

ASCCA INTERCHANGE

AMERICAN SOCIETY OF CRITICAL CARE ANESTHESIOLOGISTS

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President's Message

On the Right Track: ASCCA in Good Hands

By Clifford S. Deutschman, M.D.
Philadelphia, Pennsylvania

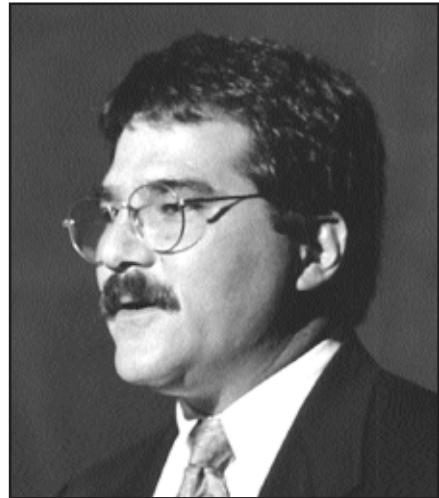
This is my last "President's Message." In October, Michael J. Breslow, M.D., takes over as ASCCA President, and I will move on to assume the position of Immediate Past President. Following Dr. Breslow will be Steven O. Heard, M.D., with Gerald A. Maccioni, M.D., in the wings. ASCCA is in good hands.

My tenure represents the first time that an ASCCA President has served a two-year term. That fact alone has made the job "interesting." The Board of Directors, however, chose to lengthen all Executive Committee terms in the hope that continuity would increase productivity. I think that the strategy has been successful, but only time will tell. We have accomplished a great deal in two years. In this final column, I would like to review some of what has occurred and what I believe remains to be addressed.

There have been two major themes in the last two years. The first has revolved around refocusing ASCCA's mission. Our hope was that we could better define what our members sought from the organization and then alter our structure to better meet expectations. What had become clear in recent years

are limited in what we can accomplish. Our members lead busy, productive lives. If ASCCA could not determine what was most important to its members and focus on these specific issues, it would be superfluous.

The process began at a hotel in Orlando in fall 2002. There, members were appointed to a task force to research our problems and formulate a blueprint for change. After a number of discussions with ASCCA members and anesthesiologist/intensivists who had declined to join or had left the organization, we met in Baltimore on a Saturday. At that meeting, Todd Dorman, M.D., Dr. Maccioni, Dr. Breslow and I began by refocusing our mission statement. In particular we sought to limit the scope of ASCCA activity to something that could be managed by a small volunteer organization. In addition we refined the committee structure and set guiding principles, goals and objectives for the organization and for each committee and subcommittee. To reiterate, ASCCA's mission is to *preserve and expand the pivotal role of critical care medicine, as practiced by intensivists in intensive care units, within the scope of practice of anesthesiology. This will*



Clifford S. Deutschman, M.D.

they improve the quality and cost-effectiveness of patient care.

2. Intensive care medicine is an essential subspecialty of anesthesiology practice because it enhances the overall quality of anesthesiology practice and care.
3. Anesthesiologists with special training and experience in intensive care medicine improve the quality of postoperative care by advancing our understanding of critical illness. They also have contributed to major improvements in intraoperative management and outcomes. Continued participation in critical care medicine is essential to the future of the specialty and to continued improvements in perioperative care.
4. The present numbers of anesthesia intensivists are insufficient to meet current and future needs of patients and practices,

What had become clear in recent years is that ASCCA had over-reached. We were trying to be all things to all people.

is that ASCCA had over-reached. We were trying to be all things to all people. As a small and entirely volunteer group (save for Executive Director Gary Hoermann and his assistants, who have been life-saving), we

be accomplished through education, advocacy and community. Our four guiding principles are:

1. Intensivists are an integral component of the modern health care system because

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Membership

Membership in ASCCA is open to all anesthesiologists and residents in approved anesthesiology programs. Membership applications may be obtained by writing to **ASCCA**, 520 N. Northwest Highway, Park Ridge, IL 60068-2573 or through the ASCCA Web site at <www.ascca.org/membership.html>.

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Editorial Policy

The opinions presented are those of the authors only, not of ASCCA. Drug dosages, accuracy and completeness of content are not guaranteed by ASCCA.

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Editorial

A Small Society With Big Goals

By Michael L. Ault, M.D.
Editor

In this issue of the *Interchange*, readers will find two timely topics of importance to critical care medicine. Additionally, ASCCA President Clifford S. Deutschman, M.D., presents exciting new information on the development of critical care medicine within the American Society of Anesthesiologists (ASA). As gleaned from the information contained in his article, critical care medicine may finally be getting its just reward for a



Michael L. Ault, M.D.

Like other endangered species, it was not until our population reached a “critical” level that anesthesiologists outside of our specialty became concerned about preserving this wonderful subspecialty.

tradition that has long been present as a subspecialty within the field of anesthesiology. Thus we are hopefully seeing an increase in preservation of our subspecialty. Like other endangered species, it was not until our population reached a “critical” level that anesthesiologists outside of our specialty became concerned about preserving this wonderful

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thus the number of trainees needs to be increased.

On the basis of this revised mission statement and these guiding principles, we derived a series of goals and objectives. We propose that ASCCA must:

1. Enhance the understanding of the value that intensivists bring to patient care;
2. Educate the anesthesiology community in particular and the health care community in general as to the benefit that anesthesia intensivists bring to clinical practice;
3. Increase the number of anesthesia intensivists;
4. Bring value to our members by providing educational opportunities and via advocacy; and
5. Ensure the viability of our organization.

In addition we decided to have the committees, each directed by a Board of Directors member, come up with their own strategies, plans and actions to meet the stated goals and objectives, which would be submitted to the Board of Directors for approval. The final step of this process has been the development of a streamlined form for committee reports and requests to the Board of Directors. In effect, we would like ASCCA to function in a more businesslike manner. We have recently circulated the first set of reporting forms to committee chairs. Dr. Breslow will have the opportunity to report to you on the process and strategies and plans and actions that result. It is my belief that we have been modestly successful in our attempts to modify the nature of ASCCA, but again, only time will tell.

The second theme has been to enhance the footprint of critical care medicine within the anesthesiology community and of anesthesiologist/intensivists within the critical care community. In this regard, we have been quite successful. The key to this success has resulted from five specific initiatives. Two were initiated by the American Society of Anesthesiologists (ASA), a third by the Residency Review Committee (RRC) for Anesthesiology and the last two represent a continuation of processes started a number of years ago.

As recounted in previous columns, ASA recently has become attuned to the impon-

tance of critical care medicine within the scope of anesthesiology practice. I initially became aware of this when James E. Cottrell, M.D., became ASA President in 2002. The real credit for beginning an important process, though, lies with ASA's current President, Roger W. Litwiller, M.D. I feel obligated to state that anesthesiologist/intensivists have no better friend or stronger supporter in any organization anywhere. Dr. Litwiller formed a task force to formulate a concrete plan as to how ASA could enhance the role that critical care medicine plays within our specialty. The task force met in Chicago, Illinois, and, during an intense day-long meeting, hammered out an action plan. These recommendations started by specifying that ASA alter its committee structure to separate critical care medicine and trauma medicine. Additional recommendations then focused on education, advocacy and investigation. These recommendations are detailed here.

Education

ASA should:

- Provide a resource for practices that provide critical care services or for those who want to expand their scope of practice.
- Provide practice management tools to support the integration of critical care medicine into anesthesiology practices.
- Define financial opportunities and risks.
- Develop business models to support critical care medicine within an anesthesiology practice, including determining when and how to negotiate with the hospital for medical direction, call coverage or other matters.
- Include critical care medicine topics in all educational programs.
- Ensure that ASA appointees to the American Board of Anesthesiology and the RRC understand and support critical care medicine as an integral part of anesthesiology practice.
- Maintain an active liaison with academic anesthesiology programs through the Director that represents academics on the ASA Board of Directors.
- Include a critical care component in all ASA-sanctioned educational programs and publications.
- Have the newly formed Committee on

Critical Care Medicine formally recommend a candidate group from which one of the three ASA representatives to the RRC will be chosen.

Advocacy

ASA should charge the ASA Washington Office and Administrative Council to:

- Establish formal liaison with other organizations representing critical care physicians to key government agencies and payers on issues of patient safety and physician reimbursement in critical care.
- Ensure that the ASA Washington Office staff is knowledgeable with respect to the political and economic variables that impact critical care practice and reimbursement.
- Develop a formal legislative/lobbying agenda in consultation with appropriate ASA committees.
- Ensure that the annual ASA Legislative Conference include topics pertinent to critical care medicine.

Further, the ASA President should consider having an intensivist as a member of all relevant ASA standing committees. This ensures broad input with regard to critical care billing, reimbursement, education and practice management. Intensivist representation on the committees on Economics, Practice Management and other committees is particularly imperative.

Investigation

ASA should charge either a task force or the new Committee on Critical Care Medicine with the design of studies examining:

- Barriers to critical care anesthesiology practice;
- Barriers to seeking education in critical care anesthesiology;
- Current models of delivery of critical care;
- Current economic models of critical care practice;
- Physician compensation for provision of critical care services;
- ASA should initiate a program to educate members on the value of critical care medicine to anesthesiology practice and on how to incorporate critical care medicine into individual and group practices.

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This plan was submitted to Dr. Litwiler. He asked that we present it first to the ASA Administrative Council and then to the ASA Board of Directors. These presentations were conducted by Dr. Maccioli, ASCCA Secretary and Chair of the ASA Committee on Critical Care Medicine. At the most recent meeting, the ASA Board of Directors approved a resolution that will be submitted to the House of Delegates in October. This resolution is reproduced below.

The resolution covers most of the task force's recommendations, but not all. It proposes alterations in the ASA committee structure and charges the Washington Office with aiding us in addressing legislative issues. It is to be hoped that the recommendations regarding education and investigation can be handled by the newly formed Committee on Critical Care Medicine. Indeed Assistant Director of Governmental Affairs Karen Bierstein, J.D., has already contacted Dr. Maccioli regarding the next Conference on Practice Management. At this point, we await approval from the House of Delegates. I urge each of you to contact your delegates and help line up support for this resolution.

A second issue initiated by ASA involves the development of a critical care educational track at the ASA Annual Meeting. While a number of individuals were responsible for proposing such a change, Neal H. Cohen, M.D., in particular rates special mention. Dr. Cohen headed the task force that designed and implemented this curriculum. The result is an exciting program that I hope will be well attended. It includes some of the best minds in our subspecialty and addresses topics in an up-to-date and innovative manner. There are refresher courses, pro-con debates, panels and scientific presentations. I urge all of you to take advantage of this remarkable educational opportunity.

Changes in the curriculum for anesthesiology residents have been proposed by the RRC, including a substantial increase in the amount of time residents will spend involved in learning critical care medicine. Specifically the new curriculum will require six months of critical care medicine spread over the four-year educational continuum. This new requirement is a real breakthrough. It is

FROM: Administrative Council
SUBJECT: Task Force on the Future of Critical Care Within Anesthesiology
DATE: August 2004

400-3

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FOR ACTION

1 A task force was appointed to consider the "Future of Critical Care Medicine Within
2 Anesthesiology." The Administrative Council considered the task force's well-researched
3 and valuable report at its June 4, 2004, meeting.

4 One of the proposed action items was "active support of the inclusion of CCM training
5 within the core anesthesiology residency programs." The Residency Review Committee for
6 Anesthesiology is actively working in this area and will likely increase critical care medicine
7 training from two to six months. Part of the impetus for this change was action by the 2001
8 and 2002 ASA House of Delegates encouraging a reconsideration of anesthesiology training.
9 A second proposed action item was to "include critical care topics in all educational
10 programs." The 2004 Annual Meeting will include a specific critical care track.

11
12 The Administrative Council considered the optimal way to implement the other valuable
13 suggestions of the report, as follows:

14
15 The Administrative Council recommends that the Committee on Bylaws prepare bylaw
16 amendments to eliminate the current Committee on Critical Care Medicine and Trauma
17 Medicine and that this amendment be reported to the 2004 House of Delegates. The
18 Council further recommends that the Committee on Bylaws prepare bylaw amendments
19 to establish a Committee on Critical Care Medicine and that these amendments be
20 reported to the 2004 House of Delegates. It is anticipated that the immediate agenda of
21 this new committee will consist of the initiatives suggested by the current task force.
22 Also, the current task force will advise the Committee on Bylaws concerning the
23 appropriate composition and duties of this newly created committee.

24
25 In addition, the Administrative Council recommends that an ad hoc committee be
26 appointed to consider the role of anesthesiology in trauma and emergency medicine,
27 particularly as it relates to terrorism, mass casualties and biological and nuclear weapons.
28 This ad hoc committee will report to the March 2005 Board of Directors with the
29 expectation that the Committee on Bylaws would prepare appropriate language to create
30 a standing committee dealing with these areas for the 2005 House of Delegates.

31
32 And finally, the Administrative Council recommends that the Washington Office work
33 with representatives of the American Society of Critical Care Anesthesiologists to
34 provide assistance in their continuing joint efforts with other critical care organizations to
35 deal with critical care legislative and regulatory issues.

ROGER W. LITWILLER, M.D., President

TREASURER'S NOTE: If approved, it is not possible at this time to estimate the fiscal impact.

A resolution on the future of critical care anesthesiology will be submitted to the House of Delegates at the 2004 American Society of Anesthesiologists Annual Meeting in Las Vegas, Nevada, this October.

clear that the RRC recognizes that learning critical care is important not only for those who will become practicing intensivists but for all future anesthesiologists. As we all believe, learning critical care medicine makes you a better doctor, regardless of your practice venue. There are, of course, significant barriers to implementation. Among these are financing to allow tighter control of the PGY-1 year. These logistics need to be worked

out, and those of you in academic practice may be called upon to assist. Again, your input is vitally important.

We have continued input into the issues surrounding reimbursement for provision of critical care services. This input is a result of the leadership provided by our representative to the Critical Care Working Group, Todd Dorman, M.D., who increasingly is recognized as the "go-to guy" in this group and,

There is a clear need for intensivists both in academia and especially in the private sector. ASCCA, with ASA's help, is poised to aid those interested in the private practice of critical care medicine.

indeed, within the entire critical care community. He has had substantial influence on the deliberations of officials at the Centers for Medicare & Medicaid Services (CMS) as they work to re-evaluate coding and definitions to allow for fair reimbursement for critical care services. In response to the recommendations of the task force, the ASCCA leadership has been contacted by the ASA Washington Office and Director of Governmental and Legal Affairs Michael Scott, J.D. We have referred them to Dr. Dorman. It is to be hoped that interactions between Dr. Dorman, the ASA Washington Office and ASCCA will increase the success of Dr. Dorman's remarkable efforts. The ultimate goal is that critical care medicine be reimbursed in an appropriate manner and that receiving payment for services provided becomes easier and more fair.

Finally, we believe that it is essential that ASCCA develop and maintain links with two essential groups of practitioners devoted to the practice and advancement of critical care medicine. The first is the Society of Critical Care Medicine (SCCM); the second is a linked body, the American College of Critical Care Medicine (ACCCM). SCCM is the group that best represents those devoted to the growth of critical care medicine as a multispecialty discipline. Involvement allows us to interact closely with internists, surgeons, pediatricians, neurologists, nurses, respiratory therapists, nutritionists and all the other specialists who are essential to safe and effective critical care practice. ACCCM has, among its charges, the development of guidelines to promote patient safety in the intensive care unit. I am a member of the SCCM Council, and Dr. Maccioli serves as a Regent of ACCCM. In addition two former ASCCA presidents have prominent roles in these organizations. Charles G. Durbin, Jr., M.D., is the current SCCM Treasurer and will soon become SCCM President. Steven Allen, M.D., also is an ACCCM Regent. Dr. Dorman

chairs the SCCM Committee on Advocacy and, as mentioned, has become quite well-known to members of the governmental health care establishment.

Also important is the development and maintenance of close ties with the international critical care medicine community. In this regard, we are fortunate to have Heidi B. Kummer, M.D., Ph.D., as Chair of our Committee on Liaison and as a member of the ASCCA Board of Directors. Dr. Kummer has spent years nurturing relationships with anesthesiologist/intensivists around the world and is our assurance that we have soul mates in other countries. Of course she could always use some assistance, and I encourage any of you with contacts or an interest to get in touch with Dr. Kummer.

So what is next? There are many issues that need to be addressed. I will mention only a few. Frankly, one of my disappointments has been my inability to deal with several problems during my tenure as ASCCA President. The most important are those of membership and participation. At one time, ASCCA had nearly 1,000 members. Today we have less than half that number. I believe that the foundation to reverse that trend is in place. The emphasis on critical care, as demonstrated by the actions of the medical establishment, third-party payers, CMS and the leaders of the anesthesiology community, indicates that our subspecialty is about to "boom." There is a clear need for intensivists both in academia and especially in the private sector. ASCCA, with ASA's help, is poised to aid those interested in the private practice of critical care medicine.

The renewed educational emphasis on critical care medicine will soon pay dividends. Indeed it may be doing so already. More individuals are choosing to pursue fellowship training. In my own program at the University of Pennsylvania, nearly two-thirds of CA-3s are enrolling in a fellowship of some kind next year.

High-quality applicants to the critical care medicine fellowship that I direct have increased exponentially. Most gratifying of all are the residents in our own program who have applied.

Each individual choosing to train as an intensivist will, I hope, become a contributing member of ASCCA. In addition I think that ASCCA's mission, which is newly focused on specific educational, political and investigative initiatives, will attract new members. The framework is in place, and many of the tools have been made available. I am confident that Dr. Breslow, Dr. Heard and Dr. Maccioli will put them to good use.

Membership, however, is not the only issue. Equally important is participation. We are a volunteer organization, and we depend on our members contributing time, effort and energy. More of you need to become involved. In appointing committees, we have called on a number of previously uninvolved individuals. This is a start, but only just that. Our new infrastructure makes it possible to accomplish much, but, ultimately, the effort of individuals is needed.

In closing, if we have accomplished anything in the last two years, it is because of the efforts of a number of extraordinary people. Three deserve to be singled out: Dr. Cohen, Dr. Dorman and Dr. Maccioli. I have been lucky to work with them, and I am even luckier to have them as friends. ASCCA and the fields of anesthesiology and critical care medicine are lucky to have them as leaders. ♦

ASCCA ANNUAL MEETING



OCTOBER 22, 2004
LAS VEGAS, NEVADA

7 a.m. *Registration and Continental Breakfast*

7:55 a.m. *Welcome*
William E. Hurford, M.D.
Michael F. O'Connor, M.D.

Scientific Session

8 a.m. *Oral Abstracts*
Moderator:
Michael H. Wall, M.D.
Scientific Paper Chair
8 a.m. Abstract 1
8:15 a.m. Abstract 2
8:30 a.m. Abstract 3
8:45 a.m. Abstract 4

9 a.m. *Young Investigator Award*
Presented by:
Michael H. Wall, M.D.
Scientific Paper Chair

9:30 a.m. *Lifetime Achievement Award Presentation and Lecture*
Presenter: Neal H. Cohen, M.D.

10:20 a.m. *Coffee Break and Poster Viewing*

Leadership Session

10:40 a.m. *Introduction of Research Award*
Presenter: Robert N. Sladen, M.B.

10:50 a.m. *Regional Effects of Alveolar Recruiting Strategies in Acute Lung Injury*
Guido Musch, M.D.

11:20 a.m. *Joint ASCCA/SCCM Anesthesia Section "Burchardi Award"*
Presenter: Heidi B. Kummer, M.D., Ph.D.
Recipient: Douglas B. Coursin, M.D.

11:30 a.m. *Address by ASA President-Elect*
Eugene P. Sinclair, M.D.

12 noon *Luncheon (sponsored by Hospira)
Epidemiology and Pathophysiology of Delirium*
Gerald A. Maccioli, M.D.

Prevention and Treatment of Delirium
Robert N. Sladen, M.B.

State of the Art

1 p.m.	<i>Tight Glycemic Control</i> Aristides P. Koutrouvelis, M.D.
1:15 p.m.	<i>Question and Answer</i>
1:20 p.m.	<i>The PA Catheter: Evidence Based?</i> Avery Tung, M.D.
1:35 p.m.	<i>Question and Answer</i>
1:40 p.m.	<i>Replacement Doses of Steroids in Sepsis: Who? When?</i> Joel B. Zivot, M.D.
1:55 p.m.	<i>Question and Answer</i>
2 p.m.	<i>Intentional Hypothermia Following In-Hospital CPR: What Should We Be Doing?</i> Brenda G. Fahy, M.D.
2:15 p.m.	<i>Question and Answer</i>
2:20 p.m.	<i>Protein C - Who Should Get It? Who Shouldn't?</i> Michael S. Avidan, M.B.,B.Ch.
2:35 p.m.	<i>Question and Answer</i>
2:40 p.m.	<i>Beta Blockers – How Do They Really Work?</i> Andrew J. Patterson, M.D.
2:55 p.m.	<i>Question and Answer</i>
3 p.m.	<i>Coffee Break and Poster Viewing</i>

Future Shocks Alternatively

3:20 p.m.	<i>Private Practice Critical Care by Anesthesiologists</i> Gerald A. Maccioli, M.D.
3:50 p.m.	<i>Ventricular Assist Devices</i> Andrew D. Rosenberg, M.D.
4:20 p.m.	<i>Infusion Devices and Safety</i> Mark E. Nunnally, M.D.
4:50 p.m.	<i>Reacting to Accidents in the ICU: Trying to Learn While Trying to Recover</i> Richard I. Cook, M.D.

5:20 p.m. *ASCCA Business Meeting*

7 p.m. *Reception*



Critical Care Pathways for the Bariatric Patient With Obstructive Sleep Apnea

By Antonio T. Hernandez Conte, M.D.
President and C.E.O.
Florida Atlantic Anesthesia, Inc.
Fort Lauderdale, Florida
Medical Director, Surgical Services
Holy Cross Hospital
Fort Lauderdale, Florida

Surgical treatment of morbid obesity and super-morbid obesity has developed into a vital and exciting new surgical subspecialty. Bariatric surgery has allowed this once-ignored population of persons an opportunity to receive medical treatment that is, to say the least, life-saving. During the past five years, bariatric surgery has become one of the more commonly performed procedures at medical centers throughout the United States. As discussed in a previous article in this newsletter, anesthesiologists and critical care physicians will very likely find themselves managing the care of bariatric patients in increasing numbers during the next decade.¹

Despite advances in surgical options and techniques, however, co-morbidities associated with the bariatric patient present unique challenges. With the proliferation of bariatric surgical cases being performed, several clinical trends have emerged in this patient population. One of the most ominous and disturbing of these trends is the high incidence of respiratory complications associated with patients undergoing bariatric surgery. A subset of the bariatric patient population possess obstructive sleep apnea (OSA), and these patients are at a significantly higher risk of airway and respiratory compromise in the perioperative period.² This subset of patients demands an additional level of care beyond that required by the typical morbidly obese patient undergoing bariatric surgery, and we will explore critical care pathways that may assist in optimizing the care of this patient population.

Obstructive Sleep Apnea

Obstructive sleep apnea is a prevalent medical disorder, and it is estimated that 4 percent of all men and 2 percent of all women possess this syndrome. Prevalence rates of

OSA and snoring increase with age. Approximately 80 percent to 90 percent of persons with OSA are undiagnosed.³ Obstructive sleep apnea is defined as cessation of airflow for greater than 10 seconds, despite continuing ventilatory effort, five or more times per hour of sleep and is usually associated with a decrease in arterial oxygen saturation (SaO_2) of more than 4 percent.⁴ The presence of obesity (defined as a body mass index $> 29 \text{ kg/m}^2$) is another independent risk factor for OSA. It is believed, however, that the mechanism for OSA in nonobese patients is attributed predominantly to craniofacial and orofacial abnormalities.

A presumptive diagnosis of OSA can be made in patients who manifest the common signs and symptoms of airway obstruction, namely, snoring and/or apnea during sleep,

Preoperative Evaluation

During the medical, surgical and anesthesia preoperative evaluations, the clinician should focus on issues that serve to establish a history of OSA. One of the primary goals during the preoperative evaluation is to improve the identification and diagnosis of OSA in morbidly obese patients undergoing bariatric surgery so that an appropriate plan of perioperative management may be initiated. In addition anesthesiologists should confirm any previous difficulties with intubation or anesthesia-related airway complications.

Some institutions have developed an OSA assessment tool in order to assist them in identifying patients who would benefit from polysomnography studies. These studies are useful in making a definitive diagnosis of OSA and allow for appropriate supportive meas-

A definitive diagnosis of OSA must be made by some form of sleep study; however, traditional sleep studies are complex and difficult to administer for a variety of reasons.

occasional snoring and daytime somnolence or fatigue. A definitive diagnosis of OSA must be made by some form of sleep study; however, traditional sleep studies are complex and difficult to administer for a variety of reasons. Some clinicians have informally noted that the Epworth sleep scale does not correlate well with the presence of OSA.⁵

Clinical Implications

Although the majority of morbidly obese and super-morbidly obese patients may not have confirmed diagnoses of OSA, bariatric patients who display classical signs and symptoms of OSA should be treated in a similar way as those with a definitive diagnosis.

Recent retrospective analyses have demonstrated that the administration of general anesthetics, opioid analgesia and sedative/hypnotics in the patient with OSA increase the number of apneic events, hypoxic events and incidence of respiratory arrests in the perioperative period.^{6,7,8}

ures to begin prior to the date of surgery. Some medical centers have facilitated processes that allow for patients with possible OSA to undergo outpatient polysomnography studies at least two weeks prior to the scheduled date of surgery. Studies demonstrate that patients are more compliant with continuous positive airway pressure (CPAP) and bilevel positive airway pressure (BiPAP) treatment when the patient has had time to become accustomed to the device prior to the immediate postsurgical period.⁹

Intraoperative Management

As previously discussed, anesthesiologists should exercise judicious methods in developing anesthetic plans for the morbidly obese patient. Anesthesiologists should confer with the primary surgeon and associated medical consultants in developing a reasonable plan to minimize adverse airway-related events. Perioperative management should reflect an attempt to reduce the number of unplanned

transfers to a critical care unit due to adverse respiratory-related events in the first 24 to 48 hours after surgery.

A recent report by the Anesthesia Advisory Panel highlighted the occurrence of unexplained respiratory arrests in hospitalized patients with OSA who received parenteral opioids; therefore, anesthesiologists should use extreme caution when administering opioids.⁸ Dosages of opioids should be conservatively administered and should be based upon ideal body weight and/or lean body weight standards. In addition the anesthesiologist must remain vigilant of any co-existing morbidities that may negatively impact the response to anesthetic agents. The pharmacodynamics and pharmacokinetics of anesthetic agents are highly unpredictable in the morbidly obese patient population.

There are a number of measures that are useful in minimizing the occurrence of airway-related complications. For instance, patients should be extubated only when they are fully awake and alert. In the event that a bariatric patient is slow to awaken in the operating room, anesthesiologists should consider transporting the patients while intubated to the postanesthesia care unit (PACU) to allow for full awakening and reversal of agents. Patients also may benefit from being extubated in the upright position in order to minimize the effects of obesity on respiratory capacity.

Bariatric patients with documented or unanticipated difficult ventilation and/or intubation perioperatively should be suspected of possessing OSA and should be considered for direct admission to a critical care unit. It is important to recognize that morbidly obese patients are at significantly greater risk than nonobese patients for untoward airway events under urgent and emergent conditions outside of the operating room.⁵ This finding is especially pertinent as some medical personnel in critical care units or general patient care wards may not be accustomed to managing this patient population and are not adept at quickly securing the airway of a bariatric patient.

Postanesthesia Care Unit (PACU)

All morbidly obese and super-morbidly obese patients should be carefully monitored in the PACU, and separate PACU discharge cri-

teria and clinical pathways for bariatric patients may be necessary in order to optimally manage this patient population. Examples of these may include:

- Patients with history of utilizing CPAP and/or BiPAP devices should be placed on these devices immediately upon arrival to PACU.
- Patients demonstrating periods of oxygen desaturation or apnea in the PACU with need for physical arousal for improvement in oxygen saturation should be re-evaluated by an anesthesiologist prior to discharge from the PACU with possible transfer to a critical care unit.
- Patients receiving reversal agents such as naloxone or flumazenil in the PACU may necessitate admission to the critical care unit.
- Consider transfer to critical care setting for patients who have been given large quantities of opioids intraoperatively and in the PACU.
- Carefully consider the use of patient-controlled analgesia devices in patients with OSA with possible avoidance of basal infusion of opioids.
- Avoid additional sedatives or hypnotic agents in patients with OSA during the postoperative period.

Patient Care on Bariatric Nursing Units

Since bariatric patients, especially those manifesting OSA, are at high risk for respiratory compromise in the postoperative period, it is important to establish monitoring protocols to allow for early detection with appropriate intervention for adverse airway and respiratory-related events. It may be prudent to consider continuous pulse oximetry, end-tidal carbon dioxide monitoring and telemetry during the first 48 hours after surgery. Nursing personnel should become familiar with the use of clinical pathways employing reversal agents and laboratory blood gas analysis if patients are found to display respiratory depression. Finally it is imperative that compliance with existing basic vital sign monitoring be reinforced.

Conclusion

The medical and anesthetic management of the bariatric patient with OSA is a challeng-

ing endeavor and demands that multiple segments of the surgical facility be well prepared and equipped to manage any surgical- and/or anesthetic-related adverse event. The development and utilization of clinical care pathways mandating collaboration between the departments of nursing, anesthesiology, surgery and critical care are essential in optimizing the care of this high-risk population.

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Minimally Invasive Hemodynamic Monitoring: A New Approach to the Treatment of Patients With Subarachnoid Hemorrhage and Vasospasm

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Aneurysmal subarachnoid hemorrhage (SAH) carries one of the most severe clinical presentations in medicine today. Its incidence is estimated at 6 to 11 per 100,000 persons per annum (18,000 cases a year in North America).^{1,2} It has a very high mortality rate approaching 20 percent to 30 percent in the first six months.^{2,3} Approximately 20 percent of those deaths occur within the first day from direct effects of the initial hemorrhage.³ The complication accounting for the highest proportion (23 percent) of deaths following subarachnoid hemorrhage is vasospasm, a condition in which prolonged constriction of the cerebral arteries causes delayed neurological deficits.³ Prolonged neurological deficits due to vasospasm occur in 7 percent of patients after SAH, and death from vasospasm occurs in another 7 percent of SAH patients.⁴ The pathophysiology of vasospasm remains unknown but is related to free blood in the subarachnoid space coming into contact with the cerebral arteries. Prolonged smooth muscle contraction occurs with hypertrophy, hyperplasia and fibrosis of the vessel wall.⁵ Current experimental evidence has implicated the byproducts of hemolysis (oxygen, hemoglobin, oxygen free radicals) in the development of vasospasm.^{6,7}

Current therapeutic strategies combine early surgery (if reasonable) with the calcium-channel blocker nimodipine. Hyperperfusion therapy, classically referred to as "triple-H" (hypervolemia, hemodilution and hypertension), is often initiated if vasospasm is diagnosed. These combined strategies have reduced the mortality rate of SAH by approximately 10 percent to 15 percent since the early 1980s.⁴ The benefit of "triple-H" in preventing delayed ischemic neurologic deficits from vasospasm, however, has remained controversial. There are no randomized, prospective, controlled clinical trials demonstrating that

this therapy improves short-term or long-term neurologic outcome or survival following SAH. There also are potential life-threatening medical complications that can result from this therapy such as congestive heart failure and myocardial infarction.

In spite of the controversy, hyperperfusion therapy continues to be widely used in intensive care units because of the clear theoretical benefit of optimizing cerebral blood flow through narrowed arteries via increased cerebral perfusion pressure, decreased viscosity or increased cardiac output. It has been shown that optimizing cardiac output can elevate cerebral blood flow in the setting of vasospasm without changes in mean arterial pressure.⁸ Because manipulation of cardiac output is thought to be much safer than simply artificially elevating blood pressure, many institutions place pulmonary artery (PA) catheters when initiating hyperperfusion therapy in order to monitor the administration of fluid and inotropes.⁹

The placement of PA catheters also has historically been controversial, and some observational studies have suggested an association with increased mortality.¹⁰⁻¹² Recently a large, randomized, controlled trial did not show increased mortality when PA catheters were used but could not find any clinical advantage to therapy guided by a pulmonary artery catheter as compared with standard care in the intensive care unit (ICU).¹³

Because of these concerns, we have begun using noninvasive cardiac output monitoring in our neurosurgical intensive care unit as part of a standardized protocol approach to the treatment of patients with subarachnoid hemorrhage who develop vasospasm (see Figure 1 on next page). Within this protocol, and once clinical evidence of cerebral artery vasospasm has been determined, either via focal neurological changes on examination or elevated transcranial Doppler flow velocities, hemodynamic monitoring is initiated with PulseCo/lithium indicator dilution cardiac output (LiDCO) or pulmonary artery catheterization (PAC) at the discretion of the clinical intensivist. Initially filling pressures are augmented using central venous pressure (CVP) or pulmonary capillary wedge pressure (PCWP) measurements to guide the administration of intravenous fluids. If no neurologic



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improvement is seen once filling pressures are optimized, the administration of inotropes is begun and titrated to augment cardiac output as measured by PulseCo/LiDCO or thermodilution via PA catheter.

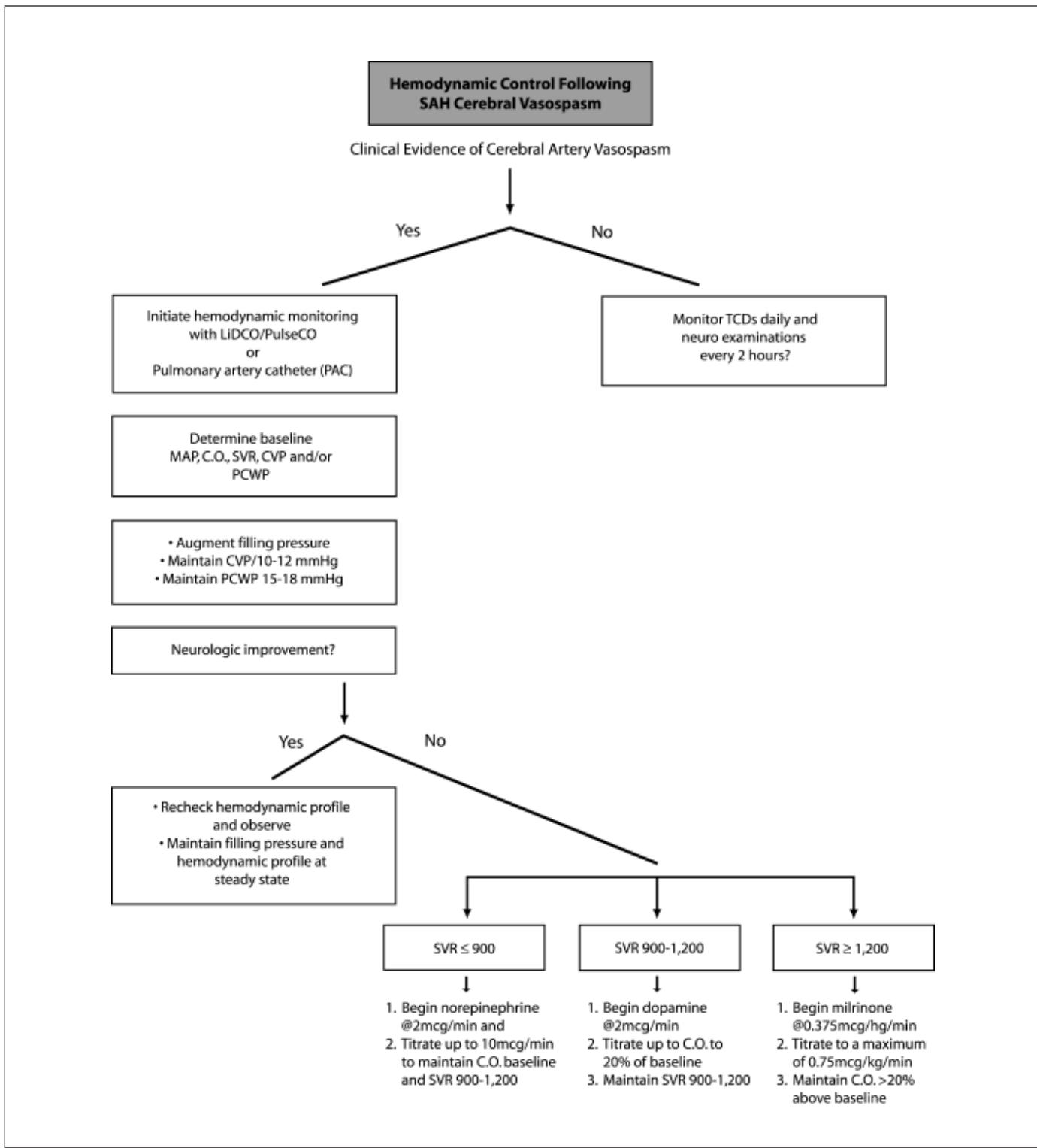
Discussion

Lithium indicator dilution cardiac output (LiDCO) measurement has become available subsequent to the miniaturization of ion-selective electrodes. This method measures cardiac output by indicator dilution. Specifically a known dose (0.3 mmol bolus) of lithium chloride is administered via a central or peripheral intravenous catheter, and a lithium-sensitive electrode measures a lithium dilution curve sampled from a standard peripheral arterial catheter.¹⁴ This method has been shown to agree well with standard thermodilution via pulmonary artery catheter^{15,16} and with electromagnetic flowmetry.¹⁵ Cardiac output measurements are comparable whether lithium is injected via peripheral or central veins.¹⁷

Pulse-contour arterial pressure waveform analysis also has been developed as a means to continuously monitor cardiac output. This method analyzes the systolic portion under the arterial pressure waveform to determine stroke volume¹⁸ and thus provides beat-to-beat measurement of cardiac output. Cardiac output measurement by arterial pulse-contour analysis has similarly been shown to be reli-

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Figure 1: Protocol for treatment of patients with cerebral vasospasm following subarachnoid hemorrhage



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able when compared to standard transthoracic thermodilution methods, even in patients with profound changes in cardiac output during periods of hemodynamic instability.^{19,20} All commercially available systems (PiCCO, Pulsion Medical, Munich, Germany; and PulseCo/LiDCO, LiDCO, Ltd., London, United Kingdom) require frequent calibration using an indicator dilution technique (generally every 12 hours). The PiCCO system is limited in that it recommends arterial catheter placement in the femoral or axillary sites.²¹ Potential errors of the PulseCo/LiDCO system can be minimized by proper calibration and restriction of its use to good arterial waveforms. The PulseCo is not recommended for patients with aortic valve regurgitation, intra-aortic balloon pumps, peripheral arterial disease or with highly damped arterial waveforms.²¹

It should be noted that although PulseCo can provide the intensivist with beat-to-beat cardiac output, stroke volume, systemic vascular resistance and systolic blood pressure variation measurements, it cannot provide some information that is available via a PA catheter. Systemic venous oxyhemoglobin saturation (SvO_2), pulmonary artery pressures and pulmonary capillary wedge pressures are unavailable via minimally invasive monitors. Trends involving these measurements may be important in caring for patients with other comorbidities such as congestive heart failure or multiple organ system failure.

Conclusion

Vasospasm is a highly lethal and debilitating complication following subarachnoid hemorrhage. Current management techniques have improved mortality related to vasospasm and include the use of PA catheters to monitor cardiac output during "hyperperfusion therapy." PA catheterization has historically been highly controversial and possibly increases patient morbidity through complications such as pulmonary embolus, arrhythmias, valvular damage, endocarditis or other infections. At our institution, we have instituted the use of minimally invasive hemodynamic monitoring such as PulseCo/LiDCO in a standardized approach to the treatment of vasospasm as an alternative to pulmonary artery catheterization.

We believe that in appropriate patients, these monitors can provide us with the same important data while minimizing complications related to pulmonary artery catheter placement. In patients who have conditions that limit the accuracy of PulseCo/LiDCO, or in patients with significant comorbidities where knowledge of filling pressures or SvO_2 would be valuable, PA catheterization should still be considered by the clinical intensivist on an individualized-patient basis.

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A Small Society With Big Goals

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subspecialty. We certainly owe a debt of gratitude to Dr. Deutschman for assuming the helm of a sinking ship. He has refocused our Society and did an excellent job of enlisting the support of current ASA President Roger W. Littwiller, M.D., who has been a strong advocate for our subspecialty. We remain confident that

Michael J. Breslow, M.D., ASCCA President-Elect, will continue to guide our Society through this difficult period.

As the ASA Annual Meeting approaches, the utilization of subspecialty tracks throughout the meeting will help those members with an interest in critical care to maximize their educational time investment. Additionally the tracks will demonstrate to members that critical care

medicine remains an integral component to the practice of anesthesiology. We look forward to seeing you at the ASA Annual Meeting on October 23-27 in Las Vegas, Nevada, and encourage members to spread the word for our small subspecialty Society. ♦