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NEWSLETTER

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2006 ASA Preview—Safety Topics Abound

by Wilson Somerville, PhD, and Robert C. Morell, MD

The 2006 Annual Meeting of the American Society of Anesthesiologists will be held at McCormick Place in Chicago, Illinois, from Saturday, October 14, 2006, through Wednesday, October 18, 2006. Patient safety will once again play a significant role in the numerous lectures, presentations, and scientific topics integral to this annual conference. The ever popular Refresher Course Lectures will begin on Saturday, October 14, and continue daily throughout the meeting, beginning with Dr. Jan Ehrenwerth reminding us of *Fire in the Operating Room: It Could Happen to You* (#108, 10:50-11:40 am, Room E271). Following this hot topic, in the same room, are Dr. William Rosenblatt presenting *Decision Making in Airway Management* (#109, 1:40-2:30 pm), and Dr. Jessica Alexander pointing out *The Potential Hazards of Perioperative Herb and Dietary Supplement Use* (#110, 2:50-3:40 pm). In Room E350, Dr. Evan Kharasch will break down *Issues in Anesthetic Degradation and Toxicity* (#113, 9:40-10:30 am). Airway topics resurface in Room E351 as Dr. Andranik Ovassapian explores *The Role of LMA, Combitube and Fiberoptics in the Difficult Airway* (#120, 10:50-11:40 am). Dr. James Cottrell presents his thinking on *Perioperative Neuroprotection for the High Risk Surgical Patient* in Room E352 (#129, 4:00-4:50 pm), while Dr. Mark Warner simultaneously sheds light on *Neuropathies, Blindness and Positioning Problems* in Room E353b (#135). Dr. Arnold Berry awakens new perspectives with *Our Health and the Safety of Our Patients in a 24/7 World: Are we Asleep on the Job?* (#136, 8:30-9:20 am). Sunday afternoon brings us the opportunity to hear Dr. Robert Caplan's ever popular discussion of the *ASA Closed Claims Project: Lessons Learned* (#217, 2:50-3:40 pm, Room E350), presented concurrently with Dr. Carin Hagberg refreshing the important topic of *Current Concepts in the Management of the Difficult Airway* (#235, Room E353b). Dr. John Eichhorn shares his expertise regarding *Risk Management in Anesthesia Practice* in Room E353c (#240, 1:40-2:30 pm). On Monday, October 16, Dr. Jerrold Levy starts the morning off with *Anaphylaxis and Adverse Drug Reactions* (#310, 8:30-9:20 am, Room E351), and Dr. Tempelhoff follows that afternoon with advice toward *Avoiding Complications in Neuroanesthesia* (#311, beginning at 1:40 pm, Room E351). The emerging topic of *Inflammatory Response: Current Concepts* will be presented by Dr. Edward Sherwood (#316, 2:50-3:40 pm, Room E352). Tuesday, October 17 revives us with *Raising the Dead: Management of the Post-Arrest Patient* presented by Dr. Grenda Fahy (#402, 9:40-10:30 am, Room E271). During this same time slot, in Room E351, Dr. Steve Hall will review *The Child With a Difficult Airway: Recognition and Management* (#412). That afternoon several practical and important safety topics will be presented including, Dr. Girish Joshi discussing *The Patient With Sleep Apnea Syndrome for Ambulatory Surgery* (#414, 2:50-3:40 pm, Room E351), Dr. Daniel Cole delving into *Depth of Anesthesia: Clinical Applications, Awareness and Beyond* (#418, 1:40-2:30 pm, Room E352), Dr. Michael Murray *Managing Mass Casualties* (#423, 2:50-3:40 pm, Room E353b), and Dr. Alan Tait helping us by *Minimizing and Managing Infections in the Perioperative Period: The Role of the Anesthesiologist* (#427, 1:40-2:30 pm, Room E353c). Room E450b is host to Dr. Frederic Berry reminding of us of *What to do After an Adverse Outcome* (#432, 1:40-2:30 pm) and Dr. Jonathan Benumof explaining *The New ASA OSA Guidelines* (#433, 2:50-3:40 pm). The ASA Refresher Courses conclude on Wednesday, October 18, 2006, with Dr. Lucinda Everett reviewing *Safety and Quality in Ambulatory Anesthesia* (#501, 8:30-9:20 am, Room E353b), followed in the same room by Dr. Jeanine Wiener-Kronish exploring the question *Infection Control for the Anesthesiologist: Is There More than Handwashing?* (#502, 9:40-10:30 am), and Dr. Barbara Leighton topping things off with *Epidural Analgesia for Labor: Safety and Success* (#503, 10:50-11:40 am).

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Your APSF Executive Committee at work reviewing and planning safety initiatives.

Inside:

Be sure to check out the APSF Booth in the Exhibit Hall at the 2006 ASA Meeting in Chicago, IL, October 14-18, 2006.

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Address all *general, contributor, and subscription* correspondence to:

Administrator, Deanna Walker
Anesthesia Patient Safety Foundation
Building One, Suite Two
8007 South Meridian Street
Indianapolis, IN 46217-2922
e-mail address: walker@apsf.org
FAX: (317) 888-1482

Address *Newsletter* editorial comments, questions, letters, and suggestions to:
Robert C. Morell, MD
Editor, *APSF Newsletter*
c/o Addie Larimore, Editorial Assistant
Department of Anesthesiology
Wake Forest University School of Medicine
9th Floor CSB
Medical Center Boulevard
Winston-Salem, NC 27157-1009
e-mail: apsfeditor@yahoo.com

Challenges Ahead in Technology Training:

A Report on the Training Initiative of the Committee on Technology

Michael A. Olympio, MD, Bonnie Reinke, and Abe Abramovich

Introduction

The most effective method of introducing new anesthesia equipment into the operating room has not been thoroughly investigated, despite recent and dramatic increases in complexity of these new machines. New machines have unique and subtle variations in breathing circuit design, automated checkout, volatile agent delivery, hidden piston ventilators, fresh gas delivery, and ventilation modes.[1] Despite conventional pre-use instruction with, or without simulation, Dalley and colleagues recently concluded that anesthesiologists could not reliably assess their ability to safely use the equipment in clinical practice. However, those clinicians who received additional training in simulation were more likely to correctly apply the machine features during a simulated anesthesia emergency.[2] Furthermore, Dalley learned that new designs meant to enhance patient safety can actually have unintended and detrimental consequences particularly when latent errors surface during abnormal (and particularly stressful) clinical situations.

Although the incidence of equipment-related critical events is relatively low, morbidity associated with such events can be quite high. Human error is the leading contributor to equipment related problems, and is typically magnitudes greater than pure equipment failure, which itself is rare.[3,4] The implication, of course, is that we need greater training and facility with our equipment as recognized by leading authorities.[3,5,6]

The APSF Committee on Technology was challenged to consider the adequacy of pre-use instruction when Dr. Michael Cox asked the Dear SIRS column to "suggest how I might propose to our group changing our approach" to a more organized and formal instructional program.[7] Cox described his perception of inadequate training and ability to troubleshoot newly installed anesthesia machines, even after an 18-month period. Although APSF representatives argued that 1) a local champion for training was essential to overall satisfaction, 2) institutional support for training be provided, 3) the manufacturers develop educational programs that far exceed current standards, and 4) manufacturers must play a crucial role with continuing after-the-sale support, APSF neglected to demonstrate how those elements could actually succeed, and probably ignored the key element: participation of the clinical staff.

Concurrently, the Corporate Advisory Council of the APSF discussed and summarily expressed industry's frustration with the inability to enforce the training of anesthesia clinicians, and physicians in particular.[8] One member of the Council expressed his concerns as follows:

> "Further on the topic of education, training, and safety, I would like to share with you the frequent reality of clinicians refusing in-service on new anesthesia equipment because they are 'too busy' or, 'can figure things out for themselves,' or, if they show up at all, they stick around for a few cursory minutes before they run out to do something else. We find ourselves chasing clinicians so we can fulfill our commitment to ensure that our equipment is operated safely. My colleague put it this way, 'No one shows, no one listens, and very few care.' These are usually the guys who scream the loudest if something goes wrong, or they misuse, or misunderstand some facet of the equipment's operation. This probably sounds harsh, but unfortunately it is true—an aspect of the business which all manufacturers face, and one not usually discussed. This situation appears to be more a function of how a specific institution 'runs its business.' The local 'champion' concept, which we discussed in our other emails, is an essential part of the solution to this problem, but I think that this may be another opportunity for the APSF to make a difference by making this issue more visible and recommending a means of ensuring that users of anesthesia equipment are adequately trained on their equipment. "

With these and other imperatives to take action, the Committee on Technology of the APSF sought examples of mandated technology training programs and developed a pilot program for implementation, analysis, and presentation to the anesthesia community. That program is described below.

The Problem with Current Practice

Conventional "in-service" programs are often recognized as superficial and inadequate because they do not require advanced preparation, are not mandated, do not allow individual practice, do not test for learning nor application skills, and are frequently abandoned for lack of time (as the morning break or refreshments run out). They typically occur only once, when new equipment is installed, do not account for personnel who are away from work, nor do they accommodate new hires or new classes of trainees. Many clinicians lack the interest to learn, or they verbalize a great reluctance to accept change, or they find it very difficult to learn complex new technologies. Not all institutions designate or recognize an equipment advocate-enthusiast, and only a handful has sent a clinician to the factory for additional training. Some anesthesia departments have on-site biomedical technicians, but they may not have obtained the specialized training prior to installation, or don't have time for teaching. Finally, simplistic instructional aides may not exist.

Getting the clinicians and educators together seems to be the problem. Should the "carrot" or "stick" method be applied to mandate training, as it promises to close the gap on deficiencies of knowledge and application skills, in order to improve patient safety?

Experience With Mandated Technology Training Initiatives

Clinical and corporate members of the Committee on Technology of the APSF were asked to provide detailed examples of organized, comprehensive, and mandatory technology training programs within their clinical base. Only 3 were provided. One included a 6-hour training session for 50 CRNA/student nurse anesthetists (SRNAs), and all MD attendings in a Michigan academic department[9] prior to installation of 25 new machines. The time and manpower expense for nursing was provided by the hospital, while the manufacturer provided a line-item training expense on the customer's invoice. Components of the training included manuals, manufacturing experts, train-the-trainers, hands-on workshops, 6 weeks of on-site company representatives, and super-user training, but no competence testing. No information was provided on training for the anesthesiologists at that same institution, nor the effects of that training on subsequent use of the equipment.

Another program was described by a major manufacturing company's director of clinical education in the United Kingdom.[10] This program utilized a new guided workbook with directed hands-on learning and response format, led by the company representative for a period of 3 hours, or by a train-the-trainer, who would have received a full day of training. The cost of the training program was line-itemized on the customer's invoice. The program was not mandated, and the spokesman commented that cooperation for training among physicians and consultants was the most difficult to obtain because of time restrictions, culture, and venue for learning.

In a third description of training in a private hospital in Michigan,[11] the Anesthesiology Department Chair mandated completion of a formal training program for 45 anesthesiologists and 20 CRNAs, who could not use the new and modern machine clinically, until they completed a 30-minute training session with a company representative, during a 3-week period. Those who did not initially participate were continuously assigned to

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Chair Did Not Mandate Training

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"less desirable" off-site locations that did not have the new machine, or they were left unassigned with negative financial consequences. Such affected individuals quickly sought training once the negative consequences were realized. The Chair further described a highly receptive CRNA staff, as well as cases of "pure arrogance" and antipathy by several anesthesiologists, some of whom initially refused to be trained.

Design of a Mandated APSF Pilot Program

Developing consensus. The authors of the pilot training program (MAO, BR, AA) from the APSF agreed that initial consensus would have to be achieved among the key advocates for change. Wake Forest University Health Sciences was chosen as the test site for the program. The authors met with the Wake Forest University Health Sciences Vice President for Operations, the Director for Surgical Services, the Director of the Surgical Services Academy, Chief CRNAs, Chair of the Nurse Anesthesia Training Program, Chief of Surgery, Risk Management officers, Residency Training Program Director, and the Chairman of the Department of Anesthesiology. All were informed of background information and the intended scope of developing a model, mandated training program for the anticipated introduction of new and advanced anesthesia machines. Universally, these institutional leaders felt that additional machine training would be valuable. In trying to develop consensus, however, the issues which were difficult to resolve included

1. demands for proof that training was necessary
2. establishment of baseline practices
3. convincing the community that this special program was valuable
4. convincing, specifically, staff anesthesiologists that the program was necessary
5. concurrent development of refresher courses
6. ability to accomplish training of 195 individuals prior to machine use
7. supportive statements from regulatory bodies (JCAHO or the ASA)
8. ability to simplify training (e.g., online programs?)
9. determining the consequences of a refusal or failure to participate
10. provision of appropriate amounts of time and resources
11. measuring the outcome and value of the training process
12. approaching the mandate through positive or negative reinforcement
13. training significant numbers of random new hires.

Mandating the training. The most difficult obstacle was the method for mandating the program to so many different categories of clinicians. The student nurse anesthetists were easily directed into the machine training modules as they would be for other subject modules, and these were organized into their classroom schedule. The residents were informed by their Program Director that the training was a mandatory part of their curriculum, but with a less-than-structured environment, they were expected to attend some of these modules independently. The Chief CRNAs instructed their employees to attend the sessions, the employees received continuing education credits, and they were typically provided relief from clinical duty by additional CRNA clinical coverage. The faculty were initially informed of the planned training program, with an expectation from the training program director (MAO) that they would participate.

In a series of memos leading up to the training, the 4 groups were informed by the training program director that the program would be mandatory, but the final detailed memo simply described the program and stated that the machines would not be installed until all clinicians had completed training. The reason for the hesitation emanated from discussions between the training program director and the Department Chair, and the resultant decision by the Chair to use a process of encouragement, advertisement, individual judgment, and certificates of completion to achieve success, particularly in regard to faculty members. The other 3 groups had their own respective leaders who communicated a relative mandate. Thus, the Chair remained silent on the issue and did not communicate with any of the staff on this topic, nor were any punitive consequences for missing the training ever announced to any group.

Program content. The training program was designed to extend over a 2-month period and contained 4 structured components: 1) a 60-minute lecture, repeated twice, with slides available on the Department intranet, 2) a 60-minute hands-on workshop led by the manufacturer's technician, as waves of clinicians attended 9 machine stations, 3) a pre-programmed, 30-minute clinical simulation application, which included functional troubleshooting, and 4) a formative assessment tool (or "test") containing 40 questions derived from the manufacturer's user manual. A fifth, unstructured component was the independent reading of the user's manual posted on the intranet.

Go live. After 2 months was allowed for participants to complete the 4-stage program, the machines were installed for clinical use. Two manufacturer's clinical applications specialists were on hand for a total of 5 days to assist the clinicians, but they were generally not called upon. Several follow-up announcements were made to encourage all to complete the 4 stages for awarding of a Certificate of completion.

Results of Implementing the Program

Number of participants and completion rates. There were 195 eligible participants, including 70 CRNAs, 42 staff anesthesiologists, 45 residents and 38 student nurse anesthetists (SRNAs) who were expected to participate in the training program. The overall certification rate was only 54%. Completion rates of the lecture, workshop, simulation, exam, and certification were readily verified. Completion rates for reading could not be verified. The percentage completion of each measurable component is reported in Figure 1. Maximum completion rates were achieved in all components by the SRNAs, with a 100% certification. The CRNAs and Residents had statistically similar component completion rates, but lower than the SRNAs, except for the Workshop component. There was a trend toward higher participation in the workshop and simulation. Certifications of those 2 groups were statistically the same at 54% and 51%, respectively. Significantly and sometimes dramatically lower rates of component completion among staff anesthesiologists were apparent, but the workshop completion was high at 90%. The MD certification rate was remarkably and significantly lowest at 14%.

Results of the examination. Whereas the initial performance on the formative assessment tool was not used as a determinate of certification, the results were analyzed to gauge the general understanding of various features of the anesthesia machine. Figure 2 demonstrates a Gaussian distribution of test scores, with an overall mean score of 22±4.9. There were significantly lower scores of SRNAs (19.5±3.5) vs. CRNAs (23.5±5.2) and faculty (25.9±6.3) ($p<0.01$ using Scheffe' post-hoc comparisons), but not residents (22.3±3.6). Individual question scores were then ranked according to correct answer rates across all groups as shown in Figure 3. Analysis of the least and the highest performing questions was next analyzed.

The most sigificant misunderstanding was demonstrated in 3 questions regarding automatic leak testing of the machine. The vast majority of respondents could not correctly identify which component of the machine could be tested for leakage, when asked to compare the water trap, piston diaphragm, flow sensor, scavenger canister, vaporizer O-ring, and vaporizer filing port. Other highly-missed questions dealt with facts about the monitoring mode, the effects of weight and age on other parameters, and the oxygen ratio controller.

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Vast Majority Recognize Value of Program

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There was a surprisingly significant misunderstanding of the reason why the machine determines its system compliance, which is a key feature of modern anesthesia machines. Out of 119 respondents 105 rated the exam as difficult to moderately difficult.

Analysis of the most highly performing questions revealed a good understanding of several basic and important functions of the anesthesia machine. For example, participants understood 1) the workstation could deliver oxygen and manual ventilation without any power, 2) it had 3 apnea detection strategies, 3) certain ventilation functions were, or were not associated with the APL valve, 4) what actions to take upon a presumed total failure of the system, and 5) the available modes of ventilation. In contrast to other misunderstandings of leak testing, respondents did understand that the APL/man/spont leak test could detect a leak in the breathing hose, and that the automated testing should be performed on a daily basis.

Training program survey results. Of 195 subjects, 125, or 64%, answered the training program survey, even though only 105 subjects fully completed the training. Unfortunately, the survey was linked to the exam and the survey responses only reflect those who sat for the exam (refer to Figure 4). The hands-on learning sessions within the Workshop and Simulation were deemed most informative (Figure 5), but despite extensive training, nearly half of the participants were still uncertain when asked of their readiness to apply the machine clinically (Figure 6).

Of 125 respondents, 104 said that the program was moderately to extremely well organized and 116 of 124 felt it was moderately to extremely valuable overall. Somewhat lower numbers (94/125) felt that patient safety would be improved as a result of the training program, whereas 97/125, or 78%, felt that such training should be mandatory (Figure 7). Finally, when asked whether or not the APSF should convene a consensus conference on whether to mandate similar technology training programs, 88 of 124 respondents (71%) either agreed or strongly agreed, while 28 were neutral.

Free entry comments. A total of 129 free-entry written comments were categorized and ranked by general concerns:

Frequency	Comment
46	Participants wanted more hands-on experience in the training program.
20	The timing and sequence of the modules needed to be changed.
12	Participants preferred take-home printed user manuals and information

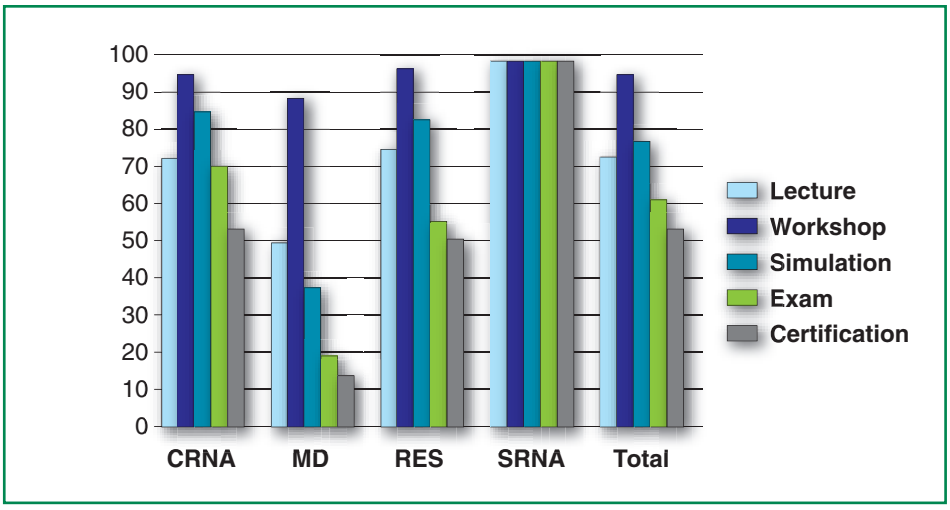

Figure 1: Component percentage completion by group. Certificates were awarded only to those completing all 4 components.

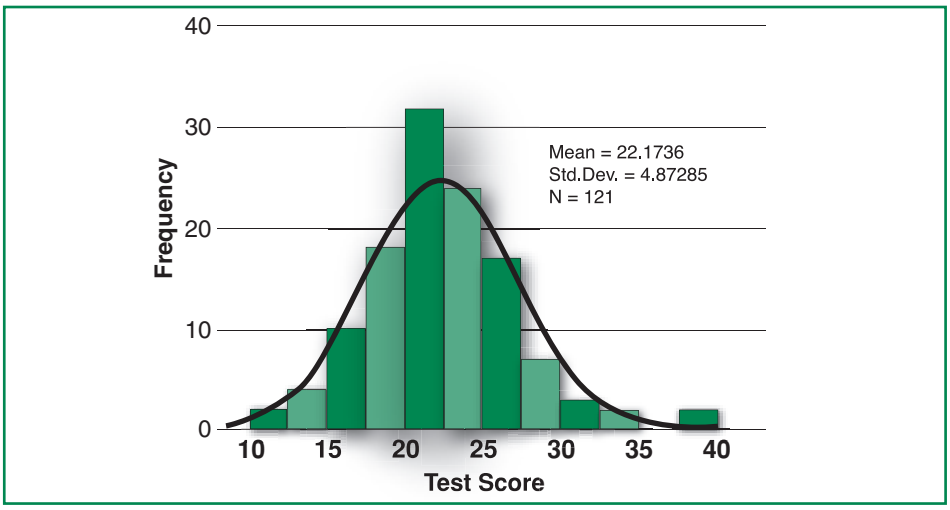

Figure 2: Distribution of initial test scores of 121 individuals, on the 40-question exam.

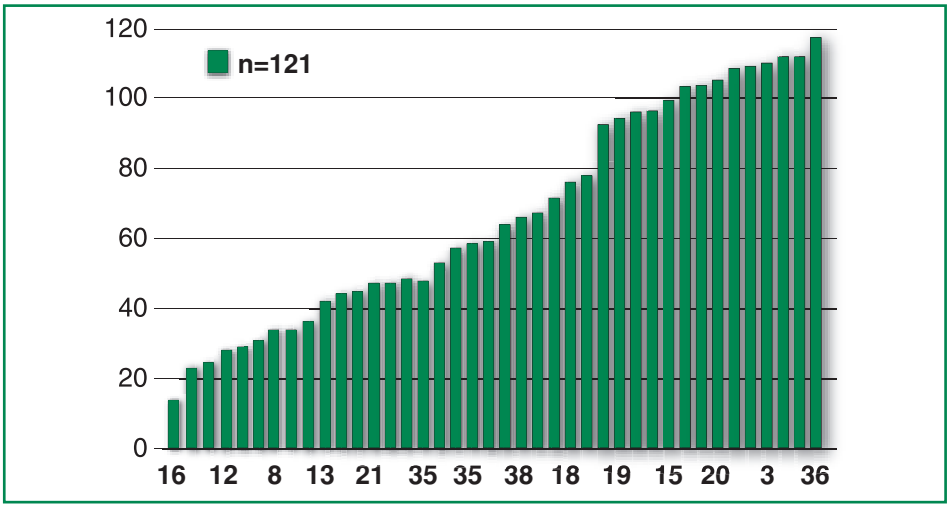

Figure 3: Number of correct answers to individual question numbers. The questions with the lowest 9 scores, and the highest 14 scores were analyzed for content (see text).

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Faculty Need Strong Motivation for Training Participation

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	as opposed to the on-line reference materials.
11	Participants preferred on-site clinical training with an experienced factory representative during actual clinical care.
11	Respondents advised that the program focus on key points.

An overwhelming majority of the comments indicated that participants wanted more hands-on experience with the machine, and this is consistent with their selected preference for the workshop and simulation learning modules. Similarly, the details behind timing and sequencing indicated that students wanted a much more concentrated effort of hands-on learning, ideally located in the OR-environment for easy accessibility during breaks, or even training in the clinical setting. They felt that lectures and exam review should follow the hands-on sessions (and they did, after the survey was completed). Many stated that they could not understand nor remember the details within the early-phase lecture, having never seen the machine.

Conclusions

An overwhelming effort to justify, to organize, and to accomplish a comprehensive mandatory technology training program, prior to the installation of a profoundly modern and unfamiliar anesthesia machine, was a real challenge on many different levels.

The biggest failure of intent was to NOT mandate the program for all categories of clinicians who would be responsible for using the equipment upon installation. It was the authors' impression (and later confirmed) that this omission of the Chairman's mandate for staff anesthesiologists to complete the program was based upon a perceived lack of realistic and enforceable consequences for non-participation. Staff anesthesiologists in academic settings, at least, are notoriously independent-minded and perhaps drawn to the academic environment by the promise of freedom of expression, and freedom of learning and specialization. Many were simply not interested in learning the intricacies of the machine, and felt confident that they could apply the machine with minimal training. Our institution does not routinely provide primary staff-administered anesthesia, but rather staff-directed care, which could have made such training seem unnecessary. Similarly, mediocre (but much higher) certification rates of completion by residents and CRNAs may have been secondary to the lack of enforceable or threatened sanctions against those who did not complete the training.

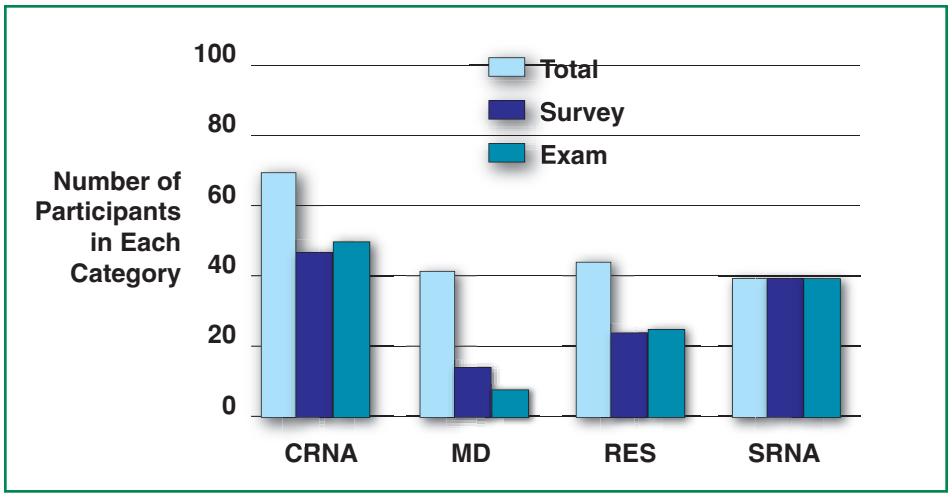

Figure 4: Survey and exam completion by group. Total refers to the number of individuals in each group. Note that the survey and exam participation are close in all groups, except that more faculty answered the survey (14) than answered the exam questions (8).

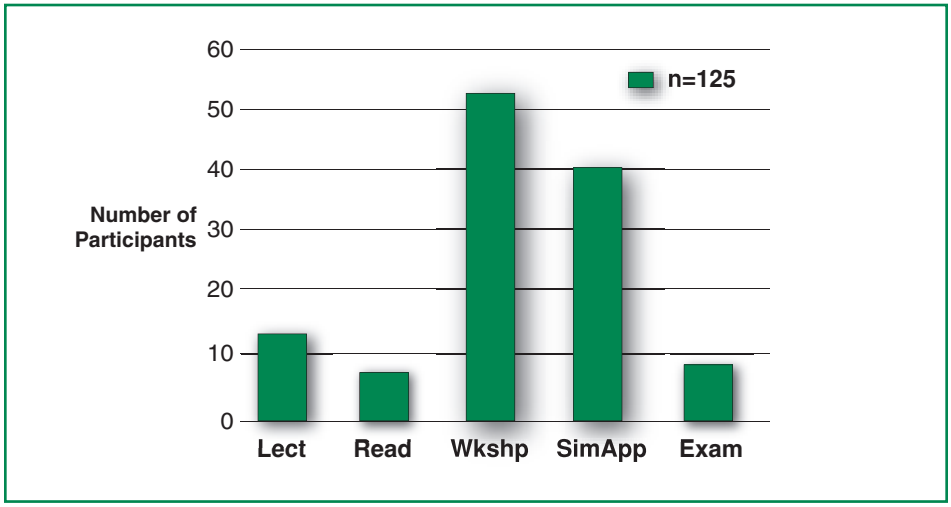

Figure 5: When asked which component they learned the most from, participants overwhelmingly chose the hands-on applications in the workshop and simulation lab.

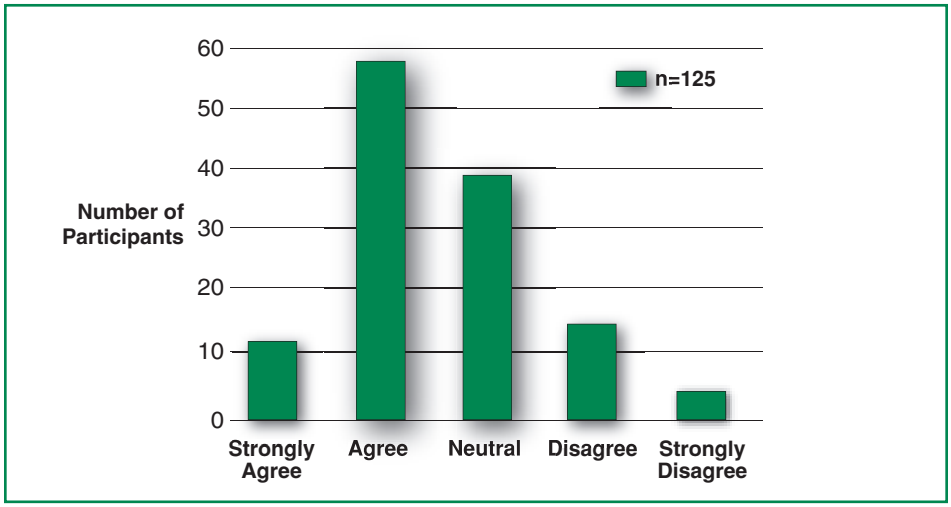

Figure 6: Participants demonstrated some reluctance when asked if they were ready to use the anesthesia machine, following all 4 components of training.

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Top-Down Mandate Effective For Student Nurse Anesthetists

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On the other hand, one would expect academic faculty, at least, to understand and appreciate the significant literature on failures of human training, and the high rates of human error in the application of complex machines.[4] Furthermore, the obligation of faculty to intervene in situations of sudden machine failure is obvious, but apparently did not enhance the faculty completion rate. Recent national emphasis on patient safety, and documentation of capability and performance both within the ABA and the ACGME, should be widely known by academic faculty. Perhaps the negative motivational factors listed above need to be overcome by negative consequential mandates from the Chairman, if indeed such training is deemed important for patient safety. At least one private hospital Chair (described above) had success in mandating training through the actualization of a threat to disallow preferred practice assignments. It seems clear in this pilot program, and with other evidence above, that the motivational "carrot" and certification was rejected for lack of enforcement, and that a top-down mandate is essential to accomplish such training.

The positive consequential mandates given to the CRNAs and the residents (including a certificate and CE credits), were still an inadequate means of accomplishing a high certification rate. There were no threats and no sanctions made by their supervisory personnel for a failure to certify. Regardless, there was a heroic effort and enthusiasm, particularly among the CRNAs and their leadership, to secure all 70 individuals to participate. Furthermore, there were high completion rates of the active-learning modules that adult learners typically find most interesting. The 90% participation of the faculty in the workshop session speaks to hands-on training, but this preference is not supported by their 38% participation in simulation.

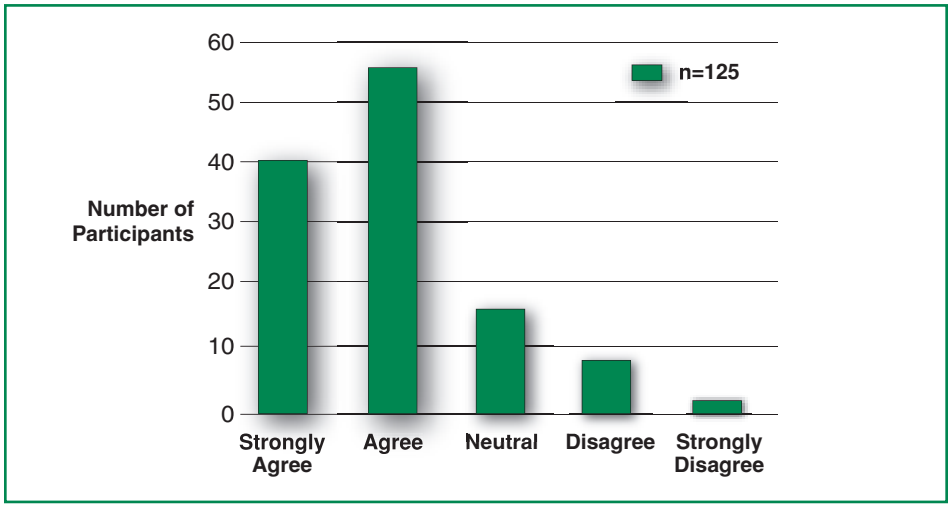

Figure 7: When asked if such training programs should be mandatory, 97 out of 125 (78%) either agreed or strongly agreed.

It is not surprising, and rather gratifying that 100% completion was obtained by the SRNAs, as this particular program is highly regarded for its quality, its rigor, its regimentation, and assertive leadership. Highly motivated students in a classroom-assignment system are unlikely to miss a mandated assignment by their Chair, presumably because of perceived or actual severe negative consequences.

Is it possible, preferable, or incumbent upon other clinicians in anesthesiology to demonstrate similar adherence to recommended training? Perhaps a cultural difference of more independent-minded practitioners, and even residents, needs to be addressed. We don't think that a lack of opportunity to attend was the reason, but maybe the lack of "assignment structure" particularly among residents and faculty, was a problem.

The next obvious failure of the training program was the low score on the formative assessment tool (which was reviewed and corrected after the initial grading). Despite what was considered to be a heroic effort at training, a high percentage of correct answers was not obtained. Although the test was difficult and detailed, and designed to distinguish variations in knowledge content, it was disappointing to see the low scores after such an intense amount of effort.

We also did not measure machine-application capabilities in simulation, following the training, primarily because this project was NOT designed as an outcome study, but rather as a trial to test our ability to implement wide-scale training of a large group of clinicians, and to gather their perspectives on that training. We already believed that simulation training would improve application of the machine, and ultimately patient safety, as it did in the Dalley study.[2]

What did succeed in this pilot program was a great deal of enthusiasm and broad participation in at least some of the components of training, and we learned that an overwhelming number of clinicians felt the training was valuable and would improve patient safety. They made a number of consistent and constructive suggestions to improve the training by making it more clinically focused, more succinct, and with greater time spent on applications training. We know that at least 50% of the entire group (97/195) felt such training should be mandatory, whereas 91% of all respondents felt it should be mandated (97/125).

The impediments to mandating this training still remain, and will probably require a consistent

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The following is a commentary and insight from Dr. Raymond Roy pertaining to the decision not to mandate faculty participation in this study:

In the project development phase Dr. Olympio and I openly discussed the pros and cons of various roles I could play as department chair. Despite Dr. Olympio's prediction of poor compliance without strong top-down pressure, I chose to treat this proposal as a routine clinical study, i.e., I endorsed it but did not mandate participation. Ironically, my decision enabled a clear demonstration of what not to do. I am pleased with the study, but disappointed in the outcome.

Is it a faculty member's fault for not doing what is right and for not being a good role model for residents and CRNAs? Is it the principal investigator's fault for not "selling the project" well enough? Or is it the chair's fault for not championing the cause? Human nature being what it is, I consider it primarily a leadership issue. I hope to be presented with a similar proposal in the future. Armed now with real data I would view the project, not as a clinical study, but as a major departmental safety initiative. I would aggressively seek buy-in prospectively from the faculty and shepherd the project to completion. Faculty members who fail to receive their certificates by a certain time would not be assigned clinically until they did so. This penalty would create significant peer pressure. If that was not enough, it would have financial consequences related to a failure to acquire the requisite number of clinical service units. And if that was not enough, it could ultimately affect recredentialing and the employment contract. What private or academic anesthesia group really wants to recruit an anesthesiologist, anesthesia resident, CRNA, SRNA, or AA who refused to participate in a mutually agreed upon safety initiative?

Raymond C. Roy, PhD, MD
Professor and Chair of Anesthesiology
Wake Forest University School of Medicine
rroy@wfubmc.edu

Value of Training Program Recognized

"Training," From Preceding Page

and persistent culture change. We believe that publicity and documented concerns over the need for technology training will continue to increase, as evidenced by the background data in this paper, and presumably by this effort itself. Cynics will need to be reminded of existing data that justifies such training, and additional research will need to provide hard, measurable data that justifies training, such as reductions in service calls, reductions in critical machine incidents, or by increased ability to rescue from, or troubleshoot machine-related problems. The APSF invites your comments and suggestions on the next steps for this initiative.

Dr. Olympio is the Chair, Committee on Technology for the APSF and is Professor of Anesthesiology at Wake Forest University School of Medicine, Winston-Salem, NC.

Ms. Reinke is a member of the Committee on Technology for the APSF and is General Manager of Anesthesia Delivery for GE Healthcare Technologies, Madison, WI.

Mr. Abramovich is a member of the Committee on Technology for the APSF and is a Principal Consultant for ProMed Strategies, LLC, Lawrenceville, NJ.

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Refresher Courses/Scientific Papers Offer An Extensive Choice of Topics

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This ASA meeting's Scientific Papers (Oral Presentations, Poster Discussions, and Posters) include 7 sessions that focus on patient safety. Leading off will be a Poster session moderated by Dr. Daniel Sessler, set for 9:00-11:00 am, Saturday, October 14, in Hall E, Area E. Topics in this session encompass postoperative outcomes ranging from PONV to mortality. Two examples to illustrate the group of posters dealing with PONV include *Multiple Agent Antiemetic Prophylaxis for the Prevention of Early and Late PONV: Is It Effective?* (A-127) presented by Dr. Jerome O'Hara's group of the Cleveland Clinic Foundation, and *Does Supplemental Intraoperative Oxygen Reduce the Incidence of PONV after Gynecologic Laparoscopy?* (A-129) from Dr. Freda Richa and colleagues at the Hotel-Dieu de France Hospital, Beirut, Ashrafieh, Lebanon. Reducing medication errors is the focus of several presentations in this session, including *Prospective Assessment of a New Anesthetic Drug Administration System Designed To Improve Safety* (A-138) presented by Dr. Alan Merry's team from the University of Auckland, New Zealand, and *A Retrospective Analysis of Anesthesia-Related Medication Errors at a Tertiary Medical Center* (A-139) offered by Dr. Gregory Applegate and his group from Case Western Reserve University and the University Hospitals of Cleveland. Mortality outcomes are the issue for Dr. Kazuo Irita's group, from the Japanese Society of Anesthesiologists, in their presentation *Deaths on the Operating Table in Japan* (A-135), and for Drs. Yvon Bryan and Thomas Taghon of the Cincinnati Children's Hospital Medical Center in *One in Ten Million: Fatalities Involving MRI* (A-145). Also, a team from the Albert Einstein College of Medicine in the Bronx, New York, offers 2 posters on structured peer review as a means for analyzing adverse perioperative outcomes (first authors in parentheses): *Structured Peer Review and the Quality Management Template – A Multi-Institutional Analysis* (A-136, Dr, Vilma Joseph) and *Adverse Outcomes and Human Errors in a System of Structured Peer Review* (A-146, Dr. Rhoda Levine).

Sunday Introduces Orthopedic Safety

An Oral Presentation session, moderated by Dr. Michael Smith, takes place from 9:00-10:30 am, Sunday, October 15, in Room N230b. This session will deal with safety issues related to orthopedic anesthesia. Dr. Boris Mraovic and colleagues from Thomas Jefferson University in Philadelphia will begin with *Glucose Management in Orthopedic Surgery Patients* (A-381). Following will be a presentation on *Factors Associated with 6 Months Mortality in 488 Patients after Surgery of Femoral Neck Fractures* (A-382), led by Dr. Philipp Honigmann and his team from Kantonsspital Lucerne, Switzerland. Dr. John Murkin and colleagues from the University of Western Ontario will present *Safety Evaluation of Aprotinin from a New, Large, Multicenter Study in Primary Total Hip Arthroplasty* (A-383). Other presentations in this session will include *Allergic Reactions Due to Aprotinin – A Prospective Study in 1,307 Orthopedic Surgery Patients* (A-384) by Dr. Guenter Singbartl's group from the ENDO-Klinik, Hamburg, Germany; *Non-Viral Disease Complications in the Cost-Utility Analysis of Cell Salvage Blood* (A-385) by Dr. Dale Szpisjak from the Uniformed Services University of Health Sciences, Bethesda, Maryland; and *Post-Operative Hypoxia Risks in Patients with Patient Controlled Analgesia after Joint Replacement* (A-386) from Dr. Michael Williams and his team, also at Thomas Jefferson University.

Internal jugular vein cannulation, various monitoring advances, ventilation, and microbial control are but a few of the subjects to be presented in another patient safety-oriented Poster session, set for 9:00-11:00 am, Monday, October 16, in Hall E, Area F, with Dr. Warren Sandberg as moderator. Two posters will address safety in internal jugular vein cannulation: Dr. Q.I. Li and colleagues from the West China Hospital of Sichuan University will report on *Monitoring of Vascular Pressure and Waveform Helps To Indicate Inadvertent Carotid Arterial Puncture* (A-926); Dr. Masato Morita's team from Nagoya City University in Japan will present *The Skin-Traction Method Can Increase Cross-Sectional Area of Internal Jugular Vein* (A-927). Two posters from a Medical College of Wisconsin team will advance the discussion on preventing desiccated CO_2 absorbents, a recent topic in the *APSF Newsletter*. These include *Sevoflurane Breakdown Produces Flammable Hydrogen Gas* (A-928, Dr. Marshall Dunning), and *Sodasorb® LF Inhibits Sevoflurane and Desflurane Degradation without Loss of CO_2 Absorption Efficacy* (A-930, Dr. Harvey Woehlck). Several posters evaluate new monitoring equipment, including one by Dr. Musa Sesay and colleagues from Pellegrin University Hospital, Bordeaux, France, which reports on the *Audibility of Anesthesia Alarms during MRI: Evaluation of the PARAPAC™, the CONTINUUM™ and MAGLIFE™* (A-925). Among the posters dealing with ventilation, Dr. Steven Cnudde's Belgium group considers *Are Ventilators with an American or an European Breathing Bag Safe To Prevent Accidental Volutrauma?* (A-932). Drs. Julie Lajoie and Elizabeth Ling of McMaster University, Hamilton, Ontario, assess *How Clean Are We? Determining Microbial Growth on Commonly Touched Items in Three Operating Rooms* (A-944).

Monday Includes Obesity and Obstructive Sleep Apnea

Also on Monday, from 2:00-3:30 pm in Room N426a, Dr. Richard Prielipp will moderate a Poster Discussion session centered on the risks of obesity

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Poster Session Highlights Airway Management

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and obstructive sleep apnea. Four sessions will concern obesity: Dr. Ashish Sinha's group from the University of Pennsylvania will present *Evaluating a Risk Assessment Tool in Morbidly Obese Patients Undergoing Gastric Bypass Surgery* (A-987); Dr. James Blum and his team from the University of Michigan will consider both *The Risk of Quality Assurance Events in 116,035 Patients Based on Body Mass Index* (A-989) and *The Risk of NSQIP Postoperative Complications with Increasing BMI* (A-990); Dr. Lois Connolly and colleagues from the Medical College of Wisconsin will address how *Increases in Body Mass Index Correlate to Increasing Perioperative Event* (A-992). Four other presentations investigate sleep apnea. Three of those come from a University of Toronto team: *Should Surgical Patients with Difficult Intubation Be Referred to Sleep Clinic for Polysomnography?* (A-986, Dr. Frances Chung); *What Is the Best Preop Screening Tool for Surgical Patients with Obstructive Sleep Apnea* (OSA)?(A-991, Dr. Chung); and *OSA Questionnaire: A New Short-Form Screening Tool for Obstructive Sleep Apnea (OSA) Patients* (A-993, Dr. Balaji Yegneswaran). Also, Dr. Kevin Finkel's group from Washington University in St. Louis will present *Obstructive Sleep Apnea: The Silent Pandemic* (A-988).

Another Poster session, moderated by Dr. Dexter Franklin, is scheduled for 9:00-11:00 am, Tuesday, October 17, in Hall E, Area D. Here the majority of posters will analyze patient flow through the OR system. While patient safety is implicitly central to this topic, a number of posters in this session stand out for specifically addressing safety-related concerns in the OR and other clinic settings. For example, Drs. Paul Barach and Jonathan Wilverding of the University of Miami explore a standardized "hand-off" system for transferring patients between hospital areas, such as from the ER to the ICU, in *Assessing and Improving Communication of Patient Care Information in Critical Care Settings* (A-1291). Drs. Jon Halling and Alexander Gutkin of the Ochsner Clinic Foundation in New Orleans, in *One Hospital's Response to a Mass Disaster – Lessons and Thoughts* (A-1304), summarize the response of that institution, and particularly their Department of Anesthesiology to Hurricane Katrina, including preplanning, disaster management, a discussion of areas for improvement down the road, and the status of the recovery of the healthcare infrastructure in New Orleans. Also in this session, Dr. Thierry Girard and colleagues from the University of Basel, Switzerland, address the present and future of testing for malignant hyperthermia in *Can We Improve on Phenotyping for Malignant Hyperthermia?* (A-1309) and *How Accurate Is Testing for Malignant Hyperthermia?* (A-1310).

Electronic Medical Records

Safety in electronic medical records will be the theme of a Poster Discussion session set for 1:30-3:00 pm on Tuesday, October 17, in Room N426a, with Dr. Robert Johnstone moderating. Two reports from Dr. Michael Vigoda and colleagues from the University of Miami highlight beta blockade issues: *Anesthesia Information System Shows Inadequate Intraoperative Beta Blockade in Patients with CAD* (A-1376) and *Intraoperative Beta Blocker Use Doesn't Change with Electronic Reminder of Patients' Cardiac Status* (A-1377). Dr. Fabian Kooij and his team from the Onze Lieve Vrouwe Gasthuis/Academical Medical Center, Amsterdam, Netherlands, will present *Decision Support System Increases Data Quality on Preoperative Record* (A-1378). *"Risky Business" in the OR: A Survey of Anesthesia Information System Policy Decisions* (A-1379) is the topic for Dr. Richard Epstein's group from Jefferson Medical College. Dr. Alfred Pinchak and his team from CWRU-Metrohealth Medical Center in Cleveland, Ohio, will report on *Automating the Analysis of Physiological Data from Computerized Anesthesia Records* (A-1380). Antibiotic administration is the issue in 2 presentations: a Vanderbilt team lead by Dr. Paul St. Jacques will examine the *Effect of an Automated Antibiotic Prompt as Part of an Integrated Perioperative Informatics System* (A-1381); *Improved Compliance with Antibiotic Guidelines with Implementation of an Electronic Visual Reminder* (A-1382) will be presented by Dr. David Wax's group from the Mount Sinai School of Medicine in New York. Dr. Warren Sandberg and colleagues from Massachusetts General Hospital in Boston will offer recommendations for *Improving Documentation Quality with Automated Anesthesia Information Management* (A-1383).

Airway management issues predominate in a Poster session scheduled for 9:00-11:00 am, Wednesday, October 18, in Hall E, Area E, and moderated by Dr. Joan Christie. A sampling of posters on that topic includes one by Dr. Anne-Marie Cros and her group from the Pellegrin University Hospital, Bordeaux, France, titled *Prospective Study of Complications, Incidence and Predictive Factors of Difficult Mask Ventilation* (A-1687). Dr. Mohammad Maroof and his team from the University of North Carolina at Chapel Hill will discuss how the *Ambu Laryngeal Mask Is a Better Alternative to Tracheal Extubation as Compared to LMA Classic* (A-1688). Dr. Masami Yamazato and colleagues from the University of the Ryukyus in Okinawa, Japan, will present *Bronchofiber-View Assist Nasotracheal Intubation Technique Can Dramatically Reduce Nasal Trauma* (A-1696). Dr. Jong Seok Lee and his group at Yonsei University College of Medicine in Seoul, Korea, report a case of *Hypoglossal Nerve Injury Following the Use of the CobraPLA*™ (A-1698). Rounding out this session is a miscellany of posters on such subjects as acute intraoperative events and sedation. These include *The Effect of Intramedullary Decompression in Preventing Bone Marrow Embolism during THA* (A-1679) delivered by Dr. Masaki Takashina and colleagues from Osaka University Hospital, Japan, and a *Retrospective Evaluation of Efficacy and Safety of Emergency Room Sedation in Pediatric Patients* (A-1695) from Dr. Tricia Meyer's team of the Scott and White Healthcare System, Temple, Texas.

This year's annual ASA Meeting promises to be an exciting series of lectures, presentations, and discussions replete with information, ideas, and food for thought. Patient safety again plays a major role. Please check out the ASA website and meeting program for a complete list of topics and schedules.

Dr. Somerville is a Research Administrative Coordinator in the Department of Public Health Sciences at Wake Forest University School of Medicine.

Dr. Morell is the Editor of this publication, Clinical Associate Professor of Anesthesiology, Wake Forest University School of Medicine, Adjunct Clinical Associate Professor of Anesthesiology, University of Florida, and a private practice anesthesiologist living in Niceville, FL.

Be sure to check out the APSF Booth in the Exhibit Hall at the 2006 ASA Meeting in Chicago, IL, October 14-18, 2006.

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Dear SIRS

Is an In-line Oxygen Monitor Still Necessary?

S AFETY
I NFORMATION
R ESPONSE
S YSTEM

Michael Olympio, MD,
Chair of the APSF Committee on Technology and Co-Founder of the Dear SIRS Initiative.

Dear SIRS refers to the **Safety Information Response System**. The purpose of this column is to allow expeditious communication of technology-related safety concerns raised by our readers, with input and responses from manufacturers and industry representatives. This process was developed by Drs. Michael Olympio, Chair of the Committee on Technology, and Robert Morell, Editor of this newsletter. Dr. Olympio is overseeing the column and coordinating the readers' inquiries and the responses from industry. **Dear SIRS** made its debut in the Spring 2004 issue.

Dear SIRS:

I am medical director of a free-standing surgery center. One of our anesthesia machines has a non-functioning O_2 sensor. We have an older Ohmeda Excel 110. Our biomedical person claims the sensor box would be impossible to replace. He said since we monitor O_2 on our end-tidal/agent analyzer, this would satisfy O_2 monitoring requirements. Is he correct, or do we need the inline O_2 sensor?

Thank you,
Michael Nakata, MD

In Response:

The anesthesia machine standard of 1979, as well as the anesthesia workstation standards of 1988 and 2000 (I chaired the committees that wrote the latter 2) required an "in-line" O_2 analyzer. It was our belief that the analyzer was the last line of defense against a machine-generated hypoxic mixture, and further, would alarm sooner than an expired gas monitor. I hope I have been of some help.

Sincerely,
Stanley Weitzner, MD

Editors' Note:

ASTM F-1161 was published in 1989, but has since been withdrawn and replaced by ASTM F-1850. The relevant requirements from ASTM F-1850-00 are as follows:

Clause 51.11.1 The ANESTHESIA WORKSTATION shall be provided with an oxygen monitor in compliance with Specification F 1462 for measurement of the O_2 concentration in the inspiratory limb or the Y-piece, or the manufacturer(s) of the ANESTHESIA GAS SUPPLY DEVICE and ANESTHESIA BREATHING SYSTEM shall state in the accompanying documents that such a means is required.

51.8.2.1 Automatic Enabling - Means shall be provided that the monitor and alarms mentioned in clauses 51.9.3 (breathing system pressure), and 51.11 (oxygen concentration) shall be in the enabled condition and functioning automatically whenever the anesthesia gas supply device is in use. . . .

Dr. Olympio

In Response:

The important aspect here is not where the O_2 is measured or by what, but rather that the O_2 measurement is activated when the anesthesia machine is turned on. There are numerous reports from history where stand-alone monitors for parameters were available on the machine, but the incident occurred nonetheless because the user had forgotten to turn the device on or had not realized that the alarms were disabled.

In our view the O_2 measurement should be checked during the machine startup and should be automatically activated on power-up of the machine. It should also have the same battery support time as the gas machine.

Robert Clark
CareArea Director
Perioperative Care
Dräger Medical, Inc.
Telford, PA USA

In Response:

The role of the O_2 analyzer is to assess the "machine"—not solely the patient. Both machine and patient monitoring could be accomplished with a side-stream gas analyzer positioned at the Y-piece, if it is always used. When a machine complies with the workstation standard, there are other requirements as well. For example, monitors must be activated when the machine is turned on. Therefore, it is tempting, but not necessarily possible, to create the equivalent of a workstation with a handful of eBay components.

To the best of my knowledge, conformance to a current equipment standard is not necessarily required for clinical use. In fact, it is almost impossible for equipment to continue to comply with constantly updated standards. Naturally, new equipment should comply. In this case, the old machine no longer complies with an old standard. The ASA's statement on machine obsolescence may be relevant: http://www.asahq.org/publicationsAndServices/machineobsolescense.pdf

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Oxygen Monitor Must Be Turned On and Have Battery Backup

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This issue probably resides within the scope of practice standards. Is the machine otherwise safe and fit for use? Will the O_2/CO_2 respiratory gas monitor always be used when the machine is used? If so, it should be OK.

Julian Goldman, MD
Massachusetts General Hospital
Departments of Anesthesia and Biomedical Engineering
President, Society for Technology in Anesthesia
www.jgoldman.info

In Response:

Before fast oxygen measurements became available as part of anesthesia gas analyzers, it was a safety requirement to monitor the O_2 content in the inspiratory limb of the breathing circuit. This was a relatively slow measurement (response time of seconds, not milliseconds) accomplished with polarographic or fuel cells. They served to detect failures in the oxygen supply.

In my opinion, a modern gas analyzer measuring as close as possible to the patient's lung, namely at the Y-piece of the circuit, does an even better job. It not only monitors the O_2 content delivered to the patient but also captures the amount of oxygen coming out of the lungs. This gives more information about oxygen delivery and it even provides a sign of effective ventilation.

So, I think if the anesthesia machine is not compromised elsewhere, it should be safe to use the O_2 information from the gas monitor. But of course, one must take care that the defective O_2 sensor does not generate distractive alerts on the anesthesia machine, thus adding risk.

Kind regards,

Dr. Siegfried Kästle
Project Manager R&D
Patient Monitoring Division
Philips Medizin Systeme Böblingen GmbH
Hewlett-Packard-Strasse 2
71034 Böblingen, Germany
siegfried.kaestle@philips.com
http://www.medical.philips.com

In Response:

I'd say that, no, a facility doesn't have to maintain an anesthesia unit to adhere to F1850, since that standard applies to manufacturers of new devices. Once a device is in a facility's inventory, that facility has an obligation to maintain and operate it in accordance with current standards of care, but that's outside the scope of ASTM. ASA and AANA standards are better guidelines for the practitioner and clinical engineer.

In his original question, Dr. Nakata pointed out that his medical-gas monitor can measure O_2 concentrations, and I'd say that's sufficient to meet ASA/AANA requirements. When healthcare facilities assemble anesthesia systems (the anesthesia unit, gas monitoring, and physiologic monitoring) from separate components, there's almost inevitably some overlap of monitoring function. Paying greater attention to a monitoring function on one component at the expense of the same feature on another component isn't unreasonable.

What's tricky is this: How does Dr. Nakata's facility ensure that a) everyone knows that the anesthesia unit's O_2 monitor is unusable and b) the gas monitor is always present and in use? Whatever method he chooses, Dr. Nakata needs to make sure that the gas monitor (or other O_2 monitor) is *automatically* enabled during each case and that no one ever thinks to rely on the anesthesia unit's (now defunct) integrated O_2-monitor. If he can't guarantee this, the safer route is to replace the anesthesia unit entirely.

Additionally, I agree strongly with 2 points raised by other respondents. First, as more than one response pointed out, Dr. Nakata will need to ensure that the problem is truly limited to an inability to monitor and/or display oxygen concentrations and does not extend to other functions of the anesthesia machine. Second, as Rob Clark (Dräger Medical) pointed out, the new monitoring component should be supported by battery power at least as long as the anesthesia machine is supported (as should any important monitoring feature).

Best regards,

Dan Alt
Senior Project Engineer, Health Devices Group
Manager, Problem Reporting System
ECRI
P: +1-610-825-6000 ext. 5445
F: +1-610-834-1275
dalt@ecri.org

In Response:

An in-line O_2 sensor tells you what is coming out of the machine. In New Jersey, it is not replaced by any other peripheral sensor.

Erv Moss, MD

Letter to the Editor

Cardiac Arrest After Popliteal Block: Are There Any Safety Lessons to Be Learned?

To the Editor:

The *APSF Newsletter* has devoted 2 articles to a single case report of local anesthetic-induced cardiac toxicity after a single-injection popliteal block.[1,2] Miraculously, the patient survived without significant deficit after being placed on emergency cardiopulmonary bypass (CPB).[3] Many readers of the newsletter have concluded that the risks of peripheral nerve block are unjustified now that general anesthesia has become so safe.

Several safety-related aspects of this case merit discussion. First, why was high-dose bupivacaine chosen for this block? Ropivacaine would probably have been a better choice. There are animal and human data suggesting that ropivacaine is a safer local anesthetic.[4,5] Many reports of successful treatment of local anesthetic toxicity after high-dose ropivacaine have been promulgated;[6-8] and the APSF-reported case is just another in a litany of reports of bupivacaine toxicity resistant to straightforward resuscitation efforts.[9]

Epinephrine was not added to the local anesthetic in the APSF-reported case. There has been a trend in regional anesthesia to avoid epinephrine due to a perceived increased risk of neural damage. These concerns are based on *in vitro* data and have not been confirmed in human or animal models of neural blockade. With regard to systemic toxicity, epinephrine probably does increase the margin of safety with single-injection nerve blocks. Epinephrine acts as an intravascular marker. When a significant amount of local is injected intravascularly, the increase in heart rate (pulse oximetry or ECG) can warn the physician to halt further injection, and either avoid a toxic reaction or at least blunt its intensity.[4]

The use of a single, immobile injection technique in the APSF-reported case should be discussed. For several decades there was an ongoing debate among aficionados of axillary block: students of Dr. Winnie favored single transarterial injection with an "immobile needle," while followers of Dr. Thompson preferred multiple injections around the artery. The bulk of expert opinion now favors the identification and injection of all 4 major nerves in the axilla.[10] While the efficacy of the 2 techniques was debated, the relative safety of the techniques was not. Local anesthetic toxicity was fairly common with the immobile needle, while there has never been a formal or informal report of toxicity with a multiple injection axillary block.[11] Critics maintain that multiple injections increase the possibility of nerve damage; however, no prospective randomized clinical trial has yet confirmed this assertion. Returning to the APSF-reported case, some suggest that a 2-injection approach to the sciatic nerve in the popliteal fossa improves efficacy.[12] By fractionating the total dose, a 2-injection technique could improve safety. Would the APSF-reported case have been prevented if the common peroneal and tibial components were identified and injected separately?

Our collective experience with epidural anesthesia also offers insight into this case. Thirty years ago epidural anesthesia was in its infancy. The usual method was to inject 20-30 ml of local anesthetic through the Tuohy needle. Despite negative aspiration, the single injection technique often resulted in serious local anesthetic toxicity. The concept of the test dose was introduced; however, serious complications were still common with through-the-needle dosing. The solution was to place an epidural catheter, test dose, and then dose incrementally.[13] When incremental injections are separated by 3-5 minutes, every dose is a test dose,[14] and serious complications became virtually non-existent.

Despite these caveats, serious local anesthetic toxicity will still occur rarely, just as severe disorders manifest during general anesthesia (e.g., malignant hyperthermia). Dantrolene has proven to be a useful antidote for the rare case of MH occurring during general anesthesia. There is promise that a similar antidote has been discovered for local anesthetic toxicity. Studies have shown that administration of lipid emulsion reliably rescues animals (rat and dog) from otherwise fatal doses of bupivacaine.[15,16] Rosenblatt et al.[17] recently reported the successful use of 20% Intralipid™ to rescue a patient with bupivacaine-induced ventricular arrhythmias who had not responded to 20 minutes of ACLS efforts. Virtually all sites that provide general anesthesia stock dantrolene for the rare case of MH. Similarly, 20% lipid emulsion should be stocked (together with dosage guidelines) in every operating theater and labor suite.[18,19] Rather than avoiding peripheral nerve blocks, the APSF-reported case should prompt readers to evaluate their use of local anesthetics and their preparedness for rare, life-threatening complications.

Richard K. Baumgarten, MD
Detroit, MI

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In memory of Laurie A. Noll, MD (The Coursin family)

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NEW

Q&A

Numerous questions to the Committee on Technology are individually and quickly answered each quarter by knowledgeable committee members. Many of those responses would be of value to the general readership, but are not suitable for the Dear SIRS column. Therefore, we have created this simple column to address the needs of our readership.

Q Dear Q&A,

One of my hospitals plans on purchasing new vaporizers for anesthetic delivery. Their machines already have anesthetic gas monitors mounted and used on every case. The vendor states that the "standard" vaporizer check/recalibration occurs every 3 years. He offers an annual check/calibration of each vaporizer for additional cost.

Does the APSF have any recommendation as to annual vs. every-3-year calibration of vaporizers?

And, if no recommendation, standard, or guideline exists for interval of calibration, do you have any opinion about whether the presence of anesthetic gas monitors in the circuit might influence the interval between calibrations?

Thank you.

George Burgess MD
VP, Innovation & Technology
Franciscan Missionaries of Our Lady Health System
Baton Rouge, LA

A Dear Dr. Burgess,

From a clinical use standpoint, I believe that gas analyzers sampling at the endotracheal tube are far more useful to me than what the dial or output of the vaporizer actually is. We know that the actual vaporizer output is not what the patient inhales. Fresh gas flow, inspired flow, carrier gas composition, mixing capacity of the circuit, circuit design, uptake, degradation, gas sampling extraction, etc., are all contributing factors. Thus, if the engineers and manufacturers believe the internal calibration mechanisms are stable for up to 3 years, then I would say that more frequent calibrations are not clinically helpful. I would further add that gross errors in output, secondary to internal failure, might occur suddenly and should be detectable by gas analysis. Vaporizer output must also be checked under highly regulated conditions with controlled carrier gas composition.

A Dear Dr. Burgess,

The above response is absolutely right. The vaporizer setting is only meaningful when an open circuit is used. In all other configurations, the vaporizer setting is different from what the machine delivers at the Y-piece. So the only adequate number is what the gas analyzer measures as "inspiratory Agent"/"expiratory Agent" value. During low flow anesthesia the vaporizer setting may differ greatly from the inspired agent concentration. That's why a gas analyzer is so helpful. The only reason for a vaporizer check (as opposed to a calibration), may be to verify its functionality in general.

A Dear Dr. Burgess,

I would defer to the vaporizer manufacturers, as they have the most definitive information regarding field verification and factory calibration process. Informally, I can tell you that very little is, or can be done, in the field, other than identifying an errant vaporizer and pulling it off the machine.

Most vaporizers on the market today, regardless of their manufacturer, cannot be calibrated in the field. They can only be checked. Usually the first inkling that calibration may be off comes from a disagreement with the multi-gas monitor. However, since the possibility exists that the gas analyzer could be misreading, then both devices need to be checked. Normally, vaporizer calibration should be checked with a reference device such as the ones made by Riken.

Different vaporizer manufacturers make greatly varying claims about how often vaporizers need to be checked or sent back for calibration. I remember that one manufacturer claims a 10-year service-free life for its vaporizer. There is also the school of thought that may suggest that "if it ain't broke, don't fix it," meaning that if the multi-agent monitor agrees with the vaporizer's setting, then all is well.

A Dear Dr. Burgess,

I suggest that one point deserves more emphasis: I had this type of discussion with my vaporizer service people who insisted on a 6-monthly check which seemed excessive apart from halothane and thymol accumulation. They made the point that most of the trouble came from foreign substances in the vaporization chamber, necessitating disassembly of the unit. In one case there was blood in a unit, and not infrequently watery solutions that could be corrosive over a long period. The wrong agent can confuse the issue. This type of problem may not be detected by a check of concentration output.

A Dear Dr. Burgess,

While there is no formal standard that addresses either a service, or calibration interval for inhalation anesthetic agent vaporizers, the vaporizer manufacturers normally have both device- or model-specific recommended intervals for each. These intervals depend on the age of the device and the degree to which technology has advanced both the accuracy and reliability of the vaporizer. Since vaporizers may be conventional pneumatic, pneumatic with electronic monitoring, or entirely electronic, the intervals will vary.

The original design for vaporizers included no electronic means to verify vaporizer output, vaporizer fill status, or any number of other potentially important pieces of information the user may wish to know. The advent of electronics in vaporizers has permitted a more careful observation of the current overall status of the vaporizer. Electronics also provide the opportunity to notify the user when something untoward has occurred with the vaporizer that may otherwise remain unnoticed by the user. The inclusion of electronics affects both the service and calibration intervals. As a result of these variations many institutions select either one single vaporizer technology or a group of similar technologies that require calibration and servicing at similar intervals.

Letter to the Editor:

National Support Needed to Fight Production Pressures

To the Editor:

I am an ABA Certified Anesthesiologist with 15 years post-residency experience in community hospitals. I have become increasingly concerned with the matter of "production pressure." If ever there was an unworthy appellation coined for a shameful and inconsistent concept, this certainly qualifies. My observation of this phenomenon over a significant period of time leads me to conclude that it has no positive connotations. It is shameful because it frequently results in a departure from patient advocacy in order to meet other competing goals, e.g., 1) deferring to a surgeon's schedule in order to avoid complaints of delay, postponement, or cancellation directed to an unsympathetic administration, 2) denying patients their legal right to informed consent and an adequate work-up due to a given facility's inefficiencies and imposed time constraints, 3) the perceived need to protect a business arrangement or exclusive contract in an environment where "production" is prized above quality or safety.

For example, when an 82-year-old, hypertensive, diabetic patient on multiple medications is treated with the same lack of laboratory work-up as a 30-year-old, ASA 1 patient on no medications, then I am of the opinion that we have exceeded the limit for rational laboratory parsimony. Similarly, consider the 59-year-old, obese patient with newly diagnosed diabetes and poorly-controlled hypertension who was admitted 24 hours earlier with cellulitis of the foot who has still not received any work-up upon arrival in the operating room for "emergency" incision and drainage. A stat EKG also shows atrial flutter with a rapid ventricular response (120s in the absence of fever or signs of sepsis), evidence of previous infarction, age indeterminate, with current ischemic changes in the lateral leads. Which is the higher priority emergency: toe pus or cardiovascular stabilization? In a profession that prides itself on skill—not just technical skills, but skills of clinical acumen and judgment—I must conclude that in such cases some "board certified" anesthesiologists have included under "clinical judgment" a heavy reliance upon lady luck. The reality is that, frequently, the patients survive their procedures and anesthetics. What should I conclude from this? Have I missed something? Has pre-anesthetic assessment for the purpose of patient preoperative stabilization and the mitigation of chronic disease exacerbation become passé? Has the oft-touted improvement in anesthesia morbidity and mortality statistics (although the incidence of adverse events for MAC anesthetics may be increasing again) rendered patient work-up and preparation obsolete because it may be inconvenient to a surgeon's schedule?

My training and experience inform me that the most important determinant of a good outcome is a rational, well thought-out anesthetic plan incorporating appropriate flexibility and based upon a thorough pre-anesthetic work-up. Vigilance does not begin with the pushing of a medication or the onset of an anesthetic. In the absence of knowledge, one is left with ignorance. I refuse to accept that any of my anesthesia colleagues possess sufficient clairvoyance to dispense either frequently or occasionally with an appropriate medical work-up, particularly when such obvious and powerful conflicts of interest as mentioned above are present.

It would seem that board certification no more guarantees consistent and persistently high standards of medical care than a license to drive implies the ability to handle a vehicle on a rain slick highway or an increased propensity to obey the speed limit. I contend that the historical insecurities of anesthesiology are alive and strong and have created many environments in which certain approaches to daily patient care would result in candidate failure if advocated during an oral board examination. The only moderating influence to this is the tort system, but the implementation of this extreme process implies a bad outcome for a lot of people. It is not really what one says during an oral board exam that counts, it is how one performs for the rest of his or her professional life. There are plainly many situations in which it is very difficult to "grasp the challenge" or to "educate" the vested power elite in order to induce positive change. Many times I have heard the saying: "It takes a death to result in change." Everyone correctly clucks the tongue with an appropriate "tsk, tsk," when speaking of "production pressure" and commiserates about this very real and dangerous antagonist to patient safety. However, the implementation of actions to ameliorate and eliminate the palpable hazards of this disreputable and ultimately counterproductive phenomenon are frequently lacking.

Pressure should be exerted upon institutions and medical staff to create environments in which each patient is provided a timely and appropriate work-up. Anesthesiologists should not be positioned to succumb to the temptation to abandon their responsibilities to patients in order to protect their jobs. Job insecurity seems to be where all the pressure focuses; this is unworthy of the discipline as well as those practitioners who hold a high view of anesthesiology and our responsibilities to patients. As long as hospital CEOs and various physicians pander to "customers" according to a business-oriented model of patient care, this situation will not improve. However, there is another approach that has been resurrected under the terminology of "systems thinking" that is first and foremost patient-based. (See national editorial by Cal Thomas, "Hospitals: Heal Thyselves," June 22, 2006, Tribune Media Services, 2225 Kenmore Ave. Suite 114, Buffalo, N.Y. 14207). This approach is reportedly enjoying a productive trial in numerous hospitals in St. Joseph, Missouri, and the Pittsburgh, Pennsylvania, areas.

I would suggest that the ASA provide leadership in proposing a practical and flexible model for institutional organization that could result in improved efficiency and thoroughness in preoperative evaluation for use in all practice settings. Individual anesthesia groups clearly are no more up to the challenge of suggesting and implementing such a proposal than they were in developing a difficult airway algorithm. If hand-washing still remains an issue among some physicians over a century after the establishment of the germ theory of disease, then why should anyone think that the more complex matter of anesthetic pre-assessment should receive its just consideration at some local levels. This is a national problem and deserves a high-profile national emphasis. I have consistently found organization to be preferable and more productive than confusion, and it decidedly contributes to better perioperative control and predictability.

Ronald L. Hedderich, MD
Gray, TN

Lessons Learned from an Operating Room Emergency Evacuation Drill

Simon C. Hillier, MD; William L. McNiece, MD; Tammy Brooks, RN; Marnie Sieber, RN; Jacqueline Allison, MD; George Sheplock, MD; Leigh Latham, MD
Section of Pediatric Anesthesia and Operating Room Nursing Division, Riley Hospital for Children, 702 Barnhill Drive. Indianapolis, IN 46202

The emergency evacuation of an operating room may be required in the event of a fire or similar emergency. Although the vast majority of practicing anesthesiologists and nurse anesthetists will never participate in an operating room evacuation, it is important to be prepared for such an eventuality. The pediatric anesthesia group at our institution recently participated in a mock operating room evacuation drill. In this article we describe the planning and execution of this drill and some of the lessons that were learned as a result of the exercise.

Planning and Organization

The Institutional fire safety officers, the operating room fire safety officer, and nursing administration were responsible for the advance planning of the drill, which was designed to be consistent with our institutional health and safety policies. Riley Hospital for Children has 2 operating room suites. The main 13-bed operating room suite is located on the second floor of the main building in an area that is adjacent to the PACU, PICU, and immediately below the NICU. A second, 6-bed, operating room is located in the basement of the Riley Outpatient Center and is dedicated primarily to same-day surgery cases. The Riley Outpatient Center is located in a newer building that is connected to the main hospital by corridors, walkways, ramps, and steps. The emergency scenario involved a fire within the same fire zone as the main operating room, but on a different floor. The fire caused a loss of power to the main operating room and precluded evacuation to the adjacent PICU or PACU. The plan involved evacuation to the outpatient center operating rooms. The evacuation route was planned by the organizing committee prior to the drill and was approximately 300 yards in length and included 2 elevator rides. These elevators were outside the fire zone of the mock fire and were therefore thought to be safe for use. Five patient scenarios were created with volunteers or dolls representing patients undergoing surgery. The drill was performed during weekly morning conference time when the operating rooms were not occupied with elective cases. The organizers recruited a staff anesthesiologist to participate in each scenario. Each operating room had 4 nurses, 1 of whom played the role of the surgeon. Several anesthesia nurses, perfusionists, and respiratory therapists also participated. There were also several nurses acting as observers.

Conduct of the Drill

The 5 scenarios and their anesthesiologists` response are briefly described below. The charge nurse distributed battery powered headlights to each anesthesiologist shortly after the power was interrupted. In each case, the anesthetic was continued using an intravenous technique during transport. Four of the five simulated patients arrived at the intended destination in less than 15 minutes.

1. *A 13-year-old undergoing a craniotomy in pins.* The surgery was performed under a primarily intravenous anesthetic. At the time the power went out, the anesthesia machine and monitors were unplugged to model the power failure. There were no backup lights in the room; however, the anesthesia machine monitoring screen continued to have power from the anesthesia machine battery. This screen proved to be an unanticipated source of light. The operating room control nurse came to the room to direct the operating room team to move the patient to the outpatient OR suite. A transport monitor was sent for, which was set up as the patient's monitor. In preparation for moving the patient, the surgeon modeled stapling the scalp closed and a portable oxygen source was obtained. With that and a flashlight, the operating room table was unlocked and the patient was moved on the OR table toward a set of elevators that was unaffected by the power failure. After navigation through the halls, an attempt was made to move the OR table into the elevator. In that process, it became apparent that the small wheels of the OR table along with the weight of the patient and table presented a significant risk of getting stuck while entering or exiting the elevator. At that point the mock drill was stopped for that patient.
2. *A 15-year-old undergoing a posterior spinal fusion.* Because the patient was undergoing evoked potential monitoring, the anesthetic was primarily intravenous in nature; thus, it was relatively easy to prepare for transport. The wound was covered in a transparent adhesive sterile drape while illuminated by flashlight. The spine was unstable and it was thought that transport in the prone position on the operating room bed was the safest option. The patient was monitored with pulse oximetry during transport. Again, problems were encountered while moving the operating room bed in and out of elevators. An unanticipated issue was the difficulty encountered in maneuvering the heavy OR bed safely up and down the slopes connecting the 2 buildings.
3. *A 3-month-old undergoing a hernia repair.* The wound was covered with a sterile dressing and the patient was transferred to a transport isolette, making transport through the hospital relatively straightforward. Ventilation was maintained with a self-inflating resuscitation bag. A pulse oximeter was used for monitoring during transport.
4. *A 6-month-old undergoing a VSD repair.* Initially there was confusion about how to transport all of the supplies needed to maintain anesthesia, such as drugs, intravenous fluids and tubing, extra endotracheal tubes, and other equipment. Most items were simply placed at the head of the operating room table by the patient's head or in a large plastic bag found in the operating room. The biggest obstacle encountered involved the moving of the operating table in conjunction with the cardiopulmonary bypass machine. The transport was slow and was frequently interrupted in order to maintain appropriate CPB circuit length and tension. One unexpected challenge arose while transporting the cardiopulmonary bypass machine through the basement tunnels. The bypass machine had to be maneuvered through numerous, low-hanging maintenance pipes. This proved to be very time consuming and contributed to the 15-minute evacuation time.
5. *An 8-year-old undergoing a laparotomy.* When the lights went out a flashlight was used to aid the surgeon. It was decided that the surgeon was far enough along to close the wound quickly and then plan to come to finish later. The anesthetic was converted to a TIVA technique using ketamine and propofol. Simultaneously, supplies were prepared in zip lock bags, and an oxygen tank and self-inflating resuscitation bag were obtained for the move. A decision was made to use a cart to move the patient to another location as the OR table would be difficult to move.

Findings

1. The operating room lighting was designed to be backed up by the hospital back-up generator. As a result, there was no wall mounted emergency lighting designed to come on in the event of power failure coupled with a generator failure. We are evaluating the possible installation of such emergency lighting. Flashlights and/or headlights should be available at every anesthetizing location.
2. The idea of moving a patient on the operating room table seemed like a good one. It probably remains a good one if the patient is to be moved laterally, perhaps to the adjacent ICU. However, moving the OR table into and out of an elevator proved to be a significant problem. In addition, ramps can present significant obstacles to transporting OR beds.

See "Evacuation," Next Page

Evacuation Planning Encouraged

"Evacuation," From Preceding Page

3. We have sufficient portable monitors and portable oxygen sources to provide for close to half of the operating rooms. We would not have had sufficient monitors and oxygen sources had we needed to evacuate the entire operating room.
4. Moving an intraoperative patient on an unexpected basis presents major challenges. The decision to move the patient needs to consider the urgency of the situation and the risk-benefit ratio of staying where you are vs. moving. In a real situation, accurate information would be essential to good decision making regarding patient management. If our drill had only been a power failure, it could have been better to have spent more time preparing for the transport. However, we expect accurate information might be difficult to obtain in a real situation.
5. Our drill had the premise of a fire and power failure affecting adjoining units, but in fact those units were not involved in the drill. Had they also been involved, there would have been a major backup at the only set of functioning elevators.
6. This drill has increased our awareness of the issues associated with emergency situations. We advocate the regular participation of the anesthesia department in such drills. The drills should be designed to simulate several different scenarios and evacuation routes. Anesthesiologists and nurse anesthetists should participate in the planning and execution of emergency evacuation drills.
7. When moving an anesthetized patient there is a significant amount of ancillary equipment and supplies that are required. In our experience, a laptop bag or briefcase with a shoulder strap proved to be extremely useful.

We hope that our description of this experience will stimulate other anesthesiologists and nurse anesthetists to participate in mock emergency drills and become actively involved in their planning.

Corresponding author: Simon C. Hillier, MD, shillie@iupui.edu

Letter to the Editor

More Thoughts on Preventing Corneal Abrasion

To the Editor:

We also share concern regarding the potential for corneal injury in the perioperative period. We would like to add another possible mechanism of injury during minimally invasive surgery, after which the patient, who suffers less postoperative pain, may be more acutely aware of other discomforts. We have noticed that the edema of the dependent eye(s) may force the lid(s) slightly open, thus allowing dryness, irritation, and potential self-inflicted injury after emergence. We see this in robotic-assisted radical prostatectomy, in which the patient is in head-down position for hours, or laparoscopic radical nephrectomy, in which 1 eye is dependent for hours. The solution, for which we give credit to anesthesiologists at City of Hope Hospital in Los Angeles, is to lubricate the eyes, tape them both vertically and horizontally, and, finally, to place a Sun-Med I Guard Eye Protector (Sun-Med Division of Azimuth, Largo, FL) mask over the eyes. At the end of the case, tape is removed, eyes are rinsed, and mask is replaced over the eyes until patient is wide-awake in the recovery room. Patients are warned they will be arriving in the recovery room wearing a blue super-hero mask. A small pinhole can be made in the clear eye shield part of the mask to prevent fogging.

Debra E. Morrison, MD
Anne B. Wong, MD
University of California, Irvine
Orange, CA

Letter to the Editor

Aims Should Not Distract

To the Editor:

With the increasing use of computerized anesthesia records, I feel it is time for some standards. Specifically, I believe the computer screen and mouse should be within visual and hand reach while one is doing a chin lift. It does a disservice to a patient to instrument an airway for no reason other than to reach the computer. It also delays turnover when one must later record the drugs and times temporarily jotted down on scrubs, tongue blades, or whatever is available.

Glee Folsom, CRNA
Edmonds, WA

Letters to the Editor:

Lessons from "Can't Intubate/ Can't Ventilate" Report

To the Editor:

Dr. C. Troop's case summary of a "can't intubate/ can't ventilate" outcome in a morbidly obese patient reflects an event feared by all anesthesiologists.[1] Tracheal intubation, initially attempted with a standard technique, eventually proved ineffective during a complex situation compounded by difficult laryngoscopy. Two problems were present, as are possible in all patients requiring general anesthesia. Initially, the anesthesiologist was unable to reliably predict a difficult airway in order to alter management preemptively. Subsequently, when a difficult laryngoscopy was encountered, further attempts at standard intubation proved both ineffective and time-consuming, a recognized and recurring outcome acknowledged in the anesthesiology literature. The continuing acceptance of what is basically a flawed technique as the standard for routine intubation stems from the unquestioned acceptance of a 60-year-old procedure originally intended to secure the airway in MOST but NOT ALL patients. The response to the inevitable "difficult intubation" has led anesthesiologists to develop personal "tricks" that are added as supplements to textbook intubation. Each additional step, however, requires extra time to implement and does not guarantee success at the time when duration of hypoxia becomes critical to patient safety. The ideal solution is to routinely use a single technique that is safe and effective for the normal patient, and yet maximizes rapid tube placement with difficult laryngoscopy. At the very least, such an approach would, in the rare instance where intubation was impossible, considerably shorten the delay between recognizing failure and entering the difficult airway algorithm.

One system of routine intubation employing a MAC 4 laryngoscope blade and a standardized endotracheal tube-stylet combination has been executed successfully in thousands of patients.[2] This system is based on 2 fundamental principles governing use of a styletted endotracheal tube. First the operator must purposefully control the endotracheal tube and deliberately place the tip at or between the vocal cords, and second, from that position slide the endotracheal tube forward into the glottis while the stylet remains stationary.

Key steps incorporated into this system include

1. A correctly performed laryngoscopy tailored to the patient. This creates a laryngoscopic channel that allows access to the larynx and a path through which the endotracheal tube must pass without contacting any part of the channel.
2. An endotracheal tube that is shaped to match a portion of the laryngoscopic channel.
3. The appropriate direction of travel within the channel that permits intentional positioning of the endotracheal tube tip at the larynx.
4. A definable endpoint to confirm when the tracheal tube tip passes between the vocal cords during grade I-III 1/2 laryngoscopic views.

As learning and skill improve with daily practice and experience, most difficult intubations gradually become routine and act as training for the anesthesiologist to respond quickly and effectively in critical situations.

Russell Stasiuk, MD
Vancouver, British Columbia.

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Return to Spontaneous Ventilation Can Be Life-Saving

To the Editor:

I read with considerable concern the article titled, "Difficult Intubation in the Obese Patient," (*APSF Newletter*, Winter 2005-2006 Issue, Page 83). While it is true that positioning is extremely important in airway management in the obese patient, I feel that the real lesson in this case is being overlooked. In an obese patient for an ELECTIVE procedure, when difficulty with visualization/mask ventilation is encountered, the goal should be to return the patient to spontaneous ventilation with a clear airway as soon as possible, not insertion of an ETT! I suspect that in this case quite a few attempts at intubation were tried with various devices before the airway was irretrievably lost. With succinylcholine, return to spontaneous ventilation should occur fairly rapidly in most cases, and the procedure should have been canceled and the patient awakened. Better to come back another day with such a patient, perhaps for an awake intubation under appropriate sedation, than to lose him in trying to be heroic.

Marc A. Pressman, MD
Surgicenter of Baltimore
Owings Mills, MD

Overjet, Not Overbite is Correct Term

To the Editor:

I enjoyed reading the well written article by Craig Troop entitled "Difficult Intubation in the Obese Patient," which appeared in the Winter 2005-2006 *APSF Newletter*. In his article he describes 6 physical signs that can alert one to the possibility of a difficult airway. One of the signs he has listed is dental overbite, rather than dental overjet. I am writing to clarify the dental terminology used in his article.

Dental overbite describes the vertical relationship of occlusion (bite) and dental overjet describes the horizontal relationship of occlusion. A patient with a large dental overjet (Andy Gump deformity) is retrognathic and would very likely have a difficult airway. This description is consistent with such a patient having difficulty performing the upper lip bite test. A patient with reverse dental overjet is usually prognathic (e.g., Jay Leno) and would not likely have a difficult airway. A patient can have a deepbite or openbite (descriptions of dental overbite relationship) and may or may not have a difficult airway.

David W. Todd, DMD, MD
Lakewood, NY

Letters to the Editor:

Epidural Not the Only Option For Labor Pain

To the Editor:

I write to you not as an anesthesia professional, but as the wife of an anesthesia professional and one who has had 4 children. It has been of interest to me to follow the string of letters regarding Dr. Parker's comments from the Summer 2005 *Newsletter* because I have often wondered, "What does the anesthesiologist think about labor epidurals?" I was actually glad to hear Dr. Parker's comments. I was glad to hear that a medical professional can see the abuse of medication so rampant with epidural labors.

Perhaps I should better explain my position. I have had 4 children in the past 10 years (1996, 1999, 2001, 2004). My husband and I prepared to have low risk pregnancies and births with each. We utilized the 9 months of pregnancy as a time to prepare physically with exercise and excellent nutrition, emotionally with daily relaxation practices, and mentally with building confidence as we educated ourselves via books and classes. I understand that most pregnant couples do not utilize the 9 months of pregnancy in this manner, but rather spend that time decorating a nursery, buying a mini-van, and finding the perfect 5-in-1 stroller. We, however, placed our focus on labor preparation. Therefore, at the time of labor, we were prepared and managed "one of the most severe pains a woman will ever experience in her lifetime" (quoted from Drs. Camman, Hughes, and Birnbach from the Winter 2006 *Newsletter*) without any medications. The following lists our children's birth weights and lengths respectively: 11 lbs. 4 oz., 23; 9 lbs. 14 oz., 21; 9 lbs. 8 oz., 21 oz.; and 9 lbs., 12 oz., 20 1/2. All 4 of our children were born vaginally without Stadol, Nubain, Demerol, fentanyl, or an epidural. In my experience, viral meningitis was much more painful than all four labors combined!

So, as a voice of the minority, I share our experience with you to show that, while drugs and procedures have their place, an epidural is not the only way to manage labor. However, anesthesiologists are at the beck and call of couples who do not prepare as we did, and for that, I am sorry.

Tami Maloney, BBA, AAHCC
Decatur, AL

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User-Friendly Alarms Needed

To the Editor:

While we all agree in principle that audible alarms should be used, the problems incurred by excessive false-positives cause many practitioners to shut them off. Especially for short cases, such as endoscopy, the anesthesiologist must spend excessive time and effort addressing alarms activated by an oximeter that falls off a finger, a patient who breathes through his mouth instead of his nose, a blood pressure cuff blocking a pulse, and the like. Not a day goes by without my repeated disclaimer to procedurists, nurses, and even to awake patients, "Sorry, the patient is fine, it is just my alarms (falsely) acting up."

My attempts to discuss the practitioners' concerns to the equipment industry, as in the literature, have always yielded excuses and justifications for the status quo. It is up to our profession's leaders, as well as practitioners, to induce the industry to develop user-friendly monitors and alarms that will be a pleasure to use.

Howard Schranz, MD
Brooklyn, NY

Fatigue Still A Problem

To the Editor:

Bravo to Dr. Ellis for his remarks regarding fatigue and long work hours in the Fall 2004 issue of the newsletter. Now you even have to make sure that a resident is not too tired to drive. Are they doing this in other critical occupations? How much sleep does the President get before sending our troops into combat?

In my practice we are off the next day after taking call; many practices that I am familiar with function in this fashion.

It always bothered me that surgeons could start long elective cases late at night or work during the night, only to continue with their elective schedule the next day.

Unfortunately, many of the important changes to healthcare cannot occur because of lack of funding. When we do make a change, it is at the discretion of JCAHO, and it often lasts for the duration of the inspection.

Steven Ginsberg, MD
Bridgewater, NJ

Inside:

Be sure to visit the APSF Booth in the Exhibit Hall at McCormick Place at the 2006 ASA Meeting in Chicago, Illinois!

Anesthesia Patient Safety Foundation
Building One, Suite Two
8007 South Meridian Street
Indianapolis, IN 46217-2922

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