



AUA

Association of University Anesthesiologists

Update

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A Personal Interview With William K. Hamilton, M.D.

The following is an interview of Dr. Hamilton by Matthew Mazurek M.D., Southern Arizona Anesthesia Services, P.C., Tucson, Arizona. Dr. Mazurek completed his residency training at the University of California at San Francisco (UCSF) in 2005.

Can you tell me something about where you grew up and where you spent your formal education?

I was born in Guthrie Center, Iowa, and attended high school in Panorama, Iowa. Both of these *small* towns were in the southwest portion of the state. I graduated with a B.A. in 1943 and my M.D. in 1946. Both degrees were earned at the University of Iowa. I completed my residency in 1951 after I had done my internship in Duluth, Minnesota.

Why did you choose to go to medical school?

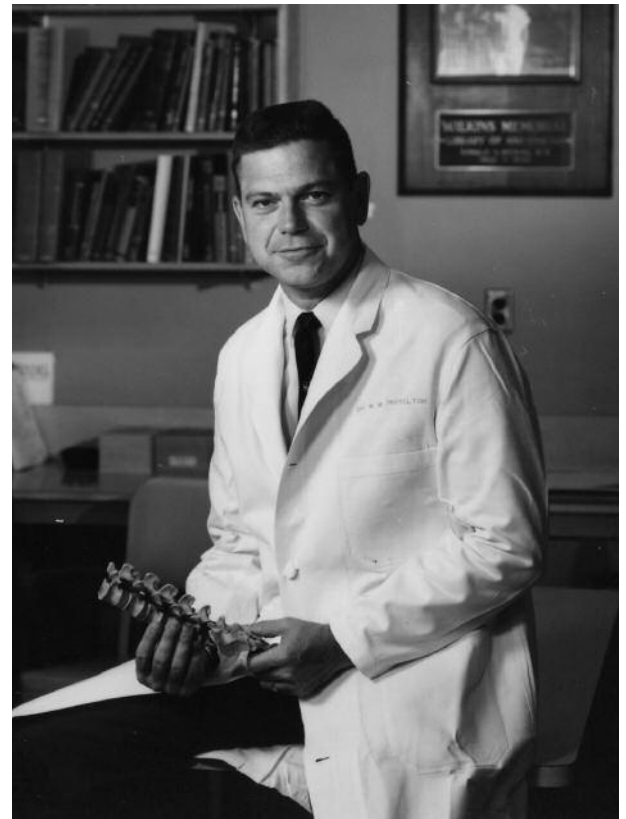
No one in my family was a physician, and I don't recall a specific incident which made me decide to go to medical school. I was impressed with two general practitioners in my hometown of Panorama. One of them actually delivered me, and the other was a neighbor. They were respected citizens in the community. I also had two sisters who had done some nursing training as well, and maybe that also had some influence. I never could claim a noble calling or specific feeling of being a great benefactor of mankind. It was just a very attractive career to me.

It sounds as if you "wandered" into medicine?

It was more than a wandering, as I think about it. I wasn't interested in engineering or law. I might have been interested in journalism but never gave any other career much time.

You attended medical school during World War II. Can you tell me more about your service?

All educational programs were compressed and "hurried" during the war. After a few months of my freshman year, the government realized the great need for physicians in the military and they took over the medical and dental schools. The male students were enlisted in either the Army or Navy and



Dr. Hamilton at the University of Iowa, circa 1950.

attended school in uniform. We went to school year-round and finished a four-year curriculum in just 36 months. We were then commissioned in the service and had two years of obligatory service following internship. Internships and residencies also were compressed — nine months was considered a "year."

How did you happen to choose the field of anesthesia?

I don't really know why I chose anesthesia. Dr. [Stuart] Cullen as a teacher and role model was probably the most

A Personal Interview With William K. Hamilton, M.D.

important factor. Additionally, physiology and pharmacology were two very favorite subjects, and anesthesia seemed to be solidly based in those two fields. My anesthesia rotation was the last rotation of my senior year. Dr. Cullen knew us by name and gave us responsible jobs. This, of course, captured our attention, and he lectured to us in a very meaningful and realistic fashion. Then in internship I ran into another individual, F.C. Jacobson, M.D., who came to St. Luke's in Duluth, Minnesota, to start an anesthesia department. His contributions to the community and the department were so impressive it cemented my decision to do anesthesia.

Why did you choose academic medicine?

I can never answer the question as to why I chose academic medicine with certainty.

I was a resident in the late 1940s, and polio was still a major cause of morbidity and mortality. At the University of Iowa, the anesthesia department was involved in the care of polio patients because, at that time, there were no modern intensive care units. Polio patients were kept on a separate ward and in isolation. I became involved in caring for these patients and developed a keen interest in respiratory physiology. The care of a patient with polio required the same level of care as if one was taking care of an anesthetized patient in the operating room. Other specialties were not as in tune to this fact as we were. It was a real chore to take care of these patients because in Iowa in the summer it was hot and humid and air conditioning was not used as it is today, and these patients also had copious secretions in this environment. The patients were placed in tank respirators, and it was difficult, physically, to take proper care of them. The anesthesia department at the University of Iowa was one of the first to obtain a major role in the care of patients outside of the operating room.

In 1958, at only 35 years old, you became the chair of the department of anesthesia at the University of Iowa. To achieve this position at your age was remarkable given the amount of time necessary to obtain the credentials to chair a department today. Can you elaborate?

It was not so remarkable at the time. There were probably more jobs than there were people willing to take them. I know I was quite frightened by the position. I knew no one in their right mind would take a residency with me when they could go elsewhere and have famous people teach them. Recruitment was tough then — even more so than now, I believe. The salary differential at the time was a factor of six!

You held this position for nine years at Iowa, and then, as if history was repeating itself, you became chair at UCSF after Dr. Cullen accepted a position as dean of the medical school. Why did you leave Iowa?

I was torn between my longtime affection for the University of Iowa and the potential to do more with the Cardiovascular Research Institute (CVRI). I had previously been offered opportunities to leave Iowa, but this time, my experience with



Dr. Hamilton addressing the 9th World Congress of Anaesthesiologists in 1988.

Dr. Julius Comroe in 1961 greatly influenced my decision, and my daughter said, "Dad, you've already been here. Do something new!"

Can you expand on this experience at the CVRI?

I spent one year in the Cardiovascular Research Institute while on sabbatical from Iowa in 1961-62. This unit was directed by Dr. Comroe, probably the most well known and respected person in his field at the time. I worked with Dr. John Clements and Dr. William Tooley on a project with lung surfactant. It was a great experience.

Was this your most enjoyable research experience?

Yes. I was on sabbatical from the University of Iowa and could devote a lot of time to research. I worked with some great people and learned the concept of discipline for good research and learned many techniques and, at the time, the CVRI was probably at the center of great research in respiratory physiology. I already mentioned my work with surfactant.

Dr. Phil Larson and I, with the aid of Dr. David Bristow under the supervision of Dr. Elliot Rapaport, studied ventricular compliance and the comparative effects of halothane and cyclopropane. We learned the technique that allowed us to measure ventricular compliance on a beat-to-beat basis. We did all of this at night, as there was no lab space during the

day. Dr. Comroe had a policy that we work on no more than one major project and that this was to be done during normal business hours. We broke all of the rules, were never caught with this transgression, and had a productive study!

When you were chair at UCSF, you made many changes to the anesthesia department, and one of those was creating a new compensation system that helped attract more staff. Can you elaborate on this?

When I arrived at UCSF, the department was just nine years old. We needed the growth of faculty in the worst way, and increased financial support from the state and municipal sources was not available. The policy at that time was that essentially all our clinical income — which was a nice amount — was distributed to the faculty. This meant that additional faculty would simply reduce the income of all the physicians. This was not attractive, but after three or four years, a new salary scale was established, which allowed us to recruit. The faculty accepted this quite well, realizing it necessary to make us a better department with increased teaching and research activities — in other words, it allowed us to become a better academic department.

What do you feel is your greatest contribution to UCSF's anesthesia department?

This is a difficult question to answer. I suppose you could get the best answer by asking those who were there with me at the time. I believe my effort to balance both the clinical and academic mission was essential, and we did this well, I believe. I recall now there was a great need to improve the clinical performance of the department, and this did surprise me. I also tried to instill the attitude that it was more important for graduating residents to ask the right question than to repeat known answers to questions posed by the examining board.

When looking back on your career, is there anything else you would like to mention?

I would like to mention the great pleasures I experience from relationships with many colleagues of those days. Mostly these are former residents and faculty from Iowa and mostly from UCSF. Drs. George Gregory and Bob Hickey honor me with frequent dining adventures. Dr. Ron Miller continues to invite me to department social functions, where I visit with many. I also have continuing contacts with some who served on the American Board with me and shared experiences in organized medicine groups here in California and on a national basis. I firmly believe that whatever income I surrendered at the beginning of my university career has been repaid many-fold. I wouldn't consider doing it any other way.

A Giant Has Retired From the Anesthesiology Scene!

By Thomas H. Cromwell, M.D.

Dr. William K. Hamilton, Vice Dean of Clinical Affairs and former Professor and Chairman, Department of Anesthesiology, University of California at San Francisco has stepped down.

My wife and I attended a dinner in honor of his retirement recently—an elaborate affair attended by several hundred professors, deans, and scientists of world renown. Accolades were presented by the University Chancellor, Dean of the School of Medicine, Director of the Medical Center, and of course, present Chairman of the Department of Anesthesiology at UCSF, Ron Miller. Given that kind of talent it would have been presumptuous of me to offer any remarks. But let me do so in the context of the *CSA Bulletin*, for as Dr. Hamilton mentioned in paying tribute to Julius Conroe and Stuart Cullen: "If someone has contributed to your career, let them know it while they are still around."

Dr. Hamilton has indeed contributed to my career. My entire career has evolved from, and revolved around William K. Hamilton. Dating back to my sophomore year in medical school in 1965, my interest in anesthesiology originated through lectures by Bill Hamilton, then Chairman of the Department at the University of Iowa. During my senior year I was given the unique opportunity to accept a "board job" with the Department of Anesthesiology—a concept originated by either

Stuart Cullen or Bill Hamilton in which a handful of senior students were selected to work with anesthesiology residents throughout the year. It was at that point that I made my career choice.

In 1967 at the invitation of his mentor, Stuart Cullen, Bill Hamilton accepted the Chairmanship at the University of California San Francisco, vacated by Dr. Cullen who became Dean. I followed and



Hamilton Tribute—Cont'd

at UCSF, which included a number of individuals heavily involved in academics and medical politics: Bruce Cullen, Ron Miller, Bob Stoelting, Dave Cullen, Tom Joas, and Richard Johnston, to name but a few. We, of course, admired him greatly for his clinical expertise and passion for teaching. But he and his wife Shyrlee still managed to remain part of the gang—faithfully attending our functions and giving many of their own. During the past 15-20 years in San Francisco, my wife and I have remained close friends of Bill and Shyrlee. We have been invited to CAL football games, quite miserable football until a couple of years ago, but still an opportunity to spend some time with the Hamiltons. We have donned the black and gold and rooted vociferously for the Iowa Hawkeyes when a game is televised. Whenever I am in need of advice, whether it be clinical, administrative, or purely personal, I continue to give Bill Hamilton a ring. As was stated in remarks that evening by someone more eloquent than I, "he has a passion for honesty and excellence."

It is curious that despite a nearly 30 year relationship with Bill Hamilton, I remain confused about how to address him. During my residency days it was of course, "Dr. Hamilton," but I now have too much grey hair for that and my midwestern ethic still does not allow me to address him as "Bill." So I guess "Boss" will still suffice. In spite of that confusion, Bill Hamilton along with Stuart Cullen, have been the major role models in my professional career and for that I will always be thankful.

A past master at the use of colloquialism, Bill Hamilton quoted another philosopher who loved colloquialism, Dizzy Dean, "it ain't really braggin if you done it yourself." Bill Hamilton has done it all! Yes indeed, a giant has retired from the anesthesiology scene. We wish him the best.

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Do You Have

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Mark J. Lema, M.D., Ph.D., President
American Society of Anesthesiologists

Introduction

Changes in the practice of both medicine and anesthesiology over the next decade are inevitable and imminent. Health care delivery is likely to be dominated by lesser-trained personnel to improve access to care and reduce costs. Hospitals will likely become inpatient intensive care unit (ICU) facilities where surgical and medical care is fused. Many specialties, including surgeons, internists, hospitalists and anesthesiologists, will compete for inpatient care. Payment of professional fees is in jeopardy of being reduced as minimally invasive surgeries expand. These potential reductions in payment for services will undoubtedly change supervisory ratios beyond 4:1 and challenge the ability of physicians to provide solo care.

Clinical Practice Changes

Futurists predict that “the future of surgery is medicine.” Clearly surgical trends in the development of laparoscopic, robotic and gamma knife surgery support this assessment. Thus expansion of conscious sedation nurses will continue as they are popular for simple procedures, less expensive than nurse anesthetists, anesthesiologist assistants or anesthesiologists, more easily controlled by proceduralists and, in some cases, can have their services billable.

Anesthesia coverage for high-risk, medically necessary procedures is fully supported and defended by the American Society of Anesthesiologists (ASA). In the matter, however, of ASA supporting the use of propofol for endoscopy, it will be hard to convince the Centers for Medicare & Medicaid Services (CMS) and private payers that only anesthesia providers can safely deliver this drug. Endoscopists are accumulating data to show that propofol is as safe as midazolam and fentanyl when used by conscious sedation nurses, and it's less expensive under their care. Because CMS currently pays more than \$64 million just for one endoscopy Current Procedural Terminology™ code, it is likely that a marked increase in payment for endoscopy anesthesia will result in CMS reducing payment to compensate for the increased volume, leading to anesthesiologists being given an “underfunded” mandate to provide care.

Changes in Payment

Payment restructuring may be necessary as the population ages to make Medicare the predominant payer for anesthesia services. Our Relative Values Scale differs from the Resource-Based Relative Value Scale used by other specialties. As a result, CMS pays anesthesiologists less than 40 percent of payers' fees while the rest of medicine receives more than 80 percent of their customary fees. By 2030, anesthesiologists could receive as much as 70 percent of their payments from CMS —

a payment shift that would drive down salaries. Thus the ASA Committee on Economics is being proactive by evaluating alternative methods of payment that acknowledge our perioperative services in addition to our expertise in complex cases. The committee will look to stratify payments so that “practice guides payment” when selecting practice styles and not vice-versa. Currently this analysis is largely a “disaster preparedness” exercise. Our current assignment of time and base units in light of dramatic changes in surgical techniques has fostered an atmosphere of “payment guiding practice.” It's now more lucrative to anesthetize short, simple cases with rapid turnover rates than complex cardiac surgery requiring continued vigilance. As a result, graduating residents often seek positions at ambulatory surgery centers instead of continuing to develop their skills in tertiary medical centers while preparing for board certification.



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

“Future medical practice paradigms should not be viewed as whether our specialty will survive but into what anesthesiology will evolve.”

Academic Anesthesiology

Curriculum restructuring to emphasize perioperative care, critical care, preoperative assessment and pain medicine will become necessary for future anesthesiologists to compete in the new health care paradigm. Continued emphasis on operative skills is likely to reduce the size of our specialty or reduce payment for services as anesthetic techniques simplify commensurate with the less-invasive surgical procedures being performed. Moreover a number of simpler diagnostic procedures are at risk for becoming a generic anesthetic application monitored by an increasing number of nonanesthesia professionals.

The CMS Teaching Rule has been hurting our training programs. In 1994 there were 162 programs. Today 130 programs

to Give to Our Future?

exist with several on probation. Failure to resolve this obviously prejudicial government policy will surely result in more programs closing because faculty can't be freed up to teach or cannot be recruited. The new Democratic Congress will be educated on this topic, and we will seek support for reintroducing our bills in 2007.

Regardless of the plight of our academic programs, all anesthesiologists should be engaged in conducting research in clinical outcomes and patient safety. These studies will become increasingly important in demonstrating our superior safety record and value to patients and payers as competition for our services from both non-M.D. providers (nurse anesthetists, conscious sedation nurses) and nonanesthesiology physicians (ICU/emergency room) intensify.

Research — The Key to Our Specialty's Health

Jerry Reves, M.D., Dean at the Medical University of South Carolina and 2006 ASA Emery A. Rovenstine Memorial Lecturer, said: “[Our lackluster research effort] must improve if we wish to sit at the table as peers with our academic colleagues in the halls of academe...for if not, I fear a future where anesthesiology will be viewed merely as a necessary, but only a technical specialty, irrelevant to mainstream medicine.” Somehow, during this upheaval in health care, anesthesiology must not forget its core mission of research to improve patient care and safety. Research got us where we are today — a respected specialty — and it will keep us in the limelight if we persevere.

The Counter Argument

Despite evidence and trends indicating that health care changes are imminent, there are several unresolved problems preventing timely implementation of new paradigms. Projected physician shortages across all specialties will certainly forestall efforts to restructure health care and will perpetuate the current “free market economy.” Supply-and-demand principles will prevail, and “boutique medical care” could become a prominent part of health care delivery for those who can afford it. To counter this trend, the U.S. government would be forced to spend hundreds of billions of dollars to support Medicare and Medicaid in order to keep physicians practicing in low-income settings, for elderly care and for medical training centers. Medical education would need to be heavily subsidized in order to survive, and loan debts would need to be partially forgiven for new physicians entering a public health service environment. Finally, the “silo system” of care will dominate health care and develop differently in metropolitan communities based on their mix of resources. Physicians in short supply are likely to be recruited like sports players to more affluent communities in need of specific services (neurosurgeons, obstetricians, intensivists, etc.).

The future may be cloudy, but some things are crystal clear. Spiraling health care costs are crippling this nation's ability to

compete on an ever-flattening playing field. Any windfall payments that benefit certain physicians will abruptly end as disruptive technologies and HMOs find innovative ways to eliminate or markedly reduce the services of high-cost providers. For physicians, it's better to be part of the solution than part of the problem, even if it means leading health care reform by cutting our losses.

The 3-Percent Solution

Embattled military troops work together to win campaigns. Each soldier relies on his or her own resources to defeat the enemy. Depending on or expecting one's compatriots on each side of that soldier to carry the load weakens the assault, places decisions on others and jeopardizes the success of the mission. If each anesthesiologist took it upon himself or herself to take action, we would have 42,000 “soldiers” addressing our challenges. If each practicing physician donated 3 percent of his/her clinical hours (about two hours) each week engaged in advocating for political issues, nine 10-hour days could be reserved each year to lobby lawmakers!

If each physician contributed a mere 0.03 percent of his/her net income (about \$56) to political action committees, 30,000 active ASA members would contribute more than \$1.7 million for state and national lobby efforts. Currently only 10 percent of our membership contributes to the ASA Political Action Committee (ASAPAC) for lobby efforts that could increase or prevent decreases in physician income.

Finally, if physicians in clinical practice spent 3 percent of their work week (about two hours) engaged in the education and/or training of fellows, residents or medical students, we would get them excited about a career that many of us would choose again if we had a second chance. It will advance our specialty and keep all who are involved current in anesthesia issues and practices.

Conclusion

Future medical practice paradigms should not be viewed as whether our specialty will survive but into what anesthesiology will evolve. You can help through volunteerism in the form of sitting on one committee at your hospital, local or state medical or anesthesiology society, or the American Medical Association, or ASA. You can attend political fundraisers locally and get to know your representatives. You can support letter-writing to state legislatures or Congress. You also can support the various PACs so that your politically active colleagues can speak on your behalf.

Remember that those who went before us fought to make anesthesiology a real medical specialty and advanced it so that it is now one of the safest higher-risk medical specialties. The torch has been passed on to us to advance our profession. Let's not douse the flame in the sand as we drop the torch to deal exclusively with immediate concerns. Look down the road to see the contour of the course. We will all benefit.

God bless America and ASA.

ABA- ASA

In-Training Examination: A Valuable Assessment Tool

“The test is extremely reliable, valid and especially well-designed to assess the knowledge of the graduating resident.”

*Robert Gaiser, M.D.
University of Pennsylvania
Philadelphia, Pennsylvania*

The American Board of Anesthesiology/American Society of Anesthesiologists (ABA/ASA) In-Training Examination (ITE) is an annual test offered on the second Saturday in July. The purpose of the test is to assess the resident's knowledge in anesthesiology as well as to provide feedback to the program and residents to improve the educational mission. A program director will receive a copy of the scores for each resident in the program as well as a comparison of the program to a calibration group. The test is extremely reliable, valid and especially well-designed to assess the knowledge of the graduating resident.



Robert Gaiser, M.D.

Background

The ITE is an achievement test that is administered to current and graduating residents. It is offered across the United States and Canada on the same day with various sites serving as testing centers. The test will be offered by computer for graduating residents by 2009. An examinee must bring proper photo identification and a pencil. An examinee is not permitted to bring electronic equipment, cellular telephones, hats, pocketbooks or book bags into the examination area. In order to ensure standard conditions at all testing sites, a proctor is hired. The proctor documents the examination conditions such as temperature of the room, noise level and the presence/absence of the examinee. The proctor must bring a stopwatch to allow for all candidates to receive similar time to complete the examination.

Test Description

The test is designed to measure a resident's knowledge in the field of anesthesiology in which an overall score is reported. In 2006, subscores were reported for 13 areas: Anatomy, Anesthesia Processes, Cardiovascular Anesthesia, Hematology, Neurologic Anesthesia, Obstetric and Gynecologic Anesthesia, Pain, Pediatric Anesthesia, Pharmacology, Physics Equipment, Physiology, Regional Anesthesia and Respiratory Physiology/Thoracic Anesthesia. These subscores allow a program to evaluate these components of the educational process. Since each of these areas had many fewer questions than the overall examination, the subscores exhibit large standard deviations. The subscores can therefore provide a general idea of knowledge in the area, but the large standard deviations prohibit further in-depth analysis such as rigorous comparisons of examinee performance among these subscore areas.

The ABA/ASA Content Outline serves as both a study guide for the resident and a blueprint for the examination. The content outline is reviewed periodically by the ABA/ASA Joint Council on In-Training Examinations (seven representatives each from ASA and ABA) for currency and relevance. An updated version was reviewed and approved in 2006.

Scoring

Instead of a percentile correct score, a scaled score is reported. The scaled score is computed using a standardized proficiency measure and standard deviation. The score indicates the performance on a scale that is not affected by test difficulty. The score may range from a low of 1 to a high of 60. A norm table is provided which allows one to compare one's score with scaled scores of residents at a similar level of training. This table displays the percentage of residents in the group of interest who scored lower.

Reliability

In classical test theory, it is assumed that a person's observed score on a test is composed of a true score plus some unsystematic error of measurement. A person's true score would be the average of scores if a person were to take the test an infinite number of times. Clearly this is not possible, so a true score can never be measured exactly; it is estimated from the examinee's observed score. Reliability is defined as the ratio of true score variance to observed score variance. Because the variance of true scores cannot be computed directly, reliability is estimated by analyzing the effects of variations in conditions of administration and test content on observed scores.

Reliability can be estimated by test-retest coefficient (giving the same test some time later) or parallel-forms coefficient (having the person take similar tests). In both instances, the scores on the two separate administrations are correlated to estimate reliability. Both techniques also are unfeasible for the ITE, as it is a long test that involves a significant amount of time and money to create. Given that test-retest and parallel forms are not possible, internal consistency is used. With internal consistency, a single test is viewed as two parts measuring the same thing. Scores for the separate parts can be generated and correlated.

A test may be divided in many different ways into two halves containing equal numbers of items, each resulting in a slightly different value for the reliability. One solution is to take the average reliability coefficient obtained from all split halves by using a formula developed by Kuder and Richardson. This form of reliability is performed for the ITE and was high for the 2006 examination (0.88). With an estimate of reliability, true score variance can be calculated. The ITE also reports the standard error of measurement, an estimate of the standard deviation of a normal distribution of test scores that would be presumably obtained by a candidate who took the test an infinite number of times. For the 2006 examination, the mean standard error of measurement was 1.7 points on the 1 to 60 scoring scale. With this value, confidence intervals for true scores can be determined.

Validity

Validity refers to the extent to which a test measures what it was designed to measure and to the value of the score. If the test were not valid, the person's score would not be interpretable. A test may be reliable without being valid, but it cannot be valid without being reliable. To be valid, a test may relate the scores to a criterion measure (criterion validity). A test also may be correlated to a similar established test to demonstrate its validity (construct validity). Neither is applicable for the ITE.

For the ITE, content validity is used. Content validity assesses whether the domain of anesthesia is measured. The test is constructed based upon a blueprint using the content outline. The blueprint, which is periodically assessed and approved by the ABA/ASA Joint Council, "weighs" the importance of any given part of the content outline by determining the number of examination questions that come from that content category. Questions are written by junior editors and then reviewed by senior editors, the Joint Council and then a

final review by the chair and vice-chair of the Joint Council, respectively. Quality control procedures are implemented at each stage of test development to ensure that standards are met. Before scoring the examination, items are analyzed to check that they are correctly keyed and free of defects. Items for which a minority of graduating CA-3 residents responded correctly or in which a negative discriminant value existed (those items in which low scorers answered correctly while high scorers did not) are reviewed by a panel of Joint Council members. If the items cannot be verified, they are not scored and are discarded. This review and deletion process improves the validity of the test.

Conclusions

It is important to realize that the reliability estimate was determined for the calibration group. The calibration group consists of residents who recently completed residency. While reliability is high for this group, reliability is not estimated for the other groups. The test is reliable for graduating residents. For other residents at different levels of training, the reliability is not known but most likely reflects the high reliability for graduating residents. The reason for using residents completing residency as the calibration group is that motivation clearly affects reliability and that this group should possess the greatest knowledge among those tested.

A resident who is taking the ITE for board certification is the most motivated candidate. Unreliability can result from measurement errors produced by low motivation, fatigue or external factors such as an uncomfortable environment. Does this mean that scores for residents in training are not meaningful? The answer to this question is a definite no, but programs should use the results wisely. A table allows for the comparison of a resident's score to scores of other residents at a similar level of training. In essence, a rank is generated. With ranking, someone must always be in the lower end. A low percentile rank does not necessarily infer lack of knowledge in the area, especially since the average ability of residents (as judged by ITE scores) has been steadily increasing in recent years. Care must therefore be used in interpreting the rank. Some programs use an ITE threshold score for retention/dismissal of residents. I would caution against this use.

The test is clearly a well-designed tool that allows for the valid and reliable estimate of achievement in anesthesiology for the graduating resident. I cannot make the same statement for residents at other levels of training because the statistics are not known. Rather than using the score as a sole criterion for retention or dismissal, trends in a resident's ITE scores and interpretation of the ITE score (and subscores) in the context of the resident's overall performance are probably more helpful. The ITE provides a valuable sketch about residents in training, but it cannot complete the picture.

When Did the Revolution Start?



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Surgical education and the residency model as we know it can be substantially traced back to William S. Halsted, M.D. He is credited with starting the first surgical residency training program in the United States.¹ This model is now being challenged and transformed.

First, a disclosure: This is not an academic treatise. It is a view from a bridge being built between academia and industry — a revolution of sorts.

Evolution or Revolution?

Are we in the midst of evolution or revolution? If we are changing only the *how*, it is an evolution in which we are doing *things better*. If we are changing the *what*, it is a revolution where we are doing *better things*. Only time will tell. In many residency programs, there is a drive to establish objective assessment as the standard of measure and proficiency-based promotion to higher responsibilities, replacing the concept of program years. There is a shift from clinical responsibilities for residents to education and learning as their purpose during residency. This has resulted in a drive to create a standardized national curriculum for surgical residencies and the acceptance of surgical simulators as a critical teaching and assessment tool.

Genesis of Reality-Based Simulation

The beginnings of virtual reality-based surgical simulators can be traced back 15 years. In those days, one could count on one hand the number of medical journal articles published on the topic per year. Today we see that many each month. In the early days, just the mention that simulation would someday be used for certification and credentialing in a surgical meeting could be reason to be thrown out. Today boards and committees within professional surgical societies are discussing these topics and endorsing them. The first 12 years or so saw almost no progress in acceptance; the last few years have seen tremendous discussion. Currently there is a mandate by the Residency Review Committee-Surgery that every surgical residency program have a skills laboratory based on the latest technology by the end of this year and that a standardized national curriculum by the leading societies be developed. Moreover surgical residencies are poised to release residents from clinical duties to participate in simulation activities.

Shifting Into a Different Gear

When and why did this shift come about? The early days of simulation were already promoting the ability of simulations to measure just about anything imaginable within the area of technical skills. The first metrics looked at time and efficiency of movement and were almost immediately challenged as not saying much about what makes a good surgeon. From a technical side, we (i.e., industry) immediately challenged the surgical educators to tell us what constitutes valid metrics, and we got a long story but no answers. This challenge, however, stimulated a series of conferences led by Richard M. Satava, M.D. (University of Washington Department of Surgery) and other thought leaders to define a taxonomy of surgical skills that had to be mastered, metrics to assess those and, finally, a taxonomy of surgical errors. Around the same time, Richard Reznick, M.D. (University of Toronto Department of Surgery) was publishing a series of landmark articles on assessing surgical skills based on trained observers, multiple simple tasks and a standardized rating schema.

Winds of Change in Surgical Education

All this would have remained as interesting academic endeavors except that a publication of the report on human errors in medicine piqued the public interest.² This sparked the challenge for reform in both education and processes in health care with associated measurement of progress.

Those Leading the Change

The exact chain of events that took place within the surgical societies will be told by the insiders who worked for change. What we can surmise by reading the literature is that the American Surgical Association convened a blue ribbon committee to report on the state of surgical education and make recommendations for change.³ Some of the committee members were pushing for more fundamental change than could be arrived at by consensus.⁴ The American College of Surgeons (ACS) started an initiative to establish credentialed education institutes to make sure the critical elements of surgical education could be uniformly found at leading centers and set an example for others to follow. Finally the American Board of Surgery, ACS and the Association of Program Directors in Surgery joined efforts to create a standardized national curriculum in three phases. This effort not only sets forth what has to be learned but also defines how the various skills can be acquired and how outcomes can be measured to ensure a uniform product, which is a critical requirement for patients. These events were a clear outcome of a marketing study fielded for a surgical device company a few years back. A representative sample of surgical patients — three months postoperatively, given the choice between guidance to find the best doctor for their particular illness versus the confidence that any doctor they chose would be equally good — overwhelmingly voted for the latter.

To attest to the speed of change, ACS has already accredited the first 10 centers (www.facs.org/education/accreditation/program/list.html) since the concept was first publicly discussed, less than three years ago. The first phase of the curriculum project is now almost complete, and the group has been expanded to include a broader subset of the professional societies this past November (home.absurgery.org/default.jsp?newsscoremtg).

The Revolution Evolves

Given that the current surgical education model has been in use for a century with minimal change, what we are witnessing today is no less than a revolution in surgical education. Mostly, educators who have embraced simulation have done so by continuing to teach the same way — just replacing one teaching venue with the other. The goal of creating 21st century teaching models can only be reached by developing new ways to teach based on enabling 21st century tools.^{5,6} The education community can certainly help us to create better teaching models, allowing us to connect the mental maps separating the experts from the novices in a much more direct way than random patient encounters and thousands of cases.

In retrospect, change will seem to have happened at break-neck speed. In reality, changing the course of history is not measured in a single moment but in the slow progress that moves us toward our goal.

References:

1. Halsted W. The Training of Surgeons. *Bull Johns Hopkins Hosp.* 1904; 15(162): 267-276.
2. Kohn LT, Corrigan JM, Donaldson MS (Committee on Quality of Health Care in America, Institute of Medicine), eds. *To Err Is Human: Building a Safer Health System.* Washington, DC: National Academy Press; 1999.
3. Debas HT, et al. American Surgical Association Blue Ribbon Committee Report on Surgical Education: 2004 Residency training in surgery in the 21st century: A new paradigm. *Ann Surg.* 2005; 241(1):1-8.
4. Pellegrini CA, Warshaw AL, Debas HT. Residency training in surgery in the 21st century: A new paradigm. *Surgery.* 2004. 136(5):953-965.
5. Sachdeva AK. Acquiring skills in new procedures and technology: The challenge and the opportunity. *Arch Surg.* 2005; 140(4):387-389.
6. DaRosa DA, Bell JRH. Graduate surgical education redesign: Reflections on curriculum theory and practice. *Surgery.* 2004; 136(5):966-974.

“ Given that the current surgical education model has been in use for a century with minimal change, what we are witnessing today is no less than a revolution in surgical education. ”

54th Annual Meeting • April 26-29, 2007

Sheraton Chicago Hotel and Towers

Thursday, April 26

5 – 8 p.m.
Registration

8 – 10 p.m.
Welcoming Reception

Friday, April 27

7 a.m. – 5:45 p.m.
Registration

7 – 8 a.m.
Continental Breakfast

8 – 8:15 a.m.
Introductions
Jeffrey L. Apfelbaum, M.D., C. Michael Crowder, M.D., Ph.D.

8:15 – 10:15 a.m.
Oral Presentations

1. *Norepinephrine Deficient Mice are both Hypersensitive to the Hypnotic Properties of Volatile Anesthetics and Demonstrate Delayed Emergence From Anesthesia*
Max B. Kelz, M.D., Ph.D.
2. *General Anesthesia Alters Phosphorylation of the Synaptic Vesicle Trafficking Protein Synapsin in Rats*
Deborah J. Culley, M.D.
3. *Anesthetic Inhibition of Firefly Luciferase Revisited: Is the Mainstream Heading in the Right Direction?*
Yan Xu, Ph.D.
4. *Dissecting the Role of the GABAAR β 3 Subunit at Inhibitory Synapses in the Hippocampus Using Etomidate-insensitive GABAAR β 3(N265M) Knock-in Mice*
Claudia Benkwitz, M.D., Travel Award
5. *Synergy and Antagonism of Multiple Volatile Anesthetic Effects in a Computational Model of the Thalamic Network*
Allan Gottschalk, M.D., Ph.D.
6. *Isoflurane Induces a Vicious Cycle of Apoptosis and A β Accumulation*
Zhongcong Xie, M.D., Ph.D.
7. *Isoflurane Induces Cytotoxicity by Activation of IP3 Receptor*
Huafeng Wei, M.D., Ph.D.
8. *Isoflurane Protects Against Renal Ischemia-reperfusion Injury via Activation of Sphingosine Kinase*
Minjae Kim, M.D. 

Chicago

10:15 – 10:20 a.m.
Presentation of Travel Awards

10:20 – 10:45 a.m.
Coffee Break, Poster Viewing and Discussion

10:45 – 11:45 a.m.
NIH Session: Challenges and Opportunities for the National Institute of General Medical Sciences
Jeremy M. Berg, Ph.D.

11:45 a.m. – 1:15 p.m.
Group Luncheon

1:15 p.m. – 2 p.m.
ASA President's Address
Mark J. Lema, M.D., Ph.D.

2 – 3:45 p.m.
EAB Session – Part 1: Resident Issues That Affect Every Training Program
Moderator: James R. Zaidan, M.D., M.B.A.

2 – 2:20 pm.
The Disruptive Resident Experience From a Program
Steven J. Barker, Ph.D., M.D.

2:20 – 2:40 p.m.
Record Keeping, Counseling, Steps to Dismissal
James R. Zaidan, M.D., M.B.A.

2:40 – 3 p.m.
Return to Residency Aftercare and Recovery
Catherine K. Lineberger, M.D.

3 – 3:20 p.m.
Experiences With the Law ADA and FMLA as They Apply to Residency
M. Christine Stock, M.D.

3:20 – 3:45 p.m.
Question-and-Answer Session

3:45 – 4:15 p.m.
Coffee Break, Poster Viewing and Discussion

4:15 – 5:45 p.m.
AUA President's Panel: Strategies for Keeping Academics in Academic Anesthesiology

4:15 – 4:30 p.m.
Overview and Review of Issues
Roberta L. Hines, M.D.

4:30 – 4:45 p.m.
FAER Medical Student Anesthesia Research Fellowship
Alan D. Sessler, M.D.

4:45 – 5 p.m.
Innovative Resident Training Progress for Future Academic Physicians: The APGAR Program
Margaret Wood, M.B.

5 – 5:15 p.m.
Interdisciplinary Research: Our Answer to the Roadmap
Laura E. Niklason, M.D., Ph.D.

5:15 – 5:30 p.m.
Emeritus Faculty: An Underutilized Resource
Fredrick K. Orkin, M.D., M.B.A., M.Sc.

5:30 – 5:45 p.m.
Discussion Session

5:45 p.m.
Evening on own

Saturday, April 28

7 a.m. – 5:15 p.m.
Registration

7 – 7:45 a.m.
Continental Breakfast

7:45 – 11:35 a.m.
The University of Chicago Hospitals Host Program

7:45 – 8:35 a.m.
First Steps: Discovering the Earliest Creatures to Walk on Land
Neil Shubin, Ph.D.

8:35 – 9:25 a.m.
The Dead Sea Scrolls Controversy – How It Happened and Where It Stands Today
Norman Golb, Ph.D.

9:25 – 9:50 a.m.
Coffee Break, Poster Viewing and Discussion

9:50 – 10:45 a.m.
Pheromones, Social Scents and the Unconscious
Martha McClintock, Ph.D.

10:45 – 11:35 a.m.
The Dark Side of the Universe
Edward Kolb, Ph.D.

11:35 a.m. – 12:45 p.m.
Luncheon

11:35 a.m. – 12:45 p.m.
Resident Luncheon

12:45 – 1:30 p.m.
AUA Business Meeting

1:30 – 2:30 p.m.
SAB Plenary Session
Charles Berde, M.D., Ph.D.

2:30 – 3:45 p.m.
Moderated Poster Session

3:45 – 5:15 p.m.
EAB Session – Part 2: Entrepreneurial Strength as a Goal of an Academic Department
Moderator: William E. Hurford, M.D.

3:45 – 4:05 p.m.
Practice Management Consultation: Using an Academic Approach for Development of Optimal Practice Patterns
Franklin Dexter, M.D., Ph.D.

4:05 – 4:25 p.m.
How to Facilitate Successful Implementation of Inventions and Patents
Warren M. Zapol, M.D.

4:25 – 4:45 p.m.
Telemedicine: The Journey From Concept to Commercialization
Michael J. Breslow, M.D.

4:45 – 5:05 p.m.
Utilizing the Strength of a Well-Organized Academic Department to Benefit From the Positive Margin of Local Community Practices
Alex S. Evers, M.D.

6 – 10 p.m.
Reception and Dinner at the Museum of Science and Industry

Sunday, April 29

7 – 10:30 a.m.
Registration

Program information continued on next page.

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7 – 8 a.m.
Continental Breakfast

8 – 10 a.m.
Oral Presentations

9. *High-Resolution Phenotyping the Arg16/Gly Beta 2-adrenergic Receptor Polymorphism in Humans: Where Are We Now?*
John H. Eisenach, M.D.
10. *Functional Status Is a Predictor of Outcome After Vascular Surgery in ASA III Patients*
Nader D. Nader, M.D., Ph.D.
11. *The Effect of Hypotension, Venous Congestion, and Anemia on Porcine Optic Nerve Blood Flow*
Lorri A. Lee, M.D.
12. *Role of Regional Selective Dysfunction of CA1 Hippocampal Astrocytes After Transient Forebrain Ischemia*
Rona G. Giffard, M.D., Ph.D.
13. *Inappropriate Stat-3 Signaling in Lethal Sepsis Is a Result of Failed Phosphorylation of Proteins in the IL-6 Pathway*
Kenneth M. Andrejko, D.O.
14. *Human Embryonic Stem Cells as a Model of Fetal Alcohol Syndrome*
Marie Csete, M.D., Ph.D.
15. *Critical Roles of Inflammatory Cells in Flow-induced Outward Vascular Remodeling*
Tomoki Hashimoto, M.D.
16. *Cytochrome P450 Reductase and Cytochrome b5 Compete for a Binding Site on Cytochrome P450 2B4*
Lucy A. Waskell, M.D., Ph.D.

10 – 10:30 a.m.
Coffee Break, Poster Viewing and Discussion

For complete meeting information, visit:

www.auahq.org

Drawing by Elise Kofke



**How to staff
remote site anesthesia ...**