Annual Review
Academic Year 2013
Department of Medicine

The Department of Medicine completed another remarkably successful year in AY 2013. Despite challenges in the research funding environment and the increasing demands on health systems and providers, the department continued to excel relative to our peers. Our educational programs drew rave reviews from the trainees and students as well. The major areas of achievement are summarized below in a spirit of gratitude and admiration for the faculty, trainees, and staff in our department.

Research:

The department's research program contracted in the past year due to federal funding cuts. The total of new grant awards was down by 14.7% relative to AY 12. Grants through BMC (down 39.6%) were down more than those through BUSM (up 6.6%). Of note, grants though BMC increased by 28% in July, 2013! The research areas that grew most were in infectious disease, cardiology, biomedical genetics, clinical epidemiology, and computational biomedicine. The expansion of these programs reflects investments in new faculty and research infrastructure.

The department has continued its goal of supporting our research faculty by awarding **fourteen pilot grants** in 2012-2013 in collaboration with the Clinical Translational Sciences Institute and the Center for Nanotechnology and Nanobiotechnology. The department has also awarded **bridge funding** to eight faculty members.

The DOM's established research cores: the **Analytical** Core, the **Metabolic Phenotyping** Core, the **Cellular Imaging** Core, **Biostatistics** Core, and the **High Throughput Screening** Core (HTS) all continue to grow. In 2012-2013, we have had **1000 internal and external users** scheduling for use of the cores. **A total of 45 grants were submitted using these core resources of which 21 were funded for a total of over $37 m.**

To continue to meet the needs, and to assist our faculty in competing for funding, the Analytical Core has developed a new array service in which the Core personnel perform plate-based arrays for investigators. This service benefits investigators by dramatically reducing the cost of array expenses. The HTS core has purchased new Liquid Handling, Robotics, and Microplate Washer. The core is also working very closely with the BU Office of Technology and Development (OTD; Primary OTD collaborator - Renuka Brown) on initiating a marketing campaign to showcase the HTS core to Pharmaceutical, Biotech, and Venture Capital firms to increase the core usage. The Cellular Imaging Core has added a new Leica SP5 confocal microscope which was purchased from the now defunct Boston Biomedical Research Institute.

The department has hired a **new Metabolic Animal Phenotyping Core** Director, Tom Balon, Ph.D., to establish the core. This has led the department to purchase new equipment such as the EchoMRI, the CLAMS system for the assessment of energy

expenditures and spontaneous activity, and an Oxymax system for the assessment of energy expenditure during exercise. The core director has also established new standard operating procedures such as solicitation and training of experienced and inexperienced end-users and the creation of a reference library with PDFs of publications pertinent to each technology/apparatus.

Over the past year the department has also created a new **Metabolomics Service Center**. The director, Anqi Zhang, is beginning to create a system which develops mass spec-based assays and supports the BU research community. Dr. Zhang has also held introductory seminars and has presented at the Department's Faculty and Research Faculty meeting. He is currently setting up protocols and working with several faculty members on their metabolomics projects.

The Department of Medicine's **Research IT** office developed and deployed a novel high security environment for the storage of unstructured identifiable patient data in research settings that has won federal approval from the NIH and was featured in a Wall Street Journal article on protecting patient privacy. **Over 1,300 separate users now use at least one system of the Department's central infrastructure and the server hosting capabilities have supported several faculty members existing or pilot grant supported research that require special purpose servers**. Dr. Meyers was the 2013 recipient of the Ventana Research Leadership award for sustainability.

The department is evaluating the feasibility of a possible Center for Translational Epidemiology based in the Section of Preventive Medicine. This center would facilitate access to human cohort studies and provide analytical capacity that would aid in T3 and T4 translational research.

The Department has internationally renowned research programs in a number of areas. Examples include cardiovascular biology, pulmonary inflammation and immunology, endocrinology, arthritis, addiction-alcohol/substance abuse, genetics, obesity, diabetes, cancer biology, clinical epidemiology, computational biomedicine, preventive medicine, osteoarthritis, amyloidosis, scleroderma, HIV/AIDS, and sickle cell disease.

Education

During the 2012-2013 academic year, the DOM has continued to adapt to an evolving and challenging educational landscape to provide high quality education across the BUSM curriculum. Despite budgetary constraints, the increasing demands of providing high quality patient care, and the downsizing of inpatient services, the department continues to make major contributions to the educational mission.

Major areas of DOM involvement in student education are highlighted with emphasis on the Medicine 1 and Medicine 2 Clerkships, Subinternship and Advanced Acting Internship.

During the **first 2 years of the BUSM curriculum**, DOM faculty play a particularly key

role in ICM, where students learn the foundational skills of the medical interview, physical diagnosis and communicating clinical information in written and oral form, and in the Disease and Therapy (DRx) course that integrates the study of disease, including pathophysiology, infectious etiologies, and pharmacologic management in an organ-based context. Approximately 60 clinicians from the DOM participate in ICM 2, many others contribute in ICM 1, while the DOM faculty form the core faculty in DRx.

Medicine 1, the 8-week core inpatient clerkship in 3rd year, introduces the clinical tools, knowledge and perspectives of the internist that are appropriate to the "undifferentiated" medical student. The clerkship is designed to develop the student's capacity to function as a caring, increasingly independent but supervised clinician on a multi-professional team. During the clerkship, students learn clinical medicine while working side-by- side with residents and faculty and help provide care to a cohort of inpatients. Students are expected to be involved in all aspects of patient care including: building a therapeutic relationship with assigned patients; gathering, reporting, and interpreting of clinical information; formulating management plans; contributing to individual and team learning; and working within the systems of care. A key principle that guides student learning is the provision of graduated patient care responsibility (based on the student's readiness) with supervision.

In addition to the clinical immersion and conferences, this learning experience is complemented by a unique enrichment in which students also work closely in small groups with a Clerkship Director/Evans Student Educator and hone essential clinical skills. For several hours each week, the CD's conduct bedside instruction and observations, coach students on their write-ups and oral presentations, lead small group case discussions and reflection exercises, deliver regular feedback, and provide a longitudinal adviser/mentor presence for their small group. In addition, the students meet in two dedicated weekly case discussions with the Chair of the Department and the Clerkship Director.

During the past 15 months, as the BMC inpatient teaching service has downsized, student learning in Medicine 1 has expanded to MetroWest Medical Center in Framingham, Roger Williams Medical Center, Providence, RI and Jordan Hospital, Plymouth. This complements longstanding sites- BMC and West Roxbury VA Hospital. The experience of the students at the community affiliates will be intensively monitored in the coming year.

The clerkship consistently scored at or above the national mean on the AAMC Graduate Student Questionnaire and compared favorably in comparison to the other 3rd year clerkships at BUSM.

Medicine 2- Advanced Medicine

This 4th year clerkship provides students with advanced training in internal medicine, emphasizing skills central for careers in both IM and other disciplines. For the central learning experience, students join faculty in a number of clinical sites in primary care,

urgent care and specialty ambulatory practices. While seeing patients with conditions commonly managed in ambulatory medicine, students will hone core clinical skills, address the management of both acute problems and chronic disease, and discuss interventions designed to promote good health and prevent disease. This intensive clinical experience is complemented by a variety of enrichment sessions including seminars, workshops and presentations designed to strengthen the core skills necessary for excellence in the practice of medicine including: advanced communication, physical diagnosis and clinical reasoning/decision-making skills; coordination of care, systems of care, QI; working effectively in clinical teams; note-writing; teaching skills; integrating evidence-based into practice; reflection and self-care."

The **Subinternship in Medicine and Advanced Acting Internship**

This rotation remains the capstone student rotation in the department for many students at BUSM. The Subinternship is designed to challenge and enhance the capacity of the student to work as an increasingly independent, highly competent and compassionate caregiver and contributing team member. To achieve this goal, the subintern works as an advanced care provider under the direct supervision of the team resident and attending, and assumes increasing responsibility for the initial evaluation and integration of the total care of assigned patients. The student is expected to integrate medical knowledge with clinical and interpersonal skills in order to demonstrate independent thought and develop a plan of action. The student is expected to develop a balance between acting independently and acknowledging his/her limitations and seeking help as appropriate.

The Advanced Acting Internship (AAI="supersub") builds upon and is a more intensive version of the traditional subinternship. Students are selected based on their excellent work during the Third Year Medicine Clerkship and asked to assume increased responsibilities beyond that of the usual Medicine Sub–intern. Two AAI students are paired on an inpatient team that has no interns, and together, they work under the direct supervision of the team resident and assume care of assigned patients.

The Subinternship and AAI are practical hands-on rotations where students truly take ownership of patient care and these experiences prepare the student for internship. The students relish the opportunity for a central role in patient care and also cite the great teaching and supervision they receive. Student evaluations from OME have consistently been extremely positive with many superlative descriptors such as " great…amazing…" The Associate Dean for Academic Affairs described these rotations as "great".

The DOM offers many **4th year electives** in general medicine and its subspecialties. Students spend 4 weeks focusing on a discipline- the clinical problems (both common and exotic) encountered, in addition to the distinctive tools and perspectives from which evaluation and treatment emerge. Overall, evaluations have been strong with students seeing an excellent spectrum of patient problems in the inpatient and often outpatient setting, and generally receiving very good instruction.

Residency Training Program Overview

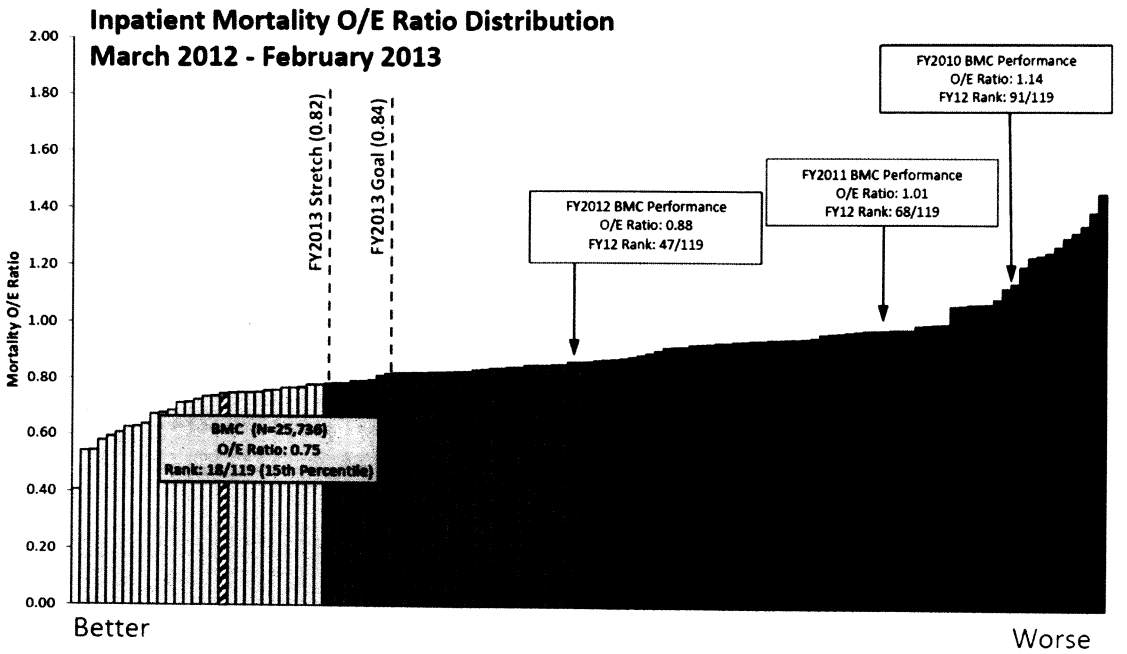
Residency and Fellowship Match Performance:
For the residency, we have seen steady improvement in the quality of matched applicants over the past 4 years, with a notable jump in 2012.

The strengths of the residency program include: strong GIM section; focus on Urban Health; complex patients; appropriate balance of resident autonomy and supervision; clinical reasoning conference; and long-standing highly successful Primary Care Track. Resident research has been productive. Development of individualized career pathways: urban health, global health, medical educator, quality and patient safety, HIV. Involvement of program leadership in national meetings. The Program Director is on the Program Planning Committee of the Association of Program Directors in Internal Medicine. The Associate Program Directors have given several national workshops. The new Program Administrator has formed a Massachusetts-wide Program Administrator society. The program has developed a new focus on Humanism in Medicine: activities by residents focusing on patient experience, music, art, etc. A new global health elective in India has been developed and has included both residents and a medical student.

Diversity of Faculty and House Staff: There are a total of 16 underrepresented minorities among GME trainees in the department: 9 (6%) in the residency program and 7 (14%) in the fellowships. For faculty we have 33 underrepresented minorities broken down as follows (3 Card, 1 Endo, 3 GI, 11 GIM, 2 Geri, 3 Hem/Onc, 5 ID, 4 Pulm and 2 Renal). The Department of Medicine has not reached our goals for faculty diversity.

Clinical Program:

Quality and Safety:
BMC is meeting its goal **Observed/Expected mortality** of 0.84 or below. For the period of March 2012-February 2013, BMC's O/E ratio was 0.75, which is a 15th percentile rank among UHC Tier A hospitals. BMC has improved its O/E mortality considerably over the past 3 years. Given the large number of discharges, the Department of Medicine has been the primary driver of this performance.



Note: The above hospitals are only UHC Tier A hospitals.

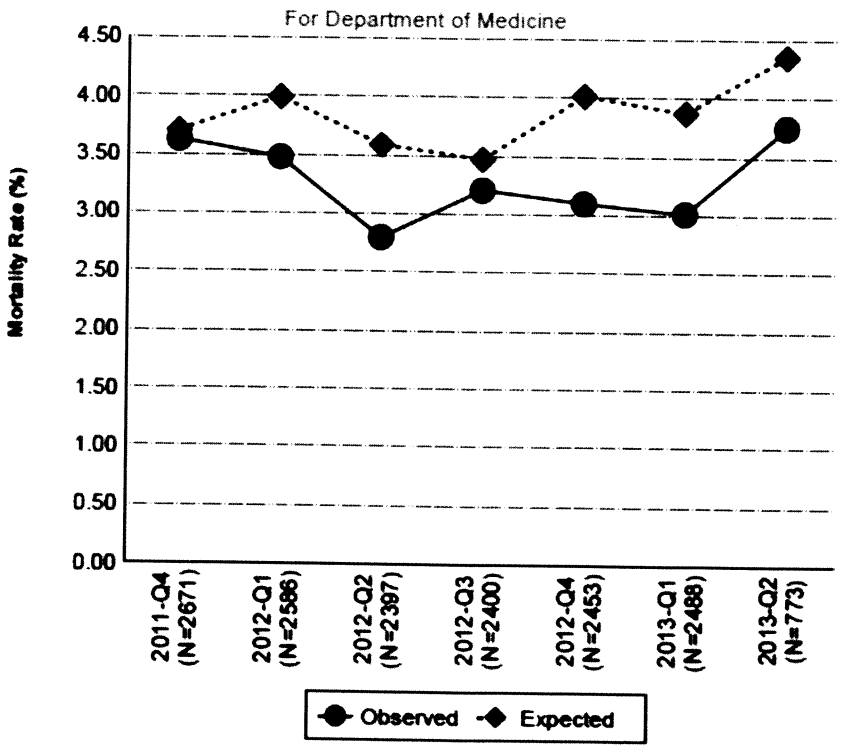
Each bar represents how a hospital performs (on mortality) relative to other hospitals if they had similar types of patients. As you moved from right to left and as the bar becomes smaller, the hospitals are performing better than the previous hospital.

MS-DRG Mortality Analysis for Department of Medicine (October 2011 - April 2013) [1]

Mortality Summary Table

	Department of Medicine			
	Denom (Cases)	Observed Mortality % (n)	Expected Mortality [2] % (n)	O/E Ratio
2011-Q4	2671	3.6% (97)	3.7% (99)	1.0
2012-Q1	2586	3.5% (90)	4.0% (103)	0.9
2012-Q2	2397	2.8% (67)	3.6% (86)	0.8
2012-Q3	2400	3.2% (77)	3.5% (83)	0.9
2012-Q4	2453	3.1% (76)	4.0% (98)	0.8
2013-Q1	2488	3.0% (75)	3.9% (96)	0.8
2013-Q2	773	3.8% (29)	4.4% (34)	0.9
Overall	15768	3.2% (511)	3.8% (600)	0.9

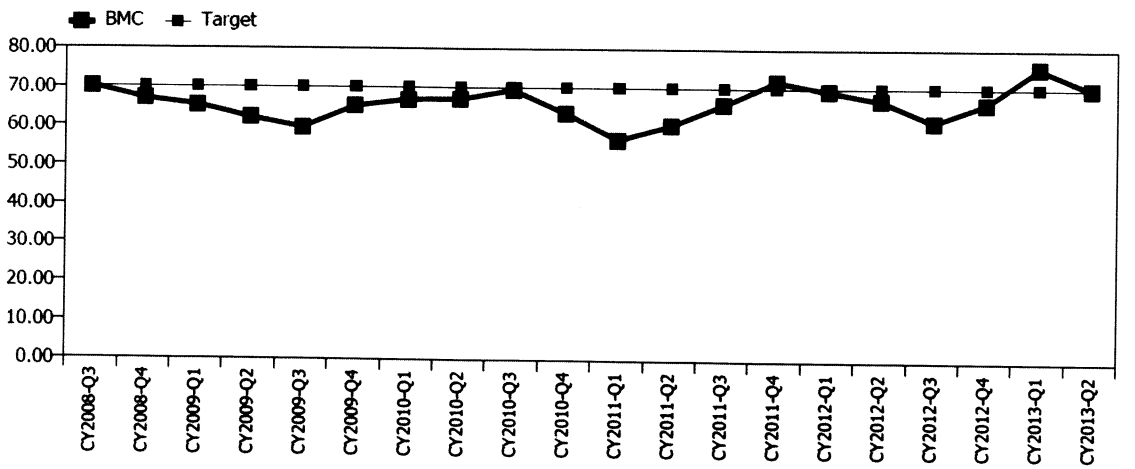
Quarterly Observed and Expected Mortality Rate Trend



CMS/Joint Commission Core Measure compliance was above 95% performance for AMI, CHF, and Pneumonia composite measures for AY 2013.

BMC continues to work on Patient Satisfaction. For academic year 2013, HCAHPS performance was 68% of patients ranking a 9 or 10, although the third and fourth quarters were at or above the goal of 70% (see graph).

Quality and Patient Safety Dashboard
Hospital Consumer Assessment of Healthcare Providers and Systems (HCHAPS) Score



Definition
The percentage of inpatients who rate BMC 9 or 10 in Hospital Consumer Assessment of Healthcare Providers and Systems (HCHAPS), the standardized patient satisfaction survey used by CMS (Center for Medicare and Medicaid Services).

Outpatient patient satisfaction performance was 72.9% of patients likely to recommend, which is below the goal of 75%.

A wide range of clinical quality measures were implemented in each specialty of the department under the direction of the Director of Clinical Quality and Section Quality Directors. A joint QI curriculum between the residency program and BUSPH students was highly successful in facilitating training of residents in clinical quality principles and in identifying opportunities for system improvements.

The number of faculty with **incomplete medical records** (Logician Red List) declined during AY 13.

A number of initiatives to improve **clinic access for new patients** was undertaken in AY 13. Six sections, including primary care, reached the hospital goal. Endocrine, Rheumatology, Pulmonary/Allergy, Medical Oncology, and Geriatrics are below their

respective hospital goals for AY 13. Each clinic has an active program underway to improve new patient access in AY 14. The data below summarize the performance for the final 9 months of AY 13 by section.

4/7/2013

Clinic	Hospital Goal	9 Mo Ave	FY 14 Goal
Geriatrics	93		*80*
Cardiology	80		*80*
Arrythmia	25		*0*
Renal	67		*80*
ID	72		*80*
Oncology	80		*80*
GI	29		*70*
Hematology	55		*70*
Pulmonology	45		*60*
Rheumatology	60		*70*
Endocrine/Dia/Nu	33		*60*
Belkin Breast	25		
GIM	68		*75*

All physicians are using electronic prescribing and are in the process of coming into compliance with Phase 2 Meaningful Use requirements.

Clinical Volume:
Clinical activity in the department remained strong in AY 13. Despite the transfer of a high volume pre-procedure clinic to the Department of Surgery and closure of clinical practices at the Commonwealth Avenue site, wRVU's only decreased by 3.6% and visits only decreased by 4700 (1.6%).

The following strategies have been implemented to **grow clinical volume**:

1. Increase in the productivity requirements of clinicians;
2. Standardization of clinic scheduling where possible;
3. Continued recruitment of new clinicians, particularly in primary care;
4. Evening and weekend sessions provided practice infrastructure available;
5. Expansion of outreach efforts to the NHC's and to select clinicians in the community (especially in Cardiology);
6. Increase in subspecialty and primary care access targets beyond those in QUEST goals;
7. Use of departmental reserve for support of clinical program including clinician salaries and bonuses;
8. Working with BMC to improve clinic practice infrastructure;

9. Use of unblinded data by clinician where available to improve clinical practice performance;
10. Use of a number of strategies to improve clinician morale (e.g., awards, incentives, improved practice infrastructure, promotion, active outreach, participatory management where possible)

Inpatient volume is likely to continue contracting by 2-3% on the inpatient medical services. We anticipate that the GI Endoscopy suite and the Cardiology Electrophysiology Laboratory will show continued growth in the range of 3=4%. Ambulatory volume will likely increase by 2-3% compared to AY 13 depending on the rate of hiring and improvements in the practice infrastructure.

The section with the highest growth is endocrinology. Most of this volume increase is related to diabetes and weight management. Other sections with growth potential include cardiology, gastroenterology, hematology-oncology, and nephrology. Primary care has growth potential as well but is very dependent upon recruitment of new providers.

We currently have partnerships with other providers and institutions in Boston to provide care for patients with hematologic malignancies and for patients requiring organ transplantation other than renal transplant.

Faculty Development and Diversity

Faculty Development & Diversity Seminar Series provided professional development for faculty across the Department of Medicine and BU Medical Campus through 11 ~monthly seminars that included presentations by DOM faculty members on issues related to education, diversity, leadership, and mentoring, among others.

Academy for Faculty Advancement BUMC's structured longitudinal career development program for early career faculty, successfully completed its second year, graduating 18 Instructors and Assistant Professors. The program includes achieving milestones on an academic project of the participant's choice with support from an assigned content mentor, and participating in seminars twice a month that include interactive presentations by senior BUMC faculty and leaders, and peer learning through facilitated small group discussions.

Academy for Collaborative Innovation & Transformation (ACIT), BUMC's mid-career faculty development program, was developed through a grant from the American Council on Education/Sloan Foundation, to meet the needs of this group, which is the largest faculty segment but is the least satisfied. A task force was convened of faculty members and leaders from BUMC to review the literature and mid-career programs at peer institutions, determine the core competencies needed for mid-career faculty to feel engaged and able to thrive in their careers, and develop a proposal of a comprehensive mid-career faculty development program for late Assistant and Associate Professors at BUMC. The inaugural year of ACIT begins in February 2014.

Faculty Flexibility Task Force of faculty members and institutional leaders convened from January – May 2013 to review all faculty flexibility policies at BUSM and the

Faculty Practice Foundation, the research literature and practices at peer institutions. The Task Force wrote a report with recommendations to institutional leadership that included:

- Enhanced faculty flexibility policies to meet the needs of today's faculty, many of who are in dual career families with responsibilities for young children and/or aging parents.
- Increased consistency in policies between BUSM and FPF to decrease confusion and uncertainty about which policies apply under which circumstances
- Greater transparency and accessibility of policies through creation of website of Office of the Provost
- Culture change led by senior leadership advocating and normalizing dialogue about faculty flexibility policies

Networking Dinners for DOM faculty were held at Emelia Benjamin's home over the course of the year. Each dinner targets a specific group that is dealing with complex challenges in academic medicine. The dinners bring people together off-campus to get to know one another, network and brainstorm innovative ways to overcome challenges faced. The 2012-2013 dinners were for women, educators, mid-career faculty, under-represented minorities and researchers.

Chief Residents' Mentoring Program provided interactive workshops for Chief Residents two times a month from July through May. Each session focuses on a topic that builds and enhances skills sets that are helpful to Chiefs during their chief year, as well as for their long term career development. Examples include building a team, having difficult conversations, academic writing, avoiding burnout and planning a career trajectory, among others.

Faculty Development Grants are available to DOM faculty members who seek opportunities to enhance their professional development beyond what BU can offer. Faculty can apply for these grants to support their participation in external faculty development workshops, courses and other activities. Approximately 20 grants were funded in 2012-2013.

One-on-one CV Review and Career Consultations were conducted with more than 40 faculty members by Emelia Benjamin, Vice-Chair for Faculty Development and Diversity, and Robina Bhasin, Director of Faculty Development and Diversity. This opportunity is available to all DOM faculty members.

Departmental Administration

The department recruited Eva Greenwood, M.B.A. as Vice Chair for Finance and Administration in AY 13. She brings considerable expertise and experience in health care and academic administration to this new role.

As part of our ongoing attempts to continuously improve the effectiveness and efficiency of our departmental administrative operations, the department initiated an **external review of our administrative functions in AY 13**. The major recommendations were:

1. Enhance staffing of central departmental administration-the central departmental staffing level was noted to be below the peer institutions represented in the survey;
2. Enhance central departmental research administration;
3. Increase finance and budgeting "user friendliness" for staff and faculty;
4. Enhance staff training

In summary, the Department of Medicine had a very successful year in AY 13. As we look to the future, we are mindful of both the privileges and obligations of our profession. Society will continue to require more value in each of our core missions. As throughout our 100 year history, the creativity, resiliency, and resourcefulness of the members of this department will empower us to meet this challenge.

Respectfully submitted,
David Coleman, M.D.
Chair, Department of Medicine