

breakthrough

NUMBER 2 • HOLIDAY 2007

Redefining Sunset: Turning Science on Aging into Action that Helps People

Walking the Walk: Antony Rosen's Guide
to Living the CIM Playbook

Global Ties: The "Silver Tsunami" of Aging

Pass the Mustard, and By the Way...

Teaching Doctors to Care More

Proteomics: Reading Life's Ticker Tape

Medicine is a public trust
THE JOHNS HOPKINS CENTER
FOR INNOVATIVE MEDICINE

breakthrough



David B. Hellmann, MD., M.A.C.P.
Aiki Perroti Professor of Medicine; Vice Dean, Johns Hopkins Bayview Medical Center; Chairman, Department of Medicine

WORTHY RISKS

Happy Holidays! With this, our second issue of *Breakthrough*, we celebrate worthy risks, and those who take them – our scientists who are trying new approaches, techniques, and ideas, and some extraordinary philanthropists who have helped make their risk-taking possible. The whole focus of these worthy risks is helping patients, making their lives better, and giving them hope. As a member of our Center for Innovative Medicine advisory committee, Landon S. King, M.D., puts it, “It’s all about the patient.” Those five words mean everything to us.

At Johns Hopkins, philanthropy has always played an important role in allowing doctors and scientists to step off in new directions to help patients. In fact, more than a century ago, it was funding from the Rockefeller Family that helped establish the Hospital’s first full-time faculty. Over the years, private philanthropists, unburdened by the restraints the government must bear, have served as a lifeline to scientists and ideas – particularly, young scientists, and those with ideas for novel, high-return projects. Without their support, it is clear that Hopkins would not have flourished as it has over the last 118 years.

Early science – an idea in its fledgling stages, or even a new investigator just starting out – is often best supported by private philanthropy, with judgment and critical review by an institution’s senior leaders and mentors. Unfettered by the bureaucracy and budgetary constraints of government funding – the inevitable workings of a huge agency – these “venture capital” research studies allow for more flexibility and facilitate rapid turnaround.

The generosity of private donors also saves the day in the lean times, maintaining support at times when the federal budget for research science shrinks – which happens once a decade or so. Most recently, after a period of record growth, during which many new physician-scientists launched research careers, the government’s budget contracted sharply. The hope for many of these young scientists now comes mainly from private funding, from donors who see the value in keeping these promising investigators in academic medicine.

These donors have done much to advance the vision of the Center for Innovative Medicine, and we are so grateful. Their gifts provide physicians and scientists with income and free them to think and try new things; they play a critical role in launching young careers and making new directions possible.

Worthy risks. I hope you will read this issue of *Breakthrough* with a sense of ownership. Our success at helping patients, by changing the focus of academic medicine, is yours, too. Not only have you helped make it possible – without you, we couldn’t do it.

David B. Hellmann, M.D.

3

**Redefining Sunset:
Turning Science on Aging into Action
that Helps People**

Seniors are changing kids’ lives, and their own. Staying stronger, sharper, healthier and happier.

**Walking the Walk:
Antony Rosen’s Guide to Living the
CIM Playbook**

First, find the brick walls. Get great people talking. Keep the focus on the patient.

5

7

**Global Ties:
Tackling the “Silver Tsunami” of Aging**

A vast tide of people, all getting older at once, 143 million of them in China.

**Pass the Mustard,
and By the Way...**

Doctors and nurses, just sitting around and talking over sandwiches, achieving spectacular results.

9

- 11 Teaching Doctors to Care More
- 13 Proteomics: Reading Life’s Ticker Tape
- 15 Finding the “Balanced Life” Lane
- 17 How We Got the Cell Sorter: A “Loaves and Fishes” Tale

WE BELIEVE

Medicine belongs to the public. Our mission is to create a different kind of academic medicine, to tear down ivory towers, share knowledge and dedicate ourselves toward one goal – making life better for patients.

CO-FOUNDERS

David Hellmann, M.D.
Director
Richard Paisner, J.D.

COMMITTEE

S. Chris Durso, M.D.
Melissa Feld
Linda Fried, M.D., M.P.H.
Landon S. King, M.D.
Steven Kravet, M.D.
Thomas Malstrom
Richard O’Brien, M.D., Ph.D.
Cynthia Rand, Ph.D.
Donna Regenstreif, Ph.D.
Annabelle Rodriguez, M.D.
Antony Rosen, M.D.
Elaine Sparks, M.S., R.N.
Janet Farrar Worthington
Scott Wright, M.D.
Roy Ziegelstein, M.D.

BREAKTHROUGH is published by The Johns Hopkins Medical Institutions, Baltimore, MD 21287-2101.

Director: David Hellmann, M.D.
Writer/Editor: Janet Farrar Worthington
Design: Claude Skelton Design

on the web

If you’d like to learn more about the Johns Hopkins Center for Innovative Medicine, please visit our website: www.hopkins-medicine.org/innovative

Redefining Sunset: Turning Science on Aging into Action that Helps People

Too many people reach what the French call “a certain age” – in this case, usually retirement age – take stock of their lives, and wish they could be doing more. Linda P. Fried, M.D., M.P.H., Director of the Division of Geriatric Medicine and Gerontology, co-founded the Experience Corps (see side story) nearly a decade ago because she didn’t like what she saw happening to many of her patients, who had recently retired, “and whose major medical problem was that they had no reason to get up in the morning.”

“It was quite serious,” she says. “There was a lot of depression, hopelessness, and unhappiness.” Some of it, she continues, was “because they hadn’t really been able to make the contributions in the world that they wanted to. I designed this to create ways for our aging population to meet those very deep personal needs.” The Corps model, which has spread to cities across the country, does many good things at once; particularly, it helps young children who are at risk of doing poorly in school. “If young children are not succeeding in school, they’re tracked for long-term failure. We wanted to concentrate the experience, knowledge and time of seniors to ensure the success of these children.”

Potential to prevent frailty. Also hidden within the design of the Experience Corps was scientific knowledge about what might prevent frailty and loss of independence: Give seniors meaningful work, the opportunity to be productive and to make a difference. Keep them active physically, mentally, and socially, and they do better.

What is frailty? Fried should know. She’s the pioneer in this field, the scientist who figured out that frailty is its own entity, and that the idea of a feeble old person is a stereotype. Some people do, indeed, become frail – but some don’t, or manage to delay showing signs of frailty for years or even decades. What’s different about these people, who seem to be more hardy? Exercise isn’t always the magic bullet; some people who jog faithfully, for example, become just as frail as those whose main exercise is the trip from the couch to the refrigerator.

Why do some people seem to be more hardy? Exercise isn’t always the magic bullet. Some people who jog faithfully become just as frail as those whose main exercise is the trip from the couch to the refrigerator.

“It is likely that all people, when they get quite old, will develop frailty,” notes Fried, “but the issue is *why*, and what causes it, and what explains the fact that some people become frail quite prematurely – in their fifties, not their nineties – and whether there’s an opportunity to prevent this. I’ve been working for almost 20 years to try and understand this.” She has made considerable headway in determining how to recognize frailty, and defining its physiologic changes. Over the next five years, she hopes to understand its underlying causes.



“Some of it is genetic, and some is deeply biologic,” she explains, “relating to how our body produces energy, and how its many regulatory systems change as we age. Perhaps, when they reach a threshold level of change, our reserves diminish.” Stress makes all of this worse.

Frailty is not the same thing as disease, Fried cautions. “It is a very physiological and biological set of changes which are aging-related.” Several diseases, including congestive heart failure, chronic obstructive pulmonary disease, and AIDS, seem to kick off the frailty syndrome, and frailty appears to be an end stage of those diseases.

CONTINUED ON PAGE 18

If you’re at least age 60, able to read, have some time on your hands, and are willing to undergo some training, you may be able to make a huge difference in the lives of children who could use all the help they can get. You may even improve your own health, to boot.

Welcome to the Experience Corps, where a “critical mass” of around 20 older adult volunteers spends at least 15 hours a week in one public elementary school, sharing their experience, wisdom, and energy with needy children, in kindergarten through third grade. The Experience Corps’ co-founder is geriatrician and epidemiologist Linda P. Fried, M.D., M.P.H., Director of the Division of Geriatric Medicine and Gerontology. So far, the Corps has spread to nearly 20 cities, with the help of a nonprofit corporation from San Francisco, called Civic Ventures.

The project, brought back to Baltimore in 1998, was one of those great ideas that instantly took off, and showed promising results right away. There are health benefits to seniors: In many studies, Fried and colleagues have shown that volunteers in the Corps do better mentally, on cognitive tests; physically, in terms of strength and walking speed; and socially – making new friends, people they can turn to for help. They’ve made new connections – on the very small level, in the brain’s neurons, and on the very large level, spanning generations, sharing their wisdom, doing a lot of good. They’re more active, and they burn more calories

What about the kids? In one initial study, of 1,194 children in kindergarten through third grade from six Baltimore elementary schools, third graders who participated in the program had significantly higher scores on a standardized reading test than children in the control schools after one year; and participating kindergarteners did better in recognizing their alphabet letters and in vocabulary skills. The children behaved better, too; trips to the office for acting up in class dropped by about half in participating schools, but remained unchanged in the control schools. CONTINUED ON PAGE 18

Walking the Walk: Antony Rosen's Guide to Living the CIM Playbook

So here's this Center for Innovative Medicine, and it's doing new, unexpected, and really creative things. You've been part of it from its start three years ago, and even helped draft its mission statement. You believe that this is how academic medicine should be, and you want to do more. What do you do next? You put your money where your mouth is. And this is exactly what Antony Rosen, M.D., the Mary Betty Stevens Professor and the Director of the Division of Rheumatology, has done. He's taken the core goals of the CIM, and reshaped his division to model them. It hasn't always been the proverbial piece of cake – change always requires some adjustment – but it has already started to reap some remarkable rewards. “It has been a worthwhile effort,” he says. Here's a glimpse at how he did it.

1.

First, find the brick walls. “We had to identify barriers within the division that were preventing people from doing what's so obviously the right thing to do – to collaborate, and to focus on issues that are most relevant to improving our patients' lives. If it's so obvious, why don't people do it more?”

Barrier Number One, Rosen says, is that “people tend to stay within their comfort zones,” and are reluctant to admit it when they don't know something. Rosen has worked hard to provide opportunities “where asking a question which may appear stupid is actually rewarded and embraced. People asking the questions feel less inhibited, because the atmosphere is less formal. But more, they develop a comfort in answering and answering questions.”

2.

Got great people? Get them talking. “We have people who are outstanding, and several who could collaborate. But unless they actually get together and talk about problems, you never get anything happening.” Rosen has used the proverbial one stone to kill two birds by instituting multidisciplinary grant reviews that mimic National Institutes of Health study sessions. At many institutions, the grant-applying process

“We want it to become second nature, that when people think about what they're doing, they think about the patients.”

can make some investigators feel very alone. But not in Rosen's division; instead, an investigator has a team of mentors offering supportive criticism, honing specific aims, tightening the scientific hypothesis, or helping focus the preliminary data. As a bonus, “this has greatly improved the way our proposals have been received when we go for formal review at the NIH.”

3.

Smooth the road. Actively look for the potholes and rough patches. “Our environment requires that *individuals* succeed, rather than groups. This really isn't a good way to recognize scholarly contributions if many people are involved.” Say a great idea comes out of a discussion. Who's the first author? Who owns the idea? What happens if a technology develops – who gets to take it to the next step? These worries squelch collaboration, Rosen states; instead, “people tend to keep their ideas to themselves; they don't share freely.” They worry about the next grant, the next paper, the next invited lecture. Rosen has set up monthly sessions for the next six months, each to resolve one set of principles, “so the same rules will apply to everyone. People are always worried about who's going to steal something, but somebody's got to give first. Generosity's got to go both ways, and it requires repeated interactions. If everybody agrees, over time, everybody will benefit.”

4.

Keep the focus on the patient. “We are all good at saying we're interested in human disease,” Rosen says. “But when you're involved in a small area of research, you lose the focus on the patient – not out of malice, but habit. We're working to instill a different kind of habit.” For every scholarly interaction – journal club, rounds, research conferences – the last few minutes are devoted to what Rosen has named the “Pathway to Patients” program. “How does this research apply to a particular disease? We want it to become second nature, that when people think about what they're doing, they think about the patients.”

Rosen credits the private support he has received, from philanthropists Esther Pearlstone, Hugh Cosner, and David Lowe, for helping to nurture his own research career, recruit good faculty and help sustain their research, and also for giving him this opportunity to focus on collaboration. “Getting people to work together is a whole lot easier if you have the resources to make it happen.”

Global Ties: Tackling the “Silver Tsunami” of Aging

Scientists working with aging call what’s happening a “silver tsunami,” and for the world’s population, that’s what it is – a vast tide of people, all getting older at once. About 143 million of them are in China. In the United States, our tide of aging is much smaller – around 78 million in the “Baby Boom” generation born just after World War II – but it’s a huge percentage of our population, about 27 percent.

In an exciting new partnership, Johns Hopkins Bayview faculty from the world-renowned Division of Geriatric Medicine and Gerontology have joined forces with Chinese colleagues to establish a geriatric medicine program at the Peking Union Medical College (PUMC), China’s flagship medical institution. The Beijing hospital, considered the “Hopkins” of China, is indeed a sister institution – founded in 1917 by the Rockefeller Foundation (which also has been a significant supporter of Hopkins over the years), and based on the Hopkins model. Two distinguished Hopkins pathologists, William Welch and Simon Flexner, even sailed overseas for the opening ceremonies. The two institutions lost touch for several decades after the Communist takeover of China in the late 1940s, but the doors are open again and the academic medical siblings have been reunited.

A big link in this cross-cultural chain is geriatrician Sean Leng, M.D., Ph.D., who trained and was on the faculty at PUMC before coming to the United States to study immunology, molecular biology, and geriatric medicine. He became interested in geriatric medicine while watching his father struggle with dementia; after seven hard years, Leng’s father died at age 89. Several years ago, on a trip back to China to visit his mother, Leng talked with some of his former colleagues at PUMC about the country’s aging population. The Chinese government had begun to recognize this issue, had set up the China National

Committee on Aging, and had decided to build a senior care center at PUMC. “PUMC, just like Hopkins, has very strong specialties,” says Leng. “But they didn’t have a geriatric medicine program.” The idea of starting one with help from Hopkins took hold.

Back at Bayview, Leng met Jerry Lazarus, Director of Dermatology, who had worked for several years in China with support from the China Medical Board of New York, a foundation that supports health care initiatives in Asia. Lazarus and Leng took the idea to the Board’s director, who liked it. Leng wrote a proposal and hammered out the details with officials at PUMC. He obtained funding of nearly \$1 million for four years, part of which PUMC has agreed to match, to help train China’s first specialists in geriatric medicine, enable exchange visits and conferences, and seek to establish other collaborative efforts related to aging research. “This is a family reunion of two great institutions,” says David B. Hellmann, M.D., the Alike Perroti Professor of Medicine, “and a great example of the Center for Innovative Medicine’s goals – focus on the patient, collaboration, and wise use of technology – in action, except the collaboration is not between departments, but on an international level.”

Among the big challenges facing the Chinese is how to pay for care. “When I was growing up in China, everything was taken care of by the government,” says Leng. “You didn’t need to pay, although the health services were bad. This is why many Chinese physicians have good skills at taking the patient’s history and doing physical exams – because they had to rely on their hands and eyes. If you were lucky, you might get a chest X-ray. Now, the majority of people pay out of pocket,” although a few employers offer health benefits.

Also, who will provide care? There aren’t many senior care facilities in China, mainly because of the “traditional Chinese value that elderly parents and grandparents are cared for by their adult children at home,” says Leng. “But that is

changing.” Now, China’s one-child-per-family policy is resulting in an inverted pyramid, Leng explains. “Soon, one young couple will have to shoulder the burden of caring for four parents, plus their grandparents.” A large, migrating work force presents other problems. “People from rural areas want to make a better life, so they migrate into the cities to do temporary jobs.” On a recent visit to his mother, Leng saw few people in the younger generation left in their small town to care for their elders. “The ones who can work have all migrated.”

China’s one-child-per-family policy is resulting in an inverted pyramid. “Soon, one young couple will have to shoulder the burden of caring for four parents, plus their grandparents.”

Daunting problems that will need creative solutions. Leng hopes some day to expand this international collaboration to help provide quality senior care in China, and “also opportunities of learning from each other, so that we will benefit from them, as well.”

Pass the Mustard, and By the Way...

It didn't take much – just sitting around and talking over a few sandwiches. Sharing lunch and sharing stories. But the results of these team-building lunches between doctors and nurses have been dramatic: Since the lunches began in 2003, daily contacts between doctors and nurses – a quick question here and there, an idea about a patient – have doubled. Nursing turnover has been cut in half, and nursing vacancy has been cut by about nearly two thirds.

It's such a simple thing, meeting for lunch once a week. But it's also a commitment – to making care better for patients, but also to improving communication between doctors and nurses. As with any worthwhile relationship, an investment of a little time reaps big rewards. "This started as an idea to foster collaboration," says Steven Kravet, M.D., Deputy Director of Clinical Activity in the Department of Medicine. "Especially, we wanted the nurses to feel more invested, that they were full partners in the care of patients, that their role was to advocate for the patients. We wanted them to feel confident to do that, and to bring forward their expertise. It was a proactive attempt to do what we thought was right, and we've solved a number of problems, just by meeting in an informal way."

One result of the lunches: A home-grown, web-based sign-out system for doctors that may even be marketable to other hospitals.

The issues they've tackled have been big and small. Over the years, the doctors and nurses have created a log system to keep track of patient charts, gotten some thermostats fixed, bought two shredders, dealt with issues of patient food quality and the smoking policy, and analyzed the way inpatients receive medication. They've instituted a multidisciplinary patient safety conference, and now doctors and nurses regularly visit units throughout the hospital together, talking with the staff and patients. The residents have begun giving a yearly award to a nurse in the Department of Medicine, and the nurses come to the doctors' annual retreat. The lunches have also brought forth an orientation program to ease the transition of new interns.

Most recently, they have developed a home-grown, web-based sign-out system that allows doctors on call to pass on critical information about their patients to doctors who cover for them from shift to shift, tells nurses which doctor is covering at any time for any patient on the service, and provides a link to the physician's text pager.

"The limits on work duty hours for residents have forced us to have less continuity in care, and more handoffs," says Kravet. "It's a systemic problem across the nation. It also makes it much more difficult to know who's covering a patient at any given time." Kravet believes this system is unique, and potentially even marketable to other institutions. "I don't think other hospitals are using anything as sophisticated as this." He hopes to expand the system for use in other disciplines. "The same issues exist for surgeons and pediatricians; their sign-out systems are not web-based." Instead, doctors rely on sending Word files back and forth to each other, using e-mail, and the nurses don't always have access to these files.

The teamwork lunches are now very structured, says Kravet, with brainstorming sessions, voting on initiatives, and identifying new projects. The nice part about it is that it just works in the flow of their day." Everybody needs to eat lunch – even doctors and nurses in a busy hospital. "It's helped them learn more about each other as people, rather than just as co-workers."

Roy Ziegelstein, M.D., Associate Program Director of the Residency Program in Internal Medicine, spends much of his time teaching residents to be better doctors by helping them to care more. The way medicine is practiced today often makes this an uphill struggle, he says. “Everyone is burdened for time. Medicine is so fast-paced now.”

Two decades ago, Ziegelstein, who is also Executive Vice-Chairman of the Department of Medicine, was a Hopkins medical resident. In some ways, the system back then was better; patients stayed in the hospital longer, which gave their doctors – who as interns and residents practically lived at the hospital – much more time to spend with them. “But we only got to know one part of them very well: their existence as an inpatient. Nobody knew my patients better as inpatients than I did – not the attending, not even the family. But I never really understood what happened after they left the hospital. There was no link to the rest of that person’s life.”

Today’s limits on duty hours promote more of a shift mentality in residents. There are more handoffs of care, combined with dramatically shorter lengths of stay. Patients seem to be in and out of the hospital in a whirlwind, with “more things being done to them” in half the time, Ziegelstein comments. “There’s far less time for communication.”

The Aliko Initiative: So how do you teach caring in a whirlwind? One way is slow down the pace. Thanks to philanthropist Aliko Perroti, as part of the Center for Innovative Medicine, this is now happening at Bayview. The Aliko Initiative – the nation’s first effort to change medical education by changing the system, and allowing time to focus on personal care – has several key features (for more, see Fall 2007 *Breakthrough*, or our website: www.hopkinsmedicine.org/innovative):

- Fewer patients for each doctor, so the doctor can devote more time with each one.
- Doctor-patient relationships that don’t end when the patient is wheeled out of the hospital.
- Evidence-based medicine, providing treatment that has been proven to work.
- Wise use of technology.
- Patients report how well their doctors did.



The Aliko Initiative is named for Mrs. Aliko Perroti, seen here with Johns Hopkins University President William R. Brody, M.D.

“Mrs. Perroti is allowing us to buy time,” says Ziegelstein, by giving the residents on one team half the number of admissions. Residents will spend the extra time calling their patients who have left the hospital, to find out how they’re doing. They will call every patient’s next provider of care, and keep a long-distance eye on the patient. They’ll go with some patients on their first post-hospital visit to their primary care doctor. With other patients, the residents will go to the pharmacy, “to try to get a sense of out-of-pocket costs of medicines, and what the barriers might be for patients to follow their treatments. Generally, there are reasons why people don’t get prescriptions filled,” and some of them are poignant. Some people skimp on pills around the holidays, for example, so they can buy presents for their grandchildren. Others can’t get the medicines they need because they simply can’t get to the drugstore.



“If we don’t teach them the skills now to understand the patient in the whole context outside the hospital, we’re doomed. Because the combination of not learning the skills plus the shortened time means we will never understand our patients. Period.”

If not now, then when? “Our hope is that we can help foster, nurture and develop attitudes of caring that will be reinforced in these young doctors later, in their practice,” says Ziegelstein. “If we don’t teach them the skills now to understand the patient in the whole context outside the hospital, we’re doomed. Because the combination of not learning the skills plus the shortened time means we will never understand our patients. Period.”

Roy Ziegelstein is able to do what he does in large part because he’s The Miller Scholar. In his other life, he’s a cardiologist, and an excellent one. He could spend his time just doing that; instead, he’s been able to do much more – to focus on projects like the Aliko Initiative, for example. “The support from the Millers has allowed me the protected time to pursue things that I might not otherwise have been able to pursue,” including research on emotional health and how it affects people with illness, especially heart disease. “One of the best ways of being able to detect whether a person with medical illness has emotional illness is by talking to them and really getting to know them as a person.” It has also allowed him to teach communication skills to medical students and residents. “Ziegelstein is also the director of a new curriculum for fourth-year Johns Hopkins medical students called Transition to Residency and Internship and Preparation for Life. “The Millers have helped me focus my career on helping young doctors to communicate better, put the patient first, and develop a caring attitude towards their patients.”



Roy Ziegelstein is the Miller Scholar, and here is the Miller family. From left: Richard Worley, G. Thomas Miller, Leslie Miller, Anne G. Miller, Sarah Miller-Coulson, Frank Coulson.

Proteomics: Reading Life's Ticker Tape

The story of what's happening in your body at every second is written in protein. If you were to have a heart attack, for example, certain proteins made only by the heart would appear in your blood. If you had a chronic illness, snapshots of key proteins in your blood would vary, depending on whether or not the disease was active or in remission. The bloodstream is like a ticker tape – if only we could read it.

Jenny Van Eyk, Ph.D., directs the Bayview Proteomics Group and the Hopkins NHLBI Proteomics Center; she also is on the faculty in cardiology, biological chemistry, and biomedical engineering. She and her colleagues have learned to read many such stories, told by the proteins produced by genes, and to recognize some proteins even when they're in disguise. If DNA is a giant script, proteins are the actors that bring it to life – except the script is always changing, and these tiny actors have many costume changes, and appear in multiple forms.

Van Eyk is a world-renowned expert in the fast-growing field called clinical proteomics (for a brief explanation, see side story); in fact, she has written the first textbook on the subject. A large part of what she and her colleagues do is develop biomarkers – identifying one specific protein, or a modified protein, or a group of proteins. The markers can be diagnostic, to determine a patient's condition, or prognostic – scientific crystal balls, in effect, that can predict what may happen in a person who is at risk. They may even be used to monitor how well a medication is working.

A large part of what she and her colleagues do is develop biomarkers – identifying one specific protein, or a modified protein, or a group of proteins.

Let's go back to our heart attack example: Say a man is shoveling snow, develops chest pain, and comes to the emergency room. Currently, a blood test that looks for a specific heart protein can tell whether heart muscle has died. "But we're trying to make a series of diagnostic windows ahead of that," Van Eyk explains. "Maybe the cells aren't dying, but they're injured. It would be good to find a set of markers so you could diagnose and treat this early, and save the heart." Even better would be to develop a test that the average medical laboratory could use before the event happens – to predict whether someone is about to have a heart attack or stroke – by telling whether plaques in the arteries are in bad shape, for instance.

How do you figure out what's a normal picture, or protein fingerprint, and what's not? Van Eyk and colleagues use vast cohorts of blood samples to answer these questions. "It's a huge amount of work," she says. And there aren't many people who can do it well. Van Eyk is director of one of 10 centers funded by the National

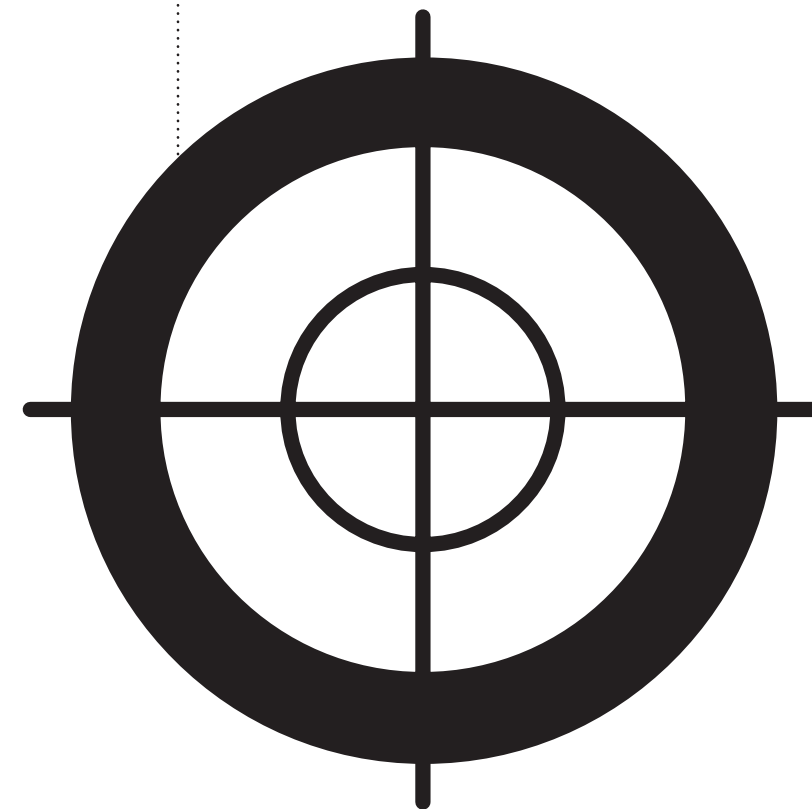
Heart, Lung and Blood Institute, the Hopkins NHLBI Proteomics Center. The contract, which has a focus on ischemic biomarkers, funds 10 principal investigators.

Van Eyk and colleagues are also looking at tissues for mechanisms underlying disease – taking apart cells, scrutinizing them for changes, quantitating them, and trying to understand the functional implications of those changes. "When you're looking at hundreds of proteins, you get a broad view of what's going on," says Van Eyk. "You see how the cell talks to itself, and you uncover things that no one ever knew." The Proteomics group collaborates with and trains scientists from throughout the world. "When we address a question, we either have the tools to do it, or we build them." When they find new diagnostic markers, they work with pharmaceutical companies to take them into the clinic.

"Jenny is an international thought leader," says David B. Hellmann, M.D., the Alike Perroti Professor of Medicine. "What she is doing is great science." Hellmann helped recruit Van Eyk from Queen's University in Kingston, Canada, nearly five years ago. "The only way we were able to get her was with the generosity of Dan Amos," whose philanthropy funded Van Eyk's lab, and some of its expensive equipment. "She is a fine example of the Center for Innovative Medicine's goals: She brings people together, scientists and physicians in many different disciplines, all to help patients have a better chance of overcoming disease, or even preventing a major episode of illness."

Van Eyk believes that she and her colleagues are making a huge difference to science as well as patient care. "If I do my job right, I think how medicine is practiced in 10 years will be different."

The short answer to this question is that it's really, really complicated and involves very sophisticated machinery. But in a nutshell, proteomics involves taking a sample of proteins in the blood, or in a few cells, and shining a powerful laser at it. The laser hits the proteins, smashes them, throws them onto a screen, and where they land is an indication of their size. Lighter bits get thrown further than heavier ones. Each protein thus makes a unique fingerprint. Each disease shows different protein fingerprints. But these protein fingerprints also mark time – each stage of a disease is slightly different. Imagine what a gift it would be to diagnose cancer at its earliest stages, years before symptoms develop – when it is most curable.



Finding the “Balanced Life” Lane

Generosity in Action

Yogi Berra said, “If you get to a fork in the road, take it.” But some roads shouldn’t have to fork. Nearly four years ago, Cynthia Boyd, M.D., M.P.H., a promising young geriatrician, was someplace she didn’t want to be – at a career crossroads that looked like a bad multiple choice test.

Her problem: She and her husband, both Hopkins physicians, had a newborn son. She wanted to spend more time with the baby. But in academic medicine, the years right after residency and fellowship are the “make-or-break” career development years, where a fledgling physician-scientist has to crank out research, prove national competitiveness, and get NIH funding. These also happen to be the prime family-starting years, and for women – and to some extent, men – who want to have children, this is a difficult conflict.

“I wanted to be around for my son, and see him while he was awake,” she says. Her options: A. To do as many women in academic medicine have done, remain on the job full-time, and try to make the most of nights and weekends with the baby. B. To do as many other women in her shoes have done – give up her research, which she loved, quit academic medicine, and try to find a part-time job in practice, or moonlight in emergency rooms at night and on weekends. There was no “None of the above.” As David Hellmann, M.D., Chairman of Medicine, comments, “In academic medicine, there’s a fast lane, and there’s the off ramp. For people who want to start families, there is no ‘balanced life lane,’ and this needs to change.”

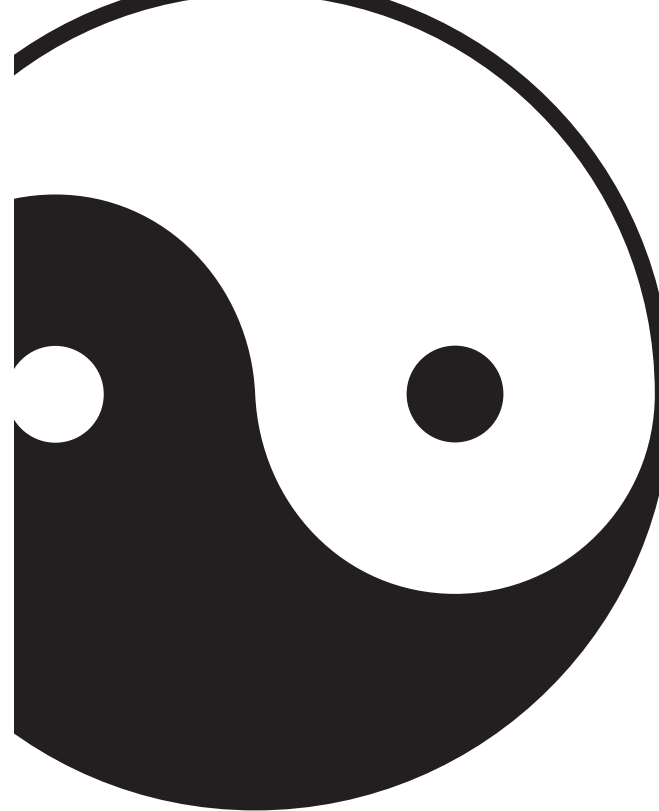
“I didn’t want to make an all-or-nothing choice,” Boyd says. “I explored a lot of avenues, looking for other ways to do this, grants that would let me be less than full time.” The National Institutes of Health offers re-entry grants for physician-scientists who have left academic medicine and want to return. “But what happens if you don’t want to leave completely? What happens if you just want to slow down?” Boyd felt that her research was important, and she didn’t want to give it up. With a small academic nest egg – about a year’s worth of grant funding that would support her research time – she made the decision to cut back to part-time, and stepped re-

“In academic medicine, there’s a fast lane, and there’s the off ramp. For people who want to start families, there is no ‘balanced life lane,’ and this needs to change.”

luctantly into a Catch-22 situation. “The way you get time to do research is if your time is funded. As a part-time employee, I was not eligible for grants I could otherwise have been applying for. It was a very tenuous, vulnerable position.”

Then came a savior – a donor, who wishes to remain anonymous, who saw the potential in Boyd’s work, didn’t like the system, either, and had the means to offer a change, in the form of a Bayview Scholarship. The donor’s support paid for Boyd to work part-time, continue her research, and still spend time with her son – and his baby brother.

“This Bayview Scholarship accomplished three great things,” notes Hellmann. “First, a talented scientist was able to stay on the faculty doing research. Second, her research has produced new ideas that are improving the care of older people, and third, this helps change the culture, to place a value on work-family balance.” And yet, he adds: “What it does not do is solve the larger



problem. This donation was only for three years, and only for one person. There are more men and women out there facing these same choices. We would like to give them this option, as well.”

Right now, Cynthia Boyd’s balanced-life lane is pretty empty; in fact, she’s the only driver, but like Hellmann, she hopes other clinician-researchers will be able to share this experience. “I cannot tell you what it has meant,” says Boyd. “This has been an unbelievable gift. Without it, I don’t think I would still be here.” With the grant’s support, Boyd developed collaborations, published papers, and built an impressive track record that will make her competitive for more grants when she eventually returns to full-time work. Her groundbreaking work on clinical practice guidelines has gained her national recognition.

“Cynthia is now the sole candidate from all of Johns Hopkins to be nominated for the prestigious Robert Wood Johnson awards,” notes Hellmann.

Boyd’s research into an unrecognized area of need began when she was a fellow, and noticed that the medical framework for caring for patients was based on single diseases. But unfortunately, most older people don’t just have one health problem; many have several things wrong at once, with different doctors treating each condition – often prescribing different medicines

that interact. “Clinical practice guidelines are a method of synthesizing the evidence, and they very much follow the single-disease pattern,” says Boyd. “How do we move from a single-disease perspective to one that incorporates all the conditions, and the patients’ wishes and priorities for their own health and lives? How do we manage their health in a perspective that’s thinking about the complex interactions of conditions? How should we take care of people?”

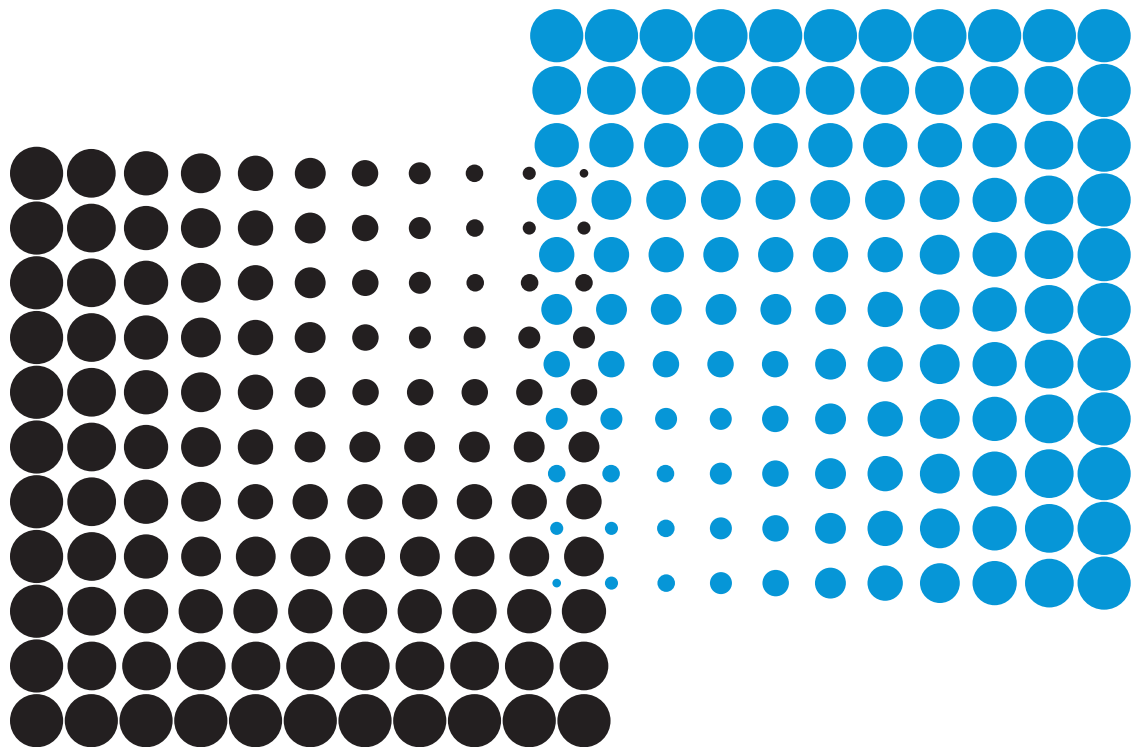
It may be, she adds, that one person with several different diseases would choose a more aggressive treatment plan than someone else with the same diseases. Making matters more complicated is the health care system itself. Managing patients with complex needs takes more time, and “our health system reduces that cognitive work, reimburses it less well than if we focus on one disease at a time and ignore everything else.” And yet, complicated patients end up costing all of us. Boyd notes that 50 percent of Medicare beneficiaries who have three or more conditions use 90 percent of Medicare’s annual budget. “There is a huge public health initiative,” she says, “to figure out how to manage patients with multiple diseases better. Not only for physicians, but in the way we train our physicians, for the patients and their families.”

Boyd, thanks to the support of her donor, is serving as a role model for young physicians in another important way. She spends at least one full day a week at home with her sons, and every other week, it’s a day and a half at home. “It’s really been great for me, and for the students, residents and fellows we’re training – who don’t want to be making all-or-nothing choices. People need to see that it can be done, and it works.”

How We Got the Cell Sorter: A “Loaves and Fishes” Tale

The Bayview Flow Core has a brand new, highly sophisticated, very expensive piece of equipment called a cell sorter, one of only a handful in the country. And how it got this powerful instrument – which boasts four lasers and can examine many individual cells, or zero in on specific types of cells very quickly – is a remarkable story of philanthropic leverage.

One reason that machines such as this are so few and far between is that they cost about half a million dollars. But the National Institutes of Health have something called a shared instrument grant. When the NIH see a group of talented scientists from several divisions – in this case, a critical mass of junior and senior investigators from the fields of allergy and immunology, rheumatology, pulmonary medicine, and geriatrics – who can work together to share a big-ticket piece of equipment, they look more favorably on providing the funds to buy it. But even better, from the NIH’s point of view, is when the institution asking for this instrument shows that it’s able to provide the upkeep, and fund the salaries of the skilled technicians needed to keep it running. The NIH want evidence of supporting infrastructure, to show that such an instrument will be able to live up to its mighty promise – that this will be a good investment.



“We can look at the lymphocytes isolated from a lung, or the blood, or an arthritic joint, and say: ‘There are 20 different populations of cells in here. Which of these is really causing the problem?’”

And this Bayview was able to show, in spades, thanks to the gifts of two philanthropists, who each gave \$50,000. “Core resources are the ‘loaves and fishes’ parable applied to medical research,” says David B. Hellmann, M.D., the Aliko Perroti Professor of Medicine. “We were able to leverage the generosity of these donors, and buy a \$500,000 machine that will let us do groundbreaking research on allergy, lung disease, aging, and autoimmunity – which, in turn, will lead to more questions, and answers, and grants.”

The cell sorter, called the FACS Aria, will be used to examine the intricacies of the immune system, says Mark J. Soloski, Ph.D., Professor of Medicine, and the principal investigator on the shared instrument grant. For example: “We can look at the lymphocytes isolated from a lung, or the blood, or an arthritic joint, and say: ‘There are 20 different populations of cells in here. Which of these is the one that’s really causing the problem?’” The machine can look at between 50 and 100 patient samples in just one hour. After it pinpoints suspicious cells, the scientists can get to work on those cells in the lab, Soloski explains, “to see if we find ways to eliminate or control them.”

Much of Fried’s work, and the work in her division, begun by her predecessor and mentor, the great clinician John R. Burton, M.D., has been to foster translation from the lab to the community. These efforts were made possible in part by funding from philanthropist Hugh Cosner. “The Cosner



Mr. and Mrs. Cosner

support has made it possible to invest in the creation of all of these bridges, between scientist and doctors, and between scientists and the community,” Fried says.

There is still so much we don’t yet know about frailty. For example, will we age as our parents did, and will our children age as we are aging? Today’s seniors came from a generation, after all, that drank a lot of martinis, smoked a lot of cigarettes, and ate a lot of red meat. They also got sick a lot as children, didn’t get vaccinated, and didn’t take a lot of vitamins – but their children have taken vitamins and had many more shots. Will the same thing happen to them? Some of Fried’s colleagues are investigating whether later generations are becoming healthier. Wouldn’t that be nice?

Are there cultural differences? Do people from other countries, who eat different foods, drink more green tea than water or soda, but who are exposed to different diseases and have different health care, develop frailty just as Americans do? There is huge potential for exploration in this field, and great opportunity, as Fried says, “to make a real contribution to the public’s health.”

CONTINUED FROM PAGE 4 **Fried sees seniors as a precious community resource of untapped potential, and this program – and similar ones she hopes to develop – as pure hope. On a national level now, the Corps is improving the lives of urban children, and improving the health of older people, allowing them to remain socially engaged and productive. If even a few of the children reached by these seniors graduate from high school instead of dropping out, she adds, all of us will benefit.**

The program is also funded with the help of the Corporation for National Service, the Weinberg Foundation, the City of Baltimore, and the Baltimore City Public School System.

FRIENDS

OF THE JOHNS HOPKINS
CENTER FOR
INNOVATIVE MEDICINE

Mr. and Mrs. George Aidinis
Mr. Aristidis Alafouzos
American Legacy Foundation
Mr. Daniel P. Amos, Daniel P. Amos
Family Foundation
Mr. and Mrs. Paul Amos, Paul and
Courtney Amos Fund of the Community
Foundation for Greater Atlanta, Inc.
Anonymous
Mr. and Mrs. Charles R. Ballard, Jr.
Mrs. Joan Carl and Mr. Bernard Carl
Dr. Christopher J. Conners
Mrs. Eleanor Conners
Mr. and Mrs. Hugh C. Cosner
Mrs. Sarah Miller Coulson and
Mr. Frank L. Coulson, Frank L. and
Sarah Miller Coulson Foundation
Mr. and Mrs. Michael J. Davies
Mr. and Mrs. Brian Finn
Mr. Leonard S. Fiore, Sr. (dec.)
Mr. Seth E. Frank, Georges Lurcy
Charitable and Educational Trust
Mr. and Mrs. William Gooch
Mr. and Mrs. William O. Goodwin

Dr. Sidney Harman, Harman
International Industries
Mr. George T. Harrison (dec.)
Mrs. Wilhelmina C. Holladay and
Mr. Wallace F. Holladay, Sr.
Mr. Christos D. Lambrakis
Stanley M. Levenson, M.D.
Mr. and Mrs. Adam M. Lewis
Mr. and Mrs. David L. Lowe
Mr. and Mrs. Edgar L. Lowe, Edgar L.
Lowe Family Trust
Mrs. Anne G. Miller and Mr. G.
Thomas Miller
Mrs. Leslie A. Miller and Mr. Richard
B. Worley, Miller-Worley Foundation
Mr. and Mrs. George Miron
Mr. Melvin C. Muntzing
Esther S. Pearlstone, The Pearlstone
Fund, Inc.
Mrs. Aliko D. Perroti
Mr. Max S. Pudelkewicz and Family
Mr. Robert R. Rosenheim
Mr. and Mrs. Mark E. Rubenstein
Mr. and Mrs. Charles H. Salisbury, Jr.
SonoSite, Incorporated
Mr. and Mrs. Richard L. Storch
Mr. and Mrs. Richard D. Thurman
Mr. Dimitris H. Varvatsoulis
Ms. Christie Weiner and
Mr. Richard Paisner

Medicine is a public trust

**THE JOHNS HOPKINS CENTER
FOR INNOVATIVE MEDICINE**

4940 Eastern Avenue
B1 North, Suite 103
Baltimore, Maryland 21224
410-550-4098

IF YOU DO NOT WISH TO RECEIVE THIS NEWSLETTER
PLEASE WRITE TO US AT THE ADDRESS ABOVE.