



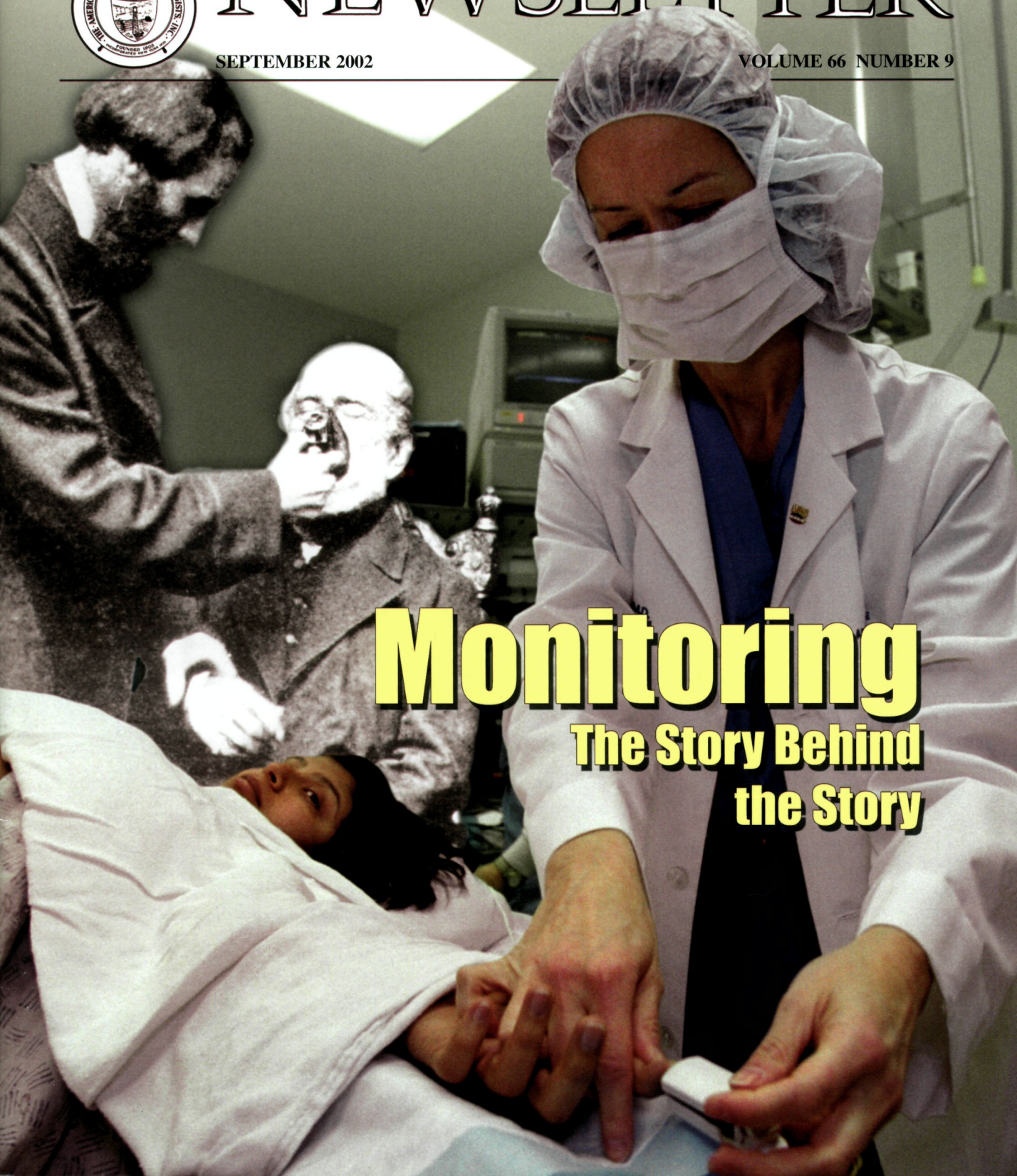
AMERICAN SOCIETY OF ANESTHESIOLOGISTS



NEWSLETTER

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Monitoring The Story Behind the Story



Since the time of J.T. Clover, M.D., one of the first to advocate for monitoring of each patient's pulse in the mid-1800s, advancements in monitoring have contributed to anesthesiology and medicine. This issue keeps a finger on the pulse of the past and future of monitoring.

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SUBSTANCE ABUSE HOTLINE

Contact the ASA Executive Office at (847) 825-5586 to obtain the addresses and telephone numbers for state medical society programs and services that assist impaired physicians.

Using the ASA Physical Status Classification May Be Risky Business

It is part of our daily practice to estimate the severity of surgical patients' medical conditions prior to anesthetizing them. For that purpose, the ASA Physical Status (PS) Classification has been used since its inception in 1941.¹ However, the purpose of this simple taxonomic guide for assessing co-existing disease has been obfuscated, exalted, distorted and misrepresented, largely by those outside of our specialty, to fill the need for an operative risk barometer. While anesthesiologists blithely use this scale to indicate the patient's overall physical health preoperatively, it is regarded by hospitals, law firms, accrediting boards and other health care groups as a scale to predict risk and thus decide if a patient should have — or should have had — an operation.

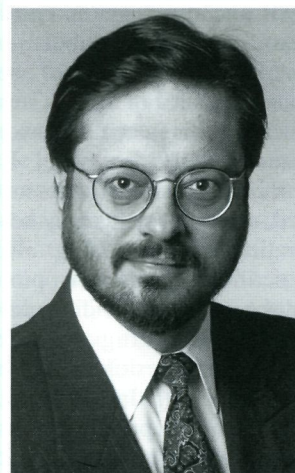
You may be mildly surprised that ASA headquarters is perennially inundated with inquiries from around the world asking for clarification regarding the link between "physical status" and "operative risk." In fact the preoperative medical condition/anesthetic technique/surgical procedure triad has never been studied extensively by ASA or anesthesiology researchers for all classifications and for all types of surgeries. It has been applied to retrospective analysis of thousands of cases, but the data are often skewed in favor of the lower classifications in large studies or higher classifications with specific types of surgery. Moreover, the assignment of classification by anesthesiologists is somewhat subjective and further biased by the foreknowledge of the proposed surgery.² Finally, a retrospective review really implies "potential" risk predictors, not "real" risk predictors as are elucidated from a prospective study.

In 1940-41, ASA asked a committee of three physicians (Meyer Saklad, M.D., Emery Rovenstine, M.D., and Ivan Taylor, M.D.); "... to study, examine, experiment and devise a system for the **collection and tabulation of statistical data in anesthesia** ... that would be applicable under any circumstances" (emphasis mine).¹ While their mission was to determine predictors for operative risk, they quickly dismissed this task as being impossible to devise. They state:

"In attempting to standardize and define what has heretofore been considered 'Operative Risk,' it was found that the term ... could not be used. It was felt that for the **purposes of the anesthesia record** and for any future evaluation of anesthetic agents or surgical procedures, it would be best to classify and grade the patient in relation to his physical status only." (emphasis mine)

So, the ASA PS classification was always meant to globally assess the degree of "sickness" or "physical state" **prior** to selecting the anesthetic or prior to performing surgery. One has no business applying it as a measure of operative risk. However, one can estimate higher or lower medical risk when factoring anesthetic technique and the extent of surgical trauma.

In 1978, William D. Owens, M.D., and colleagues tested the consistency of PS assessment by sending a questionnaire to 255 anesthesiologists that presented 10 hypothetical patients.³ Of the 10 hypothetical scenarios, six



Mark J. Lema, M.D., Ph.D.
Editor

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Vigilance, Participation, Professionalism and Family

Peter L. Hendricks, M.D., Assistant Secretary

As I sit and think of the continuous stream of trials and tribulations that face each of us in the practice of anesthesiology, I am reminded of an old Texas saying, "Cheer up, things could be worse." I did, and sure enough, they were! It seems that just when one problem looks as though it is solved, another rears its ugly head.

Frustrating and depressing are hardly able to describe the stress of our profession. However, the pride in providing care to our patients and expanding the scientific boundaries of anesthesiology makes it all worthwhile for most. In the future, if we are to maximize the pride and lessen the stress, it will require a lifestyle for each of us that will take more of our time, treasure and talent than many may be willing to give. It is not a one-day deal! It is an everyday commitment for the rest of our careers. If we are not willing to live this lifestyle of *Vigilance, Participation, Professionalism and Family*, there are "anesthesia providers" out there who claim they are every bit as capable and well-trained as we are. And they want our jobs.

Vigilance is being continuously aware of the big picture around us — not just in the operating rooms, but the hospital as a whole (substitute outpatient facility as appropriate). If we are to survive, we must be aware of and participate in hospital policies and politics. If the hospital is planning to open up four new operating rooms, we need to know in advance so we can have appropriate dialogue in order to form a plan of action. Being surprised after decisions are made only leads to disaster. A response such as, "There is no way we are opening four more rooms" just brings about heated discussions in which battlelines are drawn and hasty, irrational decisions often are made (such as designating an outside group to come into the hospital and take over anesthesia). Furthermore, we are seeing an increasing number of instances where a group of nurse anesthetists have contracted with hospitals to provide anesthesia services by hiring anesthesiologists to "supervise." One of the problems we face in today's medicine is an increasing number of CEOs and COOs who are under such pressure to compete for business that the bottom line becomes the only consideration. The result is that "patient care" too often takes a back seat. Also compounding the problem is the fact that the ranks of administrators are get-



Peter L. Hendricks, M.D.

ting spread so thin that your odds of having one who will deal realistically and fairly with your problems are becoming remote.

There are also a growing number of administrators who seem to be living in a world of their own with no grip on reality. Case in point: a medium- to large-sized hospital that for years has been covered adequately by an anesthesia care team group gets a new administrator who comes in and says, "In order to compete and to please my surgeons, it is my decision to have 17 operating rooms open from 7 a.m. to 7 p.m., and, oh, by the way, I don't want to pay anything additional. If you don't comply, you are out!" Given this unrealistic demand, the group felt they had no choice but to leave. The administrator

then offered the contract to a nurse anesthetist entrepreneur group. In this hospital and another Alabama hospital where this nurse anesthetist-owned group has taken over contracts from anesthesiologist groups, they are offering anesthesiologists highly lucrative salaries, short time to "partnership" and no corporate administrative duties. Although there is no hard evidence of substantial hospital subsidies, doing the math indicates that these hospitals seem willing to help out financially in a manner not offered to the anesthesiologist groups.

We must take this mode of business very seriously because the nurse anesthetists do as evidenced by the business literature available on their national association's Web site. A piece of advice — if you find yourself in a war with an administrator, try to get professional third-party mediation; it often makes it less "personal." A hard fact: to be vigilant requires participation.

Participation in the life and politics of our hospitals is essential. Too often we have the choice of going home early or staying for a medical staff or committee meeting, and far too often the answer is, "Oh well, someone will tell me what went on." The only way to find out about matters that are vital to our practices is to be a "good citizen," to serve on committees and task forces and to take an interest in what happens outside the operating room, even when it is at the most inconvenient times. Hospital administrators have too often mistrusted and viewed anesthesiology practices as a hindrance or roadblock to progress as they see it.

While at times this may be true, most of the time, our differences are because of our inability to generate additional revenue to do the job properly, our unwillingness to commit the time and our frustration over not being given the same consideration as other medical specialties, especially the surgeons. Even in this hostile atmosphere, we must strive to educate the hospital administrators about our unique problems and assure them of our desire to work with them in finding solutions. Participation does not stop at the hospital door. We must be active in our medical societies, locally as well as at the state and national levels. It is essential that we do everything in our power to be seen in our hospitals, communities and societies as part of the solution and not part of the problem. This means participation, participation, participation. This is not easy, but if we want to be part of the solution that provides better care for our patients, we must make it a priority and carry it through with professionalism.

Professionalism is essential to our very existence. In this area, we can become our own worst enemy. The most successful and influential anesthesiologists act in a professional manner to everyone, from their patients to their colleagues to the cleaning staff. Quite often, we are willing to delegate our responsibilities to others in exchange for additional time for ourselves. I think the most egregious area is in our preoperative visits. All too often the only anesthesia personnel the patient sees is a nurse anesthetist who tells the patient, "I am responsible for your anesthesia care, and I will be with you every minute." Some of us have abdicated the one time we have to let the patient know we are anesthesiologists who are preparing them for their anesthetic. Over the last few years, we have been on an expensive educational mission to inform the public that an anesthetic provided by or under the medical direction of an anesthesiologist is the gold standard. What better place to start than the preoperative visit to assure that later, after the anesthetic, when the question is asked, "Do you want an anesthesiologist involved in your care?" the answer is always "yes." Obviously, professionalism encompasses much more, including safely expediting the operating room cases, being available throughout the hospital when called upon, and aiding and respecting our colleagues. The benefits of hard work and a willingness to help others, especially the surgeons, do pay off. This was verified a few years back at one of our local hospitals when the hospital administrator made plans (unknown to the anesthesiology group) to bring in another group to take over the

anesthesia services. The surgeons (who were informed prior to the anesthesiologists) then went to the administration and said this arrangement was unsatisfactory and they wanted "their anesthesia group" retained. The retention was not without cost to the anesthesia group as they had to absorb the salaries of the nurse anesthetists, but the quality of anesthesia was preserved, and now, after serious negotiations, the group even has a supplement from the hospital. I use this as an example to show how participation and professionalism can lead to solutions. Granted, it may not work every time, but without it, we are guaranteed failure.

Last, but certainly not least, is the importance of the **ASA Family**. It continues to distress me when I get an exit survey saying, "I am giving up my membership in ASA because I am no longer an anesthesiologist; I am a pain specialist." Although it is true that all pain specialists are not anesthesiologists, it is equally true in my opinion that the best pain specialists are anesthesiologists. It is disheartening to hear the opinion expressed that ASA has nothing to offer and has done nothing for the pain practitioners, when as an officer of ASA, I have seen the Administrative Council, Board of Directors and numerous ASA committees as well as a major task force working to improve pain education, knowledge and reimbursement, both on the local and national levels.

ASA members who practice the specialty of pain medicine are far from forgotten and provide valuable contributions to ASA. But this great ASA family is made up of many valuable contributing parts that allow the Society as a whole to provide benefits to many by using its strength in numbers and unity of purpose to achieve patient care and academic, educational, financial and political goals that would be unobtainable if we were divided. We are a powerful force for safe patient care! If we remain ever vigilant to our changing surroundings; participate as "good citizens" in our hospitals, state and national organizations; and act in a professional manner toward our patients and all those with whom we work — then the only way we can lose is by dividing our family.

Again, I leave you with a quote attributed to Benjamin Franklin: "Gentlemen, if we do not hang together, we most certainly will hang separately." May health and happiness be with each and everyone, and God Bless America.

Senate Fails to Adopt Medicare Drug Bill; Separate Mark-Up of Provider Bill Likely

Michael Scott, J.D., Director
Governmental and Legal Affairs

Just prior to adjournment for the August recess, a compromise Medicare prescription drug bill in the Senate failed to gain the 60 votes necessary to overcome a budgetary point of order. Barring a significant change of position by several Senators after Labor Day, the vote brings to an end any possibility of prescription drug legislation reaching the President's desk in 2002 and also raises some uncertainty about congressional action on improved Medicare reimbursement for providers, including physicians, beginning next year.

As previously reported in this column, the House passed its version of a Medicare prescription drug bill in late June. Contained in that bill was a provision calling for physician updates of approximately 2 percent in the years 2003 through 2005, followed by a drastic negative update in 2006 unless Congress acts further. None of the several drug bills considered in the Senate contained any provision dealing with provider reimbursement; in fact, no provider package was ever seriously advanced in the Senate during the prescription drug bill debate.

At this writing, it now appears that the greatest likelihood for congressional action on provider updates lies in the Senate Finance Committee, which is expected to turn its attention to this issue upon return of Congress to Washington after Labor Day. If that committee produces a bill that is in turn adopted by the Senate as a whole, Senate and House conferees would then meet to hammer out an agreed bill on provider reimbursement.

Complicating further consideration of the provider issues are the budgetary limitations under which the two congressional bodies can operate.

In the House, that limitation was set at \$350 billion for Medicare improvements over the next 10 years, and the House drug bill, including new provider payments, meets that standard. The Senate, on the other hand, found itself unable to pass a budget resolution for FY 2003 and, as a consequence under Senate rules, was limited to \$300 billion over 10 years for Medicare improvements — the approved amount for the prior fiscal year.

Should the impasse in the Senate on prescription drug legislation continue after Labor Day, theoretically the budget limit for provider reimbursement would radically improve because it need not take into account the cost of a new drug benefit. Seniors advocates, including the American Association of Retired Persons, however, can be expected to launch a virulent attack on larger provider payments in the absence of action on the prescription drug issue.

One of the difficulties for physician groups, including the Coalition for Fair Medicare Payment, is that neither the staff of the Senate Finance Committee nor any individual Senator has put forth a proposal that individual physicians could be expected to accept. A major reason for this vacuum of leadership is the fact that because of estimation errors in 1998 and 1999, the budgetary cost of rebasing the Medicare update formula to correct the errors (and still giving physicians *no* increases for 10 years) is estimated at more than \$40 billion. The "magic" of the House bill is that although it gives modest updates for three years, it does not attempt to rebase the formula, thus holding the cost at under \$20 billion over 10

years, when one takes into account a radical drop in reimbursement beginning in 2006.

There are strong incentives for physicians to seek a "fix" in the formula that rebases it to eliminate the effect of the 1998-99 Centers for Medicare & Medicaid Services (CMS) errors (errors that CMS now admits but says it is legally powerless to correct). The real task, however, is to accomplish this in the context of acceptable payment updates over the next decade. At a minimum, it is likely that the Senate Finance Committee will fashion a temporary fix along the lines of the House bill; the trick is to get the Committee to fashion something better that will be both acceptable to physicians and meet congressional budget limitations.

President Pushes Liability Reforms

In late July, President George W. Bush delivered a major health policy speech in North Carolina, calling for adoption of federal professional liability reforms for health care providers, including a cap of \$250,000 on noneconomic damages along the lines of California's highly successful Medical Injury Compensation Reform Act (MICRA) statute. Not coincidentally, the speech was given on the home turf of Senator John R. Edwards (D-NC), a former medical malpractice lawyer, who is expected to seek the Democratic nomination for President in 2004.

The President's speech gave added impetus to the "HEALTH" bill (H.R. 4600, "Help, Efficient, Acces-

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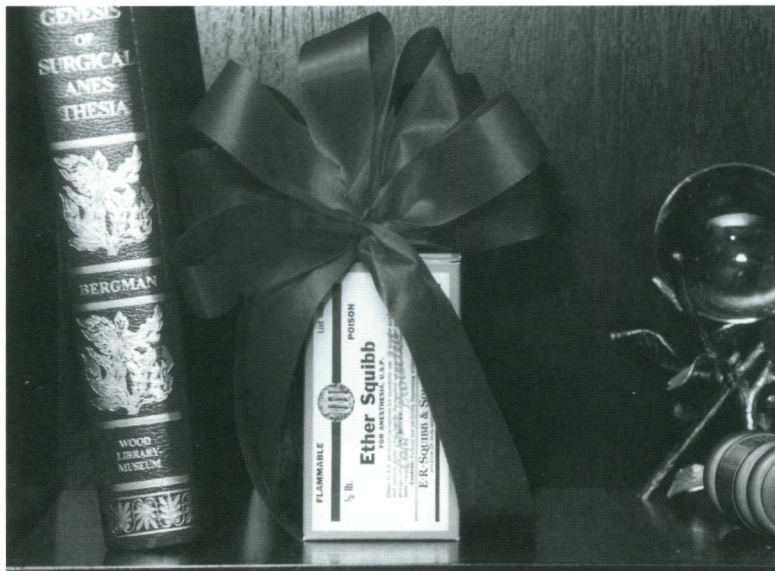
Monitoring: The Story Behind the Story

Lydia A. Conlay, M.D., Ph.D., Trustee
Wood Library-Museum of Anesthesiology

Almost 100 years ago, Harvey Cushing, M.D., married the measurement of blood pressure (BP) to the anesthetic record, giving rise to the field of monitoring in anesthesiology. Of course, the merits of this new technology were not immediately appreciated by everyone. The Harvard departments of surgery, for example, following a thorough examination, determined that “the skilled finger was of much greater value for determination of the state of the circulation than any pneumatic instrument” and that the new data could at best only confirm other information already available from palpating the pulse and physical examination.^{1,2} Perhaps it is worth pointing out that some of our esteemed colleagues still hold to this line of reasoning today. Yet this field has blossomed — from just a finger on the pulse to continuously monitoring the very essence of life itself with newer and seemingly more sophisticated devices each decade!

As most of you know, the September issue of the *ASA NEWSLETTER* is traditionally compiled by representatives of the Wood Library-Museum of Anesthesiology (WLM). It seems only fitting that we dedicate this issue to the history of monitoring, thus celebrating this most important anniversary within our specialty. In her new role as president of the WLM, Kathryn E. McGoldrick, M.D., recently queried individuals for suggestions regarding future directions for the organization. In response, John J. Savarese, M.D., recommended cataloging the developments that lead to the technological devices in use today, and the theme “Monitoring: The Story Behind the Story” began to take shape. In this issue of the *NEWSLETTER*, authors describe the stories “behind the scenes” of the earliest monitoring of the pulse, respiration and eye signs; the development of monitoring at the neuromuscular junction; and, of course, the ASA “Standards for Basic Intraoperative Monitoring,” which are so very much a part of anesthetic practice today. It also contains a wonderful pictorial review of monitoring artifacts, many of which are on display in the WLM in Park Ridge, Illinois.

My own recent experience with memorabilia relates not to monitoring but rather to a certain scorched medicine box previously belonging to E.R. Squibb, M.D. It all began at a Christmas party when a senior staff member



This box of Squibb ether has a “hot” history, but managed to make its way safely onto the shelf in Dr. Conlay’s office where it sits today.

brought a gift for our department’s historical collection at Temple University. It was a 40-odd-year-old can of Squibb ether, in its original box, now topped with a big, red bow. Evidently, the box had been housed in the staff basement for many years. Some of our colleagues (clearly not “dyed in the wool” antiquers) thought it was a bomb and suggested that we call the hazardous materials squad, lest we all be incinerated on the spot. I, of course, took the can (with bow) into protective custody in my office where it now sits in a hallowed spot in my bookcase.

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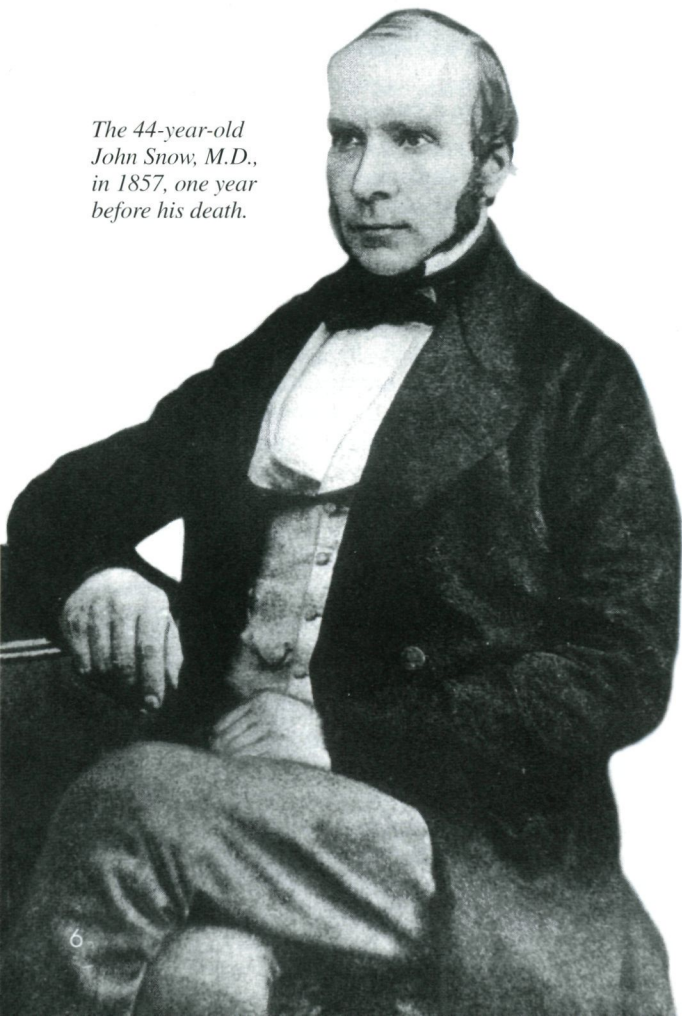
Lydia A. Conlay, M.D., Ph.D., is Professor and Chair, Temple University School of Medicine, Philadelphia, Pennsylvania.

Monitoring in the 19th Century:

From Blood-Letting to Blood-Flow Measurements

Doris K. Cope, M.D., Trustee
Wood Library-Museum of Anesthesiology

*The 44-year-old
John Snow, M.D.,
in 1857, one year
before his death.*



Prior to the advent of anesthesia, surgery was accomplished by either brute force or life-threatening efforts to subdue the surgical patient. In 1819, James Wardrop, Esq., an English surgeon proposed some alternative methods to accomplish surgery. In patients with “irritable minds” who disrupted the operation procedures by wresting themselves away from the surgeon, he proposed enclosing the nonoperative parts of the body in a wooden box or bag and binding the patients’ hands and feet. For unruly or difficult-to-manage patients, however, syncope could be induced by blood-letting.¹ This he described in detail, adding that, in his opinion, exsanguination also was advantageous in minimizing surgical pain and was distinctly superior to large doses of laudanum for intraoperative pain.² Another surgeon, James Arnott, M.D., created a vacuum around extremities that were bled-until fainting resulted with the salutary results purported to be both muscle relaxation for the reduction of joint dislocations as well as a bloodless surgical field. This practice was described and advocated in a widely used surgical text published in Philadelphia in 1823.³

In this context, the discovery of surgical anesthesia within the ensuing two decades was a remarkable phenomenon indeed. Once the amazement that surgical anesthesia was “no humbug” was over, a debate, which continues to this day, ensued over the safest way to receive the benefits of this new invention. As originally reported, the amazement that anesthesia actually worked superceded any mention of monitoring the clinical state of a patient under its influence. As news of the Boston public demonstration reached London late in 1846, John Snow, M.D., personally adopted the technique, publishing his series of 80 anesthetized patients ranging in age from children to octogenarians in the *Inhalation of the Vapour of Ether in Surgical Operations*. He mentioned the customary monitoring



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under anesthesia to include respiration depth and frequency, muscle movements, skin color and stages of excitation or sedation. Although the pulse was continually palpated, its characteristics were not considered worth studying.⁴ By 1855, the Edinburgh surgeon James Syme, M.D., lectured on the importance of monitoring respiration and explained in his surgical lectures that, in his opinion, chloroform was safer than ether anesthesia if it was administered properly. The key, however, to proper administration was monitoring the patient's respiration.⁵

Joseph Thomas Clover, M.D., was the leading clinical anesthetist in Victorian England during his professional life from the beginning of his anesthesia practice in 1846 until his death in 1882. His clinical prowess and teaching are commemorated in the Clover Lectures of the Royal College of Surgeons. In his anesthesiology career, he rendered service to more than 20,000 patients, including many socially prominent figures of his time such as the Princess of Wales, Florence Nightingale, Sir Robert Peel and Napoleon III. In the notes of Sir Henry Thompson regarding the latter case, it was noted that the patient "recovered consciousness gradually and was watched by [Dr.] Clover until his intelligence had fully returned."⁶ In 1864, the Royal Medical and Chirurgical Society established a committee to investigate chloroform fatalities, and as an expert assistant to that group, Dr. Clover described his innovations in apparatus and animal experimentation with anesthetics. He strongly advised that the pulse be continuously observed during an anesthetic and that irregularities such as a diminution should alert the anesthetist to discontinue the anesthetic. He also advised monitoring the pulse continuously while administering an anesthetic [see *NEWSLETTER* cover]. "If the finger be taken from the pulse to do something else, I would give a little air."⁷

Much of Dr. Clover's clinical practice was based on the systematic discoveries of Dr. Snow, the pioneer British anesthetist. Dr. Snow emphasized the importance of measuring the pulse as well as respiration — techniques that were advanced beyond the common practice. James Young Simpson, M.D., also voiced caution during the administration of chloroform when snoring ensued and the pulse became "languid."⁸ Yet, even as late as 1889, the second Hyderabad Chloroform Commission reported that anesthetists should be guided entirely by respiration as the commission deemed pupil size and pulse not significant enough to monitor.⁹

Once again, Americans demonstrated their Yankee ingenuity in developing a desire to quantitatively and qualitatively measure the pulse. An American surgeon in

"Dr. Clover strongly advised that the pulse be continuously observed during an anesthetic and that irregularities such as a diminution should alert the anesthetist to discontinue the anesthetic."

Philadelphia, Professor D.H. Agnew, in a textbook from 1881 discussing the relative safety of ether and chloroform, demonstrated his point by showing a diminished pulse waveform after chloroform anesthetic. His readings also captured a premature cardiac contraction¹⁰ — a major milestone in operative monitoring. Later studies invalidated these measures due to, among other difficulties, variation in skin thicknesses and the operative techniques.

This measurement of pulse curves by early sphygmographs was based on the earlier work of scientists Karl von Vierordt in 1854 and Etienne Marey in 1863. Etienne Marey developed a device made of brass, steel, ivory and wood. A steel spine tipped by an ivory plate was applied to the skin above the radial artery that magnified and recorded pulse waves. He correlated the pulse-wave progression and the relationship between heart sounds and the cardiac cycle with Auguste Chaveau, M.D., in Lyon, France, in the early 1860s. They correlated changes in duration of the cardiac cycle with cardiac function.¹¹ J.B. Sanderson, M.D., refined the sphygmograph with a more effective wrist attachment and the ability to record the tracing on smoked glass, which could be varnished and shown as a glass lantern slide.¹² The history of these cardiac measurements from experimental methods to more modern recapitulations of these innovations can be found in *Anesthesia From Colonial Times*¹³ (1966) by James E. Eckenhoff, M.D., and Schneider and Redford's special article in *Anesthesiology*, "Historical Pulse Tracing Made During Anesthesia" (1979).¹⁴

Unlike pulse and blood pressure measurements, direct chest auscultation along with documentation of medical history were the mainstays of physical diagnosis in the 19th century. René Théophile Hyacinthe Laënnec, M.D., gradu-



Laënnec Stethoscope instrument and case in the collection of the Wood Library-Museum of Anesthesiology, American Society of Anesthesiologists, Park Ridge, Illinois.

ated from medical school in 1803. Direct auscultation with the ear on the chest was considered to be unethical in female patients and distasteful in others. Dr. Laënnec improvised with a paper rolled into a cylinder for this purpose and later experimented with other materials, including Indian cane and wood.¹⁵ (An early Laënnec stethoscope is currently on display in the collection of the ASA's Wood Library-Museum of Anesthesiology.) His treatise "De l'Auscultation Mediate" was published on August 15, 1819, in two volumes and packaged with a wooden stethoscope.¹⁶ Despite Dr. Laënnec's detailed descriptions, many physicians thought the device too troublesome to transport or even ridiculous and undignified, and the sounds emanating from it were described as too vague or obscure for this device to have any practical use. As late as 1837, stethoscopists were a minority group against which there was considerable prejudice.¹⁷ Yet with the practice of anesthe-

sia in the mid-19th century, there was a generation of physicians with exposure to this type of monitoring.

The earliest clinical account of auscultation in the operating room was reported in 1896 by Robert Kirk, M.D., of the Glasgow Western Infirmary. An ordinary binaural stethoscope lengthened by Indian rubber tubing was first used. Later, 200 patients anesthetized with chloroform were auscultated using a phonendoscope with timing of heart rate and rhythm by a watch.¹⁸ Dr. Kirk was involved at the time with the Glasgow Committee on Anesthetic Agents and saw the stethoscope as a clinical research tool to assess the effects of chloroform on cardiac physiology. It took the strong advocacy of routine, continuous monitoring of cardiac and respiratory sounds under anesthesia by Harvey Cushing, M.D., to give impetus to the widespread clinical use of the technique.¹⁹ While an esophageal stethoscope was described in 1893 by Solis-Cohen²⁰ for diagnostic purposes, it was almost three-quarters of a century later that stethoscopy under anesthesia by precordial or esophageal stethoscopes was considered standard care.

Once the idea that monitoring patients under anesthesia was clinically useful and early tools were developed to do so, the anesthetic record could not be far behind. B. Raymond Fink, M.D., credits the first anesthetic record to A.E. Codman, M.D., at the Massachusetts General Hospital in 1894.²¹ Dr. Codman's chief, F.B. Harrigan, M.D., recommended recording the patient's pulse during an anesthetic. This practice was encouraged by Dr. Cushing who published a classic paper in 1902 reproducing an actual patient's anesthetic record.²² Dr. Cushing also brought the sphygmomanometer cuff invented in 1896 by Scipione Riva-Rocci, M.D., to the Massachusetts General Hospital in 1898. This instrument allowed a systemic pressure measurement by palpation of the radial pulse. Dr. Cushing's initiatives were not accepted easily, and opponents to the newer devices to measure temperature, pulse, blood pressure and the auscultation of the heart were castigated by an editorial in the *British Medical Journal* claiming that "by such methods we pauperize our senses and weaken clinical acuity."²³ Thus it is yet again confirmed that paradigm shifts, however salutary, are never easy. In this 100-year period, the transformation from blood-letting to blood-flow measurement was nearly complete, and anesthesiology emerged as perhaps the clinical discipline that most utilizes physiological monitoring, which continues to this day.

References are available from the ASA Executive Office or on the ASA Web site.



Anesthesia, Respiration and the Stethoscope

James C. Erickson III, M.D.

During the first years following a demonstration in 1846 by dentist W.T.G. Morton, monitoring of anesthetized patients received little attention beyond the patient's state of consciousness and responses to surgically induced pain. In Great Britain, an early report suggesting clinical monitoring is noted in the 1848 legal proceedings regarding the first death attributed to anesthesia.¹ At the coroner's inquest, the anaesthetist, Thomas N. Meggison, M.D., described his observations of the young victim's respirations, pulse and the rigidity that occurred just prior to her demise. In 1847, John Snow, M.D., declared that "the point requiring most skill in the administration of the vapor of ether is, undoubtedly, to determine when it has been carried far enough."² Nevertheless, the means to determine that point would remain illusive for some time to come.

Joseph Lister, M.D., the founder of the principles of antisepsis in surgery, was an eminent surgeon in Scotland and the United Kingdom of the 1850s through the 1890s. He protested against palpation of the pulse as "a most serious mistake. As a general rule, the safety of the patient will be most promoted by disregarding it altogether, so that the attention may be devoted exclusively to the breathing."³ Dr. Lister's instruction to the senior students who served as his anaesthetists was "that they strictly carry out certain simple instructions, among which is that of never touching the pulse, in order that their attention may not be distracted from the respiration." He repeatedly emphasized the importance of airway management, urged "the drawing out of the tongue" and expressed the belief that the services of special anaesthetists were unnecessary if simple routines were followed in the administration of chloroform. Dr. Lister gave short shrift to monitoring beyond observation of the adequacy of respiration and whether or not patients responded to surgical stimulation.

Laënnec Stethoscope

Auscultation of the heart and lungs gained importance following the description by René Théophile Hyacinthe Laënnec, M.D., of the clarity of cardiac sounds in 1816 when he rolled "a quire of paper into a sort of cylinder" and applied one end to his patient's chest and the other to his ear.⁴ From this beginning, he constructed a wooden stethoscope 20 cm (7.87 inches) in length with a hollow passage through the center and shallow concavities at both thoracic and auricular ends. He initially called his invention "Le Cylindre," but later coined the term *stethoscope*, taking the name from the Greek words *stetho*, meaning

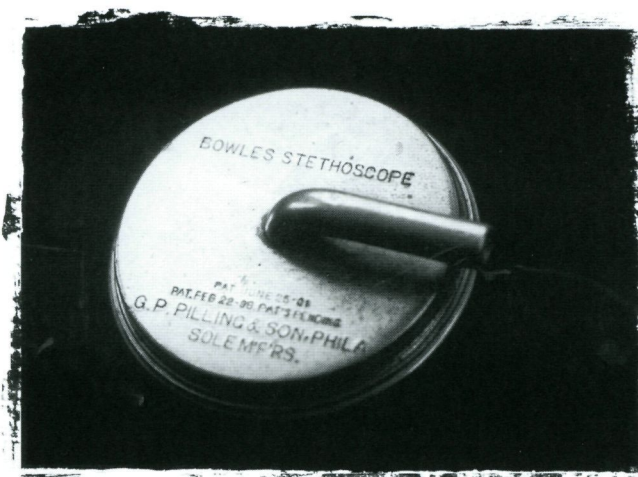
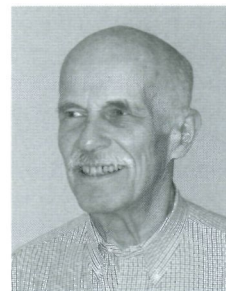


Figure 1: The Bowles stethoscope, patented in 1901, gave physicians improved amplification of higher frequency sounds. Photo courtesy of the Wood Library-Museum of Anesthesiology

"chest," and *scope*, meaning, "I see." (A well-preserved wooden Laënnec stethoscope can be examined in the Wood Library-Museum of Anesthesiology; see photo on page 8.) The new device underwent many modifications from the original wooden tube, from flexible monaural devices, then to binaural stethoscopes with a bell-shaped appendage on the thoracic end. Flexible rubber tubing connected the bell to the earpieces. A flexible diaphragm was added to the thoracic bell and added improved transmission of heart and breath sounds.

Stethoscopes were not mentioned in descriptions of clinical anesthesia during the 50 years following Dr. Morton's demonstration, although they undoubtedly were used to determine the presence or absence of cardiac sounds in patients who were in distress or were presumed to be dead.



James C. Erickson III, M.D., is Professor Emeritus of Anesthesiology, Northwestern University, Chicago, Illinois, and is a volunteer consultant at the Wood Library-Museum of Anesthesiology.

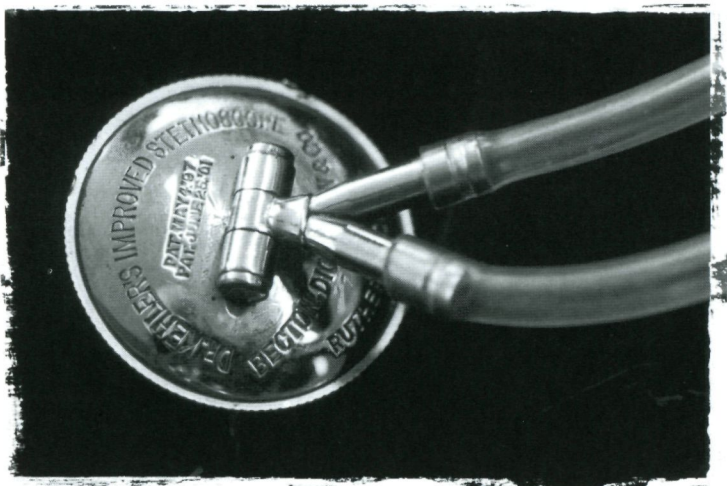


Figure 2: The patent for “Dr. Kehler’s Improved Stethoscope” was granted in 1901. Photo courtesy of the Wood Library-Museum of Anesthesiology

Bowles Stethoscope

In 1897, Robert C.M. Bowles, M.D., applied to the U.S. Patent Office with his plans to create a flat chest piece with a shallow concave chamber covered by a flexible diaphragm like that of a telephone. This stethoscope offered improved amplification of higher frequency sounds and was even used to auscult the chest without requiring patients to disrobe. The patent was granted in 1901. The flat metal thoracic piece had a tube curved to 90 degrees that was connected to flexible rubber tubing leading to the ear pieces. The “Bowles” was 51 mm (2 inches) in diameter and presented a flat silhouette with the connecting tube extending vertically only 16 mm (0.64 inches) above the upper surface [Figure 1]. It was manufactured by G. P. Pilling & Son, in Philadelphia, Pennsylvania.

The Bowles was used by Harvey Cushing, M.D., to auscult respirations in his experimental laboratory, but the 2-inch diaphragm was adjudged to be unwieldy during surgery and was removed when the animals’ chests were opened. This stethoscope was then used to determine blood pressures by detecting Korotkoff’s sounds just distal to the Riva-Rocci cuff placed on the upper arm of patients.⁵ The Bowles also could be placed on the precordium to detect changes in cardiac rhythm as well as the intensity of heart beats and thus offered a means to monitor patients during anesthesia and surgery. Because of the anesthesiologists’ need to communicate with (and hear) the sur-

geon, this application was accepted reluctantly. Nevertheless, the inconvenience of disengaging one hand to palpate the pulse was now overcome. During this era, Dr. Cushing urged anesthesiologists to observe cardiac and respiratory rates every five minutes during an anesthetic.⁵

Kehler Stethoscope

Charles K. Teter, D.D.S., described the benefits of using “Dr. Kehler’s Improved Stethoscope” during anesthesia, especially in poor risk patients.⁶ He praised the convenience of the flat Kehler stethoscope, which “will usually stay without being held” on the precordium. When necessary, adhesive tape prevented its being dislodged. The Kehler stethoscope also was submitted for patent during 1897 and approved in 1901. The concavity of the chest piece was covered by a firm diaphragm and presented a low silhouette, identical to the Bowles [Figure 2]. It was manufactured by Becton, Dickinson and Company of Rutherford, New Jersey. An advantage of the Kehler stethoscope was the

mobile swivel that enabled one to turn the tubings within a 180-degree range to auscult the chest. This feature was probably of little advantage to anesthesiologists whose position adjacent to the patient was usually fixed once the anesthetic and operative procedure started.

Dr. Teter praised the stethoscope because “uninterrupted information will be given to any and all change[s] in the heart beat and respiration.” He expressed his feeling of confidence when “every variation of heart sound is at once discernable, and what might be serious complications can be averted by the premonitory symptoms thus made manifest.”⁶ (The author certainly agrees and used his Bowles stethoscope during anesthesia of pediatric patients to auscult the precordium during residency training in 1953 and for four decades thereafter.)

Author’s note: The Bowles stethoscope and the Kehler’s Improved Stethoscope are displayed in the Wood Library-Museum of Anesthesiology in Park Ridge, Illinois.

References are available from the ASA Executive Office or on the ASA Web site.



Cardiorespiratory Monitoring: A Pictorial Sampler

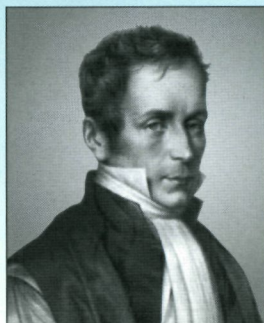
Leslie Rendell-Baker, M.D.

George S. Bause, M.D.

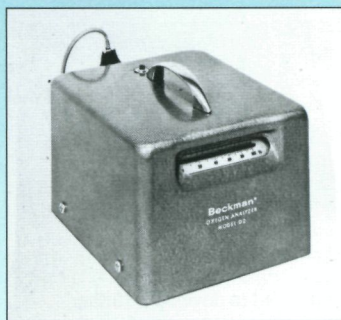
1820 French physician Laënnec invented the stethoscope to help diagnose chest diseases, including tuberculosis, a disease that would eventually kill him.

1940s Precordial Stethoscope popularized.

1950s Esophageal Stethoscope popularized.



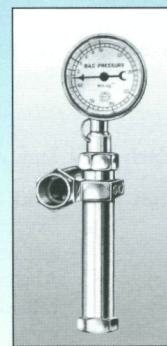
*René Théophile Hyacinthe
Laënnec (1781-1826)*



*Beckman Oxygen
Analyzer*

1937 The Bag Pressure Manometer gauged pressure within the breathing circuit, showing variations needed to ventilate lungs when resistance/compliance changed.

1946 The Beckman Oxygen Analyzer (BOA) used Linus Pauling's paramagnetic technique. A string galvanometer with light-reflecting mirror, the delicate BOA was rendered inaccurate by anesthetic gases.

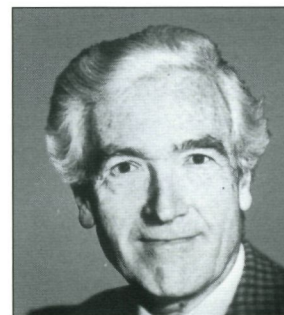


*Bag Pressure
Manometer*

1952 Danish anesthesiologist Ibsen manually ventilated polio patients after tank ventilators failed. Hundreds of students were recruited to provide around-the-clock hand ventilation for up to 90 patients at a time. Ibsen guided ICUs worldwide away from iron lungs to modern ventilators. Rapid estimation of $p\text{CO}_2$ was essential to determine correct ventilation. Danish physician Astrup used arterial sampling to measure pH and CO_2 content (Van Slyke method) to adjust ventilators for normal ventilation. This led to the "equilibrium method" and, by 1958, to his introduction of the micro pH electrode and of "base-excess."

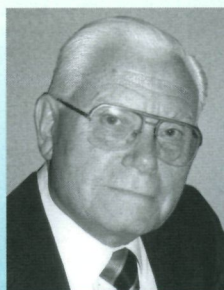


*Bjorn Ibsen, M.D.
(1915-)*

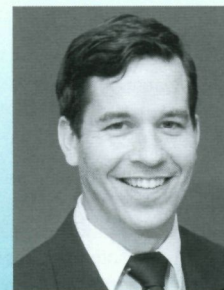


*Poul B. Astrup, M.D.
(1915-)*

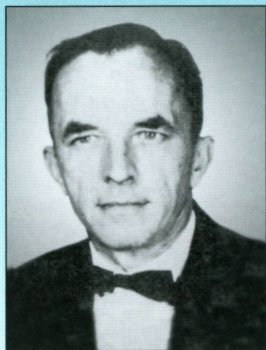
Leslie Rendell-Baker, M.D., is an Emeritus Clinical Professor of Anesthesiology, Loma Linda University, Loma Linda, California.



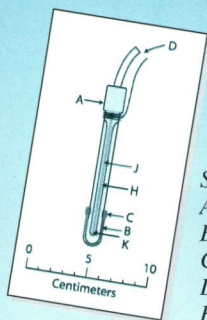
George S. Bause, M.D., is an Associate Clinical Professor of Anesthesiology, Case Western Reserve University, Cleveland, Ohio. He is Honorary Curator of the Wood Library-Museum of Anesthesiology.



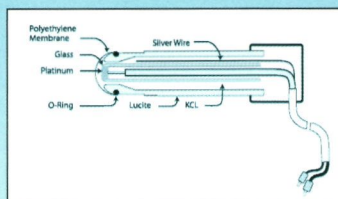
Respiratory Monitoring • Blood Gases



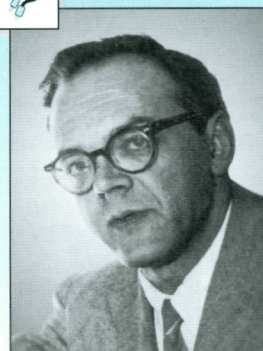
Richard Stow, M.D.
(1916-)



Stow CO₂ Electrode
A. rubber membrane;
B. glass & Ag/AgCl electrodes;
C. rubber band;
D. leads;
H. Tygon enamel strip;
J. Tygon paint;
K. Ag tip.



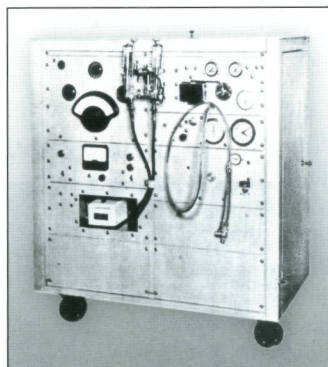
*Clark-Yellow Springs
polarographic PO₂
electrode*



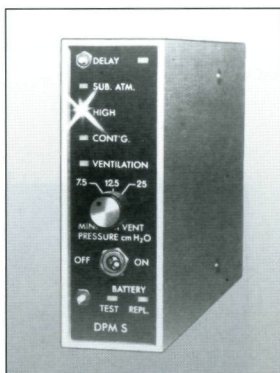
Leland C. Clark, Jr., Ph.D.
(1918-)

Early 1954 Stow described his CO₂ electrode but failed to develop it further.

Late 1954 Clark designed his PO₂ electrode, just two years after his other "first": a bubble oxygenator for humans. His Clark-Yellow Springs polarographic PO₂ electrode analyzed oxygen broken down at a cathode beyond a semi-permeable membrane. Altered KCl conductivity allowed current passing between a Ag anode and an Au-Pt cathode to be proportional to O₂ concentration.



Autoanestheton



Dräger DPM-S

1956 Frumin & Lee's Autoanestheton ventilator monitored EtCO₂ and varied tidal volume to hold a preset CO₂.

1960s Use of volume ventilators and Astrup blood gas apparatus for pCO₂ control led to widespread ICU-use of respirometers, which supplanted industrial gas meters & huge water-seal Collins-type spirometers.

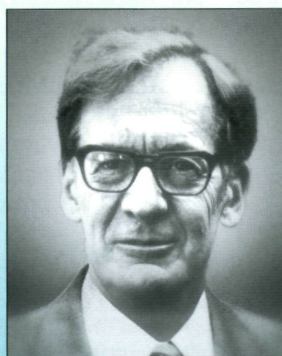
1981 The Dräger DPM-S was the first monitor for sustained positive / high / subatmospheric pressures or failure to reach minimum ventilation pressure (e.g., disconnection).



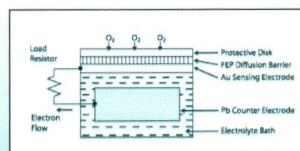
Respirometers

1958 Severinghaus developed a complete blood gas apparatus by combining his practical version of Stow's CO₂ electrode with Clark's PO₂ electrode. The first commercial blood gas system featured a cuvette with stirrer for Clark's PO₂ electrode and a Stow-Severinghaus electrode.

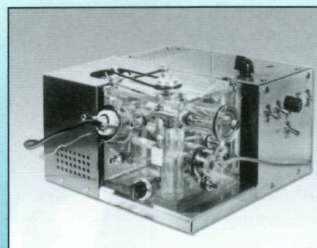
1975 Galvanic electrode oxygen analyzers were introduced. They reduced O₂ at a Au electrode while oxidizing a Pb electrode. The potential difference is proportional to the O₂ diffusion rate.



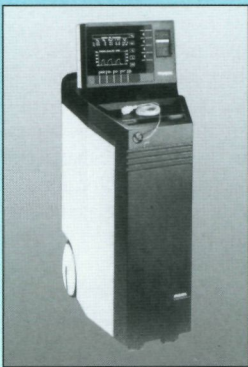
John W. Severinghaus, M.D.
(1922-)



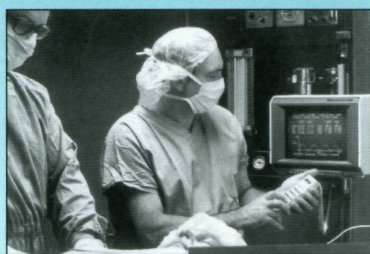
*Galvanic electrode
oxygen analyzer*



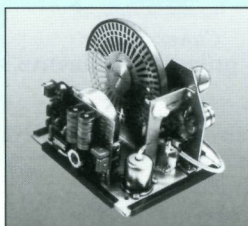
*Earliest commercial
blood gas system
with Clark & Stow-
Severinghaus elec-
trodes.*



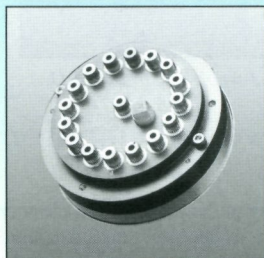
*Albion Instruments
(Raman) Gas Analyzer*



Mass Spectroscope



Photoacoustic Spectroscopy



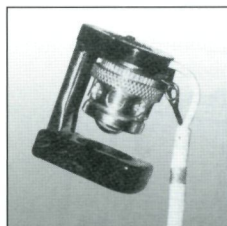
*Rotary Valve from
a Mass Spectroscope*

Respiratory Monitoring • Precision

- 1977** Computerized timesharing mass spectroscopy was introduced for multiple-patient use. The initial use decreased in favor of single-patient EtCO₂ monitors. The latter avoided the large capital outlay and the whole-system downtime.
- 1985** An anesthetic and respiratory gas monitor using Raman light-scattering analysis was introduced by Albion Instruments. A photon from a laser collides with gas molecule. The excited molecule re-emits light at a lower energy and different wavelength. The detected wavelength shift is different for each gas.
- 1988** Photoacoustic spectroscopy was introduced by Bruel and Kjaer to analyze all anesthetic gases. A magnetoacoustic technique was used simultaneously to measure oxygen. This new technology was more accurate than infrared, was very stable and required no consumable parts.

Respiratory Monitoring • Oximetry

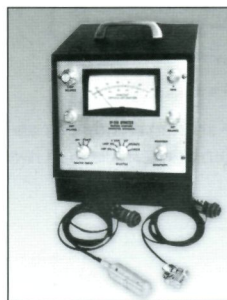
- 1939–** Glen Millikan developed a lightweight and practical ear oxygen meter and coined the term "oximeter." Initially used to determine O₂ saturation in aviators, by 1948 a similar device was used to control anoxemia during surgical anesthesia.
- 1942**
- 1966** The Waters Company X-350 Oximeter, based on Earl H. Wood's work in the 1950s at the Mayo Clinic, was the first oximeter to give absolute readings of oxygen saturation without prior adjustment to a known concentration. Similar oximeters were used in early cardiac surgery at the Mayo Clinic. Unfortunately, the photo cells available in the 1950s were nonuniform in spectral sensitivity and variable with time, which delayed their widespread adoption as a routine monitor in anesthesia.
- 1971** Japanese engineer Aoyagi, originator of the pulse oximeter, worked at Nihon Kohden on estimating cardiac output by the dye dilution method using an earpiece densitometer. His pulsations of transmitted red and infrared light indicated oxygen saturation levels. This prototype pulse oximeter was first used clinically in Sapporo in 1973.
- 1983** The Nellcor pulse oximeter first associated the pitch of the pulse-tone with the level of oxygen saturation. A fall in pitch signaled a fall in oxygen reaching peripheral tissues. Nellcor, Inc. was founded by Stanford anesthesiologist New with Jack Lloyd and engineer Jim Corenham: **NEW, LLOYD & CORENHAM**, hence the name **NELLCOR**. Their convenient, accurate pulse oximeter revolutionized patient monitoring during and following anesthesia.



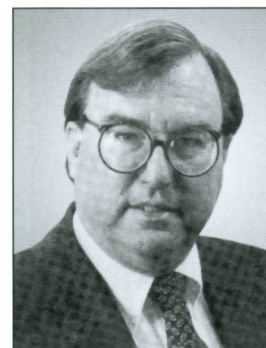
Millikan ear oximeter



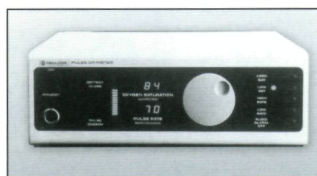
Takuo Aoyagi



*Waters Company
X-350 Oximeter*

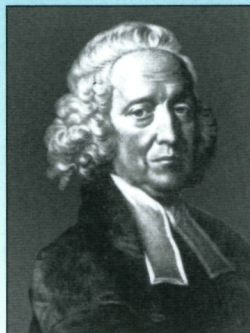


*William New, Jr., M.D.,
Ph.D., of Nellcor, Inc.*



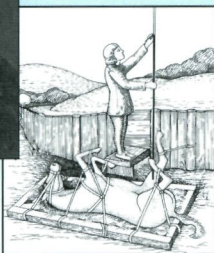
Nellcor Pulse Oximeter

Cardiac Monitoring • BP & Pulses

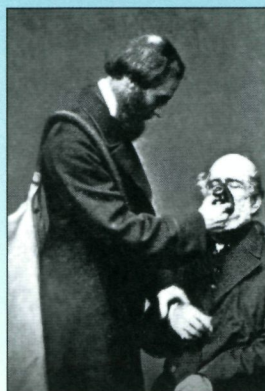


Rev. Stephen Hales
(1677-1761)

- 1706** Hales first demonstrated blood pressure using a 9' glass tube attached to a mare's crural artery. The blood rose 8' 3" and oscillated 2"–4" with each heart beat.



Hales' observation laid the foundation for the modern arterial-line method of blood pressure monitoring.

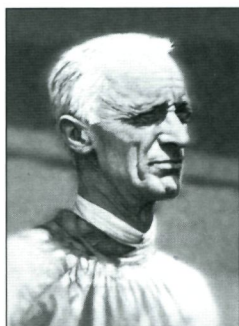


Joseph T. Clover, M.D.
(1825-1882)

- 1862** Clover monitored the pulse during administration of 4-1/2 percent chloroform in air from the bag of his apparatus. He was aware that deaths associated with chloroform anesthesia were related to circulatory collapse.

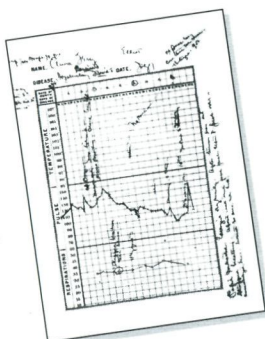


Clover Inhaler



Harvey Cushing, M.D.
(1869-1939)

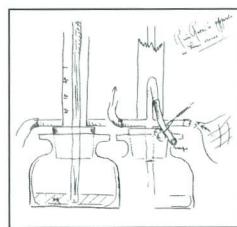
- 1894** Cushing and Codman introduced charting of the pulse and respiratory rate during ether anesthesia.
- 1903** Cushing reported his use at Johns Hopkins of a Riva-Rocci blood pressure apparatus brought back from Italy.
- 1907** Cushing used his Bowles as a precordial stethoscope.



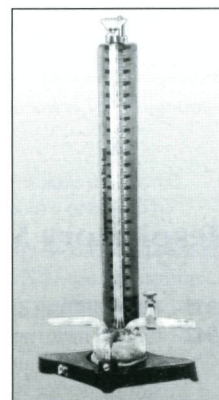
Dr. Harvey Cushing's July 17, 1895 chart: "Did not vomit. Not nauseated. Very quiet."



Cushing's precordial
stethoscope



Cushing's sketch
of Riva-Rocci's
Apparatus

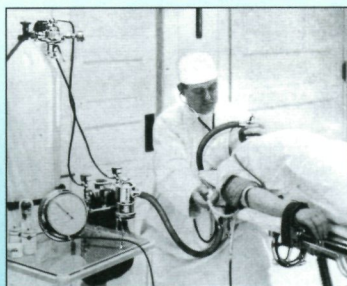


Riva-Rocci's 1896
BP Apparatus

- 1914** McKesson described the use of the aneroid manometer and brachial stethoscope for routine monitoring of the blood pressure during anesthesia in Gwathmey's *Anesthesia*.



Elmer I. McKesson, M.D.
(1881-1935)



McKesson's brachial stethoscope
and aneroid BP manometer

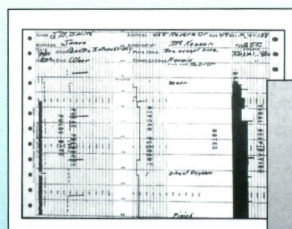
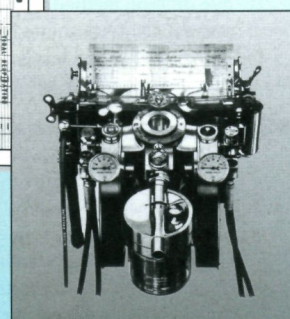


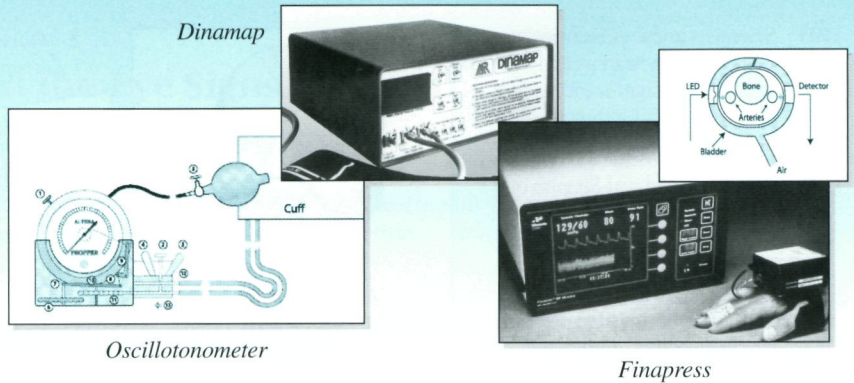
Chart (above) from
McKesson Recording
Nargraf (1930) (right)



Cardiac Monitoring • Peripheral & Central

Peripheral Monitoring

- 1976** The Dinamap determined the systolic, diastolic and mean arterial pressure using the oscillometric method.
- 1986** The Finapres was the first continuous noninvasive blood pressure device. It provides a display similar to an arterial line as well as giving the digital values.

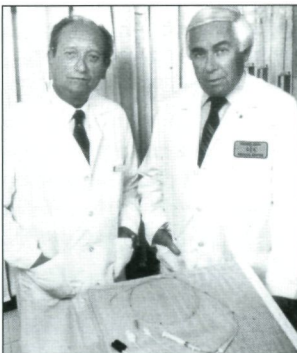


Central Monitoring

- 1958** Clinical central venous pressure monitoring was introduced when plastic catheters became available. Simple water manometers using crystalloid solution were used prior to the availability of pressure transducers and oscilloscopes.
- 1960s** Introduction of pressure transducers simplified the measurement of pressures from arterial and central lines.
- 1970** Swan, Ganz, et al. introduce balloon-tipped flow-directed catheter to reflect right ventricular and pulmonary artery pressures for fluid management of sick patients. The pulmonary artery catheter thermodilution technique for cardiac output supplanted the earlier cardio-green dye dilution technique.

Doppler

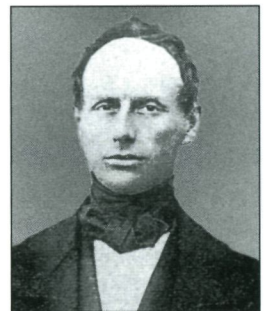
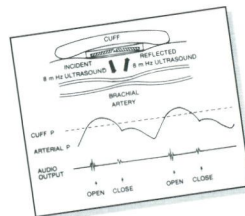
- 1842** Austrian physicist Doppler enunciated the Doppler principle relating observed wave frequency to the motion of the source or the observer relative to the medium on which the wave is propagated.
- 1971** The Arteriosonde, an automatic BP apparatus, utilized 2 mercury manometers to "retain physicians' confidence." Doppler detection determined systolic and diastolic levels.
- 1988** 2-D transesophageal echocardiography used the Doppler effect, providing continuous assessment of cardiac segmental wall motion and regional myocardial ischemia.



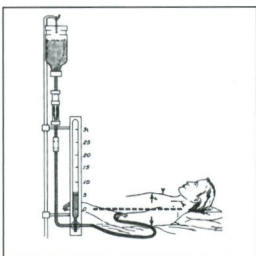
W. Ganz, M.D., and
H.J.C. Swan, M.D.



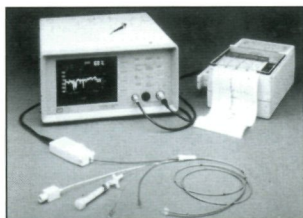
Conventional
and Miniature
Transducers



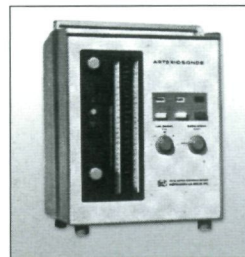
Prof. Johann C. Doppler
(1803-1853)



Central Venous Pressure
(CVP) Monitoring



Oximetric Pulmonary
Arterial Catheter



Arteriosonde

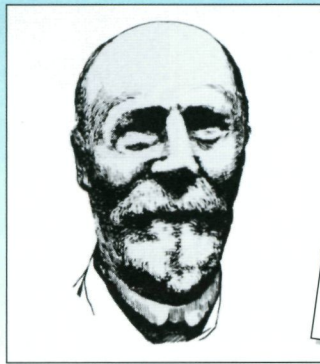


Early 2-D Hewlett-Packard
transesophageal echo

Cardiac Monitoring • ECG

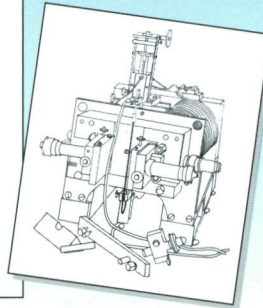
1903 Scientists knew of electrical currents from the heart as early as 1855. Their significance was unknown until Einthoven invented the string galvanometer.

1936 Kurtz, Bennett and Shapiro of Madison, Wisconsin, after monitoring 113 cases under anesthesia, drew attention to the occurrence of serious arrhythmias, such as multifocal ventricular tachycardia, during cyclopropane.

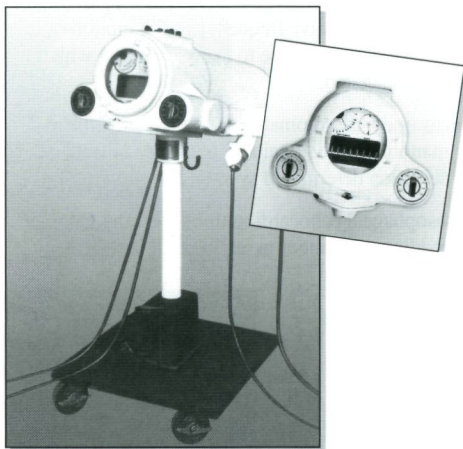


*William Einthoven
(1860-1927)*

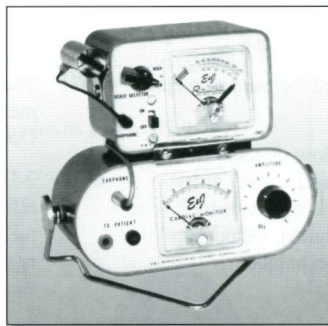
*Einthoven's String
Galvanometer*



*Ventricular dysrhythmias
noted by ECG during 32-year-
old's pelvic surgery under
cyclopropane anesthesia.
(1936: Kurtz, Bennett &
Shapiro)*



*Cambridge "Bullet"
Cardioscope*



"R" Wave Monitor

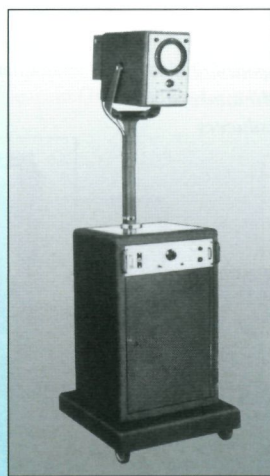
1954 Cambridge introduced the explosion-proof Cardioscope. Before this device, continuous ECG monitoring during anesthesia was limited by fire and explosion hazards with ether and cyclopropane.

1957 A simple but effective "R" wave monitor with an audible signal was introduced in 1958 based on a 1957 cardiac monitor designed by John Severinghaus. Both alerted the anesthesiologist if there was a change in rate or rhythm but did nothing to indicate ischemic changes. These partially filled the gap while waiting for more ECG monitors that could be used in the O.R.

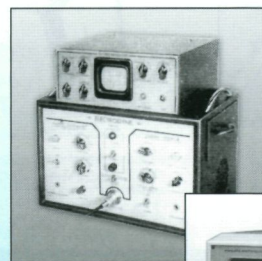
1958 Sanborn and Levinthal each introduced oscilloscopic ECG monitors in the 1950s for O.R. use, placing them 5 feet above the floor to avoid the "hazardous area" of "flammable anesthetizing locations."

1958 Development of AC then DC external defibrillators increased awareness for continuous ECG monitoring. The Electrodyne AC defibrillator was one of the first available following the original development of external defibrillation by Zoll in 1956.

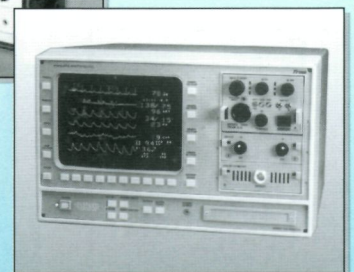
1980s Innovations by Marquette Electronics included their 7010 Surgical Monitor. This multifunction ECG monitor had sophisticated ST segment measurement and arrhythmia detection capabilities.



Sanborn Viso-Scope



*Electrodyne
PM-65 with
Electrocardioscope*



*Marquette Electronics 7010
Surgical Monitor*

Arthur Guedel, M.D., and the Eye Signs of Anesthesia

Selma Harrison Calmes, M.D.

Today anesthesiologists rarely examine a patient's eyes to determine the depth of anesthesia. Our sophisticated monitors usually tell us all we need to know. In the early days of anesthesia, however, eye signs were enormously important. Physiologic monitors were nonexistent then, anesthetic techniques were simple (usually only one agent was used) and eye signs were easy to observe. This article discusses how Arthur Guedel, M.D. (1883-1956) developed the eye signs of anesthesia during World War I.

Dr. Guedel, who made many vitally important contributions to anesthesia practice, equipment and knowledge, began his career with severe handicaps. Born in Indianapolis, Indiana, to a poor family, he had to leave school at age 13 to work. A machine shop accident led to the loss of the first three fingers of his right hand — and he was right-handed. Guedel dreamed of practicing medicine, even though he had no high school diploma and no financial resources. With the assistance of his family's physician, he was able to graduate from the University of Indiana Medical School in 1908. Dr. Guedel administered his first anesthetics while an intern at Indianapolis City Hospital. This was a common duty for interns at the time because there were so few physicians interested or trained in anesthesia. Dr. Guedel established a practice in Indianapolis in 1909 and earned additional income by giving anesthesia in hospitals and dental offices.¹ Part-time anesthesia practice was also common at the time.

From the earliest days of anesthesia, physicians had tried to define the "stages" of anesthesia. When Dr. Guedel began administering anesthetics, four stages of anesthesia were generally accepted:

Induction: Beginning of administration until loss of consciousness.

Stage of struggling, breath-holding, delirium: From loss of consciousness to onset of surgical anesthesia.

Surgical anesthesia: Characterized by deep, regular, automatic breathing. Some authors also noted loss of the corneal reflex.

Overdose, or stage of bulbar paralysis. No exact signs except shallow, irregular breathing and dilated pupils that no longer reacted to light.²

Dr. Guedel was a careful observer. As he anesthetized his patients, he tried to verify these observations and to look for other possible signs, for example, the characteristics of respiration and what was happening to the eyes. He then tried to organize these observations. Dr. Guedel's contributions better defined stage III, the all-important level at which surgery could be done, by further dividing it into four planes and by adding the eye signs.

The eye signs were new² and the most significant contribution to Dr. Guedel's signs of anesthesia. His eye signs included the activity of motor muscles of the eyeball, pupillary dilatation and, later, the eyelid reflex. (The eyelid reflex is tested by gently raising the upper eyelid with the finger. If the reflex is present, the eyelid will attempt to close at once or within a few seconds. The corneal and

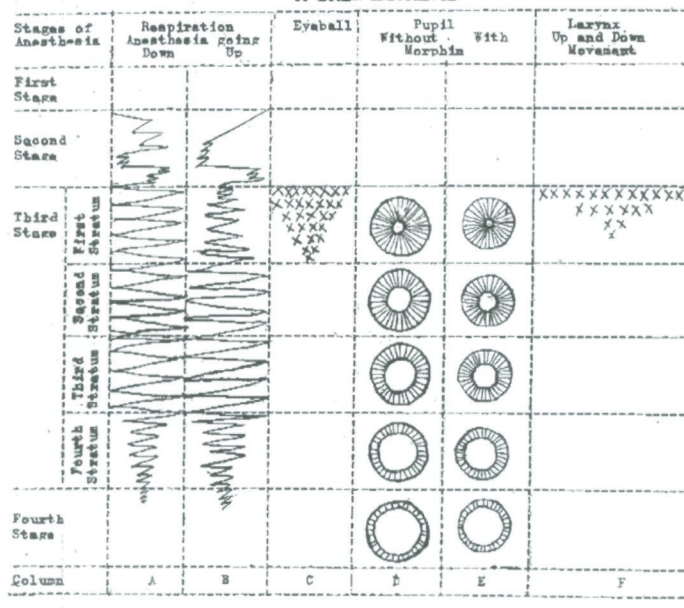


Lieutenant Arthur Guedel, "The motorcycle anesthetist of World War I." Photo courtesy of Guedel Memorial Center



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SCHEMATIC CHART SHOWING THE SIGNIFICANCE OF
CERTAIN REFLEXES UNDER VARIOUS STAGES
OF ETHER ANESTHESIA.



Earliest version of Guedel's stages and signs of anesthesia.⁵ Courtesy of Guedel Memorial Center

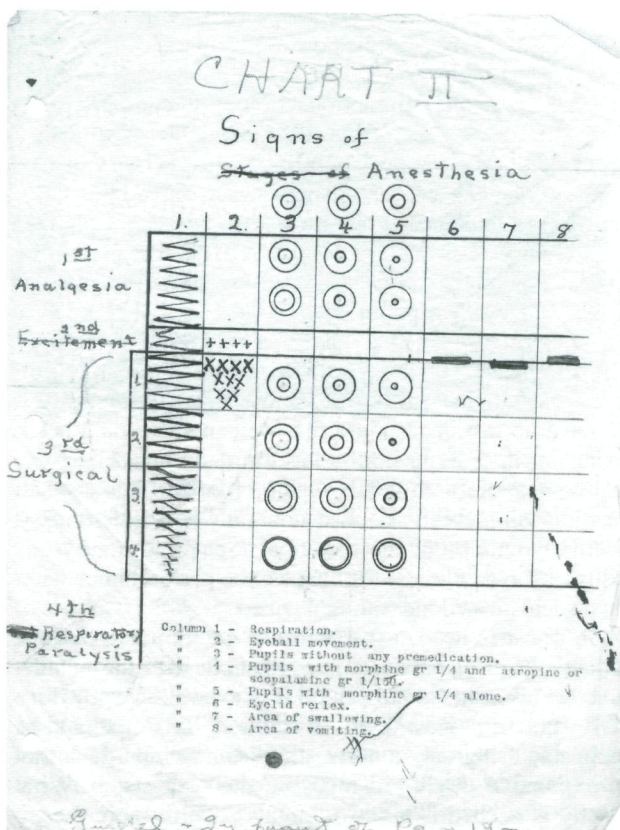
eyelash reflexes are better known to us today but were not mentioned.)

The setting for these contributions was the great need for anesthesia during World War I. When America entered the war in April 1917, the U.S. Army had not a single trained specialist in anesthesia among its 491 medical officers.³ Dr. Guedel was called to service in June 1917 and arrived in France in August. Due to a crush of casualties from a major battle, his staff of three physicians and one dentist needed to run as many as 40 operating room tables at a time. After working 72 hours straight, Dr. Guedel decided that other staff would have to be trained quickly to meet this overwhelming need. He developed a school that trained physicians, nurses and orderlies in open-drop ether.⁴ However, how could he help these trainees work safely once they left the school and Dr. Guedel's immediate supervision? He prepared a little chart of his version of the signs and stages of ether anesthesia, the most common agent in use at the time and an agent with a wide margin of safety. This chart was a visual version of the concepts he had been developing for himself before his Army service.

Armed with their charts, the trainees went out to nearby hospitals to work on their own. Dr. Guedel was given a motorcycle to make weekly rounds of the six hospitals for which he was responsible. He would roar from hospital to hospital through the deep mud that characterized WWI's battlefields, checking on his trainees. This led to his becoming known as "the motorcycle anesthetist of World War I."³

Dr. Guedel returned to the United States in April 1919.⁴ The same month, he presented the chart at a meeting of the Indianapolis Medical Society and later at the state medical society and the Interstate Association of Anesthetists. In 1920, it appeared in *Anesthesiology*, the only anesthesia journal of the time.⁵ There were still the four accepted stages of anesthesia, but stage III had now been divided into four planes. There were only two eye signs, eyeball oscillation and pupillary dilatation, in the original chart. Entry into stage III, where surgery could be performed safely, could now be determined by the onset of eyeball oscillation. Eyeball oscillation indicated a safe plane; it meant the patient could have surgery and was not too deeply anesthetized. A more dangerous level began when the oscillation stopped. Pupillary dilatation was an indication of deep anesthesia. Dr. Guedel also emphasized the need for the lightest anesthesia possible and the need for deeper anesthesia at certain points of the operation. Because of their simplicity and usefulness, Dr. Guedel's stages and signs became widely known.

Dr. Guedel moved to Los Angeles, California, in 1929 because of his health. In addition to practicing anesthesia, he continued work in his research laboratory at home. Items to come out of the home laboratory during this period were studies of cyclopropane and CO₂, the Guedel laryngoscope blade and the Guedel oropharyngeal airway, which is still in use today. (Work in his home laboratory in Indiana led to the cuffed endotracheal tube while in collaboration with his close friend Ralph M. Waters, M.D.) Dr. Guedel continued working on his chart, further refining it based on his careful observations of clinical cases. A series of four articles on his signs and stages of anesthesia appeared in 1935-36.^{6A-C} In 1937, this revised material appeared in his notable book, *Inhalation Anesthesia: A*




Original hand-drawn copy of the 1937 version of Guedel's stages and signs of anesthesia. Courtesy of Guedel Memorial Center

Fundamental Guide.⁷ There was now another eye sign, the eyelid reflex (previously mentioned) and further refinement of pupillary dilatation. For unknown reasons, the lash and corneal reflexes were still not mentioned. This book went through three editions and was enormously successful, further popularizing the chart. Copies of the chart appeared in other anesthesia texts and also were used by the military for teaching in World War II. A 1972 study of minimum alveolar concentrations (MAC) of various anesthetic agents documented that the pupillary changes of ether correlated with its alveolar concentrations, confirming Dr. Guedel's observations. This was not true of most other agents that were not available in Dr. Guedel's time.⁸

Although of little use to us today, the eye signs developed by Arthur Guedel, M.D., were an important innovation for the time, and their usefulness lasted for many

years. They resulted from his careful, precise observations of his patients in a time of little or no monitoring and limited anesthetic agents. The eye signs were one of the many contributions that led to Dr. Guedel receiving the ASA Distinguished Service Award in 1950.

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Monitoring of Neuromuscular Function: Past, Present and Future

John J. Savarese, M.D.

From the introduction of d-tubocurarine into clinical practice in 1942 until the early 1980s, all neuromuscular blocking drugs were long-acting because they were not metabolized and were excreted very slowly by the kidney. Recovery from paralysis was so slow and gradual that it was difficult to decide at which point clinical function had returned to normal in a patient who was still unresponsive. Consequently, this poorly definable and lengthy period of paralysis required a conservative approach to dosing and reversal, and the importance of testing neuromuscular function evolved out of clinical necessity. Guidelines for clinical practice were badly needed to help ensure safety, particularly during recovery and emergence from anesthesia.

At the time when d-tubocurarine (1942), alcuronium (1964) and pancuronium (1967) were the staple relaxants, Christie and Churchill-Davidson¹ and Katz^{1A} first popularized the use of peripheral nerve stimulation in the mid-1960s (the "Block-Aid® Monitor") to evaluate neuromuscular function. This device applied a twitch (every four seconds) or tetanic stimulation (30 Hz on demand). These investigators popularized the observation and recording of adductor responses from the thumb, elicited via the ulnar nerve at the wrist.^{1A} Shortly thereafter, Ali and others (1971)² introduced train-of-four (TOF) stimulation, and Lee (1975)³ further popularized this technique by quantifying and correlating depth of blockade (percent twitch inhibition) according to the TOF count. The TOF technique has remained the most useful method of evaluation of neuromuscular function in the clinic for more than 30 years because of its simplicity and ease of evaluation and because the stimulus pattern creates its own internal standard each time the response is evaluated; that is, the strength of the fourth response is simply compared with that of the first without the need for establishment of a baseline prior to the administration of neuromuscular blocking drugs.

The trouble is, the TOF response/evaluation needs updating to properly link new relaxants and new techniques to the more stringent safety requirements of today's anesthetic practice. The introduction of double-burst stimulation (DBS),⁴ which enables the practitioner to estimate a depth of paralysis corresponding with a TOF value of about 60 percent, was an advance in this direction. DBS, in turn, usually suggests that the patient will be able to perform clinical tests such as head lift. This test is not discriminating enough, however, to ensure normal function of airway and swallowing reflexes.

Several recent studies⁵⁻⁷ have called for the adoption of a TOF value of 0.90 as an indicator of the ability to protect the airway and to swallow (or vomit) normally. At present, we have no test or response that we can elicit via a nerve stimulator in order to infer a level of neuromuscular function compatible with a TOF value of 0.90. This level of function can presently be measured only by accelerometry, electromyography or mechanomyography and not by any easily observed clinical test that can be performed or without a sophisticated measuring device.

So a test is needed that will tell the clinician that the patient's level of paralysis is compatible with the maintenance of his or her airway, the ability to swallow and with a TOF value of at least 0.90. In addition, the test should be applicable using only a nerve stimulator without the aid of an expensive device to measure the response. What exactly is needed is a new stimulus pattern, more "sensitive" than DBS, to elicit a response that can be seen or felt and is compatible with or indicates a TOF value of 0.90 and the level of neuromuscular function appropriate to that indicator.

The above commentary would be completely pertinent if we continue to practice with current relaxants (intermediate and long-acting nondepolarizers) and antagonists (anticholinesterase agents). What about the future? There are at least two new developments in testing that will change neuromuscular monitoring significantly and dramatically and will thereby alter clinical practice very much in the direction of added patient safety. These drugs and techniques might conceivably render "routine" neuromuscular monitoring unnecessary or at least superfluous in nearly all cases.

The first is a new antagonist, most specific for rocuronium but which may also be given to remove residual paralysis due to other steroidal relaxants such as vecuronium or pancuronium.⁸ This compound is a doughnut-shaped polysaccharide (cyclodextrin) that is negatively



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"There are at least two new developments in testing that will change neuromuscular monitoring significantly and dramatically and will thereby alter clinical practice very much in the direction of added patient safety."

charged and, as a result, is able to chelate the steroidal relaxants and thereby prevent their ability to block nicotinic receptors. The "reversal" is rapid and complete, according to early reports, and the chelating agent has minimal side effects. This may allow the cancellation of relatively deep paralysis without the need for some evidence of beginning recovery such as the reappearance of one or two twitches on TOF stimulation.

The second is the new ultra short-acting nondepolarizing relaxant GW280430A (430A).⁹⁻¹⁰ This nondepolarizer has all the kinetic characteristics in humans of succinylcholine (onset, duration and recovery), is destroyed chemically with a probable half-life of one to two minutes and is noncumulative with minimal side effects. It appears to be the first true candidate to actually replace succinylcholine. If administered by infusion, it can be predicted that patients will recover spontaneously to TOF values of greater than 0.90 within six to seven minutes after stopping the infusion, and this speed of recovery can be expected even if double the dose required to maintain a 95-percent blockade were infused. Since the destruction of GW280430A in the body is entirely a chemical reaction, most likely there will not be any rare exceptions to its normal kinetics. In other words, pseudocholinesterase problems are rare because the drug is destroyed in a chemical reaction requiring no enzymatic catalyst. With this kind of speed of spontaneous recovery, will antagonism of residual blockade ever be necessary?

Will neuromuscular monitoring disappear from clinical practice? Not entirely, I think. Most likely we will be influenced to monitor more for documentation and safety purposes and less for precise control of depth of relaxation. How about the following fantasies? If spontaneous recovery from paralysis occurs in everybody within six to seven

minutes without reversal following 430A, and if the compound always "reverses" block by steroidal relaxants within five to 10 minutes, why bother to monitor at all?

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ASA Monitoring Guidelines: Their Origin and Development

Ellison C. Pierce, Jr., M.D.

Committee on Patient Safety and Risk Management

On October 21, 1986, the ASA House of Delegates approved the ASA "Standards for Basic Intraoperative (now "Anesthetic") Monitoring." How did this come about after a long period of opposition on the part of most anesthesiologists?

In my view, there were two major factors. Beginning in the mid-1970s, the first medical malpractice crisis occurred, brought about by the shrinking availability of insurance as commercial insurers fled the marketplace. The second crisis concerned decreasing affordability as premiums rose to several times previous levels. Anesthesiology premiums were, therefore, among the very highest — in many areas, two to three times the average cost for all physicians. By the early 1980s, anesthesiologists recognized that something drastic had to be done if they were going to be able to continue to be insured.

The other major factor occurred on April 22, 1982, when ABC broadcast its 20/20 program titled "The Deep Sleep, 6,000 Will Die or Suffer Brain Damage." The program described a number of anesthesia mishaps that appeared to have been preventable. The reaction of the public was strong; for months after the broadcast, patients appearing in the operating room for anesthesia had questions about its safety.

Both of these factors pushed anesthesiologists toward development of ways to improve anesthesia morbidity and mortality. Thus the current patient safety campaign was born. As President-Elect of ASA in 1983, I was able to establish a new committee, the Committee on Patient Safety and Risk Management. The concept for such a committee received widespread approval in the Society. One of the committee's early initiatives was the preparation of a series of videotapes on patient safety, now totaling 30, available on the Anesthesia Patient Safety Foundation (APSF) Web site at <www.apsf.org>.

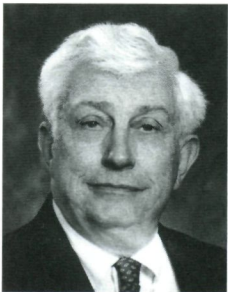
Several other undertakings followed quickly. An International Symposium on Anesthesia Morbidity and Mortality was held in 1983 in Boston, Massachusetts, which resulted in an increased understanding of the safety problems facing anesthesiology. Establishment of APSF was a direct outcome of this meeting. ASA led the medical community with its support of the ASA Closed Claims Study of liability cases under the auspices of the Committee on Professional Liability.

In the early 1980s, Boston was by no means exempt from the crisis; there were a significant number of serious anesthesia mishaps at several Harvard hospitals. The Harvard self-insurance medical malpractice carrier, as a result, established a Risk Management Committee to find solutions. This committee believed that most of the cases involving major morbidity or death were preventable and concluded that better intraoperative monitoring of the patient and the anesthesia delivery systems would give warnings early enough to allow appropriate responses that might prevent the accident.

Many of the incidents involved inadequate ventilation or oxygenation. The committee further believed that the use of minimal safety monitoring requirements as a means of preventing catastrophic accidents needed to be mandatory. It was obvious to the committee that there would be objections on the part of many anesthesiologists to the establishment of standards. It was further recognized that any published standards would have to be considered and approved by each of the department heads with agreement by the majority of their clinicians. After considerable debate, the Harvard Standards for Minimal Monitoring were adopted in March 1985.

Readers interested in examining in greater detail the ASA and Harvard developments may find them in the Spring 1987 issue of the *APSF Newsletter* on the APSF Web site. The Harvard story is seen under the section "From the Literature," and the ASA story can be found under "ASA Adopts Basic Monitoring Standards."

I have been asked several questions during the preparation of this short article. Why was I interested in patient safety in the first place? Well, I would say that from the mid-1960s, when I started collecting examples of anesthesia mishaps, it became more and more obvious that something had to be done. It is interesting that the same was said of the numerous railway accidents in England in the mid-19th century. If it were your child who died because of misplacement of the endotracheal tube during surgery for the extraction of molars, the mortality rate for you was 100 percent.



Ellison C. Pierce, Jr., M.D., is Executive Director of the Anesthesia Patient Safety Foundation. He is currently retired from practice. Dr. Pierce was ASA President in 1984.

What were the challenges? Clearly, it was obvious that many, if not most, physicians resented being told what to do. This, of course, was true in all of medicine, from the early guidelines in cardiology concerning emergency treatment of a myocardial infarction to the listing of indications for carotid artery surgery. It was assumed by many practitioners that any guidelines or standards would be fodder for the plaintiff's attorneys. This, of course, has not been the case.

What were the joys? Certainly, the greatest joy is the knowledge that our specialty has drastically decreased the incidence of anesthesia mortality and morbidity. Anesthesia-related deaths in healthy patients are extraordinarily rare today. It also is pleasing to all of us that the field of anesthesiology is recognized worldwide as the leader in patient safety. Praise for our specialty may be found in numerous publications over the past several years, from the reports of the Institutes of Medicine to specialty journals to the Commonwealth Fund Report on Patient Survey of Error and Quality.

In addition, there is satisfaction in recognizing that anesthesia medical liability premiums have declined significantly. Even in the current medical malpractice insurance crisis, anesthesiology has been less affected than many other specialties. In its dealing with the media and government entities, ASA has justifiably pointed to the success of its efforts in promoting anesthesia patient safety.

Lastly, for the younger anesthesiologists who have not been through these dramatic changes over two decades, a review is available in my 1995 Emery A. Rovenstine Memorial Lecture: "The 34th Rovenstine Lecture — 40 Years Behind the Mask: Safety Revisited," which also is available on the APSF Web site at <www.apsf.org/foundation/rovenstine>.



Washington Report: Senate Fails to Adopt Medicare Drug Bill

Continued from page 4

sible, Low-cost, Timely Healthcare Act of 2002"), which would impose federal MICRA-like limits on professional liability suits and awards. As the House adjourned in late July, that bill enjoyed 103 sponsors and is being strongly supported by medical groups, including ASA.

It is a fact, however, that the House has passed a professional liability bill on several occasions only to have the bill die in the Senate. Even the strongest proponents of liability reform can count only 40 to 45 Senate votes for any kind of medical liability bill; during debate on the drug prescription bill in late July, a professional liability proposal by Senator Mitch McConnell (R-KY), which contained no cap on noneconomic damages, was tabled, 57-42.

Patients' Rights Talks Flounder

Discussions between the Administration and Senate representatives aimed at breaking the logjam on passage of patients' rights legislation appear to be at an impasse over the issue of the extent of liability for erroneous coverage or treatment decisions.

For several months since the passage of patient protection bills by the House and Senate last year, Senators John McCain (R-AZ), Edward M. Kennedy (D-MA) and John R. Edwards (D-NC) have been engaged in desultory negotiations with White House staff in an effort to resolve the different liability provisions of the two bills.

ASA and a large number of medical specialty organizations, working together as the Coalition for Fair Medicare Payment, had endorsed the House bill — supported by the Administration — because it contained the patient protections advocated by those organizations. It also contained liability protections, which although not as stringent as those contained in the Senate bill, were deemed adequate to assure the availability of the advocated protections. Conferees for resolution of the House and Senate bill provisions were never appointed.

Ventilations: Using the ASA Physical Status Classification May Be Risky Business

Continued from page 1

patients were rated identical to the authors' assessments. The other four elicited a wide range of responses. They concluded that the PS scale is a "workable classification" but "suffer(s) from a lack of scientific definition." A

three-page editorial written by Arthur Keats, M.D., in the same issue of *Anesthesiology* simultaneously defended both the classification and the criticisms of the classification. Dr. Keats prophetically states:

"At issue then is the expectation — what the classification system is supposed to do and not do. Progress requires periodic repetition to renew what is forgotten by the sliding scale of memory."²

As recently as last year, Dr. Owens was compelled to address this issue again in *Anesthesiology*. Commenting on a previous article in the journal about variability in surgical procedure times, Dr. Owens succinctly clarified why the ASA classification system does not predict risk, saying, "The kind of operative procedure is not a part of the classification system because a physical status 3 patient is still in that status if scheduled for an excision of a skin lesion with monitored anesthesia care or if scheduled for a pancreatectomy with general anesthesia. The operative risk is different because of the surgery, but the physical condition of the patient is the same preoperatively."⁴

The following questions beg for answers:

Of what value is the physical status classification today?

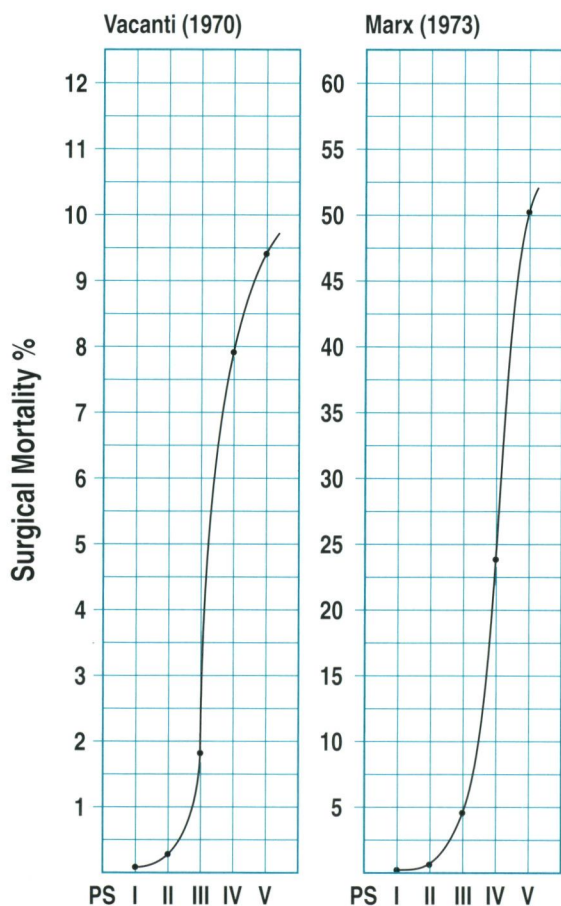
Should it be abandoned, modified, maintained via committee assignment or remain unchanged to allow for the different interpretations by ASA members and other organizations?

It seems to me that we have an opportunity to add to our reputation of being the safest (high-risk) medical specialty. ASA might revisit the PS classification and attempt to expand it into the realm of operative risk predictability. With super computers in the palm of our hands and on every desktop, this generation of anesthesiologists could computerize the data to prospectively assign relative risks.

Consider the variables for determining outcome:

- preoperative medical condition, be it acute or chronic
- selection of anesthetic techniques
- the nature and severity of the operation

Figure 1: Comparison of 2 Mortality Studies



Trends in two separate retrospective studies^{4,5} suggest that information on surgical mortality rates with respect to ASA physical status is similar despite coming from disparate practices.

Figure 2: Anesthetic and Surgical Risk

		Surgical Risk		
		Low	Moderate	High
Anesthetic Risk	Low	Low	Low	Moderate
	Moderate	Low	Moderate	High
	High	Moderate	High	High

The combined risk of the patient's medical condition with the selected anesthetic and the severity of the surgery can be depicted as a three-point (low/moderate/high) medical risk scale.

- surgical skill (experience)
- anesthetic skill (experience)

We could surely set up a matrix that assigns a relative risk to the first three variables while assuming that quality assurance mechanisms and human interactions take care of the last two issues.

Ironically, the old data may provide the foundation for a new classification. In the Keats' editorial, one table cited two large studies by Vacanti and Marx that retrospectively showed surgical mortality rates with respect to physical status. I noticed a trend in both studies — one using 68,000 patients and the other using 34,000 patients.^{4,5} I generated two graphs of the studies: Figure 1 and a second graph using semilog paper (not shown

here). What I found was there is a similarity to the shapes of the curves and their slopes, suggesting that like information is obtainable from disparate practices. In addition, low (PS 1) and high (PS 5) classifications offer little change when compared with PS 2 and PS 4, respectively. Thus, the current five-point scale might simply be reduced to a three-point scale of low/moderate/high medical risk. Assuming that less (i.e., more safe) anesthetics are given as patients' medical conditions worsen, the PS classification in this age of low anesthetic morbidity and mortality might serve as the anesthetic risk factor. Using the same three-point scale for assessing the risk of a surgical procedure, low/moderate/high, a matrix can be formed to assign the combined risk of the patient's medical condition with the selected anesthetic and the severity of the surgery as depicted in Figure 2. I used the combined mortality rates for PS 1 + 2, PS 3 and PS 4 + 5 in the two 1970s studies to roughly predict the surgical risks (as they existed in the 1960s).

My purpose in the brief exercise is not to come up with the "New ASA Operative Risk Classification" but to show that patterns exist among the data garnered over 60 years of assessment to embark on developing a more meaningful assessment scale. Our current PS assessment scale applied to a 1:250,000 mortality risk is meaningless if one was to estimate a 10-fold risk of dying (10:250,000 anesthetics). Perhaps it's time for ASA, the Society of Academic Anesthesiology Chairs, the Association of Anesthesiology Program Directors, the Association of University Anesthesiologists and even the American College of Surgeons to collectively attempt to construct a more useful risk assessment scale for anesthesia/surgery.

In the meantime, my advice to those who must answer questions at headquarters about the predictability of the ASA Physical Status Classifications with operative mortality is simple. The current classification has evolved into a ceremonial exercise engaged by all anesthesiologists in memory of those pioneer physicians who set out to define anesthetic risk in a bygone era. It has little meaningful clinical application in today's practice of anesthesia.

— M.J.L.

Continued on page 32

Monitoring Those Who Monitor

James B. Eisenkraft, M.D., Chair
Committee on Equipment and Facilities

The Committee on Equipment and Facilities identifies and monitors standards-writing activities in regard to equipment and facilities of concern to the ASA membership. Some committee members serve as ASA liaisons to the major standards-writing organizations, in particular, the American Society for Testing and Materials (ASTM) and the National Fire Protection Association (NFPA). Activities at the International Standards Organization (ISO) and the European Committee for Standardization (Comité Européen de Normalization [CEN] and CEN's Healthcare Forum [CheF]) are monitored via United States Technical Advisory Groups (US TAG) to ISO Technical Committees (TC).

ASTM is a not-for-profit organization that "provides a forum for producers, users, ultimate consumers and those having a general interest (representatives of government and academia) to meet on common ground and write standards for materials, products, systems and services." The ASTM Committee on Anesthetic and Respiratory Equipment is designated F-29. One of the better-known ASTM voluntary consensus standards is F1161.88, titled *Standard Specification for Minimum Performance and Safety Requirements for Components and Systems of Anesthesia Gas Machines*. It describes "the requirements to be used in the design of gas machines for human use in order to enhance the safety of the patient and operator." Approved in 1988 and reapproved in 1994, it defined many of the safety features that we have come to expect from our modern anesthesia machines. In 2000, F1161.88 was superseded by ASTM F1850.00, *Standard Specification for Particular Requirements for Anesthesia Workstations and Their Components*, which defines minimum safety requirements for an anesthesia workstation. The latter is defined as a system for administration of anesthesia to patients, comprising anesthesia gas supply device, anesthesia ventilator, monitoring devices and protection devices.

Although ASTM standards such as F1850 are a consensus of producers, users and other interested parties in the United States, it is not a requirement that all new devices conform to such standards. However, an informed consumer would likely prefer to purchase new equipment that did meet or exceed the specifications of the most recent standard.

Recognizing that the anesthesia equipment market is becoming global (and less national), ASTM began in 2001 to reorganize and sought to adopt international standards (ISO) with a one-page cover sheet of American deviations from ISO. Similarly, the ASTM F-29 Committee will be able to submit their standards to ISO for "fast-track" adoption. This should eliminate duplication of effort in writing a standard, although ASTM F-29 retains the option of publishing an American standard in the event that the ISO standard is unacceptable.

In 2001, the European organization CEN/CHeF issued a report on Luer connectors. There had been several incident reports of cross-connects of different systems that used such connectors; mainly enteral feeding being given intravenously and gas being pumped intravenously. The CEN/CHeF report stated that Luer connectors should be used only for intravenous systems. While work on the potential hazards of Luer misconnections is ongoing, the most likely change expected at this time will be that of changing the exhaust port of the respiratory gas monitor to a sleeved male Luer connector and some labeling requirements.

ASTM Committee F-29 on Anesthetic and Respiratory Equipment proposes to bolster patient safety by establishing standard requirements for devices that open airways in supraglottic areas of the throat during surgery. The Food and Drug Administration (FDA) Manufacturer and User Facility Device Experience Database (CDRH MAUDE) includes more than 500 reports of adverse events involving supraglottic airway-like medical devices. Examples of supraglottic devices are laryngeal-mask airways, cuffed-oro-pharyngeal airways, pharyngeal airways, laryngeal airways and seals, and glottic/laryngeal airways and seals not regulated by other tracheal or tracheostomy tubes, oral/nasal airway, laryngoscope or anesthesia-mask standards. The F-29 committee has invited producers and users of these devices, members of US TAG to ISO TC 121 and others to develop a "Standard for Supraglottic Airways." The standard will provide essential requirements for the safe use of devices that open, secure and seal the supraglottic area (above the larynx) typically during anes-



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thetic administration, providing unobstructed airways in patients who are breathing spontaneously or whose lungs are being ventilated. A committee task group will draft the standard as an informational review of current literature and best practices, describing general essential requirements with a suggested risk assessment and specific design attributes when required in the risk assessment.

Other equipment on which standards work by ASTM is ongoing includes nitric oxide delivery devices, respiratory gas monitors, sleep apnea devices, blood/fluid warmers, pulse oximeters and operating room fire safety equipment.

NFPA publishes criteria to minimize the hazards of fire, explosion and electricity in health care facilities. In this past year, NFPA has issued updated 2002 editions of both *NFPA 99 — Standard for Health Care Facilities* and *NFPA 70 — National Electrical Code*.[®] *NFPA 115 — Recommended Practice on Laser Fire Prevention*, published in 1999 is currently being revised with the intention of publishing a new standard in 2003.

The ASA Committee on Equipment and Facilities has undertaken to review and possibly revise the 1988 ASA statement "Policy for Assessing Obsolescence" in relation to anesthesia gas delivery systems (machines). In this litigious yet cost-sensitive era, there is concern as to the appropriateness or advisability of the use of older anesthesia machines and ventilators that may not meet even the ASTM F1161.88 standard. Some believe that the use of such "older" machines, perhaps in office-based anesthesia

practice, may be dangerous. With the recent introduction of the electronic anesthesia workstation, the Committee on Equipment and Facilities also is revisiting the generic *Anesthesia Apparatus Checkout Recommendations*, published by the FDA in 1993.

The Committee on Equipment and Facilities serves a very important function in determining optimum anesthesia equipment and facilities as our specialty continues to evolve. A panel on anesthesia equipment issues is scheduled to be held on Monday, October 14, 2002, from 9-11:30 a.m. at the ASA Annual Meeting in Orlando, Florida.

In October 2002, Daniel E. Supkis, Jr., M.D., will become chair of this committee. He is ideally qualified for this position, having a longstanding interest in standards and equipment and serving as secretary of ASTM Committee F-29. I would encourage anyone with an interest in anesthesia equipment or facilities to become involved with the Committee on Equipment and Facilities and the standards organizations described above. Information on membership in ASTM can be obtained by visiting its Web site at <www.astm.org>. The F-29 committee homepage address is: <<http://www.astm.org/COMMIT/COMMITTEE/F29.htm>>.

Input from practicing anesthesiologists is essential to future success.

Help SEE Into the Future: Become a Question Writer

The Self-Education and Evaluation (SEE) program of ASA is produced with the help of many anesthesiologists. The editorial board of the SEE program is seeking anesthesiologists from the academic and private sector who are willing and able to help "build" the SEE product.

Each of the 100 questions and discussions contained in the SEE program begins with one anesthesiologist reviewing an article sent to him or her by the medical editor of the SEE program. In this first step, after reviewing the article, the first draft of the question and discussion is written. Although the editorial board of the SEE program reviews many additional drafts of this

work prior to final publication, the entire production process is dependent upon this first step. Therefore, success of ASA's SEE program is dependent upon the work initiated by the pool of qualified question writers. It is especially important that individuals with expertise in all the subspecialty areas of anesthesiology participate as this adds to the depth and educational value of the SEE program.

If you feel you might be interested in serving as a question writer, please contact the editor-in-chief of the SEE program, Peter L. Bailey, M.D., at <peter_bailey@urmc.rochester.edu>.

Resource Center at Annual Meeting



For the third consecutive year, ASA will have a Resource Center at the ASA Annual Meeting. This is the one-stop area at the meeting to answer your questions and obtain information on services and programs offered by ASA. The resource center in Orlando, Florida, will be located in the Technical Exhibit Area in Exhibit Halls C-E1 with hours of operation as follows:

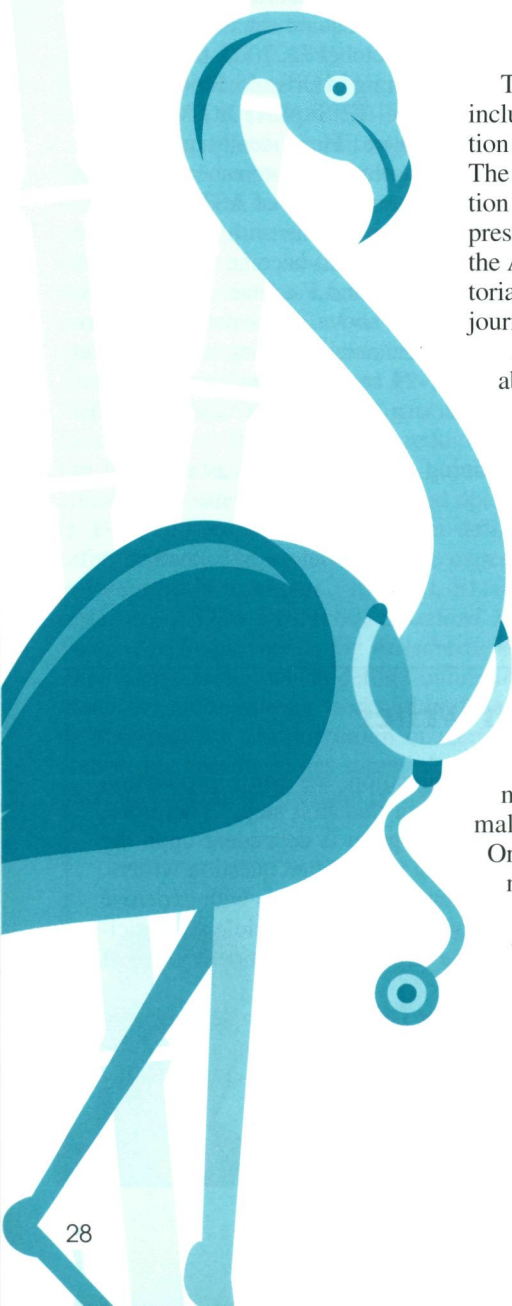
Sunday, October 13	12 noon to 5 p.m.
Monday, October 14	9 a.m. to 4 p.m.
Tuesday, October 15	9 a.m. to 4 p.m.

The committees and organizations involved in this year's Resource Center include the ASA committees on Communications, Electronic Media and Information Technology, Patient Safety and Risk Management, and Practice Management. The Anesthesia Patient Safety Foundation, the Foundation for Anesthesia Education and Research and the Wood Library-Museum of Anesthesiology (WLM) will present exhibits about their current and projected activities. Also available will be the ASA journal *Anesthesiology*. This is your chance to talk to members of the editorial board, find out how to access the journal online and review past issues of the journal.

Access to the scientific papers presented at the Annual Meeting will be available in the Resource Center. Attendees who wish to access the full text of all scientific abstracts may access them from this area of the Resource Center. Information on continuing medical education opportunities offered by ASA, including the Self-Education and Evaluation (SEE) program and workshops, will be available. Computers will be available on which to view the SEE Program. You can also stay in contact with your office or home via e-mail kiosks. Attendees with questions regarding membership and services offered by ASA will have the opportunity to meet with ASA staff to have their questions addressed.

Other services available at the meeting but not included in the Resource Center this year are the Placement Service and ASA Book Sales. If you are looking for an anesthesiologist for your practice or are an anesthesiologist looking for a position, the Placement Service can help. Notice of practice opportunities and positions being sought will be posted on interactive multimedia units. A meeting room will be reserved for people to meet informally to discuss practice opportunities. The Placement Service will be at the Orange County Convention Center in the lobby outside the registration area. The message center also will be in this area and throughout the convention center.

The ASA and WLM publications will be on display and available for purchase in ASA Book Sales. Book Sales will be in room 230C-D.



ASA recently commissioned a survey of hospital administrators to determine the extent and impact of the nationwide shortage of anesthesiologists and nurse anesthetists. We confirmed that both are severe. Information such as the facts that 59 percent of hospitals are currently recruiting anesthesiologists and that 34 percent are supplementing the clinical practice revenues of their anesthesia providers may be useful in some contract negotiations.

Survey Methods

The Tarrance Group, a public affairs research firm with which ASA has worked on several occasions, sent surveys to senior-level administrators at 957 large hospitals with at least 100 beds between March and June 2002. Alexander A. Hannenberg, M.D., Chair of the Committee on Economics, and Washington Office staff participated in developing the 24 survey questions. Our contractor completed 327 interviews (34-percent response rate) by either telephone (36-percent) or mail (64-percent). Hospital administrators were identified through preliminary telephone calls to the entire survey sample of hospitals.

Survey of Hospital Administrators About Anesthesia Coverage

*Karin Bierstein, J.D.
Assistant Director of Governmental
Affairs (Regulatory)*

The responses were divided approximately equally between hospitals with 100-149, 150-249 and 250 or more beds and between the four major regions of the country [Figure 1]. Almost three-quarters of the hospitals use a combination of anesthesiologists and nurse anesthetists. Anesthesiologists provide all the anesthesia care in the other 85 hospitals (26 percent) responding to the survey.

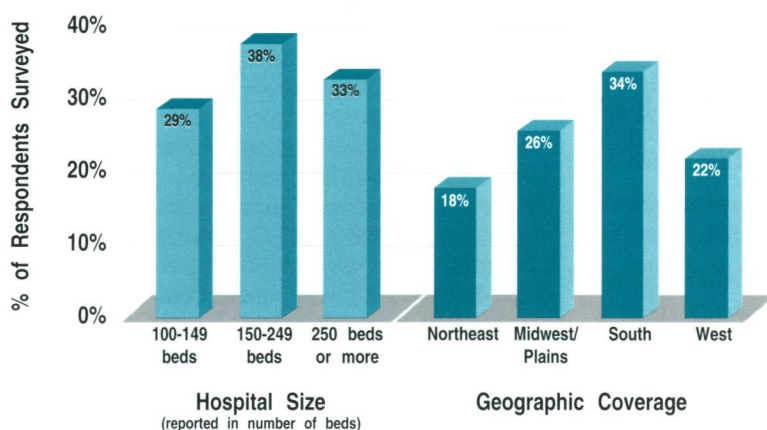
Results

Provider shortage. The survey revealed that almost one-half of the hospital administrators report a need for additional anesthesiologists on staff. This is in spite of the fact that the total numbers of both anesthesiologists and nurse anesthetists have increased at 43 percent and 36 percent of hospitals, respectively. Of the 59 percent with anesthesia groups that are currently recruiting, the majority (57 percent) has been recruiting for more than six months. The supply is clearly not meeting the demand.

Nearly three in 10 administrators indicated that they expect to lose anesthesia providers over the course of the next six months. Sixty-eight percent have lost at least one during the last 12 months; 18 percent have lost four or more providers. The departures are more frequently a function of relocation to other practices than to retirement. Eighty-three percent of hospitals have lost at least one anesthesiologist to relocation versus 24 percent that have lost an anesthesiologist to retirement. This would suggest that competition and better opportunities are causing anesthesiologists and nurse anesthetists to leave hospital positions.

The largest hospitals (250+ beds) are more likely to report that they do not have enough anesthesia providers and that they expect departures than are the smaller hospitals.

Figure 1: Hospital Size (in number of beds) and Geographic Coverage



Economic impact. Thirty-four percent of the responding hospital administrators stated that they are “subsidizing the clinical practice revenues of their anesthesia providers.” Such subsidies typically take the form of stipends for obstetric or trauma coverage, or for medical director or O.R. management services. (The survey of hospital contracts conducted by Genie Blough, MBA, CMPE, and Shena Scott, MBA, CMPE, and reported in the “Practice Management” column in the August 2001 *NEWSLETTER* indicated that 58 percent of the 153 practices responding received stipends. The Tarrance survey terminology and respondent sample probably explain the difference; 7 percent indicated that they were “unsure.”)

Fifty-one percent of the hospitals have had to supplement their anesthesia staff with locum tenens providers or temporary personnel. In locations with a high proportion of government payers (e.g., Medicare, Medicaid, CHAMPUS/Tricare), which usually pay a good deal less for anesthesia services than do private carriers, the cost of the locum tenens personnel is probably significantly greater than the collections for their services. The same may well be true in the case of the 94 percent of nurse anesthetists who are employed by the hospitals, the anesthesiologists, or a combination of the two.

Impact on access to care. Nearly 30 percent of the administrators feel that the low Medicare payment levels for anesthesia are having an impact on Medicare patients’ access to surgical care at their hospitals. Approximately the same percentage reports that the wait time for surgery (for all patients) has increased over the past five years based on the availability of anesthesia care.

Of the nearly one-half of the respondents who have had to limit the number of operating rooms in service or the operating hours of any O.R.s, 73 percent have done so “frequently” or “occasionally.” Twenty-two percent indicate that their anesthesiology departments have curtailed or eliminated services provided outside of the O.R., such as pain management or critical care.

Conclusion

The nationwide shortage of anesthesia providers is creating serious difficulties for hospitals and patients. Nearly one-half of hospitals surveyed report that they do not have enough anesthesiologists on staff; more than half are currently recruiting and a small majority have had to resort to the use of locum tenens providers, who may not improve the efficiency, quality or bottom line of the anesthesia ser-

vice. Administrators of the largest hospitals are more likely to report that the numbers of both anesthesiologists and nurse anesthetists have decreased over the past three years. Consequently, they also indicate that wait times for surgery have increased and that they have reduced the volume of services provided by anesthesiologists outside the O.R. The inadequate numbers of anesthesia providers are having the greatest impact on patients who rely on the largest — and often busiest — hospitals in America.

Report Payer Problems

Do you want help resolving claims disputes with third-party payers? There is strength in numbers: the American Medical Association (AMA) Private Sector Advocacy group has launched a national clearinghouse for complaints against health insurers. ASA has placed the AMA/ASA Health Plan Complaint Form in the “Members Only” section on our Web site at <www.asahq.org>, where members may download the file and mail or fax a completed form to AMA, which will forward a copy to us.

This form asks for data on the types and the severity of the administrative and payment “hassles” that physicians and physicians’ billing offices experience on a day-to-day

REMINDER:

Don’t Miss the Deadline to File for a HIPAA Extension!

To take advantage of the extension of the deadline for compliance with the Health Insurance Portability and Accountability Act (HIPAA) electronic transactions rules, go to <<http://www.cms.hhs.gov/hipaa/hipaa2/ascaform.asp>>.

If you submit a compliance plan by October 15 this year, you will have until October 16, 2003, to comply with HIPAA’s new national electronic transaction standards. Otherwise, your electronic claims will have to be HIPAA-compliant by October 16, 2002.

For further information, see the “Practice Management” column in the May 2002 issue of the *ASA NEWSLETTER*.

basis in the managed care environment. The information will help to identify trends and facilitate discussions to resolve hassles encountered with third-party payers. In addition, the information will be used to promote legislative and regulatory changes to benefit patients and physicians.

The data received will be processed and aggregated in a secure and confidential manner. Physician names are not requested and will not be presented in any of the findings or reports derived from completion of the Health Plan

Source Materials:

- The Tarrance Report executive summary, questionnaire and data tables may be downloaded from <http://www.asahq.org/Washington/Pract_Mgmt.html>
- The AMA/ASA Health Plan Complaint Form may be downloaded from the "Members Only" section of the ASA Web Site <www.ASAhq.org>. To access this section, go to "Professional Information" and then follow the pop-up menu to "Members Only Login."

Complaint Form. If you have any questions or any problems completing the form, please send an e-mail to <HPComplaint@ama-assn.org>. Administrative staff should log in to the ASA Web site using their anesthesiologists' ASA member numbers.

Please join AMA and ASA in our fight against the abusive business practices committed against patients and physicians.

New *e-PM Letter* Posted

We have just posted Volume 2, Number 1 (August 2002) of the *e-PM Letter*, at <<http://www.ASAhq.org/Washington/Newsletters/e-pmletterv2n1.pdf>>.

We sincerely hope that you will find the new issue interesting. We are also open to ideas for or offers of future articles. If you or any colleagues or practice management staff would like to receive their own announcements when new issues are posted, have them add their e-mail addresses to the subscriber list by sending a message with no subject and the single word "subscribe" in the body to: <e-PM-L-request@listserv.ASAhq.org>.

Monitoring: The Story Behind the Story

Continued from page 5

Word of the new acquisition quickly spread via Christmas cards from senior staff members to an alumnus, who also is a consultant to the WLM and an old friend of the donor. He relayed advice from the WLM: "Tell your chair that it is really a very good idea to keep the bottle of Squibb ether in her office. Particularly if she wants to redecorate. You see, Dr. Squibb also had a fire in his office, which was thought to be due to his storage of ether."

Hence the scorched medicine box — now in my office — is a constant reminder of our history and, hopefully, what we can learn from it.

The lesson here: the resources of the good folks at the WLM are seemingly limitless. I hope you enjoy the issue.

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Academics and History: UAB Creates History of Anesthesia Section

David Chestnut, M.D

David Chestnut, M.D., Professor and Chair of the Department of Anesthesiology, University of Alabama School of Medicine in Birmingham, is pleased to announce the formation of the History of Anesthesiology Section within the department's Education Division. This Section will be directed by A.J. Wright, M.L.S., Associate Professor of Anesthesiology, assisted by Maurice S. Albin, M.D., Professor, and Mark A. Mandabach, M.D., Assistant Professor.

The mission of this Section includes several goals. The first is to expose anesthesiology residents, fellows, faculty, medical students and the general public to the historical

developments behind the progress in anesthesiology. A second goal is to enable our residents, fellows and faculty to participate in more advanced studies concerning anesthesia history. Finally, the Section plans to develop ties with scholars in the humanities to gain other perspectives in historical research.

These goals will be accomplished through lectures, exhibits, research in local and other archives, libraries and publications. One of the first projects planned by Section members is to develop a basic History of Anesthesia reading list of primary and secondary materials designed for use by residents and any other interested parties. A combination of lectures and exhibits in March 2003 in conjunction with Doctors Day is also being planned.

For more information, contact:

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Ventilations: Using the ASA Physical Status Classification May Be Risky Business

Continued from page 25

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What's New With SOAP?

Joy L. Hawkins, M.D., President
Society for Obstetric Anesthesia and Perinatology

The Society for Obstetric Anesthesia and Perinatology (SOAP) came into being in 1968 when six anesthesiologists met at Chicago's O'Hare International Airport to discuss the formation of an obstetric anesthesia interest group. They were: Robert D. Bauer, M.D., from University of California-Los Angeles; Richard B. Clark, M.D., from University of Arkansas at Little Rock; James O. Elam, M.D., from Chicago Lying-In; James A. Evans, M.D., from Emory University; Robert F. Hustead, M.D., from Johns Hopkins; and Bradley E. Smith, M.D., from University of Miami.

In October 1968, all anesthesiologists known to be interested in obstetric anesthesia were invited to meet during the ASA Annual Meeting, and the rest, as they say, is history! Today, SOAP is a vibrant organization of about 1,100 members with an active educational program through its annual meeting and newsletter. Those six anesthesiologists, known as the founders of SOAP, were honored with the 2002 Distinguished Service Award at SOAP's Annual Meeting in Hilton Head, South Carolina.

What issues face us 34 years later? This year at the ASA 2002 Annual Meeting, the SOAP Breakfast Panel will be titled "Clinical Dilemmas in Obstetric Anesthesia" and will include discussions about management of the morbidly obese parturient, anticoagulants, regional anesthesia in obstetrics and choosing among options for regional analgesia in labor. The SOAP newsletter publishes a regular "Pro-Con Forum" in which two members debate "gray areas" in the subspecialty. Recent controversies have included whether use of epidural anesthesia for external cephalic version is useful or appropriate, whether provision of regional analgesia for labor requires in-house anesthesia coverage, whether written consent for labor epidurals is necessary, the timing of postpartum tubal ligations and the role of the obstetrical nurse in obstetric analgesia. Suggestions for future topics are welcome!

Separate from clinical controversies are the dilemmas in practice management that have centered recently on two areas. These are the guidelines for vaginal birth after cesarean delivery (VBAC) written by the American College of Obstetricians and Gynecologists (ACOG) and adopted by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and the position state-

ment by the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) titled "Role of the Registered Nurse in the Care of the Pregnant Woman Receiving Analgesia/Anesthesia by Catheter Techniques." Both guidelines have significantly impacted staffing requirements for many anesthesiologists covering labor and delivery units.

ACOG's Statement on VBAC

In 1999, ACOG published a revision of their practice bulletin "Vaginal Birth After Previous Cesarean Delivery."

The guidelines now state: "Because uterine rupture may be catastrophic, VBAC should be attempted in institutions equipped to respond to emergencies with physicians *immediately available* to provide emergency care" and that contraindications to performing VBAC include "inability to

perform emergency cesarean delivery because of unavailable surgeons, *anesthesia*, sufficient staff or facility" (italics are mine). Although ACOG declined to define "immediately available," it was assumed by most that this meant in-house coverage while the woman was in labor. The reality is that many anesthesiologists in the community cover labor and delivery suites from home, and the change to in-house coverage for a service that does not typically allow for reimbursement is a difficult one. Although many anesthesiologists and obstetricians objected to the new requirements, ACOG has stood by its guidelines, noting that this is a patient safety issue and that VBAC is an elective procedure planned as much as nine months ahead so alternate arrangements can be made if necessary. A recent



Society for Obstetric Anesthesia and Perinatology



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article quantified the risk of uterine rupture for VBAC versus elective repeat cesarean delivery.¹ The relative risk of uterine rupture was 3.3 with spontaneous onset of labor, 4.9 with induction *not* using prostaglandins and 15.6 with induction *using* prostaglandins. If uterine rupture occurred, neonatal mortality increased by a factor of 10. The accompanying editorial closed by saying "...a patient might ask, 'But doctor, what is the safest thing for my baby?' Given the findings...my unequivocal answer is: elective repeated cesarean section."² JCAHO adopted ACOG's recommendations into its standards as of January 1, 2001. Some hospitals have chosen not to allow VBACs any longer, feeling they cannot staff appropriately. Others offer patients the option of an elective repeat cesarean delivery or transfer to another hospital where in-house personnel are available. Anesthesiologists should be involved in discussions at their hospitals when VBAC guidelines are decided.

AWHONN's Nursing Guidelines for Labor Epidurals

AWHONN revised its nursing guidelines on epidural analgesia for labor in 2001, stating that nonanesthetist registered nurses should not increase or decrease the rate of an epidural infusion or start one that has been stopped, bolus an epidural catheter from the pump or by other methods, or manipulate patient-controlled epidural (PCEA) doses. Earlier this year, ASA President Barry M. Glazer, M.D., and SOAP President Valerie A. Arkoosh, M.D., jointly wrote a letter to the president of AWHONN, which is available on the SOAP Web site at <www.soap.org>. They make three very important points:

1. Infusion adjustment of a properly placed epidural catheter can be performed safely within defined parameters. Labor nurses adjust other "dangerous" medications such as oxytocin and magnesium once they have received training. In many other settings (postanesthesia care unit, intensive care unit and postsurgical), nurses adjust epidural infusions under a physician's written order, and there are no data to suggest that this practice is unsafe. Labor nurses are capable of the same level of care.

2. The current practice of using dilute solutions for labor epidural infusions makes overdosing nearly impossible. The local anesthetic and opioid concentrations used in current practice are so dilute, the risks to patients are minimal even if catheter migration occurs. Intravenous migration would cause inadequate pain relief rather than any toxic manifestations, and subarachnoid migration would cause increasing motor block rather than hemody-

namic compromise. The nurse would then contact the anesthesiologist to evaluate the patient for pain or excessive motor block.

3. To underutilize all reasonable resources in the delivery of care will mean that ultimately it will be laboring women who lose the most. Nonphysician providers are used increasingly throughout medicine once training and parameters have been provided. The shortage of anesthesiology providers and the increasing demand for labor analgesia mean there is an insufficient workforce to provide all laboring women the care they request. ASA and SOAP believe that labor nurses should be active participants in all aspects of their patients' obstetric care, including pain relief.

Reports of hospitals discontinuing their labor epidural services because nurses have stopped adjusting epidurals, despite a patient-specific physician order, has prompted the California Society of Anesthesiologists to partner with California ACOG to issue a joint letter to AWHONN urging them to revise their position statement and providing a suggested revision. SOAP and ASA will continue to try to work with AWHONN so pain relief in labor can be managed as a partnership.*

The mission of the Society is to promote excellence in research and practice of obstetric anesthesiology and perinatology. Through its annual meeting, newsletters and Web site, the mission continues to be addressed and improvements in health care for pregnant women continue to be made.

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*A statement written jointly by the ASA committees on Pain Medicine and Obstetrical Anesthesia titled "Statement on the Role of Registered Nurses in the Management of Continuous Regional Analgesia," was presented to the ASA Board of Directors at its meeting last month. The statement outlines several duties that can be done safely by registered nurses if they follow a patient-specific protocol written by a qualified physician. The actions of the Board will go to the House of Delegates in October for approval, disapproval or referral.

Once Upon a Conference...

*Carlos O. Viesca, M.D.
Residents' Review Co-Editor*

As residents we are always involved in a lot of work, stress and dreams. One dream concerns acquiring as much knowledge and skill as possible during our training time, and I believe each of us admires the qualities of some of our professors. At some point during our medical education or postgraduate years, we all have heard of or attended a meeting. At those meetings we have been able to witness the ability of great speakers who increase our knowledge base, and we are astonished by the humbleness, kindness and wisdom within these great doctors. It has not been only the advances reached at the investigative level nor the publications, but also the opportunity to share knowledge with peers that has brought us to where we are now.

We have to remember with respect and attempt to honor our predecessors, the pioneers of our specialty, who in the late 19th and early 20th centuries presented to their peers the results of their clinical research. In this way, they initiated the movement that nourished our specialty and helped it grow to be what it is right now and what it will become.

It is in these fertile grounds that medical associations have been created and sustained through to our time. These meetings and conferences are bigger, better and able to display a great array of information in the right amount of time and space. Some of the greatest physicians are invited to impart their knowledge and abilities to others in the same specialty or other specialties and fields. It is always a great pleasure to be able to attend these meetings, and the ASA Annual Meeting happens to be an example of quality, quantity and desire to excel when it comes to sharing information pertaining to our specialty.

The ASA Annual Meeting, to be held this year on October 12-16 in Orlando, Florida, fosters a perfect environment for learning. Its goals are noble and fulfilled as tens of

thousands attend every year. I have still yet to meet anyone in the specialty who is unsatisfied with it. However, not all residents attend this meeting or any other anesthesiology-related meeting.

As residents, we have several obligations, a few rights and a lot of dreams. We dream of being able to sleep at night, enjoy the company of our loved ones, have a good meal and attend a big meeting in anesthesiology. We want to hear the results of investigations, experiences and opinions from the best on subjects that pertain to the daily practice of anesthesia. To a great extent, we aspire to become like them in one degree or another. I would bet that every resident, whether practicing regularly without involvement in the scholastic arena or whether involved in the training and education of new anesthesiologists, has felt this way.

Sadly, however, reality strikes: not all program directors are interested or able to allow their residents to experience this opportunity during training time. Reasons vary with the program, the overall work load and the past experience of those in charge. Many of those in charge feel that the resident can attend any meeting he or she wants, but not until graduation. Not all of us are blessed with an institution that has as part of the curriculum a chance to attend a major meeting in the specialty nor the financial allowance to do it.

At some point during training, every resident should be able to experience this rich exchange of knowledge and ideas.



Carlos O. Viesca, M.D., is a pain medicine fellow at the University of Texas at San Antonio, Texas.

ABA Announces ...

ABA Recertification Examination Dates Scheduled

All certificates awarded by the American Board of Anesthesiology (ABA) on or after January 1, 2000, expire at the end of the 10th year following the year in which the candidate passes the certifying examination. The ABA recertification program is voluntary for ABA diplomates whose certification is not time-limited. ABA diplomates may take the examination by computer at more than 350 test centers during a two-week period, July 12-26, 2003. ABA will inform applicants of the test sites when the list is available.

Diplomates may obtain an application on or after October 15, 2002, either on the ABA Web site <www.ABANES.org> or by writing the ABA at 4101 Lake Boone Trail, Suite 510, Raleigh, NC 27607-7506. Applicants may submit their application to the ABA directly from the Web site or via mail.

The deadline for the ABA to receive completed recertification applications is **December 15, 2002**. The ABA will consider applications received by January 15, 2003, with payment of an additional fee for late filing. *The Board will not consider applications received after January 15, 2003.*

Nine Candidates Announce for Elected Office

Nine ASA members recently have announced their candidacies for elected office. The anesthesiologists and the offices they seek are:

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First Vice-President

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Eugene P. Sinclair, M.D.

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Richard M. Flowerdew, M.D.

The ASA Board of Directors has approved the following regulations for the announcement of candidacies for elected office:

1. On or before August 1, any candidate for ASA office may send to the Executive Office a notice of intent to run for a specific office.

2. The Executive Office shall prepare a list of candidates submitted to be published in the September issue of the *ASA NEWSLETTER* and the Handbook for Delegates.

3. The announcement for candidacy does not constitute a formal nomination to an office, nor is it a prerequisite for being nominated.

4. Nominations shall be made at the Annual Meeting of the House of Delegates for all candidates as prescribed by the ASA Bylaws.

As approved by the Board of

Directors in August 2000, a Candidates' Forum is now available on the ASA Web site. ASA members can view candidates curriculum vitae at <www.ASAhq.org/candidates>.

TEE Workshop Set for Scottsdale

The Workshop on Transesophageal Echocardiography is intended as an introductory course on intraoperative echocardiography. The program will be held on February 2-3, 2003, at the Marriott Mountain Shadows Resort and Golf Club in Scottsdale, Arizona.

This workshop will introduce a number of topics that will provide the basics on the physics of ultrasound, the use of knobs on the echocardiography machine, the components of a complete transesophageal examination along with the corresponding anatomical views and the pathophysiology of valvular heart disease and its intraoperative assessment.

Robert M. Savage, M.D., is the program chair. He will speak on "Basic Cardiac Anatomy and Imaging Planes" as well as the corresponding workshop "Mitral Valves" and the "Valve Workshop." The other faculty and their topics are:

- Solomon Aronson, M.D., "Physics of Ultrasound," "Artifacts and Pitfalls," "Economics of Intraoperative Echo" and in the "Cardiac Anatomy Imaging Plane Workshop";

- Jonathon B. Mark, M.D., "Assessment of the Left Ventricle and Right Ventricle Systolic Function and Regional Wall Motion," "Tricuspid and Pulmonic Valve" as well as the Workshops "Knobology — Improving the Image" and "Valve Workshop";

- Jack S. Shanewise, M.D.,

"Intraoperative Examination: Indications, Contraindications, Safety, Comprehensive Examination," "Cardiac Hemodynamics" and "Hemodynamics Workshop";

- Stanton K. Shernan, M.D., "Organization of an Intraoperative Echo Service," "Thoracic Aorta" as well as "Valve Workshop";

- Lee K. Wallace, M.D., "Common Platforms and Knobs" and the Workshops "Knobology — Improving the Image" and "Hemodynamics Workshop."

ASA is approved by the Accreditation Council for Continuing Medical Education (ACCME) to sponsor continuing medical education programs for physicians. ASA designates this educational activity for a maximum of 14 hours in category 1 credit toward the AMA Physician's Recognition Award. Each physician should claim only those hours of credit that he/she actually spent in the activity.

Registration is suggested by **October 2, 2002**. Registration fees are \$300 for ASA active members, \$125 for resident members and \$750 for nonmembers.

A block of rooms is being held at the Marriott Mountain Shadows Resort and Golf Club until October 11, 2002. Reservation information will be sent to registrants upon receipt of registration.

Book/Multimedia Education Award

The Anesthesia Foundation announces the Book/Multimedia Education Award to be presented at the 2003 ASA Annual Meeting in San Francisco, California.

This prestigious award will be given tri-yearly for excellence and innovation in books or multimedia that have significant impact on the sci-

ence and practice of anesthesiology, critical care or pain medicine. Multiple authors are eligible, with the stipend being divided between the first and senior authors.

The award is \$10,000 plus expenses for winners and guests to attend the Academy of Anesthesiology 2004 Spring Meeting in Victoria Island, Vancouver, British Columbia, Canada.

Deadline for receipt of contributions is **November 15, 2002**. For further information and specific criterion, please contact:

Doris K. Cope, M.D.
UPMC St. Margaret Pain Medicine Center
200 Delafield Ave., Suite 2070
Pittsburgh, PA 15215
(412) 784-5343 telephone
(412) 784-5350 fax

In Memoriam

Notice has been received of the death of the following ASA members:

Quincy A. Ayscue, Sr., M.D.
Norfolk, Virginia
July 8, 2002

Otto K. Bosch, M.D.
St. Paul, Minnesota
March 11, 2002

John W. Bryant, M.D.
Anniston, Alabama
July 30, 2002

Casimir Harris, M.D.
Healdsburg, California
January 12, 2002

Virginia B. Hartridge, M.D.
Rochester, Minnesota
November 22, 2001

Marcel A. Mersch, M.D.
Louisville, Kentucky
May 25, 2002

Kathleen M. Schaefer, M.D.
Tucson, Arizona
April 18, 2002

Samuel B. Singer, D.O.
Manchester, Missouri
March 20, 2002

Physician/Poet: The Next Subspecialty?

The following poem was dedicated to University of Texas Medical Branch faculty and was read at the graduation dinner on June 8, 2002:

Seems like only yesterday when everything was new,
A Macintosh was an apple; a Miller was a brew.
Since the day I started, I've learned so much from you
About ventilators, ABGs and mixed SVO₂.
One night on call as a CA-1, I became a CA-3
'cause a AAA rolled on back, and there was only you
and me!
Should I aspirate a *second* time when I place a spinal
block?
Are you OK with an 18-gauge and only *one* stopcock?
Which I.V. induction agent would you like to use?
I have a nice selection here; which syringe will you
choose?
Propofol, pentothal, ketamine or etomidate,
My job is not to direct, but only to accommodate.
Vapor pressures and intubating doses dance inside my
brain.
There really is so much to know, it's driving me insane.
Sorry about all those pre-op calls while you were home
eating dinner,
But I knew if I didn't make them, you'd treat me like a
sinner!
Besides, knowing too much is always much better than
knowing nothing at all,
But it doesn't matter when your first case is some dis-
aster leftover from call!
With your help, I've learned to keep the anesthetic
goals in focus.
Maintaining normal hemodynamics is not just hocus
pocus.
You showed me how to relieve the pain from a chronic
lower back,
And how to save a patient or two from a scalpel-wield-
ing hack.

I learned to place a labor epidural under your direction,
And I got to see the smiling face as I won my patient's
affection.

But then I had to drop it all, not a dereliction,
Instead, it was to intubate another crash c-section!
I've learned so many things from you and shared so
many cases,

UTMB is a special place, I'll never forget your faces.
As we move on in our professional lives, our paths will
cross again,
And I will always refer to you as my teacher, colleague
and friend.

Jeffrey S. Richards, M.D.
Galveston, Texas

Guardians of Sleep Have No Time to Rest

Dr. Lema's "Where Would You Rather Be But Right
Here, Right Now?" in the April 2002 ASA
NEWSLETTER literally brought tears to my eyes. I was
afraid that I was alone in my feelings; now I know that I
am not.

Despite all of the obstacles that have been placed
before us in patient care, we still are granted that unique
privilege of treating those who need us most. To have
strangers quite literally place their lives in our hands, to
guide them through the psychological and physiological
stresses of the perioperative period and to do it in a fash-
ion that preserves their dignity and soothes their psyche is
indeed a gift and privilege. I feel bad for our colleagues
who have forgotten this, or worse, have never felt this
way. They have a job; we have a profession.

Production pressures, financial pressures and the
decrement in the quality of life that modern-day anes-
thetic practice is subject to are all undeniable. I expect
that those of us fortunate enough to have practiced in the
1970s and 1980s, when these were not issues, are suffer-
ing the worst from having known the "good times." For

The views and opinions expressed in the "Letters to the Editor" are those of the authors and do not necessarily reflect the views of ASA or the NEWSLETTER Editorial Board. Letters submitted for consideration should not exceed 300 words in length. The Editor has the authority to accept or reject any letter submitted for publication. Personal correspondence to the Editor by letter or e-mail must be clearly indicated as "Not for Publication" by the sender. Letters must be signed (although name may be withheld on request) and are subject to editing and abridgment.

those who have known nothing else, this is "business as usual." This realization came to me several years ago when interacting with a senior medical student who reminded me that he had nothing to compare American medicine with!

Despite this, whenever I lecture to students or residents or precept them clinically, I remind them of how remarkable it is, the trust that our patients have in us. I remind them that it is more precious because it is so acutely earned. More often than not, we meet our patients minutes before surgery (not the day before) where we must establish rapport and earn their trust so that they can comfortably and confidently lay their lives in our hands. They must know that we will not "drop them" by doing anything other than providing 100 percent of our effort and attention in their behalf. We cannot breach that trust.

Thank you for your wonderful editorial.

Shepard B. Stone, PA
Branford, Connecticut

No Choice But to Retire

I read the June *ASA NEWSLETTER* on professional liability. I thought the subject was very important. Each article was well done.

I retired on June 30, 2002. I've planned this action for several years, so the malpractice premiums were not a deciding factor. Last November my net premium increase was over 34 percent. This was on top of a similar increase the year before. I was glad that I had decided to retire!

Recently two surgeons asked me to consider working in a surgical center one or two days a week. I looked at the numbers, the types of cases (mostly Medicaid and Medicare) and pointed out to them that my income would barely cover expenses (including malpractice insurance premiums). It just is not worth the risks involved.

Besides, my mind was made up, and I was ready to move on. Thanks for the well done job you do as editor.

James R. Moyes, M.D.
Lubbock, Texas

Tort Reform for the Common Good

Dr. Lema's June's editorial, "America the Suable," focuses on the problems with our legal system. While doctors have always complained about medical malpractice insurance, the situation has never been as bad as this. A true crisis exists that will eventually involve the entire country. Those of us practicing in the Philadelphia area can attest firsthand to your observations. Neurosurgeons, orthopedic surgeons and obstetricians really are moving out of the area, limiting their practices or retiring early. As you pointed out, the problem goes beyond medical malpractice to involve the entire tort system.

There is a ray of hope. This unsustainable situation has been recognized by many prominent individuals with political backgrounds. I would like to call everyone's attention to a bipartisan organization known as "Common Good." Common Good is allocated to a radical overhaul of America's tort system. The Board of Directors include many prominent individuals from both sides of the political spectrum, including: George McGovern, Newt Gingrich, Alan Simpson, Paul Simon, Richard Thornburgh, Tom Kean and many others. Anyone interested in this subject should visit the very informative Web site: <www.ourcommongood.com>.

While change will certainly be slow, there may be a light at the end of the tunnel.

Joseph L. Seltzer, M.D.
Malvern, Pennsylvania



FOUNDATION FOR ANESTHESIA

EDUCATION ■ RESEARCH

Anesthesia's Emergency Room

Sean K. Kennedy, M.D.

Foundation for Anesthesia Education and Research Board of Directors

Although there was much discussion over the exact wording of our mission statement, all agreed that our focus is on education and research – the “ER” in FAER. In Orlando this October, FAER continues its two-pronged efforts at highlighting research and educating physicians.

On Monday, October 14, at 2 p.m., James C. Eisenach, M.D., will deliver the FAER Honorary Research Lecture — the “R” in FAER. Immediately following that talk comes the “E” in FAER — the annual FAER panel discussion, this year titled “Anesthesiology and Palliative Medicine — Is It Part of Our Mission?” (Panel members are listed below.)

The panel’s goal is to help educate the anesthesiology community about an increasingly important but largely hidden area of medical practice: palliative medicine. Great strides in medical care have meant longer survival times from illnesses that once brought quick mortality. In some cases, we have seen cure; in other cases, longer survival but reduced quality of life. The rapid growth of hospice care is one inevitable result. What should be the role of anesthesiology, if any, in this field?

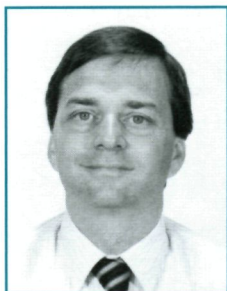
For many patients, the major determinant of “quality of life” during the terminal phase of an illness is pain. Pain becomes the dominant force in the terminal patient’s life, and the will to live then depends on pain relief. With ade-

quate pain control, issues of assisted suicide may become moot; poorly controlled pain creates despair that leads to such a request. With adequate pain control, patients can die on their own terms. Many say they want to die at home, not in a hospital, but pain stands in the way. The pain doctor becomes the most important physician in this patient’s life. Who should that doctor be?

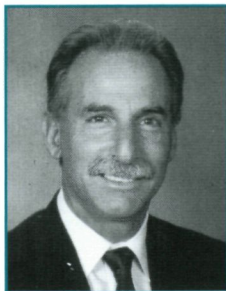
Palliative medicine requires a whole different orientation to success. We are used to a cure equaling success and death symbolizing failure. Now that death is inevitable in the short term, the focus must shift to quality of life, a shift not easily made by many physicians, including anesthesiologists. In addition, we are in the midst of a growing shortage of trained anesthesiologists in the operating room, a situation that would be made worse by siphoning off some to nonsurgical practice. Is this the right time to expand the specialty into yet another nonoperating room site?

The FAER panelists will tackle these issues and more that always come from the audience. Our goal is to educate, to look at all sides of this complex issue from the perspective of physicians who are on the “front line.” Palliative medicine is still in its formative stage, and anesthesiology’s involvement has yet to be defined. This is the time for a thoughtful, comprehensive, in-depth discussion of anesthesia and palliative medicine. Is it part of our mission?

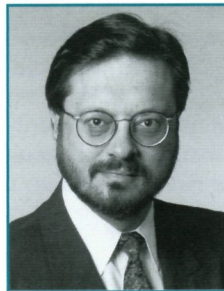
Members of FAER Panel on Anesthesiology and Palliative Medicine



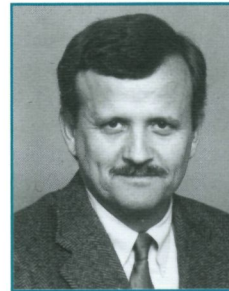
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Tufts University*



*Perry G. Fine, M.D.,
University of Utah*



*Mark J. Lema, M.D.,
Ph.D., University at
Buffalo, State University
of New York*



*Ronald D. Miller, M.D.,
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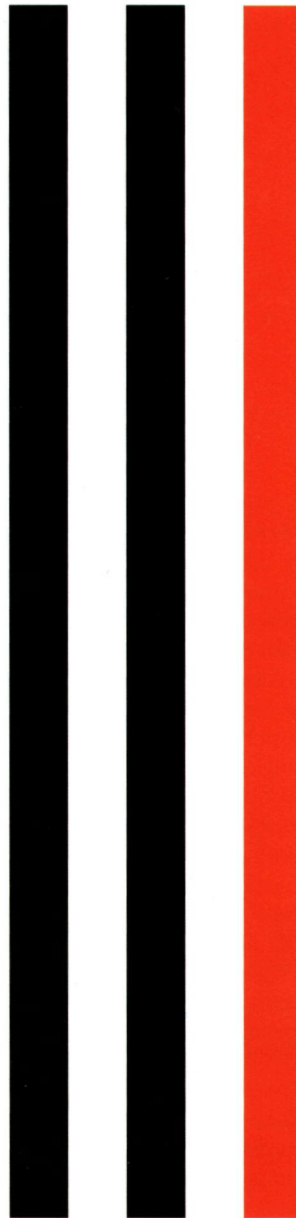
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