

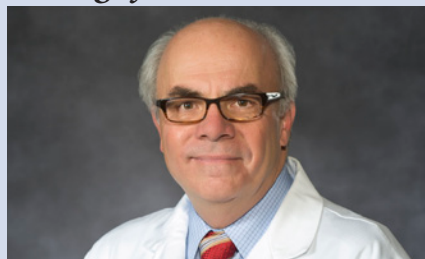


# PROGRESS NOTES

A Quarterly Publication of the Department of Internal Medicine

V i r g i n i a C o m m o n w e a l t h U n i v e r s i t y

## Message from the Chair



**John E. Nestler, MD, Department Chair**

This issue of Progress Notes illustrates our commitment to comprehensive and compassionate patient care, educational excellence, and the development of the next generation of physician-scientists.

The Department is particularly proud of its two residents, **Drs. Kobulnicky and Meliagros**, who received the "Gold Foundation Humanism and Excellence in Teaching Award." These two individuals exemplify what we all strive for: to provide clinical care that addresses not only the physical needs of our patients, but that encompasses the emotional and spiritual needs of our patients as well. In an era focused so intently on technology and the business of medicine, the efforts of our faculty and trainees to incorporate the humanistic aspects of medical care are especially appreciated and valued by our patients.

Similarly, such compassion prompted an icon of the Department, **Dr. Michael Hess**, to establish an entirely new clinical program addressing the needs of cancer patients, who all too often develop cardiovascular complications as a result of their treatments.

In the same vein, **Dr. Lori Sweeney**, following a stint at Eisenhower Medical Center, has returned to VCU to work with her surgical colleagues and other health professionals to establish a comprehensive Bariatric Program. This is yet one more step toward providing the best care to our patients.

Finally, **Dr. Brant Ward** is one of the Department's success stories and an example of our commitment to the academic mission. Dr. Ward is a graduate of Internal Medicine's Physician-Scientist Research Training Program, which allowed him to develop his research expertise while completing clinical training in Internal Medicine and Allergy and Immunology. Dr. Ward now joins the faculty, and we look forward to following his successful career as a physician-scientist.

These individuals exemplify what is best about the Department, and we extend our heartfelt thanks and admiration to them all.



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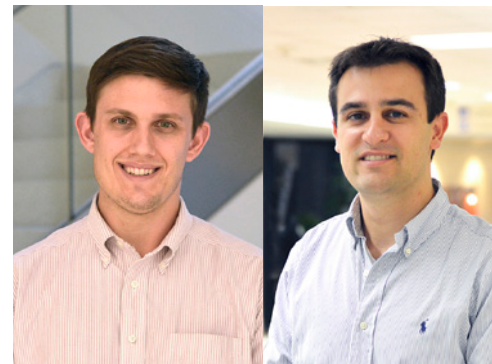
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# Cardiology Program Provides Cancer-Specific Care and Research

In 2013, veteran Cardiologist **Dr. Michael Hess** began VCU's Cardio-Oncology Program to provide care for patients with cardiac complications as a result of cancer treatments. Cardio-oncology is an emerging area in patient care with a large patient population because many standard oncology treatments increase the risk of patients experiencing heart complications. VCU's program is the only one in the state. After pioneering VCU's Heart Failure Program, Dr. Hess is now leading VCU's Cardio-Oncology Program as it cares for patients, conducts research, and establishes new standards of care.

Oncology treatments, such as chemotherapy and radiation, put a burden on the cardiovascular system and increase the risk of heart issues. Dr. Hess points out that, "the second leading cause of death in adults who survive cancer is cardiovascular issues." The practice of oncology-specific cardiology originally emerged as cardiologists recognized a link between chemotherapy and heart failure. With breast cancer in particular, the American Heart Association reports that "12 percent of older ... patients developed heart failure within three years [of treatment]."

Despite knowing the negative cardiovascular effects of cancer treatments, these treatments effectively cure cancer. Therefore, Dr. Hess explains, "we work alongside oncologists as they cure and we identify and treat any cardiovascular risk factors that emerge. This strategy is best for the patients and allows them to lead a normal life in the long run, often with just a few medications."

Another large challenge in the emerging area of cardio-oncology is that standard cardiology treatments are often not an option for patients because basic oncology treatments, such as radiation therapy or doses of anthracyclines, compromise their health and create irregular results during common cardiology scans. "The old rules are out and there are many questions," says Dr. Hess. "But this is intriguing because it involves a lot of pure medicine and science."

There is very little literature or standard of care protocol for cardiology complications brought on by oncology treatments. In addition to treatment, there is much research and protocol development to be done. For some specific treatments, such as bone marrow transplants, there is no literature on related cardiology issues. Having treated many of these cases, Dr. Hess is working on publishing descriptions of observed cardiac complications in bone

marrow transplant patients.

Given that the CDC identifies cancer as one of the leading causes of death in the United States and VCU's **Massey Cancer Center** is the highest rated cancer center in Virginia, the patient population is a large one. The program has steadily grown in response to this — since starting with clinic hours on one day a week in 2013, the program now offers clinic hours everyday of the week.



**Michael Hess, MD**, a veteran Cardiologist who pioneered heart failure care, leads the VCU Cardio-Oncology Program which provides specialized cardiology care to cancer patients with heart issues related to oncology treatments.

To treat patients, the program works closely with Massey Cancer Center. When Massey oncologists see patients with heart risks, they are referred to the Cardio-Oncology Program Clinic for treatment. The program provides three main clinical services to patients. First, it works to provide preventative care by screening patients before they undergo oncology treatment. Next, it provides treatment to patients that develop heart issues in the

course of being treated for cancer. Finally, when patients conclude cancer treatments the program sees patients to help them maintain good health into the future. The program also sees patients from other institutions as they are referred.

***"We work alongside oncologists as they cure and we identify and treat any cardiovascular risk factors that emerge. This strategy is best for the patients and allows them to lead a normal life in the long run, often with just a few medications."***

As Dr. Hess moves forward, he looks to add more cardiologists to the program and is exploring how VCU's training programs can participate as well. "There is good work to be done in this area," says Dr. Hess. "The administrative leadership is the best I have seen in my time at VCU. They have a great concept for building care and expertise and it allows us to advance programs like this one." He looks forward to continuing to use his expertise and experience to pioneer care for patients with oncology treatment induced heart complications at VCU. **IM**



## New Focus for Bariatric Program Includes Endocrine Expertise and Research

In the coming months, endocrinologist **Dr. Lori Sweeney**, will be collaborating with the soon to arrive Division of Bariatric and Gastrointestinal Surgery Chair, **Guilherme M. Campos, M.D., Ph.D.**, to advance VCU's bariatric medicine offering. Both physicians bring strong experience to their roles. Dr. Campos is a pioneer and thought leader in the field of weight loss surgery, while Dr. Sweeney helped developed a multidisciplinary Bariatric Clinic in her previous position at Dwight D. Eisenhower Army Medical Center, in Augusta, GA. As a part of the VCU Bariatric Medicine Program, Dr. Sweeney plans to help provide comprehensive care and to conduct research to improve the effectiveness of bariatric treatments.

Bariatric Medicine, which involves the study and treatment of obesity, is an area of particular importance because, as CDC figures show, one third of adults in the United States are obese. Dr. Sweeney points out, "Obesity is a complex endocrine disorder and many of the comorbid conditions attributable to obesity are clinically improved with bariatric surgery. Conversely, bariatric surgery may have long term adverse effects on the endocrine system – for example, bariatric surgery may detrimentally affect bone metabolism and several distinct forms of hypoglycemia may occur in the postoperative period."

Dr. Sweeney is an important edition to the VCU faculty as she will be the first endocrinologist in the Division to specialize in the perioperative medical care of adult patients undergoing bariatric surgery. While Dr. Sweeney arrived at VCU Medical Center only six months ago, she is not new to VCU. She completed her endocrinology fellowship training at VCU Medical Center and served as junior faculty until 2009.

The main focus of Dr. Sweeney's practice will be in the optimization of patients for bariatric surgery and the treatment of medical complications resulting from bariatric surgery. She has particular interest in identifying interventions for weight regain in bariatric patients and plans to conduct translational research in this patient population. She remarks, "we are just beginning to develop clinical guidelines for the medical management of bariatric patients, and there are no guidelines which are specific to the different types of bariatric surgery. I am particularly interested in the development of tools to assist primary care providers in two discrete areas. The first is a set of comprehensive guidelines which direct the surveillance by physicians for medical complications and the other is an algorithmic approach to the reduction of hypertension and diabetes medications in the immediate postoperative period.

To address these issues, the VCU Bariatric Program will add more thorough screenings prior to surgery that address patients' mental and emotional, as well as physical health, and provide endocrine

care through the surgery process. "We want patients to be in the best place they can be before surgery, to work with them closely during the perioperative period, and to track their health after surgery to understand the factors that determine success," says Dr. Sweeney.



**Lori Sweeney, MD**, an endocrinologist with experience in bariatric medicine, brings endocrinology expertise to VCU's Bariatric Program. Dr. Sweeney aims to provide comprehensive care and research to give bariatric surgery patients the best opportunity for success.

This approach will allow for excellent clinical care and important research to be done simultaneously. Dr. Sweeney explains, "I am a strong believer in the development of clinical databases to facilitate clinically relevant research in the "beside to bench" tradition. This strategy allows for the early identification of trends in patient outcomes and serves as a resource for multidisciplinary research collaboration." To this aim, Dr. Sweeney looks forward to including VCU endocrine fellows in the clinical and research process. She will also be collaborating with **Dr. Edmond Wickham**, an adult and pediatric endocrinologist who leads the Healthy Lifestyles Center at Children's Hospital of Richmond at VCU.

***The main focus of Dr. Sweeney's practice will be in the optimization of patients for bariatric surgery and the treatment of medical complications resulting from bariatric surgery. She has particular interest in identifying interventions for weight regain in bariatric patients and plans to conduct translational research in this patient population.***

In addition to focusing on medical aspects of bariatric surgery, Dr. Sweeney will be serving in the recently created role of Assistant Program Director for Internal Medicine Fellowship Programs. In this role, she will provide centralized leadership to the fellowship programs. Dr. Sweeney will be a resource for Fellowship Program Directors and will help streamline the accreditation process. She will also focus on the promotion of scholarly research by the fellows. Having been active in both general medicine education

*(continued on page 4)*

and research throughout her career, Dr. Sweeney is passionate about her role with the fellowship programs.

As the VCU Bariatric Program moves towards full operation and her position as Assistant Program Director for Fellowships gets underway, Dr. Sweeney is incredibly excited to be back at VCU. “I

look forward to collaborating with Dr. Campos and others as we develop a dynamic multidisciplinary Bariatric Program. There is a palpable difference as compared to my previous time here. The VCU infrastructure is stronger. Richmond has a different, more modern pulse now, as well.” **IM**

## Physician-Scientist Training Alumni Advances Allergy and Immunology Research

In the spring of this year, Allergist-Immunologist **Brant Ward, M.D., Ph.D.**, of the Division of Rheumatology, Allergy and Immunology, finished the research portion of the rigorous six year Physician-Scientist Research Training Program of the VCU School of Medicine. With his post-doctoral research complete, Dr. Ward will be staying at VCU as an independent investigator and continuing the research he has been developing throughout his training which focuses on mast cell behavior, as well as myeloid derived suppressor cells and common variable immunodeficiency.

The **Physician-Scientist Research Training Program** at VCU is an American Board of Internal Medicine Certified Pathway designed for physicians who want to pursue careers in research. Residents can choose between an Internal Medicine Research Pathway and a Subspecialty Research Pathway. These pathways take between five to seven years depending on the program. Dr. Ward's Allergy and Immunology Subspecialty Research Pathway involved six years of training – those years were comprised of two years of internal medicine training, one year of allergy and immunology training, three years of research training.

During the past three years of research training, 80% of Dr. Ward's time has gone to research and 20% has gone to clinical care. As an independent investigator, that ratio will stay the same.

The main focus of Dr. Ward's research has been investigating the immune responses of mast cells. While these cells are usually associated with the release of histamine in allergic reactions, Dr. Ward has been studying whether or not mast cells can function as antigen presenting cells, an action thought to be restricted to only a few specialized types of cells. His research, in collaboration with MD/PhD student Sahar Lotfi-Emran, suggests this is possible and that mast cells may be able to activate T cells in an antigen-specific manner. These findings may significantly change our understanding of how immune responses are initiated or maintained at the sites of inflammation. This in turn might lead to better treatments for diseases like psoriasis, Crohn's disease, and rheumatoid arthritis.

Dr. Ward has also been looking at myeloid-derived suppressor cells in a condition called mastocytosis. Specifically they are looking at how these myeloid-derived suppressor cells interact with mast cells. “In cancer literature there is interest in determining if these cells suppress the immune response against cancer. We are investigating

if these cells are elevated and if this would have implications on why the body doesn't fight off or get rid of the abnormal mast cells in patients with mastocytosis.”

In his clinical work, Dr. Ward's primary interest is immunodeficiency disorders, as well as mast cell and eosinophil disorders, in both adult and pediatric patients. Dr. Ward is also engaged in clinical research that bridges his basic science work and his clinical practice.



Independent investigator, **Brant Ward, MD, PhD**, an Allergy Immunology Specialist who recently completed the VCU Physician-Scientist Training Program, conducts basic science and clinical research on mast cell behavior, myeloid derived suppressor cells, and common variable immunodeficiency.

Currently, he is working with a pair of physicians to seek a better understanding of how to treat patients with Common Variable Immunodeficiency (CVID). Recurrent infections are common symptoms among CVID patients, and can be effectively treated with replacement antibodies. However, treatment can be challenging, for while most patients treated with antibodies are essentially symptom-free, a substantial proportion of patients continue to battle various autoimmune diseases. Dr. Ward, along with Allergy and Immunology Fellow, **Dr. Alexander Alvarez**, and Internal Medicine Resident, **Dr. Krista Edelman**, are looking for markers to understand why this is the case. Currently they are investigating abnormalities in T and B cells as potential causes for this outcome with the goal of being able to detect how patients will fare after treatment.

While the Physician-Scientist Research Pathway is challenging, it provides excellent training for physicians who want to bridge medicine and research. “I was extremely fortunate to get into the program,” says Dr. Ward. “It has been a great opportunity to train with the strong basic science research faculty we have here, such as

*(continued on page 5)*



**Dr. [Lawrence B.] Schwartz**, [M.D., Ph.D., Chair of the Division of Rheumatology, Allergy and Immunology,] who holds extensive experience in human mast cell research.”

Having completed the program, Dr. Ward shares “It is exciting

to be finished with training and I hope to publish soon. A bulk of the manuscript for our mast cell research is prepared and we are working on finalizing it.” Dr. Ward aims to publish in a basic science journal that focuses on immunology and will be co-first author on the article. **IM**

## Update from the Associate Chair for Quality and Safety

It has been an exciting few months since I begin the journey as our Department’s Associate Chair for Quality and Safety. As I meet with colleagues to discuss my vision for the quality program, I am reminded of how fortunate I am to work with physicians who are so committed to excellence. Our faculty are passionate about the quality of care provided and truly believe that “better has no limit”. Accordingly, the goal of the quality program is to support our department’s clinical and academic mission through the continuous improvement of both the patient and the provider experience.

With that in mind, I wanted to provide an update on a few of the department’s priorities for this year.

Transitions of care represent times of high risk for patient harm. Safe, effective patient handoffs require complex and time-sensitive collaboration between multiple providers. **This year, we will continue efforts to improve the safety of patient handoffs during three specific transition periods:** admission from an outside acute care facility to our inpatient medicine teams, handoffs between providers on inpatient services, and the critical transition from the inpatient to outpatient setting.

**Outside hospital transfers** represented 15% of all VCUHS admissions last calendar year and 38% of all inpatient deaths. Effective handoffs between hospitals for these medically complex, high risk patients depends on a reliable process for transfer of information and for timely acceptance. Our Academic Hospitalists have partnered with bed liaisons and the patient transfer center to improve the process for transfers to our general medicine services. Their new process for ensuring availability of records at the point of transfer has been adopted hospital wide. They continue to focus on improving initial level of care selection for accepted patients and ensuring high quality handoffs to the accepting teams.

**I-PASS** is a standardized, evidence-based handoff bundle

that aims to reduce medical errors associated with verbal and written miscommunication. This tool is used during inpatient handoffs as oncoming providers assume ownership for patient care. Implementation of I-PASS is being led by **Dr. Ryan Vega** and the Academic Nocturnists for the housestaff, and **Dr. Michelle Brooks** for the Academic Hospitalists.

### Effective Discharge Planning

remains a focus for our department given the potential for readmissions reduction, reduced length of stay, improved discharges by noon and better patient satisfaction scores. Our department has partnered with Care Coordination under the leadership of Ryan Raisig to develop a set of “best practice elements” for care transitions from the inpatient to outpatient setting. Borrowing from evidence-based programs such as Project RED and Project BOOST, this group has outlined 10 best practice elements for discharge that result in improved patient outcomes. Implementation will begin on our non-teaching services to allow for testing of the new process without disruption of the resident learning environment.

The above highlights a few of our initiatives, but there are plenty more opportunities to become engaged with our quality and safety program. Faculty who are interested in being more involved are encouraged to contact me directly.

### Sarah Hartigan, MD

Associate Chair for Quality and Safety  
Assistant Professor  
Division of General Internal Medicine



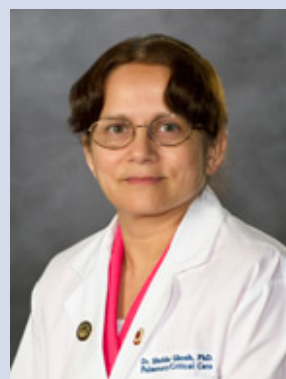
**Sarah Hartigan, MD**  
Associate Chair for Quality and Safety

## Update from the Associate Chair for Research

Despite the continuing effects of sequestration and federal cut backs in NIH budget, the Department of Internal Medicine continued to increase its share of research funding in the fiscal year 2013. Furthermore, a higher number of grant applications were submitted to various funding agencies by DOIM faculty this year. The Research Services Office continues to provide the necessary administrative support to facilitate the grant submission process. While Ms. Elizabeth Fortune, former Associate Administrator for Research, has transitioned to a role in the CCTR, she and Ms. Felicia Harris still facilitate the DOIM grant submission process.

While the DOIM web page showcases the wide spectrum of

research conducted by DOIM faculty, we are in the process of developing a DOIM “Research Newsletter” to summarize the achievements of the DOIM faculty. In addition to effectively communicating the latest research advancements, fostering collaborations between interested faculty members is a major objective of this initiative. Requests for the detailed listing of the research



**Shobha Ghosh, PhD**  
Associate Chair for Research

achievements by the faculty and fellows will be sent to the Department Chairs and Administrators and the success of this effort will greatly depend on timely participation by all Divisions.

To align DOIM research with the increased focus on multiple PI grant applications by the NIH, we are continuing efforts to bring together VCU faculty members with similar or interactive research interests. The **Third DOIM Research Forum** will take place on Wednesday September 24th (3-5 PM, MMRB 1-009) and will combine research expertise from several Departments to discuss

the important role of intestine (e.g., intestinal microbiota and barrier function) in health and disease process. As always, this forum is expected to foster collaborations between clinicians and basic researchers and pave the way for future translational research at DOIM.

**Shobha Ghosh, PhD**

Associate Chair for Research

Professor of Medicine

Division of Pulmonary Disease and Critical Care Medicine

## Welcome to Our New Faculty

**Jawad Al-Khafaji, MD**, has joined the Division of General Internal Medicine. He is joining the faculty after completing his Residency Training at VCU Medical Center.

**Erin Alesi, MD**, has joined the Division of Hematology, Oncology and Palliative Care. She joins after completing her Hematology-Oncology Fellowship Training at VCU Medical Center.

**Steven Bishop, MD**, has joined the Division of General Internal Medicine. He joins after completing his Residency Training and serving as Chief Resident at VCU Medical Center.

**Sosipatros Boikos, MD**, has joined the Division of Hematology, Oncology and Palliative Care. He joins the faculty after completing his Hematology-Oncology Fellowship Training at John Hopkins Hospital in Baltimore, MD.

**Benjamin Chopski, DO**, has joined the Division of General Internal Medicine. He joins the faculty after completing his Residency Training at the Virginia Tech Carilion School of Medicine and Research Institute.

**Oveimar A. De la Cruz, MD**, joins the Division of Infectious Diseases. He is joining the faculty after completing his Infectious Diseases and Transplant Infectious Diseases Fellowship Training at the University of Pittsburgh Medical Center in Pittsburgh, PA.

**Markos Kashiouris, MD, MPH**, has joined the Division of Pulmonary Disease and Critical Care Medicine. He joins

the faculty after completing his Cardiovascular Surgery Critical Care Fellowship Training at John Hopkins Hospital in Baltimore, MD.

**Abhay Khashu, MD**, has joined the Division of General Internal Medicine. He joins the faculty after completing his Residency Training at Akron General Medical Center in Akron, Ohio.

**Roshanak Markley, MD**, has joined the Division of Cardiology. She is joining the faculty after completing her Cardiology Fellowship Training at Vanderbilt University in Nashville, Tennessee.

**Sarika Modi, MD**, has joined the Division of General Internal Medicine. She joins the faculty after completing her Residency Training at VCU Medical Center.

**Ellen Moore, MD**, has joined the Division of Geriatric Medicine. She joins the faculty after completing her Geriatric Medicine Fellowship at VCU.

**Bin Ni, PhD**, has joined the Division of Endocrinology and Metabolism. He comes to VCU from the National Institute of Diabetes & Digestive & Kidney Diseases at the NIH in Bethesda, MD.

**Inna F. Tchoukina, MD**, has joined the Division of Cardiology. She is joining the faculty after completing the Heart Failure and Transplant Fellowship at VCU Medical Center.

## Congratulations to Our Faculty Who Were Recently Promoted

**John Kuemmerle, MD**, of the Division of Gastroenterology, Hepatology, and Nutrition, has been named Chair of the Division of Gastroenterology, Hepatology, and Nutrition.

**Sarah Hartigan, MD**, of the Division of General Internal Medicine, has been appointed the Associate Chair of Quality and Safety.

# VCU Medical Center Honored with National Prize for Quality and Safety

In July, the American Hospital Association awarded VCU Medical Center with its top honor for leadership and innovation in safety and quality improvement – the AHA-McKesson Quest for Quality Prize®. The AHA-McKesson Quest for Quality Prize is the AHA's top honor for leadership and innovation in safety and quality improvement, is presented annually, and is supported by a grant from the McKesson Corporation.

VCU Medical Center was selected as the 2014 recipient of the AHA-McKesson Quest for Quality Prize® in part because of training that resulted in a 50 percent reduction in serious safety hospital events, an electronic early warning system that alerts caregivers in real time of a patient's declining health status and a community clinic that has enhanced care management and care coordination for the sickest, poorest patients.

"We are humbled and honored by this recognition because it affirms that we are among the best of the very best in the nation," said **John Duval, CEO of MCV Hospitals**. "It is because of the dedication and hard work of our more than 10,000 alert and concerned team members that we have had such success in keeping our patients from encountering preventable harm."

**Sheldon Retchin, MD**, CEO of the VCU Health System and Senior Vice President for Health Sciences at VCU, said that to achieve the highest quality, an organization must foster a culture of high reliability across all team members, from the physicians and nurses to the pharmacists and therapists to the environmental care workers.

In 2008, the medical center developed "Safety First, Every Day," a mantra to support the goal of becoming America's safest health system, through reaching zero events of preventable harm to patients, team members and visitors. Since the initiative's inception, more than 12,000 team members have been trained in safe behaviors and error-prevention tools, and the hospital has seen a 50 percent reduction in serious safety events.

In 2012, VCU Medical Center created a customized early warning system that pulls data from more than 650 patients' electronic records to alert providers to potential changes in their conditions. The system empowers the medical center's Rapid Response Team, a team of clinicians who are in the hospital 24/7, to effectively triage and visit the most critically ill patients before their conditions deteriorate.



American Hospital Association–McKesson  
Quest for Quality Prize®

As a part of this medical center wide initiative towards safety, the Department of Internal Medicine has taken a number of steps to ensure quality care for patients. In 2012, the Department created its Quality and Performance Improvement Program in order to pursue clinical and service excellence at a system level. The program is comprised of a Quality Improvement Representative from each of the Department's ten divisions. The group meets monthly to identify opportunities for improvement and review ongoing initiatives.

More recently, in June of 2014, the Department announced that **Dr. Sarah Hartigan** would join the Department's Leadership Team as Associate Chair for Quality and Safety. Dr. Hartigan has been at the forefront of the Department's efforts in providing care safely and has led the Quality and Performance Improvement Program since 2012.

You will find Dr. Hartigan's **Associate Chair Update on Department of Internal Medicine Quality and Safety** in this edition of Progress Notes.

*(Content from this article sourced in part from [VCU Medical Center wins prestigious national top honor for safety and quality](#) from VCU University Affairs.)*

## Congratulations to Residents Recognized with Gold Foundation Humanism and Excellence in Teaching Award

Each year third and fourth year medical students nominate interns and residents they train with for the Arnold P. Gold Foundation Humanism and Excellence in Teaching Award. The award goes to physician instructors that demonstrate compassion with patients, serve as role models for students and colleagues, teach students excellently and effectively, and show respect to patients, students and colleagues alike. The physicians below were recognized for outstanding teaching in 2014:

**Jared Kobulnicky, MD**  
Second Year Resident  
Medical School:  
*VCU Medical Center*  
Post Residency Plans:  
*Hematology–Oncology  
Fellowship Training*



**Peter Meliagros, MD**  
Third Year Resident  
Medical School:  
*VCU Medical School*  
Post Residency Plans:  
*Practice as Hospitalist*



*Please Join Us For The Following Department Sponsored Event:*

### **Third DOIM Research Forum**

## **Role of Intestinal Function in Health and Disease**

Wednesday, September 24th

3:00 - 5:00 PM

Molecular Medicine Research Building (MMRB) 1-009

#### **The following lectures will be presented:**

##### **Mary Ann Peberdy, MD**

*Division of Cardiology, Department of Internal Medicine*

"Effects of Cardiac-Arrest Induced Changes in Intestinal Barrier Function on Systemic Inflammation"

##### **Puneet Puri, MD**

*Division of Gastroenterology, Hepatology, and Nutrition,  
Department of Internal Medicine*

"Effects on Metabolic of GI Diseases"

##### **Phillip Hylemon, PhD**

*Microbiology and Immunology, Department of  
Physiology and Biophysics*

"Gut Bacteria and Metabolism"

##### **Siddhartha S Ghosh, PhD**

*Division of Nephrology, Department of Internal Medicine*

"Effects of Targeted Improvement of Intestinal Barrier Function on Attenuation of Inflammatory Diseases"



# **VCU**

**VIRGINIA COMMONWEALTH UNIVERSITY**

## **Medical Center**

**Thank you for reading.**

For more about the  
**Department of Internal Medicine,**  
please visit us online at:

**[www.intmed.vcu.edu](http://www.intmed.vcu.edu)**