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STAYING ON COURSE
When U.S. News & World Report released their rankings of medical schools and medical school specialties, the U-M Department of Internal Medicine was ranked 6th overall nationally, tying our rank for the last two years. The U-M Medical School moved up to 8th from 10th overall for research medical schools, and remained at 8th overall for primary care medical schools. This continued national recognition reflects our dedication to making U-M the best place for education and training, for clinical care, and for research.

MAKING CONNECTIONS
Our 2012 annual report’s theme is “Making Connections Near and Far” to reflect both the local and global collaborations our department continues to cultivate. These partnerships and networks are allowing us to make groundbreaking new discoveries and provide amazing educational opportunities all with the goal of improving patient care (page 20).

CLINICAL IMPROVEMENTS AND GROWTH
This has also been a year with a strong focus on clinical improvements and growth. We’re in the midst of renovating several of our clinics in Taubman Center (page 70), we recently launched a new electronic medical records system and patient portal (page 56), and planning continues for our new Northville site. We’re starting a new academic Adult Palliative Medicine Program at the U-M Health System that would aim to increase the number of physicians specifically trained for palliative medicine. The program will expand clinical care, education and research opportunities related to adults with chronic debilitating disease and poise the institution as a national leader in the emerging field of palliative care. We will also be launching an Acute Care for the Elderly unit at St. Joseph Mercy Hospital that will be run by faculty from our Geriatric and Palliative Medicine Division.

FACULTY RECOGNITION
This year we created a clinical excellence society in the Department of Internal Medicine (page 7) to acknowledge and recognize our outstanding clinicians. We are the first and only department at UMHS to provide this type of recognition for faculty. I am personally providing the initial funds for the society through my Searle Professorship until we can secure permanent funding.
**NEW APPOINTMENTS**

I am excited to announce that John Ayanian, MD, MPP, has joined our department as an endowed professor in the Division of General Medicine. He comes to U-M from Harvard University and will be the first director of the Institute for Healthcare Policy and Innovation — one of the nation’s powerhouses of health services research, health care policy development and new ideas in health care delivery (page 90).

I am sad to share that James Baker, Jr., MD, stepped down as our Chief of the Division of Allergy and Clinical Immunology on September 1, 2012. He had led the division since 1993, providing a wealth of clinical expertise, research prowess, and a strong commitment to education for the field of allergy. James Baldwin, MD, a clinical associate professor and the director of the allergy fellowship program is currently serving as the interim chief of the division.

The U-M Department of Internal Medicine continues to grow as a leader in the state of Michigan through our steadfast dedication to our research, education, and clinical care missions. Our top national rankings confirm these efforts. As “leaders and best,” we continue to be ahead of the curve in everything we do to meet our patients’ needs. Many of the stories in this year’s report capture how we’re creating environments, cultivating collaborations, implementing structures and conducting research to provide the most effective and efficient patient care.
We experienced continued steady growth of our clinical programs in 2012. Our outpatient facilities in Ann Arbor (Brianwood and Domino’s Farms) and Livonia and Brighton continue to perform well, and our new efforts to establish facilities in the Northville area are now in full development. In addition to this, we have been implementing and exploring several other approaches that will enable us to meet the growing demand for patient care.

NORTHLAKE EXPANSION
The construction of a new $39 million health center in Northville Township, at the intersection of Seven Mile Road and Haggerty Road, near our existing Livonia Center for Specialty Care, is running on schedule. This new facility will include 100,000 square feet of clinical and diagnostic space dedicated to caring for adults and children.

TAUBMAN IMPROVEMENTS
The U-M Health System is investing $20.5 million to renovate, reorganize, and revitalize Taubman center after the outpatient clinics for women, newborns, and children moved to the new C.S. Mott Children’s Hospital and Von Voightlander Women’s Hospital. This shift in clinic space opened up nearly 30,000 square feet of space that is now being transformed to better serve our patients (page 70).

MEDICAL PROCEDURES UNIT RENOVATIONS
The Medical Procedures Unit (MPU) on the 2nd floor of University Hospital that provides endoscopic and procedural interventions in the fields of digestive and pulmonary

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<tr>
<th>Year/Year</th>
<th>Hospital Admissions</th>
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<tr>
<td></td>
<td>Observations Cases</td>
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<tr>
<td>2007/08</td>
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<tr>
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<td>16,320</td>
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2012 Internal Medicine Annual Report
assessment and disease finished major site renovations in 2012. The updated facilities include two new interventional GI rooms, eight additional prep/recovery bays, and the renovation of two existing GI procedure rooms, a locker room, and the MPU business office and waiting room.

**MiChart Implementation**
In August 2012, a new electronic medical records system called MiChart was launched in ambulatory care settings at UMHS (page 56). Once established and fully integrated into our system this new approach is expected to help improve overall efficiency and streamline our workflow.

**Expanded In-Patient Care Options**
A new initiative will allow U-M Health System patients who live on the western side of Washtenaw County to receive inpatient care from a U-M-led team closer to home at Chelsea Community Hospital. This expanded relationship, which is part of the broader UMHS-Trinity Health-Michigan affiliation, allows the two entities to share resources and ensure patients receive care in a location that’s convenient to them.

It is through our continued efforts to grow, improve, collaborate, and innovate that the U-M Department of Internal Medicine continues to provide the best patient care and clinical programs in Michigan and the nation.
The Department of Internal Medicine continues to experience steady growth over the past four academic years. Our clinical faculty continues to grow while our research faculty numbers are stable. The chart below breaks down that growth by year and by faculty type. In total, the department has added 22 net positions during 2012.

**PROMOTING DIVERSITY**

The diversity of Department of Internal Medicine faculty continues to slowly increase. Our efforts to increase diversity continue through several initiatives that develop strategies to recruit the best faculty candidates from all demographic groups.

I am proud to share that one of our internal medicine faculty members dedicated to developing cultural and ethnic diversity at U-M received the 2012 Harold R. Johnson Diversity Service Award from the Office of the Provost and Executive Vice President for Academic Affairs. **Juanita Merchant**, MD, the H. Marvin Pollard Professor of Gastrointestinal Sciences, professor of internal medicine, and molecular and integrative physiology was recognized for her work. She recently chaired the Dean’s Review Committee of the medical school diversity office and policies, and the committee that developed the Health System’s strategic plan for diversity. She is also a member of the Strategies and Tactics for Recruiting to Improve Diversity and Excellence committee that provides faculty workshops on recruiting diverse faculty, and has been a keynote lecturer on faculty diversity at peer institutions.

**EXPANDING CAREER DEVELOPMENT**

The department continues to support the efforts of the U-M Medical School’s new faculty career development website. The site and faculty development programming continues to expand. Each year, there are more workshops and educational programs, as well as mentoring and skill development opportunities available to faculty.
ACKNOWLEDGING
CLINICAL EXCELLENCE

In contrast to research grants and papers, teaching evaluations, and national talks — all of which factor heavily into the academic promotion process — clinical excellence is harder to measure but nonetheless is an essential aspect of academic medicine. Recognition of the many internal medicine faculty who provide outstanding clinical care has been limited. This year, with the strong support of Chair John Carethers, MD and Senior Associate Chair for Clinical Programs, Timothy Laing, MD, the department initiated a clinical excellence society named Academiae Laureati Medici to recognize faculty who, by acclaim of their peers and their patients, provide exemplary clinical care. The inaugural group consists of 23 members (see photo at right). There will be up to 10-12 new members elected annually.

MAKING A GLOBAL IMPACT

This year, our annual report is highlighting the global impact and connections of the Department of Internal Medicine. There’s a huge amount of diversity in what our faculty are doing across the globe. As you will see through the featured stories (page 20), our department faculty have been at the forefront in establishing these connections — connections that are advancing research and improving patient care both near and far.
The VA Ann Arbor Healthcare System continued to experience a significant increase in both outpatient and inpatient activity in 2012. There was a 6 percent increase in total inpatients and an 11 percent increase in outpatient visits. Through numerous on-going initiatives and efforts, we’ve been able to decrease our readmission rates and maintain our lengths of stay for patients this past year.

**FACILITY IMPROVEMENT UPDATES**

These past few years we’ve been making many improvements to our facilities. To improve the situation for short-term stays, an observation unit with eight beds opened in July 2012. A new 28-bed unit is being added to our 6th floor. It is slated to open in summer 2013.

**VA RESEARCHERS AT NCRC**

Last fall, 150 VA health researchers moved into 24,600 square feet of space at the North Campus Research Complex (NCRC) closer to their U-M colleagues, making it easier for all of them to study health issues that affect veterans and non-veterans alike, and to test new ideas for improving care in heart disease, diabetes, mental illness, post-traumatic stress disorder and more. Almost all of the core researchers in the group were from the Ann Arbor VA Center for Clinical Management Research. Many of the VA researchers are also key members of the new Institute for Healthcare Policy and Innovation (page 90), which includes more than 400 researchers from U-M and beyond and is also located at the NCRC.

**VA INITIATIVES**

Our Specialty Care Access Network—Extension of Community Healthcare Outcomes (SCAN-ECHO) program, continues to grow. Directed by Grace Su, MD, a professor within the Division of Gastroenterology, it now leads the nation in the number of patients served. Services have expanded beyond the VA Liver Clinic to include cardiology, nephrology and IBD. There are plans to add rheumatology and endocrinology clinics to the program. Using telehealth video technology, VA primary care providers can evaluate and treat veterans in rural and underserved areas — without the cost and inconvenience of the patient traveling to Ann Arbor.

**DEPARTMENT RECOGNITION**

Full-time VA clinical instructor Avinash Prabhakar, MD, received the Department of Internal Medicine’s 2012 Special Recognition for Contributions to the House Officer Teaching Program. William Barrie, MD, an assistant professor in the Division of General Medicine was among the inaugural 23 inductees into the department’s new Clinical Excellence Society (page 7).
In 2012, the VAAAHS continued to improve our facilities and find innovative ways to meet veteran’s health care needs. Our committed faculty members continued to provide exceptional care while collaborating on exciting new research that is changing the face of health care for all patients.
The current funding climate has had an unprecedented impact on research at U-M. Facing an environment with federal cuts in research funding requires close monitoring of costs and streamlining research activities. This has caused the health system, the medical school, and our department, to find more creative ways to promote the same basic and translational research excellence that is the standard at U-M.

**NCRC COLLABORATION**
The U-M North Campus Research Complex (NCRC) continues to inspire collaboration and expand our basic and translational research programs. Less than three years after the first person moved in, U-M has transformed a vacant former pharmaceutical company campus into a vibrant hub for research—an achievement marked recently with the move of the 2,000th person to the site.

**METABOLIC CENTER**
Most impressive is the success of our faculty in securing highly collaborative federal grants even during difficult NIH funding pay lines. With a $9.1 million core grant from the National Institutes of Health, researchers at the U-M will broaden their ability to improve disease diagnosis through metabolic profiling. The grant has created the Michigan Regional Comprehensive Metabolomics Research Core, one of only three centers in the country that will help researchers examine small molecules called metabolites—to detect changes in cell behavior and organ function. Charles Burant, MD, PhD, director of the Michigan Metabolomics and Obesity Center in the MEND Division, is the principal investigator of the grant.

**MCUBED**
Daniel Couriel, MD, professor in the Division of Hematology/Oncology was notified that his project, “Extracellular Matrix Turnover in Chronic Graft-Versus-Host Disease” was one of 50 selected in the first round of MCubed funding. MCubed is a two-year seed-funding program U-M introduced in 2012 to empower interdisciplinary teams of faculty to pursue new initiatives with major societal impact. The program minimizes the time between idea conception and successful research results by providing immediate startup funds for novel, high-risk and transformative research projects.

As you can see from some of the events of the past year, these growing financial pressures created by the funding environment are encouraging new collaborations, new partnerships, and the pooling of resources that will allow our basic and translational research programs to continue to grow and to make important new discoveries on a global scale.
The North Campus Research Complex, a major hub of research activity and collaboration at U-M, welcomed its 2,000th person in 2012 and continues to grow.
As you will see illustrated in several stories in this year’s report, the Department of Internal Medicine’s clinical research programs continue to grow and make partnerships around the world. Back home at the U-M Health System, we have been finding new ways to support our growing needs and to acknowledge our dedicated faculty.

**MiChart and Clinical Research**

This past year, MiChart, a new electronic medical records system rolled out to all of ambulatory care at the U-M Health System (see page 56). While it may take some time at first to integrate into our workflow, we hope that there will be several benefits for clinical research. First, patients’ status in research studies will be more readily apparent and easier to track. Second, study participant enrollment will be directly reported from the Calendar Review & Analysis Office to MiChart in order to properly allocate charges to patients’ insurance versus study accounts. Third, diagnosis codes and clinical data will now be in a more standardized format that will allow for more granular searches to identify potentially eligible subjects for research. Best Practice Alerts will also notify study teams when a patient meets pre-specified eligibility criteria for a particular study.

**HONORING MENTORS**

In 2012, the Michigan Institute for Clinical & Health Research (MICHR) established the MICHR Distinguished Clinical and Translational Research Mentor Award to recognize the efforts and accomplishments of faculty who demonstrate consistent, high quality research and career mentoring in areas of clinical & translational health and research. Eight awardees were selected from a wide field of highly qualified nominees.

A special award, the 2012 MICHR Lifetime Achievement Award for Mentoring in Clinical and Translational Research, was presented to Professor Emeritus of Internal Medicine David E. Schteingart, MD. Dr. Schteingart was the Director of the K30 clinical training program for many years and has mentored more than 100 people during his long and distinguished career at U-M.

**CLINICAL RESEARCH SUPPORT**

The Internal Medicine Study Coordinator Network was established in 2009 to provide a home for the more than 100 study coordinators who make clinical research in the department possible. In February of 2012 the Study Coordinator Network committee voted to expand the network to include study coordinators from pediatrics. The network was renamed to Internal Medicine Pediatrics Study Coordinator Network. Our 3rd annual network luncheon was held in March with approximately 80 attendees. A progress report from the committee chair was followed by social and networking time and round table discussions on training of study coordinators and streamlining workflow.

We also continue to provide training and resources for Internal Medicine faculty so they can efficiently conduct research studies during these times of tight research funding. The Mentored Clinical Scientists Career Development (MICHR K) award provides two years of protected time for a clinician scientist to focus on training in clinical research and conducting pilot projects that will support...
individual NIH K grant applications. Successful faculty are supported by a combination of funds from MICHR and our department. The faculty lead for this program is Professor Fernando Martinez, MD, from the Division of Pulmonary and Critical Care Medicine.

The Department of Internal Medicine’s clinical research programs continued to grow and evolve during 2012. With the help of ongoing developments at U-M such as our new electronic medical records systems and our extensive global network, we will be able to make discoveries that will transform patient care.

Charles Burant, MD, PhD (left), presents the 2012 MICHR Lifetime Achievement Award for Mentoring in Clinical and Translational Research to David E. Schteingart, MD, Professor Emeritus of Internal Medicine.
Front row (left to right): David Fox, MD (Rheumatology); James Baldwin, MD (Allergy & Clinical Immunology Interim Chief); Peter Arvan, MD, PhD (Metabolism, Endocrinology & Diabetes); Theodore Standiford, MD (Pulmonary & Critical Care Medicine Interim Chief); Kathleen Cooney, MD (Hematology & Oncology); and Chung Owyang, MD (Gastroenterology).

Back row (left to right): Raymond Yung, MB, ChB (Geriatric & Palliative Medicine); Frank Brosius III, MD (Nephrology); Powel Kazanjian, MD (Infectious Diseases); John Carethers, MD (Chair of Internal Medicine); David Pinsky, MD (Cardiovascular Medicine); Eric Fearon, MD, PhD (Molecular Medicine & Genetics); and Laurence McMahon, Jr., MD, MPH (General Medicine).
DEPARTMENT OF INTERNAL MEDICINE CHIEF MEDICAL RESIDENTS

Back row (left to right): Molly J. Horstman, MD; Amneet Sandhu, MD; and John Carethers, MD, Chair of Internal Medicine; Front row (left to right): Jessica L. Tsui, MD; and Samar S. Sheth, MD
The Dr. Jacob P. Deerhake Community Service Award
Megan Wilson, MD

The H. Marvin Pollard Award for Outstanding Teaching of Residents Award
Anthony Courey, MD

The Excellence in Continuity General Internal Medicine Teaching Award
Brent Williams, MD

The John G. Frohna Award for Outstanding Teaching in Medicine-Pediatrics
Pamela Davis, MD

The Jerome W. Conn Award for Excellence in Research
Subramaniam Pennathur, MD

The Paul de Kruif Lifetime Achievement Award
Jeffrey Halter, MD

The Chairman's Award for Outstanding Service to the Department
David Fox, MD

The Richard Judge Award for Excellence in Medical Student Teaching
Thomas O'Connor, MD

Special Recognition for Contributions to the Medical Student Teaching Program Award
Avinash Prabhakar, MD
research
There are many reasons why the Department of Internal Medicine is waist deep in the global health arena. At the broadest level, of course, a world-class department at a world-class university should, by its nature, be engaged with the world. And at the most personal level, individual physicians and researchers have their own motivations: Some stepped into the international arena early, through Peace Corps or study abroad. Others feel a deep connection to health issues in a native country or region. Still others want to take advantage of the kind of comparative studies, global disease sets, and natural experiments that could transform our understanding of disease mechanisms and treatment — and that are only accessible through international collaboration.

Another reason for the department’s heavy involvement is the evolution of the global health field itself. As Senior Associate Dean for Education & Global Initiatives and Professor in the Division of Gastroenterology Joseph Kolars, MD, explains it, the field has stepped increasingly into internal medicine’s terrain. “In the early days, global health meant largely tropical medicine,” he says. “Over time, it moved toward infections of the developing world like TB and HIV. Now the focus also includes health care systems — which is something our health services research group in internal medicine has an international reputation in — as well as on the big burden of chronic disease. Now that people in the developing world are surviving those acute infections and living longer, they’re getting problems we wrestle with here, like heart disease and diabetes, but in a more devastating way. People think of global health as involving under-resourced places where people are starving, yet starvation has taken a back seat to the global problem of obesity. The department is working in every division to bring its expertise to bear on chronic disease locally and worldwide.”

And it’s doing it in a way that is distinctly “Michigan.” In practical terms, this means making available the facilities and expertise that have been attractive to partners around the world, like the large animal transgenic model facility (page 47), high-throughput genetic and metabolomic platforms, bioinformatics capabilities, and expertise in health services research and chronic disease management, just to name a few.

On the philosophical side, it’s employing the same ethos that distinguishes U-M and the medical school at home to make itself a valuable partner abroad — combining intellectual rigor with a strategic investment of resources, all in an environment of collaboration and equity.

A COLLABORATION OF Equals
The collaboration piece, in particular, is paramount. The goal is for every collaboration to be first and foremost a partnership of equals and a true win-win proposition.
“That is why,” says Ojo, “we must come to the global health arena wanting to do something with other places in the world, not for them.”

For us, it means enabling discovery through access to populations with different genetic profiles, behavioral practices, and environmental contexts. It means learning new ways of doing things and exposing trainees to the techniques of global research. It means access to new pools of global health funding. And it means acknowledging that with increased connectivity, global health is our health — after all, diseases can now traverse the globe in less than 24 hours, and insights gleaned in one place can benefit us all.

This requires a specific approach. It means abandoning preconceived notions of what a partner needs and what each side has to offer. It means working explicitly to build trust, rather than assuming it will grow. And it means working to ensure that researchers aren’t just partnering for grant funding but are truly engaging their primary interests. “It involves a lot of listening,” says Associate Professor Akinlolu Ojo, MD, PhD, from the Division of Nephrology, was the idea that global health work meant being “charitable” toward poorer parts of the world. Certainly, an ethos of service is essential in medicine, as CEO of the U-M Health System and Executive Vice President for Medical Affairs Ora Pescovitz, MD, argues in her recent opinion piece in JAMA. It is also an explicit aim of the school’s global education mission (page 76). However, the benefit for both sides must be fully appreciated.

Equally damaging, though perhaps more selflessly intentioned, says Professor Sofia Merajver, MD, PhD, from the Division of Hematology & Oncology, calls the old, “vacuum cleaner model” of global health research. This is where researchers would “show up, suck up all the data, then come back to the States and write a paper,” she says. While effective at building U.S. careers, it did little to benefit our colleagues abroad.

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Professor Michele Heisler, MD, from the Division of General Medicine, “and learning about shared priorities so we can really complement each other.”

The end result, says Kolars, should be collaborations that are “co-owned, co-shaped, and co-led.”

He should know. He was among those who helped the China platform develop its “science of collaboration” core, which aims to identify potential stumbling blocks in international collaboration and specific ways to address them. The lessons learned are being applied to other international partnerships.

This is critical because the potential stumbling blocks are many. There are differences in language, communication styles, facilities, funding, record keeping, information technology, notions of intellectual property, IRB practices, cultural norms on providing biosamples and rules on transporting them, among others.

STRATEGIC TIERS OF ENGAGEMENT

Syncing up on these issues is essential but requires substantial upfront effort. That is why UMMS has taken a strategic approach to partnership building. While it encourages fruitful collaboration around the globe, it ups the ante on individual lab-to-lab collaborations with two additional tiers of engagement. These are areas where groundwork has been laid, and there are ready-made research and training structures to link into.

The first is the Memorandum of Understanding (MOU), which formalizes specially selected institutional relationships. UMMS currently has 21 MOUs in place with institutions in 13 countries, and additional sites are under consideration.

The highest level is the “platform” for collaboration. These have emerged where a critical mass of collaborations exist, where the potential for engagement is broad and deep, and where institutional goals and structures are particularly complementary and well-aligned. This has happened so far in Ghana across multiple sites, in China with the Peking University Health Science Center, and in Brazil with the University of São Paulo Faculty of Medicine. India may be next.

The benefits of these relationships are many. Long-standing collaborations create a foundation of trust and goodwill. Exchange mechanisms for faculty, trainees, and students already exist. Knowing “who’s who” means potential partners and areas of overlap are readily identified. And there’s no need to start from scratch in areas like IRB approval and biosample sharing. In addition, resources have already been committed for things like conferences and pilot grants.

“By building this structure, we create synergism that can attract others and leverage additional funding,” says Kolars, who also directs Global REACH, the medical school initiative that supports these platforms and other global efforts.
**PRODUCING RESULTS**

As this report shows, in 2012 these partnerships logged real progress in making this vision a reality.

In Brazil UMMS was cited as a “most favored partner” by the University of São Paulo Faculty of Medicine. This puts the partnership in a strong position for funding from the State of São Paulo Research Foundation (FAPESP). Professor Gary Hammer, MD, PhD, from the Division of Metabolism, Endocrinology & Diabetes (MEND) and his Brazilian colleagues, for example, have submitted a large grant to FAPESP addressing adrenal cancer. And by combining the DNA samples from their cohorts with those of other international collaborators, they helped make adrenal the first rare cancer to be sequenced by the National Cancer Institute’s Cancer Genome Atlas.

In China, the platform met its enrollment target of 5,000 patients well ahead of schedule, and two initial seed grant recipients have used the partnership infrastructure to submit major NIH-National Science Foundation of China grant applications: Anna Lok, MD, the Alice Lohrman Andrews Research Professor of Gastroenterology, to study predictors of progression from hepatitis C to cirrhosis and liver cancer; and Margaret R. Gyetko, MD, professor in the Division of Pulmonary & Critical Care Medicine and senior associate dean for faculty & faculty development, to investigate the role of the respiratory microbiome in lung disease.

In Ghana, Ojo and his co-PI from the University of Ghana Medical School were awarded a $5.9 million NIH H3Africa grant to build African-based infrastructure and develop an international network to research the genetic underpinnings of kidney disease on the continent. It involves investigators at six sites in North America and 11 institutions in five African countries (Ghana, Ethiopia, Kenya, Nigeria, and South Africa).

Of course, even with these successes, UMMS has never believed that one size fits all. So, while it works hard to leverage the strengths of these platforms, it recognizes that faculty and students have a range of interests.

**DEPARTMENTAL LEADERSHIP**

Global REACH supports this range of interests, as do the departments themselves. In internal medicine, that effort is led by Ojo, who was named the department’s first Global Health Program director. Charged with creating a systematic approach to the department’s global health efforts, he helps members share insights for working abroad and garner funding. He stresses that this is an enhancement to, not a duplicate of, the work done in Global REACH.

He is particularly enthusiastic about a grant mechanism he manages that allows internal medicine researchers to meet and build pilot projects with potential collaborators abroad. This is critical, he says, because funding agencies that support global health require evidence of a productive relationship that has been in place for some time. “We provide resources to develop those relationships so that two to three years down the road when they apply for a grant, they can show what they’ve done together,” he says. “You can’t just say to a granting agency, ‘I know Dr. X in Bulgaria, and we like each other; please give me half a million dollars to work with him.’” That is why the platforms and these formative grant mechanisms are so important.

The pages that follow illustrate how members of the department are using this infrastructure to understand disease and improve human health. Given the numerous international connections maintained by our roughly 700 faculty members, this selection is by no means complete. But it does provide a sense of how the department’s distinctive approach to collaboration can generate real global impact.
The Brazil platform is a deep and productive partnership between the UMMS and the University of São Paulo Faculty of Medicine (FMUSP). While the first MOU was signed in 2010 and reaffirmed during Mary Sue Coleman’s presidential visit in 2012, connections between the institutions go back decades. At least to the 1950s, in fact, when the former Chief of FMUSP’s Endocrinology Division Bernardo Léo Wajchenberg, MD, collaborated at U-M with Professor Emeritus Stefan Fajans, MD, of the MEND Division on the effects of type 1 diabetes drugs.

Since then, numerous other collaborations have taken shape throughout the medical school in areas like fertility/reproductive endocrinology, spinal cord injury, primary care medicine, and a range of internal medicine specialties.

There’s good reason for this. FMUSP is widely considered to be the best medical school in Latin America, with substantial research funding and tremendous patient volume — nearly 10 times that of UMMS. And there are significant areas of overlap. It is, like U-M, an adrenal cancer destination center and a hub of research for the continent. In addition, FMUSP is involved with what Michele Heisler calls “the most exciting primary health care experiment in the world today.” Brazil has been a pioneer in developing a medical home model of universal health care, and FMUSP is now charged with running numerous health centers in the western part of the city. These centers are serving as laboratories for quality improvement and research, which is ideal for Heisler and others who specialize in evaluating health programs.

The strength of the partnership led FMUSP to name UMMS a “most favored partner” last year, putting platform researchers in a strong position for a variety of collaborative grant opportunities, including those through the State of São Paulo Research Foundation (FAPESP).
Gary Hammer, MD, PhD

2012 Internal Medicine Annual Report

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Building Leverage for Rare Disease

Having U-M designated an international destination center of excellence for adrenal cancer is impressive. It reflects the expertise assembled here and the fact that some 20 to 40 percent of all adrenal cancer patients in the country come to U-M for treatment. However, as the results from the Brazil platform show, this doesn’t scratch the surface of internal medicine’s impact on this disease.

In many ways the story begins when former U-M football coach Bo Schembechler’s beloved wife, Millie, was diagnosed with adrenal cancer. He invested heavily in finding a cure, going so far as to create, at U-M, the only endowed professorship for the disease. The position was filled with one of the world’s leading researchers on the subject, Professor Gary Hammer, MD, PhD, of the MEND Division. As he approached this work, he quickly realized one thing: The field was in desperate need of cooperation.

“It was pretty clear that the major players had no idea what the others were doing,” says Hammer, “and we were all doing different things.”

This is a problem in any field, but especially with rare diseases like adrenal cancer. There are only about 600 Americans diagnosed with it each year, and this is typically in late stages where there is little hope of survival past five years.

With so few patients, it’s a challenge to get meaningful genetic data or run meaningful clinical trials. And despite its dire prognosis, the numbers make it hard to attract government funding and drug-company investment.

The only hope was to get researchers around the world working together.

To start the dialogue, Hammer and his colleague and mentor, David (Ed) Schteingart, MD, professor emeritus in the MEND Division, organized the first-ever international adrenal cancer symposium at U-M in 2003.

It turned out to be a watershed event with game-changing consequences: European researchers assembled themselves into a cohesive group, the European Network for the Study of Adrenal Tumors (ENS@T). The first-ever Phase III clinical trial for adrenal cancer got underway. The symposium became a regular event. And Hammer met fellow researcher Ana Claudia Latrònico, MD, chief of endocrinology at FMUSP — and the Brazilian collaboration was born.

The partnership was a natural. Like U-M in the North, FMUSP was a destination center for adrenal cancer in South America. Curiously, this area in Brazil has the highest concentration of adrenal cancer in the world — it is 15 times more prevalent than here — and FMUSP has led the Latin American effort to understand its genetics and biology.
Combining both teams’ strengths has been uniquely productive. There have been numerous faculty, fellow, and student exchanges. They’re developing shared data registries. And their evidence of IGF pathway involvement convinced drug companies to run a $70 million trial with an IGF inhibitor. Based on the results, the groups worked together to identify a second pathway, beta-catenin, that when up-regulated in conjunction with IGF seems to make adrenal cancer particularly virulent. Work on another gene, TCF-21, which is implicated in both adrenal homeostasis and adrenal cancer, has just been co-published by teams led by Hammer and Claudimara Lofti, PhD, from FMUSP.

But perhaps even more exciting is that the partnership, along with other relationships that took shape at the 2003 symposium, led to something unheard of in the rare cancer community: The National Cancer Institute agreed to deep sequence adrenal cancer through The Cancer Genome Atlas (TCGA). “This is going to be transformative in terms of new targets for therapy,” says Hammer, “and it was only possible because we had the cooperation piece nailed. We had Brazil, Australia, ENS@T, and the U.S., and we were able to deliver 100 samples to them within months. That’s leverage.”

They’re now taking their platform for cooperation even further, developing a pan-American version of ENS@T called PANS@T. They’ve applied to FAPESP for an NIH U54-type grant to help coordinate the network and advance their genomic research. Ultimately they plan to link the two networks into a global powerhouse for battling adrenal cancer.

In the meantime, they’re broadening their scope to include other adrenal disease, organogenesis, adrenal stem cells, and steroid production. This will draw other endocrine researchers from both institutions into the platform and further expand its impact.

Gary Hammer is the Millie Schembechler Professor of Adrenal Cancer, director of the Endocrine Oncology Program at the Comprehensive Cancer Center, director of the Center for Organogenesis, and a professor of molecular & integrative physiology and of cell & developmental biology. He acknowledges support from many colleagues in this work. In addition to those mentioned, these include several from the MEND Division: Tom Giordano, MD, PhD; Tobias Else, MD; Richard Auchus, MD, PhD; Bill Rainey, PhD; and Andreas Moraitis, MD.
Imagine the perfect project for a health services researcher with expertise using community health workers to help patients manage chronic disease. How about a national health care system that has incorporated salaried community health workers into its primary care efforts throughout the country? Oh, and the researcher is fluent in Portuguese and has lived and worked in Brazil — exactly where the project is located.

It’s a match made in heaven for Associate Professor Michele Heisler, MD, from the Division of General Medicine, who has devoted her career to figuring out how health care systems can better support adults living with complex, chronic conditions that require a lot of self-management — particularly in resource-poor settings. She’s shown, for example, that community health workers and reciprocal peer support could be used to improve health outcomes for diabetes patients in mostly Latino and African-American communities in southwest Detroit.

So imagine her excitement when, in her role as an associate director and Latin American specialist at Global REACH, she encountered the natural laboratory that is Brazil’s new health care system. “I came into Brazil to help strengthen collaborations overall with the medical school,” she says, “but I realized there was this incredible opportunity for my own research interests.”

This is because Brazil has recently transformed its health care system. It has set up primary health centers throughout the country structured on the medical home model — with teams of a doctor, a nurse, two nursing assistants, and six salaried community health workers allocated to each caseload of patients. “This is exciting,” says Heisler, “because even though I and others have shown that community health workers can be very effective, Brazil is one of the few countries in the world to fully incorporate them into the primary health care system.”

Furthermore, FMUSP was contracted by the city of São Paulo to run eight, and eventually 20, of these health centers in the western part of the city. Called the Western Region Project, it will serve as a laboratory of innovative primary health care programs.

For Heisler, teaming up with colleagues at FMUSP offered a textbook case of synergy. “Those of us from U-M are very interested in training the community health workers and improving their self-management support to patients,” she says. “Among our partners, there’s a lot of interest in evaluating these programs — but health services research in Brazil is not yet well-developed. They know all about randomized, controlled clinical drug trials, but the idea of doing randomized, controlled trials to test a way of delivering primary care is new to them. U-M is a leader in this area.”
She’s formed a collaboration with FMUSP health economist Alexandra Brentani, PhD; FMUSP Pediatrics Professor Sandra Grisi, MD; FMUSP Endocrinology Professor Márcia Nery; and U-M Public Health Professor Ken Resnicow, PhD. In 2012 they launched a pilot project in one health center to test the feasibility and acceptability of a community health worker-led diabetes self-management program. The goal is for health workers to be able to use behavioral counseling techniques to support patients between clinic visits in taking their medications, eating right, exercising, and managing their symptoms.

Based on the pilot findings, Heisler hopes to expand the program to a larger sample of randomized teams and centers. She and her colleagues would then layer in additional health issues, including cardiovascular disease management and early childhood health and nutrition. They’d capitalize on health workers’ use of smartphones to gather patient data by giving them smartphone-based e-health tools. They will also incorporate a longitudinal research component examining health care needs and outcomes among a representative sample of Western Region residents.

“We hope these programs will become a model for other limited-resource settings,” says Heisler, “not just in Brazil or Africa but also in inner-city Detroit and health care systems throughout the U.S.”

Michele Heisler is also an associate professor of health behavior & health education in the School of Public Health and a research scientist at the VA Center for Clinical Management Research.

Heisler and Resnicow have already run “train the trainer” sessions so the Western Region Project staff can train community health workers in behavioral counseling this summer. They’ll also be doing a pre and post mixed-methods evaluation to assess satisfaction with the program, determine whether patients’ clinical measures improve, and refine the intervention.

SALLY CAMPER
Partnering on the Genetics of Short Stature

Sally Camper, PhD, professor in the Division of Molecular Medicine & Genetics, James V. Neel Collegiate Professor of Human Genetics, and chair of the Department of Human Genetics, formed one of her most valuable collaborations just hoping to “give back.”

“I spent a year abroad in college,” she says, “and it totally changed my life. So I decided to become involved in the International Endocrine Scholars Program to help others have this same opportunity.”

During one of the society’s international meetings, she agreed to meet a potential postdoc from Brazil and interview her for a spot in Camper’s lab. Her name was Luciani Carvalho, and she was an MD-PhD working with the short stature clinic at FMUSP. Both women were looking at the genetic basis of severe short stature caused by pituitary dysfunction, and what each brought to the table excited the other.
“Across Brazil, people with severe short stature come to São Paulo for treatment with growth hormone,” says Camper. “So they have a catchment of patients from the entire country, which was exciting to me. Dr. Carvalho had been working to identify genes that cause short stature from these patients. She wanted to learn from my lab how to model these things in mice to study the pathophysiology of disease as well as how to test the function of variants you’d find in people.”

This is important, says Camper, because it’s not always obvious whether a variant found in a person of short stature is one that is tolerated or whether it’s causing the problem. Carvalho spent two years in Camper’s lab, learning to do cell culture assays and work with genetically modified mice.

But this was only the start. They have continued to collaborate on the causes of hypopituitarism in patients and have also begun exploring the role of stem cells in pituitary development and disease. In 2012 Camper won renewal of a longstanding NIH grant based in part on data she’s gathered with Carvalho and other collaborators at the short stature clinic.

They are now turning their attention to next-generation sequencing technology, where Camper feels she can bring additional value. “In Brazil right now, the state of the art analysis is to check plausible disease genes one at a time by single gene tests,” she says. “We’re planning to screen the entire genome. What we expect to find, based on our preliminary data, is examples of gene-gene interactions.”

Initially, the plan is for the Brazilian researchers to identify patients, get informed consent, and carry out treatment, while the DNA sequencing and bioinformatic analysis are done at U-M. However, the goal is to conduct trainings at FMUSP so that bioinformatic analysis can also be done there.

The collaboration is ideal because high-throughput sequencing, bioinformatic analysis, and follow-up functional studies in animals are areas in which FMUSP is eager...
to build capacity. The potential ripple effects of this excite Camper since the techniques can be used to study so many medical problems, from birth defects to cancer.

And, just as importantly, she hopes the results of this research will ultimately help patients answer life-altering questions like the risks to their children and the likely progression of their disease.

**MARC PETERS-GOLDEN**

The ‘Train & Retain’ Model of Pulmonary Research

Perhaps without setting out to, one internal medicine researcher has perfected what could be called a “train and retain” model of collaborative research.

It all began nearly 15 years ago at a professional meeting in Paris. Professor Marc Peters-Golden, MD, from the Division of Pulmonary & Critical Care Medicine, whose research focuses on the role of prostaglandins and leukotrienes in inflammation and immune responses, was giving a lecture when a like-minded researcher approached him about his work. It was Sonia Jancar, PhD, a professor of immunology at FMUSP. She invited him to speak at a meeting in Brazil. He visited her university. He met with her collaborators and students. Soon he was being invited down every couple of years to lecture, teach, and advise. Eventually, he began hosting — first some students, then some postdocs, and before long, an entire collaborative web was formed.

This was a natural fit for Peters-Golden, who has spent much of his career in training and mentoring leadership roles in his division. Brazil makes it easy, he says, because they’re investing vigorously in science — not only in terms of grants, but in supporting young scientists training abroad. “It’s quite feasible for a recently minted Brazilian PhD who wants to do a postdoc abroad to get a year or two of funding from Brazilian research agencies,” he says. “In addition, Brazil has what they call a ‘sandwich program,’ where PhD students can spend a year of their research in a foreign lab.” He’s hosted four sandwich students so far, plus another three postdocs for two to five years each.

The results have been impressive. Not only did the postdocs under his tutelage break new ground in areas such as toll-like receptor signaling and the role of prostaglandin E2 in dampening immune response, they have taken on professorships in Brazil and the U.S. — and are now making plans to send some of their students to Peters-Golden’s lab. He continues to work with his former postdocs on papers and grants.

Looking ahead, he’d like to expand on this model. He’ll continue to host but is eager to send his trainees to Brazil on both the research and clinical sides.

Top: Marc Peters-Golden, MD (center), with a former postdoc, Alexandra Medeiros, PhD (center left), and some of her students at the State University of São Paulo at Araraquara.

Bottom: Dr. Peters-Golden with his first postdoc from Brazil, Claudio Canetti, PhD, now a professor at the Federal University of Rio de Janeiro, overlooking the famous Sugarloaf Mountain in Rio.
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Bringing E-Health to Latin America

One of the most important tools for managing chronic conditions in resource-poor settings, says Professor John Piette, PhD, from the Division of General Medicine, is right in most people’s pockets.

It’s their mobile phones. And this health services researcher is harnessing expertise throughout the department to help some of the Americas’ most underserved populations use their phones to access high-tech, high-quality between-visit care.

“Our department has such strength in chronic disease management,” he says. “We’ve developed interventions with support from the NIH, VA, foundations, and health insurance plans to improve the support of people with conditions such as diabetes and hypertension between face-to-face encounters with their clinicians. Now we’re taking advantage of all that investment in domestic programs to benefit patients abroad.”

One of the interventions Piette is most eager to transfer features regular automated calls to a patient’s cell phone that mimic what he calls “the rich back-and-forth of a normal clinical encounter.” Patients are asked questions about their symptoms, their physiologic health indicators, their medication management, and other dimensions of their self-care, which they answer using their touch-tone keypad.

Based on their responses, three things happen. First, during the call, patients get tailored information addressing any problems they report. Second, if their responses indicate an urgent health problem, their clinical team is automatically alerted. Third, the patient’s chosen friend or family “care partner” can get feedback via email, text message, or automated call on the patient’s status, including what any symptoms mean and how to help the patient manage his or her disease.

It sounds straightforward, but it has drawn on the department’s vast resources in areas like diabetes, cardiovascular medicine, primary care, mobile health, medication management, and behavior-change communication.
The most important aspect of the system is that it works. Piette has been testing the system, starting in 2010 with patients in Honduras and adding sites in Mexico the following year. Using teams of student researchers, he’s done studies showing that the system was not only technically feasible but that patients found the information useful, they better managed their self-care, and their blood pressure and glucose control improved. This was true even among patients with limited education and income.

In 2012, with support from Global REACH, Piette looked to Bolivia to take things further. His team partnered with the Institute for Applied Engineering at the Bolivian Catholic University. “In previous trials, the infrastructure, which was developed at U-M, was also based here using a cloud computing model,” he says. “But we’d found a group with the capacity to say, ‘Yes, you could do it from Michigan, but we’d like you to empower us to manage our own health.’ So, we transferred the whole platform there. This was a huge milestone for sustainability.”

His team will still do testing and help make refinements to the system, but they’re also working hard to bring Bolivian stakeholders to the table, introduce them to the platform, and foster ownership. They held a meeting in September 2012 with health care leaders, providers, and cell phone providers — who by law must serve the social interest and who are ideally positioned to provide technical and financial support.

As if this level of impact on Latin America weren’t enough, in 2012 Piette also chaired a multinational e-health conference in Quito, Ecuador. Joining him were internal medicine colleagues Michele Heisler, Sofia Merajver, and Steven Bernstein, MD, professor from the Division of General Medicine and assistant dean for clinical affairs, along with stakeholders and experts from 15 countries.

Based on his work, Piette was named associate director for e-health within Global REACH. He was also awarded a Fulbright Faculty Scholarship to expand teaching and research capacity in Latin America. And the paper on his trial in Honduras and Mexico was awarded the 2012 paper of the year from the Journal of Telemedicine and e-Health.

John Piette is also a senior research scientist at the VA’s Health Services Research & Development Center of Excellence and the director of the Program on Quality Improvement for Complex Chronic Conditions.
Manuel Valdivieso
Stomach Cancer in Peru — Going Straight to the Source

Clinical Professor Manuel Valdivieso, MD, of the Division of Hematology & Oncology, is from Peru. So when data from a study he’s involved in at six Latin American sites showed 80 percent of the population infected with *Helicobacter pylori*, he knew he had to do something.

“Gastric carcinoma, or stomach cancer, is the most common cancer in Peru,” says Valdivieso. “It’s also the most common cause of death there, which is far different from North America — and it can be caused by *H. pylori*.”

He and colleagues from SWOG (previously the Southwest Oncology Group) had already been working to find the ideal antibiotic regimen to treat these infections and have published the results in *The Lancet* and *JAMA*. But Valdivieso wanted to go further.

So in 2012 he assembled a team with complementary expertise from U-M and Peru to find out where the bacteria were coming from and how they were causing infection. With funding from Global REACH and the Graham Environmental Sustainability Institute, he undertook a 100-patient pilot study using what’s called an “integrated assessment.” It involves key stakeholders from the very beginning to ensure that everyone’s goals are well-aligned, that their needs are incorporated into the project, and that the resulting data are positioned to affect relevant health policy.

For this team, Valdivieso tapped microbial ecologist Chuanwu Xi, PhD, a water quality and treatment expert from the School of Public Health, as well as two Peruvian counterparts: gastroenterologist Alejandro Bussalleu, MD, vice president of academic affairs at the Cayetano Heredia Medical School; and Soledad Osorio, PhD, who directs DIGESA, a water quality and food laboratory for the Ministry of Health in Lima. He is also using U-M medical and public health students to support the research.

“Together, we are looking at the entire chain of how water is prepared and used, from the water treatment plant, to vegetables irrigated in the fields, to patients’ kitchens, all the way to their stomachs,” says Valdivieso.

Bussalleu’s group identifies patients for the study and samples their gastric mucosa. Osorio’s team samples the water and tests its characteristics. The samples are then sent to U-M for DNA analysis to look for correlations between the water and patients’ infections.

“This goes to the heart of the matter,” says Valdivieso. “We’ll learn if the water is the vehicle of infection in Peru, and, if it is, we’ll figure out what to do about it.”

One step they’ve already taken that will greatly enhance the project’s sustainability is helping the water plant and DIGESA choose a PCR platform to test for the bacteria. *H. pylori* is notoriously difficult to culture in water, so PCR is used to look for its DNA.

The Ministry of Health has ordered the machines, and Xi and his students will help with set-up and training.
“In the end, we’ll need to convince the politicians to address anything we find,” says Valdivieso. He’s hoping the integrated assessment will make all the difference.

Manuel Valdivieso, MD (center), Chuanwu Xi, PhD (center right), and their collaborators in Peru led by Alejandro Bussalleu, MD (far left).
Ghana is the medical school’s oldest platform. It was launched more than 20 years ago by Timothy Johnson, MD, chair of the Department of Obstetrics & Gynecology, and now features partnerships with institutions across the country (see map on page 40). Emergency medicine has developed an increasing presence within the platform, and internal medicine has recently used it to catalyze a major pan-African effort to battle kidney disease and build genetics capacity on the continent.

**AKINLOLU OJO**  
Building Africa’s Capacity to Study the Genetics of Kidney Disease

Sometimes in medicine, genes that protect us in one area can be problematic in another. This may be just the case for African-Americans and kidney disease. There is mounting evidence that the very genes that offered their ancestors protection from African sleeping sickness now give this population three to four times more risk than Caucasians for developing kidney failure.

In 2012 he and his co-PI, Dwomoa Adu, MD, from the University of Ghana Medical School, were among the recipients of nine inaugural Human Heredity and Health in Africa Consortium (H3Africa) grants. Funded jointly by the NIH and the Wellcome Trust in the UK, the grants aim to boost genomic research in Africa by developing laboratory infrastructure, biorepositories, and most importantly a cadre of experts in the field.

Their research questions are twofold. “First, we want to know whether the genetic factors we’re seeing in African-Americans are indeed present among Africans,” says Ojo. “Then, if they are, are they present to varying degrees among the different African populations who are actually more genetically diverse than different peoples in the U.S.?”

This information is valuable, he says, because identifying the genetic cause of kidney disease could lead to the development of therapies for both Africans and members of the African diaspora. In fact, Ojo is working on a project that addresses similar issues among Afro-Brazilians in Salvador de Bahia, Brazil.

As valuable as the research questions are, the truly distinctive element of this grant is its approach to developing sustainable genetics research infrastructure within Africa. While U-M and the University of Ghana are the grant’s “coordinating centers,” the overall team spans 11 institutions in five African countries. These include nine teaching hospitals in Ghana, Ethiopia, Kenya, and Nigeria, as well as a bioinformatics component in South Africa. Support will be provided from six sites in North America.

How will the capacity building work? The team will focus on strategic areas of need and impact, while taking deliberate measures to prevent the “brain drain” that is a perennial peril of these efforts.
While U-M and the University of Ghana are the grant’s “coordinating centers,” the overall team spans 11 institutions in five African countries. These include nine teaching hospitals in Ghana, Ethiopia, Kenya, and Nigeria, as well as a bioinformatics component in South Africa.

The first need is training. The bulk of it will be aimed at two levels: PhD research scientists and lab technicians. They are already among Africa’s best, says Ojo. Most of the scientists were trained in the West and have strong nephrology research skills; what they need is the genomics piece. Ojo has recruited key U-M colleagues to support both the analytical and training efforts (see postscript).

“We will be training PhD research scientists in genetics at U-M with support from the medical school and Rackham at no cost to the project,” says Ojo. “This type of support was critical to the NIH’s decision to award the H3Africa grant to us. These investigators will return to be African-based scientists, doing genetic analysis in the labs we are building as part of this project. In the end, what we hope to accomplish is to have experts in Africa who are able to ask appropriate, relevant biomedical research questions and answer those questions with the infrastructure in Africa.”

There will be occasions where, because of the need for specialized equipment or expertise, some questions cannot be answered locally. In these cases, the project will avail itself of its collaborative infrastructure.

For example, the equipment being shipped to Africa includes systems capable of doing single nucleotide polymorphism (SNP) genotyping — a foundational form of genetic analysis. The equipment is relatively inexpensive and rugged in harsh environmental conditions. Thus, these types of analyses will routinely take place in Africa. However, whole exome sequencing, which requires extremely sensitive, costly equipment, will be done in North America.

The project is taking great care to train participants on the very equipment they will encounter when they return to Africa. The technicians, for example, will learn in a lab created by U-M geneticist David Burke, PhD, that will be identical to what they will be using at home so that when they return, there will be no disconnect.

“One of the issues that leads to people not being able to stay in sub-Saharan Africa...
when they train in the West," says Ojo, “is that they learn on systems that are sophisticated, highly organized, and highly productive. If they cannot duplicate that in the African setting, it leads to a lack of satisfaction and professional frustration.”

The project is addressing other barriers to remaining on the continent, as well. They are training a critical mass of researchers and fostering their identity as a scientific community. They have ensured that their research questions are those most relevant to health issues in sub-Saharan Africa. They are also providing pilot grants within the project to enable trainees to launch their own research programs.

Though only announced in 2012, the project has already made important progress. The team held a three-day meeting in Accra, Ghana, to finalize the research protocol and introduce it to the clinical centers. They’ve begun enrolling the study’s 8,000 patients. And they’re poised to bring the first lab technicians to U-M this summer.

Ojo, who is from Nigeria himself, says he’s proud of the grant and grateful for the opportunities it will provide. “I feel privileged to work with these investigators from the various African countries,” he says. “They are the most committed, the most passionate about kidney disease and its ravages there, and want to do everything possible to understand and prevent kidney failure in Africa and beyond.”

Among Ojo’s U-M collaborators who will provide statistical and training support as part of this grant are: Matthias Kretzler, MD (nephrology); Frank Brosius, MD (nephrology); Daniel Clauw, MD, (rheumatology); David Burke, PhD (human genetics); and Michael Boehnke, PhD (biostatistics).

Akinlolu Ojo, MD (back row, far left), with investigators and research staff from various H3Africa clinical sites in Ghana, Ethiopia, Kenya and Nigeria during the H3Africa Kidney Disease Research Network First Annual Investigators Meeting in Accra, Ghana.
Sofia Merajver
Multidimensional Research in Aggressive Breast Cancer

Professor Sofia Merajver, MD, PhD, from the Division of Hematology & Oncology, started her battle against cancer early. She was only 15 when she read in the newspaper about a clinical trial for lung cancer near her home in Buenos Aires, Argentina — and she was determined to get help for her father. She traveled to the trial site, knocked on the door, and persuaded the researchers to donate the treatment.

Though she’ll never know if it gave him additional time, the experience impressed her deeply. “It got me interested in understanding cancer from a molecular standpoint,” she says. “I wanted to know why cancer kills so quickly and how the drugs worked. But I also became very interested in how to create health systems where there are no inequities; I wanted to learn how to bring good cancer care to the bottom billion.”

Those dual interests became the themes of her career. Merajver got her start in global health working with former U-M epidemiologist Amr Soliman, MD, PhD, in Africa and the Middle East. The research model they developed still guides her work today. While looking into why inflammatory breast cancer was so common in an area outside Cairo, Egypt, she was struck by how late it was being diagnosed, despite the availability of care. Stakeholders posited many reasons, but being a scientist, Merajver wanted data. So she tapped what she calls the “agents of synergy” — her students.

“We decided to use student projects as a tool to work with local professors, doctors, and nurses and teach how to research the questions of importance to them in their environment,” she says, “in this case, why women were coming in late.” She sent these student teams to clinics and mosques to speak in depth with both genders. They quickly struck a problem: Whenever people saw a breast cancer patient go to the hospital, she died. “So we launched an educational program to help break the chain of belief that there was no help in the hospital,” she says.

Merajver was overwhelmed by what ensued. Over a seven-year period, the number of breast cancers diagnosed in the late stages were halved, and those diagnosed at stages I and II doubled.

She is using this same approach in the Ghana platform today. With funding from the Breast Cancer Research Foundation, she’s working with U-M surgical oncologist Lisa Newman, MD, Ghanaian graduate student Evelyn Jiagge, MD, and Ghanaian partners to compare the molecular genetics of aggressive breast cancer in African-Americans with populations in Ghana and Tanzania. Because African-Americans often have as little as 30 percent African heritage, the team hypothesizes that the genetic pathways of their tumors can vary significantly from those of pure Africans.

“We suspect there are specific metastasis-associated genes, which we studied in our laboratory, called Rho proteins that may make the African tumors more aggressive,” she says. “Ultimately, I would like to get breast cancer diagnosed earlier in Ghana.
Over a seven-year period, the number of breast cancers diagnosed in the late stages were halved, and those diagnosed at stages I and II doubled.

To further this effort, she’s been advocating for a cancer registry in West Africa that would provide incidence data by cancer type. And in 2012 she deployed student teams to explore how traditional healers — who are used by 90 percent of the population — might be engaged to help diagnose cancer earlier.

Early diagnosis has been a challenge with the shortage of specialists in Ghana; there are only five oncologists for 25 million people, says Merajver. But she believes that by leveraging traditional healers and mobile technologies like cell phones, email, and social networks, she can connect people with information, teach them how to do breast exams, and diagnose cancer sooner.

Merajver was honored in 2011 for this work by Delta Airlines and the Breast Cancer Research Foundation, and has recently received a MICHr Distinguished Mentor Award. She also served her fellow global researchers and students as director of U-M’s Center for Global Health from 2010 to 2012.

Sofia Merajver is also a professor of epidemiology at the School of Public Health, the scientific director of the Breast Oncology Program, and the director of the Breast and Ovarian Cancer Risk Evaluation Program at the Comprehensive Cancer Center.
2012 found the China platform thriving. Despite being only two years into the U-M Health System’s Joint Institute (JI) with Peking University Health Science Center (PUHSC), researchers found themselves ahead of schedule in reaching key milestones.

The first was enrolling more than 5,000 patients in JI studies. Another was having two of the most mature seed grant projects leverage their research infrastructure for major NIH-National Science Foundation of China grant applications (see table below). One of these, the COPD microbiome project, has also generated interest at the National Heart, Lung, and Blood Institute (NHLBI) in extending the collaboration. The NHLBI has funded a COPD microbiome supplement grant with Professor Margaret R. Gyetko, MD, from the Division of Pulmonary & Critical Care Medicine, as PI and with U-M as the sequencing core and the clinical and data coordinating center. Participating international sites include PUHSC, Nepal, Bangladesh and Peru. Funding is through the United Health and NHLBI Collaborating Centers of Excellence, and is part of the NHLBI Global Health Initiative.

Among the projects that are in the early stages of receiving their funding, there was still important progress to report. Elizabeth Speliotes, MD, PhD, assistant professor in the Division of Gastroenterology and in the Department of Computational Medicine & Bioinformatics, for example, has completed a pilot nutrition study in Pinggu, China, which is allowing her team to develop a customized survey instrument that can be used to inform gene-environment interactions. One of the most important aspects of this, she says, was learning about cross-cultural collaboration. “Our work so far has helped us to understand how to do research in China, and...”

### University of Michigan Health System — Peking University Health Science Center

#### Current Translational and Clinical Research Projects

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*Projects that have leveraged their research infrastructure for NIH-National Science Foundation of China grant applications.
how to communicate, how to address cultural differences in sample collection, and what is feasible and tractable," she says.

Another key piece of foundational work was training. “We’re training all kinds of people from Peking University,” says Eugene Chen, MD, PhD, Frederick G. L. Huetwell Professor of Cardiovascular Medicine and co-lead of the JI’s Cardiovascular Program. “We’ve brought them here for anywhere from a month to a year, or we’ve gone there. We’ve done scientific training and training in IRB standards and patient recruitment. We’re working hard to make sure we’re all on the same standards.”

In November 2012, the JI held its Second Annual Symposium in Ann Arbor, which included a special all-day forum on diabetes research. Shortly after, the JI issued a call for proposals for another round of seed grants. A number of proposals were submitted by internal medicine researchers representing a range of topics. From the Division of Cardiovascular Medicine, José Jalife, MD, the Cyrus and Jane Farrehi Professor of Cardiovascular Research, proposes to study the molecular mechanisms of the progression from paroxysmal to persistent atrial fibrillation. Also from cardiovascular medicine, Assistant Professor Elizabeth Jackson, MD, is interested in probing the association between hot flashes/night sweats and cardiovascular risk in menopausal women. From the Division of Nephrology, Matthias Kretzler, MD, the Warner-Lambert/Parke-Davis Professor of Medicine, has dual aims. He hopes both to find non-invasive molecular markers that will distinguish patients at high risk for progression to end-stage renal disease and also to identify potential drug targets. These, along with Robert Brook’s project (highlighted below), are just a sampling of the projects proposed for the next round of JI funding.

ROBERT BROOK
Drilling Down on Air Pollution’s Cardiovascular Impact
Most of us are well-aware of China’s struggle with air pollution. We’re also aware of what a problem it can be for those with asthma, COPD, and other respiratory ailments. But what might surprise most of us, says Robert D. Brook, MD, associate professor in the Division of Cardiovascular Medicine, is that there is 20 years’ worth of evidence that — even at the relatively low levels we have here in the U.S. — the air pollution-related risk of dying from cardiovascular disease is as great if not greater than it is for pulmonary disease.

Brook has been a leader in helping to discover why this is so. “There was a lot of skepticism in the early days as to whether this could be biologically plausible,” he says. “Second-hand smoke provides 10 to 100 times higher doses of inhaled particles than a typical urban outdoor environment — and active smoking, 1,000 to 5,000 times higher. So the thinking was that if there truly were a cardiovascular association with these comparatively low levels of air pollution, it would stand to reason that every time someone took a puff of a cigarette, they would die.”

But the epidemiological evidence continued to grow. What was needed was someone with
Robert D. Brook, MD, cardiovascular expertise to study the mechanisms by which air pollution could cause disease. This is where Brook stepped in.

His group conducted a series of controlled, double-blind experiments where subjects were exposed to both filtered and polluted air. The pollution caused a host of cardiovascular effects in healthy people—among them, impaired blood vessel function, increased blood pressure, changes in blood coagulation, and markers of increased inflammation. Long-term studies he’s done since have corroborated these findings and confirmed the relationship with atherosclerosis and other signs of heart disease. While not life-threatening in healthy people, these changes could play a role in triggering arrhythmia, heart failure, heart attack, and stroke among susceptible individuals. Even if the risk is small for a single person, the public health impact can be significant given the number of people affected by air pollution every day.

Given what he knows about air pollution and cardiovascular risk, it was only natural for Brook to turn his attention to China. Air pollution there is roughly 10 times U.S. levels and is the fourth leading contributor to death (it’s fourteenth in North America). With a billion people affected, the potential public health consequences are staggering.

Brook already has an NIH grant in Beijing with colleagues from the U.S. and the Peking Union Medical College Hospital. They’re studying the cardiovascular effects of exposure to fine particulate matter and black carbon in Chinese metabolic syndrome patients.

He’s applied for JI funding to add a critical piece to the puzzle: how air pollution can distort the function of HDL, high-density or “good” cholesterol. Its normal function is atheroprotective, shuttling cholesterol from cells to be broken down by the liver. However, Brook wants to test recent animal and basic science data that air pollutants can turn HDL “dysfunctional,” converting it from protective to pro-inflammatory.

He’s proposed to link this question into an ongoing study by collaborators at Peking University on the cardiovascular effects of air pollution in China. By comparing these results to those from Brook’s U.S. studies, they’ll be able to see these effects across the worldwide spectrum of air pollution, from one of the top five to 10 cleanest countries in the world to one of the top five most polluted.

This is critical, says Brook, and gets to the heart of the early skeptics’ arguments. Cardiovascular effects don’t increase in a direct line with air pollution; clearly, there’s blunting at higher levels. The key is figuring out where along the curve we can realize real improvements to public health. “It’s important to see what reductions in particulate matter will translate into substantial population health benefits,” says Brook. “Will it happen going from 150 micrograms per cubic meter to 100, to 80, or do we need to go all the way down to North American levels of 10-15 to see health benefits? This is tremendously important if we’re talking hundreds of millions of people, and these questions can only be answered in places like China.”

Brook’s collaborators from U-M include: Subramaniam Pennathur, MBBS (nephrology); Eugene Chen, MD, PhD (cardiovascular medicine); Masako Morishita, PhD, and Lu Wang, PhD (public health). From Peking University, they are: Jianping Li, MD; Wei Huang, PhD; and Lemin Zheng, MD.
While the Ji is a centerpiece of the medical school's work in Asia, there are numerous high-value collaborations throughout the continent, some lasting decades, others that were just being formed as of 2012. Here are three of these emerging stories.

With a grant from the department’s Global Health Program, William (Rick) Weitzel, MD, clinical professor from the Division of Nephrology, traveled to China to explore potential partnerships in elasticity imaging. Weitzel is interested in using this ultrasound technique in vascular and kidney diseases to discriminate healthy from diseased tissue based on its elasticity/viscosity. He met with potential collaborators in Beijing, Dalian, and Chongqing, sharing his lab’s recent advances and observing their progress in using the measurement of shear waves to assess tissue health.

He sees tremendous potential in working together to move these diagnostic tools into clinical research. “Our group has developed advanced ultrasound signal processing methods in areas like strain and elasticity measurement,” he says. “The Chinese have an extensive ultrasound research infrastructure and clinical delivery system, streamlining their ability to introduce new diagnostic methods into clinical practice.”

Thanks to groundwork laid in 2012, UMMS has just signed a formal partnership agreement with Shandong University. Leading the effort on the U-M side are Nathan Qi, MD, PhD, research assistant professor in the MEND Division and co-director of the Animal Phenotyping Core of the Michigan Nutrition and Obesity Research Center, and Charles Burant, MD, PhD, the Dr. Robert C. and Veronica Atkins Professor of Metabolism and director of the Michigan Metabolomics and Obesity Center.

Qi is a graduate of Shandong’s medical school and has built on his relationships there to foster this agreement for exchanges and joint research. Among the proposed projects is a first-of-its-kind comparative study on the genetics of oxidative capacity. “One of the best predictors of how long you’re going to live and what your overall health will be is how far you can run on a treadmill — your oxidative capacity,” says Burant. “We’d like to be able to compare the European populations we’re studying here with a...
population in China to figure out the relationships among genes, diet, oxidative capacity, the metabolome, and disease risk.”

This project takes advantage of Shandong’s ability to rapidly recruit and phenotype large numbers of study participants and its willingness to invest in DNA sequencing technology. For its part, Shandong has expressed interest in various U-M offerings, like high-throughput molecular phenotyping, animal research facilities, expertise in systems-level analysis, and customized Illumina gene chips enriched with Asian variants.

Qi says the collaboration builds on mutual interests and overlapping strengths, and is a valuable complement to work being done in Beijing through the JI.

Beyond China, Rodica Pop-Busui, MD, PhD, associate professor in the MEND Division and co-director of the Michigan Peripheral Neuropathy Center, is working with researchers at the Korea University in Seoul on a unique study of the development of diabetes complications. The original study was designed to explore the health impact as North Korean refugees adopt the South’s more Westernized lifestyle — a lifestyle that has increased South Korea’s diabetic prevalence sevenfold during the past 30 years and brought its prevalence of metabolic syndrome to U.S. levels.

Pop-Busui has partnered with a Korean endocrinologist to expand the study by phenotyping matched cohorts of South Koreans and North Korean refugees, adding evaluations for diabetic peripheral neuropathy and cardiovascular autonomic neuropathy. Diabetic patients with the latter can develop myocardial dysfunction and cardiac failure independent of traditional cardiovascular risk factors. This is Pop-Busui’s specialty, and she is eager to bring this dimension to the research, while accessing this unique natural experiment in the development of diabetes complications.

U-M’S LARGE-ANIMAL RESEARCH FACILITY:
A Product of and a Draw for International Collaboration
U-M has tremendous expertise in large-animal research, and this is both a product of and an attraction for international collaborators.

“How now that scientists can do so much on a molecular level, many started thinking that large-animal research was obsolete,” says Joe Kolars. “Eugene Chen has shown that this is not true, and he’s heading a major large-animal unit that can answer some very unique questions that other people can’t because they’ve gotten out of the large-animal business.”

Chen says he started this effort as a result of his frustration over the past 20 years in using mouse models to study cardiovascular disease. “For my research,” he says, “there is a huge gap between mouse models and human disease. This has really limited cardiovascular drug development.” So at the end of 2012, he began working with others in the department and medical school to develop transgenic and knock-out rabbits and pigs — animals whose cardiovascular systems are much closer to humans.

“The technology behind this has been developed by six groups from four different countries,” says Chen. “It’s been a 10-year effort among Japan, China, Taiwan and various U.S. institutions.”

Chen serves as director for UMMS’ new large-animal facility, called the Center for Advanced Models for Translational Sciences and Therapeutics (CAMTraST). It has just come online through support from the school and department. Plans are that it will be available first for U-M projects, then more broadly for U.S. academic use, pharmaceutical development, and global research.

“This center is very attractive to our global partners,” says Kolars. “Many are eager to use it and to learn how to set up these labs themselves.”
DEAN BRENNER
In on the Ground Floor of Cancer Research in India

For someone interested in identifying anti-cancer compounds, India, with its tradition of Ayurvedic medicine, is fertile ground for research. That is what first attracted Dean Brenner, MD, Kutsche Family Professor in the Division Hematology & Oncology, professor of pharmacology, and a staff physician at the Ann Arbor VA Medical Center, to the country in 2007.

He collaborated with a group in Allahabad on a study using a synthetic form of curcumin, derived from the Indian spice turmeric, as an anti-cancer agent. A few years later, the NIH’s National Cancer Institute approached him about developing a broad-scale cancer prevention program in India, and he hit the ground running.

He began by helping to organize a workshop in Bangalore that brought together more than 90 researchers from the U.S., Europe, Israel, and India. This sparked a series of relationships between Brenner and key Indian colleagues. These have deepened over the past few years to the point that Brenner now finds himself on the “ground floor” as AIIMS expands from its base in New Delhi to include six new satellites, among them a site in Bhopal with which he’s been working closely.

A veteran of international collaboration with a 20-year partnership at the Cancer Control Center at Carmel Medical Center and a 10-year partnership at the Weizmann Institute in Israel, Brenner was quick to see what each side could bring to the table.

“I’d like to swap data,” says Brenner. “They have a genetic profile that’s different from what we have in North America, and I want to be able to compare cancer preventive interventions here and there. I’m also interested in Ayurveda — their products and insights.”

His colleagues have needs of their own. “They want my expertise in developing these things pharmacologically in people and animal models,” he says. “They want to learn how to define components for cancer prevention and identify biomarkers to select winners and throw out the losers. They also want my program-building skills.”

To foster the relationship, Brenner gave AIIMS/Bhopal’s very first seminar in September 2012, when, he says, “the buildings weren’t even complete.” He and his colleagues have also submitted a proposal to work together on tobacco-related neoplasms. He hopes the collaboration will move forward because, he says, India is investing heavily in health care and technology, and both sides have much to gain.
Supporting Epidemiological and Health Services Research

Newer to the realm of research collaborations in India is Professor Rajiv Saran, MD, from the Division of Nephrology. Motivated to support the country that provided his own medical training, Saran made use of an internal medicine global health grant to visit five medical schools and the newly established Public Health Foundation of India in search of collaborations to which he could add value.

The first opportunity came from his alma mater, the Jawaharlal Institute of Postgraduate Medical Education & Research (JIPMER), Pondicherry, where he was the keynote speaker on World Kidney Day in 2012. Here Saran met Sreejith Parmeswaran, MBBS, a dynamic, young nephrologist, who sought his advice regarding the large number of patients presenting at the institution’s ER with severe hypokalemic paralysis (paralysis caused by low potassium levels in the blood). Suspecting he was only seeing the tip of an iceberg, Parmeswaran collected data on these patients but was eager to work with Saran to develop a broader epidemiological study. As associate director of U-M’s Kidney Epidemiology and Cost Center, Saran was able to bring a U-M biostatistician and epidemiologist to the project. The team quickly analyzed the data and presented their findings at the 2012 American Society of Nephrology meeting. They now hope to look in the surrounding community to determine how prevalent the problem is and why so many patients are presenting with low blood potassium.

Another partnership has developed with AIIMS/New Delhi, which Saran visited twice in 2012. He met with the chief of nephrology to discuss how they might work together to develop data systems for kidney disease surveillance in India. He also visited their trauma center, where he was intrigued to find them using an open-source electronic health record system with which Saran is very familiar. “There is great potential here,” he says. “We are extremely well-positioned to help our partners at AIIMS take a tool they’re now using for clinical applications and expand it for both quality improvement and health services research.” Saran has since assembled a team of U-M experts who will work with the trauma center to further develop its IT infrastructure and research enterprise to accomplish this. They hope the system can then be expanded to other trauma centers, specialties, and institutions.

Saran is now exploring both traditional and non-traditional funding mechanisms to support these potentially transformative projects.

**NEXT STEPS**

Will India be the next platform? Only time will tell. But its value as a collaborative partner is why Professor Gary Hammer, MD, PhD, from the MEND Division, was invited to develop a relationship with the King Edward Memorial Hospital in Mumbai as an Endocrine Society Ambassador. It’s also why it was chosen as the site of Mary Sue Coleman’s 2013 presidential visit, which is scheduled for November.
Europe and the Middle East
MATTHIAS KRETZLER
Making Breakthroughs in Kidney Disease through Global Cooperation

Professor Matthias Kretzler, MD, from the Division of Nephrology, is known for bringing people together. He’s spent his career fostering networks of research centers that cooperate around the world to define the molecular mechanisms of kidney disease.

In 2012 this work produced a major breakthrough — the first-ever clinical trial of a drug targeting a specific inflammatory pathway in diabetic kidney failure. “It’s the first new therapy evaluated in diabetic kidney disease in 20 years,” he says.

And it’s all a product of international collaboration.

The story began in Munich, 1998, where Kretzler co-launched a pan-European network dedicated to unraveling the mechanisms of chronic kidney disease. The European Renal cDNA Bank (ERCB) included 24 sites across Europe that developed a joint protocol and began collecting biopsies for molecular gene expression analysis.

When Kretzler left Germany for U-M in 2005, he not only maintained his relationship with the ERCB, he teamed up with Crystal Gadegbeku, MD, then an assistant professor in the Division of Nephrology, to establish a sister platform out of U-M’s O’Brien Kidney Research Center. The NIH-funded Clinical Phenotyping and Resource Biobank Core (C-PROBE) is a collaboration among U-M and four other university/research partners that extends the ERCB protocol and provides a matching North American cohort.

U-M serves as both networks’ hub for system-level sample analysis. So it was that by comparing samples from European patients with diabetic kidney disease and a cohort of Native American patients with earlier-stage disease, Kretzler and his colleagues identified a new therapeutic target. Follow-up mouse studies conducted by Nephrology Division Chief Frank Brosius, MD, confirmed that increased activation of the JAK/STAT signaling pathway in diabetes was a primary cause of kidney scarring and dysfunction. The group published their data in the journal Diabetes, and Eli Lilly responded. They already had a compound against JAKII in clinical trials for other conditions. In a mere 15 months, they repurposed it and began enrolling patients in a Phase II clinical trial for diabetic kidney disease. The trial should be fully enrolled by the end of this year.

Kretzler hopes this work will have major implications for the world’s 350 million diabetics, a significant portion of whom will go on to develop kidney disease. The global impact of an effective new treatment could be game-changing.

Translational Nephrology Core
Front row (left to right): Chrysta Lienczewski, MD; Tennille Leak-Johnson, MD; Alexandra Klim, MD; Celine Berthier, MD; Middle row (left to right): Jeni Chapman, MD; Wenjun Ju, MD; Stephanie Wylie, MD; Colleen Kincaid-Beal, MD; Viji Nair, MD; Denise Taylor-Moon, MD; Soumya Pochiraju, MD; Sunitha Kogenaru, MD; Back row (left to right): Jennifer Hawkins, MD; Barbara Mirel, MD; Kyle Spotts, MD; Tyler Schlientz, MD; Sha’haan Smith, MD; Kollin Jensen, MD; Matthias Kretzler, MD; Sebastian Martini, MD; Claudiu Komorowsky, MD; Felix Eichinger, MD; Matt Sampson, MD; Not shown: Jeff Hodgin, MD and Ann Randolph, MD
Kretzler has recently brought this winning approach to rare kidney disease, where a coordinated protocol and the pooling of patient samples and data are especially important. In 2009 he received funding from the NIH Office of Rare Disease Research to establish the North American Nephrotic Syndrome Study Network (NEPTUNE). It includes a patient registry, researchers at 20 participating institutions, and a clinical cohort of more than 400 patients.

Kretzler has since expanded this effort, working with colleagues to catalyze similar networks in Europe (EURenOmics), China (through the University of Nanjing), and sub-Saharan Africa (through the H3Africa project — page 37). U-M is the systems biology core for all these efforts.

When asked how he managed this, Kretzler replies, “Because it’s Michigan. We came here because this place is incredibly collaborative. We were able to establish a multi-disciplinary team not only across four continents but also across four schools here. The scientists in the team are highly dedicated to working together to serve the research community. By tying in expertise from the medical school, statistics, public health, and engineering, we developed a systems biology platform and data mining enterprise that allows researchers around the world to link into these data sets and learn what relevant knowledge about disease can be extracted from them.”

Matthias Kretzler is the Warner-Lambert/Parke-Davis Professor of Medicine and a research professor of computational medicine & bioinformatics. He acknowledges support from his entire team and numerous colleagues in this work.

DAVID PINSKY

The Gift of U.S.-Israel Collaboration

With few exceptions, most of the collaborations featured in this article got their start as grassroots efforts of individual U-M researchers connecting with colleagues abroad. While such relationships have long been in place in Israel, what’s unique about this bilateral partnership is how it was quickly propelled to the next level.

“It started with a gift,” says David J. Pinsky, MD, chief of the Division of Cardiovascular Medicine, “a wonderful philanthropic gift — I would call it visionary. D. Dan and Betty Kahn provided resources for two institutions they were very fond of to work together on cardiovascular research.” These were U-M and the Technion — Israel Institute of Technology.

While the seeds of collaboration were scattered here and there, this gift formalized the relationship. Pinsky considers it visionary because of the institutions’ synergistic potential. “U-M is one of the world’s great public universities,” he says. “We not only have outstanding individual programs, but we are unmatched in team-based science. Technion is a marvelous example of Israeli science and entrepreneurialism. Israelis are really good at taking ideas and turning them into things that can help people. They invent technologies; they turn chemicals into drugs. Per capita, Israel has the most start-up companies in the world. There is a lot we can learn from each other.”

Pinsky agreed to lead the Kahn Initiative on the U-M side, along with Professor Michael Aviram, PhD, at Technion. In its first year, researchers from both universities met at a symposium in Ann Arbor. They explored overlap, formed relationships, and discussed research and clinical exchanges. The initiative awarded a first round of collaborative grants with co-PIs from each site. The first two recipients at...
U-M were arrhythmia researchers: Omer Berenfeld, PhD, associate professor in the Division of Cardiovascular Medicine and the Department of Biomedical Engineering, who’s examining the role of activating transcription factor 3 in atrial remodeling and fibrillation, and Jérôme Kalifa, MD, PhD, assistant professor in the Division of Cardiovascular Medicine.

Kalifa’s project exemplifies the synergy Pinsky envisioned for the collaboration. It combines a gene Kalifa studied in his laboratory that affects atrial fibrillation with ultrasound technology developed by his Israeli collaborator that can deliver the gene into heart tissue. “It’s marvelous,” says Pinsky. “His gene and her delivery tool together create this completely original way to address arrhythmia.”

While these early activities were exciting, Pinsky soon realized the relationship could go further. He joined forces with Alan Saltiel, PhD, the Mary Sue Coleman Director of the U-M Life Sciences Institute and professor in the Division of Molecular Medicine & Genetics and the Department of Molecular & Integrative Physiology, to tie into U-M’s affiliation with the Weizmann Institute, a graduate-level science university in Israel.

Rebranded the UM-Israel Partnership for Research, the new collaboration goes beyond the cardiovascular program, beyond the Life Sciences Institute, to become a U-M-wide biomedicine venture, says Pinsky. Technion and Weizmann are still the leading collaborators, but it may grow to include others.

Under the new umbrella, a second symposium was hosted in late 2012, in Haifa, Israel. Themed “Electricity and Sugar in the Heart,” it included a number of internal medicine researchers in arrhythmia, diabetes, and related areas. The partnership awarded an additional two grants, again to pairs of co-PIs from the U-M and Technion. On the U-M side, these included Associate Professor Daniel Michele, PhD, from the Division of Molecular Medicine & Genetics and the Department of Molecular & Integrative Physiology, and Assistant Professor Santhi Ganesh, MD, from the Division of Cardiovascular Medicine and the Department of Human Genetics. They are working with their Israeli collaborators to test genetic mutations in patient-specific cell lines: Michele, to determine how the dystrophin-glycoprotein complex affects the heart in muscular dystrophy patients; and Ganesh, to examine the role of collagen in abnormal development of artery walls, which can lead to narrowing, aneurysms, and tears.

Pinsky is quick to point out that while the original gift is what initiated the partnership, other donors have jumped on board and helped the program thrive. He is eager to further the collaboration and is working with Saltiel to plan the 2013 symposium, which will coincide with a football game. “If we can bring them to the Big House,” he says, “I know they’ll be hooked.”

David Pinsky is also the J. Griswold Ruth MD & Margery Hopkins Ruth Professor of Internal Medicine, professor of molecular & integrative physiology, and director of the U-M Frankel Cardiovascular Center.
patient care
During 2012, the University of Michigan Health System (UMHS) launched a new electronic health records (EHR) system called MiChart that significantly changed the way physicians, nurses, other care providers and administrators use information technology in every U-M hospital, clinic and procedure area. In fact, for most, it may be the largest transformation project they’ve encountered during their careers at the health system. As with any major change, a lot of adjustments, training and fine tuning have been needed along the way.

A NATIONAL GOAL
The use of EHR has been central to the aim of overhauling health care in America. Advocates contend that electronic records systems will improve patient care and lower costs through better coordination of medical services, and the federal government is spending billions of dollars to encourage doctors and hospitals to switch to electronic records to track patient care.

In 2009, the Health Information Technology for Economic and Clinical Health Act, abbreviated HITECH Act, was enacted through the American Recovery and Reinvestment Act. The HITECH Act set meaningful use of interoperable EHR adoption in the health care system as a critical national goal and incentivized EHR adoption. Health care providers who demonstrate meaningful use of certified EHR systems — that is, they are using features of a modern electronic medical record to capture, store and exchange patient information and ideally using this information in a manner that contributes to improvements in care — could start qualifying for Medicare and Medicaid incentive payments beginning in 2011. Starting in 2015, hospitals and doctors that are not using certified electronic health records will be subject to financial penalties under Medicare.

“The goal is not adoption alone but the ability to ‘meaningful use’ our new EHR,” explains Connie Standiford, MD, the executive medical director of ambulatory care services at UMHS and an associate professor of internal medicine in the Division of General Medicine.

TAKING IT TO THE NEXT LEVEL
UMHS has long been a leader in using information technology in health care, research and education. Its three hospitals and 140 ambulatory care units, as well as its business functions have been using digital systems for some time. CareWeb, its home grown electronic medical records (EMR) system developed by UMHS faculty and staff, had been truly unique among large academic medical centers.

“We had been fortunate to enjoy a very innovative digital medical record, scheduling and billing system that was actually made up of dozens of separate computer applications brought together through one Web-based viewer called CareWeb. Because these were all separate systems they were extremely difficult to maintain and upgrade to meet new demands, and would have been impossible to retrofit to meet the new meaningful use requirements and become a certified EMR,”
explains Andrew Rosenberg, MD, chief medical information officer for UMHS. David Spahlinger, MD, senior associate dean for medical affairs, U-M Medical School, who has worked with Rosenberg and other UMHS leaders on the first stages of this project adds, “CareWeb would have had to be replaced to meet the federal 2014 deadline to use the International Statistical Classification of Diseases and Related Health Problems 10th — or “ICD-10” — medical coding system. Given this and the meaningful use incentives, it just made the most sense to get a new system now. We knew we had to make a change. The biggest challenge has been meeting the aggressive timeline to implement such a large project.”

After reviewing all of its options, the UMHS determined that a significant investment in clinical informatics was needed in order to remain at the forefront of medical care, education and research.

**AN EPIC UNDERTAKING**

In 2010, UMHS signed a contract with Epic Systems Corporation beginning its multi-year effort as the primary vendor for clinical software and systems at UMHS. Its products are replacing and/or augmenting the hundreds of clinical, research, quality and business applications that have been developed and purchased by UMHS over the past two decades.

Epic is used by many other academic medical centers (page 58). Knowing this...
gave UMHS leaders confidence that it could serve the complex needs of highly specialized physicians and researchers — as well as patients, referring physicians and administrators.

“It really was the best of the commercial choices out there,” explains Timothy Laing, MD, the Department of Internal Medicine’s senior associate chair for clinical programs.

The new Epic effort at U-M, which has been named MiChart, is replacing and unifying existing systems and making new functions possible — including online “portals” for patients and referring physicians (page 61). It will also allow UMHS to qualify for $40 million in incentives by meeting the federal government’s goals for meaningful use of electronic health records and to meet the federal 2014 deadline to use the ICD-10 medical coding system.

During the planning stages, UMHS and Epic staff conducted a detailed analysis of all the clinical and administrative processes that currently rely on information technology or paper, and also outlined the ways in which researchers could leverage improved access to UMHS clinical information. For instance, the new MiChart system will allow researchers to automatically identify patients who might meet the criteria for the studies they are conducting, and contact them to see if they would be willing to volunteer.

“With MiChart’s robust applications, over time, we will have the ability to be more efficient, more patient-centered and more able to make new discoveries about human health. Having integrated EMR is a critical piece in the path for the UMHS to become a learning health system, as envisioned by the Institute of Medicine. We’ll be able to use it to create new knowledge that can be transferred to providers to improve the care that they give. It will create a ‘virtuous cycle’ of information and knowledge,” explains Rosenberg.

**TRAINING AND PREPARATION**

In 2012, UMHS began the process of transforming its outpatient clinics, procedure units and treatment centers, its coding and billing operations, its scheduling and registration systems, and its emergency department to run Epic systems almost exclusively.

In order to prepare for the MiChart launch on August 15, 2012, all Department of Internal Medicine faculty, fellows, residents, medical students, physician assistants and nurse practitioners had to complete 80 minutes of online eLearning prerequisites in addition to 10 hours of instructor-led training in a classroom.

The MiChart training provided a general overview of the system. In order to practice workflows specific to their specialty, faculty also need to conduct “sandbox practice” with UMHS content to operationalize standard workflows to meet their service/department needs, understand how processes within their department are handed off between roles, and to practice developing SmartPhrases, preformatted phrases and statements both for documentation and for patient education, that could be added to the system when it became live.
PHYSICIAN CHAMPIONS

Given the aggressive timeline, the MiChart planning and launch had to rely heavily on the knowledge and talent of many UMHS computing staff and clinicians who have a special interest in health care information technology.

Several Department of Internal Medicine physician champions (see chart) were actively engaged in the system build. They also planned and executed activities to ensure workflow changes were understood and that their teams were ready for them. “The success of our department’s MiChart implementation was largely due to our physician champions. They were instrumental in the entire process,” explains Standiford.

CREATING A NEW PATH

As with any big change, the transition to MiChart has not been an easy one. “Everyone was very familiar and comfortable with our existing system. In order to best meet our future needs, we had to move beyond the ‘warm blanket of CareWeb,’ as one of our colleagues in the department said to me,” explains Rosenberg. “It’s really been a challenging year of adjustments for everyone at UMHS system wide. We are not alone in this. There are major transitions to new EHR systems happening all across the country. We are very sensitive to this and doing everything we can to minimize the disruption.”

As MiChart gets integrated into the UMHS, many refinements are still being made. “We are in the process of providing advanced training for providers to help with efficiency of the new system. We are also continuing to making system improvements as well,” explains Margaret Punch, MD, associate medical director, ambulatory care services, associate chief medical information officer for ambulatory care, and professor of obstetrics and gynecology, U-M Medical School. “There are still some adjustments needed on both sides.”

“At this stage, there are varying levels of adoption and proficiency with the MiChart system. It will take some time to get everyone on
the same page. I think this transition has been particularly difficult for internal medicine providers because of the complexity of our patients,” explains Standiford. One of the biggest concerns voiced by physicians has been about preserving the patient narrative within a more automated, template system. “To address this, Dr. Laing is co-chairing an EHR committee to explore how we can continue to ensure the quality of our patient’s stories,” she adds.

Next steps for MiChart will involve converting systems in the hospitals, pharmacies and central medical record operations. There will also be cell phone (Haiku) and iPad (Canto) apps for physicians. Many smaller systems used in highly specialized areas will also be able to transition to Epic beginning mid-decade.

“When they first built the hospital and the Taubman Center, they didn’t put the sidewalks in right away. The developer told us to wait and see where the paths would be created by foot traffic. That’s kind of how I feel about MiChart right now — we’re not sure where to put all of the sidewalks yet, but we will after it gets worn in,” explains Laing.

“This has been a massive adjustment to how we operate. Throughout all of it, I came away feeling deeply proud of the Department of Internal Medicine staff. They stepped up to the challenge and tried their best to make it work. Everyone is dealing with a huge impact and change on their workflow and process. They have kept a positive attitude and displayed great teamwork. I give them all tremendous credit.”

– TIMOTHY LAING, MD

After the MiChart implementation, 97 percent of Department of Internal Medicine faculty met meaningful use criteria in 2012.
With the launch of a patient portal MyUofMHealth.org in conjunction with MiChart, U-M patients now can manage their health online. The new U-M Health System portal, along with its corresponding Epic ‘MyChart’ app for iPhones and Androids, offers patients electronic access to portions of their own health records.

“I am truly passionate about this portal — it’s a great empowerment and communication tool for our patients. It allows them to become more active participants in their care,” says Margaret Punch, MD, associate medical director, Faculty Group Practice Ambulatory Care Services and professor of obstetrics and gynecology, U-M Medical School.

“Allowing secure, online access to health information is really just a reflection of everything else happening in society as consumers come to expect convenient access to most services,” she explains. People with asthma and other conditions requiring frequent prescription renewals can now fill out online requests instantly. Parents can print out their child’s vaccination records wherever and whenever they need them. If patients are anxiously awaiting results of regular tests — such as those undergoing chemotherapy or fertility treatment — they don’t have to wait for office hours to find out.

So far, the patient portal has been a great success. “To date, 69,000 patients have signed up for it and we are now collecting $600,000 a month in patient payments through it,” adds Andrew Rosenberg, MD, chief medical information officer for UMHS.
PATIENT SERVICES PROVIDED BY UOFMHEALTH.ORG:

- Review and print out medications, immunizations, allergies and other medical history at any time of day from any location.
- Receive test results and doctor opinions online – no waiting for a phone call or letter. (Tests to determine potentially fatal or debilitating diseases would be delayed for online access for 14 days or longer to allow physicians time to speak with patients first.)
- Review health education topics and discharge instructions provided by providers.
- Secure messaging with doctor’s office. No more phone tag.
- Request prescription renewals.
- Pay bills online.

BENEFITS TO PROVIDERS:

- Convenient way to remind patients they are overdue for health maintenance like a vision exam, physical or other type of appointment.
- Easier billing process, with patients able to make online payments.
- Documented communications with patient.
- Potential use for research improving the ability to reach out to patients with certain conditions or medications.
- More options for communication with patients. Both quick and secure.
MiChart is also making it possible for UMHS to participate in the Great Lakes Health Information Exchange (GLHIE), a sophisticated system to securely access electronic health data, contributing to a regional and national effort to create robust clinical exchange between health providers.

Participation in GLHIE allows physicians to have secure, real-time access to health and demographic information for new patients, helping prevent medical errors and avoid test duplications. Partner providers will be able to receive data on patients from multiple sources, including different hospitals the patient has visited.

Among patient data that will, over time, become readily available to physicians through GLHIE are hospital admission, hospital discharge, and transfer notifications; inpatient notes; outpatient encounter documents; radiology results; laboratory results; emergency department summaries and hospital discharge summaries.

Currently, physicians must specifically request data from each source and then wait for the information to be faxed. UMHS is encouraging referring physicians to join the GLHIE network to speed up these exchanges.

“This modern health information exchange system will radically change the way physicians are able to share health records,” says Andrew Rosenberg, MD, chief medical information officer for UMHS. “The ultimate goal is to speed up access to critical health documents while reducing costs and improving coordinated, high-quality care. Joining a health information exchange like GLHIE is the cornerstone of that effort for us.”
PATIENT SAFETY ENHANCEMENT PROGRAM: 
Laying the Foundation for Better Care

When the Institute of Medicine released its report “To Err is Human: Building a Safer Health System” in 1999, it estimated as many as 98,000 people may die in hospitals each year as a result of medical errors that could have been prevented. This report struck a chord with Sanjay Saint, MD, MPH, the George Dock professor of internal medicine and the associate chief of medicine at the VA Ann Arbor Healthcare System. When he expressed his concerns about patient safety with General Medicine Division Chief Laurence McMahon, Jr., MD, MPH, he was encouraged to seek out startup funding from the U-M Health System (UMHS) to do something about it. “So that’s what I did. I asked UMHS for seed funding to start a patient safety program. Gilbert Omenn, PhD, MD, the executive vice president for medical affairs of the UMHS and a professor from the Division of Molecular Medicine and Genetics gave us the crucial initial seed funding that started it all. Gil was our angel investor.”

The Ann Arbor VA Medical Center/University of Michigan Patient Safety Enhancement Program (PSEP) was established in November 2000 to improve the quality of patient care through research that focuses on methods of avoiding or preventing adverse patient outcomes or injuries that stem from the processes of healthcare (http://psep.med.umich.edu).

“Our program tries to produce and disseminate high-quality, evidence-based research that can be used to enhance patient care,” explains Saint, the PSEP’s director. “We’re focused on addressing endemic problems that are common in hospitals such as urinary tract infections (UTIs) and other healthcare-associated complications, preventing diagnostic errors and cognitive

Sanjay Saint, MD, PhD, started the Patient Safety Enhancement Program in 2000 with seed funding from UMHS.
Three main components of the PSEP are: research, operational, and educational-ethical-legal. Since its creation, it has sponsored or participated in countless applications for extramural funding. Faculty members affiliated with PSEP have been awarded more than $15 million in PSEP-related extramural grant funds. In addition, program faculty have published a large number of articles in peer-reviewed journals — including papers appearing in the New England Journal of Medicine, Annals of Internal Medicine, Lancet, and JAMA — and several book chapters on patient safety-related topics. PSEP faculty have given numerous invited patient safety-related presentations to national and international audiences that have consisted of diverse groups of physicians, nurses, infection control practitioners, and healthcare executives. Ongoing data collection, management, and analysis support a robust research agenda. Some examples of recent highlights of this work include:

**UTI PREVENTION IN MICHIGAN**

Due in part to PSEP research efforts, patients at Michigan hospitals are less likely to experience a UTI caused by a catheter than at other hospitals in the country, according to a new study led by Dr. Saint that recently appeared in the Journal of the American Medical Association Internal Medicine.

“Importantly, we are trying to identify approaches that hospitals can use in order to be more successful in preventing infection and enhancing patient safety.”

– SANJAY SAINT, MD, MPH
“Hospitals recognize that UTIs are a common, preventable and costly health issue but many still don’t routinely use practices proven to prevent them,” says Saint. “Michigan hospitals, which have taken the lead in applying low-tech practices aimed at timely removal of urinary catheters, are also proving to be leaders in reducing the risk of patient harm from UTIs.”

UTIs, which often arise from catheters used to empty bladders for hospitalized patients, are responsible for 35 percent of infections related to hospitalization, and can lead to serious complications. Aiming to cut expenses and improve care, a 2008 Medicare policy stopped paying hospitals for the cost of treating preventable urinary tract infections that develop in hospitalized Medicare patients.

Michigan's Keystone "Bladder Bundle" Initiative has focused on a significantly higher use of practices addressing the timely removal of urinary catheters in Michigan hospitals. The study funded by a $1.7 million grant from the National Institutes of Health four years ago, supports efforts by UMHS and the VA Ann Arbor Healthcare System to help hospitals find the best ways to prevent UTIs.

Saint and his colleagues found that Michigan hospitals were more likely to participate in efforts to reduce catheter-associated infections by using bladder-scanners as well as reminders or stop-orders to ensure catheter use was discontinued at an appropriate time. More frequent use of preventive practices coincided with a 25 percent reduction in UTI rates at Michigan hospitals compared to a 6 percent overall decrease experienced by other U.S. hospitals.

These findings coincide with another U-M study in the same issue of JAMA Internal Medicine led by PSEP faculty Sarah Krein, PhD, RN, research associate professor, U-M Department of Internal Medicine, research scientist, VA Ann Arbor Healthcare System; and of the U-M School of Nursing. Her team identified the barriers some hospitals face in implementing strategies to reduce urinary catheter use. Common barriers included difficulty engaging nurse and...
physicians to change their practice styles, patient and family requests for indwelling catheters, and emergency departments’ customary process on catheter use.

Both Saint and Krein are on the national leadership team of a nationwide project funded by the Agency for Healthcare Research and Quality that aims to reduce catheter-associated UTIs by 25 percent in all 50 states and Puerto Rico. So far, more than 850 hospitals are participating.

THE MICHIGAN MODEL
Through the PSEP, UMHS chief medical officer Darrell A. Campbell, Jr., MD, and executive director of clinical safety Rick Boothman, JD, have led a decade-long effort to implement and measure the results of the “Michigan Model” for handling medical errors, unexpected clinical problems and unintended outcomes. According to their results — published in the Annals of Internal Medicine with PSEP faculty member Mary Rogers, PhD, MS, serving as senior author — it is becoming a model for the nation that other hospitals can and should copy.

The “Michigan Model” of how UMHS addresses these situations, and prevents them from happening again, has not only helped patients and medical staff alike — it has also helped UMHS go against the grain of the costly, combative “deny and defend” medical malpractice culture. It is based on these key principles:

• Compensate patients quickly and fairly when inappropriate care causes injury
• Support clinical staff when the care was reasonable
• Reduce patient injuries (and claims) by learning from patients’ experiences

Their evaluation found that new malpractice claims per month have dropped, total liability costs have dropped, claims and potential claims are being resolved faster, and UMHS is increasingly avoiding litigation in both claims without merit and claims with merit.

“There is general consensus that the Michigan approach — also called DA&O for ‘disclose, apologize and offer’ — holds great potential to improve medical liability and patient safety. Other health systems are now starting to consider it,” explains Saint.

HOPE INITIATIVE
With the Ann Arbor VA Medical Center/University of Michigan Hospital Outcomes Program of Excellence (HOPE) Initiative, Dr. Saint is hoping to create the ideal inpatient service that could eventually become a national and international model for how inpatient care should be provided in an academic setting (http://va-hope.org).

A “Gold” hospital medicine service has been developed to serve as a model for how inpatient care could be delivered in a safe, effective, efficient, scientifically rigorous,
dynamic, and patient-centric manner. “It is serving as a behavioral laboratory to help us test different care approaches. For instance, the Gold team conducts ‘circle of concern’ patient rounds where all care team members including nurses take part — having everyone together to voice their concerns or observations about a patient. Then we can evaluate how patient care and safety is impacted by this increased team communication and participation,” he explains.

A SAFER FUTURE FOR PATIENTS
There’s no doubt that overall awareness and concern about patient safety issues has grown immensely since the Institute of Medicine released its report in 1999. As both the U-M Health System and the VA Ann Arbor Health System work to become the safest in the country, they’re also helping other hospitals and providers across Michigan improve the safety and quality of the care they give. By sharing data and best practices, these efforts work to reduce preventable problems, and increase use of preventive measures, in hospitals of all kinds. “Many of the efforts related to the Patient Safety Enhancement Program are providing the foundation for state and national efforts,” explains Saint. Additionally, PSEP faculty are conducting several studies with investigators abroad. Specifically, Saint and others are working with collaborators in Japan, Thailand, Italy and Switzerland on research to enhance the safety of patients in those countries through the International-Ann Arbor Safety Collaborative (I-A2SC) (http://i-aasc.org).

This past year, Dr. Saint and the PSEP have moved to the North Campus Research Complex (NCRC) opening a whole new door of possibilities. “Moving to NCRC has the potential to be transformative,” says Saint. “In our new location and as a member of the new Institute for Healthcare Policy Innovation (page 90), our patient safety program is now surrounded by high-caliber and multidisciplinary health services researchers committed to turning ideas into action. This will definitely help us broaden our reach.”
Building on UMHS’ early support, the following organizations have provided the resources necessary to turn the PSEP concept into a program:

- The Agency for Healthcare Research and Quality
- Alzheimer’s Association
- Blue Cross Blue Shield of Michigan Foundation
- Claude Pepper Center
- Department of Veterans Affairs
- Health Research & Educational Trust
- MHA Keystone Center for Patient Safety & Quality
- National Heart, Lung and Blood Institute
- National Institute of Aging (National Institutes of Health)
- National Institute of Diabetes and Digestive and Kidney Diseases (National Institutes of Health)
- National Institute of Nursing Research (National Institutes of Health)
- Research Foundation for the Prevention of Complications Associated with Health Care
For more than 25 years, the A. Alfred Taubman Health Care Center on the University of Michigan’s medical campus has drawn patients from around the state and the world, for outpatient visits with some of the nation’s top specialists in a broad range of diseases.

When the new C.S. Mott Children’s Hospital and Von Voigtlander Women’s Hospital opened in December 2011, it opened up nearly 30,000 square feet of space in the center that had previously been used as outpatient clinics for women, newborns and children.

To make the most of this new space, the U-M Health System (UMHS) is currently investing $20.5 million to renovate, reorganize, and revitalize Taubman Center. The south end of the first floor is being converted to a multidisciplinary Transplant Center clinic that will provide one-stop access to specialized care for patients who are waiting for or have received an organ transplant at UMHS. Also new will be an outpatient infusion area, specifically for transplant recipients and other patients who have diseases other than cancer that can be treated with intravenous medications. This will be the third such clinic opened by UMHS to help meet rising demand for such care. There will also be expanded or renovated space for other specialties including internal medicine, neurology, neurosurgery and otolaryngology; and a larger pharmacy also offering medical supplies.

**INTERNAL MEDICINE’S CLINICS**

As part of this effort, there are plans to renovate and redesign 27,500 square feet on the third floor where many clinics run by the Department of Internal Medicine will be renovated for the first time since the building opened in 1986 to improve the patient experience and the efficiency of clinic operations. This includes areas for gastroenterology, general medicine, pulmonary medicine, nephrology, infectious diseases and overseas travel, medical genetics, and rheumatology.
When the new C.S. Mott Children’s Hospital and Von Voigtlander Women’s Hospital (far left) opened in December 2011, it opened up nearly 30,000 square feet of space in the Taubman Center (middle right).

“As we continue to experience steady growth in patient demand, this is one way to help meet those needs in the face of rising overhead costs. We have to be thoughtful and intelligent about how we grow.” – Timothy Laing, MD
A renovated exam room completed during phase I of the renovations.

“We’re all very excited about these improvements. There will be updated exam rooms and expanded waiting areas. Overall the clinic spaces will be more efficient and more comfortable and have a better flow. There will be increased privacy for patients, better lighting and computers integrated into every exam room,” explains Timothy Laing, MD, the Department of Internal Medicine’s Senior Associate Chair for Clinical Programs.

It is estimated that 1.6 million adult outpatient visits took place at the Health System’s 40 ambulatory care locations last year, and that demand for that is rising around 3 percent a year. It’s likely to grow even more due to the Accountable Care Act. These new projects, and a recently announced health center in Northville, Mich. that will open in 2014, will help meet that demand.

“As we continue to experience steady growth in patient demand, this is one way to help meet those needs in the face of rising overhead costs. We have to be thoughtful and intelligent about how we grow,” adds Laing.
This $7.5 million project is being carried out with the help of the architectural firm of Niagara Murano. Walbridge Construction was selected as the general contractor. The total renovation is organized into four major phases and is scheduled to be complete in fall 2013.

**INTERNAL MEDICINE CLINIC RENOVATIONS AT A GLANCE**

- **67 Exam Rooms** (see opposite page)
- **2 patient waiting areas** with multi-functional front desk stations and one with seating for 35 (Reception areas A/B) and one with seating for 54 (Reception areas C/D)
- **3 dedicated medication rooms**
- **Redesigned nursing offices**
- **New Pulmonary Function Testing lab and Travel Clinic/GFR (glomerular filtration rate) Lab**
- **New clean supply, equipment storage**

Additional upgrades include:

- **Furniture**
- **Finishes** (paint, carpet, ceilings)
- **Lighting**
- **Infrastructure** (electrical, wireless, ventilation)
- **Artwork and signage**

Each division selected their own design colors and fabric themes for their reception and clinic areas (see right).
education
GLOBAL HEALTH EDUCATION

Though the bulk of this report’s global health emphasis is devoted to the department’s research efforts, research and education here are inextricably intertwined. Student teams have supported research projects throughout Latin America, Africa and Asia. It’s an ideal arrangement: Students gain experience in international research, and the projects gain a renewable energy source.

But global health is increasingly prominent within the curriculum, as well. Undergraduates, for example, can take the “Global Health Equity” course developed by Professor Sofia Merajver, MD, PhD, from the Division of Hematology & Oncology. She reports that it fills 20 minutes after registration opens — a strong indicator of student interest in the subject.

For greater involvement, medical students can participate in the Global Health and Disparities Path of Excellence, directed by Brent Williams, MD, associate professor in the Division of General Medicine. This mentored, self-directed track complements the traditional curriculum with a seminar series, outside readings, and a capstone project (page 96).

Professor John Del Valle, MD, from the Division of Gastroenterology, has been working to provide a parallel experience for residents and fellows. As director of the Internal Medicine Residency Program, he has convened a cross-departmental interest group that he hopes will build a curriculum and ultimately a global health track for graduate medical education. He’s aiming for a formal mechanism that would augment trainees’ month-long “away rotation” and build a community and consciousness around global health.

Of course, engaging our students is only half the story; equally important is hosting visitors from abroad. And, while the learning opportunities for both visitors and hosts may be clear, there is another, more subtle value in these types of exchanges, according to Senior Associate Dean for Education and Global Initiatives and Josiah Macy Jr.
Professor of Health Professions Education, Joseph Kolars, MD. “We talk a lot about building trust in our global partnerships,” he says. “An important part of that is reciprocity. Traditionally, some 60 percent of our medical students spend time overseas, but it’s often been difficult for students from underserved countries to come here. We’ve worked hard to change that. For example, we sent about 45 of our medical students to do learning experiences in Ghana, but we’ve actually brought over 90 Ghanaian students here. Nobody else has done that, and people notice that we’re trying to give back as much as we’re getting, if not more.”

Many in the department would argue that the value of these exchanges goes even further. One of these is David Pinsky, MD, chief of the Division of Cardiovascular Medicine and co-lead of the UM-Israel Partnership for Research (page 52). He tells the story of hosting the first Melvin Lester CVC Fellow from a Technion-affiliated hospital who spent a year in the department learning advanced cardiac interventional techniques. “To me, it’s quite meaningful,” he says, “that she will go back and use her University of Michigan-acquired clinical skills in Israel to treat Arab and Jew alike. It’s an important message about medicine transcending boundaries. When we treat patients, we don’t ask what their background is. Through these exchanges, we can help heal a very rough patch of the world.”

“To go to a different culture and see different people, a different health care system, different diseases, and the ways people do more with less is very important for our medical students.”
– MANUEL VALDIVIESO, MD
CARY ENGLEBERG
Using E-Learning to Expand Medical Education in Africa

Professor Cary Engleberg, MD, from the Division of Infectious Diseases and the Department of Microbiology & Immunology is helping Ethiopia use e-learning to support an unprecedented expansion of medical schools and tackle the crippling shortage of physicians on the continent.

To look at one of his videos training African doctors in Caesarian sections, it may seem a long way from studying Legionnaires’ disease and Group A streptococcus in his lab at U-M. But it’s not.

Engleberg actually cut his teeth in Africa as a Peace Corps physician in the late 1970s. Among the many things he learned was that “treating people off the street doesn’t add much value because there’s the possibility you’re taking an African physician’s job.” He wanted to be sure that in his next role he was truly adding value.

He got his chance in 2006 when he was asked to develop an electronic course for M4 students in advanced medical therapeutics. Students visiting the U-M from Ghana took the course and encouraged Engleberg to go global. He accepted the challenge and adapted the course for the Ghanaian context, taking a sabbatical in 2009 to introduce this and similar tools to two medical schools there.

Ethiopia took notice. “Under a really dynamic Minister of Health, Ethiopia began trying to massively increase its physician pool by opening 13 new medical schools in one year,” Engleberg explains. “They didn’t have enough faculty to run a full curriculum at all these schools, so they asked me for help.”

U-M is already sponsoring a residency program in OB/GYN at one of the new medical schools, St. Paul’s Millennium in Addis Ababa. “The plan is to use it as a laboratory for teaching methods, which they could transport to the other medical schools the Ministry of Health wants opened,” he says.

So he went with a contingent from OB/GYN in 2012 to see what he could do. While OB/GYN is somewhat outside Engleberg’s specialty, his role helping African partners with the technical and pedagogical aspects of e-training is fully transferrable. It’s also the perfect example of responding to a partner’s priorities rather than arriving with your own fixed agenda.

The materials they’re planning include a series of self-administered modules featuring lectures, interactive cases, procedure videos, and self-assessments. They’re web-based
The new OB/GYN residents at St. Paul’s Millennium Medical School in Addis Ababa who are using Engleberg’s e-training tools. Also pictured is Senait Fisseha, MD (front row, fourth from left), an Ethiopian-born gynecologist who is an associate professor of OB/GYN at U-M and a strong supporter of the residency program. On the far right are the chair of St. Paul’s OB/GYN department and the vice provost for medical services.

and can be stored on a flash drive or CD and run in any browser.

Some of the modules will be developed from scratch; others need only be adapted from materials he has in Open.Michigan — the online initiative that lets U-M faculty and students share educational resources worldwide.

A global health veteran, Engleberg always has one eye on sustainability. To that end, he and his colleagues hope to make the development of teaching materials a requirement of the residency. “Under the guidance of faculty, the residents themselves can create materials for medical students and future residents,” he says. “The idea is to start something, then if it’s advantageous to everyone involved, other institutions and departments will want to do the same thing.” He plans to return to Ethiopia this summer.

In 2011, Engleberg received a UMMS Lifetime Achievement Award recognizing his rich contributions to medical education.
HARI CONJEEVARAM

Education Evolves from
Selfless Service in India

Hari Conjeevaram, MD, associate professor in the Division of Gastroenterology (GI), began his work in India in the spirit of selfless giving. But he soon realized how easily he could blend his call to service with his commitment to medical education.

He started almost 15 years ago, traveling with a service organization to two free hospitals in southeast India to do general health education and screenings. This continued until about five years ago, when he decided to draw on his specialist’s background and help set up a free GI clinic and endoscopy unit. His head nurse trained the nurses, and he not only volunteers there but also coordinates physicians from around the world to do so, too.

But being the director of the GI Fellowship Training Program, Conjeevaram began to wonder about the educational piece — in particular, how he could help trainees in India while exposing his own trainees to the patient experience in this part of the world. He knew there were gains to be had on both sides.

“Our residents and fellows have so much to learn in countries like India,” he says. “The variety and depth of disease are a lot greater. For example, with ulcers, here you might see something mild; there you see the full-blown picture. Our trainees learn about the extent and varied pathology of disease. And because of the sheer patient volume, fellows can do lots of procedures. Since patients may come to the clinic from great distances, trainees also get continuity — they see a patient, scope him or her in the next day or two, and provide immediate care based on the findings.” And, most importantly, he says, they learn the value of giving back.

On the other side, he believes Indian trainees have a lot to gain from U-M. One is learning how to do strong clinical research. “There are plenty of really smart physicians in India,” he says, “what they often need is to learn sound research techniques — how to choose a topic; how to collect, analyze, and interpret
data; and how to write good papers. That is something they’re very interested in and where we can offer expertise.”

In 2010 Conjeevaram began bringing U-M residents and GI fellows to the free hospitals he works with, and in 2012 he added an academic liver institute in New Delhi. Because it’s harder to bring fellows to the U.S., Conjeevaram teaches Indian trainees during his visits there. However, he hopes to make use of the new MOU to bring AIIMS GI and hepatology fellows to train in the GI Division. He’s also planning a training exchange at AIIMS for himself. He’s eager to learn a delicate but minimally invasive “glue technique” that his colleagues in India have perfected for treating gastric varices, the enlarged veins in stomachs of cirrhosis patients that can lead to life-threatening hemorrhages.

He hopes these exchanges will yield additional opportunities for collaborative mentoring, research, and education.

“Our residents and fellows have so much to learn in countries like India. The variety and depth of disease are a lot greater.”

Hari Conjeevaram, MD
MAKING OUR MATCH: The Continued Growth of the Residency Pool

THE CURRENT SITUATION
The Department of Internal Medicine Residency Program has always attracted some of the best residents in the nation to U-M. But now, the competition is tougher than ever. “Each year, we have been experiencing a growth of 100-150 applications and this number continues to increase,” explains John Del Valle, MD, the Department of Internal Medicine’s senior associate chair for graduate medical education and the director of the residency program.

No one feels the impact of this high demand more than the Department of Internal Medicine Residency Program administrative staff. They start coordinating the details of resident recruitment in early August each year. By the program’s application deadline of December 1st, 2,649 medicine applications and 273 combined medicine-pediatrics applications were received for 2012.

Of that pool, a total of 511 medicine and 96 medicine-pediatrics applicants were invited to interview for the 50 (42 medicine and 8 medicine-pediatrics) open residency positions. Of these, 405 medicine and 81 medicine-pediatrics candidates were interviewed on 16 different recruitment days.

![Applications Invited to Interview Interviewed 2012 Residents](image.png)
The Department of Internal Medicine Residency Program administrative staff processed 2,922 applications for the 2012 residency slots. Left to right: Mary Ernst, Brian Minnich, Amy Cutting, Sue Suslee, and Karen Brown.

It doesn’t appear that this pace will be slowing down anytime soon.

“More than 15 new medical schools have recently opened across the U.S., including three in Michigan alone. The pool of medical students continues to expand while the amount of internal medicine residency spots has remained stable by the federal government since 1997,” explains Department of Internal Medicine Chair John Carethers, MD.

While residencies are primarily paid for through a combination of federal and state dollars, some hospitals do self-fund additional residency spots when possible. “At Michigan, we have been able to get nine extra slots funded, two for internal medicine residencies and seven for sub-specialty areas. Unfortunately, this is not even close...
The Department of Internal Medicine Residency Program leadership team

Left to right:
Namita Sachdev, MD
Associate Program Director, Medicine-Pediatrics

Cara A. McDonagh, MD
Assistant Program Director

Subramaniam Pennathur, MD
Associate Program Director

Adam S. Tremblay, MD
Associate Program Director

Michael P. Lukela, MD
Program Director, Medicine-Pediatrics

Anna M. Booher, MD
Assistant Program Director

John Del Valle, MD
Program Director, Senior Associate Chair
Graduate Medical Education

Vikas I. Parekh, MD
Associate Program Director
to meeting the growing demand for new physicians. There is an expected shortage of more than 135,000 physicians by 2025,” adds Del Valle.

**FUTURE OUTLOOK**

Over the last several years, concerns about this shortage have continued to grow. The American Medical Association launched a “Save GME” campaign calling to eliminate the shortage of residency slots and reverse the constraints on federal funding for them.

Congress recently reintroduced, for the third time, the Resident Physician Shortage Reduction Act that would add 15,000 Medicare-financed residency positions over five years and set aside new training spots for specialties where there are identified shortages, such as primary and geriatric care. During Match Days of the past, when medical students learn where they will be doing their residency training, there were always more openings available than doctors graduating from U.S. medical schools. This gap has been traditionally filled by graduates of U.S. osteopathic schools and foreign medical schools.

The Association of American Medical Colleges predicts that graduates from U.S. medical and osteopathic schools alone will exceed the number of expected residencies by the end of the decade.

Residency applicants from foreign schools are likely to be left out making it more difficult to fill the nation’s growing need for primary care physicians, which includes internal medicine, family medicine and pediatrics.

“Graduates of foreign medical schools are generally more likely to go into primary care. U.S. graduates tend to prefer more the lucrative specialties,” explains Carethers.

Given this, some argue that rather than fund additional residencies, Medicare should find ways to channel more U.S. medical students away from specialty fields and into primary-care medicine. While others predict that doctors will be able to care for more patients in the future with more efficient systems, more physician assistants and nurse practitioners, and telemedicine done via phone and online.

“Until this issue can be resolved, I have a feeling our application pool will be overflowing for some time,” adds Del Valle.

### 2012 CHIEF MEDICAL RESIDENTS

Every year the Department of Internal Medicine and Medicine-Pediatrics Residency Programs assign new chief medical residents to an administrative role in their respective programs. For 2012, the CMRs for internal medicine were Molly Horstman, MD; Amneet Sandhu, MD; Samar Sheth, MD; and Jessica Tsui, MD (page 16). In the medicine-pediatrics program, the chief resident was David Stewart, MD. These residents were selected based on their outstanding performance during their residency period and strong commitment to their respective programs.
In addition to the many global pursuits featured in this report, this past year was also filled with progress and achievement in medical education right here in Ann Arbor, Mich. Most notably, many Department of Internal Medicine faculty played a pivotal role in helping the U-M Medical School (UMMS) pass its reaccreditation with flying colors.

This process started in fall 2010 when the UMMS began its institutional self-study in preparation for the Liaison Committee on Medical Education (LCME) reaccreditation. Sponsored by the Association of American Medical Colleges and the American Medical Association, the LCME is the nationally recognized accrediting authority for medical education programs leading to the MD degree in U.S. and Canadian medical schools. In March 2012, a LCME survey team came and met with UMMS faculty, students and administrators during a site visit.

“In June 2012, we learned that U-M’s medical education program leading to the MD degree was reaccredited for the full eight-year term. The LCME evaluation cited many great strengths and praised several aspects of our program,” explains Cyril Grum, MD, the Department of Internal Medicine’s senior associate chair for undergraduate medical programs.

In addition to Grum, numerous internal medicine faculty took part in the LCME working groups and committees that were critical during this 18-month effort. Including the UMMS Dean James Woolliscroft, MD, Joseph Kolars, MD, the senior associate dean for education & global initiatives, and Rajesh Mangrulkar, MD, the associate dean for medical student education.

“Our success is due, in part, to their dedicated leadership and strong commitment to providing the best medical education. Overall, this effort was incredibly valuable for all faculty involved and the medical school has put processes into place to leverage the experience and knowledge that was gained to ensure the continuous improvement of our medical education program,” says Grum.

“Our department is very proud of these results. Once again, our work has helped demonstrate the exceptional quality of the U-M Medical School. It’s no wonder our graduates consistently rate among the best residency candidates in the country,” he adds.

Cyril Grum, MD
Student Awards
The William Dodd Robinson Award was given by the faculty of the Department of Internal Medicine to graduating senior **Kevin I-Gong Duan**, MD, for his outstanding performance in the junior medicine clerkship and senior electives in internal medicine.

The Eli G. Rochelson Memorial Award was given to **Laurel Elizabeth Roberts**, MD, for the most outstanding performance in pulmonary and critical care medicine by a graduating medical student.

Faculty and House Officer Teaching Awards
The Galens Medical Society awards Bronze Beepers to house officers who they feel have been exemplar in their teaching duties towards medical students. This year, two were awarded to house officers in medicine-pediatrics: **David Stewart**, MD and **Laura Taylor**, MD.

**Thomas O’Connor**, MD, was awarded the Richard Judge Award for Excellence in Medical Student Teaching which is the highest award the Internal Medicine Department bestows for teaching.

**Seetha Monrad**, MD, received the department’s Special Recognition for Contributions to the Medical Student Teaching Program Award.
outreach
The Institute for Healthcare Policy and Innovation (IHPI) was approved in May 2011 by the U-M Board of Regents. Since that time, it has grown to one of the world’s largest university-based groups of health care and health policy researchers, involving more than 400 experts who are tackling some of the nation’s most challenging health care problems including diabetes, cancer, heart disease, mental health, children’s health and surgical care. IHPI faculty are drawn from a broad range of disciplines across the University of Michigan and also members from external organizations devoted to health services research. About half of its members are faculty at the Medical School, one-fifth from the School of Public Health and another one-third from 10 other schools, colleges and institutes across U-M.

Since June 2012, Building 16 at the North Campus Research Complex has become home to approximately 450 IHPI faculty, staff and trainees, who are collaborating in new ways because of their closer physical proximity to one another. The remaining members retain primary offices elsewhere on campus and have access to shared collaborative spaces at IHPI.

Beyond the physical building, the IHPI is designed to bring this diverse community of physicians, scientists and policy analysts together in new ways. The institute is also working to offer researchers the services they need to advance and promote their research. “Given the incredible challenges facing health care in the United States, there is a huge need for evidence-based approaches to inform policy. The work of the IHPI holds great promise to improve quality and reduce costs throughout the country,” explains John Carethers, MD, chair of the U-M Department of Internal Medicine.

IHPI’s First Director
Needless to say, it was with great anticipation that the IHPI named its first leader in 2012. In a speech at the President’s Annual Leadership Breakfast in October, U-M President Mary Sue Coleman announced the appointment of Harvard Professor...
John Z. Ayanian, MD, MPP, as the first director of the institute.

“John’s stellar credentials include work on a broad range of health care issues, from uninsurance and disparities in care to the factors that impact the quality of care,” Coleman said, who worked with Ayanian on the Institute of Medicine’s landmark Committee on the Consequences of Uninsurance. “As we build this institute to leverage the vast expertise of our faculty and partners, I am confident John will lead in a way that will help our research make the most impact.”

Ayanian currently is a professor of medicine and health care policy at Harvard Medical School, a professor in health policy and management at the Harvard School of Public Health, and a practicing primary care physician at Brigham and Women’s Hospital in Boston.

He studies the effects of race, ethnicity, gender and insurance coverage on access to care and clinical outcomes, and the impact of physician specialty and organizational characteristics on the quality of care for cardiovascular disease, cancer, diabetes and other major health conditions.

“In November 2012, he began working to develop IHPI’s potential as one of the nation’s powerhouses of health services research, health care policy development and new ideas in health care delivery. He is currently transitioning from Harvard to Michigan holding part-time appointments at both institutions. In September 2013, he will

“With experience in the clinical realm, and in the world of public policy, John Ayanian is uniquely poised to ensure that the work of IHPI members translates into action to improve the way health care is provided, paid for and regulated.”

– James O. Wooliscroft, MD
Dean of the U-M Medical School
IHPI MISSION
To enhance the health and well-being of local, national and global populations through innovative interdisciplinary health services research that effectively informs public and private efforts to optimize the quality, safety, equity and affordability of health care services.

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IHPI Membership
- Medical School: 54%
- School of Public Health: 12%
- Other U-M Schools: 15%
- External Partners: 19%

Ayanian has been busy working to strengthen existing research partnerships and stimulate new ones, set research priorities, recruit faculty together with U-M’s schools and colleges, appoint associate directors, form an external advisory board and raise IHPI’s visibility nationally.

He has been meeting with deans, department chairs, research leaders, faculty, and trainees in a number of the fields that are central to IHPI, including medicine, public health, nursing, engineering, public policy, dentistry, and social research. He has also met with leaders of the institute’s five external partners. In these meetings, he is gathering information about the current strengths and potential new synergies for interdisciplinary research that IHPI can foster.

Throughout this process, the following five themes for interdisciplinary research and innovation have emerged as promising domains for IHPI:

MOVING FULL SPEED AHEAD
Ayanian is now leading an institute whose members, like him, mine vast quantities of health care data to assess the impact of policy, payment and practice changes on patients’ health. “The opportunity to lead IHPI truly is an exciting endeavor. Michigan already has an extremely strong tradition of health services research. This is taking it another step forward. I believe this institute will allow us all to have a much greater impact on the field of health policy,” he explains.

“We’re hopeful that the IHPI will become a major voice within the national health care conversation, similar to the RAND Corporation,” adds Carethers. “John is the perfect person to help us build up these pieces and spearhead the institute’s outreach.”
Promoting greater value in health care, i.e. maximizing health outcomes relative to costs, through value-based insurance design and value-based clinical performance management.

Evaluating the implementation of federal health reform through the Affordable Care Act, including the Medicare Pioneer Accountable Care Organization launched by the U-M Health System and the proposed changes to Medicaid.

Partnering with State of Michigan to improve health system performance and population health and reduce disparities in the state.

Integrating mental health services more effectively in chronic disease care.

Developing and assessing innovations in information technology and care delivery to improve health communication, patient safety, and efficiency, particularly as a path to improve care in the U-M Health System.
IHPI’S LEADERSHIP TEAM
IHPI’s leadership team consists of eight members from the medical school and the schools of nursing and public health who have helped lead the institute’s formative efforts. Three of the team members are faculty with primary appointments in internal medicine. Rodney Hayward, MD, director of the Robert Wood Johnson Foundation Clinical Scholars Program and professor of internal medicine in the Division of General Medicine served as the IHPI’s interim director. IHPI members Eve Kerr, MD, MPH, director of the VA Center for Clinical Management Research and professor of internal medicine and Laurence McMahon, Jr., MD, MPH, chief of the Division of General Medicine and professor of internal medicine and public health are key contributors on the leadership team.

“IF I COULD GIVE YOU THREE WORDS TO DESCRIBE IHPI, THEY WOULD BE COLLABORATION, INNOVATION AND IMPACT.”

NEXT STEPS
Dr. Ayanian is consulting with the IHPI’s leadership team to advise him on priorities and early decisions for the institute. Key IHPI functions moving forward will include government relations, communications, development and financial management. Faculty working groups are currently developing three research cores as central resources for IHPI members:

• **Methods Core** – to provide expert consultations in quantitative and qualitative methods for manuscripts and grant proposals, and advanced methods seminars for health services research.

• **Data/Computing Core** – to identify and support health care databases (e.g. Medicare and Medicaid data, private insurance data, disease registries, U-M Health System clinical data) and data management tools that can be shared across IHPI research groups.

• **Research Impact Core** – to cultivate policy-relevant projects with potential for impact and coordinate outreach to public and private policy-makers and stakeholders for IHPI research.

While these first six months have been marked by a whirlwind of activity and information gathering, Dr. Ayanian already has a clear vision to guide the way: “If I could give you three words to describe IHPI, they would be collaboration, innovation and impact. Collaboration, which is already a major U-M strength, will create the best interdisciplinary work. Innovation will help us frame old problems in new ways that will lead to better solutions. And impact is our ultimate goal. We will raise awareness about IHPI research so it is used to improve patient care and population health.”

“IF I COULD GIVE YOU THREE WORDS TO DESCRIBE IHPI, THEY WOULD BE COLLABORATION, INNOVATION AND IMPACT.”

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<th><strong>IHPI Members from the Department of Internal Medicine</strong></th>
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Building a sense of community through professional networking has been an early priority for IHPI. In November, 2012, they conducted a full-day “kick-off” event at NCRC attended by approximately 200 IHPI members, at which 15 research groups presented highlights of their research.
In addition to the many global opportunities described in this year’s report, many University of Michigan Medical School (UMMS) faculty and students have been reaching out and volunteering their time to provide and improve care for underserved and vulnerable populations both locally and globally.

**CARING FOR THE UNDERSERVED**

Brent Williams, MD, MPH, an associate professor from the Division of General Medicine, has been active in local community development work since 1989. He has been the medical director of the Shelter Association of Washtenaw County’s Health Clinic since 1990. In 2005, the U-M Health System asked him become Liaison for Underserved Populations.

He had already been developing curricula in caring for underserved populations in the U-M Medical School and for the Department of Internal Medicine residency program for many years when UMMS decided to develop a Global Health and Disparities Path of Excellence (GHD Path) in 2010. It was no surprise that they called upon Dr. Williams, with his expertise and experience in the GHD Path’s planning and development, to create a structured framework for interested students to learn about health disparities along with faculty from Internal Medicine, Family Medicine, Psychiatry, Physical Medicine and Rehabilitation, and Obstetrics and Gynecology. In 2011, he became the program’s director.

“GHD was purposely selected as the first Path of Excellence to help expand and integrate UMMS’s social mission into the culture and curriculum of the medical school,” explains Williams. “We wanted to raise awareness about the profound inequalities in health care in the U.S. and throughout the world.”

**THE PATH TO GHD**

Before the GHD Path was created, there were several existing opportunities available for medical students to learn about health disparities. “The GHD Path is just one part of a large number of activities of the U-M Medical School and the Department of Internal Medicine focused on the care of underserved populations,” explains Williams.

Domestically in the formal curriculum, there are brief immersion experiences during years one and two, a month-long fourth year elective in Caring for the Underserved, and exposure to vulnerable populations through several clerkships in federally qualified healthcare centers in Jackson and Flint, Mich.

On a global scale, more than 60 percent of UMMS graduates were already spending some time training in low- and middle-income countries (LMIC) through established programs such as the Global Research, Education, and Collaboration in Health, or Global REACH program.

There has also been a growing interest among medical students in providing healthcare for vulnerable populations, including student groups that recently initiated a student-run free clinic in Pinckney (page 99), Mich., and independent learning experiences in urban Detroit, Mich. Other student groups have focused on revising the curriculum as a whole,
providing service in a local homeless shelter clinic (page 99), and hosting an annual symposium on global health disparities.

**THE GHD PATH**
The GHD Path was developed as a co-curriculum — complementary to, and alongside, the standard curriculum — that operates through structured, learning experiences. Students participate in a variety of educational activities on topics including social determinants of health disparities, tools and strategies to promote sustainable change, health care systems and policy, and professional and leadership development. The program includes both small group seminars facilitated by a medical school faculty member, and field projects in which students apply their knowledge and skills in caring for vulnerable patients locally and globally. “While students in the Path are interested in addressing health disparities throughout their careers, most are not yet committed to either domestic or international settings. Combining learning of both types of health disparities in a single path allows them to learn about the full spectrum of issues,” explains Williams.

The first cohort of the GHD Path began their journey in spring of 2012. Of the 29 students who completed faculty-mentored summer projects in 2012, 18 were in LMIC, and 11 were in domestic settings. Projects covered a wide range of contexts and content, including clinical interventions, medical technology, epidemiology, health services organization, medical sociology, program evaluation and medical education. Eleven projects took place in Michigan, 10 in Sub-Saharan Africa, four in Central and South America, three in East Asia and one in Israel. Six projects were sponsored in part by Global REACH.

Due to the GHD Path, student initiated activities in health disparities grew substantially during 2012, especially among the first- and second-year medical students. GHD faculty served as advisors to several groups, which helped foster open exchange of ideas and the results of ‘mini-experiments’ between students and the GHD Path. By the end of the GHD students’ second year, a total of 14 papers were planned for submission or submitted for publication, three had been accepted for publication.
The Paths Ahead

The GHD Path of Excellence was just the beginning for UMMS. Several Paths of Excellence are being developed to offer self-directed, flexible programs of study for medical students to develop the skills to become change agents and serve as leaders in the ever-changing field of health care. Other Paths of Excellence are planned in the areas of ethics, health systems organization and finance, patient safety and quality improvement.

“The Paths of Excellence are designed to move the medical school past the traditional model of teaching. We want to give the students exposure to and hands-on experience with the realities of healthcare in their communities and around the world. We want to give them the tools, resources, opportunities and goals to be able to provide leadership in these areas,” adds Williams.

The mission of the GHD Path is to “…integrate foundational, investigative and experiential learning that will prepare medical students to be agents of sustainable change to reduce domestic and global health disparities.”
INTERNAL MEDICINE IN THE COMMUNITY

Delonis Center Health Clinic

The Shelter Association of Washtenaw County offers a health clinic at the Delonis Center Homeless Shelter in Ann Arbor, Mich., which is available at no cost to individual adults in Washtenaw County who are experiencing homelessness or who are precariously housed. Dr. Williams has been the medical director of the clinic since 1990. It is staffed on Monday nights by nurse practitioners, volunteer physicians, psychiatrists, as well as residents and pre-clinical students from the U-M Medical School — including many from the Department of Internal Medicine. This experience provides pre-clinical students an opportunity to both learn clinical skills while guided by U-M faculty and residents, as well as learn about health disparities and social issues surrounding medicine.

The U-M Student Run Free Clinic

In the fall of 2012, UMMS students and U-M faculty physicians began volunteering their time to provide free primary care each week at a clinic in Pinckney, Mich., on Saturday afternoons. The U-M Student Run Free Clinic, initiated and operated by U-M medical students, uses the same location as the Faith Clinic, a free-care site for patients without insurance.

For the U-M students, the free clinic is not just a chance to give back to the community — it’s also a chance to get to learn more about opportunities to care for the uninsured and to know the administrative and business side of medicine. The UMMS Dean’s office and the Michigan Central Student Government are providing funding.

The students handle all aspects of the clinic and patient visits except for those that require a licensed physician — a role filled by a faculty physician. Patients who need more advanced care receive a referral and help in finding low-cost or free options, including through the U-M Health System’s own charity care program.

Hari Conjeevaram, MD, MSc, an associate professor of internal medicine from the Division of Gastroenterology is the lead faculty advisor to the clinic team and medical director of the clinic. Other internal medicine faculty that are part of the faculty team advising the students include Dr. Williams and Kevin Flaherty, MD, FCCP, an associate professor of internal medicine from the Division of Pulmonary and Critical Care Medicine who has been involved in the Faith Medical Clinic for several years.

The storefront, which housed Faith Medical Clinic and the U-M Student Run Free Clinic, was destroyed by a fire in February 2013 and determined to be a total loss, along with its equipment, furniture and all of the donated medical supplies. After numerous fundraising efforts, a new space was found and both clinics were able to reopen two months later in the former location of the Pinckney Community Library.
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A “physician’s physician” known for his devotion to high-quality patient care and training future clinicians, Steven E. Gradwohl, MD, died following a car accident on May 18, 2013.

He had been on the U-M Medical School faculty since 1994 and was a clinical assistant professor of internal medicine and practiced general internal medicine at the Briarwood Medical Group.

In honor of Dr. Gradwohl and his dedication to patient care, memorial donations are being collected to endow the Steven E. Gradwohl “Art of Primary Care” Award and Lectureship Fund at:
giving.umich.edu/gradwohl
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