breakthrough

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THE JOHNS HOPKINS CENTER
FOR INNOVATIVE MEDICINE

breakthrough

In this issue

David B. Hellmann, MD., M.A.C.P.
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A CULTURE THAT ENCOURAGES INNOVATION

In this holiday season, as always, I am reminded that we here at the Center for Innovative Medicine have so much to be thankful for, that so many good things happened this year, and that we have so much to look forward to in 2013. One of the milestones, of course, is the subject of our cover story. Five years ago, with the support of Mrs. Aliki Perroti, we began the Aliki Initiative. It continues to have a tremendous, culture-changing impact throughout Johns Hopkins, and the ripples are spreading to other medical centers.

We owe much of our success at Johns Hopkins, and here at the CIM, to philanthropists who have allowed us to pursue innovation and to reward excellent clinicians and scientists in ways that we otherwise could not do. One of them is the Amos Family, which has made possible our Amos Proteomics Center. In late-breaking news, Allen Everett and Jenny Van Eyk, the Center's director, have developed a specific biomarker, which can be measured in a blood test, that will allow unprecedented early detection of brain injury and heart attacks. We will cover this promising discovery in our next issue.

We are also very thankful for the Miller Family, and we look forward to the 10th Miller Lecture this spring. It will be delivered by Dr. Risa Lavizzo-Mourey, who is the President of the Robert Wood Johnson Foundation. In related news, Roy Ziegelstein, the Sarah Miller Coulson and Frank L. Coulson Professor of Medicine, and member of the Miller-Coulson Academy of Clinical Excellence, has been appointed the Senior Associate Dean for Faculty Development. The end of the year is a time of transition, and this is a happy one for me to report.

On page 8 of this issue, we tell you about our new Daniel and Jeannette Hendin Schapiro Geriatric Medical Education Center. There is a great and growing need in this country for better care for the elderly that is patient-centered – in other words, care that takes the patients' wishes into consideration. Right after that story, you'll read about a new app that provides a starting point for doctors and patients to talk about behavioral issues such as obesity, drinking, and smoking.

We have some exciting research news to report, as well: Cosner Scholar and physician-scientist Bruce Bochner, after years of working with a pharmaceutical company to develop a drug, has joined with other scientists to develop it instead. This drug may offer new hope to many people with "orphan" illnesses (see Page 14). And in mice, Jeremy Walston has found that a commonly used blood pressure-lowering drug (see Page 16) may help fight the age-related decline in muscle strength. Finally, we tell you how "smart" ordering of a certain test in people who might be having a heart attack is on track to saving the hospital $1 million a year. What I like most about this story (see Page 12) is that this change was led by our residents. It is one thing when groups are led from the top, and another when young people are sparking change. What a dynamic culture we have here that supports this kind of innovation – and this, too, is a cause for celebration.

Best wishes,

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.

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Aliki at 5:
Wise Care

Knowing what to say to a patient, and how best to say it, is the stuff of practical wisdom. Many doctors develop this beautifully with the help of time, plain old experience, and if they're lucky, some guidance from a mentor or two. But many others struggle a bit. Unlike hard facts, concrete things like symptoms, diagnostic tests, and recommended forms of therapy, these skills are softer, less cut-and-dried, and often difficult to teach.

The Aliki Initiative, made possible with the help of the Greek philanthropist, Mrs. Aliki Perroti, was designed to teach young doctors to be more caring in an increasingly hectic hospital environment by giving them more time to spend with their patients, and encouraging them to get to know their patients as people. All along, its leaders have continued to develop and refine the program. Recently, to mark the Aliki Initiative's five-year milestone, *Breakthrough* talked with its leadership team and with a member of the Aliki faculty. Here's some of what they had to say:

THE ROUND TABLE THINK TANK

Every Tuesday morning, the Aliki leadership team holds roundtable discussions at an actual round table in Roy Ziegelstein's office. Ziegelstein, M.D., and Cindy Rand, Ph.D., are the Aliki Initiative's co-directors. Also at the table are geriatrician Colleen Christmas, M.D., the Residency Program Director; hospitalist Janet Record, M.D.; and general internist Laura Hanyok, M.D.

Sometimes, Vice Dean David Hellmann, M.D., joins the group. He likens it to the Bell Labs, the legendary research and development think tank of AT&T, "where the synergy produced by great minds working together inspired scientists to become even more creative, with phenomenal results." (Among other developments, Bell Lab scientists created the transistor, the UNIX operating system, the laser, and radio astronomy.) "This is the quintessential inno-

vation group, and what they're achieving in our Bell Labs of Aliki is galvanizing for our young doctors, the faculty teaching them, and our patients."

The team focuses on the teaching faculty, known as the Aliki Scholars, as much as on the rotating group of medical students, interns, and residents who comprise the Aliki Service. "We have 15 faculty who usually serve as attending physicians on the Aliki Service for a month at a time," says Ziegelstein. "But if all they did was a month of attending, there would be no faculty development, no sense of a learning community." Instead, the Scholars meet quarterly and talk about the Aliki curriculum, "what's working and what could be done better."

Even though the Aliki Scholars are all excellent doctors, the leadership team found that they needed some guidance on how best to teach what they know. "If you are not in health care, it would seem second nature that doctors would know how to do the specific things we're focusing on," says Laura Hanyok. "But they are not things that have traditionally been taught." For example, when Hanyok was a resident, she says, "no one ever went to me and said, 'This is how you have a phone call with a patient.'"

"We hear the residents use 'Aliki' as a verb." As in, "I have a patient who needs to be Aliki-ized. What they mean by that is, they need to sit down, understand that patient's particular situation, maybe they need a home visit."

In 2007, "when we first got the initiative started," says Janet Record, "we noticed variable implementation of the ideas that we wanted people to learn. We realized we needed to do more to prepare the faculty members, to bring them up to speed on what our teaching goals were, and also to share teaching methods." Record and Hanyok came up with a handbook and peer-reviewed curricular

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Culture Changes

"When I think about what our program was like six years ago," says Colleen Christmas, "it has just hugely changed. The culture has changed. The things we teach and the ways we teach them have changed in large part because of the Aliki initiative." In fact, the word, "Aliki," has taken on a life of its own at Hopkins. "Commonly now, we hear the residents use 'Aliki' as a verb." As in, "I have a patient who needs to be Aliki-ized. What they mean by that is, they need to sit down, understand that patient's particular situation, maybe they need a home visit."

At first, Christmas says, there was some resistance. "People said, 'This makes no sense to coddle the residents and have them spend so much time getting to know their patients, because they're not going to have that in the real world.'" That changed "once people realized how important it is to establish the habit to get to know your patients very well. You can't expect to do that very well off the bat if you never did it very well slowly."

David Kern, M.D., is an Aliki Scholar who is also Co-Director of the Johns Hopkins Faculty Development Program for Clinician-Educators, and Director of the Program in Curriculum Development. In addition to what students are taught formally anywhere, Kern says, there is a "hidden curriculum," which is "not so much what we teach as what is learned."

As part of a surgery curriculum, for instance, "say you are teaching surgeons in the classroom how to get informed consent. The students learn to describe the procedure to the patient, to describe alternative procedures, discuss pros and cons, and address the needs of the individual. They field questions, and make sure the patient understands. Then say the student learns how to do this, goes to a ward service and the senior resident says, 'We don't have time for that. Just have them sign the form.' Everything they just learned is extinguished." If an attending physician treats patients and colleagues rudely, that's part of the informal curriculum, too, Kern says. "People learn a lot from the way things are practiced and done as well as what they are formally taught."

For a long time, "we have been teaching communication skills," Kern adds. "There's nothing new about that aspect of the Aliki program. But if you put people into an environment where they have minimal time to interact, they can't use that skill set, and it gets extinguished. What David Hellmann and Aliki did was to implement a culture change from the top down, combining funding with authority. Things just move much faster that way. We have taken what people wanted to do here, and made it more possible."

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"Do you have to teach a house officer how to call a patient? Yeah, the truth is, you do."

materials for the Aliki Scholars. "We are constantly re-examining what we are teaching," says Colleen Christmas, "how it's working out, how we can keep the curriculum very nimble and fresh."

Take the dry-sounding, yet very important, subject of medication adherence. The team spent hours coming up with ways to help a young doctor to talk to Mr. X and figure out what medications he's taking and not taking, and to ask specific questions in a manner that is likely to produce an honest answer. "It's essential to create a safe environment," says Ziegelstein, "to give the patient the sense that what you're really interested in is not saying, 'Aha! Gotcha!' but in figuring out how to work together." The goal is to enable Mrs. Y to learn what she needs to know about her medical condition. But it's also important that the doctor works with Mrs. Y to come up with a realistic drug regimen, one she can afford, and that fits with her own goals – which may not be for perfect health, for example, but for the ability to remain independent.

"David and Roy were setting a tone for patient-centered care long before the Aliki Initiative existed," Record points out. "This is an opportunity to build on those ideas." For example, the team has spent hundreds of hours on a patient-centered discharge curriculum, developed with the help of a small grant from the Picker Institute for Patient-Centered Care. When a patient leaves the hospital, the discharge process is often chaotic, says Record. "We noticed that even on the Aliki service, where we're trying to know our patients better, the patients said it still feels like a confusing and rushed time. Our patients were leaving the hospital feeling a bit overwhelmed, and the attending physicians were feeling like there might still be a disconnect." The leadership team held extra meetings for a year to design a patient-centered discharge curriculum that includes a worksheet to check the patient's understanding of the issues and what's required for follow-up, and also to address the patient's concerns about the transition home.

PHONE CALLS 101

One of the most important things Aliki students and house officers learn is how to call their patients after they are discharged. "Do you have to teach a house officer how to call a patient? Yeah, the truth is, you do," says Ziegelstein. "What if the patient says this, what do you do?" In many professions, he points out, "the idea of coaching is pretty standard. Even a great hitter in baseball will have a coach who watches what the player is doing, tries to pick up flaws and correct them, and sees what things are going well. But the idea that doctors might need coaches is almost unheard of. If you go up to most faculty and say, 'Has anybody observed and evaluated your performance and given you constructive feedback?' the answer is no."

Laura Hanyok observes phone calls, "kind of as a fly on the wall," as well as in-person conversations between young doctors and their patients. How can communication be improved? For one thing, it helps if doctors lose the jargon habit – saying the word, 'carcinoma,' instead of 'cancer,' or 'ambulate' instead of walk." Also, medications are hard, because most have at least two different names – the generic name and one or more brand names. This can be confusing for patients." Another communication problem is easily fixed: "I think one thing we as physicians do is we talk too much and don't listen enough."

Making these conversations easier and better is no different than getting to Carnegie Hall: "Basically, you practice," says Hanyok. You get feedback, and then practice some more.

The team has developed quite a few mnemonics and pocket guides to help residents with specific tasks. One of them, devised by Cindy Rand, is "RUBBER," and it's designed to help cover the important basics when the doctor calls a patient who has left the hospital. It stands for: *Review* – the medicines the person is taking. *Understanding* – the patient's understanding of the home care plan. *Beliefs* – an example here might be the patient thinking, "I don't like this medicine because of what it does to me." *Barriers* – what might prevent him from taking this drug? The answer might be, "Nobody told me how much this costs." *Education*. Take a moment to teach why this is important. And then, *Repeat*. Make sure the patient can repeat what

she needs to do. RUBBER is posted on the wall near the phone in the Aliki residents' office; it's also on one of several handy pocket-sized reference cards given to the house officers. "Eventually, they don't need the cards anymore," says Hanyok.

HELPING THE PATIENT LEAVE THE HOSPITAL

A significant part of the job for Aliki residents is helping their patients as they leave the hospital – sometimes for home, sometimes for a nursing home or rehab unit. "It can be challenging because you're not technically their doctor anymore," says Hanyok. "But we act as facilitators to get people what they need." When the Aliki Initiative began, a home visit was part of the teaching, but this has evolved. There is now a specific curriculum, for example, on how to make a "subacute" home visit, for patients who are still fairly sick and require monitoring and skilled nursing care; and how to visit someone in an inpatient rehab center or nursing home. "Some medical students and residents have never set foot in a nursing home, and don't know what they can reasonably expect in terms of care," notes Hanyok. At many nursing homes, the doctor may only see the patient every few days, or two weeks, or even once a month. "When they're making a care plan, some medical students think that all the things that can happen in a hospital can happen in a nursing home. Part of what we're hoping they will gain in doing these visits is an understanding of what the patient's daily life is going to be like. This can be a big surprise, at least for the first visit."

The Aliki training now includes a dedicated rotation in "transitions of care," says Colleen Christmas, "where they visit patients in various care settings, talk to the providers, and understand the roles." For example, how is a physical therapist different from an occupational therapist, and which one's assistance would be more helpful for your patient? "They get a better sense of the whole health care system beyond the places they work in every day and are familiar with. Our patients are so complex now that it's not simply about a doctor-patient relationship. That certainly is an important part about patients getting better and staying healthy, but it really does take a village." When a patient goes to a rehab center, "the doctor may be one of the least important people in the patient's life. You may not be the leader of the new team, but you need to know how to be a good collaborator." ■

Why It's So Important to Know the Person

During a Grand Rounds presentation, Aliki resident Linda Mobula described an interview with a particular patient. "The patient," says Cindy Rand, who was there, "was an African American man who had metastatic cancer." The man had delayed getting further treatment after a worrisome colonoscopy. "He didn't follow up, and unfortunately, his disease spread." So the question was, "why had a smart man who had been given medical advice not acted on it?" When Mobula talked to him further, she learned that his decision had everything to do with his life history. Now in his seventies, the man had grown up when the treatment of black people was largely substandard and different, Rand says, "and he developed a distrust for interacting with what he perceived as the 'white' medical establishment. As a result, he used medical care only when he had to, and that lack of trust, tragically, influenced his ability to get appropriate care."

The Aliki teaching point here is that each patient encounter can have long-range ramifications that include someone's likelihood of coming back for follow-up care. This "continuum of experience" is important, Rand says, and yet another reason why it's important for doctors to understand the whole person. "Each encounter we have is an opportunity potentially to change the curve and trajectory of someone's life. That's a pretty hard concept to teach unless you can experience it, and that's what Aliki has done."

After getting to know patients as people, it becomes a lot harder, rightfully so, to categorize "good" or "bad" patients – the good ones being those who do what the doctor tells them to, and the bad ones being "noncompliant," or otherwise not able or willing to follow directions.

Many people have complicated lives. Rand cites one example of a woman who shared her house with her son, who was schizophrenic. At a home visit, the Aliki resident saw that the woman had many bottles of medicine all over the kitchen; the son had his own bottles, too, and it was hard to tell which bottles belonged to whom. "When the house staff visited, they didn't necessarily see a simple solution. But they got an amazing opportunity to understand that just because you tell someone to do something doesn't mean it's simple for them to do it."

The Aliki curriculum represents things that have "always been a part of what fine physicians strive for," adds Rand, "but I think medical education lost its path a bit, in part because of time demands, in part because of the urgency of getting people in and out of the hospital. The general consensus is that this had been neglected, and the Aliki Initiative re-prioritized it, put it back, gave it credibility, and allowed it to become a part of the culture."

Better Medical Care for the Elderly:
Schapiro Center for Geriatric Medical Education Address a Growing Need

Vital and creative things are happening in our approach to aging. Just think of how our own perspectives have changed in just the last couple of decades: The whole concept of "healthy aging" wasn't around when many of us were kids. Geriatric medicine wasn't a specialty. Nobody realized that the things we thought were inevitable about growing older don't necessarily have to be.

Medical care for the elderly has come a long way, and there is still room for improvement. The vast majority of older people are taken care of by family doctors or internists, but there are specific health issues that develop in these people, and these "may not always be incorporated into the usual care of specialty problems" that their doctors are accustomed to treating. Daniel and Jeannette Hendin Schapiro experienced this. Then they came to see Samuel C. Durso, M.D., Director of the Division of Geriatric Medicine and Gerontology. "On a couple of occasions, the patients' family had been told, 'What do you expect? Your parents are old.' That's not an uncommon encounter with a physician, unfortunately," says Durso. "What they were looking for was care that would improve the quality of their parents' lives. We agreed to focus on the couple's priorities, which centered around being able to stay at home with appropriate support." Working with the family, Durso and colleagues were able to honor the Schapiros' wishes, and they lived their remaining years at home. "When they passed away, the Schapiros were honored through anonymous support from a visionary donor to establish a center which would teach those values to other physicians."

Although our population is aging, there is a growing shortage of certified geriatricians, says Vice Dean David Hellmann, M.D., "and the need for programs of excellence in training has never been greater. The new Daniel and Jeannette Hendin Schapiro Geriatric Medical Education Center will speak to this need, by teaching physicians and nurses how to recognize and manage geriatric syndromes and chronic illness."

Geriatrician Danelle Cayea, M.D., has been named to direct this center. In addition to her clinical practice, she directs the undergraduate internal medicine clerkship and recently received one of the University's highest recognitions, *The Excellence in Teaching Award by the Johns Hopkins University Alumni Association*. "This is an exciting opportunity," says Cayea, "to rethink how we teach the next generation of doctors to care for the elderly."

"On a couple of occasions, the patients' family had been told, 'What do you expect? Your parents are old.' That's not an uncommon encounter with a physician, unfortunately,"

For years, Durso and Scott Wright, M.D., Director of the Division of Internal Medicine, who collaborate on several projects together, have dreamed of bringing internists and geriatricians together to improve teaching in medical care of older patients. "Now, in collaboration with the Schapiro Center, our general internist clinician educators and geriatric clinician educators can really put their heads together to think creatively about how to help practicing physicians, physicians in training, and other health care providers do an even better job in caring for these patients," says Wright. These educators are truly working together, side by side in renovated space in the Mason F. Lord Building. "We wanted to provide more of an opportunity for informal talking, which leads to the generation of ideas, which may lead to projects," says Durso.

Adds Wright: "Now we are using the same microwave and the coffee maker and seeing each other throughout the day, going to each other's conferences, and co-teaching. There's more collaboration at all levels, and it's wonderful. We are thrilled to be doing this."

Although the center's educators will be teaching medical students and residents, its leaders also want to reach out to internists and family doctors in the community. "They're the ones on the front line," Durso notes, and they may need help in understanding how to translate their care into "goals that are compatible with the patients' goals." Say, for example, an 80-year-old man comes to see the doctor. Like many older adults, he has more than one chronic problem – three, in fact. "The physician may be very good at prescribing medications that meet guidelines for hypertension, diabetes and lung disease, but the patient's goals may be more personal than that. His goal may be to work in his garden. The physician's perspective may be different; the patient comes into the office and the focus is, 'Your blood pressure is still a little high, you need to add medications.' But the patient may say, 'I don't want to be dizzy when I'm in the garden and I'm bending over to prune my rose bushes.' This may sound obvious from a patient's perspective, but physicians don't typically approach patients that way." Durso hopes the center will develop programs to help doctors and their elderly patients work together, to set goals and measure outcomes in a practical way. "You'd be surprised. For a lot of patients, just having someone understand what's important to them is a big step for better communication with their physician, and better prioritization in tackling a laundry list of problems."

There is also a "special art," Durso explains, to talking to older adults, particularly those with a hearing impairment or other sensory difficulties. "Many physicians not trained in geriatrics don't understand the differences between delirium and dementia," for example.

Wright is "very lucky," he says, because his internal medicine practice group includes two geriatricians. "We have a really unique situation," he says. "I care for many patients in their eighties and nineties. For a few of my most frail elderly patients, we alternate whom they see. They see me a couple of times, and then every third visit, see a geriatrician who has a slightly different perspective than I do. We co-manage a number of patients." Wright hopes to see more models such as this, where geriatricians serve as consultants to primary care practitioners. Another idea: "Imagine if we took one physician from a large practice and trained that doctor to become very skilled in core geriatric principles. Then this doctor could take on the responsibility for periodically seeing the most frail of the older patients, and could provide additional guidance to other doctors in practice. Perhaps that doctor would be able to spend more time," which is a necessity for assessments of mental status, function, and mobility, "than might be possible otherwise in a regular 20-minute follow-up visit."

"Our frailer older patients really do want to stay active, and want to stay at home and remain functional as long as they can, and the current model in most practices is that they get the same 15- to 20-minute visit as do younger patients with less chronic illness."

Taking time is important, Wright adds, because older individuals have different needs. Two 85-year-old men, for example, could be "worlds apart" in terms of vigor, mental status, and general health. "Our frailer older patients really do want to stay active, and want to stay at home and remain functional as long as they can, and the current model in most practices is that they get the same 15- to 20-minute visit as do younger patients with less chronic illness. Our goal is to do an exceptional job of caring for our older patients, and to try and keep them living where they want to be – most of the time at home – and continuing to function at a high level." ■

Breaking the Ice:
App helps Doctors Talk to their Patients about Self-Care Issues

You may have seen it on the Internet: Two pictures, side by side, of the gluttonous character Augustus Gloop from the original Willy Wonka movie and the recent remake. The caption reads: "Image of Childhood Obesity 1971 vs. 2005." The Gloop from the 1971 picture, frankly, doesn't look that bad by today's standards. He just seems a bit chunky, a husky lad with some meat on his bones. The boy from the 2005 movie is roughly twice as large; most of us would look at his picture and think, "Now, there's a hefty kid." Or maybe not.

Our 21st-century eyes are jaded. Being overweight is so common in our society that unless it's fairly spectacular, we hardly notice. If you've been in a Wal-Mart lately, you might have observed that tee shirts don't just come in Small, Medium, and Large, but in XL, XXL, and even XXXL. Order at most fast food restaurants – not just McDonald's – and you can super-size your soda and fries, no problem. Go to the movies, and for just a quarter, you can bump up that medium buttered popcorn to a large. Big is easy.

All of this may help explain why so many doctors tend not to talk to their patients about obesity. "I have seen it happen repeatedly" and this translates to tens of thousands of missed opportunities daily in doctors' offices nationwide, says Hilary Hatch, Ph.D. She is a clinical psychologist in New York and is also on the faculty at the Johns Hopkins Center for Behavior and Health. "At this point, if a man 47 years old, with a Body Mass Index (BMI) of 32, who's five-foot-ten and weighs 240 pounds, walks into a doctor's office with his shirt untucked and has high cholesterol, he's not always raising grave alarm bells." Because the doctor likely sees several people like him every day. This is normal. "If it was a sick visit, and I asked the doctor afterward, 'Why not bring up his weight?' the response would often be, 'I'll get to that at his annual visit.' But that guy only came to see the doctor because he had a cold. He's probably not coming back for an annual visit."

So, say you're the doctor. What are you supposed to do? You have a waiting room full of sick people, scheduled so tightly that you may have just a minute or two to talk about behavior. You are burdened with preventive guidelines that you cannot possibly cover during this time frame. And "if the doctor spends that time trying to say to the patient, 'You're obese,' the patient is uncomfortable and feels judged, and it's just painful for everyone. Both the doctor and patient go home feeling bad," says Hatch.

Our 21st-century eyes are jaded. Being overweight is so common in our society that unless it's fairly spectacular, we hardly notice.

And yet, this is the "era of behavior," she continues: "75 percent of $2.5 trillion spent annually on health care in the U.S. pays for the treatment of chronic diseases like diabetes and heart disease – diseases considered preventable, because they are caused by overeating, smoking, excessive drinking, and lack of exercise. Behavior is considered the single most im-

The app doesn't say, "Hey, buddy, you're a mess." Instead, it says, "Let's figure out how you can increase your score and start feeling better," and this score – not you – is the talking point with the doctor.

portant determinant of health," a far more powerful factor than genes or environmental risks. "But the underlying concept of self-care has gone unaddressed."

"If I came into this project thinking that primary care doctors were failing patients, I have changed. It is behavioral health specialists who have failed to provide doctors with tools that are reasonable for 15-minute visits. We've told doctors to tell every smoker, every visit, to quit smoking and to offer assistance. It's time to translate that into a vital sign for key unhealthy behaviors that can deliver clear directives to patients without burdening the already crunched primary care visit."

To meet this need, Hatch has designed an app for the iPad, called Vital Score. It's a simple tool, delivered to the patient during wait time as a part of the standard vital signs protocol, that she hopes will help doctors do what they really want to do – help the patient become healthier – by shifting the patient's perspective from changing behavior to improving self-care. It is upbeat and friendly, an arm around the shoulder rather than a kick in the pants.

Most of the people who need help taking better care of themselves don't just smoke, or drink, or not exercise, or need to lose weight. In fact, says Hatch, "the majority of the population has more than one problem." Although "there are intense levels of unhealthy behavior in the general population, it's even worse in the clinical population," the people who come to the doctor's office or wind up in the hospital. Unhealthy people come to the doctor more often, and an estimated 75 percent of a doctor's daily visits are with overweight patients.

It's not that doctors don't want to discuss behavioral issues with patients, Hatch adds. "In fact, they feel like they're talking about behavior all the time, because this is what they see day in and day out, but really, they're not. It's also hard to keep saying, 'You're obese.' You've got to figure out another way of approaching it."

When a patient is in the doctor's office, that's the perfect time for the doctor to connect the dots and create a teachable moment, Hatch believes. "When the patient is coming to the doctor for help with a specific problem – a low sex drive, trouble sleeping, or back pain – the doctor can say, 'That really isn't going to get better unless you lose weight and start exercising.' If that opportunity is squandered, or the patient is sent to a specialist or gets a prescription, that reinforces the patient's denial about the problem."

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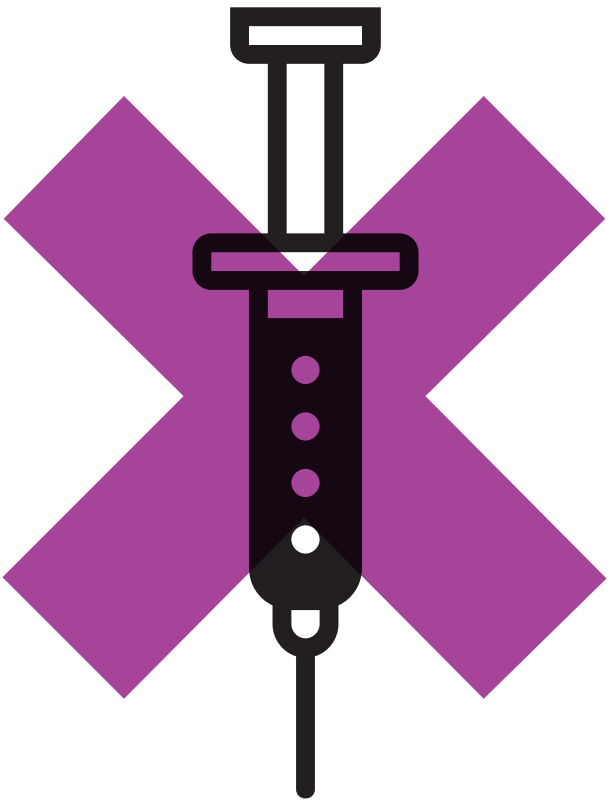
Responsible Ordering:
How a Small Group got Big Results in Reducing Unnecessary Testing

It's a "small, grass-roots effort," but it has already saved more than half a million dollars in hospital charges to patients. And that's after just a few months of one initiative to reduce unnecessary testing in just one group of people: patients being evaluated for concern of a heart attack.



"The residents made this happen," says cardiologist Jeff Trost, M.D. In 2009, Trost was at a meeting where a medical resident was discussing a patient with classic symptoms of cholecystitis, inflammation of the gallbladder. Although one test would have been enough to confirm the diagnosis, this patient had undergone multiple imaging studies, "all of which concluded the same thing," notes Trost, "And that bothered the resident. She wondered, what was the motivation for so many tests being ordered when one would do? And was there anything we could do to change the system to promote a culture of more responsible ordering?"

"I couldn't see any good reason for physicians to order a test that was basically telling them what they already knew."

The residents soon formed a group called Physicians for Responsible Ordering (PRO). Trost, who had just been named Deputy Director of Clinical Practice for the Department of Medicine, became its faculty leader. PRO's first target was a phenomenon that had concerned Trost for years. Many patients come into the hospital with chest pain. Are they having a heart attack? Are they about to have one? To find out, doctors order an EKG and also blood tests to look for cardiac enzymes. When heart muscle cells die, they release certain enzymes in the blood; troponin is one of these. The problem, Trost had noticed, was that some doctors tended to order four, five or even ten troponin tests, as well as tests for another set of enzymes, called CK and CKMB, over the next two or three days, "even in patients who had completely normal results after two or three tests. To me, that seemed incredibly wasteful. I couldn't see any good reason for physicians to order a test that was basically telling them what they already knew."

WHY DO DOCTORS ORDER TESTS THEY DON'T REALLY NEED?

Now, nobody – not Trost, and not the PRO group – thinks for a minute that doctors are just out there living it up, like cowboys after payday in a saloon, shouting, "Yippee! Drinks on the house!" and otherwise spending money as fast as they can on unnecessary tests.

Instead, when the PRO group set out to investigate this issue, they found that a big reason for this had to do with physician culture. "When it comes to ordering tests," explains Trost, "doctors aren't really trained to be sensitive or judicious." Because they would much rather be safe than sorry, doctors tend to err on the side of getting too many tests rather than too few – particularly when what's at stake is the risk of a heart attack, and the serious complications afterward if the heart is damaged. Also, physicians have traditionally been "insulated completely from the cost ramifications to the patient," so for many, this potential drawback to ordering too many tests has not been on the radar screen.

Another reason for the excess of tests, the PRO group discovered, involved a simple click on a computer screen. "Although I wholeheartedly support the shift from paper to electronic medical records, one of the downsides is that we have constructed an electronic system that allows you to order things by default," Trost explains. "At Johns Hopkins Bayview and, I suspect, at many places, you could click a box on a routine order set, and automatically order a number of tests that may or may not be necessary." As the ad for Staples goes, "That was easy." For busy physicians, such prepackaged sets are a time-saver, "but there was no penalty or accountability for ordering unnecessary tests."

"We found that roughly a quarter of patients admitted for chest discomfort – none of whom had a heart attack – had more than three sets drawn."

Take-Home Lessons

How do you make a culture change? In this case, the PRO had a very focused approach; a single, although very large, group of patients, and well-defined, easily measured goals. As it looks for other targets, it keeps this approach in mind:

First, look for the magnitude of the problem. Then, see what the evidence says. Develop a consensus for what's appropriate. Make sure that any intervention follows Rule One of the Hippocratic Oath: Do no harm. In this case, the PRO group confirmed that ordering fewer cardiac enzyme tests was not going to allow someone's heart attack to be missed. Finally, come up with a strategy for change.

What's next? Trost is looking for other "low-hanging fruit," easy changes that could save money without compromising medical care. One potential candidate is routine chest x-rays; many patients get them, but do they all need them? Another is daily finger sticks for patients with diabetes. Some hospitalized patients with diabetes get their finger stuck three or four times a day when for many, Trost says, "maybe one would suffice."

HOW TO SAVE $1 MILLION A YEAR

The group's first step was to determine just how big the problem was. Resident Marc Larochelle, M.D. (now doing a research fellowship in Boston – see side story) came up with a novel idea: Look at a day's worth of admissions on a medical (not cardiology) unit, and see how many patients have cardiac enzymes drawn, and how many tests they get. "We found that roughly a quarter of patients admitted for chest discomfort – *none of whom had a heart attack* – had more than three sets drawn," says Larochelle. "That to us indicated the magnitude of the waste."

In what Trost describes as a back-of-the-envelope calculation, they figured that simply reducing this by 20 percent would save the hospital and patients $1 million a year. Next, they researched the medical literature to confirm that what they were about to do was appropriate. It was. One set of guidelines stated that troponin does not need to be measured more than two or three times in a patient

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Overcoming Barriers

In the Dr. Seuss book, *Horton Hatches the Egg*, a bird abandons her nest and the egg inside it. An elephant named Horton comes to the rescue. He sits on that egg for months and months, determined not to fail its occupant. In the end, his fortitude produces a wonderful result.

Bruce Bochner, M.D., an allergist and immunologist, must have felt a bit like Horton over the last decade – except what he was nurturing, metaphorically, was a molecule. It had great promise to help people with asthma and other diseases involving eosinophils, a kind of white blood cell made in the bone marrow. Eosinophils are supposed to protect the body from parasites and other enemy invaders, but sometimes they can launch a full-scale misguided attack that causes allergies and severe inflammatory reactions. Eosinophils are also major contributors to asthma, and are the villains in more than a dozen serious illnesses that can affect the respiratory tract, gastrointestinal tract and other organs.

For years, Bochner's ability to explore his molecule's potential in helping patients was limited. Back in the 1990s, a pharmaceutical company had asked for his help in finding new targets for an anti-eosinophil drug. The Bochner lab provided eosinophils; the company purified genetic material from these cells and looked for new genes. "This was before the era of the human genome being sequenced, so we didn't already have this information," he recalls. "This was cutting-edge research." Along with hundreds of other labs, each submitting material from different cells and tissues, the company created a database of genes.

In the material Bochner developed was a gene that had never been described before; it was not in any of the other tissues submitted by others. Named Siglec-8, this gene was in the family of sugar-binding inhibitory receptors. Importantly, Siglec-8 is selectively expressed on eosinophils.

Hoping to learn more about the gene's function, the company made an antibody against Siglec-8, and when Bochner tested it in his lab, what he and colleagues found was exciting: "When you bind the antibody to the Siglec-8 that's sitting on the surface of the eosinophil, it causes the eosinophil to die." But his collaboration with the pharmaceutical company stalled as the company pursued other, competing anti-eosinophil targets. For the progress to slow when, to Bochner, it was just getting good, was unacceptable. "At this point, I thought the research was interesting enough that I was able to apply for and receive NIH grants to keep it going," he says, and soon, his effort paid off with an even more intriguing finding: Siglec-8 is present on mast cells, which are also important in allergic diseases. "When you use this antibody on mast cells, it doesn't kill them, but it does prevent them from releasing the allergic substances that they normally send out, like histamine."

At last, physician-scientist Bruce Bochner is able to pursue a drug that could bring new hope to many with "orphan" illnesses.

This meant that Bochner's antibody packed a one-two punch: It could get rid of eosinophils, and dampen allergic reactions. And yet, Bochner couldn't convince the pharmaceutical company to make this a top priority as a drug. Meanwhile, he kept plugging away. "We continued to do the research and explore the biology. I finally convinced the company that if they weren't going to develop it, they ought to let Johns Hopkins have the patents." More than five years went by, and finally, Bochner and Robert Schleimer, Ph.D., formerly on the faculty at Hopkins and now chief of

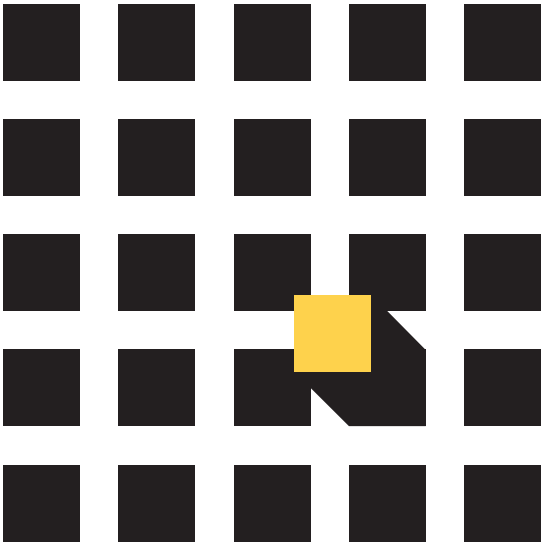
Bochner couldn't convince the pharmaceutical company to make this a top priority as a drug. Meanwhile, he kept plugging away.

Allergy-Immunology at Northwestern University, joined forces with two scientists in California "who know how to take antibodies and turn them into therapy." Last summer, the four scientists founded a company with their own money. Now they are in the final stages of raising the venture capital to allow their new company to begin the process of turning this antibody into a drug.

Bochner, a Cosner Scholar whose work is also supported by the Hugh and Tuxie Cosner Center for Translational Research, sees great potential for this antibody as a ray of hope for people with "orphan" diseases – ailments that don't affect as many people and usually don't receive as much attention when it comes to developing forms of therapy.

"There are rare diseases with which I as a physician am very frustrated, because I basically only have steroids to offer to my patients, and steroids are pretty nasty to take on a long-term basis. I am reminded every time I'm in clinic and see one of these patients that I wish I had something newer and better and safer to offer them. And here I am sitting on a molecule that I think might be useful." Some of these diseases include: Hypereosinophilic syndrome, Eosinophilic esophagitis and gastroenteritis; Churg-Strauss syndrome, in which severe asthma is associated with vasculitis; and chronic sinusitis, which produces nasal polyps that can require repeated sinus surgery.

Academic achievements like publishing papers and getting promoted, are good, Bochner says, but "as a physician-scientist, for me the real Grand Slam is to be part of a process where I actually help discover a new drug that allows me to treat patients in a successful way that I otherwise could never treat them. To be part of a team that does this is the greatest possible contribution I could make. It is really exciting to see this go from being stalled to being something that is worthy of a try."



Bochner adds, "People in academia, we see patients for a living, do research for a living. We don't normally start companies for a living. I want to keep my day job. To me, this is just an extra opportunity to try and help patients." ■

"I am reminded every time I'm in clinic and see one of these patients that I wish I had something newer and better and safer to offer them. And here I am sitting on a molecule that I think might be useful."

Recharging the Cell's Power Plants:
A Blood-Pressure Drug May Help Treat Age-Related Muscle Weakness

Something happens to the muscles when people get into their seventies and eighties. Their muscle strength declines rapidly, and the muscles don't heal the way they used to. Sometimes, these changes can be devastating: When some older people go to the hospital, for instance, a few days of bed rest can cause them to lose muscle mass. This is called "disuse atrophy," and sometimes just this little disruption can be enough to tip the balance between remaining independent and needing a caregiver. Sometimes, the muscles take such a hit that they can't recover.

Older mice, it turns out, have similar troubles. But in exciting research, investigators supported by the Johns Hopkins Older Americans Independence Center (OAIC) have found that a commonly used blood pressure medication shows promise in fighting this age-related decline in muscle strength. Tyesha Burks, a postdoctoral fellow in Geriatric Medicine, and colleagues have found that in older mice, the blood pressure-lowering drug losartan helps to accelerate muscle healing and prevent disuse atrophy. "It works very well in older mice, but not in younger mice," notes geriatrician Jeremy Walston, M.D., Principal Investigator of the

"The goal of this program is to help people maintain health and vigor later in life."

OAIC. "There is certainly an age-related impact on skeletal muscle." The findings so far are only in mice, and the drug has not been tested in humans for this purpose, Walston cautions. However, he adds, "these results are encouraging for further study in humans and for potential clinical use in the future."

In addition, another group of investigators supported by the OAIC has observed that this same drug has important effects on mitochondria, the "power plants" inside our cells. When we get older, the mitochondria don't put out the energy or power that they used to; there are also fewer of them. But in older mice, geriatrician Peter Abadir, Walston and other colleagues found that losartan apparently "shifts mitochondria to a more youthful appearance and function after several weeks of treatment," Walston says. "The improvements that we noted in skeletal muscle of older mice may be in part explained by the improvement in mitochondrial function with the losartan treatment." Although these results are "certainly impressive in older mice, and full of potential for humans," they are "not yet ready for prime time" in humans. More studies are needed to determine "losartan's impact, if any, on the mitochondria and skeletal muscle of older adults." The next step will be to translate these important findings into clinical studies. Walston believes that finding a way to keep the mitochondria young, one day, might not only help people stay healthier, but might provide new hope for other "mitochondrial-influenced, age-related degenerative diseases," such as diabetes, hearing loss, and Parkinson's disease.

Abadir, Burks, Walston and others will continue this line of investigation at Bayview's Biology of Healthy Aging Program. This laboratory-based program aims to identify important basic biological aging changes and translate them into humans where it can make a big difference, says Walston. "The goal of this program is to help people maintain health and vigor later in life." For more information about the research programs for older adults at the Bayview Medical Center, please call (410) 550-2113. ■

Who Are the Bayview Scholars?

They are among the best and brightest scientists and clinicians we have here at Johns Hopkins Bayview. With the support of dedicated philanthropists including the Lowe Family, the Miller-Coulson Family, Mr. and Mrs. Hugh Cosner, Mr. Aristidis Alafouzos, the Amos Family, and Mr. and Mrs. Fred Mirmiran, these scholars are able to spend more time doing what they do best: helping people who are sick.

Felipe Andrade, M.D., Ph.D.,
Lowe Family Scholar

Kathleen Barnes, Ph.D.,
Mary Beryl Patch Turnbull Scholar

Cynthia Boyd, M.D., M.P.H., *Bayview Scholar*

Colleen Christmas, M.D.,
Miller-Coulson Scholar

Bruce S. Bochner, M.D.,
Cosner Scholar in Translational Research

S. Chris Durso, M.D., *Miller-Coulson Scholar*

Linda Fried, M.D., M.P.H.,
Cosner Scholar in Translational Research

Frank Herlong, M.D., *Bayview Scholar*

Landon King, M.D., *Bayview Scholar*

Steven Kravet, M.D., *Miller-Coulson Scholar*

Stuart M. Levine, M.D., *Lowe Family Scholar*

Constantine G. Lyketsos, M.D., M.H.S.,
Alafouzos Scholar

Parviz Nikoomanesh, M.D.,
Mirmiran Family Scholar

Cynthia Rand, Ph.D., *Bayview Scholar*

Antony Rosen, M.D.,
Cosner Scholar in Translational Research

Philip Seo, M.D., *Lowe Family Scholar*

Michael T. Smith, Ph.D., *Alafouzos Scholar*

John H. Stone, M.D., M.P.H.,
Cosner Scholar in Translational Research

Jennifer Van Eyk, Ph.D., *Amos Family Scholar*

Scott Wright, M.D., *Miller-Coulson Scholar*

Roy C. Ziegelstein, M.D., *Miller Scholar*

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Hatch has tested her Vital Score app in a pilot project at the Water's Edge Johns Hopkins Community Physicians Practice in Harford County, to positive response from patients as well as doctors. "The doctor's office is a unique opportunity," she explains. "There's no way that any public health campaign, any employer wellness program, a chronic disease management program, can engage a patient in the way a doctor can." When a doctor advises a patient to stop smoking, the patient is more likely to quit. "Patients listen to their doctors, and the doctor's advice really matters. Doctors may feel that they engage fewer patients than they wish they could, but they're doing better than anyone else." The thing is, patients actually want their doctors to say something: "People give their doctors worse ratings if they don't intervene about smoking. They know the doctor should intervene."

A SCORE, NOT A JUDGMENT

The Vital Score app is a conversation starter. It's quick and easy, and the result is a score, not a judgment. It just takes a few minutes, and there are just a few questions about things like how much exercise you get, whether you drink and how much, your weight, whether you smoke, whether you're tired, and how much sleep you get. The top score is a 10. Let's say your score is a 6. The app doesn't say, "Hey, buddy, you're a mess." Instead, it says, "Let's figure out how you can increase your score and start feeling better," and this *score* – not you – is the talking point with the doctor. In the conversation that follows, the goal is not losing weight, or drinking less, but *feeling better*. "We've become so anxious that the patient might feel judged or criticized that it's hard to say anything," says Hatch. "Doctors are treading in a very sensitive zone. Part of the goal of the app is to try to provide a script for that interaction. Every line in there was very carefully thought through, so that it provides an honest assessment, but is also encouraging. We are trying to promote health, not thinness."

If a patient is very overweight, the app doesn't tell the patient what she ought to weigh. Instead, it gives the patient a number of pounds that equals 7 percent of her body weight, "a goal that might feel realistic," says Hatch. "So rather than saying, 'Here's your ideal weight,' which to many patients feels impossible, it's just saying, 'Here's a first goal that would make a big difference in your health.' In fact, losing 7 percent of your body weight can have a dramatic impact on your cholesterol and blood sugar."

In the pilot project, all of the participants said they would be willing to take the quiz again, and that they would be willing to discuss it with their doctor, and they took home some papers with specific things they can do to help reach their goals. In follow-up phone calls a few weeks later, most of the patients remembered their score and all remembered the areas they needed to work on. The doctors reported that they thought Vital Score added value to their encounter with the patient, that it helped them communicate, and that they would use it again. Hatch is now conducting a larger pilot project at Water's Edge. She hopes to be able to provide the app on smart phones and online – as something to download with "new patient" forms, perhaps and something that can eventually be linked to a larger follow-up system.

"This is just a step, but without the step, you don't get there." ■

CONTINUED FROM PAGE 13

who has been ruled out as having a heart attack. Another expert panel stated that because troponin is much more sensitive in detecting a heart attack, it should be the preferred biomarker – and CK and CKMB should not be tested unless the troponin test is unavailable.

Based on the evidence, the PRO group designed an intervention. "We said, 'let's figure out a way to discourage ordering of the CK and CKMB, period,'" says Trost. Second, they worked with the hospital's computer experts to change the electronic ordering system. "We couldn't eliminate the ordering of CK and CKMB completely, because sometimes it is appropriate, but we could eliminate it from routine ordering sets, so it was no longer a default order." They also put in a notice that pops up if a doctor orders two troponin tests too closely together. "The tests need to be done at least eight hours apart to be meaningful."

An important note: "We did not eliminate the provider's ability to order either test manually. We are not telling people how to order," Trost says. "We just changed the electronic system and made it harder to order these other tests."

Next, the PRO group developed a small index card with guidelines on ordering cardiac enzyme tests. It appeared in "every corner of the hospital," notes Trost, "and said, 'This is what you need to know, this is what we're doing, and this is why.'" Response to the card was positive, Trost adds. "It's not hard to make the argument that you shouldn't be ordering 11 troponins when two will do."

The group has data from three months and six months after making these changes. The findings aren't published yet, but Trost reports a dramatic drop in the ordering of CK, CKMB, and troponin. "There is about a 50-percent reduction in cardiac enzyme testing. We've reduced the amount of charges by $600,000, and are actually on pace to exceed the $1 million in charges that we were hoping to save patients." ■

Spreading Culture Change: From Hopkins to Harvard

Marc Larochelle, M.D., who is combining his fellowship with getting an M.P.H. degree at Harvard, hopes to take what he learned in the successful PRO project and apply it to new problems. His first target: Prescription painkillers. Larochelle thought about this at Johns Hopkins Bayview as he refilled prescription for about a hundred outpatients in the residents' clinic, and it continues to bother him: There sure seem to be a lot of people taking prescription narcotics. Do they all need them? Are physicians contributing to addiction and overdose? And what could help a physician make this determination?

Larochelle believes that a simple urine test might add some clarity. For example, if the patient's urine shows no trace of the drug, that tells the doctor that the patient is either not taking it very often – and therefore doesn't need as much – or maybe the drug is being used by someone else. If the test shows other prescribed narcotics or the presence of illegal drugs, this could highlight an addiction problem. Another strategy that might help is having the patient come back more frequently, so the doctor can monitor how things are going. Although these risk-mitigation strategies are recommended by experts, there is little evidence to support them.

"What I would like to do is start with a local intervention like we did at Bayview," says Larochelle, "that could be scaled to work at other places, too."

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