ANESTHESIA INTENSIVISTS TRANSFORM THE PALO ALTO VA MEDICAL-SURGICAL ICU
BY JULI BARR, MD

Enormous opportunities exist for those who specialize in critical-care medicine, an anesthesiology subspeciality of increasing need and impact. The Stanford Department of Anesthesia trains intensive-care anesthesiologists uniquely qualified to improve patient care and safety in the ICU, the fastest growing and most expensive area of medicine. Over the last several years, the Anesthesia intensivists at the Veterans Administration Palo Alto Health Care System (VAPAHC) have transformed its Medical-Surgical ICU (MSICU) into a national model for improved patient outcomes.

History—Prior to 1993, the surgical ICU (SICU) at the VAPAHC hospital was managed by surgeons. Stays were long, patient outcomes were suboptimal, and often new patients could not be admitted, causing daily cancellation of surgical cases. Enter two board-certified intensivists-anesthesiologists: Drs. Eran Geller and me. Between us, we created a multidisciplinary team of critical-care specialists to assist surgeons in caring for our sickest patients—to improve patient care and clinical outcomes and to reduce SICU length of stay (during our first year, only three cases were cancelled).

Four years later in 1997, when a new hospital was built, a 15-bed Medical-Surgical ICU (MSICU) was created for the sickest medical and surgical patients. Directed by Dr. Eran Geller, intensivists from both the Anesthesiology Service and the Division of Pulmonary and Critical Care Medicine from the Medicine Service (early adopters of multidisciplinary ICU care), oversaw patient care. Instead of following the traditional, physician-driven approach, they teamed up with ICU trained nurses, respiratory therapists, pharmacists, dieticians, and social workers to manage each patient. Studies show that such an approach improves patient care and clinical outcomes in critically ill patients.

National Initiatives—In 2000 the Institute for Healthcare and Improvement (IHI) initiated collaboration among 48 hospitals, including the Palo Alto VA, to improve patient safety in high-hazard areas, including ICUs. IHI advocated adopting Toyota Motor Corporation’s rapid-cycle change methodology—an iterative, problem-solving approach of planning and making changes, studying changes’ effects, and rapidly scaling up the results.

In 2001 the Institute of Medicine (IOM) issued its report, Crossing the Quality Chasm: the IOM Health Care Quality Initiative, specifying additional standards: implementing electronic physician order-entry, performing high-risk surgeries at a handful of recognized specialized centers, and requiring board-certified intensivists to manage all ICU patients. The report estimated 65,000 lives and $42 billion saved. In 2002 the Committee on Manpower for Pulmonary and Critical Care
Societies (COMPACCS) surveyed the nation’s ICU staffing and found only 12% had mandatory involvement of intensivists. Other, more recent initiatives, have amplified goals to improve patient outcomes.

**VAPAHC Anesthesiology Service’s Response**—In 2000 in response to the IHI’s national initiative to improve patient safety in ICUs, the VA’s Chief of Staff asked me to head a one-year project that fit the IHI’s goal. My colleagues and I selected three MSICU problems that had been identified but not solved: reduce ventilator-associated pneumonia (VAP) by 20% and nosocomial methicillin-resistant staph aureus (MRSA) infections by 75%, and obtain >75% compliance with process changes.

To plan changes, we formed a multidisciplinary ICU stakeholder team (ICU physicians, nurses, respiratory therapists, pharmacists, housekeepers, and materials management personnel) whose members agreed to a systems approach: identify the causes of VAP and nosocomial MRSA; review the literature to identify evidence-based practices that reduced the incidence; apply evidence-based solutions; and survey current ICU policies and practices.

To rapidly eliminate VAP and MRSA risk factors, the team made concurrent changes to 15 clinical processes, then measured the changes, and specified outcome measures. Changed processes included 1) surveilling nasal and sputum cultures on all patients, 2) implementing contact-isolation precautions for all MRSA-positive patients, 3) reducing cross-contamination, and 4) improving ICU housekeeping practices.

Run charts, posted on the wall, graphed progress over time; individuals annotated these charts on a daily basis. Healthcare workers suggested further improvements to the stakeholder team, and the overall rapid-cycle change methodology became continuous, the overall goal being to make effective changes a permanent part of the MSICU culture.

**Results**—The project was successful: within 12 months VAP was reduced by 36% and MRSA infection rates by 76%. Whereas the national VAP average had been 18.7 cases per 1000 ventilator days, within one year the VAPAHC’s average was 6.7 cases per 1000 ventilator days—a 64% decrease over the national average. By 2007, the VAPAHC MSICU had only 3 VAP cases—an annual rate of only 1.9 cases compared to the national average of 4.2 cases.

Overall, during the last seven years, the MSICU team has continued to apply evidence-based practice and rapid-cycle change methodology to these performance measures: 1) prevent central-line infections; 2) deploy rapid-response teams at first sign of patient decline, resulting in fewer cardiac arrests; 3) prevent ventilator-associated pneumonia; 4) reduce incidence of nosocomial-acquired MSRA infection; 5) implement protocols for sepsis, glycemic control, and ventilator weaning; and 6) reduce length of stay. They met these mandates with an electronic charting system with remote access to the patient’s full record, bedside patient-monitoring systems, and patient ventilators. These improved patient outcomes have reduced ICU morbidity and mortality, saved lives, and saved dollars spent on expensive healthcare.

**Model of Success**—Today the VAPAHC is part of Region 21, a western region serving veterans throughout N. California, W. Nevada, and all of the Pacific Rim. Region 21 includes five acute-care hospitals, but the VAPAHC is the tertiary referral center, academically affiliated with Stanford University School of Medicine whose anesthesiologist-intensivist faculty, residents, and fellows work in the MSICU. Within Region 21, The Palo Alto MSICU is the best performing of the five hospitals, and Region 21 is the best performing VA region for ICU care nationally. Because of its success stories, the VAPAHC MSICU has become the national model for improved patient outcomes within the largest healthcare system in the US. The MSICU’s best practices have been adopted by accreditation bodies, reflected in ACGME core competencies, and tracked and analyzed by the University Health System Consortium. In addition, results have been presented at several national scientific meetings, and have been published in peer-reviewed medical journals.
For academic medical centers, summer is a time of transition. This year the department will graduate an outstanding class of 21 residents and welcome an equally outstanding group of new residents. A similar number of fellows will complete their subspecialty training and be replaced by a new group of incoming fellows. Finally, two of our faculty reached emeritus status this year, and multiple faculty were recruited or promoted. For an academic department, change is inevitable. In fact, change is critical for us to remain a leader in anesthesia.

Residency Program Changes—Our residency program, under the leadership of Alex Macario, Janine Roberts, and the members of the Education Committee, has made multiple changes during the past few years to improve the effectiveness of our educational training. We have improved the orientation program for the incoming residents (pairing residents with faculty and senior residents, initiating an exciting didactic program with two dozen lectures and the new Chief Resident Rounds, and expanding simulation). We added Assistant Program Directors for each class, reorganized the annual rotation schedule to increase subspecialty rotations, revised the pain rotations to emphasize chronic pain and ambulatory procedures, expanded regional anesthesia, increased cardiothoracic critical care, and revised every rotation to achieve specific goals and objectives.

Changes to Medical and Undergraduate Education—We have expanded our activities in medical student and undergraduate education. For medical students, Mike Rosenthal created *Anesthesia 202* (Anesthesiology and Pathophysiologic Implications for the Perioperative Patient), which has received rave reviews, further increasing interest in anesthesia. Juli Barr directs the medical school critical-care core clerkship, Audrey Shafer co-directs the biomedical ethics and medical humanities scholarly concentration, and Dave Yeomans directs the scholarly concentration in neuroscience. The department sponsors multiple medical students from Stanford and other medical schools in summer research programs sponsored by national organizations. In addition, multiple faculty now teach medical school and undergraduate courses, especially the freshman and sophomore seminars.

Expansion of Clinical Programs—Our clinical programs have undergone continued expansion. This year we had a successful transition to the Epic electronic medical record at Stanford and the expanded Cerner Links system at Packard. This fall we will open seven, dedicated pediatric operating rooms (ORs) in Packard Hospital, improving patient care. Next February, we will open the Stanford Medicine Outpatient Center (SMOC) in Redwood City, including ambulatory ORs for orthopedic surgery and new facilities for our pain management clinic. The resulting increased OR capacity will allow new approaches to decrease after-hours work. Our ongoing collaborations with orthopedic surgery to develop guidelines for anesthesia care will expand the use of regional anesthesia, increasing opportunities for resident education and improving patient satisfaction and outcome.

Growth in Research Programs—Over the past several years, our research programs have grown dramatically, particularly in junior faculty career development and grant funding, particularly in pain research, where we currently have 15 grant awards for over $11 million. Our pain research ranges from the basic mechanisms of pain,
imaging, experimental human pain, and clinical trials. Our research programs in neuroscience and the mechanisms of anesthesia have also expanded; we have won 5 RO-1 awards and one NIH career-development award. In addition, we have developed funded research programs in cardiac physiology, obstetrical anesthesia, perioperative inflammation, and pediatric pharmacology.

The Faculty—The survival of an academic department depends upon the quality of its faculty. Our expanded clinical activities have resulted in recruiting superb, new faculty. For faculty with a primary research focus, we have successfully created a career-development pathway from fellowship training to career-development awards to peer-reviewed grants. For faculty with a primary focus on clinical care and education, our Faculty Teaching Scholars Program has had a successful first year with six faculty members (Aileen Adriano, Michael Chen, Jeremy Collins, Kyle Harrison, Daryl Oakes, and RJ Ramamurthi) receiving training in advanced teaching skills while also completing an individual project to improve resident education.

Benjamin Franklin said, “When you’re finished changing, you’re finished.” As we enter the annual summer cycle of transition, our department continues to embrace change as an opportunity to build upon our strengths.

I want to thank the graduating residents and fellows for their multiple contributions to the department, and I wish them the best of luck in their anesthesia careers. I enthusiastically welcome the new residents and fellows to the department and hope that we can provide them with the opportunities to fulfill all their goals.

Clinical Case for Discussion: A 70-year-old man presents for an elective descending colectomy. Immediately prior to induction of anesthesia, the patient’s heart rate drops to 48 beats per minute. You reach for a vial of atropine 0.4 mg, but grab the wrong vial by mistake and administer 1 mg of IV epinephrine. His heart rate climbs to 175 beats per minute, and he cries out, “My head is exploding.” What do you do?

Discussion: Consider this math problem: Assume you'll practice anesthesia for 25 years, performing 700 anesthetics per year. If on the average you inject 10 different drugs into each patient, you will have personally injected a total of 1,750,000 drugs in your career. What are the odds that you'll make a mistake and pick up a wrong ampoule or wrong syringe at least once during those nearly two million repetitions? I’d say the odds are 100%. You’re good, but you’re human.

Human error is a topic of intense scrutiny in medicine. In 1999, the Institute of Medicine released its landmark publication To Err is Human: Building a Safer Health Care System, which reported that 44,000 to 98,000 hospitalized patients in the United States died every year due to medical errors. This publication stated that, “high error rates with serious consequences are most likely to
occur in intensive care units, operating rooms, and emergency departments.”

Miller’s Anesthesia (6th Edition, 2005, Chapter 83) states that, “errors in executing a task are termed “slips”, as distinguished from errors in deciding what to do, which are termed “mistakes.” Slips are actions that do not occur as planned, such as turning the wrong switch or making a syringe swap.”

Anesthesiologists are unique among medical doctors in that we routinely handle and inject medications ourselves, rather than writing orders for nurses to carry out. While this direct involvement has the advantages of efficiency and flexibility, it carries the risk of human error. While multi-tasking (watching monitors, performing hands-on procedures, and filling out medical records), anesthesiologists are vulnerable to having their attention distracted.

The issue of inadvertent syringe-swap or ampoule-swap has been discussed in the medical literature. Currie, et al reported 144 incidents where the wrong drug was nearly or actually administered by an anesthesiologist (The Australian Incident Monitoring Study. The “wrong drug” problem in anaesthesia: an analysis of 2000 incident reports, Anaesth Intensive Care. 1993 Oct;21(5):596-601.) In 81% of the 144 incidents the wrong drug was actually given. In over half of these occurrences, the syringes were of the same size, and they were correctly labeled. The most common error was giving the wrong drug from a correctly labeled syringe. The most common drug involved was a muscle relaxant in both ampoule and syringe incidents. Factors which contributed significantly to the incidents were similar appearance, inattention and haste. The only significant factor that minimized the outcome was rechecking of the syringe or drug ampoule before giving the drug. Strategies suggested to address the wrong drug problem include education of staff about the nature of the problem and the mechanisms involved; color coding of selected drug classes for both ampoules and syringes; the use of standardized drug storage, layout and selection protocols; having a drawing up and labeling convention; and the use of checking protocols.

In a Japanese study, Irita, et al reported the incidence of critical incidents due to drug administration error as 18.27/100,000 anesthetics. (Critical incidents due to drug administration error in the operating room: an analysis of 4,291,925 anesthetics over a 4 year period, Masui. 2004 May;53(5):577-84.) Cardiac arrest occurred in 2.21 patients per 100,000 anesthetics. Causes of these critical incidents were as follows: overdose or selection error involving non-anesthetic drugs, 42.1%; overdose of anesthetics, 28.7%; inadvertent high spinal anesthesia, 17.9%; local anesthetic intoxication, 6.4%; ampoule or syringe swap, 4.3%; blood mismatch, 0.6%. Ampoule or syringe swap did not lead to any fatalities. Eighty-eight percent of ampoule or syringe swap occurred in patients with American Society of Anesthesiologists-Physical Status 1 or 2, who did not seem to require complex anesthetic management. The authors concluded that bar-coding technology might be useful in preventing drug administration error.

In a confidential survey, private practice anesthesiologist colleagues of mine admitted the following significant syringe or ampoule swaps during their careers: pancuronium instead of neostigmine, mivicurium instead of midazolam, atracurium instead of atropine, epinephrine instead of naloxone, epinephrine instead of ephedrine, and metoclopramide instead of neostigmine.

**Have you ever administered the wrong drug to a patient?** If you did, did you fess up and write the wrong drug on your anesthetic record, or did you merely treat the consequences of the wrong drug (if any) and tell no one? I suspect the true incidence of syringe and ampoule swap is unknown, and is indeed a higher number than reported in the medical literature. Because of the risk of being sued and/or the risk of becoming the focus of peer-review criticism, I believe many practitioners avoid reporting a drug-administration error, unless they can’t avoid reporting it (e.g., their patient is paralyzed for an extra three hours because of an unintended dose of pancuronium).

Future application of bar-coding technology for anesthesiologists in the operating room to assist in pharmacy billing of drug ampoules may serve to improve the accuracy of proper drug administration.
administration as well as improve accuracy of wrong drug reporting. In the meantime, I’d advise leaving a drug in the ampoule until you need to use it, and then double-checking the ampoule twice before administering the drug.

Let’s turn the discussion to our case study patient who received 1 mg of epinephrine instead of 0.4 mg of atropine. You choose to treat his elevated heart rate of 175 beats per minute with two doses of esmolol 50 mg each. The heart rate drops to 110, but the blood pressure rises to 255/150, the patient develops acute pulmonary edema, has a grand mal seizure, followed in minutes by ventricular fibrillation, and dies.

In a parallel universe, you’re aware that treating epinephrine overdose with a beta-blocker alone can result in unopposed alpha-adrenergic stimulation, marked vasoconstriction, and hypertension. You begin combined alpha and beta-blockade with titrated doses of labetalol, 10 mg each, until the patient’s heart rate drops to 98 and his blood pressure drops to 150/85. You cancel the elective surgery and report the mishap to your Quality Assurance/Peer Review committee. Rather than condemning you, the QA committee works with the pharmacy to assure that dangerous medications such as epinephrine and phenylephrine are in ampoules and locations dissimilar to other medications. The QA committee works with the administration and pharmacy to investigate bar code reading of all administered drugs in the operating room.

**Clinical case for next month:** An anesthesia colleague of yours dilutes a 50-microgram ampoule of sufentanil with 9 cc of normal saline, so the final syringe concentration is 5 micrograms per cc. He then injects 10 micrograms of sufentanil from this syringe into the clean IV line of three different patients during his OR day. Is this practice OK? **What do you do?**

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**FROM THE RESIDENCY DIRECTOR**

**ALEX MACARIO, MD, MBA**

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In response to issues residents raised, we made changes to the residency this past academic year 2007-2008; some are highlighted below. For 2008-9, we added a fourth resident to the Stanford OB rotation, as well as another resident for chronic pain. An additional resident will be rotating through the preop clinic. These changes are meant to increase the subspecialty opportunities for our housestaff.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Solution</th>
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<tr>
<td>High workload on ICU rotation</td>
<td>Changed to two teams of 4 residents (call from Q3 to Q4)—in 2007</td>
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<td>Increase peripheral nerve block experience</td>
<td>Changed regional rotation so that resident/attending not assigned to OR—in 2007</td>
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<td>Outdated residency education website</td>
<td>New Education Website launched—in 2007</td>
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<tr>
<td>Transition for CA1s</td>
<td>Formal orientation program with mentors during July restructured—in 2007</td>
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<tr>
<td>Feedback to rotation directors</td>
<td>Annual compilation of MedHub resident comments and evaluations presented to rotation chiefs every September—in 2007</td>
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<td>24-hr 1st call shift at Stanford GenOR</td>
<td>Nightfloat system with shifts—in 2007</td>
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<tr>
<td>Resident evaluation of faculty</td>
<td>Core competency structured form (developed by Education Committee)—in 2008</td>
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<tr>
<td>Increasing residency size</td>
<td>Class Director/Associate Program Director—in 2008</td>
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<tr>
<td>Pediatric pain service teaching</td>
<td>Daily pain rounds/talk—in 2008</td>
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<td>Self-assessment by residents on core competencies</td>
<td>Faculty advisors use form when meeting with residents to incorporate residents’ self-assessment on core competencies—in 2008</td>
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<td>Coverage for sick residents</td>
<td>Jeopardy resident scheduled—in 2008</td>
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As you know, the anesthesia residency is 3 years, plus a separate internship. This may change! It turns out that half of the more than 1,000 anesthesia residency spots nationwide in 2008 were for integrated 4-year residencies, otherwise known as categorical spots. This trend has grown over the past few years.

Typically, the main anesthesia program incorporates the internship, which allows for more control over the curriculum for the interns (who are going to be anesthesia residents). The 2008 program requirements from ACGME state that having the clinical base year integrated is “desirable” but not required.

Over the past few years, applicants to our residency have indicated that they like the current system of a separate internship. This is in part because of the geographic flexibility of choosing what part of the United States to do the internship. Applicants have also told us they like the flexibility of choosing different types of internship, such as surgery or pediatrics or the traditional medicine year, before anesthesia residency at Stanford.

However, we have come to the conclusion that to stay competitive with other top-notch residencies, we are going to investigate the possibility of some day offering some categorical 4-year anesthesia positions at Stanford. This is despite the fact that there are no data to indicate that a 4-year program produces better anesthesiologists. Currently, there are 4 Santa Clara Valley internship slots that often are taken by interns coming into our anesthesia program.

It’s just food for thought, but there may come a time when training is not time-based (where a person has to complete 4 years in anesthesia residency) but competency-based, such that when a resident shows that she or he can perform all the necessary skills, knowledge and attitudes of an anesthesiologist, the resident will be allowed to finish training. This could occur even before a 4 full years, and in other cases could require more than 4 years.

What are our 21 residency graduates doing? Thirteen are doing fellowships. The most commonly selected fellowships over the past 3 years are pediatrics, pain, and cardiac anesthesia. The table below shows the number of graduates choosing each fellowship type.

<table>
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<tr>
<th>Fellowship</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
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<tbody>
<tr>
<td>Cardiac anesthesia</td>
<td>3</td>
<td>1</td>
<td>1</td>
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<tr>
<td>Ob anesthesia</td>
<td>1</td>
<td>2</td>
<td></td>
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<tr>
<td>Pain</td>
<td>3</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Pediatric anesthesia</td>
<td>3</td>
<td>2</td>
<td>6</td>
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<tr>
<td>Patient safety &amp; crisis management</td>
<td></td>
<td>1</td>
<td></td>
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<tr>
<td>Clinical research</td>
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<tr>
<td>Palliative medicine</td>
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<tr>
<td>ICU</td>
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<td>2</td>
<td></td>
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<tr>
<td>Regional anesthesia</td>
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**Match Results 2008**—In this outstanding class of 22 that will finish residency at Stanford four years from now, two-thirds are either AOA or in the top 25% of their medical school classes. Three of the 22 come from the ten 2008 graduating Stanford medical students— twice the normal number—that chose anesthesiology for a career, a fact we may attribute to our faculty’s and residents’ efforts to promote the specialty.

**Congratulations to our Stellar Residents-of-the-Month**

- Dr. Mike Wagner, April 2008
- Dr. Lindsey Atkinson May 2008
- Dr. Chad Pitts, June 2008

**Congratulations to our Stellar Residents-of-the-Year**

Drs. Albert Chiang and Jimmy Wong
**THE EPICENTER OF RESEARCH**  
**BY PATRICIA ROHRS**

“The Stanford Department of Anesthesia has set itself up to be the epicenter of the big issues in Anesthesia,” concluded external research referee, Marie Csete, MD, PhD, an established senior anesthesiologist and researcher, whose current position is Chief Scientific Officer of the California Institute of Regenerative Medicine. Dr. Csete’s remarks, made at the annual departmental research event, applied to the 43 poster abstracts she had seen and the discussions she had had with the researchers who prepared them.

After a sumptuous buffet, Rona Giffard, MD, PhD, vice chair of research, opened the after-dinner program by summarizing the past year’s research accomplishments and thrust. Faculty members have won 21 NIH awards—15 in basic science and 6 in clinical or human subjects. In addition, they have earned 6 NIH career-development awards, 2VA merit awards, one DARPA (DoD) award, and two FAER awards. Dr. Giffard noted that research funding has almost doubled over the past four years and will likely increase from $5 to $6 million per year—a laudable 20% increase in an increasingly competitive environment for fewer dollars. Dr. Giffard credited Nancy Federspiel, PhD, and Frances Davies, PhD, for their instrumental help with learning about and obtaining grants. Dr. Giffard highlighted the blossoming of pain research (see speaker’s topics below). Finally, she reminded attendees to apply for small departmental research grants, described the FARM fellows program, in which anesthesia residents interested in academic careers can pursue research under a faculty’s mentorship, and thanked Drs. Ron Pearl and Alex Macario for their support of the FARM program.

Four speakers then described their intricate, seminal work, each talk followed by lively Q & A, moderated by Dr. Csete.

The first speaker, Dr. Wenwu Li, co-authored his abstract with Tian-zhi Guo, Wade Kingery, and David J. Clark: *Keratinocyte expression of IL1β may contribute to nociceptive sensitization in a tibia fracture rat model of complex regional pain syndrome type 1.*

The second speaker, Dr. Martin Angst, co-authored his abstract with Jason M. Cuellar, Gaetano J. Scuderi, Vanessa Gabrovsky, and David C. Yeomans: * Epidural interferon gamma: a biomarker and potential therapeutic target for disc herniation-induced sciatica.*

The third speaker, Dr. Ian Carroll, co-authored his abstract with Rebecca McCue and Sean Mackey: *Borulinum toxin type A markedly prolongs pain relief following lumbar sympathetic block: a prospective, placebo-controlled, double-blind, randomized, crossover study.*

The fourth speaker, Dr. Edward J. Bertaccini, co-authored his abstract with James R. Trudell and Erik Lindahl: *A computational approach to understanding effects of anesthetics On Ligand-Gated Ion Channels (LGIC).* He used impressive animated graphics to model the motion of molecules and ion channels.

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**THE EVOLVING ANESTHESIA LIBRARY**  
**BY HILLARY FARKAS**

The Anesthesia Library has acquired over 60 new book titles or editions in the past several months, put new “reader-friendly” subject labels on the shelves, replaced all the computer monitors with flat screens, bound several dozen volumes of loose journals, and sent years worth of older materials into storage to make room for more current materials.

And, I am the new Medical Librarian with over 20 years of experience, the past 14 years (and continuing) as Stanford’s Veterinary Medical Librarian at the Department of Comparative Medicine. I’m usually at the Anesthesia library every Tuesday.

Future library improvements under consideration include improved computer access. I also hope to pull together a large used book sale sometime this summer or early fall. Stay tuned for how and when these events will happen.

I’m a shopper at heart, so if there are any books or important materials you feel would be beneficial for our collection, please don’t hesitate to send me the information and requests.
Here’s a short list of a few of our newer books:

- *Anesthesia for Cardiac Surgery* (RD 87.3 H43D 2008)
- *Anesthesia for Fetal Intervention and Surgery* (RG 732 A547 2005)
- *Geriatric Anesthesiology* (RD 145 G467 2008)
- *Management of Postoperative Pain with Acupuncture* (RM 184 S84 2007)
- *Pediatric Anesthesia Practice* (RD 139 L58 2007)
- *Spinal and Epidural Anesthesia* (RD 85.S7 W66 2007)
- *Textbook of Regional Anesthesia and Acute Pain Management* (RD 84 R422 2007)
- *Understanding Anesthesia Equipment* (RD 78.8 D67 2008)
- Wall and Melzack’s *Textbook of Pain* (RB 127 T45 2006)

**WESTERN ANESTHESIA RESIDENT CONFERENCE (WARC)**

*BY JOHN BROCK-UTNE, MD, PHD*

The 46th Annual WARC conference, hosted by the Department of Anesthesiology, Virginia Mason Medical Center at the Renaissance Seattle Hotel from 25 to 27 April 2008, is for residents and fellows to present their research. Nineteen anesthesia departments from the western United States were represented—11 from California, 2 from Arizona, 1 from Oregon, 1 from Colorado, 1 from New Mexico, 1 from Utah, and 2 from Washington. We were told at the opening of the conference that this was the biggest WARC ever with 167 presentations. Faculty from our department, who attended, included Drs. Pearl, Carvalho, Butwick, and me.

There were 31 Oral Presentations of which Stanford had 3 (10% of presentations), namely,

- Jim Wong (CA3) who presented *Beta2-adrenergic receptor: role in modulating oxidative stress in murine myocardium,*
- Chris Cornelissen (Cardiac Fellow) who presented *The impact on patient survival of aprotinin use during cardiopulmonary bypass in lung and heart /lung transplantation,* and
- Scott Ahlbrand (CA3) who presented *Nanoparticle Gene Array: the future of bedside pathogen detection.*

Of 136 posters Stanford had 10. Eric Cornidez, who was a Stanford medical student and is now an anesthesia resident in the Mayo Clinic, Arizona, presented the work he had done as a medical student at Stanford and if you include that the number of posters becomes 11. That makes Stanford’s contribution about 8%.

Stanford Residents who presented (as recorded in the program) include the following:

- Dondee Almazan with Andrew Patterson, presented *Nonmaleficence: Rwandan Style.*
- Jennifer Hah with Jason Talvera (MS from Davis), John Brock-Utne and Richard Jaffe, presented *An unusual Capnograph tracing – the Dromedary sign.*
- Karl Zheng with Cosmin Guta, Vivek Kulkarni and John Brock-Utne, presented *Corneal abrasion – an increased incidence in patients with anti-phospholipid antibody syndrome?*
- Sam Mireles with Richard Jaffe, David Drover and John Brock-Utne presented *A comparison of noninvasive and invasive arterial blood pressure as measured by the Philips MP70 monitor.*
- Carlos Brun (ICU fellow) with Fred Mihm presented *Where did it go? – Aspiration of a nasopharyngeal airway.*
Gary Lau with Vivek Kulkarni, Cliff Schmiesing and John Brock-Utne, presented *A new technology to potentially make difficult intravenous access easier.*

Glen Valenzuela with Leopoldo Montejo, presented *Extreme variability of patient state index values on a brain-dead patient during multiple organ procurement.*

Nicholette Kasman with Naiyi Sun, R. Ramamurthi and Calvin Kuan presented *Management of thoraco-omphalopagus twins with congenital heart disease.*

Jerry Ingrande with Alexander Butwick presented *Anesthetic management of an obstetric patient with severe pre-eclampsia and HELLP syndrome requiring cesarean section.*

Everyone did exceedingly well and their posters and oral presentations were well-received. There were 3 prizes for the best oral presentations and 3 for the best posters. Carlos Brun won the prize for best poster with his report of the missing pharyngeal airway in an ICU patient. His use of video of the missing airway was very dramatic.

We were very pleased that Scott Ahlbrand and Jim Wong were invited to present their work at the CSA Resident Research Competition on May 31 2008 at the Annual California Society of Anesthesiologists (CSA) conference. The total number invited is 8, so to get 2 out of 8 was a big day for Stanford.

As is tradition at Saturday night’s dinner, there is an after-dinner speaker. This year’s was NPR’s senior national correspondent, Linda Wertheimer, best known for hosting NPR’s *All Things Considered* from 1989 to 2002. Her insightful talk on this year’s Presidential election was terrific. Her wealth of experience as correspondent could easily be gleaned from her presentation. In the question session she was equally impressive but would not be drawn into whom she thought would win of Obama and Clinton, nor would she comment on the possibility of Obama and Clinton forming what has been termed: “the dream team.”

Afterwards, some of us went looking for a karaoke bar. In the process, we lost people, but the ones who managed to stick together were Dondee Almazan, Caros Brun, Alex Butwick, Brendan Carvalho, Jennifer Hah, Gary Lau, Jennifer Lee, Karl Zheng and yours sincerely. The first bar we went to was called Seattle Best Karaoke (SBK). Much to our surprise, we found it closed and this was at 11pm on Saturday night. I am not sure if SBK saw us coming, but despite banging and scratching on the door, the bar remained locked. What was interesting to us was that this karaoke bar was in the middle of an apartment complex. Furthermore, it was not in the best part of town as Karl was very quick to point out: “We are like sitting ducks. It does not get any better.” We therefore scurried into a bar on the other side of the street. Modern technology is an amazing thing. Patrons worked the iPods, cells phones and Blackberries. Soon taxis appeared and took us to the Hula Hula Karaoke bar. It was packed. That meant we had to wait over an hour before we could sing our team song: *Yellow Submarine.* In the meantime, we amused ourselves with games and got many new friends. Eventually, long after midnight, we got the floor. By this time we were in scintillating form. With the large spot-lights blaring on us and with many microphones in hand we did a lovely job of singing, and the place came alive. That is...
what we thought, but I think we emptied the place. Good job, people.

May 1-3 2009 the next WARC will be hosted by the Loma Linda University at Rancho Las Palmas Resort in Palm Springs, CA, so get working on projects and case reports. This meeting in this venue has every chance of being a mighty party.

MEDICINE AND THE MUSE: AN ARTS, HUMANITIES AND MEDICINE SYMPOSIUM
BY AUDREY SHAFER

Medicine and the Muse is an energizing, thought-provoking celebration of the intersections of the arts, humanities and medicine. Directed and organized by Stanford medical students, the evening event incorporates music, readings, art and scholarly projects. This spring marked the seventh annual symposium and featured keynote speaker Anne Fadiman (shown below, center, with students Joanna Wrede and Alisa Mueller).

Author of The Spirit Catches You and You Fall Down, required reading for medical students, Fadiman spoke about the eight years it took to write the book, including a year as a Knight Fellow at Stanford. The book focuses on a child with severe epilepsy, Lia Lee, daughter of Hmong immigrants in the central valley of California. Fadiman emphasizes the need for careful translation of language (for example, some single English words require over forty Hmong words for accurate translation) and attention to cultural mores and family dynamics in health care situations. Fadiman remains close to the Lee family.

Student works included an excerpt from a play written by Steven Lin (to hear the title song, visit http://bioethics.stanford.edu/arts/events/Musica ndMedicine.html), a soon-to-be published short story by Blake Charlton, a demonstration by the Tai Chi class, a presentation on Healing HeARTs by Alisa Mueller, and music by Cindy Mong and Bernard Chang. The exhibit featured literature, photography, and multimedia creative arts by medical students, faculty, staff and visiting seventh graders from the Hoover Magnet School in Redwood City.

For more information about the Arts, Humanities and Medicine Program, please visit http://bioethics.stanford.edu/arts/ and to see an archive of Medicine and the Muse symposia, see http://bioethics.stanford.edu/arts/events/MedicineandtheMuse.html.

FARE THEE WELL BUT STAY NEAR US
BY PATRICIA ROHRS

On the Faculty Club’s upper terrace, the bees worked the lavender, while the new emeritus honorees—Drs. Ian Geller and Larry Saidman—mingled with Anesthesia Department colleagues and guests who celebrated their accomplished careers with Stanford. Chairman Ron Pearl spoke about the honorees’ combined 30 years of service. He pointed out that the medical-surgical ICU at the VA, developed under Dr. Geller’s leadership, had achieved the best patient outcomes within the national VA hospital system. He noted that prior to joining Stanford in 1997, Dr. Saidman had been Anesthesia Chair at the University of California, San Diego, and had served as Editor-in-Chief of the leading journal, Anesthesiology, from 1986-1996. Dr. Saidman was attracted to Stanford, in part, because a new grandchild resided nearby. Attendees included past and present faculty, spouses and partners, and staff, who relaxed and caught up with each other in the late-afternoon sunlight.
PUBLISHED ARTICLES


ABSTRACTS AND POSTERS


- Tim Angelotti, MD, PhD moderated the poster session on Liver/Transplantation at the 82nd IARS Clinical and Scientific Congress in San Francisco, CA in March 2008.
• Aiono-Le Tagaloa L, Broderick DK, Carvalho B made an oral presentation at the Gertie Max Symposium: Can labor pain and epidural analgesic consumption be predicted with psychological tests? at the Society for Obstetric Anesthesia and Perinatology (SOAP) 40th Annual Meeting, May 2008 in Chicago, IL.

• Carvalho B, Clark D, Angst M. The effect of continuous wound infiltration with bupivacaine on the local release of nociceptive and inflammatory mediators following cesarean delivery at the Society for Obstetric Anesthesia and Perinatology (SOAP) 40th Annual Meeting, May 2008 in Chicago, IL.

• Carvalho B, Broderick DK, Aiono-Le Tagaloa L. Predicting labor pain and epidural analgesic consumption using quantitative sensory tests at the Society for Obstetric Anesthesia and Perinatology (SOAP) 40th Annual Meeting, May 2008 in Chicago, IL.


• Coleman L, Daniels K, Carvalho B, Lipman S. Failure to properly administer CPR to parturients during simulated arrest: ACLS certification may not be enough at the Society for Obstetric Anesthesia and Perinatology (SOAP) 40th Annual Meeting, May 2008 in Chicago, IL.

• Aiono-Le Tagaloa L, Lipman S, Schmiesing CA, Riley ET. Accidental intrathecal sufentanil overdose during combined spinal-epidural for labor analgesia at the Society for Obstetric Anesthesia and Perinatology (SOAP) 40th Annual Meeting, May 2008 in Chicago, IL.

• Pedram A, Riley E, Cohen S, Butwick A. Retrospective Review Of Transfusion Management In A Large Obstetric Tertiary Referral Center at the Society for Obstetric Anesthesia and Perinatology (SOAP) 40th Annual Meeting, May 2008 in Chicago, IL.


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**GRANTS**

• Drs. Martin Angst and David Clark are co-principal investigators for NIH, R01-DA023063-01A1 Opioid efficacy in humans: A twin study.

• Dr. Martin Angst is primary investigator for the Stanford Institute for Immunity, Transplantation and Infection (ITI) study A Systems Biology Approach for Discovery of Biomarkers for Inflammatory Pain.

• Dr. Martin Angst is Stanford’s primary investigator for DARPA, W911NF-07-1-0462 Feedback Regulated Drug Delivery System Based on Polymer Hydrogels and Vesicles, a consortium grant.

• Dr. Martin Angst’s lab was awarded a research contract with Scientific Imaginetics to study the influence of Magnetic Resonance on Inflammation and Pain in Humans.
Dr. Ian Carroll won an NIH K23 Mentored Patient-Oriented Research Career Development Award *Prescription Opioid Use, Misuse and Pain in Post-Surgical Patients.*

Dr. Tim Angelotti was funded by the NINDS National Institute for Neurological Disorders and Stroke (NINDS) for *Administrative Supplements for High-Quality Low-Cost Monoclonal Antibodies for Studies of the Nervous System*, a supplements to his K08 Sympathetic Neuron alpha2 Adrenoceptor Structure/Function.

**INVITED TALKS AND GUEST PROFESSORSHIPS**

- Scott Ahlbrand, MD, spoke about *Metabolic markers of adequate tissue perfusion* at the Society of Critical Care Medicine’s 37th Congress in Honolulu, Hawaii in February 2008.
- Andrew J. Patterson, MD, PhD, spoke about *Bioterrorism and chemical injuries: how to recognize and respond* at the Society of Critical Care Medicine 12th Critical Care Refresher Course in Honolulu Hawaii in February 2008.
- Ronald G. Pearl, MD, PhD spoke about the *Role of transfusion for early resuscitation* at the Society of Critical Care Medicine 12th Critical Care Refresher Course in Honolulu Hawaii in February 2008.
- Joe Hsu, MD, spoke about *Tropical diseases* at the Society of Critical Care Medicine’s 37th Congress in Honolulu, Hawaii in February 2008.
- Harman Paintal, MD, spoke about *Malaria* at the Society of Critical Care Medicine’s 37th Congress in Honolulu, Hawaii in February 2008.
- David Daniels, MD, spoke about *Laboratory and clinical detection of decompensation in acute heart failure* at the Society of Critical Care Medicine’s 37th Congress in Honolulu, Hawaii in February 2008.
- Allen Namath, MD (former ICU fellow and older brother of Sarah Namath) moderated a panel on *Diagnosing Infections in the ICU* and gave two lectures: *Nanoparticle Gene Arrays and Technology for Gene Profiling.*

- Steven Seth Lipman, MD, spoke about the *Demise of general anesthesia for cesarean: prescription for a cure* at the OAA 2008 meeting in Belfast, Ireland in May 2008.
- Brendan Carvahlo, MBCh, FRCA, spoke about *Optimizing Post Cesarean Delivery Analgesia* as part of the SOAP panel at the International Anesthesia Research Society (IARS) Clinical and Scientific Conference in San Francisco in March 2008.
- Brendan Carvahlo, MBCh, FRCA, spoke about *Post-cesarean delivery analgesia* at the World Congress of Anesthesia (WCA) Meeting in Cape Town, South Africa in March 2008.
- Brendan Carvahlo, MBCh, FRCA, spoke about *Patient-controlled epidural analgesia (PCEA)—the gold standard?* at the World Congress of Anesthesia (WCA) Satellite Meeting: Obstetric Anaesthetists’ Association (OAA) Refresher Course in Obstetric Anaesthesia, in Cape Town, South Africa in March 2008.
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- Martin Angst, MD, spoke about *Towards a definitive evidence base for opioid management of chronic noncancer pain: clinical assessment of opioid-induced hyperalgesia* at A Collaborative Workshop Chaired by the Pain Research Center of the University of Utah in Salt Lake City, UT in March 2008.
- Martin Angst, MD, spoke about *Pharmacokinetic considerations for the rational use of*...
opioids: as Visiting Professor at the Department of Physiology and Pharmacology, Oregon Health & Science University in Portland, OR in January 2008.

- Martin Angst, MD, spoke about Opioid-induced hyperalgesia, a newly recognized side effect of opioid therapy as Visiting Professor at the Department of Physiology and Pharmacology, Oregon Health & Science University in Portland, OR in January 2008.

- Martin Angst, MD, spoke about Altered sensitivity to opioids – hyperalgesia and tolerance at the Refresher Course, Annual Meeting of the European Society of Anesthesiology in Copenhagen, Denmark in May 2008.

- Martin Angst, MD, chaired the Plenary Session Pain assessment in experimental medicine and also spoke on Analgesic efficacy in models of experimental pain at the Annual Meeting of the European Society of Anesthesiology in Copenhagen, Denmark in May 2008.

- Martin Angst, MD, spoke about Towards a definitive evidence base for opioid management of chronic noncancer pain: clinical assessment of opioid-induced hyperalgesia at a workshop chaired by the Pain Research Center of the University of Utah, Salt Lake City, UT in March 2008.

- Tim Angelotti, MD, PhD spoke about Alpha2 adrenergic receptor regulation of the sympathetic nervous system at the 55th annual Association of University Anesthesiologists (AUA) meeting in May 2008.

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**Books**

- John Brock-Utne’s book, *Clinical Anesthesia, Near misses and lessons learnt* will be published in French this year.


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**Promotions, Awards, and Honors**

- Ronald G. Pearl, MD, PhD, professor of anesthesiology and chairman of the Department of Anesthesiology at Stanford, has been elected president of the Association of University Anesthesiologists (AUA) for a two-year term, effective May 2008. Founded in 1953, the AUA’s mission is to advance the art and science of anesthesiology by 1) encouraging its members to pursue original investigations in the clinic and in the laboratory, 2) improving anesthesiology teaching methods, and 3) informally and freely exchanging ideas.

- Sean Mackey, MD, PhD, announced that the Stanford Pain Center was awarded 2008 American Pain Society Center of Excellence at the May meeting of the American Pain Society (APS). This prestigious award represents a multidisciplinary effort in clinical care, education, and research.

- Tim Angelotti, MD, PhD received the Best of Meeting award at the 82nd IARS Clinical and Scientific Congress in San Francisco2008, CA in March for his research Regulation of alpha 2C adrenergic receptor cell surface expression by its amino terminal domain. He was also awarded best abstract in the session entitled Pharmacology Basic Science.

- Tim Angelotti, MD, PhD was one of four finalists for the Kosaka Award, given in honor of Dr. Futami Kosaka, who established the America-Japan Anesthesia Congress to promote science and friendship between the IARS and Japan Society for Clinical Anesthesia. The award is given to the best pair of abstracts (one Japanese and one non-Japanese), submitted from around the world.

- Hendrikus J.M. Lemmens, MD, has been promoted to Professor of Anesthesia at the Stanford University Medical Center, effective 5/1/08.

- Emily Ratner, MD, has been appointed as a Clinical Professor of Anesthesia at the Stanford University Medical Center, effective 4/1/08.

- In May 2008, Drs. Jim Wong and Scott Ahlbrand were awarded first and third place in the California Society of Anesthesiologists’ competition for resident research awards.