

## Following a Hunch, Startup Develops Early-Stage Ovarian Cancer Test



A group of oncology researchers was simply acting on a hunch when it found solid evidence that cells from early-stage ovarian and endometrial cancers could travel to the surface of the cervix.

“This research showed that cancer cells could travel a long way from their source of origin and still be detected,” says Howard Kaufman, CEO of Johns Hopkins startup PapGene.

That meant cells collected during a Pap test—in use for decades to screen for cervical cancer—could potentially be used to screen for ovarian and endometrial cancers too.

“If specific genetic defects can be detected in collected ovarian or endometrial cancer cells, it’s a reliable sign that the patient has an associated cancer,” says Isaac Kinde, PapGene’s chief scientific officer and a 2015 graduate of the Johns Hopkins University School of Medicine.

“And, when detected early, most cancers can be successfully treated with therapies available today,” Kaufman explains.

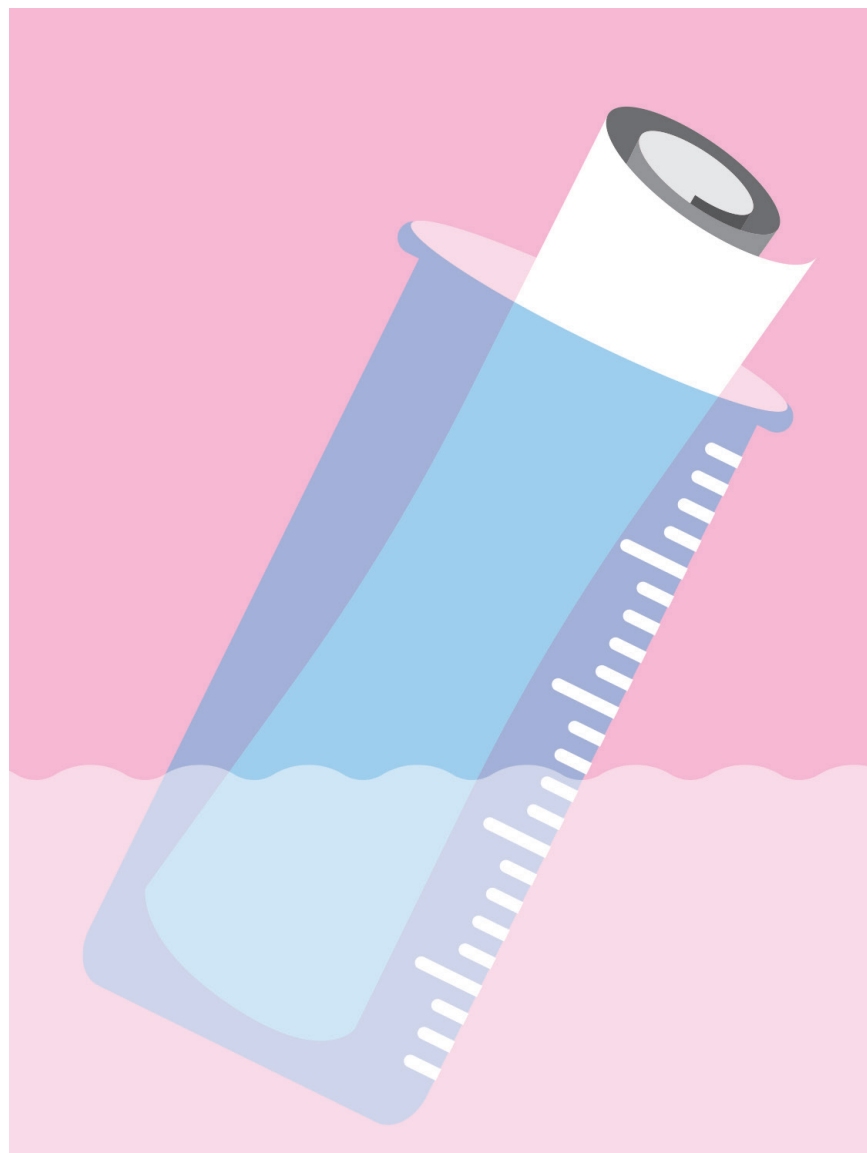
The researchers—including Chetan Bettgowda, Luis Diaz, Kinde, Kenneth Kinzler,

Nickolas Papadopoulos, Bert Vogelstein and Yuxuan Wang—filed a patent on their work in 2013. Four of them also filed a patent on a DNA sequencing system that can detect very small percentages of mutant DNA in cell samples in 2012.

In 2014, the researchers incorporated the company, and the following year, they licensed the technologies from The Johns Hopkins University.

PapGene is headquartered at the FastForward Homewood innovation hub, where Johns Hopkins Technology Ventures facilitated the construction of a laboratory designed especially for the startup.

In the next few years, Kaufman hopes to make the test available to patients. Until then, PapGene is focused on conducting clinical studies to gain regulatory approvals.

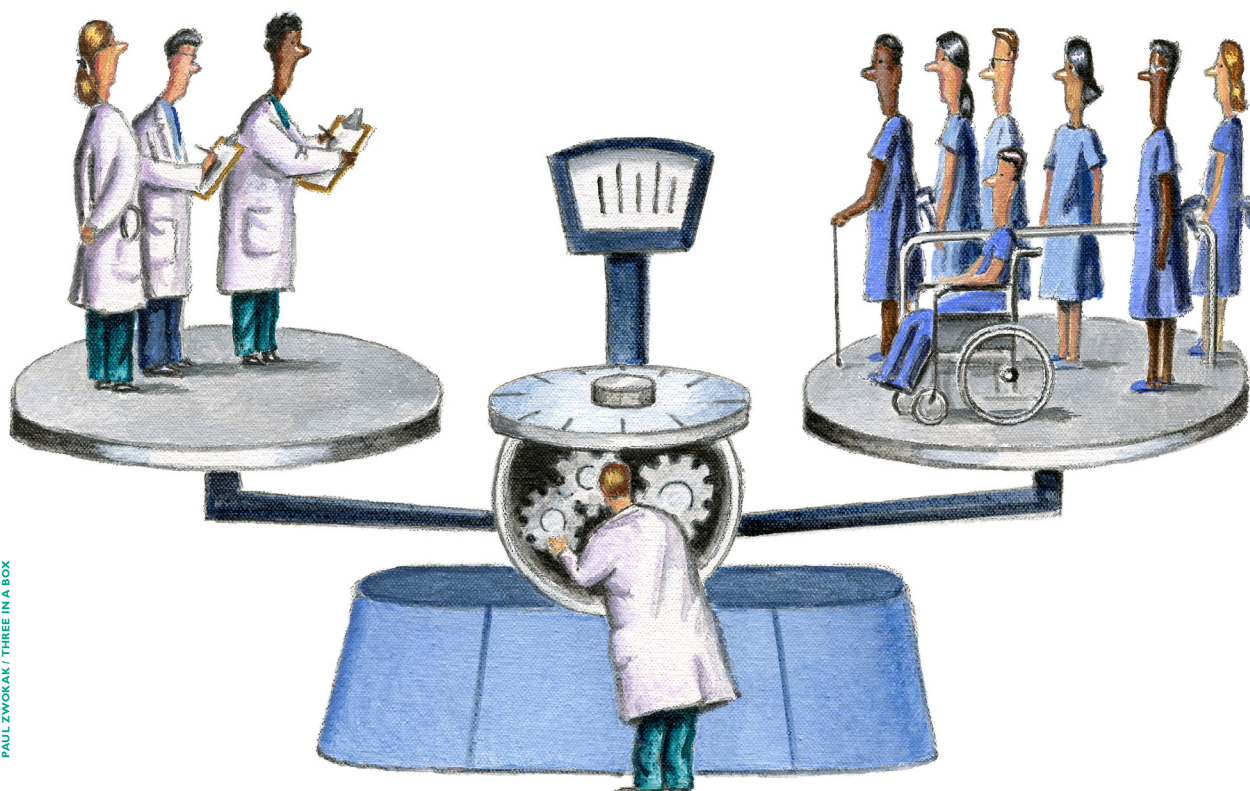


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## Clinician-Developed System Triage Patients for Therapy



On any given day in the hospital, there are more referrals for physical and occupational therapy than there are therapists to provide the care. To help prioritize these patients, clinicians at Johns Hopkins Bayview Medical Center devised the Rehabilitation and Healthcare Analytics Platform (ReHAP).



PAUL ZWOKAK / THREE IN A BOX

“It narrows patients down based on their ability to move, walk and perform daily activities out of more than 100 patients a day,” says Krishnaj Gourab, a physiatrist and director of physical medicine and rehabilitation consult services. “If patients are not walking the way they should or performing daily activities, they are priorities.”

The proof of concept for ReHAP was developed with SharePoint and Tableau software in 2014. It has since been custom-coded in MATLAB software, with assistance from the Johns Hopkins Technology Innovation Center, to use data extracted from electronic medical records.

Occupational therapist Barbara Ruzicka says she would spend an hour each day reading through the paper cards used to keep track of patients. Now she can access any computer in the hospital to see the priority patients or sort patient data by date, therapist name, location,

function and more. Each therapist using the system saves 20 minutes a day, while therapy coordinators save 150 minutes a day—valuable time that now goes toward high-priority patients.

John Adamovich, administrator of innovation and research for Johns Hopkins Home Care Group, is coordinating with Gourab to use ReHAP to follow patients after they leave the hospital. If a patient’s function starts to decline after going home, updates from Home Care staff members will appear in the system and alert clinicians to respond.

Johns Hopkins Technology Ventures is helping to commercialize ReHAP. “Interviews with outside hospitals and home health agencies found almost everybody needs something like this for therapy case load management,” Adamovich says. “It directs resources in real time to the patients who truly need them.”



A look at innovative developments outside the halls of Johns Hopkins Medicine

## Body Electronics

Newly developed electronics for our bodies aim to get the disabled moving and the wounded healing.



**T**he feelSpace navigation belt vibrates to help the vision-impaired find their way outside. Worn around the waist, the German Institute of Cognitive Science-developed belt connects wirelessly to a smartphone navigation app. As individuals move, specific sides of the belt vibrate to direct travel to a predetermined destination.

**A** medical implant called a stentrode could help people suffering from paralysis to move again. Inserted into a blood vessel next to the brain's motor cortex, the tiny devices detected and recorded brain activity in animal testing. Researchers at the University of Melbourne in Australia plan to use stentrodos with a group of paralyzed patients in 2017. It's hoped the technology will wirelessly communicate brain activity to bionic exoskeletons that patients wear, allowing them to move by thought alone.

**S**mart bandages with integrated temperature sensors, informational LEDs and tiny reservoirs to deliver medicine could help skin wounds heal better. Made out of a rubbery hydrogel designed by MIT mechanical engineers, the material is extremely flexible and can stick to the inside fold of a knee, for example. The bandage can release medication in response to skin temperature or light up if its medication runs low.

## App Educates Teens and Families on Depression



Parents worried about whether their teen's moodiness is hormonal or something more serious can now get reliable information on depression off the smartphone in their purse or pocket.



mADAP, an app created by Johns Hopkins psychiatrists, is meant to provide dependable, handy information about teen depression to parents and teenagers. Roughly 2.8 million teens suffered at least one major depressive episode in 2014, according to the Substance Abuse and Mental Health Services Administration.

As part of the Adolescent Depression Awareness Program (ADAP), psychiatrist Karen Swartz visits schools to educate teens, parents and teachers about depression. She considers mADAP one more tool to reach families. "The next generation is probably more likely to sign up for and download an app than get a book from a library," says Swartz.

Swartz and her colleagues began work on mADAP in 2011. Using free software, they built the prototype before securing \$20,000 in department funding

for an app developer to create, test and deploy a better version.

Users can click on the app's stylized illustrations of teenagers to view Johns Hopkins psychiatrists explaining who's at risk of becoming depressed and the difference between sadness and depression. They can also read about the symptoms, diagnosis and treatment of depression in adolescents.

"We wanted to strike a balance between something that would appeal to teenagers and something that would still take the topic seriously," says psychiatrist Anne Ruble, who started the app project with psychiatry emergency service director Vinay Parekh.

mADAP includes information on what to do if you're a teen feeling depressed—short answer: tell an adult, talk to your doctor—and links to resources, like a treatment locator. Launched last October, the free app is available for iOS devices and in a beta version for Galaxy S5 and S6 phones.

## 6 Top Facebook Posts from Johns Hopkins Medicine



Each day, the Internet strategy and Web services team makes numerous posts on Johns Hopkins Medicine's Facebook page. When people on Facebook interact with these posts, the activity is called "actions taken" and includes the following:

- Click on the post
- Like it
- Comment on it
- Share the post

On the left, see the top six Facebook posts from 2015 with most action as of April 2016.