASC must provide a functional and sanitary environment for the provision of surgical services by adhering to professionally acceptable standards of practice.

2. **Standard: Infection control program.** The ASC must maintain an ongoing program designed to prevent, control, and investigate infections and communicable diseases. In addition, the infection control and prevention program must include documentation that the ASC has considered, selected, and implemented nationally recognized infection control guidelines. This program must be:
   a. Under the direction of a designated and qualified professional who has training in infection control
   b. An integral part of the ASC’s quality assessment and performance improvement program
   c. Responsible for providing a plan of action for preventing, identifying, and managing infections and communicable diseases and for immediately implementing corrective and preventive measures that result in improvement.

Dr. Philip also discussed the ASC Quality Reporting (ASCQR) Program which was recently established by CMS. Beginning October 1, 2012, this new program will require ASCs to report the following five quality measures on Medicare claims forms:

♦♦ Patient burn (scalds, contact, fire, chemical, electrical, or radiation).
♦♦ Patient falls (falls within the confines of the ASC)
♦♦ Wrong site/side/patient/procedure/implant

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Managing a Patient on Antiplatelet Therapy, for Ambulatory Surgery

Ask the Expert: Issues Facing the Ambulatory Anesthesiologist

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There are several classes of antiplatelet agents that act at different receptors or on different enzymes to prevent platelet activation (Figure 1). These classes include cyclooxygenase inhibitors (aspirin and NSAIDS), phosphodiesterase inhibitors (dipyridamole and cilostazol), glycoprotein IIb/IIIa inhibitors (abciximab, eptifibatide, tirofiban, and bivalrudin), and the thienopyridines (clopidogrel, prasugrel, ticagrelor, and cangrelor).\(^1\) The evolution of the thienopyridines, also known as P2Y\(_{12}\) receptor blockers, has had and will continue to have a large impact on the field of perioperative medicine.

Antiplatelet agents provide both primary and secondary prevention of cardiovascular, acute cerebrovascular, and peripheral vascular thrombotic events. Management of patients receiving chronic antithrombotic therapy is a frequent occurrence in the perioperative setting. When making a perioperative anesthetic plan, the anesthesiologist must consider the surgical procedure, the patient's underlying reason for therapy, and the drug in question. The risk for perioperative thromboembolic events must be carefully considered and compared to the risk for perioperative bleeding. With an array of drugs on the market and new ones in development, it is critical to understand the differences that exist among this evolving class of drugs.\(^2\)

Within the class of thienopyridines many important differences exist. Clopidogrel and prasugrel are irreversible inhibitors of platelet aggregation. As prodrugs, they require enzymatic conversions to attain an active substrate. This leads to delayed onset of action as well as an inter-individual variability in metabolism and subsequently efficacy. Prasugrel offers the advantage of needing fewer conversions than clopidogrel to achieve its active form; therefore there is less variability in percent platelet inhibition.\(^3\)

<table>
<thead>
<tr>
<th></th>
<th>Clopidogrel (Plavix(^{TM}))</th>
<th>Prasugrel (Effient(^{TM}))</th>
<th>Ticagrelor (Brilinta(^{TM}))</th>
<th>Cangrelor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mechanism of Action</strong></td>
<td>Pro-drug - Irreversible</td>
<td>Pro-drug - Irreversible</td>
<td>Direct acting - Reversible</td>
<td>Competitive - Reversible</td>
</tr>
<tr>
<td><strong>Formulation</strong></td>
<td>Oral</td>
<td>Oral</td>
<td>Oral</td>
<td>IV</td>
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<tr>
<td><strong>Onset time</strong></td>
<td>4-6hrs</td>
<td>1hr</td>
<td>2-3hrs</td>
<td>immediate</td>
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<tr>
<td><strong>Time to maximum level</strong></td>
<td>3-7days</td>
<td>30min</td>
<td>1.5hr</td>
<td>&lt;1min</td>
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<td><strong>Plasma Half life</strong></td>
<td>8hr</td>
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Ticagrelor is the first reversible and direct acting thienopyridine. This allows for a more rapid onset of action and recovery of platelet function after discontinuation of therapy.\(^4\) Cangrelor is a novel antiplatelet agent that is currently being investigated in clinical trials. It is an intravenous formulation that provides near complete platelet inhibition in fifteen minutes after a bolus is administered. Given its reversibility, rapid onset of action, and intravenous formulation, cangrelor has the potential to play a significant role in the perioperative period.\(^5\) (Table 1). Should cangrelor obtain FDA approval, it has the potential to revolutionize antiplatelet agent management in the perioperative setting by minimizing the time that therapy is withheld from the patient. While we wait to see the outcomes of clinical trials, we must aim to maximally utilize the drugs that are currently available. One way of achieving this end, is by incorporating preoperative platelet function testing into the perioperative patient care plan. There are several commercially available platelet function tests that give providers data on percent platelet inhibition. This is valuable information that can have direct implications on patient care and outcomes.

It has been previously described that there is great inter-individual variability in clopidogrel metabolism. Current literature supports 5-7 days off of clopidogrel prior to surgery; however if the patient is a poor metabolizer, two or three days off of therapy may be enough time for adequate recovery of platelet function. In this subset of patients, any additional time off of therapy could put the patient at an especially increased risk of thrombotic complications. There are genetic tests available to determine how well clopidogrel is metabolized, and can be utilized for long term treatment planning. Conversely, if the patient is a rapid metabolizer of clopidogrel, five to seven days may not be enough time for sufficient recovery of platelet function prior to surgery or placement of neuraxial or peripheral nerve blockade. These patients are at higher risk of bleeding and precautions should be taken. Instead of a standard algorithm, there is a need to develop an individualized approach to antiplatelet therapy in the perioperative setting.

**Figure 1. Inhibition of platelet activation by ADP-receptor antagonists.\(^1\)**

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**References:**


2. Ortel T. Perioperative management of patients on chronic antithrombotic therapy. Hematology 2012;120:529-535


What Has the SAMBA Resident Section Been Up To?

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The SAMBA Resident Section has been busy this winter season and I am eager to share our recent activities as well as what is in store in the months to come.

Our Webinar lecture series has continued to draw large, enthusiastic audiences. This educational Web-based lecture series, which is resident organized and facilitated, features topics in ambulatory anesthesia by the field’s leading experts, to keep us informed of current trends in ambulatory anesthesia and help us provide excellent patient care. Two topics this winter were *Obstructive Sleep Apnea in the Ambulatory Patient* by Dr. Frances Chung and *Multimodal Analgesia in the Ambulatory Setting* by Dr. Stephen A. Cohen. We are continuing to expand the lecture series at the request of our enthusiastic membership. The next installment of the series is planned for early spring 2013. We are looking for more resident involvement in the planning and production of these lectures in the hope of expanding the series to monthly presentations.

We also have been hard at work with the Annual Meeting and Education Committees to produce a rich and engaging Resident Educational Track at this year’s annual meeting. The 28th annual meeting will be held in Scottsdale at the exquisite Camelback Resort from April 11-14. As in years past, the educational track will include problem-oriented discussions and Consult the Expert sessions. Moreover, the Resident Educational Track will incorporate leaders in the field discussing topics tailored to residents’ interests including regional anesthesia, multimodal analgesia, and contract negotiation, to name a few. We are sure that these leaders will share insight and advice in these close-knit and productive sessions. And back by popular demand are free, resident-only, hands-on workshops on ultrasound and on peripheral nerve catheters.

New this year, are practice oral board sessions for residents and newly graduated residents who wish to develop the specific skill-set to pass the ABA oral board examinations after participating in a realistic oral board exam experience. Our faculty examiners, many of whom are previous ABA oral board examiners, will administer a private practice oral board exam followed by individualized feedback sessions focused on the strategies to navigate the exam.

This is an exciting time for the SAMBA Resident Section. As we continue to expand our offerings including our Webinar series, mentorship program, and resident track at the annual meeting, we are redoubling our efforts for more resident involvement. Please contact me at my e-mail address (top, left) if you are interested in becoming actively involved in any of these programs. The annual meeting offers leadership opportunities within the SAMBA Resident Committee. It is at this meeting that the Resident Committee chair and chair-elect are elected. So whether you’d like to become a member-at-large and take advantage of all of these opportunities or help direct the Resident Committee, the annual meeting is not to be missed!

As healthcare is evolving and favoring “fast-track” techniques to expedite patient recovery and decrease hospitalization costs, we, as residents, should understand how this trend affects our careers. The Society for Ambulatory Anesthesia (SAMBA) dedicates itself to clinicians involved in the perioperative care of ambulatory surgery patients and can keep us informed of current trends in ambulatory anesthesia. Our organization is committed to high professional standards and excellence in patient care by promoting education and research in ambulatory anesthesia administered in locations such as hospital outpatient centers, ambulatory surgery centers, or outpatient offices. It would be great to have you actively involved in our pursuits!
The number of procedures performed on an outpatient basis has risen steadily. In 2006, 53.3 million people were surgical outpatients. Orthopedic procedures are one of the most common and painful procedures performed in an ambulatory setting. Pain not only delays discharge from an ambulatory unit, but also remains a burden for patients 24 hr after discharge. Pain tends to be worse in a patient who has had general anesthesia than for the patient who had regional anesthesia. No surgical pain dissipates in less than 24 hr but all single shot regional anesthesia techniques wear off in less than 24 hr. With the steady rise of outpatient surgeries, anesthesiologists in ambulatory centers must consider relieving a patient’s pain and nausea after discharge. Until liposomal or microsomal local anesthetics, which can last more than 24 hr, become clinically available the only practical way to provide consistent analgesia for 2-3 days is through peripheral nerve catheters (PNC).

The first continuous brachial plexus block was described in 1946. The first use of a continuous nerve block at home with an elastometric balloon pump was described in 1998. Since then, continuous nerve blocks have been successful for pain relief in thousands of patients with good outcome.

Patient selection is important for a successful outcome. For patients unwilling or incapable of taking care a PNC who do not have a good support system at home pain is impossible to manage safely despite the best of intentions. Patients who can tolerate regional anesthesia for surgery may be good candidates for PNC at home. Some concerns are the failure of the catheter to control pain, leakage from the catheter site, and dislodgement of the catheter. There are always risks of infection, local anesthetic toxicity, nerve injury, and catheter breakage.

Communication and close follow-up are key to successful pain management and patient satisfaction. All patients with a PNC should receive written instructions about managing the device and a 24/7 contact number. The instructions should be simple and practical. Reminders are given about safely caring for a numb limb, how to prevent falls, the need to rest pressure points on a well-padded surface to prevent pressure sores, and using the other functioning limb to test water temperature before washing the numb limb to avoid a burn.

Peripheral nerve catheters are easy to place and easily managed in an outpatient setting. Patient education and maintaining communication is most important for successful outcome.

Before the patient is discharged from the hospital, the catheter dressing, connections, and delivery system are checked for malfunctions. Catheter dressings may get wet or come off when the surgical team prepares and drapes the surgical site. The catheter site is inspected for swelling, discoloration or emphysema. The patient is sent home with a clean, dry dressing. Any leakage of local anesthetic around the insertion site should be taken care of in the PACU. Minor leaks are not uncommon, but a large one will be an annoyance when the fluid drips down the skin and saturates a patient’s clothing or pillow. A high volume leak raises the probability of catheter failure or breakage, compromising sterility. An injection of 5-10 ml of local anesthetic under direct ultrasound visualization confirms a properly placed catheter, which is covered with a new dressing and a pressure component. A neurological examination of the limb is documented. Results of a motor or sensory examination should not worsen with time. Both patients and at home caregiver are reminded that the surgical block will wear off. The patient should also know how to stop the infusion at
home. All patients are contacted daily by telephone until the catheter is removed, usually after 2-3 days. We recommend that the catheter remain in place until sensation in the limb returns. Paresthesia is a warning sign that a catheter was tangled around nerves when it was removed at home. A catheter should slip out easily, and patients are discouraged from using force when removing a catheter. After removal, the insertion site is wiped clean with an alcohol pad and covered with a bandage.

If a leak is noticed at home, management depends upon whether the catheter still provides pain relief. If the leak is small and pain relief is good, the patient is advised to cover the catheter dressing with gauze to soak up leaking fluid. If the leak is large and the catheter has no narcotic sparing effect, the patient is advised to remove the catheter.

Variable rates of catheter failure have been reported depending upon site, technique and the experience of the operator. To minimize the risk of failure, the local anesthetic is administered through the catheter instead of through the needle before the catheter is placed. A functioning catheter, however, does not always translate into optimum pain relief. Once a surgical block wears off, many patients also need oral analgesics. Patients are instructed to have their analgesic prescription filled before they go home. Also, the medication should be readily available by the bedside so they do not have to look for it in the middle of the night. Most patients are given a prescription for oxycodone or hydrocodone as a breakthrough pain medication. Since surgical pain is an inflammatory acute nociceptive process, a nonsteroidal anti-inflammatory drug (NSAID) naprosyn 500 mg twice a day or ibuprofen 600 mg three times a day for 3-4 days, is often effective. The patient is encouraged to take a NSAID with narcotics, if no contraindications exist.

Catheter dislodgement is perhaps the most common complaint, and incidence is 1% -30%. Different strategies have been proposed to secure the catheter: threading it at least 3-5 cm beyond the needle tip, using sterile glue (benzoin) or steri-strips, tunneling the catheter, and using special devices to hold it in place. Combining these different techniques may achieve a retention rate of 95%-100%.

If the catheter becomes disconnected from the drug delivery system, it should be removed since it is no longer sterile. The most common site of disconnection is at the connector. If the connector and catheter junction are reinforced with tape, disconnection may be prevented. Witnessed disconnection can be reconnected if the patient was sent home with a spare sterile connector and has access to help at home. The catheter end is wiped with an alcohol swab and a new connector is applied.

The risk of nerve damage is real but no higher than that after single shot techniques. If the motor block does not wear off in 36 hr, the patient is advised either to stop the infusion altogether or cut the infusion rate in half. Recovery of some motor function must be demonstrated to discover nerve damage. Once a block wears off and the patient is able to move the limb, the infusion can be restarted at a lower rate. If motor function does not recover, the patient returns to the hospital for examination to rule out nerve damage or to intervene as early as possible.

In a few cases swelling develops at the insertion site after placement of a PNC. Swelling may result from vascular puncture and subsequent hematoma. Vascular punctures may be overlooked at the time of discharge since bulky dressings after surgery (e.g., shoulder surgery) may cover the catheter site. The hematoma resolves by itself but may be a source of distress for the patient. If a hematoma is noticed by the patient once at home, he is asked to draw an outline of the swelling. If there is no pain, fever, difficulty breathing or swallowing, or failure of the surgical block to wear off, the swelling is monitored for increase in size. Increase or other symptoms warrant a return to the hospital for evaluation and management.

In some cases a catheter cannot be removed by the patient. In one study inability to remove a catheter was around 0.13%. Self removal of a catheter is an integral component of the continuous nerve catheter program at home. A catheter should only be removed by the patient after complete return of sensation. For difficult catheters, an x-ray will reveal knots in the catheter or the point at which it is stuck. An MRI or CT scan can also reveal catheters knotted around nerves. Inspection of the catheter marking can help to decide whether it can be pulled out with or without fluoroscopy. Different strategies have been proposed to remove the catheter percutaneously, but a knot around the nerves requires surgical removal.

All indwelling catheters carry a risk of infection. The risk of inflammation and colonization is much higher than the risk of infection or abscess formation. The risk of an infection in an ambulatory setting is no higher than in an inpatient setting. Risk factors for an infection continued on next page...
with a PNC are: the site of catheter placement, male sex, trauma cases, admission to ICU, diabetes, and placement for longer than 48 hr without antibiotic coverage. The risk of infection is minimized by strictly adhering to antisep tic precautions and keeping the catheter in place for only 2-3 days. Transparent dressing reveals the skin around the catheter entry site. Mere redness does not warrant catheter removal, but swelling or drainage with redness may. The most common bacterium is Staphylococcus epidermidis, which responds to oral antibiotics such as cefazolin over 3-4 days.

There are a few reported cases of patients with indwelling catheters who were admitted for an unrelated reason and found, upon chest x-ray, to have lung volume loss or infiltrate on the side of the catheter. Patients received antibiotics for possible pneumonia, and they improved after catheter infusion was discontinued. Such cases remind us of the importance of keeping in contact with the patient even if he returns to the hospital for a reason other than catheter maintenance.

Peripheral nerve catheters are easy to place and easily managed in an outpatient setting. Patient education and maintaining communication is most important for successful outcome. In large scale observational studies of home-based catheter programs, very few interventions were needed. A daily phone call was all that was required to manage the patients at home.

References:
8. Ilfeld BM. Continuous peripheral nerve blocks in the hospital and at home Anesthesiol Clin 2011;29:193-211.

...Thilen: CMS Issues, continued from page (6)

- Hospital transfer/admission (transfer/admission directly to the hospital or emergency department)
- Preoperative antibiotic timing (initiated within 1 hr prior to incision, 2 hrs for vancomycin)

These quality indicators should be reported as G-codes on the Medicare claims form CMS-1500 (in box 24 D). ASCs will be considered successful reporters and not face financial penalties if 50% of claims include G-codes. If these codes are reported on less than 50% of claims in the period Oct 1- Dec 31, 2012, then a payment reduction of 2% will apply in 2014 and thereafter. Additional quality indicators are planned each year in the future and the reporting percentage needed to avoid penalty may well increase.
Anesthesia for Advanced Diagnostic Bronchoscopy: A New Frontier for the Ambulatory Anesthesiologist

Ask the Expert: Ambulatory Anesthesia Issues

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The last few years have witnessed more demand for anesthesiology services in the bronchoscopy suite, an area that had been rarely visited by the anesthesiologist in the past. Pulmonologists had mastered the art of administering minimal to moderate sedation for simple bronchoscopic examinations with or without bronchoalveolar lavage, a procedure that typically lasts for a few minutes. With advances in ultrasound technology and the development of an ultrasound bronchoscope, paratracheobronchial lesions and enlarged nodes are easily visualized (Fig. 1). A transtracheal fine needle aspiration biopsy can now be performed with the aid of endo-bronchial ultrasound. These procedures have led to complete mediastinal staging, thus virtually eliminating the need for more invasive mediastinoscopy.

With the development of electromagnetic navigation biopsy (Fig. 2) the pulmonologist can navigate blindly in the bronchial tree distal to the largest one that accommodates a large diameter operating bronchoscope to reach peripheral lung lesions for biopsy or to mark a tumor (fiducial implantation, and/or dye) for future surgery or radiation therapy.

Endobronchial ultrasound biopsy and electromagnetic navigation biopsy require the use of a larger diameter bronchoscope and take much longer than a simple bronchoscopic examination.

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surgery, which may require postoperative ICU admission and a hospital stay.5

Although the procedures described are currently performed in bronchoscopy suites attached to a main hospital, as training and experience on the part of pulmonologists and anesthesiologists expand, the procedures may become common at an ambulatory surgical center near you.7

Preoperative assessment is usually conducted in the customary fashion with special attention to airway evaluation, symptoms that compromise a patient’s medical condition, and a review of the pulmonologist’s evaluation of the size and location of the lesion or tumor within the bronchial tree. Judicious use of pre-medication sedatives and anxiolytics is advised because of limited respiratory reserve expected in the patients.8 A total intravenous anesthetic (TIVA), usually an infusion of propofol, is preferred over an inhalational anesthetic. Compared to an inhalational anesthetic, TIVA delivers anesthetic continuously and prevents pollution of the operating room by inhalational agents caused by circuit leaks or the nature of the procedure.9 Muscle relaxants are also commonly used for these procedures, regardless of the airway used or the endotracheal tube (ETT) or supraglottic (SGA) airway to facilitate ETT insertion or SGA placement. Muscle relaxants also improve overall lung compliance by eliminating the chest wall component, thus making positive pressure ventilation easier and more effective. Finally, relaxants result in a motionless patient, an advantage because unexpected patient movement can have serious consequences.5 Administered fluids are kept to the minimum needed because in many patients having these procedures lung reserve is limited, and pulmonary congestion may aggravate their condition.

Potential complications of bronchoscopic procedures can range from hypercarbia and minor levels of hypoxemia or cough to profuse bleeding.

Corticosteroids, in particular dexamethasone, can be used as a prophylactic measure to decrease airway edema after airway surgery and to prevent residual postoperative swelling of the vocal cords. Steroids are also used in cases in which extensive surgical trauma to tracheobronchial tissues is anticipated. This practice is defended on the basis of its perceived clinical advantage; evidence of its real advantage is controversial at best.10-13

Administering a fraction of inspired oxygen (FiO₂) of 1.0L in such procedures is very common. Intubation with a large-diameter ETT, e.g. size 8.5, facilitates ventilation around the relatively large-diameter flexible bronchoscope (Fig. 3) and is generally cut short to facilitate the maneuverability of the fiberoptic bronchoscope and decrease resistance to its insertion and removal through the ETT (Fig. 4). Use of a fiberoptic swivel connector/adaptor allows continuous ventilation and prevents circuit disconnection during flexible bronchoscopy (Fig. 3).1

Figure 3. A cartoon illustration of the operating bronchoscope during endobrachial ultrasound biopsy through a large 8.5 mm ID ETT to biopsy a paratracheal lymph node. 5
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Figure 4. A large 8.5 mm ID ETT cut short with the operating bronchoscope inserted through it. Simultaneous ventilation is possible by attaching the circuit to a blue swivel adapter. The flexible “Bennet” connector stabilizes the tube as the bronchoscope is inserted and removed from the airway.1
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When the intended biopsy site is subglottic, a supraglottic airway (SGA) such as a laryngeal mask airway (LMA) or an I-Gel can be effective (Fig. 5). The high para-tracheal (subglottic) nodes are accessed with the flexible bronchoscope while the lungs are ventilated. Reliable protection against aspiration, however, is not guaranteed.

The techniques described above require clear communication between the anesthesiologist and the pulmonologist. Potential complications of bronchoscopic procedures can range from hypercarbia and minor levels of hypoxemia or cough to profuse bleeding. The key to favorable outcomes lies in a comprehensive understanding of the underlying lung pathology and the nature of the procedure, open two-way communication between the anesthesiologist and pulmonologist, and above all, vigilance and preparedness.

References:
Obstructive Sleep Apnea in Children: What is the "STOP-BANG Questionnaire" Equivalent in Pediatric Practice?

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Preoperative screening and early diagnosis of obstructive sleep apnea (OSA) have been shown to reduce perioperative risk. The STOP-BANG questionnaire has a strong sensitivity for moderate to severe OSA in adult patients and helps to stratify risk. Most of its elements, however, do not apply to the pediatric population. Among the most common surgical procedures in children are tonsillectomy and adenoidectomy, OSA and sleep-disordered breathing are concerns in this surgical population. What tool do pediatric practitioners have to screen for and non-invasively assess and quantify OSA cost effectively in this large patient group? Do we have a STOP-BANG equivalent for pediatric patients?

Sleep-disordered breathing is a spectrum of disorders ranging from snoring to OSA. Habitual snoring affects 10%-12% of the pediatric population, but only 1-4% progress to OSA. The continuum of sleep-related disturbances is characterized by the degree of upper airway obstruction. A subset of children with snoring develops cognitive dysfunction as a result of frequent micro arousals during sleep. Increasing degrees of upper airway resistance lead to upper airway resistance syndrome (UARS). Formerly all children who snored and had some cardiovascular or neurobehavioral changes were diagnosed with OSA. The current practice is to modify this diagnosis to include the more specific elements of sleep-disordered breathing or UARS for which the treatment is (CPAP) continuous positive airway pressure rather than surgical removal of the tonsils and adenoids. CPAP is poorly tolerated in children, however, so surgery is often the definitive treatment.

The magnitude of pharyngeal muscle contraction is controlled by neural mechanisms, and the interaction between the anatomical balance and neural mechanisms determines pharyngeal airway size. Increased neural mechanisms can compensate for the anatomical imbalance in OSA during wakefulness; however, during sleep or anesthesia the pharyngeal airway severely narrows. Although anatomic variability is most reliably diagnosed by polysomnography (PSG), there are many limitations to the test and standardized criteria for testing children are lacking. The American Thoracic Society guidelines for diagnosing OSA via PSG in children are as follows: apnea index > 1/hour, apnea-hypopnea index >5/hour, peak CO2 tension >50mm Hg for more than 10% of sleep period, and minimum oxygen saturation <92%. Sleep centers often limit PSG to children older than 6 years of age. The testing environment is stressful to children and the test is expensive and intrusive. There are few pediatric-focused, child-friendly sleep environments. Centers are not widely accessible, and the wait is often up to 6 weeks. Even if a diagnosis of OSA is made, that alone does not predict morbidity.

Sleep centers often limit PSG to children older than 6 years of age. The testing environment is stressful to children and the test is expensive and intrusive.

The American Academy of Pediatrics has published a clinical practice guideline for the diagnosis and management of childhood OSA. Included in this document are recommendations that all children be screened for snoring so that complex high-risk children can be referred to a specialist. Children with cardiorespiratory comorbidities should be evaluated on an urgent basis, and PSG should be used to discriminate snoring from OSA. The American Academy of Otolaryngologists Head and Neck Surgeons has a clinical practice guideline for indications for PSG in children as well. These recommendations include the following: children ages 2-18 years should be referred before tonsillectomy and adenoidectomy if they are obese or have Down syndrome, craniofacial abnormalities, neuromuscular disorder, sickle cell disease or mucopolysaccharidosis. They should also undergo PSG if there is discordance between the tonsillar size and the severity of sleep-disordered breathing.

There have been many alternative diagnostic methods...
suggested: videotaping during sleep, audiotaping during sleep, nocturnal oximetry and observation, and documentation of daytime sleep patterns. The American Academy of Sleep Medicine has endorsed portable home monitoring as an alternative to PSG in adults. This modality measures four variables: respiratory effort, airflow, heart rate, and oxygen saturation measured by pulse oximetry. The validity of this method in children is unknown.

The sleep history is important ... but History and physical examination alone are poor predictors of OSA in pediatric patients.

Questionnaires and clinical examination should be part of every health screening in children. Several studies have evaluated questionnaires that attempt to determine the prevalence of OSA in children who snore. The best sensitivity was 35% with a specificity of 39%. Thus, questionnaires have minimal usefulness for discriminating between physiologic snoring and OSA in children. The predictive value of a clinical history of symptoms is poor even in children with severe OSA. Loud snoring does not necessarily correlate with the degree of obstruction, and noticeable snoring may occur without apnea. Parents report loud snoring, mouth breathing or long pauses in children who have normal PSG studies. Children with OSA usually have obstruction during REM sleep in the very early hours of the morning when parents may not be observing them. Therefore, there is the potential for underestimating obstructive events. The sleep history is important and should include the sleep environment as well as characteristics of the sleeping pattern. If a positive history of snoring is elicited, a more detailed history should be sought. Snoring should be quantified for frequency and loudness. Parents should be queried for the presence of labored breathing during sleep, restless sleep, apnea, diaphoresis, enuresis, nightmares, cyanosis, daytime somnolence, learning disorders, poor academic performance and attention deficit hyperactivity disorder (ADHD).

History and physical examination alone are poor predictors of OSA in pediatric patients. Abbreviated screening such as videotaping, nocturnal pulse oximetry and daytime nasal PSG tend to be helpful if results are positive but have a poor predictive value if results are negative. Children with a negative result should undergo more comprehensive evaluation. The cost effectiveness and availability of standard PSG in children are impediments to fully implementing this strategy.

So the dilemma remains: What is the equivalent to the STOP-BANG questionnaire for predicting morbidity in children? Pediatric practitioners who face this clinical challenge must make uncovering OSA a priority, especially as shrinking health care dollars require physicians to be more and more selective in testing.

References

Don’t Miss the IAAS Meeting!!!!

Take note of the upcoming 10th International Association for Ambulatory Surgery (IAAS) Congress on Day Surgery, 5 - 8 May, 2013, in Budapest, Hungary (www.iaas2013congress.com) where SAMBA is sponsoring a special session (symposium). Budapest is a wonderful city to visit in the Spring, and members will be treated to an array of anesthesia, surgery and administrative presentations.
SAMBA 28th Annual Meeting

Ambulatory Anesthesia: Future Proofing Your Practice

April 11-14, 2013
Camelback Resort, A JW Marriott Resort
Scottsdale, Arizona

Schedule Highlights

Thursday, April 11
General Session 1: Production Pressures
General Session 2: Building the Ultimate ASC: The Team Approach
General Session 3: Accessing Medical Information in the "i" Age
Welcome Reception with Exhibitors

Friday, April 12
General Session 4: Running the Regulatory Gauntlet: What’s on the Horizon
SAMBA Frontiers Lectureship
Lecture Series: Acute Pain Control – Not An Option Anymore
PBLD’s
Consult the Experts

Saturday, April 13
General Session 5: Current Status of the ASC Industry
General Session 6: Personal Growth Cases From the Real World
Business Meeting and Awards
Panels: Ask the Experts - Part Issues in the ASC
Resident Luncheon: Mock Oral Exams
Parallel Track 1: Resident Session
SAMBA Golf Outing
SAMBA Social Event

Sunday, April 14
General Session 7: Hot and Have Not Excellence and Innovation: Abstract Presentations
General Session 8: Journal Club

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