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<u>Annual Report for 2010-11</u> <u>Department of Medicine</u> <u>Boston University School of Medicine</u> <u>Boston Medical Center</u>

The Department of Medicine completed a very successful academic year in 2010-11. As outlined below, the department's clinical and research programs continued to grow in size and quality. The training programs successfully competed for a diverse and outstanding group of trainees, both in the department's residency program as well as the subspecialty fellowships. In addition, a number of enhancements in the department's administrative structure and personnel have contributed to improvements in efficiency and service to our patients, faculty, staff, and trainees. The following report summarizes achievements in Clinical Care, Research, Education, and Faculty Development.

Research Activities

Under the leadership of Barbara Corkey, Ph.D., Vice Chair for Research, progress and achievements in research during the 2010-11 academic year have been quite noteworthy. **The department's research grant funding of new grants totaled \$103.4 m. This total does not include funding through the National Emerging Infectious Disease Institute or of departmental faculty at the Boston VA Healthcare System or Roger Williams Medical Center.** The 2010-11 research funding was 4% below that of 2009-10, reflecting an anticipated decline in ARRA funding from NIH.

The department funded **10 pilot grants in 2010-11** in collaboration with the Clinical Translational Sciences Institute, The Boston Older Americans Independence Center (Pepper Center), Wing Tat Lee Fund of Boston University, and the Center for Nanotechnology and Nanobiotechnology. The department also awarded bridge funding to three faculty.

The **Evans Center for Interdisciplinary Biomedical Research (ECIBR)** has organized Affinity Research Collaboratives (ARCs) that include the Mitochondria Consortium, Protein Trafficking and Neurodegenerative Disease, Sex Differences in Adipose Tissue Remodeling, Obesity and Cancer, iPS-Driven Tissue Regeneration (Regenerative Medicine), Calcium Homeostasis and Disease, Arterial Stiffness, and evaluation of the Microbiome in human blood. In addition, new ARCs continue to be explored as pre-ARCs, such as in Nanotheranostic and Genomic and Computational models of environmental chemical carcinogenicity: (see:

<u>http://www.bumc.bu.edu/medicine/evansbiomedicalresearch</u>). During the past academic year the following achievements of the ARC's are notable: 32 co-PI interdisciplinary publications; 13 funded grants involving co-PIs and one PPG; participation by 27 graduate students and 19 post doctoral fellows. From a total of 146 participating faculty in all ARCs and pre-ARCs, 28 are from basic science and other departments at BUSM, 3 from the dental school, 7 from the School of Public Health, 18 from Charles River Campus, 14 collaborators are from outside of BU and 79 **from the Department of Medicine.** In addition, the ECIBR initiated new interdisciplinary courses in Principles in Nanomedicine and Biological core technologies. The ECIBR also worked closely with Drs. Bennett Goldberg (Director, BU Nanoscience Center) and Douglas Faller (Director, Cancer Center) to secure a NCI-funded Cancer Nanotechnology Training Center (R25). Also at research/educational level, the ECIBR initiated and co-organized interdisciplinary thematic seminars on topics such as, "Stem Cell, Development and Cancer" and "Molecular Biology of Aging" and a mini symposium on "New Frontiers in Molecular Medicine" to honor the achievements of Dr. John Murphy.

In 2009-10, the department established a new section - **Computational Biomedicine.** This new section serves as an important home for research and training in genomic and computational approaches to disease pathogenesis, diagnosis, and treatment. The section's faculty and trainees use high-throughput technologies (i.e., microarrays and next generation sequencing) to generate genome-wide data sets that are then analyzed with state of the art computational tools. <u>Seven</u> new faculty have been successfully recruited to Computational Biomedicine since its inception in 2009-10.

In September, 2008, the department established three instrumentation cores, Analytical Core, Animal Phenotyping Core, and Cellular Imaging Core. In 2010-11, use of these cores by faculty and staff from in and outside the Department of Medicine dramatically increased from 76 PI's in 2009-10 to more than 100 PI's in 2010-11 with an increase in hours from 7,800 in 2009-10 to a total of 20,000 hours. A total of 31 grants were submitted using these core resources of which 10 were funded for a total of over \$27 m. Four additional infrastructure and instrumentation grants were also submitted. A new departmental Biostatistics Core was established in 2010-11. Based on heavy use of this core in the first year, it will be expanded in the coming academic year. The department also contributes resources to the staffing of the Bioinformatics core and Clinical Research Resources Office of the Clinical Translational Sciences Institute.

During the past year, two new Evans Scholars were appointed: Drs. Vasan Ramachandran and Joseph Vita. The Evans Scholar Award was established to recognize and support the research activities of distinguished senior faculty in the department. In addition, the department distributed four Evans Junior Faculty Research Merit Awards to recognize Assistant Professors with exceptional promise as independent investigators. The 2010-11 Robert Dawson Evans Junior Faculty Merit recipients were Tracy Battaglia, M.D., Section of General Internal Medicine, Andrea Coviello, M.D., Section of Preventive Medicine, Naomi Hamburg, M.D., Section of Cardiovascular Medicine, Ross Summer, M.D., Section of Pulmonary, Allergy, and Critical Care.

Clinical Activities

Under the leadership of Raj Krishnamurthy, M.D., Vice Chair for Outpatient Medicine and Nila Radhakrishnan, M.D., Vice Chair for Inpatient Medicine, the department's clinical activities continued to grow substantially during 2010-11. Despite a slowing in the growth of new clinical faculty, the **department's faculty increased wRVU's to 712,111 – a 6.3% increase compared to 2009-10. Over the past three years, the department's total wRVU's have increased by 24%.** This growth is attributable to an increase in the number of providers, increased productivity by individual providers, and to improvements in documentation and capture of clinical activity.

The opening of the Carl and Ruth Shapiro Ambulatory Care Center in spring of 2011 created a significant increase in the quality and quantity of the department's ambulatory practice space. The Adult Primary Care, Nephrology, Pulmonary and Allergy, Rheumatology, Infectious Disease and Pre-

Procedure Evaluation clinics moved into the Shapiro building. This state of the art facility has greatly improved our efforts to create an academic ambulatory practice that optimizes the experience for our patients, providers, and trainees.

The department's revenue cycle management continued to be a major focus of operational improvement during the past year. **Billings increased by 7% and collections increased by 6% to \$32.03 m** (excluding Free Care funds). Accounts receivable decreased by 3% and days in accounts receivable decreased to 35.4 days from 39.1 days. The net collection rate reached 94% by the end of the academic year and charge denials fell by 1% to 14%.

<u>Ambulatory Care:</u> The ambulatory practice of the department continued to grow during 2010-11. Overall, **Ambulatory visits (267,741) increased by 3.3% over the preceding year**. The access to care for new patient referrals as represented by the number of new patients seen within 15 days of the request in our department's practices increased to 55% in 2010-11 from 45% in 2009-10.

The ambulatory practices are working to improve access to care for new patients, patient satisfaction, and overall operations and quality of care delivery. Improvements were made in patient flow by streamlining scheduling processes and better telephone access. Clinical practice dashboards were created for each practice and for individual providers to provide timely reports of coding, RVU and volume trends. Scheduling templates within the ambulatory practice have been standardized in session length and visit types and duration. A major practice reorganization pilot is underway in the department's primary care practice to create a medical home model.

The capacity and aesthetics of our off site practice at Commonwealth Avenue, BU Medical Group at Commonwealth Ave, have improved significantly during the past year. The Commonwealth Avenue location also added a Polysomnography Laboratory in August 2010, in addition to its existing Endoscopy Suite. The clinical volume at this site has increased substantially.

<u>Inpatient Care:</u> The Department of Medicine's number of discharges from the Medical service for the 2010-11 academic year was down slightly and the length of stay remained steady at 4.6 days.

The department instituted changes on the inpatient service to improve the teaching program and to improve the observed to expected mortality ratio for our patients hospitalized on the inpatient service. Attendings were required to round twice daily, barriers to transfer to the MICU/CCU were reduced, a Procedure Team was established, and coordination of care with referring physicians was improved. Care of patients with sepsis, congestive heart failure, and requiring anticoagulation were targeted for systembased improvements. The Observed:Expected mortality ratio on the inpatient medical service fell from 1.4 to 0.9 during 2010-11.

The Department of Medicine's Quality Council has been working to address issues of Patient Safety and to promote Quality Improvement activities within the department. The focus of the committee during the 2010-11 academic year has been to review University Health Consortium mortality data and identify opportunities for improvements in patient care systems. Additionally the Quality Council worked with BMC IT and the Internal Medicine Residency Program to develop improved systems for communication with Primary Care Providers during hospital admissions. Lastly, the Quality Council has begun to use the BMC Data Warehouse to review Ambulatory Quality Data and to develop systems for process improvements within the clinic practices. Each section within the Department of Medicine has also implemented metric driven quality plans to insure that we are achieving best practice and delivering

high quality care to our patients.

Educational Activities

Under the leadership of Angela Jackson, M.D., Vice Chair for Education, the department's education programs thrived in 2010-11. Our department is enriched by engaged medical students, a diverse and highly qualified group of trainees in the residency and subspecialty fellowship programs, and committed and talented faculty mentors, who model excellence in research, education, and clinical activities.

<u>Medical Student Education</u>: The 2010-11 academic year was the third year of the new model for the core Medicine rotation, comprised of Medicine 1 and Medicine 2. All 3rd year students participate in the 8-week inpatient rotation (Medicine 1) and the fourth year students participate in a restructured ambulatory rotation (Medicine 2).

The student evaluations of the third year clerkship in the department were markedly improved during the past year. The department's clerkships in Medicine and in Geriatrics had the highest overall rating of all clerkships in BUSM! Remarkably, the number of students rating the clerkship good or excellent increased to over 90% in all domains of the evaluation!

<u>Residency Program:</u> The Internship Match for the 2010-11 PGY 1 class (41 categorical, 14 preliminary and 5 Primary Care positions) was highly successful. We were particularly pleased that 15 BUSM students matched in our program- an unusually large number. There are 25 women and 4 under-represented minorities in the PGY-1 class. Additionally, the residents applying for fellowship training following the completion of residency were extremely successful in the fellowship match.

Remarkably, the **PGY-1 and PGY-2 classes have significantly increased their In-Training Exam** scores relative to the national pool in each of the last four years. The PGY-1 class has doubled the average percentile score to just under 80th percentile and the PGY-2 class has increased their average percentile score to just over the 60th percentile.

Building on our experience over the past two years, a novel model for resident schedule development was implemented in the 2010-11 academic year. The 3+1 model increased the time residents spend in the ambulatory setting, and eliminated the tension between the inpatient service needs and the requirements of attending continuity clinic. This new scheme required a complete redesign of the precepting model in the primary care and subspecialty clinics, more closely linking faculty preceptors with the residents and the patients, and a new model for curriculum delivery via lectures and case discussions. The feedback from residents and faculty on the new scheduling format has been overwhelmingly positive.

<u>New curriculum</u>: In the 2010-11 academic year, we implemented the Academic ½ Day, a three-hour morning block dedicated to didactic and skill building sessions for all residents on their Ambulatory Long Block. The innovative EBM curriculum implemented during the last academic year was integrated into the Academic ½ Day, along with physical diagnosis skills, professional development workshops and communication skills sessions.

<u>Senior Resident Academic Day</u>: All of our PGY 3 residents participated, presenting either a talk, poster of their original research or clinical vignette.

<u>Fellowship Programs</u>: All Internal Medicine subspecialty fellowship programs continue to recruit high quality candidates, and are fully accredited.

Faculty Development and Diversity Activities:

Under the leadership of Dr. Emelia Benjamin as Vice Chair of Faculty Development and Diversity, Dr. Peter Cahn, Director of Faculty Development and Diversity, and Dr. Jane Liebschutz, chair of the Faculty Development and Diversity Committee (FDDC), the Department has expanded its efforts to nurture a vibrant and diverse faculty. The guiding vision for their activities has been to foster a respectful, creative and collaborative environment that will support the faculty to reach their full potential and maximize their contributions to the educational, research, clinical, and service missions of Boston University, Boston Medical Center, and the Department of Medicine.

The Early Career Faculty Development Program launched in January 2011. An interdisciplinary committee selected 18 participants from 32 applicants representing 20 academic departments. The curriculum reflects the input of the BUMC Mentoring Task Force, focus groups, and needs assessment survey.

The FDDC designed a curriculum of **21 one-hour professional development seminars**. Participants received Continuing Medical Education credit. On a scale from 1 to 5 where 5 is excellent, the seminars rated an average of 4.5. The **FDDC awarded 27 grants for professional development (\$33,731) to departmental faculty.**

The faculty development website was also further augmented to aid faculty in identifying professional development opportunities (<u>http://www.bumc.bu.edu/facdev-medicine/</u>). The faculty development program has also worked to build and respect diversity within the faculty community (<u>http://www.bumc.bu.edu/facdev-medicine/diversity/</u>).

The following members of the department received awards during the 2010-11 academic year:

Research Mentoring: Neil Ruderman, M.D. Jr Faculty Mentoring: Marie McDonnell, M.D. Robert Dawson Evans Special Recognition Teaching: Harrison Farber, M.D. Outstanding Citizenship: Christine Campbell Reardon, M.D. Hospital-Based Faculty Teaching: Adam Segal, M.D. Community-Based Faculty Teaching: Catherine Rich, M.D. Fellow Teacher of the Year: Stephen Humm, M.D. Resident Teacher of the Year: Mark Villalon, M.D.

<u>Faculty composition</u>: The number of faculty increased to 439 during 2010-11 and 15 faculty were promoted to a higher academic rank including four to the rank of Professor (Drs. Apovian, Roy, Sanchorawalla, and Sparrow). **The percent of women faculty increased to 44% and under-represented minorities was 4.1%.** The number of women at senior faculty ranks and under-represented minorities remain below departmental goals.

	Men	Percent	Women	Percent	URM	Percent	Total
Instructor	21	38	35	63	1	1.8	56
Assistant Professor	98	48	106	52	8	3.9	204

Associate Professor	53	63	31	37	5	6.0	84
Professor	72	76	23	24	4	4.2	95
Total	244	56	195	44	18	4.1	439

Summary Summary

The 2010-11 academic year was one of extraordinary accomplishments by the faculty, trainees, and staff of the department. Our research, clinical, and educational programs established new benchmarks of achievement. Our research programs garnered the second highest funding level in our department's history. The participation in affinity research collaboratives and use of the department's research cores accelerated during 2010-11. Our clinical programs increased markedly in volume and access for new patients. Inpatient mortality (O:E ratio) was decreased. Our residency program had one of our best matches in recent memory and the residents continue to improve their performance on the In Training Examination. The student rotations in medicine received the highest evaluations in BUSM and the number of BUSM students who matched in our program doubled over the previous year.

I am reminded on a daily basis of the extraordinary privilege of working with such talented and creative individuals in this department. The faculty, trainees, and staff possess an inspiring sense of community, generosity, and excellence. Although much will be demanded of our profession in the years ahead, these qualities will assure that we excel in providing leadership in discovery, clinical care, and education.

David Coleman, M.D.

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