Neurobehavioral Pharmacology of Anesthetics and Analgesics

by Igor Kissin, M.D., Ph.D.

When I came to America in 1978, MAC had been an index used to measure all aspects of the anesthetic action. If one of the anesthetic components could not be measured with MAC, it was usually declared a non-essential property of anesthesia. My first research project was born as a hypothesis that questioned the above concept; it was related to the measurement of anesthetic potency. This question has continued to intrigue me for the past 25 years and led to a series of publications based on an idea that general anesthesia represents not a single general anesthetic action but a spectrum of separate pharmacological actions, even if anesthesia is produced by one inhalational agent. As a result, the characteristics of an anesthetic agent depend on the relative strength of various independent actions that constitute the components of anesthesia (unconsciousness, absence of movement to noxious stimulation, attenuation of autonomic responses, etc.). The development of this concept resulted in a conclusion that the search for a reliable index of anesthetic depth should continue on page 2.

A Passage from India

by Bhavani Shankar Kodali, M.D.

It is a great privilege to be asked to write for our wonderful new magazine. My story may not be as adventurous as Life of Pi, nor as exciting as a James Bond thriller; still, I have made an effort to make it interesting and educational.

Looking back into my life, it seems that the path I followed was one predetermined by the Will of God rather than by my own deliberate planning or ambition. After completing high school in Delhi, I was unsure about what to pursue, so I wrote entrance tests for both medical and engineering schools in India. Results of the engineering school were announced first, and so I joined the Indian Institute of Technology, a premiere institution on the east coast of India, in Madras. It turned out to be only a diversion though. An unexpected telephone call from my father changed the course of my life one day, when he asked if I wanted to switch to medicine, insisting on an answer in 60 seconds! Only the previous day, I had been joining two 8˝ long pieces of metal using ARC welding electrodes for the first time. The electrode got stuck to the metal at least twenty times during the 8˝ run and the final joint line looked like venous waveforms rather than a straight line. I believe this frustrating experience had more to do with my decision than any cajoling my father did, although I’m not sure anymore; my three brothers were engineers and my parents did wish for me to pursue medicine. In 48 hours, I found myself in an entirely different domain—a federally administered, well laid-out campus situated on a hill facing the Bay of Bengal, where, for the next 10 years I would be awakened each morning by the bright rays of the rising sun flashing through the windowpanes.

There were two principal reasons why I chose to pursue
be transformed into a search for separate indices of different components of anesthesia. We now continue to work in this direction using animal experiments to study anesthetic interactions.

Another area of investigation is preemptive analgesia. Preemptive analgesia is a treatment that prevents establishment of the altered sensory processing that amplifies postoperative pain. The treatment should cover the entire duration of high-intensity noxious stimulation that can lead to establishment of central and peripheral sensitization caused by incisional or inflammatory injuries (during surgery and the initial postoperative period). Two approaches have been used to reveal preemptive analgesia. One of them is to demonstrate a reduction in pain intensity and/or analgesic use beyond the drug presence in the biophase. This approach is based on a study design comparing preoperative treatment and nontreatment groups (PRE versus NO). The other approach is to prove that a treatment applied before surgery is more effective than the same treatment provided at the end of surgery (PRE versus POST). The present direction of our investigations is to prove that full potential of preemptive analgesia can be revealed only with PRE versus NO approach. The other condition is the completeness of interventions suppressing C and Aδ fibers central input.

One of our projects is based on the idea to use vanilloid agonists for the blockade of peripheral nerves. Vanilloids bind to the transient receptor potential type channels (TRPV1) and cause nerve desensitization. We have shown that vanilloids can provide selective (C fibers and Aδ fibers) and long-lasting (days) neural blockade. Extension of the traditional local anesthetic blockade into the postoperative period presents a problem for early mobilization (rehabilitation) after surgery and when protective sensation is required. Vanilloid agonists have an advantage in this regard. They do not affect non-painful sensation to touch and pressure or motor function. Our experiments demonstrated that perineural resiniferatoxin (vanilloid agonist) prevents hyperalgesia in a rat model of postoperative pain. This result may indicate a new direction for peripheral analgesia. Presently we are using electron microscopy to confirm that resiniferatoxin does not cause any morphological changes in C fibers.

Anesthesiology as my career choice. Looking back at the history of medicine, it seemed to me that anesthesiology was the one branch that was undergoing tremendous changes that had an influence on other medical specialties. And secondly, this is the only branch of medicine where you can exercise your will on any individual under your care—we pretty much decide when an individual should sleep or wake up!

I started my career during the Ether/Trilene era with no electronic monitoring, and have witnessed the monumental progress within the field to the Desflurane/Sevoflurane/Propofol era, with the present-day electronic monitoring without human touch altogether. The Anesthesia Machine was simple, with two cylinders on the side, oxygen and nitrous oxide, with or without gas pipelines. The vaporizers were “flow by” (plenum vaporizers) for Ether and Trilene. The ether vaporizer was equipped with a copper plunger to bubble gases through—copper having a high specific heat to provide latent heat of vaporization. The anesthesia circuit was Mapleson A for spontaneous ventilation (best for spontaneous ventilation—an exam question!) and closed circuit for controlled ventilation. The ventilator was the most sophisticated yet known to man, with two palms with five fingers each. The I:E ratio, inflation pressure, and frequency of ventilation were servo-controlled electronically by the cortex and sub-cortical structures. This servo hand-controlled ventilator gave us tremendous experience in judging lung compliance with its “hand feel”, particularly to detect endotracheal tube obstruction with secretions in children and neonates and pulmonary edema during cardiac cases (mitral volvotomy). Mapleson B was never used. Mapleson C was the handiest circuit for short-term ventilation during ECTs, and Mapleson D along with Bain circuits (modified Mapleson D) was used for facial and head and neck surgeries.

Epidurals were singe-shot, with sharp 20 gauge needles; 15 to 20 ml 0.25% Bupivacaine provided preemptive analgesia for long surgical procedures with general anesthesia supplementation. Monitoring consisted of finger-felt radial, temporal or dorsalis pedis pulse and a manual mercury
manometer. Ventilation was by hand as well—the longest hand ventilation case, I remember, lasted an interminable 8 hours! Later, hand ventilation was replaced with the Manley Ventilator; the accompanying disadvantage of this system was the lack of a warning system to detect accidental disconnections.

After my initial medical training and anesthesia residency, I decided to spend a few years outside of India. My first assignment landed me in the dense rainforests of Guyana, the only English-speaking country in the South American continent. If I had known earlier about the Jim Jones mass suicide story (over 900 people dead), or the communal violence in Guyana, I would certainly have thought again. As it happened, I landed at the small airport in Guyana and found myself without a welcoming ride; I was the lone occupant of a taxi going through pitch-dark highways. I noticed that houses along the way were built on wooden pillars or stilts. Before I could ask why, I noticed several checkpoints along the way where the police were interrogating with pointed guns while inspecting cars. At every checkpoint, my driver would yell, “I am taking a Doc!” be waved through, and then hurriedly reassure me that I had absolutely not the slightest need for worry in his safe hands. To add to the nightmare, I asked about something I could not well discern on the dark roads, golden streaks shining brilliantly in our car headlights—I should never have asked! I nearly had a cardiac arrest when I was coolly informed of what these streaks were—poisonous snakes infesting the dense forests—hence the houses on stilts! The following day I also learnt that the increased security I had witnessed on the way from the airport was due to large-scale communal violence that had recently taken place. The hospital in the mining complex was too small for me after the large teaching institution I had attended. The entire hospital was a wooden shack. I was the sole anesthesiologist with one nurse anesthetist. This assignment did, however, give me my first publication—a letter to the editor. One morning, I entered the operating room and was startled to find oxygen and nitrous oxide lines cross-connected. This should not be possible with the Boyles Major machine of late ’60s, as the pin Index system was implemented in the ’50s after one of Alfred Hitchcock’s thrillers. My examination revealed that this particular late-model machine did not have the requisite pin index system!

Neither the snakes, nor the hospital in Guyana were palatable for me. Every time I walked on the road, I was looking for snakes; anything that moved in front of me was a snake until proven otherwise. It was time to make a move.

The move was to Barbados, a tiny island of 155 square miles with a population of 250,000 and a hospital of 650 beds catering to about one million people from neighboring islands; from Grenada in the south to Anguila in the north. Pregnant women for cesarean delivery had general anesthesia irrespective of weight or airway. There were only two anesthetic circuit systems in use when I made my entry into the island—Bain-system for all adults, and Mapleson F for newborns and children. There was a good variety in anesthetic management and cases were challenging. A day generally started with an elective list, with occasional interruptions for cesarean deliveries requiring general anesthesia; it usually ended with anesthesia for newborns with TOF or congenital diaphragmatic hernia.

Most of my research projects were focused on the problems or interesting clinical observations that came by me during my clinical practice there. It was sheer coincidence that I got involved in capnography. During one of my frequent visits to the medical library in Barbados, I came across a paper entitled Flow requirements of Bain anesthetic system during cesarean delivery. To recapitulate, a flow rate of 70 ml/kg/min will maintain normocarbia, and 100 ml/kg/min will result in mild hypocarbia during controlled ventilation with Bain anesthetic system in non-pregnant subjects. The authors of the study had stated that a flow rate of 120 ml/kg/min was required to maintain normocarbia during cesarean delivery. The authors did not measure arterial blood gases directly, but determined arterial values (PaCO₂) indirectly based on measurements of end-tidal carbon dioxide levels (PETCO₂); they assumed that
PaCO\textsubscript{2} is higher than PETCO\textsubscript{2} by 4–5 mm Hg (4–5 mm Hg is the normal gradient in non pregnant patients). Prior to this publication from England, I had had the opportunity to evaluate arterial blood gases during cesarean delivery under general anesthesia using the Bain system, as this was the circuit commonly in use in Barbados. An FGF of 100 ml/kg/min during cesarean delivery maintained normocarbia of pregnancy. Therefore, the assumption made by the authors in the above study that PaCO\textsubscript{2}-PETCO\textsubscript{2} value being similar in non-pregnant and pregnant women may have been wrong and needed re-evaluation. Could this be done in Barbados? Yes—as far as the availability of subjects was concerned, but what of the lack of equipment? I believed there was no possibility of having capnographs in Barbados in the early to mid-eighties. I was wrong. One fine morning, I was watching through the window of our office the Queen Elizabeth II docking into the harbor and wondering again about the CO\textsubscript{2} gradient. The former head of anesthesiology in Barbados, recently retired, walked into the office and wanted to know what was on my mind. He immediately ushered me into a dark room where, in a corner, covered with a bed sheet, was a brand new, World Bank-donated Siemens Servo 900 ICU ventilator, with a CO\textsubscript{2} module—equipment that he quickly labeled a “white elephant” for the World Bank! With great enthusiasm I converted that ICU ventilator into an anesthesia ventilator and pulled off several studies one after the other. My assumption that PaCO\textsubscript{2}-PETCO\textsubscript{2} gradient was different in pregnant subjects compared to non-pregnant subjects turned out to be right.

Other interesting areas where I focused my research attention were anesthesia without nitrous oxide (N\textsubscript{2}O is imported into Barbados, occasionally resulting in short supply), oxygen concentrators, humidity in gas pipelines, tracking the use of disposable items, and Imperial Chemical Industries, UK-sponsored multi-center trials of Propofol in the eighties.

An example of how things often do come full circle is that two of my senior registrars in Barbados were Suresh Kannan and Venkatesh Srinivasa, both of whom later shadowed me to the Brigham, and have since left a legacy of academic and clinical excellence.

You may not believe me if I tell you that I came to know of Brigham and Women’s Hospital through a popular TV show called Unresolved Mysteries, one of a few that I watched regularly, others being Knight Riders and Hunter. In one episode (some of you are bound to remember), a 32-week pregnant wife of a Boston-area law enforcement officer was shot and admitted to BWH in critical condition for an emergency cesarean delivery. The opening scene had the name of the hospital on it, a name that somehow stuck in my memory, and even as I immigrated sometime later, stayed in my consciousness, as I sought out the hospital. I do not know what Drs. Gelman, Ostenheimer, Dedrick, Concepcion and Datta saw in me, but I saw enough reason to change the course of my life yet again, this time from tranquil, blue-green seas and sun to rough, freezing snowstorms of Boston. Dr. Gelman wanted one assurance from me only—that I would not enter into any conflict with a staff member over anesthetic management—something I am proud to admit I have not done to this day. I worked long hours during my 2nd residency and was treated kindly; there was tremendous encouragement from Dr. Dedrick who never considered me as a resident-in-training but treated me as an equal. Several of my teachers, colleagues now, encouraged me to continue my research interests.

Several interesting events took place during my residency and fellowship, but one instance with Dr. Camann that I remember very distinctly I would share with you. We met for the first time in OR 22. As soon as he had introduced himself I informed him that he’d misspelt my name on two occasions in which he’d quoted me in his articles. He wanted to know who I was. During his break he retrieved the papers in question from his files, and upon his return smilingly acknowledged my identity—and his misspelling.

It is a blessing to be associated with such highly regarded intellectuals as I have been here. It has given me wonderful opportunities to widen my research interests to include, among others, airway changes in pregnancy, coagulation studies using Thrombelastography, cerebral oximetry dur-
ing cesarean delivery, evaluation of transcutaneous carbon dioxide monitor during thoracic anesthesia and finally, my brainchild, a new generation of capnographs. The latter is an interesting module, where one can superimpose respiratory flow waveforms over CO$_2$ waveforms to better delineate inspiratory and expiratory portions of time capnograms and simultaneously determine physiological dead space noninvasively.

The project that has given me the greatest sense of satisfaction and achievement has been to develop the website on capnography, [www.capnography.com](http://www.capnography.com), freely available to all. When I came to this country I realized that capnography meant only checking CO$_2$ after intubation. Surely, there is more to capnography than intubation check. I felt that a good website on this subject can be useful to a wider section of the medical community. The initial attempts at web-designing were difficult and frustrating until the techniques were mastered. Presently over 500 visitors visit the site on a daily basis; many have left “Thank you”, and other complimentary messages on the visitor’s gallery, something that has certainly made it worth my while.

Recapitulating my practice over the years—Ether to Sevoflurane—I would like to think I have gained a little wisdom to be able to offer some advice…

To residents: Never think that you have learnt it all. Learning is a never-ending process. While in training, take this golden opportunity to learn as much as you can. Eventually all who come here become anesthesiologists; what is important is to become a good one, good enough to command respect from your colleagues and peers.

To junior faculty: You need to spend some time in planning your future. One does not have to be a Professor Vacanti or Paul Allen to do research. My story should be an example to show you that clinical research is within your reach. With very little effort but some motivation, one can write letters to the editor, short case reports of interesting events, and gradually progress to clinical or laboratory studies. There are many mentors in our department and I am sure that they’re eager for you to seek them out or participate in their studies. Dr. Mushlin’s faculty development program is meant to help you in this effort.

To senior faculty: I am grateful to all my colleagues who were once my teachers. You may not realize or remember what you taught me, but your guidance and encouragement has certainly inspired me to enhance my clinical and academic abilities. If I am somebody today, it is because of all of you.

I end this note with heartfelt thanks to those of you who have helped me fulfill my dreams.

Bhavani Kodali
Associate Professor of Anesthesia

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Letter from the Program Director:

The Department can be rightly proud of our success in recruiting new residents during the interview season just completed. On page 10 of this issue, the reader will find a list of our 2006 incoming trainees, including their undergraduate, medical, and, for some, other graduate education and residencies. Since we plan an entering class of thirty, we have reserved a few positions for applicants becoming available during the coming year.

Under the able leadership of our Vice Chairman for Resident Education, B. Scott Segal, our interview team used a new approach to screening candidates. Each application on ERAS (the Electronic Residency Application Service) was reviewed by at least two members of the Interview Committee before we selected the cadre to invite for personal interviews. In the past, Scott and I had tackled that enormous task of examining about 700 files ourselves! We appreciate the special effort our IT team did in setting up the database and arranging for specific Zeus terminals to have the necessary ERAS software installed and tested.

Nearly all of our interviews were done on group interview days. Many folks in the Department aided in our recruiting efforts. Eileen Stanford and Susan Caggiano organized daily schedules, including last-minute revisions when New England weather altered some interviewees’ travel plans, and assisted with arrangements for lodging and parking. Many other members of our support staff assisted with guiding candidates to interview sites and arranging breakfasts, lunches, and cocktail receptions for each date. Scott and I owe a special thank you to each.

As part of the process, several of our subspecialty and research faculty spoke about their respective areas of expertise. A special group of residents served as tour guides, showing the applicants highlights of the Departmental facilities and operating rooms. Because the tours included time for each candidate to see the interactions between our faculty and our residents and fellows in an individual operating room, a very large number of staff and trainees automatically became a part of the recruiting process as well. Again, Scott and I wish to express our gratitude for everyone’s help and willingness to share their time.

At the end of each interview day, with Eileen recording the outcomes, that day’s interview team would discuss that day’s candidates and assign preliminary ranks. For physician candidates, who are not currently required to go through the NRMP (National Residency Matching Program), the committee might make an offer directly that same day. At the end of the interview season, the entire team gathered over Thai food and Scott’s personal wine selection, for a final review and ranking of the Match applicants.

Early in the week of St. Patrick’s Day, we were notified by the NRMP that we had filled our quota. A day later, we received the confidential list of Matched individuals. On St. Paddy’s Day itself, we were allowed to share those names with the Department, with justifiable pride. We had matched each of the top five on our list and completed our quota proportionately higher than any other Match but one! The following Monday, the Interview Committee hosted a celebratory reception for the Department, our way of saying thanks to all, as without a doubt such a successful Match was made possible only with the help of the whole Department.

The cycle of the academic year continues apace. Eileen, Susan, Scott, and I are now preparing for the new trainees arriving in July of 2005. As has been the case in recent years, Anne Schools is developing the orientation and tutoring schedules. Roger Russell continues to chair the Clinical Competency Committee, dealing with evaluation of resident performance and assisting and guiding those few who need extra help.

Finally, for those who have not yet heard, I am extremely pleased to make two announcements. First, at my recommendation, Dr. Vacanti has appointed Rob Lekowski to serve as my Assistant Program Director. We have begun coordinating our efforts and expect to continue to keep our training program in the forefront nationally. Second, following nominations by their residency peers and subsequent election by the faculty, Johanna Higgins and Tjorvi Perry have been chosen as our Academic Year ’05–06 Chief Residents. Chuck, Rob, Scott and I all look forward to working with them next year.

Daniel Dedrick
Dr Gelman, how old were you when you came to this country?
I was forty.

A fresh beginning at forty. What does it take—courage, inordinate wisdom?
I wouldn’t put wisdom or courage in the first place, not at all. I think, (it takes) a clear understanding that you are starting from the beginning. Forget about all the achievements of the earlier life. Nobody knows you, nobody is supposed to know you, you are just a beginner. If psychologically you can do that, it wouldn’t be that difficult to go through it again. Among the five or six older residents in my program—I was a resident in Birmingham (AL)—I have to admit I was the one who took the residency psychologically the best.

Because you fought it the least?
Because I knew where I was going and what I was going for.

Does growing up in a repressive environment somehow prepare one for humility or subservience, or simply for the immigrant experience itself?
From personal experience, I would say yes, but looking at many others, including some Russian immigrants who went through the same experience, I couldn’t say; they didn’t always take a new beginning in the U.S. that easy.

What was the seminal event of your life?
The seminal event of my life was many years ago, when I came back from the Tundra. Being Jewish in Leningrad, I couldn’t find a job as a surgeon, except in some outpatient clinic which I didn’t like at all. I planned to leave medicine to become a truck driver.

For real?
For real. I even remember the time of year. I was to start the truck-driving school on the first of March; on the 21st or 22nd of February I got a call from a surgeon friend; there was need for an anesthesiologist at a small hospital where he was going as chief of surgery. I said, okay, let me try that.

Seminal for sure.
But that’s not it, yet. Working there I became bored quickly. A friend, who belonged to the family of a famous professor of medicine in Leningrad, suggested I try research. “What for?” I said. “Try it, maybe you will like it”. So I tried and I liked it.

That is what I am always saying to others: we are born with many different urges, we are not born with an urge to do research; unless we try we will never know if we like it.

A clichéd question: is happiness synonymous with success?
In my case, absolutely, I would say happiness is the main thing. I would avoid doing anything in life if it didn’t give me happiness. It would not have been easy for me to Chair two departments if I had a fear of losing my job. When I was con-
sidering the job of chairman, I called a few of my older friends; one of them gave me very interesting advice. He said, “you want to be a Chair or do a Chair?” The message was that if I wanted to be a Chair I should not (pursue it) because I would soon be unhappy—he didn’t say it, it was implied in the question.

Life of a Chair is quite fragile, particularly outside the Harvard system. At the time I was Chair and president of Society of Academic Anesthesia Chairs, 20–25% of Chairs of anesthesia were replaced every year. If you are chair for four years you are very successful.

In reality, to be fired or to have to resign never bothered me. I was not afraid for a single second to lose my job. And I was happy to do my job. It was never a burden for me. I am very happy not doing it now. Some people say (it is because I) have much more free time now. That’s not the point. I was doing my job and I was very happy with it. If I were not, I wouldn’t do it.

Does that make leaving easier?
Well, let’s say, if I were fired somewhere in the middle of something like this, would I be disappointed? Certainly. I would consider it my mistake not to have assessed the situation properly. Everyone has a right to equal opportunities but not necessarily a right to become Chair (person). I would be sad for a week, maybe, but no more. I don’t think that in another ten years I would have been happier than in the first ten years.

In that context, let me ask you this: you steered this department for ten years, you were in a position of authority for a sustained period. And then—you were not Chairman anymore. Another person might have chosen to leave. What made you decide to stay?
For me it was absolutely the other way around. I wanted to be around, I wanted to see what the next chairman would do with the department. It’s my baby. I wanted to see how the baby would grow. Certainly there would be differences in dealing with (different situations), but to see how (it would) affect things. You know, it might be misunderstood, I hope I can explain it. At my age—I think that in a certain number of years I would be gone—when I was stepping down I thought I want to be around for a few more years to see what would happen.

Is it analogous to letting children go?
This was much less painful. Because it was time. You see, the job of a Chairman in our times is relatively complex and quite stressful, but it is wonderful. It is what I loved about the job.

How much of the parents can be found in the children?
Many years ago, I read a philosophical (adage): children—especially sons—consciously or subconsciously compete with their fathers; very rarely do they take the path of a successful father, because they are afraid to lose the competition, or to win it much later when the father wouldn’t see the victory of the son. What they often do, he writes, is take a feature of the father and develop it to an extreme. When I read that, I looked at my sons and realized that these two guys had done exactly that. I love art and theatre; my older son became a theatre director. I am, fearless or not—I’m unsure because I do have fears—something of a risk taker; my other son became commander of Special Forces, got the Bronze “V”, which stands for Valor.

Recently I was in a physical confrontation in an aeroplane, the first and only in all these years in this country. The man was much bigger than me. When the plane landed, he pushed
me twice, then stepped on my foot. I retaliated and kicked him. He grabbed me by my throat; by this time people started to yell at him and he was forced to back off. My wife was telling this story to our sons. They had very interesting responses. The older wanted to know, “Why did you do it?” The younger said, simply, “I wish I were there.” I think that the environment plays only a limited role; our responses are really determined genetically.

You have recently assumed the leadership of our department’s Mentoring Program. In your opinion, can effective mentoring change the outcome of a career?

Outcome of a career? Absolutely. Absolutely.

What would be the perfect anesthetic in year 2055? Would we be dabbling in virtual anesthesia?

I don’t have a clue. But the overall line of development would be such that we would have a few—more than a few—drugs with an extremely narrow area of action; they would do only one thing, wouldn’t have any side-effects, have an extremely wide margin of safety. Essentially, you would have (a set of) drips, you would open it—it doesn’t matter how much because you couldn’t kill with it—with complete analgesia, complete hypnosis; then you turn it off and the patient is awake in a minute.

Your favorite book?

So many.

Favorite author?

Oscar Wilde, Churchill.

Composers?

May I mention a dozen? Shostakovich and Prokofiev from the last century; from earlier, Tchaikovsky, Chopin, Beethoven, Bach. I like Mozart very much.

Are you friends with your wife?

We are closer than you could imagine.

Do you think one could be best friend to a spouse?

I do not believe a real marriage could survive for long without it.

There exists a school of thought that the two are mutually exclusive.

I do not believe in it. I think it is very wrong. I see many couples that compete one with each other for different things—for power, for the ability to make decisions, to manipulate; I never saw these couples happy, because a victor wants victory.

What do you think it takes for a Chair to bring out the best in others?

When I answer this question, please note that I am emphasizing that I do not believe I managed to bring out the best in all the people in the department. I do not regret it that I didn’t, I had some successes and some failures; in fact I wouldn’t (consider it) my failure—I’m not sure a chairman can bring out the best in every faculty member.

Now this is my observation, not necessarily my own experience of success. I think that he must be excited. Excitement is contagious. You cannot fake it—it doesn’t work if you fake it. People will see through it. In a department like this where you have close to four hundred people, energy is needed, much more than wisdom or intelligence. Energy. Enthusiasm. Passion.
**News & Updates**

**Appointment**

Roger Russell, M.D. has been appointed Director of the Department Performance Committee. He is also set to take over responsibility for medical student clerkships through Anesthesiology in the capacity of Director, Medical Student Rotations in Anesthesiology at the end of the year, from Joseph Garfield, M.D. who has run the program for years with tremendous success and acknowledgment from the Medical School community. Roger will continue to Chair the department’s Clinical Competency Committee.

Dr. Garfield will assist Dr. Russell with the transition and continue to work with the students in an emeritus capacity. Dr. Garfield is planning to devote more time to student-related educational activities, including the Patient-Doctor Sequence, the Harvard Medical School Admissions Committee and a new Medical School-based initiative on developing and teaching professionalism to medical students and house officers.

**Match List, July 2006, Incoming Class**

Arboleda, Nicole, Medical School: Un. of Colorado, Undergraduate: Un. of Colorado at Boulder, Colorado, BA in Biochemistry with Chemistry minor, Internship: Preliminary Medicine, Exempla St. Joseph Hospital; CO

Boulanger, Kristine, Medical School: Baylor, Undergraduate: Rice Un., BA in Kinesiology, Internship: Transitional, Northwestern McGaw/ENH; IL

Chang, Candace, Medical School: UCSF, Undergraduate: California Institute of Technology, BS Chemistry, Graduate: Harvard School of Public Health, MPH in Quantitative Methods, Internship: Preliminary Medicine, Kaiser Permanente-Oakland; CA

Cheung, Jamie, Medical School: Wake Forest Un., Undergraduate: Cornell Un., BA in Psychology-Cognitive Studies, Internship: Preliminary Medicine, St. Vincent’s Hospital; NY

Connor, Christopher, Medical School: Harvard, Undergraduate: Cambridge Un., England, MEE in Electrical and Information Services, Graduate: MIT/Harvard, PHD in Medical Engineering/Medical Physics, Internship: Preliminary Medicine, Mt. Auburn Hospital; MA

Cramer, Benjamin, Medical School: MCV-Medical College of Virginia, Undergraduate: Brigham Young Un., BS in Biochemistry, Internship: Preliminary Medicine, Virginia Commonwealth U. Health Systems

Crosby, Megan, Medical School: Georgetown, Undergraduate: Dartmouth, BA in Chemistry; minor in Government, Internship: Transitional, Georgetown Un. Hospital; DC

Donnenfeld, Brian, Medical School: Georgetown, Undergraduate: Emory Un., BS in Biology Anthropology, Graduate: Georgetown, MS in Physiology and Biophysics, Internship: Preliminary Medicine, Brown Un.; RI

Flatto, Russell, Medical School: Penn State, Undergraduate: Emory, BS in Biology, Internship: Transitional, Carney Hospital; MA

Giua, Matthew, Medical School: Saba Un., Netherlands, Antilles, Undergraduate: Hahmemann Un., BS in Biology with Physics Minor-Transfer-Physician Assistant Program, Graduate: Un. of St. Eustatius, BS in Medicine with additional study of Hyperbaric Medicine, Internship: Surgery Preliminary, North Shore-LIJ Health Sys.-NY

Lu, Jeffrey, Medical School: Columbia, Undergraduate: Harvard, BA in Biochemical Sciences, Internship: Transitional, Cambridge Hospital/CHA; MA

Maher, Emily, Medical School: Johns Hopkins, Undergraduate: Un. of North Carolina at Chapel Hill, BS in Biology with Honors in Creative Writing, Internship: Preliminary Medicine, Brigham & Women’s Hospital/Faulkner

Max, Bryan, Medical School: U. Penn, Undergraduate: Franklin and Marshall College, BA in Art History, Internship: Preliminary Medicine, Un. of MD-Mercy Med. Center

McSweeney, Jennifer, Medical School: Tufts, Undergraduate: College of the Holy Cross, BA in Chemistry/Pre-Medical, Internship: Preliminary Medicine, Brigham & Women’s Hospital/Faulkner

Parish, Benjamin, Medical School: Un. of Miami, Undergraduate: Tufts, BA in Economics, Internship: Preliminary Medicine, Mt. Sinai Med. Center-Miami; FL

Rickerson, Elizabeth, Medical School: Columbia, Undergraduate: Yale, BA in Humanities, with Honors, Internship: Preliminary Medicine, Beth Israel Med. Center; NY

Singh, Daljit, Medical School: SUNY-Buffalo, Undergraduate: Un. of Rochester, BS in Biochemistry, Internship: Preliminary Medicine, Mt. Sinai Med. Center-Miami; FL

Splensner, Andres, Medical School: Baylor, Undergraduate: Un. of Texas Pan American, BS Biology, Internship: Preliminary Medicine, Baylor College Medical-Houston; TX

Stewart, Jason, Medical School: U. Penn, Undergraduate: Harvard, BA in Organismic & Evolutionary Biology, Internship: Preliminary Medicine, Pennsylvania Hospital

Zacur, Heather, Medical School: Un. of Miami, Undergraduate: Un. of Miami, BS in Psychobiology, Internship: Preliminary Medicine, Jackson Memorial Hospital; FL

**Outside of the Match**

Kaschner, Imme, Medical School: Un. Rostock, Germany, Internship: Preliminary Medicine in Pediatrics, Janet Weiss Children’s Hospital; PA
**Academic Activities & Achievements**

Massimo Ferrigno, M.D., gave a poster presentation entitled *Induction of Hypothermia by Liquid Evaporation in the Respiratory System* (authors Chen X, Ferrigno M, Diaz E and Jiang, Y) at the XXXV International Congress of Physiological Sciences held in San Diego, CA on March 31–April 5, 2005.

Beverly Philip, M.D., served as ASA’s representative to the JCAHO Discussion Group on Roles and Accountabilities — The Relationship Between the Individual Performing the Surgery/Procedure and the Person Administering Sedation/Anesthesia.

**Publications**


This publication has recently been cited by the BBC, Nature, and Forbes (links below):
- [http://news.bbc.co.uk/1/hi/health/4325679.stm](http://news.bbc.co.uk/1/hi/health/4325679.stm)


**Lectures**

William Camann, M.D., was the Visiting Professor at Duke University Medical Center, Durham, NC and gave a lecture on *From Adam and Eve to Madonna — The History of Obstetric Anesthesia as Reflected in Popular Culture*, on March 9.

William Camann, M.D., was a Visiting Speaker at the Obstetric Anaesthetist’s Association Controversies meeting, London, UK on March 2. Debate: *It is the Right of Every Anaesthetist to Refuse to Participate in a Maternal Request Cesarean Section*.

George Frendl, M.D., presented the four-year experience with our CA3 ICU elective program at the 2005 Meeting of the Northeast Group of the Association of American Medical Colleges, focusing on Scholarship and Leadership in Medical Education held in Washington, D.C. on March 4–5: *G Frendl: Educational Initiative for Inter-Disciplinary Peri-Operative Critical Care Training (poster presentation).*

Simon Gelman, M.D., gave 3 talks at the Arizona Society of Anesthesiologists in Phoenix, AZ this past February 11–13. The lectures were entitled: (i) *Pathophysiology of Aortic Cross Clamp*, (ii) *Men are from Earth, Women are from Earth; Deal with this: Miscommunications, Cultural and Gender Differences*, and (iii) *Preservation of Kidney Viability During Aortic Surgery*.

McQuillan PM, Jamison RN, Gelnet CM, Girdharly T, Polomano RC. Pain outcomes and satisfaction with postoperative pain care among patients followed by an acute pain management service. Paper presented at the 24th Annual Scientific Meeting of the American Pain Society, April 1, 2005.


Beverly Philip, M.D., spoke to practitioners in Providence, Rhode Island on April 11. The lecture was entitled: *Towards Equanimity as a Professional Characteristic for Anaesthetists. The Evolution and Progress of Anaesthetic Care*.
Island on March 2. Her topic was, *Advances in Inhalation Anesthesia*. Alums Barbara Loferski and John Flanders say “Hello”.

**Beverly Philip, M.D.**, gave Grand Rounds at University of California, Irvine on February 17, and Grand Rounds at USC, LA County on February 18. Her topic was *Advances in Inhalation Anesthesia*. She also held Journal Club for the USC residents, on journal articles related to the grand rounds. Dr Philip gave presentations to practitioners in Torrance and Beverly Hills, CA. Alums Mark Rothman, Michael Sanchez and Nick Fuller send enthusiastic “Hellos”, and regards from Aruna Patil.

**Greg Stahl, M.D.**, was an invited speaker to the Department of Cardiothoracic Surgery and The Sarver Heart Center at the University of Arizona on March 11. The title of his talk was: *Innate Immunity and the Cardiovascular System; A New Paradigm*.

**Greg Stahl, M.D.**, was an invited speaker to the Department of Immunology at the University of Michigan on March 23. The title of his talk was: *Complement Activation following Oxidative Stress; A New Twist on an Old Problem*.

**Gary Strichartz, Ph.D.** Director of the Pain Research Center and Vice Chairman for Research of this Department, recently organized a panel on *The Role of Endogenous Endothelin-1 in Cutaneous Pain and Hyperalgesia*, at the Spring Brain Conference in Sedona, AZ. Dr. Strichartz presented a paper on *Tactile Alloodynia and Aversive Behavior following Incision of the Rat’s Hairy Skin: Temporally Separate Roles of ETA and ETB Receptors*, at that meeting, which followed the tri-annual grant review session of the NIH Scientific Review Group on Somatosensory and Chemical Senses, which Dr. Strichartz chairs.

**Lawrence Tsen, M.D.**, presented at the 31st Annual Virginia Apgar Seminar on Obstetric Anesthesia and Care of the Newborn (Orlando, FL) on March 11–13. The lectures given were entitled: *Epidural and Spinal Technique Failure for Cesarean Delivery: Why and What Now?, What’s New in Obstetric Anesthesia, and Epidural Equinox: Can My Epidural Labor Analgesic Technique Really be Improved?*

**Chief’s Corner**

It’s hard to believe that the three years are so quickly coming to an end. We’re as convinced now, as much as on the day we started, of the excellence of our Department. It’s been our honor and privilege to work with each of you to make our collective experience so rewarding. Thank you, to our attendings for having orchestrated our transformation from interns to anesthesiologists—we continue to be inspired by your pursuit of perfection and desire to expand the knowledge in our specialty. To our fellow residents, Congratulations, for perpetuating an atmosphere of congeniality and camaraderie—it has been a pleasure to work with such bright and motivated people. Thanks to all who took the time to voice an opinion, share an idea and care about the program’s future. Over and over we heard from applicants how impressed they were with the current residents. It might be argued that credit for our success as residents really belongs to two people—Eileen and Susan—you both make our lives that much better!

Along with fresh faces, each July brings new ideas and energy. To that end, we’d like to congratulate and welcome the new Chief Residents for the 2005–2006 academic year, Johanna Higgins and Tjorvi Perry.

**Johanna Higgins** was born in Chicago and grew up in Sugar Land, Texas. After high school she attended Caltech in Pasadena, CA. Before going to medical school, she worked at Genentech, Inc. as a research associate. She attended medical school at the University of Chicago and did a medicine internship at the University of Oklahoma, Tulsa. She is married to Dr. John Higgins, a cardiologist at the VA-West Roxbury.

**Tjorvi Perry** graduated from the University of Iceland, School of Medicine in 1998, followed by an 18 month surgical-medical internship. Tjorvi subsequently completed a Research Fellowship in the Cardiovascular Tissue Engineering Laboratory of Dr. John E Mayer at The Boston Children’s Hospital. After finishing a transitional internship year at the MetroWest Medical Center in Framingham, MA, Tjorvi started his anesthesia residency at the Brigham and Women’s Hospital in 2003. Tjorvi and his wife Katrin have two children, Edda Brynja (8), and Kari Karl (1).

We wish them all the best.

—Nicole and Jake

**Profile**

**Athena Dimas** was born in Milwauk ee, Wisconsin and moved to Boston in 1988 from Detroit, Michigan. Before moving east she began her undergraduate education with a major in American Sign Language and Deaf Education. Midway through her studies she provided medical interpreting for, and taught beginning sign classes to, newly deaf and hard of hearing seniors in the Detroit area. Arriving in Boston she continued her studies at Boston University and went on to work for an educational consulting firm that specialized in placement for boarding schools and colleges, where she served as both the firm’s office manager and manager of an SSAT center. It was during this period that she became friends with Fred Donovan, our current IS manager.

Athena began working full-time with computers in the mid ’90s, at Harvard University and at a local tax preparation and financial services firm, eventually arriving here at BWH Anesthesia in 1998. Athena thoroughly enjoys her work, as well as the challenge of staying current with emerging technologies; outside of work she’s an avid reader, loves traveling and shopping, and keeps fit at the gym. ♦
January 23, 1848, The Tombs penitentiary, New York City.

Imprisoned for having splashed acid onto the clothing of two prostitutes during a chloroform-induced delirium, Dr. Horace Wells, co-discoverer of anesthesia, father to a young son, opens an artery and brings his life to an end. He had just turned 33. In the note to his wife he wrote that he was rapidly losing his mind.

By all accounts Wells had, just a few years before, been an excellent and progressive Hartford dentist, counting among his many notable patients the governor and his family. In 1844 he'd chanced upon the anesthetic effects of the deeply-inhaled vapors of nitrous oxide, laughing gas, oft-abused in inhalation frolics by assorted free spirits of the age. Immediately sensing its greater potential, Wells first experimented upon himself (inducing a colleague to remove a troublesome wisdom tooth while he was under), and then, carefully, upon his patients, soon completing over a dozen painless tooth extractions. Then came the all-important demonstration of the wondrous thing before the learned doctors and students of Massachusetts General Hospital—a spectacular failure. The patient groaned—he later stated he’d felt no pain and didn’t know why he’d yelled—shouts of “Humbug!” and “Swindler!” rang out from the assembled men of science, and the sensitive Wells, mortified, fled the hall to hisses, the fiasco setting in motion his three-year downward spiral. (Could a mere dentist from the hinterlands of Connecticut, after all, have found something worth the attention of the Brahmins of Boston medicine? —Not likely! —Don’t waste our time!) Not quite two years later, building in part upon what he’d learned from his mentor, Wells’ well-connected former pupil and partner had his own demonstration, of ether anesthesia, in the same MGH amphitheatre (later dubbed the Etherdome). William Morton’s hugely successful performance (immortalized in Hinckley’s painting hanging in Countway Library), was everything Wells’ was not, replete with final flourish when celebrated surgeon John Collins Warren famously proclaimed “Gentlemen, this is no humbug.” But as Morton and ether’s star ascended, radiant before a rapt and grateful public, Wells’ (and nitrous oxide’s) faded into the glare. Recognition for the basic discovery, in fairness his due and once seemingly within his grasp, had yet, somehow, slipped away, leaving him eclipsed…passed by…without a second chance.

One can imagine a pure, noble nature, intent solely upon bringing the Blessing of Anesthesia within mankind’s ken, remaining serenely unaffected by all this human drama. Even a man of flesh and blood, with deeper reserves from which to draw, might have borne these misfortunes unbroken. From this perspective Wells seems not to have been a truly great figure, but rather a man of a more ordinary sort—who’d made an extraordinary discovery. Some truths, meeting resistance and skepticism at every turn, can but slowly wind their way into the minds of men, bringing difficulty and sometimes tragedy to those whom, alive to their worth, would bear them to us. The irony here is both glaring and sad—he who so helped usher in the era of painless surgery—with all it’s meant for the countless individuals who’ve since gone under a surgeon’s knife and for the advancement of medicine and surgery itself—was himself overwhelmed and destroyed by this same pain, albeit visited upon him in its psychic, emotional guise. (And where is the agent for suffering of this kind…for despair?) Although in the end bested by the human-all-too-human aspect of his being, Wells’ accomplishment remains undimmed. The crude beginnings, eagerly embraced and elaborated by others, have blossomed into today’s wisdom-filled Anesthesiology. What Horace Wells observed, imagined and did that winter of 1844/45 can in retrospect be deemed the decisive step in this becoming. His bronze deathmask, pictured above, is found in the collection of the Boston Medical Library at Harvard Medical School’s Countway Library—yet more irony!—and may be viewed there by appointment. —Jamie Bell

“The death of this gentleman has caused profound and melancholy sensation in the community. He was an upright and estimable man, and had the esteem of all who knew him, of undoubted piety, and simplicity and generosity of character.”

—The Hartford Courant, 1848