

FY2009 Annual Report: Section of Endocrinology, Diabetes, Nutrition and Weight Management



RESEARCH ACTIVITIES

The past year witnessed substantial growth in research awards and clinical activity in the Section of Endocrinology, Diabetes, Nutrition and Weight Management, under the leadership of Shalender Bhasin, M.D., Professor of Medicine.

During this period, the level of federal and private funding increased, in spite of a difficult climate at the National Institutes of Health (NIH). In addition to a pre-existing strong base of federal funding, Section faculty received ten new federal grants from NIH, the Department of Defense, and other federal agencies and a new multidisciplinary Grant from the Claude Pepper Ageing Center. Currently the Section has more than \$9 million in annual funding. Particularly notable are a program project on cardiometabolic dysfunction in diabetes mellitus, and a P30 - the Claude D. Pepper Older Americans Independence Center for Function Promoting Therapies. Also, the T32 Training grant in Endocrinology, Obesity and Metabolism was competitively renewed for its 50th year of uninterrupted funding. The various research programs within the section, including the Androgen Clinical Research Unit, the Muscle and Aging Research Unit, the Steroid Hormone Assay Laboratory, and the Laboratory of Exercise Physiology and Physical Performance, the Diabetes Research Program, the Nutrition and Obesity Research Program, the Vitamin D Research Program, and the Thyroid Research Program have continued to thrive. January 2009, Susan Fried was recruited to head the Nutrition and Obesity Research Program and build a translational research program in the area of obesity and related disorders. She adds international expertise on adipocyte metabolism in human obesity and has a long track record of fostering collaborative research. She has already created new clinical research and training programs and fostered many new collaborations at Boston University.

The **Androgen Clinical Research Unit (ACRU)** has continued to grow and now includes Drs. Bhasin, Coviello, Barsaria, Travison, and Dr. Bachman. The unit has currently eight NIH-funded clinical research studies underway related to androgen biology in men and women. Studies being conducted within ACRU include the Testosterone Dose Response in Surgically Menopausal Women (TDSM Study), the Role of 5 Alpha Reductase in Mediating Testosterone Actions (5 AR Study), Effects of Testosterone Replacement on Muscle Performance and Physical Function in Older Men (TOM Study), Testosterone and Physical Function in Men on Hemodialysis (ESRD Study), Effects of Testosterone Replacement on Atherosclerosis Progression in Older Men with Low Testosterone Levels (TEAAM Study), and Testosterone Modulation of Response to Selective Phosphodiesterase Inhibitors (The TED Study), Testosterone in Prostate Cancer, and Testosterone Deficiency in Opiate Users. These studies are being conducted in the General Clinical Research Unit of the CTSI with physical evaluations performed in Laboratory of Exercise Physiology and Physical Performance (under the direction of Thomas W. Storer, Ph.D., Professor of Medicine) and drug supplies dispensed by the Investigational Drug Service (under the direction of Hyeseon Hong, Pharm.D.).

Additionally, Dr Coviello has received an NIH grant to study the distribution and relationship of sex hormones with cardiometabolic outcomes in women. Dr. Bhasin has received an NIH grant to generate the population-based reference ranges in men participating in the Framingham Heart Study.

The **Muscle and Aging Research Unit (MARU)** was established to spearhead interdisciplinary translational research to foster the development of anabolic therapies for functional limitations associated with aging and chronic diseases. MARU's current research focuses on investigating the mechanisms by which androgens regulate mesenchymal stem cell differentiation. These investigations are being led by Section faculty members Ravi Jasuja, Ph.D., Assistant Professor of Medicine; Assistant Professor of Medicine, Wen Guo, Ph.D., Associate Professor of Medicine, Carlo Serra, Ph.D., Instructor of Medicine, Samudra Gangopadhyay, Ph.D., Instructor of Medicine.

Under Dr. Bhasin's direction, the **Steroid Hormone Assay Laboratory** specializes in the measurements of sex steroid hormones and vitamin D analogs using liquid chromatography tandem mass spectrometry (LC-MS/MS). Anqi Zhang, Ph.D., has established new methods for the measurement of testosterone and estradiol. Under Dr. Holick's direction, Dr. Zhang established procedures for measuring 25-hydroxy vitamin D2 and 25-hydroxy vitamin D3. In the coming year, the laboratory plans to add assays for dihydrotestosterone and progesterone, and enhance the estradiol assay's sensitivity.

The **Biophotonics Laboratory**, under Dr. Jasuja's direction, uses a variety of biophysical techniques to investigate the kinetics and thermodynamics of the conformational changes associated with androgen binding to the androgen receptor. Dr. Jasuja is developing optical spectroscopy instrumentation to study the molecular fingerprints of ligand-receptor interactions in the androgen receptor-signaling pathway. The instrumentation has an integrated millisecond mixer and utilizes components from photoacoustics, photothermal beam deflection, and time-resolved emission spectroscopies. Combined with the fluorescence lifetime imaging capabilities, these measurements will elucidate the residue-specific perturbations in the ligand binding

pocket that modulate functional activation of androgen receptor in cellular milieu. A better understanding of agonist and antagonist induced structural changes will allow for rational design of selective androgen receptor modulators for anabolic therapies. The research is currently being conducted in collaboration with James Dalton, Ph.D., at Ohio State, Chris Yengo, Ph.D. at University of North Carolina and James Head, Ph.D., Professor of Physiology at Boston University. These investigations should help determine the mechanisms of tissue selective actions of selective androgen receptor modulators.

The **Laboratory of Exercise Physiology and Physical Performance (LEP³)** is a state-of-the-art exercise laboratory within the Section under the direction of Drs. Storer and Krasnoff. Renee Miciek, M.S., is the laboratory's manager. The LEP³'s global mission is to assess muscle performance and physical function in states of health and disease. The LEP³ continues to design and conduct testing protocols for primary and secondary outcomes in several federally-funded research programs investigating the effects of anabolic therapies on muscle mass and function in states of health and disease; Dr. Bhasin is the Principal Investigator. These research protocols include: the Role of 5-Alpha Reductase in Mediating Testosterone Actions (NIH/National Institute of Child Health & Human Development, 1R01HD43348-02); Testosterone Dose Response in Surgically Menopausal Women (NIH/National Institute of Diabetes & Digestive & Kidney Diseases, R01); Effects of Testosterone Replacement on Muscle Performance and Physical Function in Older Men (NIH/National Institute of Aging, 2R01AG014369-06); and Testosterone Effects on Atherosclerosis Progression in Older Men. In addition to forging collaborations with other Sections within the Department, the LEP³ has been working with investigators at Massachusetts General Hospital on Strategies for the Treatment of HIV-associated Metabolic Syndrome (NIH/NIDDK 2R01DK0493-02), and with investigators from New England Research Institute on the BACH-BONE Study.

Dr. Wen Guo's investigations, supported by an RO1 grant, focus on the role of free fatty acids in inducing insulin resistance. Dr. Guo's research has also provided novel insights into the mechanisms by which myostatin regulates adipogenic differentiation. This research has implicated Wnt signaling pathway as an important player in regulation of fat mass by myostatin.

Diabetes Research Unit. The Diabetes Research Unit under the direction of **Neil Ruderman, M.D., D.Phil.**, has continued to focus its research on the AMPK / malonyl CoA fuel sensing and signaling mechanism and its role in regulating cell metabolism and disease prevention. Over the past year the laboratory has shown that downregulation of AMPK by genetic or chemical means increases oxidative stress in cultured endothelial cells and makes them more susceptible to the inflammatory effect of TNF α . Likewise, we have found that sustained exposure of these cells to a high glucose medium or to the fatty acid palmitate causes similar effects on both AMPK and oxidative stress and inflammation (Jose Cacicedo (pre-doc), Yasuo Ido, Asst. Prof. of Medicine). We have also found that AMPK activation prevents these effects from occurring. Thus it appears that AMPK dysregulation by fuel excesses could make the endothelial cell more susceptible to events though to initiate atherogenesis.

Dr. Ido, together with Lan Fan, Ph.D., and Mr. Cacicedo have also discovered that activation of the sirtuins, histone/protein deacetylases that have been linked to delayed aging, also leads to activation of AMPK. They have shown that this is likely due to their ability to deacetylate and activate the AMPK-kinase, LKB1. In other studies, Marie-Soleil Gauthier, a post-doctoral fellow working in part with Dr. Asish Saha (Asst. Professor of Medicine) has demonstrated that AMPK is activated in the adipocyte by lipolysis which in turn acts by causing an increase in the AMP/ATP ratio. As we did in the endothelial cell, she found that failure to activate AMPK in this situation causes a substantial increase in oxidative stress. Other projects are examining the mechanism for glucose-induced downregulation of AMPK and the induction of insulin resistance in skeletal muscle (Dr. Saha) and cultured HepG2 cells (G. Suchankova, post-doctoral fellow); the inhibition of keratinocyte growth by AMPK and Vitamin D (joint effort of the Diabetes Unit and the Holick laboratory); and the characterization of the IL6 deficient mouse in which a decrease in muscle and adipose tissue AMPK precedes the development of obesity, glucose intolerance and dyslipidemia (M. Kelly, post-doc). All of these studies are supported by grants from the NIH and many have been done in collaboration with other laboratories in U.S. and overseas.

The Iodine and Perchlorate Research Laboratory. The Iodine and Perchlorate Research Laboratory, under the direction of Dr. Lewis Braverman, Dr. Xue Mei He, and Mr. Sam Pino, continues to provide iodine analyses for outside investigators and commercial laboratories and is a resource for thyroidologists. Mass spectroscopy assays for perchlorate and thiocyanate have recently been established at BMC. Dr. Braverman, Dr. Elizabeth Pearce, and Dr. Angela Leung are conducting an international study of the effects of environmental perchlorate content of human breast milk, human colostrum, and infant formula in several large pregnancy cohorts to establish the iodine nutrition of breast and formula-fed infants. In addition, Dr. Pearce has reported the effects of thyroid function on lipid subparticle size and cardiovascular risk, using BMC clinical studies as well as data from the Framingham Heart Study cohort.

Vitamin D, Skin and Bone Research Laboratory. Michael F. Holick, PhD, MD, Professor of Medicine, Physiology and Biophysics, Program Director for General Clinical Research Unit and Director of the Bone Healthcare Clinic and his team of physicians and researchers continue to be leaders in the field of vitamin D, osteoporosis, metabolic bone disease, psoriasis and hair research. Dr. Holick and his colleagues, Dr. Ray, Dr. Chen have been investigating the important role of sunlight and artificial ultraviolet B radiation devices in providing elders and patients with fat malabsorption with their vitamin D requirement. Studies are underway to understand the mechanism by which 1,25-dihydroxyvitamin D is able to reduce risk of colorectal cancer. Several active vitamin D analogues are being tested in animal models for both prostate and colon cancer with the goal of identifying one for clinical trials. Dr. Holick recently received the Linus Pauling Prize for his contributions in human nutrition.

Center for Nutrition and Weight Management. In the Center for Nutrition and Weight Management, Dr. Apovian and her colleagues are participating in ongoing

research projects including several areas of weight loss, weight maintenance, and the molecular effects of weight change. In collaboration with the Noyan Gokce, M.D., Associate Director of Echocardiography at BMC, Associate Professor of Medicine, and a member of the Section of Cardiology, the Center is looking at obesity and its effects on inflammation, endothelial cell function, vascular consequences of lipid deposition, alterations in fat cell-derived adipocytokine expression before and after weight loss and between subcutaneous, omental and mesenteric depots. Results have established that weight loss both medically and surgically induced can bring about significant improvements in endothelial cell function, which lowers the risk for cardiovascular disease. Two R-01 grants from the NIH are funding this project; Dr. Gokce is the Principal Investigator and Dr. Apovian is the Co-investigator. Dr. Apovian has become an expert in the technique for subcutaneous adipose tissue biopsies and has been performing these biopsies on research subjects for over 5 years. In addition, Center faculty members investigated the use of meal replacement therapy for weight loss in adolescents. Funded by the food industry, this study is also complete and has been published in *ICAN: Infant, Child, & Adolescent Nutrition* in 2009.

The Center is also performing research with the bariatric surgery population in the Nutrition and Weight Management Center. In collaboration with Christina C. Wee, MD from the Division of General Medicine and Primary Care at Beth Israel Deaconess Medical Center, they are studying quality of life before and after weight loss surgery. The Center is also looking at the effects of bariatric surgery on adipose tissue and the effects of a novel meal replacement program on body composition.

Dr. Apovian's research also includes novel pharmacotherapeutic antiobesity agents, such as leptin. She is currently completing a study designed to quantify the relative inflammatory burden and cytokine expression of adipose cells in human fat stores in obese participants after weight loss treatment with low-fat vs. low-carbohydrate diets. This study is funded by the Dr. Robert C. and Veronica Atkins Foundation.

Industry-related research within the Center has expanded to include several new projects. Orexigen Therapeutics funded two appetite suppressant studies that were recently completed with additional studies to follow. Amylin Pharmaceuticals recently funded a combination injection medication of leptin and pramlintide with promising results for weight loss and weight maintenance.

The **Boston Obesity Nutrition Research Center** is a NIH-funded NIH-funded Obesity and Nutrition Research Center (P30). This center brings together obesity and nutrition researchers at Tufts University, Beth Israel Deaconess, and the Harvard School of Public Health. Susan Fried was appointed as director of this center in October 2009. The focus of this center is on adipocyte metabolism, specifically on the elucidation of regional differences in fat cell metabolic and endocrine function. The long-term goal is to understand how fat deposition in different anatomical depots is regulated and why abdominal obesity is associated with metabolic abnormalities.

Dr. Fried's recent work addresses the regulation of leptin, an adipocyte hormone that regulates metabolism and appetite and is centrally involved in the regulation of body weight. Recent studies using human adipose tissue placed in organ culture and a rat model indicate that the nutritional regulation of leptin production is regulated, at least in part, by insulin, glucocorticoids, catecholamines and cytokines. Using metabolic labeling and immunoprecipitation methods to monitor rates of leptin synthesis, turnover and secretion, we have demonstrated that pre- and post-transcriptional mechanisms are involved. Reporter assays show that elements within the 5-UTR of leptin stimulates, while the 3-UTR inhibits translation. The insulin stimulation of leptin mRNA translation requires both UTRs. Current studies are investigating the cis elements and transacting factors that mediate the nutritional regulation of leptin mRNA translation. We also conducts collaborative studies to examine the mechanisms underlying depot- and sex-differences in the metabolism and function of visceral and subcutaneous fat depots, and how fat distribution is linked to health consequences, including diabetes and cardiovascular disease.

Dr. Friend became Director of the Graduate Program in Medical Nutrition Sciences in July 2009. This graduate program trains Masters and doctoral students to conduct basic and clinical research in the nutritional sciences, from gene to biochemical, physiological and systemic metabolism, translational research, and nutritional epidemiology. Dr. Fried is expanding the faculty, including nutrition researchers from the Dept of Medicine and others within the BUSM to build a first class multidisciplinary nutrition graduate program.

The **BMC Thyroid Nodule and Cancer Center** is a newly established comprehensive multidisciplinary center for the evaluation and treatment of patients with thyroid nodules and cancer and to promote translational research targeted to improve diagnosis and management of patients with thyroid disease. The research team of Dr. Lee and Dr. Rosen of Surgical Oncology was recently awarded a pilot project grant by the Genome Science Institute to encourage new collaborations between groups with diverse expertise to address an important scientific question in genetics and genomics research. The pilot project will examine if there is a relationship between specific miRNAs and papillary thyroid carcinoma resulting in tumorigenesis and influencing extent of disease and prognosis. These investigators have also been award a BMC Bridge grant to further explore this topic. Future collaborations will be multidisciplinary with the participation of pathology, Dr. De Las Morenas and Dr. Factor, nuclear medicine in Radiology, Dr. Subramaniam, and Radiation Physics, Dr. Rick Behrman.

CLINICAL ACTIVITIES

The consolidated clinic that integrates Endocrinology, Diabetes, Nutrition and Weight Management was established in September 2001 and is a state-of-the-art, 4,500-square foot facility permitting complete endocrine, nutrition and weight

management evaluation. The clinic has expanded in the last year by the additional of 4 large exam rooms, a patient intake room, a medication room, a nurses station, an administration area and additional patient waiting room. The current clinical space on the second floor of the Preston Building includes 17 spacious examining rooms, 2 patient intake areas, three thyroid ultrasound instruments, two procedure rooms, three bone densitometry instruments, a patient education and conference room, a phlebotomy room, and rooms for dietary and diabetes teaching dieticians and nurses. The clinic census has increased steadily at an annualized rate of 10% over the past five years; the past year witnessed an even more impressive 20% increase in patient visits. The wait time to first appointment decreased by 50% during the past 2 years and is expected to fall further with additional faculty recruitment and streamlining of clinic procedures.

The clinic provides medical consultation in the areas of thyroid disease, obesity, malnutrition and other nutritional disorders, gastric bypass surgery, lipid disorders, type 1 and 2 diabetes mellitus, androgen-deficiency syndromes, bone diseases, sexual dysfunction in men and women, infertility, and polycystic ovary syndrome. The clinical expertise of our physicians has been recognized by five of our faculty listed at Best Doctors in Boston Magazine and participating in national treatment guideline:

- Bhasin: Chair, Endocrine Society's Androgen Panel, Chair, Endocrine Society's Guideline Committee
- Lee: Member, American Thyroid Association's Evidence based Guidelines for Thyroid Nodules and Thyroid Cancer
- Holick: Chair: Endocrine Society's Vitamin D Deficiency Panel
- Apovian: Member, American Association of Clinical Endocrinology's Bariatric Surgery Panel
- Rosenzweig: Chair: Endocrine Society's CV Risk Reduction in Diabetes; Chair, Endocrine Society's Committee on Performance Metrics
-

Our faculty are editors or associate editors of four premier endocrine and nutrition journals:

- Shalender Bhasin: Associate Editor, Journal of Clinical Endocrinology and Metabolism
- Lewis Braverman: Editor-in-Chief, Endocrine Practice
- Alan Farwell: Editor, Thyroid; Editor in Chief of the online journal Clinical Thyroidology for Patients
- Caroline Apovian: Editor, Clinical Nutrition
- Susan Fried: Editor, Obesity Research
- Elliot Sternthal: Associate Editor, Endocrine Practice

New Faculty Recruitment

The section recently added four new physicians, Dr. James Rosenzweig, a specialist in diabetes mellitus, Dr. Sara Pietras, a specialist in diabetes mellitus, Dr. Shehzad Basaria, a specialist in androgen disorders, Dr. Eric Bachman, a specialist in diabetes, and 2 nurse practitioners specializing in Diabetes Mellitus, Deb Urquhart and Roberta Capelson. Dr. Thomas G. Trivison joined the section as a biostatistician for the Claude D. Pepper Center.

Housed within the clinic is the Center for Weight Management and Nutrition. The Center includes three physician nutrition specialists, two bariatric surgeons, four registered dietitians, a behaviorist, and an exercise specialist. Drs. Apovian, Istfan and Khaodhiar provide medical consultation in the area of obesity and nutritional disorders. Drs. Hess and Burch consults on gastric bypass surgery, and Dr. Ruderman, Dr. Sternthal, Dr. Rosenzweig and Dr. McDonnell provide expertise on the management of diabetes mellitus. The clinic has a comprehensive, multidisciplinary approach to diabetes with a patient management coordinated by a physician, four nurse practitioners, three certified Diabetes Nurse Educators (CDE) and dietitians

Thyroid Nodule and Cancer Center Drs. Braverman, Lee, Farwell, Safer, Pearce, and Leung offer nationally and internationally recognized expertise in diseases of the thyroid in the Thyroid Nodule and Cancer Center. The Thyroid Center offers comprehensive medical evaluation and medical and surgical therapies of diseases of the thyroid. Specialized services offered at the Thyroid Center include:

- Thyroid ultrasound
- Neck ultrasound for adenopathy
- Parathyroid ultrasound
- US guided biopsy of thyroid nodules
- US guided biopsy of parathyroid masses
- US guided biopsy of cervical neck adenopathy
- Radioactive iodine ablation of hyperthyroidism
- Radioactive iodine ablation of thyroid cancer
- Dosimetry for maximal dose radioactive iodine therapy

With eighty years of combined experience with radioactive iodine therapies, Drs. Braverman and Lee offer special expertise in the treatment of hyperthyroidism and thyroid cancer. Drs. Lee and Braverman are two of a select number of endocrinologists who personally administer radioactive iodine to patients. Dr. Lee has developed a radioactive iodine dosimetry program for maximal dose I-131 therapy of advanced thyroid carcinoma. BMC's program is one of only a dozen in the country to provide extremely high dose radioactive iodine therapy for life-threatening thyroid malignancies.

Drs. Braverman and Lee's expertise in thyroid disease has made BMC a national and international referral center for patients with complicated thyroid disease. Drs. Lee, Farwell, Safer, Pearce, Anathakrishnan, Knapp, and Leung are certified and experts in thyroid ultrasonography for diagnostic imaging and ultrasound guided biopsies of thyroid nodules and cervical neck adenopathy. The endocrinologists and surgeons (David McAneny, M.D., Jennifer Rosen, M.D., and Michael Stone, M.D. of Surgical Oncology

and Gregory Grillone, M.D, Sharukh Jalisi, M.D., and Dr. Pieter Noordzij, M.D. of Otolaryngology-Head and Neck Surgery) work closely to ensure excellent coordinated care of patients who require surgical treatment of their thyroid disease.

General Endocrinology Robert Levin, M.D., Professor of Medicine, continues to provide superb endocrine care in general endocrinology and Paget's disease. Thomas Moore, M.D., Professor of Medicine, provides special expertise in endocrine hypertension and general endocrinology.

Male and Female Sexual Health Disorders Clinic Dr. Bhasin, Dr. Coviello, Dr. Safer and Dr. Basaria have initiated a sexual health program at BMC that specializes in sexual dysfunction and androgen deficiency in men and women. When fully developed, this program will provide a multidisciplinary team approach to the management of reproductive disorders in men. Dr. Andrea Coviello is a nationally-recognized expert in polycystic ovary disease and other androgen-related disorders in women. The breadth of clinical conditions seen in this clinic is wide including. Dr. Safer has special expertise in the hormonal management of trans-sexual patients.

- Androgen deficiency in men
- Sexual dysfunction in men and women
- Male infertility
- Gynecomastia
- Hirsutism
- Acne
- Polycystic ovary syndrome
- Disorders of puberty
- Hormonal treatment of trans-sexual patients

Center for Nutrition and Weight Management The Nutrition and Weight management program at Boston Medical Center is an integral part of the Center for Endocrinology, Diabetes, Nutrition and Weight Management. We offer state-of-the-art diagnostic and treatment services for the entire spectrum of nutritional disorders and weight management concerns for individuals 18 and older. Our exceptional team of dedicated professionals is comprised of 3 Nutrition physicians, Dr. Caroline Apovian, Dr. Nawfal Istfan and Dr. Lalita Khaodhair and 8 Registered Dietitians, Stephanie Spaide, Jean Carr, Wendy Anderson, Karen Chalmers, Kelly Karlstad Smallcomb, Zong Liu, Mitali Shah and Anette Vehus. Additionally, we have a supportive counselor, Kelly Fournier, on staff to help address the underlying causes of overeating and/or disordered eating for both our medically and surgically managed patients.

We are fortunate to have our medical nutrition program integrated with an American Society for Metabolic and Bariatric Surgery (ASBS) Bariatric Surgery Center of Excellence. Dr Donald Hess and Dr Miguel Burch are the surgeons leading our exceptional surgical team. The collaborative relationship between our medical and

surgical programs allows us to provide optimal pre, peri and post surgery care to our patients.

The Nutrition Support Service at Boston Medical Center is an inter-disciplinary service utilizing the expertise of Physicians with specialty training in nutrition, Dietitians, Nurses and the Department of Pharmacy. The three nutrition attendings rotate on a monthly basis to provide consultation on inpatients requiring specialized nutrition support therapy: parenteral and enteral nutrition. The Nutrition Support Service also functions in the education and training of a Nutrition Research and Clinical Fellow, medical students, gastrointestinal fellows and Dietetic interns. There is also a Home Nutrition Support component to this service whereby patients requiring specialized nutrition support after discharge are monitored and followed in an outpatient setting and seen in the Endocrinology clinic. These include patients with various nutritional disorders, including complex gastrointestinal issues necessitating comprehensive nutrition therapy.

Diabetes Center of Excellence Under the direction of Dr. James L. Rosenzweig, the Director of Diabetes Services, the staff and services have significantly expanded over the past year. With the development of BMC's Diabetes Center of Excellence, the range of diabetes services has grown to accommodate and increase both outpatient and inpatient referrals for specialized diabetes care. The incorporation of Diabetes Outreach efforts has been accomplished through collaboration and support for referring primary care providers within BMC's General Internal Medicine, Women's Health, and Geriatric Clinics as well as BMC's 15 Community Health Centers.

In the past year, the Diabetes Center of Excellence has welcomed several new diabetes team members to join together with our existing staff of skilled diabetes providers:

- Sara Pietras, MD, Instructor in Medicine, has joined our team and provides diabetes expertise in the inpatient and outpatient settings. Dr. Pietras devotes her outpatient sessions to diabetes and general endocrine. Her research interests include inpatient diabetes and bone and vitamin D disorders.
- Roberta Capelson, MS, ANP, Manager of Diabetes Outreach, and Clinical Instructor in Medicine, has joined our team to provide specialized diabetes expertise, support, and collaboration with referring primary care providers in BMC's general medicine clinics, its 15 Community Health Centers as well as outside healthcare systems with large diabetes populations.
- Deb Urquhart, FNP, CDE, Clinic Assistant Nurse Manager, provides clinical diabetes expertise and education to patients including insulin pump therapy and continuous glucose monitoring. She directs patient care coordination and triage to assure timely referrals and appointments for patients with new or existing diabetes.
- Karen Chalmers, MS, RD, CDE, Diabetes Services Program Manager, has joined our team to provide clinical diabetes and nutrition education. She develops standardized culturally sensitive, multi-language educational curricula and materials to meet the many literacy levels of patients in our Center, general medicine clinics and BMC's community health centers. She is also involved in the coordination of diabetes clinical protocols and procedures.

Clinical research efforts within the Diabetes Center of Excellence have also been expanded. These efforts include measuring the effectiveness of behavioral and educational tools, expanded care coordination, clinical effectiveness of disease management interventions, studies of hormone physiology in diabetes and the role of inflammation in diabetes.

Outpatient Diabetes Services: With Dr. Rosenzweig's significant expertise in disease management, his vision is to deliver outpatient diabetes health care services utilizing interdisciplinary clinical teams, collect and analyze relevant data, and provide cost-effective improvement measures to enhance the health outcomes of our patients. Dr. Rosenzweig has also instituted additional innovative and up-to-date diabetes technology and education programs for our patients, including a non-mydratic camera for retinal screening, continuous glucose monitoring devices for diagnostic purposes, and intensive insulin therapy including continuous subcutaneous insulin infusion. A basic diabetes basics group class has been developed and is offered once a week for patients new to diabetes or for those who need a review or have never had diabetes education. An interactive low literacy diabetes flipchart and 41 topic-specific diabetes educational materials have been designed for the patient population within the BMC system and its affiliated Community Health Centers. Our Diabetes Self-Management Program has been recognized by the American Diabetes Association for many years and our program has been granted renewed recognition again this year with the ongoing support and assistance of Barbara Jarvis, RN, CDE.

Inpatient Diabetes Services: Since 2005, under the leadership of Dr. Marie McDonnell, the Adult Inpatient Diabetes Program (IDP) has been committed to state-of-the-art care of hospitalized patients with hyperglycemia. The team currently has three dedicated attending physicians (Drs. McDonnell, Sara Pietras and Elliot Sternthal) in addition to a team of dedicated Nurse Practitioner/ CDEs (Patricia Hanrahan, Marina Donahue, Lynn White and Roberta Capelson). The IDP is designed to meet current national standards for glycemic control in hospitalized patients. The program recognizes that, with the rising prevalence of insulin resistance due to conditions such as obesity and the metabolic syndrome, the number of inpatients with known diabetes, as well as unknown diabetes, is expected to rise. Moreover, expert opinion and clinical research have identified hyperglycemia as a factor that increases length of stay, hospital complications, and inpatient mortality. The Endocrinology fellow, the "GLUC" service, and the Nurse Practitioner service work together with Diabetes attendings as a physician-nurse practitioner team to optimize the care of this large patient population, both in the hospital, and following discharge to the outpatient clinics

An important component of the Adult Inpatient Diabetes Management Program is the education of nurses, physicians and patients. A multidisciplinary endocrine subcommittee, comprised of representatives from Pharmacy, Nursing, Information Technology, Internal Medicine, and the Section of Endocrinology, provides this

resource. The committee's goal is safe and effective insulin therapy for all inpatients with hyperglycemia.

In collaboration with BMC's Pharmacy and Information Technology departments, the Section has put a plan in place to continuously evaluate the diabetes-related clinical outcomes in the patient population. The data from this ongoing project will be invaluable for both internal and general knowledge about the management of patients with diabetes and hyperglycemia at BMC. This team will provide daily consultation to all patients with hyperglycemia in all BMC intensive care units (medical and surgical) and will assist the transition to the floors to improve medical outcomes.

Medical Staff

The Diabetes Center of Excellence includes the following diabetes medical management and education team:

- James Rosenzweig, MD, Elliot Sternthal MD, Marie McDonnell MD, Sara Pietras MD, Neil Ruderman MD, D.Phil, Philip Knapp MD, MS, Sonia Ananthakrishnan MD, and Andrea Coviello MD, MSE, FACE.
- Pat Hanrahan, ANP, CDE, Marina Donahue, MS, FNP, CDE, Lynn White, FNP, CDE, BC-ADM, Roberta Capelson, MS, ANP, and Deb Urquhart, NP, CDE provide diabetes medical management and education
- Barbara Jarvis, RN, CDE, and Mary Rushton, MS, RN, CDE offer diabetes education and skills training. Karen Chalmers, MS, RD, CDE and Jean Carr, MS, RD, CDE provide diabetes and nutrition education.

Highlights of the Diabetes Outpatient Services include:

- Collaboration with GIM clinics and 15 Community Health Centers at BMC
- Development of a Diabetes Menu and Clinic Patient Flow System
- Development of a Diabetes Center of Excellence marketing tool (brochure)
- Purchase and installation of non-mydratiac Camera for retinal screening
- Purchase of Continuous Glucose Monitoring Systems for diagnostic purposes
- Development of 41 standardized and branded patient educational materials
- Development of a branded Diabetes FlipChart (low literacy)
- Development of a one-time Basic Diabetes group class called
- 'Get On Track' including a diabetes skills training component
- Continuous Glucose Monitoring (CGM)
- Intensive insulin therapy, including pumps
- Non-mydratiac camera
- Point of Care A1C

Highlights of the Inpatient Diabetes Program include:

- A 24/7 consultative service for inpatients with hyperglycemia: insulin administration, patient education and transition to home
- Computerized physician-order-entry algorithms for insulin therapy in the intensive care unit and hospital wards

- Collaboration with inpatient Pediatric diabetes care program
- Standardized approach to the hyperglycemic pregnant woman
- Perioperative Glycemic Control initiative
- Newly-Diagnosed Diabetes pathway
- Enhanced house staff and faculty education
- Annual Diabetes Symposium for nurses

Bone Clinic Dr. Michael F. Holick, an international expert in both clinical and research aspects of vitamin D, with 4 additional providers, Dr. Knapp, Dr. Coviello, Dr. Pietras and Dr. Khadohlar, read more than 3,000 axial and peripheral DPX bone mineral density exams annually. The bone clinic provides expert consultation on all aspects of common metabolic bone diseases including osteoporosis and Paget's disease, as well as, rare conditions such as hypophosphaturic rickets and pseudo-hypoparathyroidism

Neuroendocrine/Pituitary Clinic Dr. Sonia Ananthakrishnan is director of a multidisciplinary program that coordinates and streamlines the evaluation and care of patients with neuroendocrine/pituitary conditions with close collaboration with the Departments of Neurological Surgery, Otolaryngology and Radiation Oncology. The development of this clinic program has contributed enormously to the best care of our pituitary tumor patients by bringing together the outstanding clinical expertise of BMC into a unit that efficiently manages complex patients with neuroendocrine disease.

Adrenal Services Dr. Philip Knapp directs a multidisciplinary program for the evaluation and treatment of patients with adrenal disorders in collaboration with the Departments of Surgery, Interventional Radiology and Laboratory Medicine. This program provides state-of-the-art diagnostic testing and integrated care for a range of conditions including adrenal insufficiency, Cushing's Syndrome, pheochromocytoma, hyperaldosteronism and adrenal tumors. By incorporating cutting-edge modalities in adrenal vein sampling we have dramatically improved our institutional success rate in localizing aldosterone producing adenomas.

EDUCATION

The Section's fellowship training program is accredited by the Accreditation Council for Graduate Medical Education (ACGME) for five years with the next site visit planned for late 2009. Joshua Safer, Associate Professor of Medicine, is the Endocrine fellowship training program director. The fellowship program remains highly competitive and received over 200 applications for three positions. Endocrinology fellowship graduates continue to do well, with recent graduates obtaining academic and clinical positions at Emory University in Atlanta, Caritas St. Elizabeth's Medical Center in Boston, Reading Hospital in Pennsylvania, Beverly Hospital, Penn State University Medical School, and Boston University Medical Center. Dr. Apovian in the last year has created a new stand alone Fellowship in Nutrition with the first graduate completing the fellowship requirements in June 2009. Selected Endocrinology fellow applicants are being considered for a 3 year program to include 2 years of Endocrinology and 1 year of

Medical Nutrition training. This has become a high competitive and attractive component of our Endocrine Fellowship program which has led to increase applicants to our fellowship program.

The Section's training program in Diabetes and Nutrition has been supported by an NIH **T32 Training grant, which is in its 50th year of continued funding**. The Training Grant has had only two principal investigators over this long period: Dr. James Melby from inception to 1985 and Dr. Neil Ruderman since 1986 to 2006, and Dr. Shalender Bhasin from 2006 onwards.

The Section's weekly Endocrine Grand Rounds series – which features national leaders presenting seminars and discussing cases, faculty-led research seminars, and fellows' case reports – continues to be well-attended. Fellows participate in breakfast conferences one or two times weekly. The conferences include core topics, case discussion, pathology review, and a journal club. Also, the fellows run a weekly board review luncheon. In addition, the Androgen Research Group has a journal club and guest lecturer series.

Section members are active in the education of medical residents. Residents from BMC and other institutions participate in Endocrine electives. Section faculty members attend on the general medicine wards, attend on the endocrine inpatient consult service, attend on the diabetes consult service, participate in morning report, and participate in Wednesday firm conferences for medical residents. Dr. Levin coordinates the Department of Medicine's weekly Medical Grand Rounds series.

The Section participates in the "Biology of Disease" (BOD) course offered to second-year Boston University School of Medicine (BUSM) students. Joshua Safer, Associate Professor of Medicine, oversees the Section's participation, which continues to garner excellent reviews from students. Section members participate in "Introduction to Clinical Medicine," offered to first- and second-year BUSM students. Section members participate in the ambulatory portion of the Medicine clinical clerkship for third-year students. Fourth-year students, from BUSM and outside institutions, participate in Endocrinology electives that are under the direction of Section members. As part of the BOD course, faculty members in the Center for Nutrition and Weight Management conduct lectures on nutrition. In addition, Center staff members teach twice a year in the cancer skills lab also offered to second-year BUSM students. In response to requests for increased nutrition education for BUSM students, Caroline Apovian, Associate Professor of Medicine, and Carine Lenders, M.D., Assistant Professor of Pediatrics, are collaborating with BUSM faculty directors to meet this need.

MAJOR ACCOMPLISHMENTS

Section faculty's research productivity continued to ace and awards.

Dr. Lewis Braverman was the recipient of the Robert Williams Distinguished Service Award of the Endocrine Society. He was also appointed the Editor-in-Chief of the Endocrine Practice, the flagship journal of the American College of Clinical Endocrinologists.

Dr. Holick received the NIH's Annual General Clinical Research Centers Program Award for Excellence in Clinical Research.

Drs. Holick and Ruderman received national awards for excellence in basic and clinical investigation.

Dr. Ruderman was the recipient of The Albert Reynold Award. The award is given to an individual whose career is distinguished by outstanding achievements in the training of diabetes research scientists or the facilitation of diabetes research by diabetes investigators.

Dr. Shalender Bhasin serves as the Associate Editor of the Journal of Clinical Endocrinology and Metabolism, and as Chair of the Endocrine Society's Expert Panel for the development of guidelines for androgen deficiency syndromes in men. He also serves as the Chair of the Endocrine Society's Clinical Guidelines Subcommittee and as a member of the American Board of Internal Medicine, Endocrinology and Diabetes Committee

Dr. Caroline Apovian co-directs the Harvard Obesity Course on a yearly basis, spoke about the Obesity crisis to the Republican and Democratic National Conventions.

Dr. Stephanie is the Robert Dawson Evans Clinician for 2007-2009

Dr. Sonia Ananthakrishnan was named as an Evans Educator 2009.

Dr. Ravi Jasuja was named the Evans Junior Investigator award recipient for 2009.

Endocrine, Nutrition and Diabetes Staff:



Shalender Bhasin, MD- Section Chief

Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Section Chief, Division of Endocrinology, Diabetes & Nutrition

Medical School: All India Institute of Medical Sciences

Residency: Northwestern University School of Medicine

Fellowship/Post-residency: Fellowship in Endocrinology and Metabolism at Harbor-UCLA Medical Center

Areas of Interest: Male and female reproductive

endocrinology, sexual dysfunction

in men and women; testosterone deficiency; erectile dysfunction

Accomplishments:

- Institute Gold Medal for the Graduate of the Year, 1976, AIIMS
- Fellow of the Year Award, Harbor-UCLA Medical Center, 1984
- Richard Weitzman Memorial Young Investigator Award, Harbor-UCLA Medical Center, 1990
- Distinguished Teaching Award of Harbor-UCLA Medical Center, 1990
- JCEM Pharmacia Award for the Finalist Research Paper in JCEM, 2003

- UT Southwestern Medical School, GCRC Award for Excellence in Patient-Oriented Research, 2000
- Best Doctors in Boston, 2006
- Associate Editor, Journal of Clinical Endocrinology and Metabolism
- Chair, Endocrine Society's Expert Panel on Androgen Deficiency Syndromes in Men
- Chair, Endocrine Society's Committee on Clinical Guidelines

Caroline M. Apovian, M.D., FACP, FACN



Associate Professor of Medicine and Pediatrics
Director, Nutrition and Weight Management Center
Director, Clinical Research at the Obesity Research Center

Boston University School of Medicine
Boston Medical Center

Medical School: University of Medicine and Dentistry of New Jersey

Residency: New England Deaconess Hospital

Fellowship/Post Residency: Fellowship in Nutrition Support at New England Deaconess Hospital

Areas of Interest: Novel medical treatments for obesity, monitoring type 2 diabetes, endothelial cell dysfunction

and obesity and cytokine expression of adipose cells after weight loss treatment in humans

Accomplishments:

- Physician certification in Obesity Medicine and Nutrition
- Associate Editor of the Obesity Journal and is co-editor of the Obesity and Nutrition Section of Current Opinion in Endocrinology and Diabetes
- Board of Directors for the Betsy Lehman Center for Patient Safety and Medical Error Reduction
- Expert Panel on Weight Loss Surgery for the Massachusetts Department of Public Health
- Director, Nutrition fellowship program at the Boston University School of Medicine



Sonia Ananthkrishnan, M.D.

Instructor of Medicine

Boston University School of Medicine
Boston Medical Center

Medical School: Northwestern University School of Medicine

Residency: Hospital of the University of Pennsylvania

Fellowship/Post Residency: Fellowship in Endocrinology, Boston Medical Center

Areas of Interest: General Endocrinology, Pituitary disorders, Thyroid disorders.

Accomplishments:

- Medical education of medical students, residents and fellows.
- 2009 Evans Student Educator
- Assistant Clerkship Director for the BUSM III Medicine Clerkship



Shehzad Bararia, M.D.

Associate Professor of Medicine
Boston University School of Medicine
Boston Medical Center

Medical School: The Aga Khan University, Karachi, Pakistan

Residency: The University of Texas Health Sciences Center at Houston

Fellowship/Post Residency: The Johns Hopkins University School of Medicine

Areas of Interest: Testosterone and fertility disorders in Men with a special clinical interest in seeing men with low testosterone levels related to opioid (narcotics) pain medications and in men

undergoing castration for prostate cancer

Accomplishments:

- Completed important research showing that men undergoing castration for prostate cancer are at risk for diabetes and metabolic syndrome
- Editor of The Journal of Clinical Endocrinology & Metabolism, which is the main clinical journal of The Endocrine Society
- Founding Associate Editor of the journal, Advances in Pharmacological Sciences



Eric Bachman, M.D.

Assistant Professor of Medicine
Boston University School of Medicine
Boston Medical Center

Medical School: Duke University School of Medicine

Residency: Beth Israel Deaconess Hospital, Harvard Medical School

Fellowship/Post Residency: Beth Israel Deaconess Hospital, Harvard Medical School

Areas of Interest: Diabetes, Obesity, Androgens and their interaction with hematopathology, especially anemia and polycythemia

Accomplishments:

- Project leader at Merck Research Laboratories for development of Janus kinase 2 inhibitors in myeloproliferative diseases
- Manuscript reviewer for the journals, *Blood* and *Biochemical Pharmacology*
- Participation in clinical trial of testosterone therapies in hypogonadal men



Lewis Braverman, M.D.

Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Medical School: Johns Hopkins School of Medicine; Honorary Doctorate in Medicine from University of Parma

Residency: Internal Medicine Residency on the II-IV Medical Services (Harvard) and Thorndike Memorial Laboratory (Harvard), Boston City Hospital

Fellowship/Post Residency: Fellowship in Endocrinology at the Thorndike Memorial Laboratory (Harvard), Boston City Hospital

Areas of Interest: Research and clinical interest have focused on the physiology and pathophysiology of the thyroid

Accomplishments:

- Recipient of Robert H Williams Distinguished Leadership Award from Endocrine Society in 2007
- Recipient of the Robert Dawson Evans Research Mentoring Award, Department of Medicine, Boston University School of Medicine
- Editor in Chief, Current Opinion in Endocrinology, Diabetes and Obesity
- Editor in Chief, Endocrine Practice, the journal of the American Association of Clinical Endocrinologists



Roberta Capelson, MS, ANP

Certified Nurse Practitioner

Boston University School of Medicine

Boston Medical Center

Graduate School: Master of Science from Boston College

Certificate of Advanced Graduate Study in Primary Care from MGH Institute of Health Professions

Areas of interest: Diabetes in the older adult, Weight management in patients with Diabetes, Web based systems for diabetes management, Diabetes in the community health setting, Inpatient management of Diabetes

- **Accomplishments:**
- ANCC certification - Adult Nurse Practitioner

- Clinical associate at BUSM
- Currently working in both the outpatient and inpatient setting at BMC
- Program manager for diabetes outreach efforts



and grants

Tai Chen, Ph.D.

Professor of Medicine

Boston University School of Medicine

Grad school/PhD training: University of Wisconsin, Madison (Ph.D.)

Areas of interest: Vitamin D metabolism, Cytochrome P-450 enzymes, cancers, biomarker and hormone and analyses

Accomplishments: Reviewer of scientific manuscripts



Andrea Coviello, M.D., MSE, FACE

Assistant Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Medical School: Duke University School of Medicine, 1995.

Master of Science in Epidemiology, University of Washington, 2003

Residency: Duke University Medical Center, 1998

Fellowship/Post Residency: Fellowship in Endocrinology, Diabetes and Metabolism, University of Washington School of Medicine, 2003

Areas of interest: Reproductive Disorders, Polycystic

Ovary Syndrome, Insulin Resistance and Diabetes, Neuroendocrine Disorders

Accomplishments:

- Fellow in the American College of Endocrinology, 2006
- Editorial Board, Journal of Clinical Endocrinology and Metabolism, 2006
- Editorial Board, Endocrine Practice, 2009-09-14
- Department of Medicine Faculty Development Grant, 2009
- NIH grant examining Clinical Correlates of High and Low Testosterone in Women in the Framingham Heart Study



Marina Donahue, R.N., M.S., FNP, CDE

Certified Family Nurse Practitioner

Boston University School of Medicine

Boston Medical Center

Graduate School: Masters of Science in Nursing from the University of Massachusetts of Boston

Areas of Interest: Passionate about educating both patients and clinic staff to understand the link between diabetes, heart disease and stroke. Aspiring to attain certification as a Clinical Lipid Specialist.

Accomplishments:

- Certified in diabetes since 1995, Certified as a Family Nurse Practitioner through American Academy of Nurse Practitioners since 2005
- Awarded Excellence in Nursing Practice through the Theta Alpha Chapter of the Sigma Nursing Honor Society
- Clinical Lipid Specialist 2008



Alan P. Farwell, M.D.

Associate Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Director of Endocrine Clinics

Medical School: University of Massachusetts Medical School

Residency: Internal Medicine Residency at Medical Center Hospital of Vermont

Fellowship/Post Residency: Academic Fellowship in Endocrinology at the University of Massachusetts Medical Center

Areas of Interest: Clinical and research interest in the etiology and treatment of thyroid disorders including thyroid ultrasonography and ultrasound-guided thyroid biopsies. Particular interest educating the public and patients about the management of thyroid disorders

Accomplishments:

- Associate Editor of the journal *Thyroid*, the scientific flagship of the American Thyroid Association
- Editor in Chief of the online journal *Clinical Thyroidology for Patients*
- Member, Board of Directors of the American Thyroid Association
- Director, Patient Education for the American Thyroid Association
-



Susan K. . Fried, Ph.D.

Professor of Medicine (appointment pending)

Director of Translational Research in Obesity and Metabolic Disorder,

Boston University School of Medicine

Director, Adipocyte Core, Boston Obesity Nutrition Research Center

Director, Boston Obesity Nutrition Research Center

Director of the Graduate Program in Medical Nutrition Sciences

Graduate Training: Columbia University, Department of Nutritional Biochemistry

Fellowship: Emory University School of Medicine, Section of Endocrine/Metabolism and Medical College of Pennsylvania, Section of Lipid Metabolism

Areas of Interest: Research focuses on the influence of nutrition and exercise on risk for age-related chronic diseases, including obesity, diabetes, hypertension, cardiovascular disease, sleep apnea, and osteoporosis. Her multi-disciplinary research team utilizes the full spectrum of genetics methods, and bridges genetic, clinical and translational research.

Accomplishments:

- NIH study section – Member Nutrition Study Section
- Director, Clinical Nutrition Research Unit of Maryland, 2005-2008
- Co-Chair, Annual Program of the Obesity Society, 2009



Samudra Gangopadhyay, Ph.D.

Research Assistant Professor of Medicine

Boston University School of Medicine

Graduate School: University of Calcutta, India, Department of Biochemistry

Post-doctoral Fellowship: Department of Immunology, Brandeis University and Boston Biomedical research Institute

Areas of interest:

- Structure function study of Androgen Receptor
- Mechanism based drug discovery: search for novel signaling molecules with anabolic effects that can be used during androgen ablation therapy for prostate and functional study of androgen receptor

Accomplishments: NRSA (F32) fellowship-NIH



Wen Guo, Ph.D.

Research Assistant Professor of Medicine

Boston University School of Medicine

Graduate School: University of Oklahoma, Ph.D. in Physical Chemistry

Post-doctoral Fellowship Training: Boston University School of Medicine, Department of Biophysics and University of Oklahoma, Department of Chemistry and Biochemistry

Areas of Interest: Effects of myostatin on adipogenic differentiation of bone marrow-derived mesenchymal stem cells

Accomplishments: 2008 Member of the American Society of Biochemistry and Molecular Biology (ASMB)



Michael F. Holick, Ph.D., M.D.

Professor of Medicine, Physiology and Biophysics

Boston University School of Medicine

Boston Medical Center

Medical School: University of Wisconsin, Madison

Residency: Massachusetts General Hospital

Fellowship/Post-residency: Massachusetts General Hospital

Areas of Interest: Vitamin D, Calcium, Bone Metabolism, Photobiology of Vitamin D, Osteoporosis

Accomplishments:

- Increased awareness in the pediatric and medical communities regarding vitamin D deficiency pandemic, and its role in causing not only metabolic bone disease, and osteoporosis in adults, but increasing risk of children and adults developing common deadly cancers, autoimmune diseases, including type 1 diabetes and multiple sclerosis and heart disease.
- American Skin Association Psoriasis Research Achievement Award
- American College of Nutrition Award
- Robert H Herman Memorial Award in Clinical Nutrition from the American Society for Clinical Nutrition
- Annual General Clinical Research Centers Program Award for Excellence in Clinical Research
- Linus Pauling Functional Medicine Award from the Institute for Functional Medicine
- Linus Pauling Prize for Human Nutrition
- DSM International Nutrition Prize



Patricia Hanrahan, R.N., A.N.P., C.D.E., M.S.N.
Certified Nurse Practitioner

Diabetes Nurse Educator
Boston University School of Medicine
Boston Medical Center

Graduate School: Masters in Nursing at Boston College

Areas of Interest: Focus has been diabetes management and education for hospitalized people with diabetes.

Accomplishments:

- Certified Adult Nurse Practitioner
- Certified Diabetes Educator (CDE)
- Insulin pump trainer
- Currently works in the clinic and inpatient units at BMC providing diabetes management and education
- Preceptor of the year by the Massachusetts Association of Nurse Practitioner, 2008
- Clinical faculty at Yale University School of Nursing

Yasuo Ido, Ph.D.

Assistant Professor of Medicine

Boston University School of Medicine

Graduate School: , Department of Third Internal Medicine, Hirosaki University School of Medicine

Post-doctoral Fellowship: Department of Pathology, Washington University School of Medicine

Areas of interest: Diabetes research



Nawfal W. Istfan, M.D., Ph.D.

Associate Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Medical School: American University of Beirut

Residency: Internal Medicine at the American University of Beirut

Post Graduate School: PhD in Human and Clinical Nutrition, Massachusetts Institute of Technology

Fellowship: Clinical Nutrition at New England Deaconess Hospital

Areas of Interest: Nutrition and cancer; regulation of cell proliferation and the effects of polyunsaturated fatty acids on cancer; insulin resistance in obesity; cardiovascular disease in obesity.

Accomplishments: Named to Best Doctors in America



Lalita Khaodhiar, M.D.

Assistant Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Medical School: Siriraj Hospital, Mahidol University, Thailand

Residency: University of Hawaii, Honolulu, Hawaii

Fellowship/Post-residency: Fellowship in Endocrinology at University of Massachusetts Medical Center

Fellowship in Clinical Nutrition at Beth Israel Deaconess Medical Center

Areas of interest: Obesity, diabetes

Accomplishments: Reviewer: obesity, metabolism

Awards received:

- Thai American Physicians Foundation Visiting Professor Awards, 2008.



Philip Knapp, M.D., M.S.

Assistant Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Medical School: University of Massachusetts Medical School, Boston University School of Public Health

Residency: Boston Medical Center

Fellowship/Post Residency: Fellowship in Endocrinology at Boston Medical Center

Areas of Interest: Adrenal disorders



Ravi Jasuja, Ph.D.

Assistant Professor of Medicine

Boston University School of Medicine

Graduate School: University of Hawaii, Department of Physical Chemistry

Post-doctoral Fellowship: Department of Biophysics, Albert Einstein College of Medicine

Areas of interest:

- Conformational gating in androgen receptor signaling
- Molecular fingerprints of ligand-specificity in selective androgen receptor modulators (SARMs)

- Androgenic modulation of skeletal muscle regeneration

Accomplishments:

- American Cancer Society grant (3/1/08-10/31/09) PI, Anabolic effects of novel Signaling molecule (BJS1) on bone mass during androgen ablation therapy for

prostate cancer. To examine the mechanisms of tissue-specific effects of an anabolic transcript in restoring the bone health without stimulating prostate growth in androgen-deprived states.

- Pepper Center grant (8/1/08-7/31/2011) PI, Boston OAIC, Mechanism-Based Drug Discovery and characterization of androgen-regulated protein. To examine the anabolic effects of wnt target molecule in increasing Skeletal Muscle Mass and Physical Function in Older Mice.
- NIH, NIDDK grant (11/30/09-12/1/14) co-investigator, Mechanisms of Anabolic Action of Testosterone.
- NHLBI grant (4/15/09-1/13/14) co-investigator, Metabolic and Inflammatory Stress and the Endothelial Cell.
- Invited speaker, ESICON, The Endocrine Society Annual Meeting, 2009

Mi Jeong Lee, Ph.D.

Instructor of Medicine (Appointment pending)

Boston University School of Medicine

Graduate School: Rutgers University, Department of Nutritional Sciences

Post-doctoral Fellowship: University of Maryland, Division of Endocrinology, Diabetes and Nutrition, School of Medicine

Areas of interest: Obesity and adipocyte metabolism

Accomplishments:

- Lee MJ, Fried SK. Integration of hormonal and nutrient signals that regulate leptin synthesis and secretion. *Am J Physiol Endocrinol Metab.* 2009 ;296:E1230-8.
- Jobgen W, Meininger CJ, Jobgen SC, Li P, Lee MJ, Smith SB, Spencer TE, Fried SK, Wu G. Dietary L-arginine supplementation reduces white fat gain and enhances skeletal muscle and brown fat masses in diet-induced obese rats. *J Nutr.* 2009;139:230-7.



Stephanie L. Lee, Ph.D., M.D., FACE

Associate Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Associate Chief of Faculty Development in the Section of Endocrinology, Diabetes and Nutrition; Director, Thyroid Nodule and Cancer Center

Medical School: University of California, San Diego School of Medicine.

Graduate School: Ph.D. in Physiology and Pharmacology, University of California, San Diego

Residency: University of California, San Diego Medical Center

Fellowship/Post Residency: Clinical Fellowship in Endocrinology and a Research Fellowship in Molecular Medicine at the New England Medical Center

Areas of Interest: Clinical and Research Interest in the Etiology and Treatment of Thyroid Disease, especially thyroid malignancies.

Accomplishments:

- Fellow of the American College of Endocrinology
- Board of Directors, New England Chapters of the American Association of Clinical Endocrinologists
- Board of Directors, Evans Medical Foundation, Department of Medicine, Boston University School of Medicine
- Chair, Radiation Safety Committee, Boston University School of Medicine
- Chair, Credentials Committee, Boston University School of Medicine
- Member, Cancer Care Committee, Boston Medical Center
- Co-investigator of translations research from the Genome Science Institute and the BUMC Bridge to investigate the use of miRNA in conjunction with ultrasound appearance of nodules and cytology to predict malignancy
- Co-PI, Phase III clinical trial using Sorafenib for advanced thyroid cancers
- Robert Dawson Evans Clinician Award 2008-9
- Recently participated in writing the 2006 and the revised 2009 American Thyroid Association Evidence-based Guidelines for the diagnosis and management of thyroid nodules and cancer
- 2009 Visiting Professor at the University of Washington, Seattle
- Named in Boston Magazine's "Boston's Top Doctors", "Top Doctors in America," and the "Guide to America's Top Physicians"



Angela M. Leung, M.D., M.Sc.

Instructor of Medicine

Boston University School of Medicine

Boston Medical Center

Medical School: Boston University School of Medicine

Graduate School: Boston University School of Public Health

Residency: Boston University Medical Center

Fellowship/Post Residency: Fellowship in Endocrinology at the Boston University Medical Center

Areas of Interest: Iodine nutrition, thyroid disease in pregnancy, environmental inhibitors of thyroid function

Accomplishments:

- Endocrine Fellows Foundation Research Grant, 2007
- Charles H. Hood Postdoctoral Fellowship Award,

2009



Robert M. Levin, M.D.

Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Medical School: Stritch School of Medicine of Loyola of Chicago

Residency: Cincinnati General Hospital and Boston City Hospital

Fellowship/Post-residency: Fellowship in Endocrinology at Georgetown University Hospital

Areas of Interest: thyroid disease, osteoporosis and Paget's disease, educator of all students

Accomplishments:

- Stanley Robbins Award for Excellence in Teaching (2002)
- One of the founding fathers of the National Organization, Clerkship Directors in Internal Medicine (CDIM)
- Elected to the Boston University Chapter: Alpha Omega Alpha, the National Honor Medical Society (1997)
- Robert Dawson Evans Faculty Special Recognition Teaching Award (1999)
- Director, "Controversies in Internal Medicine" CME course at Hilton Head Island held yearly since 1984



Marie McDonnell, M.D.

Assistant Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Director, Inpatient Diabetes Program

Medical School: Boston University School of Medicine

Residency: New York Presbyterian Hospital, Columbia Campus

Fellowship/Post Residency: Fellowship in Endocrinology at Boston Medical Center

Areas of Interest:

- Diabetes and nutrition.
- Dr. McDonnell collaborates with investigators working to identify the immunologic aspects of chronic inflammation in obesity-related type 2 diabetes, which relates not only to the development of the disease from insulin resistant pre-diabetic states, but to the progression of serious complications, such as cardiovascular disease.
- Member of the active obesity research group at BMC and has co-developed adipose tissue biopsy techniques.
- One focus of this research group is inflammation via adipose tissue macrophages and insulin resistance, and has associated the presence of organized groups of adipose tissue macrophage with systemic insulin resistance in humans.

- Recent investigations examine the role of circulating lymphocytes in the modulation of chronic inflammation in type 2 diabetes, specifically in defining the characteristics of Toll-like Receptor (TLR) expression and function. We plan to further investigate aberrant TLR2 and TLR4 expression and function in this patient population in relation to endogenous ligands known to be elevated in type 2 diabetes, including the bacterial product lipopolysaccharide (LPS).



Thomas Moore, M.D.

Professor of Medicine

Boston University School of Medicine

Associate Provost, Boston University Medical Campus

Medical School: University of Cincinnati College of Medicine

Residency: Dartmouth Medical Center and University of Cincinnati Medical Center

Fellowship/Post Residency: Research fellowship at

Peter Bent Brigham Hospital and Harvard Medical School

Areas of Interest: Nutritional aspects of hypertension; Using the internet to modify eating behaviors

Accomplishments:

- Chairman of the DASH, multicenter, NIH-sponsored study showing that a diet rich in fruits, vegetables and low-fat dairy food can lower blood pressure
- Clinical Investigator Award for the National Institutes of Health
- Established Investigator Award from the American Heart Association
- Published the *Dash Diet for Hypertension: Lower Your Blood Pressure in 14 Days – Without Drugs*



Elizabeth N. Pearce, M.D., M.Sc.

Associate Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Medical School: Harvard Medical School, Boston University School of Public Health

Residency: Beth Israel Deaconess Medical Center

Fellowship/Post Residency: Fellowship in Endocrinology at Boston Medical Center

Areas of Interest: Sufficiency of dietary iodine in the U.S., thyroid function in pregnancy, thyroid effects of environmental perchlorate exposure, the

cardiovascular effects of subclinical thyroid dysfunction and thyroid disease

Accomplishments:

- Recipient of the Robert Dawson Evans Junior Faculty Merit Award, Department of Medicine, Boston University School of Medicine, 2008.

- Editorial board member for the journals, Thyroid, The Journal of Clinical Endocrinology and Metabolism, and Endocrine Practice
- Chair, American Thyroid Association Public Health Committee



Sara Pietras, M.D.

Instructor of Medicine

Boston University School of Medicine

Boston Medical Center

Medical School: Dartmouth Medical School

Residency: Mount Auburn Hospital in Cambridge, Massachusetts

Fellowship/Post Residency: Fellowship in Endocrinology at Boston Medical Center

Areas of Interest: Diabetes, bone disease and thyroid dysfunction



Rahul Ray, Ph.D.

Professor of Medicine

Research Professor of Biophysics and Physiology

Boston University School of Medicine

Graduate School: Washington State University, PhD in Chemistry

Post-doctoral Fellowship: Massachusetts Institute of Technology, Department of Chemistry and Applied Biological Sciences

Areas of interest: Vitamin D and cancer (therapeutics and molecular biology), nanomedicine, targeted drug delivery, photodynamic therapy of cancer

Accomplishments:

- Recipient of numerous RO1, R21, SBIR, STTR, US Army grants
- Grants from other agencies including Community Technology Development Grants (BU)
- NIH study section member
- 80 peer-reviewed publications
- Recipient of four US patents on assay development and cancer therapeutics



James L. Rosenzweig, M.D.

Associate Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Director, Diabetes Services at Boston Medical Center

Medical School: Yale School of Medicine

Residency: Barnes-Jewish Hospital, Washington University School of Medicine, St. Louis, Missouri

Fellowship/Post Residency: Diabetes Branch, National Institute of Diabetes, Digestive and Kidney Diseases, National Institutes of Health, Bethesda, Maryland. Clinical Associate, U. S. Public Health Service. Lita Annenberg Hazen Fellowship in Clinical Research in Diabetes, Endocrinology, and Metabolism.

Areas of Interest: Diabetes disease management, prevention of diabetes and cardiovascular Disease, clinical quality improvement, physician performance measurement, clinical guidelines and pathways, patient risk stratification.

Accomplishments:

- Dr Rosenzweig led a workgroup that developed nationally-recognized guidelines for the prevention of diabetes and cardiovascular disease in patients at risk.
- Dr. Rosenzweig is Chairman of the Performance Measures Committee and a member of the Clinical Affairs Committee of the Endocrine Society
- He was Chairman of the National Diabetes Quality Improvement Alliance

Sayon Roy, Ph.D.

Associate Professor of Medicine

Boston University School of Medicine

Graduate School: Boston University, Department of Molecular Biology

Post-doctoral Fellowship: Harvard Medical School, Harvard University, Department of Ophthalmology

Areas of interest: Microvascular Biology, Diabetic Microangiopathy, Gene Therapy

Accomplishments:

- Innovative Award from Juvenile Diabetes Research Foundation
- Mentor of the Year, Boston University
- Research Award from American Diabetes Association
- Two NIH R01 research grants
- Juvenile Diabetes Research Foundation research grant



Neil Ruderman, M.D., D.Phil.

Professor of Medicine, Physiology and Biophysics

**Boston University School of Medicine
Boston Medical Center**

Director, Diabetes Research Unit at Boston Medical Center

Medical School: University of Pittsburgh School of Medicine

Residency: Presbyterian Hospital, Pittsburgh, PA;
Metropolitan Hospital, NY

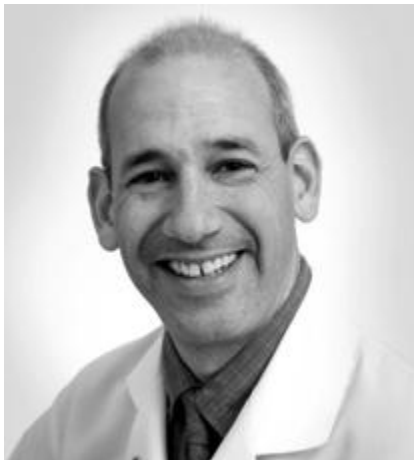
Fellowship/Post Residency: Joslin Diabetes Research

Laboratory, Harvard Medical School

Areas of Interest: Diabetes and Metabolic Disorders

Accomplishments:

- Internationally known for research in areas such as diabetes and exercise, vascular complications of diabetes and the metabolic syndrome, a disorder that predisposes people both to type 2 diabetes and coronary heart disease.
- Recipient of many honors, most recently the Albert Renold Award of the American Diabetes Association



Joshua D. Safer, M.D., F.A.C.P.

Associate Professor of Medicine and Molecular Medicine

**Boston University School of Medicine
Boston Medical Center**

Director, Endocrinology Fellowship Training Program

Medical School: University of Wisconsin School of Medicine, Madison

Residency: Beth Israel Medical Center, New York City

Fellowship/Post Residency: Fellowship in Endocrinology at Beth Israel Deaconess Medical Center

- Harvard Medical School, Boston

Areas of Interest:

Clinical - treatment of thyroid disease, use of sex hormone therapies.

Research: Thyroid hormone to treat skin disease and improve wound healing.

Accomplishments:

- Editorial Board member for Endocrine Practice, the journal of the American Association of Clinical Endocrinologists
- Fellow of the American College of Physicians



Asish Saha, Ph.D.

Associate Professor of Medicine

Boston University School of Medicine

Co-Director, Biochemistry and Molecular Biology Core

Graduate School: University of Calcutta, India

Ph.D. in Biochemistry, University of Calcutta, India

Post-doctoral Fellowship: University of Pittsburgh, Dept. of Biochemistry & Molecular Biology, School of Medicine

Areas of interest: Fuel Sensing and Insulin Resistance; AMPK/malonyl CoA mechanism in mammalian tissues and the role of its dysregulation in the pathogenesis of the metabolic syndrome

Accomplishments:

- Recipient of WHO Fellowship
- Established investigator of Boston area Diabetes Endocrinology Research Center



Carlo Serra, Ph.D.

Instructor of Medicine

Boston University School of Medicine

Graduate School: University of Rome, Department of Cytological Sciences

Post-doctoral Fellowships: University of Rome; Dulbecco Telethon Institute, Rome; The Burnham Institute for Medical Research, La Jolla; Cold Spring Harbor Laboratory, NY

Areas of interest: Molecular mechanisms of skeletal muscle differentiation. The role of testosterone on skeletal muscle regeneration. Cell-based therapies for the Duchenne Muscular Dystrophy.

Accomplishments: Pilot Project grant from the Boston Pepper Center for Older Americans.



Elliot Sternthal, M.D.

Assistant Professor of Medicine

Boston University School of Medicine

Boston Medical Center

Medical School: McGill University Faculty of Medicine, Montreal, Canada

Residency: Jewish General Hospital, Montreal, University of Massachusetts Medical Center,

Fellowship: Fellowship in Endocrinology at University of Massachusetts Medical Center

Areas of interest: Clinical management of diabetes mellitus and hyperlipidemia

Accomplishments:

- Fellow of the American College of Physicians
- Fellow of the American College of Endocrinology
- Co-principle investigator for the BARI 2D trial, an international multi-center trial assessing medical vs. interventional treatment of diabetic patients with coronary artery disease
- Course director of several BMC CME programs to improve diabetes mellitus management skills of primary care
- Originated the concept and curriculum for a novel 1 week intense immersion preceptorship in diabetes mellitus for primary care providers. This was first program offered in the United States. 3 programs will be completed in 2009 with 8 additional programs in 2010
- Associate Editor of Endocrine Practice

Thomas Storer, Ph.D.

Adjunct Professor of Medicine

Boston University School of Medicine

Graduate School: Exercise Science, University of Utah

Areas of interest:

- Anabolic agents including hormone therapy, resistance exercise training, and nutrition in treatment of sarcopenia of aging and chronic diseases.
- Resistance exercise and functional training to improve mobility in older adults.
- Assessment and training of cardiopulmonary function.

Accomplishments:

- Director, Laboratory of Exercise Physiology and Physical Performance, Boston University School of Medicine
- Distinguished Professor Award, El Camino College
- Member, American College of Sports Medicine
- Member, American Thoracic Society
- Member, National Strength and Conditioning Association
- Member, California Society of Pulmonary Rehabilitation

Thomas Trivison, Ph.D.

Assistant Professor of Medicine (appointment pending)

Boston University School of Medicine

Graduate School: Biostatistics, Johns Hopkins University

Areas of interest: Temporal trends in serum testosterone levels and treatment in older men. Relation between serum testosterone, serum estradiol, sex hormone-binding globulin, and geometrical measures of adult male proximal femur strength and age-related decline in physical function.

Accomplishments:

- Helen Abbey Award for Excellence in Teaching,, Johns Hopkins School of Public Health
- Margaret Merrell Award for Excellence in Academic Research, Johns Hopkins School of Public Health

- Kappa Delta Award for Orthopedic Research (with LEAP study team) Orthopedic Research Society / American Academy of Orthopedic Surgeons
- Special Achievement Award for Collaborative Research, New England Research Institutes



Lynn White, R.N.-C., F.N..P-B.C., C.D..E, B.C.-A.D.M.

Certified Nurse Practitioner

Boston University School of Medicine

Boston Medical Center

Graduate School: Master of Science from Boston College

Areas of Interest: Working with diabetes patients to manage their disease. Improving medication therapy while developing life skills to make medications work in the best way for each patient. Firm belief in working with the patient to find and reach their goals for health maintenance and diabetes control.

Accomplishments:

- Certified NCBDE, AANC in Family Nurse Practice,
- Advanced Diabetes Management, Diabetes Education
- Insulin Pump trainer for Medtronic, Omnipod, Deltec Cozmo, Animas insulin pumps