

**ANNUAL REPORT  
DEPARTMENT OF INTERNAL MEDICINE  
JACK A. ELIAS, M.D., CHAIR**

**JULY 1, 2006 – JUNE 30, 2007**

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**Overview**

This has been an important and exciting year for the Department of Internal Medicine at Yale University School of Medicine (YSM) and Yale-New Haven Hospital (YNHH). It has been marked by significant changes in departmental and sectional leadership. It has also been characterized by a recommitment of the faculty to all of its missions and to institutional and personal excellence. As a result, there has been substantial growth and development of the department's clinical, research and educational programs. When compared to FY 06, clinical billings increased 4.12 % to \$73,681,025, clinical collections increased by 10.1% to \$25,241,544 and clinical contract income increased by 18.6% to \$8,487,132. Research grant income also increased by 10.65% to \$89,935,884 (direct and indirect). Simultaneously, the department's educational programs continued to thrive, attracting the best and the brightest to New Haven to do their internal medicine, fellowship and research training at YSM and its affiliated hospitals. The excellence of these efforts is also reflected in the large number of major awards and honors that were bestowed on our faculty during this past year. A more detailed discussion of each of our missions is highlighted below. The specifics of these issues as they relate to each of the sections can be evaluated in the attached sectional reports.

**Structural Alterations**

The last permanent Chair of the Department of Medicine left Yale in 2003. The Department of Medicine has been run by an acting Chair during this interval. As a result of this interim status, a number of key appointments in the department, including the Chiefs of the Sections of Infectious Diseases, Cardiovascular Medicine, Endocrinology and Hematology, were occupied by "acting/interim" leaders. In addition, with the abrupt departure of the acting Chair of the Department and the long-term department administrator, Mr. Gary Mulligan, the departmental infrastructure was virtually eliminated.

In October 2006 after a long search, Jack A. Elias, M.D. (formerly Chief of Pulmonary and Critical Care Medicine) was appointed Chair of the Department. In the interval since this appointment, a number of important events have occurred including the:

- Reconstitution of the Department of Medicine Business and Administrative offices.
- Successful recruitment of Jonathan Tamir, M.B.A. to be the Associate Chair for Finance and Administration. Mr. Tamir was recruited from the Department of Medicine at Albert Einstein College of Medicine and Montefiore Medical Center.
- Appointment of Lawrence Young, M.D. (Professor of Medicine in Cardiology) to Chair the Department's Appointments and Promotions Committee.

- Appointment of Lloyd Cantley, M.D. (Professor of Medicine in Nephrology) to become the Associate Chair of the Department of Medicine for Research.
- Appointment of Mark Siegel, M.D. (Associate Professor of Medicine in Pulmonary and Critical Care Medicine) to be Director of Critical Care Medicine for the Department.
- Initiation of national searches for new Chiefs of Hematology, Infectious Diseases, Cardiology and Pulmonary and Critical Care Medicine.
- Successful recruitment of Madhav Dhodopkar, M.D. to become the Chief of Hematology and the Director of Malignant Hematology in the Yale Cancer Center. Dr. Dhodapkar was formerly the Irene Diamond Associate Professor and Head of the Laboratory of Tumor Immunology and Immunotherapy at Rockefeller University.
- Successful recruitment of Erol Fikrig, M.D. to become the new Chief of Infectious Diseases at Yale University School of Medicine and YNHH. He was formerly a Professor of Medicine at Yale University School of Medicine and is a world's expert in arthropod borne diseases and vaccine biology.

Searches are presently underway for new Chiefs of Cardiovascular Medicine and Pulmonary and Critical Care Medicine. These are both in an advanced stage and lead candidates have been identified. During the coming year it is likely that new inpatient Firm Chiefs will be selected.

### **Clinical Activities**

The Department's clinical practice continued to grow and diversify during this past year. Clinical billings increased by 4.12 % to \$73,681,025, collections increased by 10.1% to \$25,241,544 and contracts increased by 18.6% to \$8,487,132. In addition, inpatient service at YNHH continued to be a beehive of activity with the Department of Medicine accounting for 18,333 discharges during this year (up from 17,698 in FY 2006) with an average length of stay of 5.29 days versus 5.35 days in FY 2006. The average daily census for Medical Service was 265, up from 259 last year. Restructuring of the inpatient service was also accomplished to improve the efficiency and quality of patient care. Highlights included the following items:

- The successful reorganization of the MICU to include a third attending, fellow, resident and physician assistant team. This was accomplished with significant YNHH support which allowed 2 MICU attendings to be recruited.
- The establishment of an interdisciplinary clinical program in solid organ transplantation. The bulk of this activity has focused on liver and kidney transplants. The program nucleated with the recruitment of Sukru Emre, M.D. to the Department of Surgery and Michael Schilsky, M.D. and Tamar Taddei, M.D. to join Mario Strazzabosco, M.D. in Transplant Hepatology.
- The continued growth of the Renal Transplant Service and the Transplant Nephrology program run by Richard Formica, M.D (Nephrology).

- The continued success of the Leukemia Service run by Peter Marks, M.D. (Hematology).
- The continued growth and success of the Yale Center for Asthma and Airways Disease run by Geoffrey Chupp, M.D. (Pulmonary).
- The establishment and remarkable growth of the Program in Pulmonary Hypertension run by Terence Trow, M.D. and John McArdle, M.D. (Pulmonary).
- The continued growth of the Thoracic Oncology Program run by Lynn Tanoue, M.D. (Pulmonary) and Frank Detterbeck, M.D. (Surgery).
- The growth and restructuring of the Primary Care Center run by Inginia Genao, M.D. (General Medicine).
- The growth of Digestive Diseases including the establishment of a new Clinical Digestive Diseases Center on the first floor of the Temple Medical Building. This has been accompanied by the continued growth in our endoscopy program and our leading endoscopic ultrasound program run by Priya Jamidar, M.D. (Digestive Diseases).
- The agreement in principle with YNHH to establish a diabetes center, a program in transplant and infectious diseases and a program in palliative care.
- The establishment and garnering of funding from YNHH for a program to manage patients with sickle cell disease.
- The restructuring of the inpatient service and hiring of 3 Associate Firm Chiefs (Frank Lobo, M.D., John Moriarity, M.D. and Krystn Wagner, M.D.) to work with Grace Jenq, M.D., the Director of Operations of the Department, to enhance the quality and efficiency of inpatient care.
- The selection of Mark Siegel, M.D., formerly the Medical Director of the MICU and now the Director of Critical Care for the Department, to receive the Department's Excellence in Clinical Care Award from the Department of Medicine.

The success of these programs is reflected in a number of ways including the:

- Selection of 7 of the Department's Programs (Respiratory Medicine #19, Nephrology #19, Geriatrics #7, Digestive Diseases #16, Cancer #23, Cardiology #42 and Endocrinology#17) as the top programs in the USA by US News and World Report.
- Selection of 15 individuals as “Best Doctors” in NY including:
  - William Batsford, M.D.                      Cardiology
  - Henry Cabin, M.D.                            Cardiology
  - Barry Zaret, M.D.                            Cardiology
  - Silvio Inzucchi, M.D.                        Endocrine

▪ Leo Cooney, M.D.	Geriatrics
▪ Mary Tinetti, M.D.	Geriatrics
▪ Vincent Quagliarello, M.D.	Infectious Diseases
▪ Michele Barry, M.D.	General Medicine
▪ Dennis Cooper, M.D.	Oncology
▪ Peter Aronson, M.D.	Nephrology
▪ Mark Cullen, M.D.	Occupational Medicine
▪ Jack A. Elias, M.D.	Pulmonary
▪ Richard Matthay, M.D.	Pulmonary
▪ Carrie Redlich, M.D.	Occupational Medicine
▪ Carolyn Rochester, M.D.	Pulmonary

- Selection of 10 YNHH All Stars:

▪ Harry Aslanian, M.D.	Digestive Diseases
▪ Geoffrey Chupp, M.D.	Pulmonary
▪ Elizabeth Cooney, M.D.	AIDS
▪ Leo Cooney, M.D.	Geriatrics
▪ Gerald Friedland, M.D.	AIDS
▪ Richard Matthay, M.D.	Pulmonary
▪ John McArdle, M.D.	Pulmonary
▪ Carolyn Rochester, M.D.	Pulmonary
▪ Mark Siegel, M.D.	Pulmonary
▪ Lynn Tanoue, M.D.	Pulmonary

The Department faces a number of important challenges in the coming year(s) including the:

- Formulation of structures and policies that allow the continued growth and development of these clinical programs.
- Establishment of a financial model that will allow the growth and development of evaluation and management intense subspecialties, particularly in the outpatient arena.
- Enhancing the productivity and efficiency of the present clinical operations.
- Establishment of a system that allows an enhanced level of personal, sectional and departmental accountability for all faculty members.
- Continued recruitment in selected areas including Hematology, Infectious Diseases, Cardiology and Pulmonary.
- The recruitment of clinically intense physicians focused on inflammatory bowel disease to work closely with Judy Cho, M.D. in the Yale Inflammatory Bowel Disease Program.

- Continued restructuring of the inpatient service and the redefinition of and hiring of new Firm Chiefs.
- The successful conclusion of negotiations with YNHH regarding the integration of the YNHH Hospitalist Service into the academic Department of Medicine.

## **Education**

The Department of Medicine had a very successful year from the educational point of view. The department continued to recruit an impressively competitive group of medical school graduates into our Traditional, Primary Care and Medicine-Pediatrics Residency Programs. A similarly highly competitive group of individuals were recruited into the various fellowship programs in the department. Highlights of the year included:

- The establishment of a Physician Scientist pathway in the Traditional Residency Program to enhance the recruitment and retention into our fellowship programs of graduates with both M.D. and Ph.D. degrees and an interest in careers in academics and investigation. Peter Aronson, M.D. (Professor of Medicine in Nephrology) now directs this program.
- The successful recruitment of 9 M.D./Ph.D. individuals into our Traditional Residency Program (in contrast to 0-3 for the last 3 years).
- The successful filling in the residency match of the 1-year preliminary residency program for the first time in years.
- The successful retention of 11 Yale Medical School graduates into residency programs in the Department of Medicine.
- The restructuring of the inpatient service and the hiring of new Associate Firm Chiefs.
- The establishment of a new Kushlin Service as an inpatient firm dedicated to the care of patients with advanced liver disease.
- The documentation by the Association of American Medical Colleges that the Department's Internal Medicine elective was considered to be outstanding or excellent by 91.6 % of the rotating medical students. This was the highest level of satisfaction of any YMS educational rotation.
- The continued growth and success of our mentoring and Faculty Development Seminar Series.
- The continued growth and development of our Program in International Health and the expansion of services in Kampala, Uganda at the Makerere University.

In accord with these accomplishments, a number of impressive educational awards were given to Internal Medicine faculty during this past year. They include:

- Majid Sedigh, M.D. - General Medicine
  - Recipient of the Department of Medicine Award for Excellence in Teaching in 2007.
  - Recipient of the Leonard Tow Humanism Award presented by the Arnold P. Gold Foundation for particular compassion in the care of patients.
- Henry Binder, M.D. - Digestive Diseases
  - Recipient of the American Gastrological Association "Distinguished Mentor Award" for lifetime mentorship.
- Fred Gorelick, M.D. - Digestive Diseases
  - Recipient of the Charles Bomfalk Teaching Award for 2007 in the Basic Sciences.
- Vincent Quagliarello, M.D. - Infectious Diseases
  - Recipient of the Leah Lowenstein Award. This Award is presented to the faculty member that is a positive role model for women in the promotion of human and egalitarian medical education.
- Damani Piggott, M.D. - Resident in Med-Peds Program
  - Recipient of the Betsy Winters House Staff Award for Outstanding Teaching.
- Frank Bia, M.D. - Infectious Diseases
  - Recipient of the 2007 George F. Thornton Award from the American College of Physicians for his contributions to education.
- Leo Cooney, M.D. – Geriatrics
  - Recipient of the Alvin Feinstein Award as the outstanding teacher of clinical skills.
- Zhinan Yin, M.D. - Rheumatology
  - Appointed Dean of the College of Life Sciences at Nankai University, People's Republic of China

## **Research**

The Department of Medicine continued to be a hotbed of research this past year. Despite discouragingly low NIH pay lines, the Department's Funding increased by 10.65% to \$89,935,884. Selected highlights during the year included the following:

- The receipt from the NIH of a Clinical and Translational Sciences Award (CTSA). Robert Sherwin, M.D. (Endocrinology) was the PI of this proposal.
- The description of extremely drug resistant tuberculosis (Xdr-Tb) in Africa and the strategies that are needed to prevent its spread by Gerald Friedland, M.D. and colleagues (Infectious Diseases).

- The development of new techniques to interrupt the life cycle of the agent that causes Lyme Disease by Erol Fikrig, M.D. and colleagues (Infectious Diseases).
- The description by Bernard Forget, M.D. and colleagues (Hematology) of the effects of null mutations of Pitx2 on hematopoiesis.
- The demonstration by Rory McCrimmon, M.D., Robert Sherwin, M.D. and colleagues (Endocrinology) that a major cause of the failure of the brain to sense hypoglycemia and activate counter-regulatory defense mechanisms after starting intensive insulin therapy is an increase in corticotropin releasing factor-2 receptor activity in the ventromedial hypothalamus.
- The demonstration by Kitt Petersen, M.D. and colleagues (Endocrine) that primary defects in insulin stimulated muscle glycogen synthesis in young lean insulin resistant individuals can lead to atherogenic dyslipidemia and the metabolic syndrome by promoting increased hepatic *de Novo* lipogenesis and increased VLDL production.
- The demonstration by Varman Samuel, M.D., Gerald Shuman, M.D. and colleagues (Endocrine) that knocking down the expression of protein kinase C $\epsilon$  in liver protected rats from fat-induced hepatic insulin resistance.
- The demonstration by Peter Aronson, M.D. and colleagues (Renal) that the oxalate transporter is a candidate gene for human kidney stone disease.
- The demonstration by Stefan Somlo, M.D. and colleagues (Renal) that cation channel protein polycystin-2 traffics to cilia normally in the absence of polycystin-1, the gene implicated in the most common and severe forms of polycystic kidney disease.
- The demonstration by Tom Gill, M.D. (Geriatrics) that persistent bathing disability among older persons can significantly increase the risk of long-term nursing home admission.
- The demonstration by Judy Cho, M.D. (Digestive Diseases) that there is an association between mutations in the IL-23 receptor and development of Crohn's Disease.
- The demonstration by Mario Strazzabosco, M.D. and Michael Nathanson, M.D. (Digestive Diseases) that CFTR, the defective gene in cystic fibrosis, regulates secretion in bile ducts by regulating release of ATP into the bile.
- The demonstration by Yasuko Iwakiri, M.D. and Roberto Groszmann, M.D. (Digestive Diseases) that nitrosylation of proteins by nitric oxide is regulated at a local, subcellular level by localized expression of nitric oxide synthase.
- The demonstration by Chun Geun Lee, M.D., Ph.D. and colleagues (Pulmonary) that genetic factors determine if TGF-beta causes emphysema versus pulmonary fibrosis.

- The demonstration by Geoffrey Chupp, M.D. and colleagues (Pulmonary) that the chitinase-like protein YKL-40 is found in exaggerated quantities in the lungs and serum of patients with asthma where the levels correlate with disease severity.
- The demonstration by Patty Lee, M.D. and colleagues (Pulmonary) that Toll-like receptor 4 plays a protective role in the pathogenesis of pulmonary emphysema.
- The demonstration by Lauren Cohn, M.D. and colleagues of a new pathway for pulmonary antigenic tolerance.
- The demonstration by David Fiellin, M.D. and colleagues (General Medicine) that buprenorphine given with brief counseling can be as effective as more intensive specialized counseling for the treatment of opioid dependence.
- The demonstration by Carrie Redlich, M.D., M.P.H. and colleagues (Occupational Medicine) that skin exposure plays an important role in isocyanate-induced asthma.
- The discovery by Arya Mani, M.D. (Cardiology) and colleagues that a missense mutation in the LRP6 gene associates with early atherosclerosis and the metabolic syndrome.
- The demonstration by Jeffrey Bender, M.D. and colleagues (Cardiology) that c-SRC plays an important role in mediating nitric oxide-mediated vasorelaxation in response to estrogen.

The impressive accomplishments of the faculty are reflected in the prominent awards and major grants that they received during the past year. Selected highlights are listed below.

- Patty Lee, M.D. – Pulmonary
  - Selected for membership in the American Society of Clinical Investigation.
- Arya Mani, M.D. – Cardiology
  - Recipient of the Sir William Osler Young Investigator Award at the November, 2007 Meeting of the Interurban Clinical Club.
- Robert Sherwin, M.D. – Endocrinology
  - Recipient of the Banting Medal for Scientific Achievement from the American Diabetes Association. This is the American Diabetes Association's highest scientific honor.
  - Renewed the NIH-funded Yale Diabetes Endocrinology Research Center (P30 DK 45735-15).
- Harlan Krumholz, M.D. – Cardiology
  - Recipient of the Award of Meritorious Achievement from the American Heart Association for Leadership in Creating the QCOR Interdisciplinary Working Group and the Annual Forum on Quality of Care and Outcomes Research.
  - Elected for membership for the Institute of Medicine.
  - Recipient of NIH-NHLBI funding for an international, long-term observational study of 2000 women and a comparison cohort of 1000 men to identify gender differences in

mortality, health status, quality of care, and other outcomes following acute myocardial infarction.

- Aldo Peixoto, M.D. – Nephrology
  - Recipient of the Young Investigator Award from the Eastern Chapter of the American Society of Hypertension.
- Tamar Taddei, M.D. – Digestive Diseases
  - Recipient of the Sherlock Award from the American Association for the Study of Liver Disease (AASLD).
- Bernard Forget, M.D. – Hematology
  - Elected to the American Academy of Arts and Sciences.
- Gerald I. Shulman, M.D. – Endocrinology
  - Elected into the National Academy of Sciences.
- Jonathan Bogan, M.D. – Endocrinology
  - Recipient of the Department of Medicine Research Achievement Award.
- Terri Fried, M.D. – Geriatrics
  - Recipient of a Pioneer Award from the Robert Wood Johnson Foundation to study decision-making and health outcome priorities among older adults with multiple health concerns.
- Mary Tinetti, M.D. – Geriatrics
  - Selected for membership in the Institute of Medicine.
- Guadalupe Garcia-Tsao, M.D. – Digestive Diseases
  - Recipient of National Hepatitis C Resource Center Award (based at the West Haven VA).
- Judy Cho, M.D. – Digestive Diseases
  - Recipient of NIH/NIDDK consortium grant to study the genetics of Inflammatory Bowel Disease.
- Robert Alpern, M.D. – Nephrology / Dean of the Medical School
  - Selected for membership in the Institute of Medicine.
- David Rothstein, M.D. – Renal
  - Recipient of Funding for Program Project Grant P01-AI064343 from the NIH.
- Peter Aronson, M.D. – Renal
  - Receipt of Merit Status Award from the NIH.

- Amy Justice, M.D. – General Medicine
  - Recipient of NIH/ NIAAA funding through 2011 for her project entitled "Alcohol Associated Outcomes Among HIV+/- Veterans" for a total of \$13,928,272.
- Barbara Kazmierczak, M.D. – Infectious Diseases
  - Recipient of the Burroughs Wellcome Investigator Award in the Pathogenesis of Infectious Diseases.
- Erol Fikrig, M.D. – Infectious Diseases
  - Recipient of an Investigator Award from the Howard Hughes Medical Institute.

There are a number of challenges that will be faced during the coming years including the need to:

- Establish horizontally integrated research teams that extend from Master Clinicians to basic science investigators.
- Foster human translational research.
- Continue to attract and nurture outstanding young physician scientists.

### **Promotions and Departures**

The total number of full-time and voluntary faculty increased to 347 and 613, respectively, during the 2007 academic year. The number of female Professors and Tenured Associate Professors in the Department increased to 14 during this time.

### **The following faculty were promoted during the 2006 – 2007 academic year:**

#### **Professors**

Lloyd Cantley, M.D.  
 John Concato, M.D.  
 Daniel Federman, M.D.  
 Kevan Herold, M.D.  
 John Hughes, M.D.  
 Richard Lifton, M.D., Ph.D.  
 Mark Mamula, Ph.D.  
 Pramod Mistry, M.D.  
 Deborah Proctor, M.D.  
 Stanley Rosenbaum, M.D.  
 Lynn Tanoue, M.D.

#### **Associate Professors**

Daniel Biemsderfer, Ph.D.  
 Lauren Cohn, M.D.

Daniel Goldstein, M.D.  
Robert Homer, M.D., Ph.D.  
Barbara Kazmierczak, M.D., Ph.D.  
Jane Kerstetter, Ph.D.  
Harriet Kluger, M.D.  
Chirag Parikh, M.D., Ph.D.  
Anna Reisman, M.D.  
Kerry Russell, M.D., Ph.D.  
Mehran Sadeghi, M.D.  
Albert Shaw, M.D., Ph.D.  
Andre Sofair, M.D.

**Assistant Professors**

Erica Herzog, M.D., Ph.D.  
Yasuko Iwakiri, Ph.D.  
Joseph Lim, M.D.  
Donna Windish, M.D.

**Research Scientist**

James Dziura, Ph.D.

**Senior Research Scientist**

Li Wen, M.D., Ph.D.

**The following faculty were newly appointed during the 2006 – 2007 academic year:**

Danielle Antin-Ozerkis, M.D.	Assistant Professor
Suzanne Cassel, M.D.	Associate Research Scientist
Herta Chao, M.D.	Assistant Professor
Carla Da Silva, Ph.D.	Associate Research Scientist
Elizabeth Drye, M.D.	Associate Research Scientist
Peter Ellis, M.D.	Assistant Professor
Shuta Ishibe, M.D.	Associate Research Scientist
Zhirong Jiang, M.D.	Associate Research Scientist
Francis Lobo, M.D.	Assistant Professor
Guang-Xun Li, Ph.D.	Associate Research Scientist
Lesiley Lincoln, M.D.	Assistant Professor
Terrence Murphy, Ph.D.	Associate Research Scientist
Yoshio Nagai, M.D., Ph.D.	Associate Research Scientist
Murli Narayan, Ph.D.	Associate Research Scientist
Manuel Rosado, M.D.	Assistant Professor
Amy Schwartz, M.D.	Assistant Professor
Fayyaz Sutterwala, M.D.	Associate Research Scientist
Rajeev Vaidyanathan, Ph.D.	Associate Research Scientist
La-Xiang Wan, M.D., Ph.D.	Associate Research Scientist
Peili Wang, M.D.	Associate Research Scientist
Yanling Wu, M.D., Ph.D.	Associate Research Scientist

**The following faculty left Yale during the 2006 – 2007 academic year:**

Vincent Andriole, M.D. (Emeritus Faculty)

George Arhin, Ph.D.

Ramana Chilkamarti, Ph.D.

David Coleman, M.D. (Emeritus Faculty)

Tong Dai, M.D., Ph.D.

Shawn Fultz, M.D.

Sunita Goyal, M.D.

Ali Hariri, M.D.

Arati Khanna-Gupta, Ph.D.

Rajlakshmi Krishnamurthy, M.D.

Xin Li, Ph.D.

Cheng Liao, Ph.D.

Vazhaikkurichi Rajendran, Ph.D.

Linda Rogozinski, Ph.D.

Gary Vanasse, M.D.

Wei Wang, Ph.D.

Madeline Wilson, M.D.

Suchat Wongcharatrawee, M.D.

Xuchen Zhang, Ph.D.