Departmental Goals

CLINICAL | EDUCATIONAL | SCIENTIFIC

JOHN P. WILLIAMS, MD, Peter & Eva Safar Professor & Chair

[CLINICAL]

The fundamental goal of the department is to provide anesthesia in the perioperative environment with a distinct emphasis on patient safety. Patient safety is not only a rational basis for the practice of medicine, but also serves as the foundation upon which all of our other goals are built; the management of any disease or patient intervention is rarely successful in the absence of this emphasis. In addition to this goal, we strive to Enhance the patient’s course of care by creating quantifiable increases in satisfaction with regard to (1) pain management, (2) patient outcome, and (3) rapid integration into society.

Pain is one of the more dreaded experiences patients confront during the perioperative period. Hence, the safe and successful management of this surgical consequence results in appreciable increases in patient satisfaction. The modulaion or elimination of perioperative pain is the goal of the acute pain service in all of our institutions. Patient outcome includes postoperative nausea and vomiting, patient satisfaction, and the time required to regain one’s physical and emotional stamina following surgery and anesthesia. In this regard, the department has made significant contributions to the positive role played by regional anesthesia.

The focus of the clinical department on these topics will serve us well in the coming years; however, this focus can only be maintained through the lens of patient safety. Doing so will allow us to enhance the care experience for each of our patients while simultaneously improving the visibility and viability of the department in the School of Medicine and the Health System.

[EDUCATIONAL]

We strive to Excel in the education of medical students, nurses, paraprofessionals, residents, fellows, and faculty. This goal is achieved through the consistent application of our core teaching principles: every student is different, every student is capable, and every student deserves our best. These three principles guide our training programs at all levels. Although the core of our education is in operating/procedure rooms, intensive care units, and at the bedside, students also benefit extensively from didactic lectures, problem-based learning discussions (PBLDs), and the use of simulation. This allows our students to rapidly exeed to the desired level of training, develop manual dexterity, broaden their capacity for knowledge retention, and is the best method for encouraging the continuous acquisition of new knowledge.

[SCIENTIFIC]

The scientific core of the department is comprised of both clinical and basic research teams. These researchers form the intellectual and fundamental core of our scientific mission. Their success has helped the University of Pittsburgh achieve worldwide recognition as a top research institution. In 2008, the School of Medicine was ranked eighth in the nation in National Institutes of Health (NIH) funding—one of the very few quantifiable measures of research success. In addition, our department ranked fifth in NIH funding among Anesthesiology departments nationwide. http://www.brimr.org/NIH_Awards/NIH_Awards.htm

Through our research programs, we continue to Enlighten our colleagues and the rest of the world with our efforts to better understand the mechanisms and manifestation of anesthesia and pain. Even though anesthetics have been administered for over 150 years, we are only now beginning to understand the mechanisms by which they work. The department’s basic research team, led by Dr. Yan Xu, currently focuses on establishing the structural and functional mechanisms of anesthesia. The department also has a large Clinical Trials Program (CTP), directed by Dr. Jacques E. Chelly. It provides all the services necessary for faculty members to initiate and conduct clinical trials and facilitates new pharmaceutical-sponsored research opportunities. In addition, the department has become very active in pain research through a multidisciplinary effort led by two world-renowned investigators, Dr. Gerald F. Gebhart and the late Dr. Mitchell B. Max, who initiated our genetic pain program.

[SUMMARY]

This is an exciting time and Pittsburgh is at an exciting crossroads. We stand at the forefront of completely new areas of exploration, and we stand ready to travel in completely new directions. Only time will tell which are leads and which are dead ends, but the joy is not in the destination, it is in the journey: we are ready to begin ours.
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EXECUTIVE SUMMARY

In 2008, UPMC Health System ranked 14th overall in the U.S. News and World Report's 2008 listing of “America's Best Hospitals.” The Department of Anesthesiology of UPMC and the University of Pittsburgh serves nine hospitals located throughout the Health System. UPMC Presbyterian is a Level I Regional Resource Trauma Center, as well as a renowned center for organ transplantation and a recognized leader in cardiology and cardiothoracic surgery, critical care medicine, and neurosurgery. UPMC Montefiore is part of the UPMC Presbyterian system and specializes in ambulatory services and liver transplantation. Children’s Hospital of Pittsburgh of UPMC is devoted solely to the care of infants, children, and young adults and was named one of the top ten children’s hospitals in the nation by U.S. News & World Report. Presently located in Oakland, Children’s Hospital will relocate to a new hospital in spring 2009. Magee-Womens Hospital of UPMC ranks among the top 12 hospitals in the nation for gynecological care. Nearly 10,000 babies are born at Magee each year and the Neonatal Intensive Care Unit (NICU) is the largest in Pennsylvania. The Department of Obstetrics, Gynecology, and Reproductive Sciences is one of the top recipients of National Institutes of Health (NIH) funding for departments of its kind. UPMC St. Margaret was named among the nation’s top 100 hospitals of Consumers Digest’s list of "50 Exceptional U.S. Hospitals." It is one of the first community hospitals in the region to utilize eRecord technology, UPMC’s electronic system that allows physicians and health professionals to electronically update medical records at the patient's bedside. UPMC Shadyside is home to Hillman Cancer Center, one of the nation’s largest and most advanced cancer research and patient care facilities. A tertiary care hospital, UPMC Shadyside employs over 600 primary care physicians and specialists who offer a broad range of specialties including cardiology, oncology, orthopedics, geriatrics, obstetrics, gynecology, vascular medicine, and endocrinology. UPMC South Side, an advanced community and teaching hospital, offers a wide range of routine, general, and specialized services that include emergency care, orthopedics, pain management, and outpatient diagnostics and testing. UPMC South Side is also home to the Institute for Rehabilitation and Research, a renowned center for orthopedics and sports medicine. Veterans Affairs Pittsburgh Healthcare System serves as an acute care facility and major surgical tertiary care facility. UPMC McKeesport is an acute care community hospital and an approved site for the Program of All-inclusive Care for the Elderly (PACE). The Mediterranean Institute for Transplantation and Advanced Specialized Therapies (ISMETT), located in Palermo, Sicily, serves as a major transplantation center for Southern Italy and other countries in the Mediterranean region.

MARK E. HUDSON, MD
Associate Professor &
Vice Chair for Clinical Operations
UPMC Presbyterian / Montefiore

JOSEPH J. QUINLAN, MD, Chief Anesthesiologist

In Fiscal Year 2008 (FY08), UPMC Presbyterian/Montefiore continued its role as the largest quaternary care hospital in Western Pennsylvania. Procedures spanned the entire spectrum of surgical and special procedures, from combined heart-liver transplantation to anesthesia for electroconvulsive therapy. The division comprises 46 faculty members who cover 40 operating rooms and up to 8 additional, non-OR anesthetizing locations. UPMC Presbyterian/Montefiore also staffs 63 Certified Registered Nurse Anesthetists (CRNAs) and up to 15 residents and 10 student nurse anesthetists (SRNAs) may rotate at any one time. In addition, six Certified Registered Nurse Practitioners (CRNPs) provide care throughout the site as well as at the Pre-Anesthesia Evaluation and Testing Center, which conducts pre-anesthesia consultations and evaluations.

Anesthesiologists supervised 42,321 cases; 33,256 were performed in the OR environment (an increase of 4.0% from the prior year) and 9,065 outside of the OR (bronchoscopy, electrophysiology, cardiac catheterization, interventional radiology, and MRI).

In FY08, several sponsored and investigator-initiated research studies were conducted at UPMC Presbyterian/Montefiore. In addition, 34 scholarly articles (32 peer-reviewed) were published by UPMC Presbyterian/Montefiore faculty.

UPMC Presbyterian provided most of the clinical platform for highly subspecialty-oriented resident education; subspecialties included liver transplantation, cardiothoracic, ENT, trauma, neuroanesthesia, and intensive care. At the same time, many CA-1 residents and SRNAs perform their first cases at UPMC Presbyterian. In FY08, division faculty actively taught in the OR, delivered lectures, coordinated problem-based learning discussions (PBLDs), designed and implemented rotation curricula, served on medical student and resident education committees, interviewed resident applicants, and instructed courses at the Peter J. Winter Institute for Simulation Education and Research Institute (WISER).

The Division of Anesthesiology at UPMC Presbyterian/Montefiore was well represented at the 2007 American Society of Anesthesiologists (ASA) Annual Meeting; faculty presented three posters, participated in a workshop and two medically challenging cases, and served on one committee. In addition, faculty gave presentations, presented two curriculum posters, and served on two committees at the 2007 meetings of the Society for Education in Anesthesia (SEA). Please see the Education section of this report for more details.

4.4% increase in cases from previous year

OVERVIEW

EDUCATION & RESEARCH
In FY08, three fellows completed one year of ERIN A. SULLIVAN, MD,
training in cardiac anesthesia in Presbyterian Hospital.

Cardiothoracic Anesthesiology faculty participated in problem-based learning discussions (PBLDs), workshops, and panel discussions at the 2007 ASA Annual Meeting in San Francisco, and one served as an invited lecturer at the 2008 SCA meeting.

In FY08, faculty participated in two clinical trials and other clinical and basic research. Topics included signaling pathways in pulmonary endothelium and genetic susceptibility to ventilator-induced lung injury. Faculty also authored two peer-reviewed publications and a book chapter.

In FY08, HTA trained 13 CA-2 residents (a mandatory rotation of 4 weeks) and 1 CA-3 resident (an elective rotation of 3-9 months).

CA-2 residents also began training at WISER in a new medical simulation course titled “Anesthesia for Liver Transplantation.” All residents carried out anesthesia for liver transplantation with a level of supervision dependent on their level of expertise, to prepare themselves to become a consultant and/or a director of a liver transplantation anesthesia program.

Faculty presented four posters and participated in a workshop at the 2007 ASA Annual Meeting, and served on a committee at the SEA meetings. In addition, two HTA faculty members served on the editorial board of the journal Liver Transplantation.

In FY08, HTA faculty were active in clinical research; they published six peer-reviewed articles and three book chapters, and participated in two clinical trials. Topics included the anesthetic care of high-risk surgical patients and awareness during and post-anesthesia.

Anesthesiologists in the Division of Hepatic Transplantation Anesthesiology (HTA) are responsible for the anesthetic care of patients undergoing liver, intestinal, and other solid organ transplantation. In FY08, a total of 326 solid organ transplants, including 133 liver transplants, were performed at UPMC and Children’s Hospital of Pittsburgh of UPMC. UPMC acts as a referral center for high risk transplant patients. As a result, an increasing number of patients over 65 years of age, with significant cardiopulmonary disease, and other co-morbidities who were often rejected as candidates by other programs underwent successful organ transplantation at UPMC. Also, UPMC performs transplants on eligible Jehovah’s Witness patients without the use of blood, and is one of the only centers in the nation to perform transplants on HIV-positive patients.

FY08 saw continued expansion of the adult living related liver and kidney transplantation programs at UPMC. Over 40% of kidney transplants performed in the United States are from live donors, and this trend is reflected at UPMC. A live liver donor continues to be an option for patients with end-stage liver disease requiring transplantation and is available at UPMC due to the expertise of our transplant surgeons and anesthesiologists.

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In FY08, 13 residents were trained in neurophysiologic monitoring, neuroradiology, neurosurgical intensive care, and pediatric neuroanesthesia. The didactic program for residents consisted of subspecialty conferences, intraoperative teaching, and a manual of guided reading. In addition, guest lectures were also provided by neurosurgeons, neurophysiologists, and neuroradiologists.

In FY08, research activities in Neuroanesthesia focused primarily on the application of state-of-the-art imaging techniques to elucidate the sites and mechanisms of anesthetic action in the living brain.

Neurosurgical anesthesiology services were provided for over 6,000 procedures.

In FY08, 15,633 patients visited Same Day Surgery either as same-day admit patients (7,359) or outpatient surgery patients (8,274). The PEC received 5,453 patients who were referred by surgeons for prior anesthetic problems, complex medical conditions, or patient concerns. The goal of the unit is 100% patient review prior to surgery, resulting in minimal unforeseen delays and cancellations on the day of surgery. Therefore, any patient who is not seen in the PEC is called and evaluated the day before surgery by SDS nurses.

8% increase in patients in Pre-operative Evaluation Center (PEC).

In FY08, nine clinical base year residents spent four weeks each participating in outpatient evaluations and learning of regional anesthesia techniques and principles of outpatient anesthesia. In addition, the PEC will be the future site of the CA-1 Preoperative Evaluation Rotation. Same Day Service faculty presented two posters at the 2007 ASA Annual Meeting and served on a committee at the SEA Fall Meeting.

Same Day Services at UPMC Presbyterian/Montefiore includes both Same Day Surgery (SDS) and the Preoperative Evaluation Center (PEC). In the PEC, preoperative testing and consults are combined with a detailed pre-anesthetic history and physical examination conducted by an Anesthesiology resident or CRNP. Attending anesthesiologists are available to review complicated patients or testing results with the PEC staff. The entire evaluation becomes available to the patient's attending anesthesiologist on the day of surgery in an electronically retrievable PowerNote. A satellite PEC is located in the South Surgery Center, an outpatient surgical center located in Bethel Park, PA. Directed by Saryu Desai, MD, the center accommodates a full range of anesthetic care for patients of all ages.

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8% increase in patients in Pre-operative Evaluation Center (PEC).
In FY08, the Division of Anesthesiology at Children's Hospital of Pittsburgh of UPMC consisted of 27 faculty members, 13 CRNAs, and 8 CNRPs who provided both anesthesia and perioperative care for children. The Acute Interventional Perioperative Pain Service (AIPPS) at Children’s Hospital continued to serve pediatric patients who might benefit from peripheral and paravertebral nerve blocks. Using state-of-the-art techniques, the physicians provided acute pain service for children requiring radiation therapy, patient-controlled analgesia, epidural narcotics, epidural local anesthetics, and pediatric caudal anesthetics and regional blocks.

The division provided anesthesia service for 24,305 procedures in FY08, which represents a 5.8% increase over FY07 and a 40% increase over the last five years. Anesthesia services were also provided at off-site outpatient surgical centers in Wexford and Bethel Park, PA (Children’s Hospital North and South, respectively), and the sites saw an overall increase in cases: 7,678 total cases (a 10.4% increase), 5,397 cases at Children’s Hospital North (a 7.9% increase), and 2,281 cases at Children’s Hospital South (a 16.9% increase).

The Pediatric Anesthesia Fellowship at Children’s Hospital is accredited by the Accreditation Council for Graduate Medical Education (ACGME). In FY08, 8 pediatric anesthesia fellows, 8 CA-3 residents, and 15 CA-2 residents (a 3-month rotation) were trained. Education programs also provided special training for Critical Care Medicine (CCM) fellows, pediatric dentists, emergency medical residents, and SRNAs on rotation through the service. Children’s faculty also participated in a PBLD at the 2007 ASA Annual Meeting and served on a committee at the SEA 2007 Fall Meeting.

In FY08, the division was very active in all aspects of pediatric research, including five sponsored clinical trials. Faculty also led several clinical and basic research projects in a wide range of topics, including the effects and safety of specific anesthetics in pediatric patients, mechanisms of anesthetic-induced calcium entry into cells, malignant hyperthermia, effects of lung expansion and positive end-expiratory pressure (PEEP) in anesthetized children, and postoperative oxygen saturation. A total of 25 peer-reviewed articles were published by the members of the Division in FY08.
The Division of Anesthesiology at Magee-Womens Hospital of UPMC provides in-house, 24-hour anesthesia coverage in two primary locations: the Womancare Birth Center and the main Surgical Services Center. In FY08, the total number of cases managed at the site was 23,981 (a 7% increase from the previous year). The Section of Anesthesia for Obstetrics oversaw 9,964 deliveries in the Womancare Birth Center (an 8.6% increase from the previous year) that included 7,355 vaginal births and 2,609 cesarean deliveries, with a cesarean delivery rate of 30.1%. In addition, the division provided anesthetic management for 16,063 cases in the Surgical Services Center (a 7% increase from the previous year).

The staff of 21 faculty members, 20 CRNAs, and 2 full-time CRNPs offered anesthesia care throughout the operating and delivery suites, as well as at the Pre-Anesthesia Evaluation and Testing Center. The division also provided emergency airway management in conjunction with Critical Care Medicine for all cardio-respiratory arrest cases, and Peripheral Intravenous Access was provided as a consultative service.

JONATHAN H. WATERS, MD, Chief Anesthesiologist

In FY08, Magee-Womens Hospital was a primary educational site for medical and nurse-anesthesia students (SRNAs), as well as nine CA-3 and 13 CA-1 anesthesia residents. The division provided both obstetrical anesthesia and general anesthesia rotations and a fellowship in obstetrical anesthesiology. All residents became certified in neonatal resuscitation by Dr. Ryan C. Romeo. Faculty also participated in the ASA 2007 Annual Meeting with three PBLDs, one poster presentation, one workshop, and one committee seat. In addition, one curriculum poster was presented at the SEA 2007 Fall Meeting, and three faculty served on committees at that meeting.

Research at Magee consisted of three clinical trials and several clinical research projects. Examples of research topics include: post-operative nausea and vomiting, ultrasound systems to reduce failed epidural placement rates, prevention of dental injury under anesthesia, effects of anesthetic agents on blood cells, and incidence of bacteriuria in patients receiving epidural anesthesia, and skill retention simulation education programs. Faculty also published 13 peer-reviewed publications.

EDUCATION & RESEARCH

In FY08, Magee-Womens Hospital of UPMC Shadyside included 23 faculty members and 52 CRNAs who provided adult anesthesia services for a 21-room main operating suite, Ambulatory Surgery Center, and Urological Comprehensive Care Program. Coverage was also provided in the GI Lab, Electrophysiology Lab, and Invasive Radiology. The division also provided subspecialty care in Cardiac Anesthesiology and Neuroanesthesiology with subspecialty trained and credentialed faculty, as well as 24-hour in-house coverage for emergency surgical cases and emergency airway management.

Anesthesia services were performed for a total of 20,954 cases in FY08 (a 5.5% increase from the previous year). There were 15,728 cases were performed in the main OR and 5,226 cases in the Ambulatory Surgery Center. Off-site volume increased to approximately 2,135 cases.

ROBERT H. BORETSKY, MD, Chief Anesthesiologist

In FY08, two anesthesiology fellows rotated at UPMC Shadyside in FY08, and 25 CA-3 residents rotated in general, cardiac, advanced clinical, and acute pain and regional anesthesia. Residents rotating in internal medicine anesthesiology and family practice anesthesiology received instruction in clinical skills, airway management, and invasive monitoring. UPMC Shadyside is designated as a primary instruction site for the Nurse Anesthesia program of the University of Pittsburgh School of Nursing, and Anesthesiology faculty and CRNAs actively participated in the education and training of these students. In addition, airway management training was provided for paramedic students from the Center for Emergency Medicine.

In FY08, division faculty presented two posters and participated in one workshop at the ASA 2007 Annual Meeting. Faculty also led 6 clinical trials and published 17 peer-reviewed publications.

EDUCATION & RESEARCH
The Division of Anesthesiology at UPMC St. Margaret provides the atmosphere of a community anesthesiology practice, with efforts centering on patient care in the OR and GI suite of the main hospital and Harmar Ambulatory Center. In 2008, the site staffed 10 full-time physicians, 25 full-time CRNAs, and a large complement of part-time and casual CRNAs. Anesthesiologists oversaw 15,247 cases – a dramatic increase of 17.6% from the previous year. When appropriate, regional anesthesia with nerve blocks for anesthesia and post-operative pain control were used for orthopedic and other cases.

EDUCATION & RESEARCH

UPMC St. Margaret served as a rotation site for 10 CA-3 anesthesiology residents, as well as SRNAs, dental anesthesia residents, and critical care fellows. In the future, the hospital will serve as a rotation site for senior residents in the advanced clinical tract focusing on perioperative pain management and OR management. Division faculty authored one peer-reviewed publication in 2008.

UPMC St. Margaret

Paul L. Shay, MD, Chief Anesthesiologist

The Division of Anesthesiology at UPMC South Side provides anesthesia care and acute postoperative pain management. UPMC South Side is a community hospital with a recently expanded inpatient rehabilitation unit consisting of a brain injury unit, a spinal cord injury unit, and a standard unit.

In FY08, staff included 9 anesthesiologists and 14 CRNAs. The surgical caseload total was 6,802 (a 9.7% increase over the previous year), and approximately 80% of those cases were ambulatory. The division continued to stress the integration of regional anesthesia into the predominantly outpatient orthopedic practice. Single shot nerve blocks and continuous peripheral nerve block catheters were an important component of perioperative management.

EDUCATION & RESEARCH

UPMC South Side hosted both third- and fourth-year medical students and anesthesiology residents in FY08. Twelve CA-3 and 11 CA-2 residents underwent training in ambulatory and regional anesthesia as part of the core curriculum of the residency program and received training in peripheral nerve blockade for upper and lower extremity orthopedic and podiatric surgery, as well as ultrasound-guided peripheral nerve blockade.

Division faculty participated in a PBLD at the ASA 2007 Annual Meeting. South Side anesthesiologists led seven clinical research projects and authored 12 publications in FY08. Examples of topics included: femoral nerve blocks for ACL reconstruction, benefits of antiemetic prophylaxis, peripheral nerve blocks with multimodal analgesics, and nerve blocks in diabetic patients.
OVERVIEW

The Division of Anesthesiology at VA Pittsburgh Healthcare System saw a sudden and unexpected change in leadership this year with the untimely death of Dr. Richard J. Bjerke in April 2008, after almost 20 years as Chief Anesthesiologist. Dr. Michael P. Mangione was appointed as Interim Chief. In FY08, division staff consisted of seven full-time faculty members, two part-time faculty members, and (for most of the year) two locum tenens physicians. In addition, 12 full-time and locum tenens CRNAs were also employed.

Clinical service consisted of 4,820 OR cases (a 2.3% increase from the previous year) and 244 cardiac surgical procedures (a 25% increase) in FY08. Cases included 28 liver transplants, 28 renal transplants, and approximately 300 non-OR procedures including cardioversions, radiological special procedures, endoscopies, and non-intraoperative transesophageal echocardiograms (TEE) were performed. The division’s pain management service provided extensive clinical service; patient encounters for the service totaled 1,185.

In FY08, the division continued to provide clinical experience for two to three anesthesiology residents at a time. Six CA-3 residents rotated in advanced general anesthesia; of the seven CA-2 residents, six rotated in cardiac anesthesia. Clinical training was also offered for SRNAs, dental residents, respiratory therapists, and anesthesia technology students. In addition, airway credentialing was provided for non-anesthesiologist airway management outside of the OR. VA faculty participated in a PBLD at the ASA 2007 Annual Meeting and authored two publications.

EDUCATION & RESEARCH

Currently, there are no anesthesiology residents that rotate at UPMC McKeesport. Student registered nurse anesthetists (SRNAs) train at UPMC McKeesport as part of their rotation. Internal medicine and family practice residents, as well as EMT students, regularly train in the UPMC McKeesport OR to gain experience in airway management.

EDUCATION & RESEARCH

The Division of Anesthesiology at UPMC McKeesport provided anesthesia services for five to six OR rooms as well as in the GI lab, cardiac cath lab, and radiology. The types of surgical cases include general surgery, thoracic surgery, non-cardiac vascular surgery, orthopedics, neurosurgery, urology, EENT, gynecological surgery, and plastic surgery. In FY08, the number of anesthesia cases increased to 4,503.

The division’s commitment to provide anesthesia services extends beyond the operating rooms. The faculty serves as the support staff for the ED physicians in the management of difficult intubations. They respond to consultation requests and also provide acute and chronic pain services.

To achieve their goals, the anesthesiologists, surgeons, CRNAs, Ambulatory Surgical Unit (ASU), OR staff, and Post-Anesthesia Care Unit (PACU) work as a team in order to provide a safe, efficient, and positive perioperative experience for their patients.

In 2008, UPMC McKeesport received a commendation from Highmark for their performance of the Surgical Care Improvement Project (SCIP) initiatives. Through the Acute Interventional Perioperative Pain Service (AIPPS), the division achieved improved perioperative pain control. They implemented measures to further decrease incidence of PONV, and developed protocols to achieve optimum glucose control for diabetic patients.

Current graduates of UPMC McKeesport include four anesthesiologists and seven CRNAs.
Mediterranean Institute For Transplantation & Advanced Specialized Therapies

Istituto Mediterraneo Per I Trapianti E Terapie Ad Alta Specializzazione (ISMETT)

OVERVIEW

In FY08, UPMC Palermo continued to build on the success of its first four years. The hospital developed the first pediatric transplantation program in southern Italy, the Pulmonary Transplant program has become the second most active in Italy, and the Heart Transplant program has become the second most active program south of Rome. In addition, UPMC Palermo has the second most active program in Italy in extracorporeal membrane oxygenator (ECMO) performance.

Clinical responsibilities in FY08 included OR anesthesia, staffing the ICU on a 24-hour basis, and coverage of the invasive radiology procedures, including the Cardiac Cath Lab, GI Clinical Laboratory, PACU, and Ambulatory Center. The total number of surgical procedures was 1,430 – an increase of 8.3%. The procedures included 16 kidney transplants (nine living related), 91 liver transplants (13 living related and 17 pediatrics), 621 cardiac and thoracic surgeries, 7 lung transplants, 3 pancreas transplants, 4 kidney-pancreas transplants, 1 heart-kidney transplant, and 5 liver-kidney transplants.

Several Anesthesiology faculty from UPMC traveled to Palermo for various teaching and clinical activities in FY08. Faculty members and fellows used the experimental animal facility equipped with two operating rooms for medium and large size animals. They performed lung transplantations, liver resection, and liver transplantations while studying conservation time, ischemia reperfusion injury, and small-for-size syndrome (SFSS). ISMETT hosted residents from other Italian medical schools for ICU and OR training; residents from the University of Messina, University of Palermo, and University of Catania have rotated in the Division of Anesthesiology.

“8.3% increase in surgical cases from previous year”

WISER is the world’s largest health care simulation center affiliated with an academic medical center.

WISER is the world’s largest health care simulation center affiliated with an academic medical center.

OVERVIEW

The objectives of WISER are: (1) to create a safer environment for patients and improve healthcare operational efficiency by using simulation and other state of the art educational technology in the training and assessment of the healthcare system professionals; (2) to serve as a laboratory to research the use of simulation and other advanced instructional technology in healthcare education and to publish the results; (3) to create simulation based education programs for primary education in various domains of the healthcare delivery system; (4) to develop and validate simulation based technology as a competency assessment evaluation tool for healthcare professionals; (5) to contribute to the education and mentorship of future generations of healthcare system educators and education researchers interested in creating or evaluating simulation-based teaching methodologies.

WISER offered 1,296 courses and the total number of class participants increased this year by 10%. The total participant hours spent in courses at WISER also increased by 7% and the number of unique participants at the Center increased to 3,271. The number of facilitators also increased from 220 to 269 (an 18% increase). WISER also opened two new satellite training facilities: one at Children’s Hospital of Pittsburgh of UPMC and one at UPMC Passavant Hospital. These two facilities joined UPMC McKeesport to bring the number of satellite facilities to three.


Dr. Joseph T. Samosky, Director of Research and Development for Healthcare Simulation, joined the department in 2007. His interdisciplinary research team studies a wide range of topics, including embedded intelligent systems, features that enhance the human presence in simulation, and the use of simulators as performance measurement tools for health care professionals.

“10% increase in course participants from previous year”

EDUCATION & RESEARCH

WISER is the world’s largest health care simulation center affiliated with an academic medical center.

EDUCATION & RESEARCH

WISER is the world’s largest health care simulation center affiliated with an academic medical center.

Peter M. Winter Institute for Simulation / Education / & Research

WISER

Paul E. Phrampus, MD, Director

Alberto Frangi, MD, Director
Pain Medicine

DORIS K. COPE, MD, Director and Vice Chair for Pain Medicine

OVERVIEW

UPMC’s Chronic Pain Medicine’s programs are designed to: (1) reduce pain and suffering whenever possible and assist patients in coping with any remaining discomfort; (2) reduce disability to restore a more normal, meaningful, and satisfying life; (3) reduce emotional distress caused by chronic pain; (4) reduce dependency on drugs and on the healthcare system; and (5) facilitate, at appropriate, the patient’s return to gainful employment and usual household and leisure activities.

Chronic Pain Medicine physicians oversaw 30,767 visits in FY08; 4,031 at UPMC St. Margaret; 14,357 at Centre Commons; 5,193 at the Oakland campus; 2,355 at Monroeville; 1,175 at St. Clair; 2,239 at Cranberry; 262 at Bethel; 817 at UPMC Shadyside; 205 at Magee-Womens Hospital of UPMC; and 133 at Suburban General. Interventional modalities were carried out at all six locations, including somatic and sympathetic nerve blockade, neurolytic blocks, placement of intrathecal pumps and neurostimulators, joint injections, and pharmacotherapy. The program also provided rehabilitative therapy for conditions not requiring invasive procedures.

Chronic Pain Medicine’s interdisciplinary staff consisted of nine faculty members spread over six clinic locations: UPMC St. Margaret, Centre Commons in East Liberty, Oakland campus, Monroeville, St. Clair, and Cranberry. Physician specialties included: medicine, nursing, occupational therapy, physical therapy, and psychology.

EDUCATION & RESEARCH

The one-year Pain Medicine Fellowship program is fully accredited by the Accreditation Council for Graduate Medical Education (ACGME). In this multidisciplinary program, the fellows work with psychologists, physical therapists, occupational therapists, and pain medicine physicians from other disciplines including neurology, psychiatry, and rehabilitation medicine. In FY08, nine fellows rotated through the outpatient services at UPMC St. Margaret, Centre Commons, Oakland campus, Monroeville, St. Clair, and Cranberry and provided inpatient consultation at UPMC St. Margaret, UPMC Shadyside, and UPMC Presbyterian.

Pain Medicine Chair Dr. Doris K. Cope served on two committees at the 2007 ASA Annual Meeting. Seven clinical trials and several research projects were performed under UPMC Chronic Pain Medicine. In addition, faculty published three peer-reviewed publications in FY08.

Acute Interventional Perioperative Pain & Regional Anesthesia

JACQUES E. CHELLY, MD, PhD, MBA
Director and Vice Chair for Clinical Research

OVERVIEW

The Acute Interventional Perioperative Pain Service (AIPPS) offered 24-hour perioperative pain management for orthopaedic, thoracic, and urologic patients requiring peripheral and paravertebral nerve blocks. The use of a standardized procedure form to record all critical information related to the performance of peripheral nerve blocks was initiated at UPMC Shadyside, Presbyterian and St. Margaret Hospitals. Quarterly meetings were established allowing the review of practices used at the different sites and QI. In April 2008, the division held its first national meeting at Nemacolin Resort, with over 150 registrants. In addition, the revenue for AIPPS increased by 42% (based on the revenue cycle summary for FY08) and the number of relative value units (RVUs) generated by the division increased by 29%.

AIPPS faculty performed 15,724 blocks, including epidural (3%), peripheral nerve blocks (66%), and paravertebral blocks (31%) in FY08. Procedures included a total of 7,919 continuous nerve blocks and 6,878 single nerve blocks, with 2,557 (17%) blocks performed using ultrasound. The emphasis on the use of ultrasound-guided techniques continued to increase. Two ultrasound machines were dedicated solely to the performance of peripheral nerve blocks at UPMC Presbyterian/Montefiore, Shadyside, South Side, and St. Margaret, and one machine was available at Magee-Womens Hospital. Negotiations were ongoing to satisfy UPMC McKeesport’s ultrasound equipment needs. A total of 6.14 full time equivalents (FTEs) were assigned to AIPPS. Additionally, the different hospitals provided one PA/NP at UPMC South Side and St. Margaret, one acute pain nurse at the UPMC Presbyterian campus, and two acute pain nurses at the UPMC Shadyside campus.

EDUCATION & RESEARCH

Four regional fellows began in FY08 and eight pediatric, eight chronic pain, and one cardiac fellow rotated at the UPMC Shadyside campus. A total of 9 CBY residents rotated with AIPPS at UPMC Presbyterian, 11 CA-1 and 3 CA-2 residents rotated for at least a week at the Presbyterian campus for an acute pain rotation, and 17 CA-3 residents rotated at UPMC South Side for the regional rotation. A total of 12 CA-3 residents rotated for a month at the UPMC Shadyside campus for an elective advanced regional anesthesia/acute pain rotation. Faculty published nine peer-reviewed publications and participated in eight clinical trials.
Research is a vital part of the Department of Anesthesiology's scientific mission. The goal of our clinical and basic research teams is to elucidate the mechanisms and manifestation of anesthesia and pain. In FY08, Anesthesiology physicians and scientists published over 70 scholarly articles, several of which were published in high-impact journals. In addition, these researchers were awarded over $5 million in funding from various sources, over $4 million of which was from the National Institutes of Health (NIH). This success contributes to the visibility and prosperity of the Department, and helps to establish the University of Pittsburgh and UPMC as world-class research institutions.

The basic research program of the Department of Anesthesiology focuses on clarifying the mechanisms of anesthetic action. Scientists study a broad spectrum of anesthesia-related topics, ranging from the genetics of pain response to protein structure and interaction of anesthetics. The Department has a history of outstanding research accomplishments: in 2008, we were ranked fifth in the nation among anesthesiology departments in the number of NIH grants awarded (http://www.brimr.org/ NIH_Awards/2008/NIH_Awards_2008.htm). In FY08, researchers published 36 articles and had 19 active NIH grants earning over $4 million in funding. The following are brief descriptions of a few key research groups:

**GERALD F. GEBHART, PhD, Director Pittsburgh Center for Pain Research** Dr. Gerald Gebhart is one of the top pain experts in the world and the Director of the Pittsburgh Center for Pain Research, a collaboration of several departments including Anesthesiology. The Center aims to be one of the nation's preeminent pain research centers by combining state-of-the-art basic science pain research with clinical pain management. Dr. Gebhart's main research focus is on the investigation of the mechanisms of enhanced sensitivity to pain (i.e., hypersensitivity or hyperalgesia) that develops following tissue insult. Since pain arising from internal organs is poorly understood, recent research has addressed the mechanisms of visceral pain and visceral hypersensitivity. Projects in the Gebhart Laboratory include: Mechanisms and Modulation of Visceral Pain, Mediators and Modulation of Noiception, and Peripheral Contributions to Bladder Sensitivity.

**GREGG E. HOMANICS, PhD, Professor** Dr. Homanics’ laboratory utilizes the latest techniques in molecular genetics and embryonic stem cell technology to model complex human diseases and to understand basic issues in biology. Mice are genetically engineered with precise mutations in the genes of interest, such as those involved in the GABA neuron transmitter pathway. These mice are proving to be extremely valuable in the study of epilepsy, Angelman syndrome, and disorders of development. In addition, they are providing novel insights into the mechanism(s) of action of alcohol and general anesthetics. Dr. Homanics’ projects include: Ethanol Mechanisms in GABAA-R Gene-Targeted Mice, Genetic Dissection of Anesthetic Mechanisms, GABAA-R Alpha4 Subunit in Ethanol-Related Behaviors, and Investigation of Gene and Cellular Therapies to Cure Maple Syrup Urine Disease (MSUD) in a Genetically Engineered Mouse Model.

**YAN XU, PhD, Vice Chair of Basic Sciences**

Dr. Xu’s laboratory is one of the leading groups in the world to combine high-resolution and solid-state nuclear magnetic resonance (NMR) techniques to solve membrane protein structures at the atomic resolution. The group's research spans several areas related to Anesthesiology. One area of focus is in the transmembrane domains of receptors in the human glycine receptor (GlyR), the primary inhibitory receptor in the spinal cord and the brain stem. Dr. Xu employs modern molecular biology and NMR editing to study transmembrane domains in the context of a fuller protein. Using this and other related approaches, Dr. Xu’s group has solved the first high-resolution structure of the second and third transmembrane domains of GlyR.

Dr. Xu’s group also uses various approaches to elucidate the effects of general anesthetics. By analyzing the structures and dynamics of membrane proteins at the sub-molecular and atomic levels, the group has helped to establish the concept that amphipathicity, not hydrophobicity, is the crucial element for anesthetic action. Dr. Xu and colleagues were the first to propose a new protein theory of general anesthesia that suggests a common molecular event responsible for the physiological effects of general anesthesia.

In addition, Dr. Xu’s laboratory has developed a clinically relevant cardiac arrest and resuscitation model for the study of global cerebral ischemia. His model is fully compatible with noninvasive magnetic resonance spectroscopy and imaging techniques, thus permitting pharmacological intervention and long-term outcome to be investigated. Using this model, along with powerful new innovations in gene and stem-cell therapy and with the state-of-the-art MRI techniques, Dr. Xu’s research focuses on restoring the health of the microvasculature in response to ischemia and reperfusion. He hopes that this research will lead to the most effective, multifaceted, therapeutic mechanisms and regimens to improve the outcome of cardiac arrest and stroke patients.

**Basic Research**
The following is a list of basic and clinical NIH grants in FY08:

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nicholas Bircher, MD</td>
<td>Quantitative Oclusive Vascular Disease Study, QUOVDADIS</td>
</tr>
<tr>
<td>Gerald F. Gebhart, PhD</td>
<td>Mechanisms and Modulation of Visceral Pain</td>
</tr>
<tr>
<td>Gerald F. Gebhart, PhD</td>
<td>Mechanisms and Modulation of Noiception</td>
</tr>
<tr>
<td>Gerald F. Gebhart, PhD</td>
<td>Peripheral Contributions to Bladder Hypersensitivity</td>
</tr>
<tr>
<td>Gerald F. Gebhart, PhD</td>
<td>Opiate-Induced Nociceptor Sensitization</td>
</tr>
<tr>
<td>Gregg E. Homanics, PhD</td>
<td>Ethanol Mechanisms in GABAA-R Gene Targeted Mice (3)</td>
</tr>
<tr>
<td>Gregg E. Homanics, PhD</td>
<td>Sites and Mechanisms of Inhaled Anesthetic Action</td>
</tr>
<tr>
<td>Eric E. Kelley, PhD</td>
<td>Mitochondrial Targeting Against Radiation Damage</td>
</tr>
<tr>
<td>William R. Larkhove, PhD</td>
<td>Genetics of Neuropathic and Inflammatory Hypersensitivity (2)</td>
</tr>
<tr>
<td>Jerome Parness, MD, PhD</td>
<td>Molecular Characterization of Dantrolene Binding Site</td>
</tr>
<tr>
<td>Paul E. Phrampus, MD</td>
<td>Development and Dissemination of Program Tools for Uncontrolled Donation</td>
</tr>
<tr>
<td>Paul E. Phrampus, MD</td>
<td>Title VII Faculty Development: Integrated Technology in Nursing Education and Practice Initiative</td>
</tr>
<tr>
<td>Pei Tang, PhD</td>
<td>Anesthetic Effects on Ion Channel Structures and Dynamics (2)</td>
</tr>
<tr>
<td>Pei Tang, PhD</td>
<td>Anesthetic Sites in Transmembrane Peptides by NMR</td>
</tr>
<tr>
<td>Margaret M. Tarpey, MD</td>
<td>Redox Transduction of Nitric Oxide Signaling</td>
</tr>
<tr>
<td>Brian A. Williams, MD, MBA</td>
<td>Peripheral Nerve Blocks with Multimodal Analgesics: Development of a Transitional Animal Model to Evaluate Injectable Drugs and Combinations to Produce Selective Nociceptive Block with Minimal Block of Motor Function and Proprioception</td>
</tr>
<tr>
<td>Yan Xu, PhD</td>
<td>Cerebral Protection and Recovery After Circulatory Arrest</td>
</tr>
<tr>
<td>Yan Xu, PhD</td>
<td>NMR Studies of Mechanisms of General Anesthesia</td>
</tr>
<tr>
<td>Yan Xu, PhD</td>
<td>TM Domain Structures of Ligand-Gated Ion Channels by NMR</td>
</tr>
<tr>
<td>Yan Xu, PhD</td>
<td>NMR of Anesthetic Interaction with Four α Helix Bundles</td>
</tr>
<tr>
<td>Yan Xu, PhD</td>
<td>Research Training in Anesthesiology and Pain Management</td>
</tr>
<tr>
<td>Li-Ming Zhang, MD</td>
<td>Signaling of S-nitrosoalbumin in Pulmonary Endothelium</td>
</tr>
</tbody>
</table>

Other Research Funding (Non-Clinical):

<table>
<thead>
<tr>
<th>Name</th>
<th>Agency</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inna Belfer, MD, PhD</td>
<td>United States Cancer Pain Relief Committee</td>
<td>Neurochemistry and Physiology of Human Pain Processing Nuclei</td>
</tr>
<tr>
<td>Barbara W. Brandom, MD</td>
<td>Malignant Hyperthermia Association of the United States</td>
<td>Maintenance of the MHAUS Registry at the University of Pittsburgh</td>
</tr>
<tr>
<td>Barbara W. Brandom, MD</td>
<td>Malignant Hyperthermia Association of the United States</td>
<td>Improvement in Genetic Testing for Malignant Hyperthermia in North America</td>
</tr>
<tr>
<td>Pablo Brumovsky, PhD</td>
<td>International Association for the Study of Pain</td>
<td>Vesicular Glutamate Transporters and Chronic Visceral Pain</td>
</tr>
<tr>
<td>Feng Dai, PhD</td>
<td>United States Cancer Pain Relief Committee</td>
<td>New Statistical Methods for Pain and Symptom Research</td>
</tr>
<tr>
<td>Tomas Drabek, MD</td>
<td>The Laerdal Foundation for Acute Medicine</td>
<td>Microglia – a Novel Therapeutic Target for Emergency Preservation and Resuscitation</td>
</tr>
<tr>
<td>Tomas Drabek, MD</td>
<td>Society of Cardiovascular Anesthesiologists</td>
<td>The Effect of Microglial Activation on Neurologic Outcome after Deep Hypothermic Circulatory Arrest in Rats</td>
</tr>
<tr>
<td>Eric E. Kelley, PhD</td>
<td>American Heart Association</td>
<td>Adenosine-Mediated Regulation of Xanthine Dioxide Ductase in Vascular Endothelium</td>
</tr>
<tr>
<td>Dawn A. Marcus, MD</td>
<td>The Raymond and Elizabeth Bloch Foundation</td>
<td>Cause, Treatment, and Possible Cure for Pain Caused by, for Example, Migraine Headaches</td>
</tr>
</tbody>
</table>

“In 2008, the Department of Anesthesiology ranked 5th in the nation for NIH funding.”
The Clinical Trials Program (CTP) of the Department of Anesthesiology is directed by Dr. Jacques E. Chelly. In the seventh year of his leadership, Dr. Chelly successfully negotiated approximately $1.5 million in sponsored research. CTP assisted researchers throughout the entire clinical trial process. To ensure satisfaction of all legal and ethical requirements, staff prepared research protocols and patient consent forms, verified compliance with federal regulations and Good Clinical Practices, and submitted Institutional Review Board (IRB) materials. The program also managed the financial aspects of the clinical trials by developing and negotiating budgets; the 2008 consolidated budgets totaled 28% over sponsor initial-proposed budgets. CTP staff also trained and supervised nine full time clinical research coordinators, coordinated trial initiation, facilitated and monitored patient enrollment and study progress, and sustained quality control of data collection and record keeping.

In FY08, Anesthesiology faculty led 29 clinical trials. The following are examples of clinical trials performed in FY08.

**Intravenous granisetron (Kytril®) in the prevention of Postoperative Nausea and Vomiting (PONV) in pediatric subjects undergoing tonsillectomy or adenotonsillectomy.**

- **Raymond Planinsic, MD; Tetsuro Sakai, MD; Ikematsu A. Hirai, MD, MBCb, FRCA; Gary S. Gruen, MD; Hana Pape, MD**
  - A Phase III randomized, double-blind, placebo-controlled, two arm, parallel, multi-center study evaluating the efficacy and safety of dezmedetomidine in the prevention of Postoperative Delirium in subjects undergoing surgery for fractured hip with general anesthesia. **Hospira, Inc.**
  - Jul 2007 - Jan 2008

- **Erin Sullivan, MD; Kathir Subramanium, MD**
  - A Phase III randomized, double-blind, placebo-controlled, two arm, parallel, multi-center study evaluating the efficacy and safety of dezmedetomidine in the prevention of Postoperative Delirium in subjects undergoing heart surgery on cardiopulmonary bypass. **Hospira, Inc.**
  - Jul 2007 - Apr 2008

- **Barbara W. Brandon, MD; SK Wootefel, MD; Chi Yang, MD; S Martin, MD; D Damiam, MD; RC Stough, MD; R Atilles, MD; J Lossie, MD**
  - A randomized, assessor-blind, dose-ranging, Phase II study, multi-center trial comparing the intubating conditions and time course of a block of three different intubating doses (0.45 mg/kg, 0.6 mg/kg, and 1.0 mg/kg) of rocuronium in pediatric and adolescent subjects under general anesthesia. **Organon, Inc.**
  - Schering-Plough® Apr 2006 - Oct 2007

- **Peter J. Davis, MD; Susan Wootefel, MD; Lamia Paulukonis, MD; Charles Yang, MD; Franklyn Cladis, MD**
  - Intravenous granisetron (Kytril®) in the prevention of Postoperative Nausea and Vomiting (PONV) in pediatric subjects undergoing tonsillectomy or adenotonsillectomy. **Roche Laboratories, Inc.**
  - Jul 2007 - Apr 2008

- **Patricia Darby, MD; Bupesh Kaul, MD; Dereck Davis, MD; Manuel Vallejo, MD; Venkat Mantha, MD; Joseph Deferroso, MD; Narayi Yaghigi, MD; Jonathan Waters, MD**
  - A randomized, double-blind, double dummy, dose-ranging, active and placebo-controlled study of single-dose oral ropivacaine monotherapy for the prevention of Postoperative Nausea and Vomiting (PONV). **Schering-Plough, Inc.**
  - Jan 2008 - Jun 2008

- **Jonathan Waters, MD; Manuel Vallejo, MD; Joseph Deferroso, MD; Patricia Darby, MD; Narayi Yaghigi, MD**
  - An open label, multicenter, randomized, controlled study to evaluate efficacy and safety of Procrit® in subjects undergoing elective major abdominal and/or pelvic surgery. **Ortho Biotech Clinical Affairs**
  - Dec 2006 - Dec 2007

- **Jacques E. Chelly, MD, PhD, MBA, Rama M. Joshi, MD; Daniel P. Sabo, MD; Anna A. Uakova, MD; Paul Sunic, RP; Mohammed A. Khanzada, MD; Dana Christopher Mears, MD; Lawrence Crossett, MD; Rita B. Merman, MD; Bruce Ben-David, MD**
  - A multicenter, double-blind randomized, placebo controlled study of the efficacy and safety of pregabalin in the treatment of subjects with post-operative pain following Total Knee Arthroplasty (TKA). **Wyeth Pharmaceuticals**

- **Daniel Sabo, MD; Jacques E. Chelly, MD, PhD; MBA; Todd H. Biagini, DO; Rama M. Joshi, MD; Mohammed A. Khanzada, MD**
  - A multicenter, randomized, double-blind, placebo-controlled, parallel-group study of intravenous methylaltrexone (MDA-728) for the treatment of postoperative ileus following abdominal hernia repair. **Pfizer Clinical Research**
  - Aug 2003 - Jul 2008

- **Dawn Marcus, MD; Cheryl Bernstein, MD; Thomas Rudy, PhD**
  - Assessment and prevention of menstrual migraine: Phase I - prospective survey of self-identified menstrual migraine. Phase II - prevention of menstrual migraine with Relpax™ (Eletriptan). **Pfizer Clinical Research**
  - Aug 2003 - Jul 2008

- **Dawn Marcus, MD; Joseph Furman, MD, PhD**
  - Effect of Rizatriptan on rotational motion sickness in migraineurs. **Merck & Co.**
  - Aug 2006 - Aug 2007
RITA M. PATEL, MD, Vice Chair of Education

**Educational Programs**

**SOCIETY FOR EDUCATION IN ANESTHESIA (SEA)**
This past year, Dr. Rita M. Patel served on the Board of Directors for the Society for Education in Anesthesia (SEA). The SEA Fall Meeting was held in San Francisco, CA in October, 2007. The theme of the meeting was “Teaching and Learning Specialty and Basic Anesthesia.” The SEA Spring Meeting, titled “Anesthesia Education in the 21st Century: Reaching to the Next Level, Education Out of the Classroom,” was held in Miami Beach, FL in June, 2008. Drs. Michael C. Lewis, David G. Metro, and William R. McIvor gave presentations at the meetings, while Drs. Shawn T. Beaman, Patricia L. Dalby, and Li Meng presented curriculum posters. Several faculty participated in committees for the two meetings, including Drs. Shawn T. Beaman, Franklin P. Cladis, Patricia L. Dalby, Patrick J. Forre, William R. McIvor, Ryan C. Romeo, Erin A. Sullivan, Joseph F. Talarico, Manuel C. Valjeo, and John P. Williams, Department Chair.

**AMERICAN SOCIETY OF ANESTHESIOLOGY (ASA)**
The American Society of Anesthesiologists (ASA) Annual Meeting was also held in San Francisco, CA from October 13 to October 17, 2007. Faculty and residents were well represented in Problem-Based Learning Discussions (PBLDs), Panels, Clinical Forums and Workshops. Drs. Doris K. Cope, Rita M. Patel, Carol E. Rose, and Erin A. Sullivan served on committees. Drs. Patricia L. Dalby, Theresa A. Gelzinis, Todd M. Oraviz, William R. McIvor, and Charles I. Yang participated in Problem-Based Learning Discussions (PBLDs). Nine residents presented Medically Challenging Cases, and ten scientific posters were presented by members of the Department.

**ANESTHESIOLOGY BOARD REVIEW COURSE**
In May 2008, Dr. Rita M. Patel and 36 department faculty presented a four-day Anesthesiology Board Review Course at the William Penn Omni Hotel in Pittsburgh. The objective of the course was to provide anesthesiologists and other healthcare professionals with current, relevant information to prepare for the American Board of Anesthesiology Certification/Recertification examination. In addition to explaining complex principles necessary for state-of-the-art practice, the course also offered participants the opportunity to participate in simulation sessions at WISER, including Obstetrical Anesthesia, Pediatric Anesthesia, Advanced Crisis Leadership Training and Difficult Airway Management.

The course design team included:

- **Shawn T. Beaman, MD**
  Director, Anesthesiology Clinical Base Year
- **Max W. Locke**
  Web Developer, WISER
- **John W. Lutz**
  Director, Information Technology at WISER
- **David G. Metro, MD**
  Program Director, Anesthesiology Residency Program
- **Andrew W. Murray, MD**
  Director, Crisis Leadership Training Simulation
- **Rita M. Patel, MD**
  Vice Chair for Education and Course Director
- **Paul E. Phrampus, MD**
  Director, WISER
- **John P. Williams, MD**
  Department Chair

**SOCIETY FOR STIMULATION IN HEALTHCARE**
The Society for Simulation in Healthcare’s International Meeting on Simulation in Healthcare (SIMSH) was held January 13-16, 2008 in San Diego, CA. WISER Director Dr. Paul E. Phrampus served as the Workshop Co-Chair for the meeting. Additional participants included Dr. Patricia L. Dalby, who led a course, and Dr. William R. McIvor who presented two abstracts with medical students.

**OTHER EDUCATIONAL ACTIVITIES**

**DR. DAVID G. METRO**
participated in a Panel Discussion titled “From Accreditation to Recreation” at the 2007 Annual Meeting of the Society of Academic Chairs/Association of Anesthesiology Program Directors (SAAC/AAPD) which was held in Washington, DC from November 2 to November 4, 2007.

**DR. RITA M. PATEL**
presented Educational Program Design and Assessment as a part of the Association of American Medical Colleges (AAMC) Graduate Medical Education Leadership Development Course, Part 1: Practical Approaches to Institutional Accreditation. Dr. Patel also served as the Chair of the Task Force for the Academy on Teaching Residents to Teach. The committee developed the Applying Principles and Practice of Learning and Education (APPLE) curriculum which will be implemented in July 2008. The committee also developed “Introduction to Teaching,” which was presented to almost 500 new residents and fellows at the UPMC Medical Education Program System-Wide Orientation Program in June 2008.

**DR. HELEN R. WESTMAN**
served as a senior editor for the ASA/ American Board of Anesthesiology (ABA) In-training Examination. Her responsibilities included editing questions before they were submitted for the July written board examination.
### Fellowship Program

The Department of Anesthesiology offers Accreditation Council of Graduate Medical Education (ACGME) accredited fellowship training programs in pediatric anesthesiology, pain medicine, and anesthesiology critical care medicine. Additional fellowships are offered in neuroanesthesia, cardiothoracic, liver transplantation, regional, orthopedic, obstetric anesthesiology, and anesthesiology research.

#### FELLOWSHIP DIRECTORS

<table>
<thead>
<tr>
<th>Director</th>
<th>Fellowship</th>
</tr>
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<tbody>
<tr>
<td>Doris K. Cope, MD</td>
<td>Director, Pain Medicine Anesthesiology Fellowship</td>
</tr>
<tr>
<td>Franklyn P. Cladis, MD</td>
<td>Director, Pediatric Anesthesiology Fellowship</td>
</tr>
<tr>
<td>Jacques E. Cholty, MD, PhD, MBA</td>
<td>Director, Regional Anesthesiology Fellowship</td>
</tr>
<tr>
<td>A. Murat Kaynar, MD</td>
<td>Director, Anesthesiology Critical Care Medicine Fellowship</td>
</tr>
<tr>
<td>Raymond M. Planinic, MD</td>
<td>Director, Cardiac Anesthesiology Fellowship</td>
</tr>
<tr>
<td>Een A. Sullivan, MD</td>
<td>Director, Cardiac Anesthesiology Fellowship</td>
</tr>
<tr>
<td>Manuel C. Vallejo, MD</td>
<td>Director, Obstetric Anesthesiology Fellowship</td>
</tr>
<tr>
<td>Steven L. Whitehurst, MD</td>
<td>Director, Neuroanesthesiology Fellowship</td>
</tr>
</tbody>
</table>

Yan Xu, PhD
NIH T32 Postdoctoral Research Training in Anesthesiology & Pain Management

* accredited by the Accreditation Council for Graduate Medical Education (ACGME)

### Pain Medicine Fellows

<table>
<thead>
<tr>
<th>Fellow</th>
<th>Medical School</th>
<th>Residency</th>
<th>Post-Fellowship</th>
</tr>
</thead>
<tbody>
<tr>
<td>Juan A. Albino-Rodríguez, MD</td>
<td>University of Puerto Rico School of Medicine (San Juan, PR)</td>
<td>Veteran's Administration Hospital (San Juan, PR)</td>
<td>Private Group Practice, Brooklyn, NY</td>
</tr>
<tr>
<td>Robert Castro, MD</td>
<td>Ponce School of Medicine (Ponce, PR)</td>
<td>Medical Sciences Campus, University of Puerto Rico (San Juan, PR)</td>
<td>Private Group Practice, Ponce, PR</td>
</tr>
<tr>
<td>Asif M. Chaudhry, MD</td>
<td>University of South Carolina School of Medicine</td>
<td>Baylor College of Medicine</td>
<td>Private Group Practice, Houston, TX</td>
</tr>
<tr>
<td>Brendan M. Coughtry, MD</td>
<td>Medical College of Georgia</td>
<td>University of Louisville, Health Sciences Center</td>
<td>Private Group Practice, Lexington, KY</td>
</tr>
<tr>
<td>John B. Groner, MD</td>
<td>St. George's University School of Medicine (Grenada, West Indies)</td>
<td>Medical College of Wisconsin Affiliated Hospitals</td>
<td>Private Group Practice, Milwaukee, WI</td>
</tr>
<tr>
<td>Dean S. Mizeleski, MD</td>
<td>St. George's University School of Medicine (Grenada, West Indies)</td>
<td>SUNY Upstate Medical Center</td>
<td>Private Group Practice, Scranton, PA</td>
</tr>
<tr>
<td>Scott C. Palmer, MD</td>
<td>University of Miami School of Medicine</td>
<td>Mayo Clinic Jacksonville</td>
<td>Academic/Clínica position, Mayo Clinic Jacksonville</td>
</tr>
<tr>
<td>Eric P. Robinson, MD</td>
<td>University of South Alabama</td>
<td>University of South Alabama</td>
<td>Private Group Practice, Mobile, AL</td>
</tr>
<tr>
<td>Andrea Y. Tan, MD</td>
<td>University of Pittsburgh School of Medicine</td>
<td>University of Pittsburgh School of Medicine</td>
<td>Private Group Practice, Royal Oak, MI</td>
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### Cardiac Anesthesiology Fellows

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<tr>
<th>Fellow</th>
<th>Medical School</th>
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<th>Post-Fellowship</th>
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<tbody>
<tr>
<td>Mario DuAngelos, MD</td>
<td>University of Pittsburgh School of Medicine</td>
<td>University of Pittsburgh Department of Anesthesiology</td>
<td>Private Group Practice, Miami, FL</td>
</tr>
<tr>
<td>Joy Onwore, MD</td>
<td>University of Pittsburgh School of Medicine</td>
<td>Mayo Clinic</td>
<td>Faculty Position, West Virginia University (Morgantown, WV)</td>
</tr>
<tr>
<td>Dean Polce, DO</td>
<td>Chicago College of Osteopathic Medicine</td>
<td>University of Pittsburgh Department of Anesthesiology</td>
<td>Private Group Practice, Las Vegas, NV</td>
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### Regional Anesthesiology Fellows

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<th>Fellow</th>
<th>Medical School</th>
<th>Residency</th>
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</thead>
<tbody>
<tr>
<td>Thomas Kim, MD</td>
<td>University of Minnesota Medical School</td>
<td>University of Minnesota Medical Center</td>
<td>Fellowship, Cardiac Anesthesiology, Cleveland Clinic</td>
</tr>
<tr>
<td>Mario Montoya, MD</td>
<td>University of Pittsburgh School of Medicine</td>
<td>University of Pittsburgh Department of Anesthesiology</td>
<td>Faculty, University of Pittsburgh Department of Anesthesiology</td>
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### Anesthesiology Critical Care Fellows

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<th>Medical School</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Eric Davidson, MD</td>
<td>University of Missouri, Kansas City</td>
<td>Western Pennsylvania Hospital</td>
<td>Faculty, University of Pittsburgh Department of Anesthesiology</td>
</tr>
<tr>
<td>Marivic Manrique, MD</td>
<td>University of Santo Tomas, Faculty of Medicine and Surgery (Manila, Philippines)</td>
<td>University of Pittsburgh Department of Anesthesiology</td>
<td>Private Practice, Tallahassee, FL</td>
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### Pediatric Anesthesiology Fellows

<table>
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<tr>
<th>Fellow</th>
<th>Medical School</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Kristina Antanaviciene, MD</td>
<td>Vilnius University Faculty of Medicine (Vilnius, Lithuania)</td>
<td>Western Pennsylvania Hospital</td>
<td>Bryan Maer Hospital, Philadelphia, PA</td>
</tr>
<tr>
<td>Roy Berenholz, MD</td>
<td>St. George's University School of Medicine (Grenada, West Indies)</td>
<td>Albert Einstein/Montefiore Medical Center</td>
<td>UPMC Locum tenens</td>
</tr>
<tr>
<td>Antonio Cassara, MD</td>
<td>University of Palermo (Palermo, Italy)</td>
<td>Western Pennsylvania Hospital</td>
<td>Faculty, Children's Hospital of Pittsburgh</td>
</tr>
<tr>
<td>Maria DeCaria, MD</td>
<td>West Virginia School of Medicine</td>
<td>University of North Carolina Hospitals</td>
<td>University of North Carolina Hospitals</td>
</tr>
<tr>
<td>Lynne Gehr, MD</td>
<td>West Virginia School of Medicine</td>
<td>Medical College of Virginia Hospitals</td>
<td>Medical College of Virginia Hospitals</td>
</tr>
<tr>
<td>Codruta Soneru, MD</td>
<td>Iuliu Hatieganu University of Medicine and Pharmacy (Cluj-Napoca, Romania)</td>
<td>University of Miami Hospitals and Clinics</td>
<td>Faculty, University of New Mexico (Albuquerque, New Mexico)</td>
</tr>
<tr>
<td>Tungha Suresh, MD</td>
<td>Chennai Medical College (Chennai, India)</td>
<td>Maimonides Medical Center</td>
<td>Faculty, Children's Hospital of Pittsburgh</td>
</tr>
<tr>
<td>Jay Tuchman, MD</td>
<td>Albert Einstein College of Medicine of Yeshiva University</td>
<td>University of Medicine and Dentistry of New Jersey</td>
<td>Faculty, Children's Hospital of Pittsburgh</td>
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### Research Fellows

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<tr>
<td>Thomas Chalifoux, MD</td>
<td>University of Pittsburgh School of Medicine</td>
<td>University of Pittsburgh Department of Anesthesiology</td>
<td>Pediatric Anesthesiology Fellowship, University of Pittsburgh Department of Anesthesiology</td>
</tr>
<tr>
<td>Danette Jordan, MD, MPH</td>
<td>University of Pittsburgh School of Medicine</td>
<td>T32 Post-Doctoral Scholar</td>
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Anesthesiology Residency Program

DAVID G. METRO, MD, Director

The Department of Anesthesiology’s Residency Program trains residents through supervised clinical experience, formal dynamic learning/teaching (lectures, problem-based learning discussions, journal club), and the extensive use of simulation and active research. For the past five years, the residency spots have been filled with high quality candidates from the top of the rank list. The Program also received a maximal (five year) accreditation, with no citations, on its last review by the Accreditation Council of Graduate Medical Education (ACGME).

In FY08, the Department hosted 15 GMT-4 residents, 15 GMT-3 residents, 15 GMT-2 residents, and ten GMT-1 residents. In addition, we matched 12 of our top 20 residency applicants for FY09.

ROTATION DIRECTORS

Shushma Aggarwal, MD
Associate Professor, Director Liver Transplantation Anesthesiology Rotation

Shawn T. Beaman, MD
Assistant Professor, Director Acute Pain Service Rotation, Clinical Base Year Director

Karen L. Boretsky, MD
Assistant Professor, General and Cardiac Anesthesiology Rotation

Jacques E. Chelly, MD, PhD, MBA
Professor & Vice Chair of Clinical Research, Director Regional Anesthesia and AirPS Rotation

Patrick J. Forte, MD
Assistant Professor, Director General Anesthesia Rotation, Pre-Operative Evaluation Clinic

Theresa A. Gelzinis, MD
Assistant Professor, Director Cardiac Anesthesiology Rotation

A. Murat Kaynar, MD
Associate Professor, Director Critical Care Medicine Rotation

Robert G. Krohner, DO
Associate Professor, Director General and Obstetric Anesthesiology Rotation

Li Meng, MD, MPH
Associate Professor, Director Post-Anesthesia Care Unit Rotation

Todd M. Oravitz, MD
Assistant Professor, Director General and Geriatric Anesthesiology Rotation

Steven L. Orebaugh, MD
Associate Professor, Director Regional & Ambulatory Anesthesiology Rotation

Nashant N. Rizk, MD
Associate Professor, Director Pain Management Rotation

Patrick J. Forte, MD
Assistant Professor, Director General Anesthesia Rotation, Pre-Operative Evaluation Clinic

Doreen E. Soliman, MD
Assistant Professor, Director Pediatric Anesthesiology Rotation

Erin A. Sullivan, MD
Associate Professor, Director Thoracic Anesthesiology Rotation

Steven L. Whitehurst, MD
Assistant Professor, Director, Neuroanesthesiology Rotation

The Annual Graduation Dinner was held on June 13, 2008 at Grand Hall at the Priory; several faculty and residents were recognized for their achievements, including:

MARK GILLIAND, MD AWARD FOR BEST CLINICAL RESIDENT
J. Mauricio Del Rio, MD

THE DR. LEROY HARRIS AWARD FOR EXCELLENCE IN TEACHING (RESIDENTS)
Li Meng, MD

RECOGNITION FOR EXCELLENCE IN CLINICAL TEACHING OF RESIDENT EDUCATION
Franklyn P. Cladis, MD, Joseph DeRenzo, MD; Richard D. McHugh, MD; Todd M. Oravitz, MD; Steven L. Orebaugh, MD; Kathirvel Subramaniam, MD; Jeffrey M. Varga, MD; Nasr Yazigi, MD
AWARDS

Western Pennsylvania Society of Anesthesiologists (WPSA) Resident Research Competition:

- **Dr. Thomas Borsari** was awarded first place for his case report, “Perioperative Pulmonary Aspiration of Patients who have had Esophagectomy with a Gastric Pull-up.”

- **Dr. J. Mauricio Del Rio** was awarded first place in the original research category for his entry entitled, “Hypoxic Induction of Xanthine Oxidoreductase is mediated by both the Phosphatidylinositol 3-Kinase and the Mitogen-Activated Protein Kinase Pathways.”

- **Dr. Ramona Nicolauc-Raducu** was awarded second place at the WPSA in the original research category with her presentation, “Safety of high dose tranexamic acid compared with aprotinin in thoracic aortic surgery with deep hypothermia and circulatory arrest.”

Pennsylvania Annual Resident Research Competition (PARRC):

- **Dr. Brian Bane** received first place for his case report, “Anterior Cervical Osteophytes: Two case reports of a common condition leading to perioperative morbidity and mortality.”

- **Dr. J. Mauricio Del Rio** ’s entry “Hypoxic Induction of Xanthine Oxidoreductase is mediated by both the Phosphatidylinositol 3-Kinase and the Mitogen-Activated Protein Kinase Pathways” was awarded second place in the category of original research.

Publications:


**Dr. Thomas Borsari** served as a course director in the second-year Basic Science of Care course. Several students participated in research projects and scholarly activities under the mentorship of Dr. Barbara W. Brandon, Shawn T. Beaman, Michael P. Mangione, William R. McIvor, Jonathan H. Water, and Steven L. Wherest.
Chancellor Mark A. Nordenberg stated: “This reaffirmation of universities to function at the highest levels across different context is a testament to the seriousness of our commitment to quality in everything that we do. Our inclusion in that cluster for a second consecutive year is especially gratifying because the competition is keen and other universities are constantly improving.”

In the center’s inaugural 2000 study, Pitt was in the fourth cluster of public universities—along with the University of Arizona, Georgia Institute of Technology, Ohio State University, Purdue University, the University of California at Davis, the University of California at San Diego, and the University of Virginia, ranking among the top 25 public universities in six of nine categories. As was explained in the introduction to that first study, though the center evaluates public and private universities in the same way, it also presents their performance separately “because the public and private research universities operate in significantly different contexts by virtue of their governance and funding structures. Private universities tend to have much larger endowments than public universities, while public institutions enjoy a much higher level of tax-based public support. Public universities tend to serve much more diverse constituencies in ways that affect their size and organization. Private universities often focus their efforts more closely and define their missions more precisely.”

In January 2007, The Center for Measuring University Performance moved from the University of Florida, where it had been founded, to Arizona State University (ASU). The preparation and publication of The Top American Research Universities are now based at ASU.

For the second consecutive year, the University of Pittsburgh ranks in the uppermost tier of U.S. public research universities according to The Top American Research Universities, the recently issued 2007 annual report of The Center for Measuring University Performance.

The report again places Pitt in the company of only six other leading public research universities: the University of California at Berkeley, the University of California at Los Angeles, the University of Illinois at Urbana-Champaign, the University of Michigan at Ann Arbor, the University of North Carolina at Chapel Hill, and the University of Wisconsin at Madison.

For its annual report, the center clusters research universities by objectively assessing their performance on nine different measures: total research and development expenditures, federally sponsored research and development expenditures, endowment assets, annual giving, National Academies members, significant faculty awards, doctorates granted, postdoctoral appointees, and median SAT scores. Tables in the annual report group research institutions according to the number of times they rank among the top 25 universities in the annual report group research institutions according to the nine categories.

The center’s coeditors—John V. Lombardi, president of the University of Arizona, and Christopher M. Leinberger—have described research universities as “highly competitive enterprises,” saying that “those with the highest performance enjoy a much higher level of tax-based public support. Public universities tend to have much larger endowments than public universities, while public institutions enjoy a much higher level of tax-based public support. Public universities tend to serve much more diverse constituencies in ways that affect their size and organization. Private universities often focus their efforts more closely and define their missions more precisely.”

In January 2007, The Center for Measuring University Performance moved from the University of Florida, where it had been founded, to Arizona State University (ASU). The preparation and publication of The Top American Research Universities are now based at ASU.

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“PITTSBURGH has undergone a striking renaissance from a down-and-out smokestack to a glimmering cultural oasis. But old stereotypes die hard, and Pittsburgh probably doesn’t make many people’s short list for a cosmopolitan getaway. Too bad, because this city of 89 distinct neighborhoods is a cool and — dare I say, hip — city. There are great restaurants, excellent shopping, breakthrough galleries and prestigious museums. The convergence of three rivers and surrounding green hills also make it a surprisingly pretty urban setting. And if the Pirates are in town, head over to PNC Park. Besides the game, the ballpark offers a great excuse to explore downtown Pittsburgh and the river views.” - Jeff Schaefer, The New York Times, July 6, 2008

Pittsburgh

Statistics

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Acknowledgements

Shannon M. Barnes; Jacques E. Chelly, MD, PhD, MBA; Linda B. Fleming; Travis P. Mensch; Matthew A. Kersten; William R. Thomson, MBA, MHA

[CONTRIBUTORS]

Shannon M. Barnes, MS; Jacques E. Chelly, MD, PhD, MBA; William R. Thomson, MBA, MHA; John P. Williams, MD

[EDITORS]

Kristen E. Shaw; PSD Media Services

[DESIGN & PHOTOGRAPHY]

Anesthesiology Division Chiefs and Vice Chairs;
Deborah J. Bloomberg; Jennifer M. Branik;
Michelle M. Darabant; David G. Metro, MD;
Missy J. Mitchell; Amy L. Wetmore

[SPECIAL THANKS]


Sonner JM, Werner DF, Elsen FP, Xing Y, Liao M, Harris RA, Harrison NL, Fanselow MS, Eger EI, Homanics GE. Effect of isoflurane and other potent inhaled anesthetics on minimum alveolar concentration, learning, and the righting reflex in mice engineered to express α1 GABAA receptors unresponsive to isoflurane. Anesthesiology. 2007; 106:107-113.