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New telemedicine effort enables off-site clinicians to assess emergency department patients in real time.

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**INSIGHT**

**FANCY FOOTWORK**

A video game controller lets players execute more than 15 commands with their feet.

# Dome

A publication for the Johns Hopkins Medicine family

Volume 67 • Number 10 • November 2016



Mark Cochran, executive director of Johns Hopkins HealthCare Solutions, stands near the site of a new Johns Hopkins-run workplace clinic at Coastal Sunbelt Produce in Laurel. Nearly 1,000 employees have access to the clinic's routine and urgent care.

CHRIS MYERS

## The Family Business

HealthCare Solutions brings Johns Hopkins know-how to private industry.

**W**HILE FACULTY AND staff members at Johns Hopkins engage in the cutting-edge research that often leads to improved medical care, an unsung group is working equally hard to promote their clinical innovations in the health care and corporate marketplace.

Johns Hopkins HealthCare Solutions, a business division within Johns Hopkins HealthCare, identifies and offers innovative products and programs crafted from the knowledge and experience of faculty and staff members from the schools of medicine, public health and nursing. Located in a waterfront office building in Fell's Point, the 17-member group comprises business development and health care practice experts. It is supported by faculty members who serve as medical and business advisers.

"The HealthCare Solutions division was created to assist faculty members in getting innovations into the marketplace in response to the 'triple aim' reform goals of better health, better care and better costs," says Patricia Brown, president of Johns Hopkins HealthCare. "In addition, it's important that Johns Hopkins Medicine has a mechanism to generate nontraditional revenue, which ultimately goes back to the institution to support its mission."

Last year, the group distributed \$6 million to faculty members and departments across the schools from revenue generated by providing its industry clients a range of Johns Hopkins' consulting services and programs. One prime example is the on-site clinic recently opened at Coastal Sunbelt Pro-

*(continued on page 4)*



Learn more about the strategic priority for performance online at [hopkinsmedicine.org/strategic\\_plan](http://hopkinsmedicine.org/strategic_plan).

# Work That's Worth Repeating

PAUL B. ROTHMAN, M.D.  
DEAN OF THE MEDICAL FACULTY  
CEO, JOHNS HOPKINS MEDICINE

**B**ig science is broken," one recent headline declared. "Many scientific 'truths' are, in fact, false," proclaimed another. Over the past few years, many similar articles have described the "replication crisis" in biomedicine.

The problem came to the fore roughly five years ago, when a few pharmaceutical companies published their concerns. Drugmakers do their homework before they invest large sums in potential new treatments. But in trying to reproduce the findings from academic studies, they were getting inconsistent results. For instance, Bayer claimed in 2011 that its scientists could replicate the original results of scholarly papers less than a *quarter* of the time.

Leonard Freedman, head of the Global Biological Standards Institute, put a price tag on the problem last year. He published an analysis of past studies showing that more than half of bench research is unverifiable, representing roughly \$28 billion per year in U.S. research that cannot be trusted with any degree of confidence. That got the attention of the public—and the purse-string holders in Washington.

It made physician-scientists take heed as well. We felt confident that widespread fraud was not to blame, but clearly it was time to re-evaluate our processes and incentive systems.

Many complex factors feed into this phenomenon. A large portion of the research conducted by academic scientists is so highly technical that it can be difficult to re-create the precise methodology and conditions from the original study. Many published reports do not provide raw data or the exact details of the experimental design, making duplication a challenge. Some degree of human error is inevitable too.

Unfortunately, there are other, more troubling forces at play. For instance, today's hypercompetitive environment in science can put intense pressure on researchers. With heightened competition to secure grants and publish in high-impact journals, some scientists may cut corners and produce work that is not of the highest caliber.

Francis Collins, head of the National Institutes of Health, recently argued in *Nature* that our system lacks the proper checks and balances, and needs restructuring. Among the major contributing factors, he cited "poor training of researchers in experimental design" and "increased emphasis on making provocative statements rather than presenting technical details."

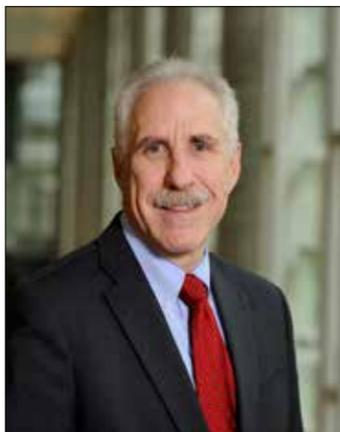
At Johns Hopkins Medicine, we are taking aim at these issues.

For instance, the school of medicine has a grant from the National Institute of General Medical Sciences to develop a 10-part course aimed at teaching the do's and don'ts of study design and data handling. Our Department of Medicine is working to devise a manageable system for banking the primary data that feed into its faculty's computations, as well as tools to improve the accuracy of data without adding burden to investigators. Moreover, we are designing a system for auditing 1 to 3 percent of our lab research protocols in-house, rather than waiting for others to do our fact-checking for us.

The School of Medicine Research Council has formed a subcommittee on reproducibility to deliver new institutional guidelines that will facilitate more open data sharing and best practices in experimental design.

Finally, as reviewers and editors of scientific journals, we must be mindful of the signals we send with what we choose to publish. When it comes to research, negative results can be, and often are, more important than positive results. Not every new treatment, new way to diagnose or new paradigm is better than the old ones. The problem is that there's a real tendency in the very prestigious journals to publish only positive results. If we can reduce such publication bias, it might tamp down the temptation to take liberties with the data.

Such reforms will go far toward ensuring a solid foundation for the future of medicine and preserving the trust of the American public.



Ingrid Zimmer-Galler, right, executive clinical director for the Office of Telemedicine and a retina specialist in the Wilmer Eye Institute, demonstrates a remote eye exam conducted by certified nursing assistant Emmoline Zaza.

## Close Up and Far Away

Remote emergency room screenings are part of a push for a coordinated telemedicine program across the Johns Hopkins Health System.

**I**N EMERGENCY DEPARTMENTS, THE sickest and most seriously injured get treated first, while less acute patients sometimes wait to see a physician. Now, The Johns Hopkins Hospital is providing medical screening exams to those patients faster, thanks to a custom-made telemedicine cart that helps off-site clinicians assess patients and initiate care.

Patients who are screened this way are taken to a treatment room in the Emergency Department for an examination in front of the cart. The connection, established before the patient walks in, lets the off-site doctor or physician assistant talk with the patient and move a camera that's on top of the screen. Meanwhile, a certified nursing assistant in the Emergency Department can use a hand-held camera to zoom in on wounds and peer into ears, eyes and throats. A stethoscope placed on a patient at The Johns Hopkins Hospital sends the sound of a heartbeat across miles.

Clinicians who are not in the hospital have access to Epic, the electronic medical record, which holds patient histories and can store images, videos and other information gathered during the technology-enabled consultation.

As a bonus, patients can see their own eyes, ears and throats in real time, boosting participation in their own care.

More than 1,500 Emergency Department patients have been screened this way since April 2, when The Johns Hopkins Hospital added the telemedicine cart. Now, similar carts

are coming to the emergency departments of Johns Hopkins Bayview Medical Center and Howard County General Hospital.

Individual telemedicine projects have been started across Johns Hopkins over the years. Doctors at Howard County General, for example, connect with nurses in local schools to diagnose ailments like ear infections in consultations that also loop in parents. Other

**MORE PATIENTS CAN AVOID THE TRAVEL ASSOCIATED WITH SEEING A JOHNS HOPKINS DOCTOR FOR CONSULTATIONS, SECOND OPINIONS OR ROUTINE VISITS.**

doctors use technology to virtually visit elderly patients in their homes or provide home video therapy sessions.

The Office of Telemedicine, created July 1, is developing and supporting a robust and connected telemedicine program, linked by a single electronic health record across the Johns Hopkins enterprise. As a result, more patients can avoid the travel associated with seeing a Johns Hopkins doctor for consultations, second opinions or routine visits.

—Karen Nitkin



Listen to a podcast: [bit.ly/negativeresearch](http://bit.ly/negativeresearch)

# 'Eager' for Change

Johns Hopkins employees and their families are determined to create a new neighborhood near the university's medical campus.

**O**N SEPT. 10, 47 UNIVERSITY and health system employees reserved not-yet-built or under-construction townhomes in Eager Park, a new East Baltimore neighborhood. The buyers were lured by one-day-only grants of \$36,000 from Live Near Your Work, a Johns Hopkins program that helps employees buy homes in Baltimore. Additional incentives for the one-car-garage townhomes, which start at \$270,000, came from Baltimore City and Ryan Homes lender NVR Mortgage.

The homes are part of a revitalization project that began in 2003 when The Johns Hopkins University and other public and private partners created the nonprofit East Baltimore Development Initiative. The 88-acre community already features a K-8 grade school, offices, businesses, restaurants, a high-tech incubator, graduate student housing and Johns Hopkins research facilities. Coming soon: a Marriott hotel, 5.5-acre park and a community of people putting down roots in Baltimore.



**Peggy and Jordan Billingsley**

*Peggy is an assistant research scientist in the Krieger School of Arts and Sciences.*

The newlyweds currently rent in Charles Village. "It's our dream to own a house and finally call Baltimore our home," says Peggy. "This seems like a good opportunity to get into an up-and-coming neighborhood."



**Sisters Shannon and Sheena Seopaul**

*Shannon is a program coordinator in the school of nursing.*

Shannon Seopaul, left, is moving from an Upper Fell's Point rental. "There's no way I could have afforded a house like this on my own," she says. "And I know the city is where I want to be."



**Terrence Woods, Chimere Walden and their daughter, Camryn Woods**

*Terrence is a senior financial analyst with the Johns Hopkins Health System.*

Woods, who is moving from an Owings Mills rental, chose a rehabilitation. "They knocked down everything but the foundation and rebuilt," he says.



## Developed:

- 2 1812 Ashland:** The newly opened seven-story building will house a Johns Hopkins business incubator and one of the nation's first Starbucks Opportunity stores, a format that includes job training.
- 5 929 Apartments:** The 20-story, 321-room graduate student housing structure opened in 2012 and includes a fitness center and common spaces.

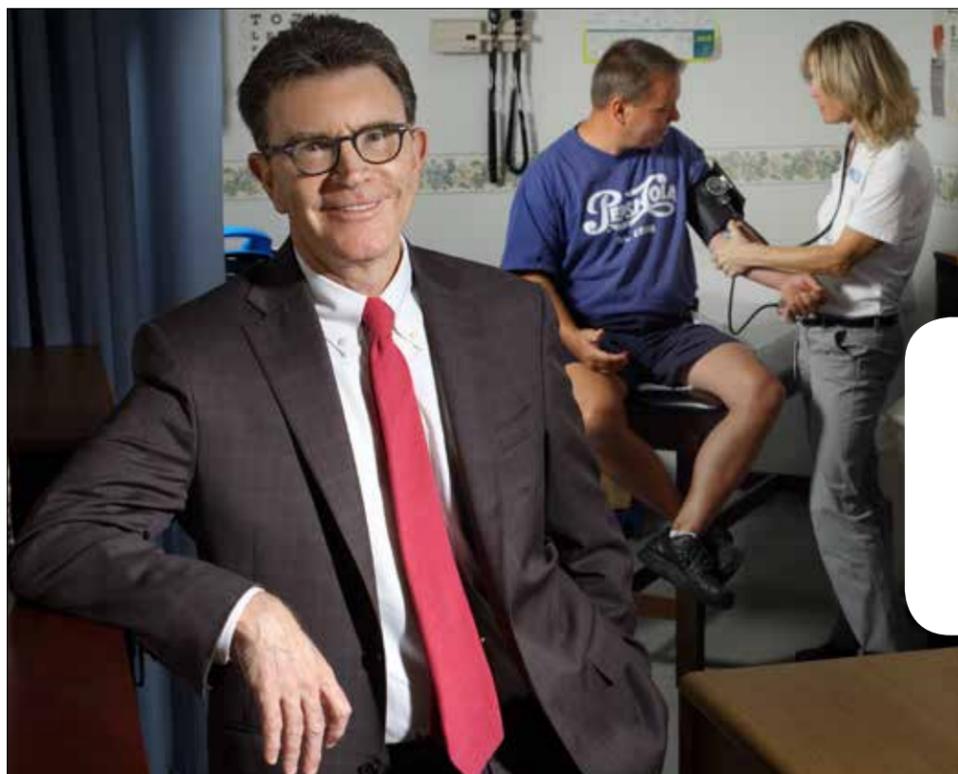
- 6 Rangos Building:** The building, which opened in 2008, has an Atwater's café, Johns Hopkins incubator space, research labs and offices. The Kabobi Fast Casual and Tapas Bar will open this year.
- 7 Schools:** These include The Elmer A. Henderson: A Johns Hopkins Partnership School, for children in kindergarten through eighth grade, and the Harry and Jeanette Weinberg Early Childhood Center, for infants as young as 5 weeks. Both opened in 2014.

## Developing:

- 1 Towns at Eager Park:** Forty-nine new-construction, one-car-garage townhomes, sold with support from Live Near Your Work grants offered by The Johns Hopkins University.
- 3 Eager Park:** A 5.5-acre park with playing fields and space for concerts and farmers markets.
- 4 Marriott Residence Inn Baltimore:** A 194-room hotel with ground-floor retail space.

## The Family Business

(continued from page 1)



**Ed Bernacki, director of the Division of Occupational and Environmental Medicine, set up the first Johns Hopkins-run workplace clinic more than 20 years ago at Pepsi bottling facilities. There are now 55 such clinics throughout the United States.**

duce. Located in Laurel, Maryland, Coastal Sunbelt ships fresh produce to supermarkets and restaurants across the Baltimore/Washington region.

Building on the expertise of Ed Bernacki, director of the Division of Occupational and Environmental Medicine, Johns Hopkins began opening and managing workplace clinics at Pepsi bottling facilities throughout the mid-Atlantic region in 1995. Since then, Johns Hopkins On-Site Employee Health and Wellness Centers have grown to include 55 clinics in 26 states, recently adding food processing giant Nestle, national pharmacy retailer Walgreens and GE Aviation, provider of commercial and military jet engines and components.

Coastal Sunbelt employs nearly 1,000 people, including truck drivers, dispatchers, packers and handlers, all of whom have access to the new Johns Hopkins-run clinic. Centrally located in the huge food distribution center, it is staffed full time by Johns Hopkins nurse practitioner Darcey Bland and provides routine and urgent care, on-site prescribing, preventive care and ongoing employee wellness programs.

"Employers lose productivity and money when staff members lose time to medical appointments and sick leave,"



**Felicia Hill-Briggs developed a health program to help employees better control diabetes.**

says Mark Cochran, executive director of HealthCare Solutions. "Our on-site clinics mean less time traveling to appointments, lower out-of-pocket costs and less time away from work. That's popular with both management and the workforce."

He says the clinics provide clients a healthy return on their investments, in most cases.

"For every dollar our clients spend on our on-site clinic solutions, they save about three. That's a threefold return on their health care investment," he says. Over the past 21 years, Cochran says, the on-site clinic business has saved its clients tens of millions of dollars.

### Turning Innovations into Solutions

**I**N ADDITION TO SETTING UP workplace clinics, HealthCare Solutions handles a variety of Johns Hopkins-developed products, such as Managing Cancer at Work, a health care benefit program that supports employees and their managers; the coach-based weight loss program Innergy; and Caring for the Caregiver, a hospital program to support those experiencing trauma from patient care.

These products exemplify the group's mission: bringing faculty "best practices" to wider audiences. The Johns Hopkins Frailty Assessment Calculator, for instance, allows a clinician to enter five standardized measurements, such as low grip strength and unintentional weight loss, to arrive at a score that shows which patients are at highest risk for disability, falls and poor outcomes. The online tool was created by geriatrician Jeremy Walston and his colleagues at Johns Hopkins Bayview Medical Center.

A home-based behavioral therapy program for children with motor stereotypy, a movement disorder characterized by purposeless body, arm or hand movements, was created by neurologist Harvey Singer and psychologist Richard Waranch. The approach to this relatively rare condition has been shown to reduce the severity of uncontrollable movements for children ages 7 to 17. Singer and Waranch produced a 45-minute training

video, and the HealthCare Solutions team developed a marketing strategy to make it and the accompanying instruction sheet accessible to parents and providers.

HealthCare Solutions also provides health care administration products, such as a due diligence assessment guide and a blueprint for developing business plans that helps hospital leadership determine how to allocate resources for their institutions.

One of the newest offerings is the employee health program DECIDE (Decision-Making Education for Choices in Diabetes Everyday). Developed by Felicia Hill-Briggs, a Johns Hopkins population health expert and board member of the American Diabetes Association, DECIDE is a self-paced curriculum that helps its users develop strategies to better control their diabetes and its resulting complications. The online program includes regular communication between care providers and users, access to online videos and workbooks, and tips on healthy eating and exercise.

**"WE HAVE GROWN BECAUSE WE TAKE CARE OF OUR CUSTOMERS, WE TAKE CARE OF OUR PEOPLE AND WE INVEST IN OUR BUSINESS. OUR NEW HEALTH AND WELLNESS CENTER IS YET ANOTHER WAY WE HOPE TO MAKE OUR COMPANY A BETTER PLACE TO WORK, TO GROW AND TO THRIVE."**

—JOHN CORSO, CEO, THE COASTAL COMPANIES, THE PARENT COMPANY OF COASTAL SUNBELT PRODUCE



### EMBRACE THE S-WORD

HealthCare Solutions Executive Director Mark Cochran says he's always been interested in the intersection of science and commerce. Starting out as a bench scientist at several Canadian universities and the National Institutes of Health, the molecular biologist has worked as an inventor, an investor, a gene engineer, a researcher and a CEO.

His broad experience makes him unafraid of sales language that more traditional academics might find unseemly.

"We're selling the work we do," he says. "A lot of people in academic medicine hate the word 'sales,' but in our business, we have to embrace it."

Often, deals can take several years to close because of their complexity. Still, Cochran and his team are confident in the timeless value of their products. "We look for ways we can use the experience and knowledge of Johns Hopkins to save money for our clients and to make their own businesses more efficient by helping their staff get—and stay—healthy." —Patrick Smith

### Turning Data into Savings

**O**NE OF THE MOST SUCCESSFUL components in the HealthCare Solutions portfolio is Johns Hopkins Adjusted Clinical Groups (ACG), an approach to population health based on the research of the late Barbara Starfield, a physician-scientist in the Bloomberg School of Public Health. It has been nurtured and expanded by the system's co-developer, Jonathan Weiner, a professor of health and policy management at the school of public health.

Over the last few decades, the ACG system has become one of the world's most widely used population health analysis and management tools. It enables health systems, health plans, governments and, more recently, large companies to use patient and health care data to target areas where costs can be controlled.

One area in particular, says Cochran, concerns rising costs in employee insurance benefits. Among the users of the analytics package are the Centers for Disease Control and Prevention and the Maryland Department of Health and Mental Hygiene.

—Patrick Smith



Learn more about Johns Hopkins HealthCare Solutions: [bit.ly/JHHSolutions](http://bit.ly/JHHSolutions)

# The Legacy of Anguish

Study in the pediatric clinic at Johns Hopkins Bayview Medical Center looks for stress factors affecting Latino parents that may trickle down to their children.

**W**HEN JOHNS HOPKINS pediatric psychiatrist Rheanna Platt meets with Latino children grappling with behavioral problems, she often ponders: Could the ways their parents adjust to life in America be playing a role?

That's hard to tell but needs to be known. Current psychosocial research on U.S. immigrants is scant, she says, and studies of Latino families even rarer. Yet more than 80 percent of Johns Hopkins Bayview Medical Center's pediatric patients and 45 percent of its obstetric patients are Latino. Anecdotes from the medical center's pediatric social workers attest to traumatic events in these parents' countries of origin and discrimination locally. Such devastating experiences, she says, likely trickle down emotionally to the children.

Platt has found a prime opportunity to learn more about the lives of Latino parents: well-baby visits. "Parents may neglect their own health, but most bring their children for the requisite six visits during the first year of life," she says.

In 2015, with psychiatric researcher Elisabet Arribas-Ibar, Platt launched a study of 100 parents of the youngest children—newborns to age 5—to examine possible mental health risk factors and physical symptoms they might display.

Using surveys, in-depth interviews and childhood records, Platt and Arribas-Ibar gathered data on immigration status, health care access and risk factors, based on experience. They also explored parental stress that surfaces in the pediatric primary care setting. Finally, the study aimed to gauge the willingness of parents to

meet as a group to discuss risk factors and mental health.

Their findings have identified a host of stressors for these parents. Chief are financial struggles, documentation status, fear of violence and relationship discord. Health problems like obesity and asthma may complicate matters, says Platt.

Among the patients who come to the pediatric



**Pediatric psychiatrist Rheanna Platt says Latino parents grappling with their children's mental health can tap into social and psychological support at pediatric clinics.**

clinics and are referred to community psychiatry's Latino Family Clinic, those with learning disruptors like ADHD are common.

Over time, Platt often sees relationships between older children and parents deteriorate. "Many Latino parents," she says, "have trouble advocating for their children's needs in the school setting because of language barriers." In families where parents sent hard-earned money back home for years before their children immigrated, tensions can mount. She notes that it's not uncommon to hear parents, their resentment

bubbling up, ask a struggling adolescent, "How can you be depressed after everything we've done for you?"

Though many Latinos are beginning to tap the hospital's adult health seminars and social services—three Spanish-speaking therapists are available at Johns Hopkins Bayview's pediatric clinics—"lots of folks are afraid to do so or don't know where to turn," Platt says.

All the mothers interviewed for the study expressed interest in an intervention within the pediatric primary care setting—encouraging news, says Platt, as the survey showed a high prevalence of symptoms like anxiety, PTSD and depression in those with minimal social support.

"Our best hope," Platt says, "is to learn more about Latino parents' struggles and design programs to promote their well-being—and in turn, their children's." ■

—Judy F. Minkove

**"OUR BEST HOPE IS TO LEARN MORE ABOUT LATINO PARENTS' STRUGGLES AND DESIGN PROGRAMS TO PROMOTE THEIR WELL-BEING—AND IN TURN, THEIR CHILDREN'S."**

—RHEANNA PLATT

## Adversities Confronting Recently Immigrated Parents

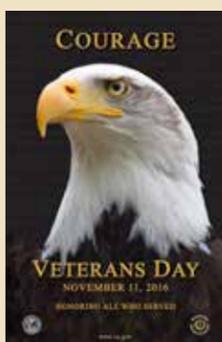
- Violence in country of origin
- Violence during immigration process
- Discrimination, trouble adapting to U.S. culture and poverty in their new environment
- Parenting stress and mental health problems

Learn more about the study at [bit.ly/latinoparentspsych](http://bit.ly/latinoparentspsych).

## IN BRIEF

### Veterans Day Commemoration

Join colleagues, patients and visitors for The Johns Hopkins Hospital's annual Veterans Day Commemoration on **Friday, Nov. 11, at 11 a.m.** in the Peterson Family Courtyard, between the Sheikh Zayed Tower and Phipps. The event is sponsored by the Department of Spiritual Care and Chaplaincy, the Veterans For



Hopkins group, and the Johns Hopkins Medicine Marketing and Communications Department. It will be live-streamed to various Johns Hopkins Medicine locations. For more information about Veterans For Hopkins at The Johns Hopkins Hospital, contact Kamala Stevenson at [ksteve16@jhmi.edu](mailto:ksteve16@jhmi.edu).

### Equity Partners for Johns Hopkins Medicare Advantage Plans

Six regional health systems are investing in Johns Hopkins Advantage MD and Advantage MD Plus, the managed care health plans of Johns Hopkins Medicine that offer comprehensive health care coverage to Medicare-eligible beneficiaries in 11 Maryland counties.

Adventist HealthCare, Anne Arundel Medical Center, Frederick Regional

Health System, LifeBridge Health, Mercy Medical Center and Peninsula Regional Medical Center now have a direct financial stake in the success of these plans. They are offered through Johns Hopkins HealthCare, the population health and managed care arm of Johns Hopkins Medicine. Learn more about the plans at [hopkinsmedicare.com](http://hopkinsmedicare.com).

# Q&A with David Newman-Toker

Maybe it's a misread mammogram or a stroke dismissed as an inner ear problem. Most Americans will experience at least one diagnostic error in their lifetime.

That's the conclusion of a recent Institute of Medicine report, and the challenge for David Newman-Toker. The professor of neurology and otolaryngology—head and neck surgery is director of the new Center for Diagnostic Excellence, established with a \$5 million gift from C. Michael Armstrong. It is part of the Armstrong Institute for Patient Safety and Quality.

*Dome* spoke recently with Newman-Toker. Excerpts are below.

**Q: What are diagnostic errors?**

**A:** The Institute of Medicine defines diagnostic error as “the failure to establish an accurate and timely explanation of the patient’s health problem(s) or communicate that explanation to the patient.” The communication piece is a big change from prior definitions. It doesn’t do any good to write down the correct diagnosis if the patient never gets it.

The best measures available suggest 12 million Americans suffer a diagnostic error every year, and up to one-third of these suffer serious permanent harms, including disability or death.

**Q: Are certain misdiagnoses very common?**

**A:** Cancer, infections and vascular events, like heart attacks and strokes, account for at least one-third of diagnostic errors and probably more than half of the harms from diagnostic errors.

**Q: Why are diagnostic errors so pervasive?**

**A:** Misdiagnosis is incredibly frequent because medicine is incredibly hard. There’s uncertainty and complexity and incomplete information all the time. But we can do better, and we will.



“SOME DIAGNOSTIC CHALLENGES ARE PURELY RELATED TO LANGUAGE BARRIERS AND CULTURAL DIFFERENCES. THESE CAN BE SOLVED BY BRINGING IN PEOPLE WITH LANGUAGE AND CULTURAL SKILLS TRAINING.”

**Q: How does your background inform your understanding of diagnostic errors?**

**A:** I’m a neuro-ophthalmologist and neuro-otologist. We deal with stuff like unexplained vision loss, headaches, optic nerve problems, dizziness, vertigo and related diseases. Neuro-ophthalmologists and neuro-otologists have developed pretty extensive skills in bedside diagnosis. We can learn a surprising amount from looking carefully at people’s eyes and eye movements. We can tell the difference between a stroke and an ear problem more accurately than an MRI can in the

first 72 hours because the anatomy lags behind the physiology.

What got me interested in diagnostic error, aside from my general interest in diagnosis, was that during my residency, I saw many instances of misdiagnoses that harmed patients. One case was a woman in her 50s. English wasn’t her first language, and nobody drilled down to what she was actually saying. They kept hearing chest pain and trouble walking the stairs, which they put together as a cardiac story. After a series of workups that didn’t reveal any heart problems, she continued to come back to the hospital, where she was dismissed as overly concerned with

“benign” symptoms.

The important detail was that she struggled going down stairs, but not up. And when you asked her specifically about the chest pain, even though she pointed to her chest, she said it wrapped around to her midback. Those are classic symptoms of spinal cord compression. She finally had emergency surgery, but it was too late. She wound up paralyzed from the waist down.

**Q: How do language, culture and race differences stand in the way of correct diagnosis?**

**A:** Some diagnostic challenges are purely related to language barriers and cultural differences. These can be solved by bringing in people with language and cultural skills training. The tougher pieces, though, are the biological disease differences across races and genders. Women and minorities are more likely to be misdiagnosed because our data are based on white men.

For example, women’s heart attack symptoms are different from men’s. But the science and literature about chest pain diagnosis is about men, and that is basically what is taught in medical school. So when women come to the hospital with back pain and nausea, rather than classic symptoms of chest pain traveling down the left arm, they can be misdiagnosed.

**Q: How can diagnosis be improved?**

**A:** Teamwork is critical. I just wrote a paper about this with a colleague who is a therapist in North Carolina. It’s called “Diagnosis Is a Team Sport,” and it appeared in *Diagnosis* earlier this year.

Physicians would send the therapist patients, asking her to treat their benign paroxysmal positional vertigo (BPPV). My colleague had to tell physicians that the patients didn’t have BPPV—they’d had strokes. It was complicated because she’s a physical therapist, and they are physicians.

We spent a lot of time breaking down those walls and getting the doctors to recognize her expertise. Now, a lot of them send her patients with instructions to evaluate and treat for dizziness, acknowledging that she may be better at diagnosing the problem.

Nurses represent a really special and important case because they are with the patient most of the time. They have the opportunity to see early signs of diseases like sepsis and pulmonary embolus. But because there are sociocultural barriers blocking nurses from assisting in medical diagnosis, we are wasting that information, and the patients are suffering. Nurses need to be integrated into the diagnostic team.

**Q: The center set an ambitious goal of reducing harms from stroke**

**misdiagnosis by 50 percent within five years for all emergency departments in the health system. How will you do that?**

**A:** Seven years ago, we published our method for using expert analysis of eye movements to tell inner ear disease from stroke. It takes two minutes, and the results are more accurate than an MRI scan. But the expertise takes five to 10 years to develop. It’s unrealistic to think every emergency physician and primary care doctor is going to learn how to do it.

So we use a device that looks like a set of swim goggles. It measures head and eye movements, and software interprets the results. We’re doing a National Institutes of Health clinical trial to see if combining the goggles with decision support will lead to better diagnoses. Meanwhile, we’re launching a “tele-dizzy” consultation that will use the goggles for real-time access to our eye movement experts via telemedicine, reducing the risks of missed strokes.

**Q: Will there be tools like these stroke goggles for other illnesses?**

**A:** Absolutely. Take sepsis, for instance. Suchi Saria is a computer scientist who is developing computer-based tools that take mountains of data that humans couldn’t possibly sift through and send out warning signals when patients are deteriorating in the intensive care unit. And this is just the beginning.

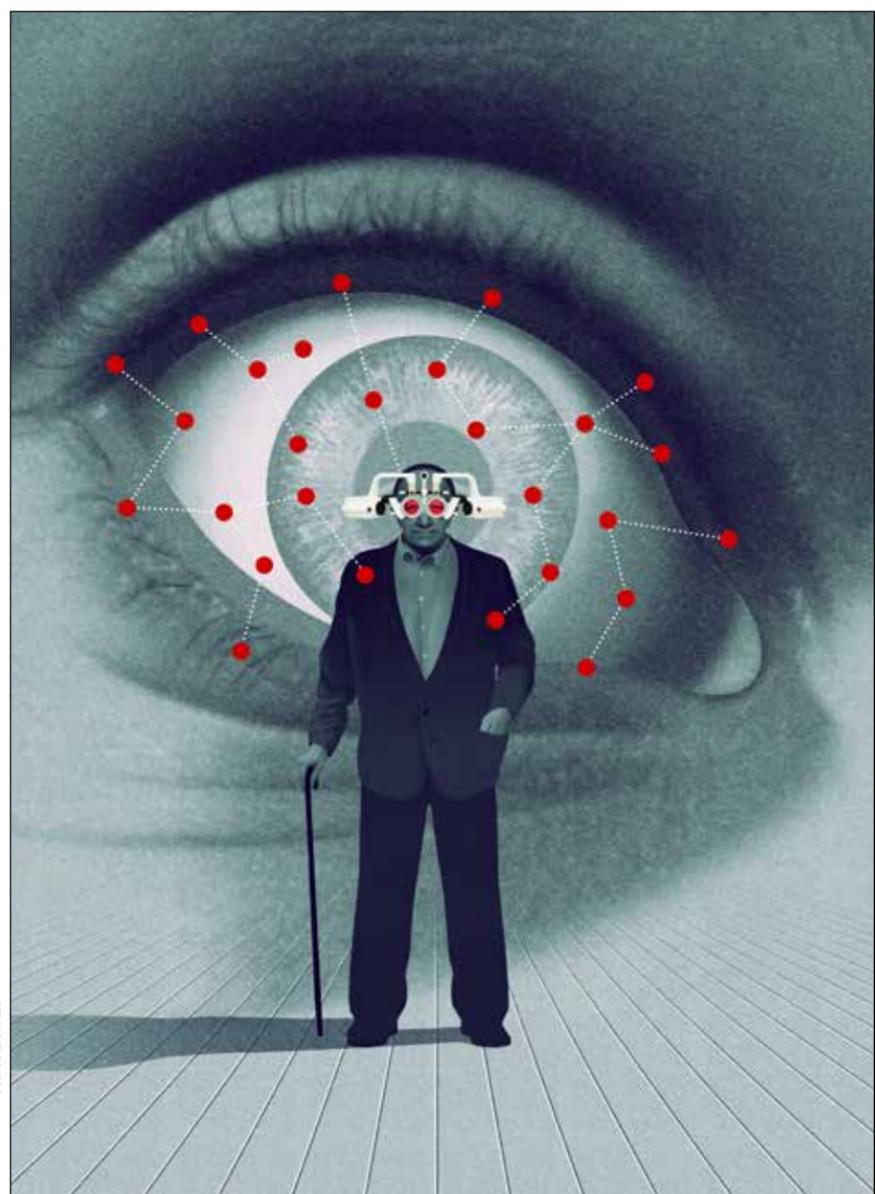
**Q: What are the center’s long-term goals?**

**A:** The center, which is the first of its kind in the world, is designed to convene transdisciplinary teams for studying misdiagnosis, the same way the Armstrong Institute convenes such teams for issues related to patient safety.

The center provides a space for clinicians, researchers, engineers and data experts to work together and be thoughtful about how we tackle both the technical challenges and the sociocultural challenges of misdiagnosis. Together, we will solve this problem.

—Karen Nitkin

Learn more at [hopkinsmedicine.org/dome](http://hopkinsmedicine.org/dome).



STUART BRIENS

# The Case for OpenNotes Access

Studies show that both patients and providers benefit from sharing clinical examination notes.

**A**LTHOUGH SOME PHYSICIANS initially balk at the idea, sharing exam notes with patients is a growing trend endorsed by the American College of Physicians. More than 8 million patients in the United States already have access to their clinicians' notes, as do many Johns Hopkins patients who use the OpenNotes option in the Epic electronic medical record system.

Studies demonstrate that reading clinicians' notes helps patients and their caregivers remember important information from the office visit, improves health literacy and increases patients' engagement in their own care. Engaged patients are more motivated to follow their care plan and have higher rates of medication adherence.

Open access to exam notes also allows patients the opportunity to address physicians' mistakes, says Howard Levy, an internist who is co-chair of the Patient- and Family-Centered Design Team and the lead physician champion of using OpenNotes at Johns Hopkins Medicine. "A patient of mine noticed that I'd written in my note that one of her medications was discontinued, but it was something she needed to take," he says. "Transparent notes help patients take a more proactive role in their care."

Levy says roughly 150 Johns Hopkins Medicine providers offer their patients OpenNotes, including the Department of Neurosurgery, Green Spring Station General Internal Medicine, Johns Hopkins Outpatient Center Audiology and the Comprehensive Care Practice at Johns Hopkins Bayview Medical Center. (Patients should ask their providers if they offer this option.)

## What the Data Show

In a 2010 demonstration study, 105 physicians from Beth Israel Deaconess

Medical Center, Geisinger Health System and Harborview Medical Center in Seattle offered some 19,000 patients access to their exam notes. More than 80 percent of patients opted to read their notes and, after a year, virtually all wished to continue to do so. More than 85 percent said that the availability of OpenNotes would influence whom they would choose as providers.

## Any Downsides?

Some physicians question whether transparency is the best policy when exam notes involve medical terms like "morbidly obese," which have negative connotations to the layperson. And they worry that certain patients' conditions might make it difficult for them to keep perspective when reading notes on their psychiatric diagnoses.

While Levy points out that patients already have access to their diagnoses in Epic's MyChart, the online portal that lets patients view their medical records, he says the system allows providers to uncheck a box if they do not want to share a specific diagnosis. The same applies to exam notes. "If the clinician judges that sharing would cause more harm than good, then it is appropriate to withhold certain notes," he says.

Already overburdened physicians fear that making their notes accessible to patients will add to their workload. In the demonstration study, however, only 3 percent of physicians reported spending more time outside of visits answering pa-

tients' questions, and their email volume remained the same.

About 20 percent said that the way they wrote about cancer, behavioral health, substance abuse or obesity changed, and 11 percent reported taking more time writing and editing their notes. However, at the end of the study period, all the participating physicians opted to continue making their notes accessible to patients.

In his own practice, Levy finds that sharing notes makes him more open with patients and facilitates sensitive conversations with them. "I'll say to a patient: 'Your BMI is over 40. The medical term

for this is morbidly obese.' And I'll ask the patient how he feels about it. No patient likes it, but none has said, 'That's wrong; take it out.' I find this to be a less loaded way to say, 'You have a weight problem. What are we going to do about it?'

"Most of us are in health care to help our patients be healthier and take better care of themselves. OpenNotes provides them with insight into our thinking and written reminders about what we want them to do, making them likelier to follow our medical advice."

—Christina DuVernay



## BIOMEDICAL DISCOVERY

# New Partnership to Improve Patient Diagnosis, Care and Outcomes

**J**OHNS HOPKINS MEDICINE AND THE JOHNS HOPKINS University Applied Physics Laboratory (APL) have joined in an effort to revolutionize the diagnosis and treatment of disease by using rigorous data analysis and systems engineering practices.

The partnership will create a "learning health system" that will speed the translation of knowledge to practice.

"The Applied Physics Lab brings significant new data analytics and systems engineering capability to the field of medicine," says Paul Rothman, dean of the medical faculty and CEO of Johns Hopkins Medicine. "These skills and experience have the potential to significantly enhance our capability to diagnose disease, predict outcomes and treat patients better than we currently do."

The partnership will build on existing precision medicine assets at Johns Hopkins, including Johns Hopkins inHealth, an effort launched in 2013 to use data analysis to improve the diagnosis and treatment of a variety of health conditions. It will also interact with the Johns Hopkins Malone Center for Engineering in Healthcare, a collaborative research effort designed to enhance the efficiency, effectiveness and consistency of health care.

Johns Hopkins aims to launch eight precision medicine centers of excellence this year to highlight areas where new technologies and measurement tools can be applied to greatly improve patient care. The centers will focus on conditions such as heart failure, multiple sclerosis, arrhythmias and prostate cancer.

"While totally unrelated diseases, these share the trait that a diagnosis alone cannot predict how the disease



will progress or whether a patient will respond to a particular treatment," says Antony Rosen, vice dean for research for the school of medicine.

Currently, a physician's expertise develops over the span of his or her career based primarily on experiences with patients that the physician has personally seen. The

new centers at Johns Hopkins aggregate this collective scientific knowledge, Rosen says, systematizing diagnosis and enabling more focused treatment and outcomes.

Johns Hopkins inHealth and the centers of excellence will collect more information from patients. In addition to family history, the various research teams hope to analyze biological markers in blood and genetic hallmarks, and incorporate additional societal and physical environment history and information.

A new National Health Mission Area at APL will focus on programs designed to predict and prevent illness, injury and disease; rapidly detect and respond to changes in health status; restore and sustain health; and improve overall health and human performance. It builds on the lab's history of applying technology to solve critical challenges by focusing these capabilities to improve health and health care, according to Sezin Palmer, executive for research and exploratory development at APL.

Learn more at [hopkinsmedicine.org/inhealth](http://hopkinsmedicine.org/inhealth).

**Rothman, Miller Honored**

**Paul B. Rothman, M.D.**, dean of the medical faculty and CEO of Johns Hopkins Medicine, has been elected to the National Academy of Medicine (NAM). The NAM is an independent organization of eminent professionals in diverse fields that serves alongside the National Academy of Sciences and National Academy of Engineering as an adviser to the national and international community, providing recommendations that have shaped health policies around the world. **Redonda G. Miller, M.D., M.B.A.**, president of The Johns Hopkins Hospital, has been named to *The Baltimore Sun's* list of 25 Women to Watch in 2016. Miller and Rothman also have been named to *Becker's Hospital Review's* 2016 list of 110 Physician Leaders of Hospitals and Health Systems to Know. They were cited for the outstanding leadership and clinical expertise they have demonstrated throughout their careers, leading initiatives to improve Johns Hopkins and the health care it provides to the communities it serves.



**Jeffrey Kahn, Ph.D., M.P.H.**, director of the Berman Institute for Bioethics, has been elected to the National Academy of Medicine. An acclaimed leader in a variety of areas of bioethics, Kahn focuses on the intersection of ethics and health and science policy. He is chair of the National Academies' Board on Health Sciences Policy and previously chaired its Committee on the Use of Chimpanzees in Biomedical and Behavioral Research, as well its Committee on Ethics Principles and Guidelines for Health Standards for Long Duration and Exploration Spaceflights.

curriculum is designed to identify and develop talent among the academy's experienced members for future leadership roles in the institute and the neurology field.

**Felicia Hill-Briggs, Ph.D.**, professor of medicine and senior director of population health research and development for Johns Hopkins HealthCare, has been named to the board of directors of the American Diabetes Association. Hill-Briggs is also a member of the Welch Center for Prevention, Epidemiology and Clinical Research, where she studies diabetes self-management, behavioral intervention trials, health disparities, neuropsychology and functional impairment disability.



**Wayne Koch, M.D.**, director of the Johns Hopkins Head and Neck Cancer Center, has received the 2016 Distinguished Award for Humanitarian Service from the American Academy of Otolaryngology—Head and Neck Surgery. Working with the Pan-African Academy of Christian Surgeons, Koch has undertaken at least 25 medical missions so far, 13 of which have been to Mbingo Baptist Hospital in Cameroon, where he created a training program for African surgeons. He also facilitates a head and neck cancer fellowship for African surgery residents who are committed to remaining in Africa and improving care at their hospitals.



**Ralph Tufano, M.D.**, director of the Division of Head and Neck Endocrine Surgery, has been elected to the board of directors of the American Thyroid Association (ATA). He is the first head and neck surgeon to hold that position in the ATA.

**Notable Nurses**

**Catherine Miller, M.S.N., A.P.R.N.-C.N.S., A.C.N.S.-B.C., C.C.R.N.**, of Howard County General Hospital; **Shawna Mudd, D.N.P., C.R.N.P.**, a pediatric nurse practitioner at Johns Hopkins Community Physicians in Odenton; **Griely Persia, C.M.S.R.N., M.S.N.**, of Johns Hopkins Bayview Medical Center; and **Marylou Zyra, R.N., B.S.N.**, from The Johns Hopkins Hospital's cardiovascular surgical intensive care unit, received Shining Star Awards for nursing excellence at the Johns Hopkins Health System's fifth annual An Evening with the Stars event at Baltimore's Center Club.

**EAST BALTIMORE**

**Kathleen Burns, M.D., Ph.D.**, associate professor of pathology and deputy director for research in that department, has been named director of the new Johns Hopkins University School of Medicine Physician Scientist Training Program (PSTP). A practicing hematologist who is recognized as an outstanding research mentor, Burns will design and implement the PSTP in collaboration with residency and clinical fellowship program directors, research faculty members, and basic science and clinical department directors. PSTP will facilitate the career paths of physician-scientists from the end of medical school through their first years on the faculty.

**Alan Cohen, M.D.**, director of pediatric neurosurgery, has been awarded the 2016 British Medical Association's first prize for best surgical specialty books for his new textbook, *Pediatric Neurosurgery: Tricks of the Trade*.



**Charlene Gamaldo, M.D.**, associate professor of neurology and medical director of the Johns Hopkins Sleep Disorders Center, has been admitted to the inaugural Transforming Leaders Program established by the American Academy of Neurology Institute. Its 10-month

**Defining and Recognizing Excellence in Patient Care**

Every year, a group of veteran Johns Hopkins physicians recognizes a select number of colleagues for qualities everyone hopes for in a doctor: professionalism, great bedside manner, diagnostic skill, depth of knowledge, ability to negotiate the health care system, a passion for patient care and teaching the next generation of medical trainees to embrace these attributes. Launched in 2008, the Miller-Coulson Academy of Clinical Excellence was created at the Center for Innovative Medicine at Johns Hopkins Bayview Medical Center to celebrate those who embody the best in patient care.

This year's class includes **Ivor Berkowitz**, clinical director of the pediatric intensive care unit; **Patrick Byrne**, director of the Division of Facial Plastic and Reconstructive Surgery; medical oncologist **Michael Carducci**; **Steven Frank**, chief of the division of adult anesthesiology; **Nancy Hutton**, medical director of the Harriet Lane Compassionate Care team; **Michele Manahan**, director of patient safety for plastic and reconstructive surgery; **Scott Newsome**, director of neurology outpatient services; cochlear implant surgeon **Matthew Stewart**; and pediatric cardiac surgeon **Luca Vricella**.



Learn more about the Miller-Coulson Academy: [bit.ly/MillerCoulson](http://bit.ly/MillerCoulson)



**OPPORTUNITY'S AMBASSADOR:** By the standards of his Baltimore neighborhood, Edward McKay says he was already a success when he graduated from Southern High School in 1999—most of his friends dropped out by ninth grade—and took an environmental services job at The Johns Hopkins Hospital. But after a few years, McKay wanted more. In 2004, he tapped an employee benefit that let him work part time and earn a surgical tech certification while receiving full-time pay plus tuition. He now works alongside pediatric neurosurgeon Edward Ahn. McKay's success is documented in a video seen more than 20,000 times on YouTube. It's

shown to all Johns Hopkins Medicine hires, making McKay, 36, a minor celebrity as he strides the hospital halls in his blue scrubs. He shares his story with local elementary and college students, as well as people who contact him from all over the world. McKay recently became a mentor with Baltimore Children of Incarcerated Parents. "My goal is to inspire as many people as I can," he says.



See McKay's video: [bit.ly/McKayvideo](http://bit.ly/McKayvideo)

**JOHNS HOPKINS HEALTH SYSTEM CORPORATION**

**Margaret "Meg" Garrett, B.S.N., M.E.D., J.D., C.P.H.R.M.**, senior legal counsel for patient safety, ethics, risk management and regulatory issues, has been elected to the board of directors of the American Society for Healthcare Risk Management (ASHRM). Garrett's two-year term on the board begins in January. She will help guide ASHRM's mission to advance patient safety and maximize value through risk management. Garrett, a 30-year Johns Hopkins veteran who received her nursing degree from Villanova University College of Nursing, recently received its highest award, the Medallion for Distinguished Contributions to Quality and Safety in Health Care.

**JOHNS HOPKINS ALL CHILDREN'S HOSPITAL**

**Peter Shaw, M.D.**, has been appointed deputy director of the Cancer and Blood Disorders Institute at Johns Hopkins All Children's and associate professor of oncology at the school of medicine. He will work with the hematology/oncology team and other pediatric specialists to provide comprehensive care for children, teens and young adults with cancer. Shaw previously directed the hematology/oncology clinic at Children's Hospital of Pittsburgh and established one of the nation's first adolescent and young adult oncology programs at the University of Pittsburgh School of Medicine.

# Dome

Published 10 times a year for members of the Johns Hopkins Medicine family by Marketing and Communications.

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