

INOVA

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MAGAZINE

winter 2017

Clot Buster

Inova's **Paul Gurbel, MD**, turns groundbreaking research into lifesaving tests for cardiac stent patients

Paul A. Gurbel, M.D.
Director
Interventional Cardiology



PLUS

Helping teens combat anxiety and depression

Partnerships form the backbone of the new Global Genomics and Bioinformatics Research Institute

As today's largest generation, millennials are redefining healthcare



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Inova Magazine is published several times a year to advance and promote Inova's mission: to improve the health of the diverse community it serves through excellence in patient care, education and research. Inova is a pioneer in the field of medicine, exploring the science of genomics and leading the way in the new era of predictive medicine.

Currents

HEALTHCARE NEWS IN SMALL DOSES



Photo courtesy of the Redskins Broadcasting Network

Making an Impact

Robin West, MD, makes espnW list of top 25 female athletes and influencers

Inova's Robin West, MD, who heads the hospital system's sports medicine program, was named to the espnW list of 2016 Impact25 Athletes and Influencers. The Impact25 is an annual list of the 25 athletes and influencers who, espnW believes, have made the greatest difference for women in sports. espnW is a digital ESPN brand focused on women.

Dr. West, who in June of 2016 became the head physician and director of sports medicine for the Washington Redskins, is also the lead team physician with the Washington Nationals.

Robin West, MD, is the first woman to be head team physician of a National Football League team (Washington Redskins) and lead physician of a Major League Baseball team (Washington Nationals) simultaneously.

She is in good company when it comes to the latest Impact25 list. Her peers include: presidential nominee Hillary Clinton; 2016 Olympics swimming champion Katie Ledecky; comedian Leslie Jones; WNBA MVP and union rep Nneka Ogwumike; and Kathryn Smith, a full-time NFL coach. Simone Biles, who won four Olympic gold medals in Rio — setting an American record for the most gold medals in women's gymnastics at a single Games — was recognized as Woman of the Year.



Photo courtesy of the Washington Nationals/MLB

Dr. West has gained national prominence as one of only two female head orthopedic surgeons in the National Football League and the only head female physician in Major League Baseball.

Ryan Draft, a former NFL safety who is now retired, got to know Dr. West while she was a doctor on staff with the Pittsburgh Steelers. He told *espnW* that she “is compassionate and cares about the players. Most of the time, the job of the doctor is to get you healthy enough to play — not necessarily just get you healthy. She never treated us that way.”

He pointed out to *espnW*, “For my daughter, who is extremely smart, she now has an example of what can be done. I think that’s cool.”

Dr. West, who started working at Inova in the summer of 2014, has helped to put Inova’s sports medicine program on the map through her professional appointments. “These partnerships bring a lot to the sports medicine program, because we have to be up-to-date on all of the research and latest surgical techniques in sports medicine so we can offer the best care to all athletes,” Dr. West said. “As team doctor, it really keeps you on your toes. It pushes me to the limit because I have to be at the top of my game.”



To learn more about Robin West, MD, and her accomplishments, visit inova.org/DrRobinWest.



Mature Mapping

MediMap testing now available for adults

Patients who are part of Inova’s VIP 360° Concierge Medicine Program now have access to a pharmacogenomics (PGx) test that indicates how a person will respond to certain medications. The PGx test, called MediMap VIP 360°, combines the science of how medications work (pharmacology) with the science of how genetic differences can influence health (genomics).

MediMap testing, which already is part of the standard package of services for babies at Inova Fairfax Medical Campus, became available to VIP 360° patients for a fee last summer.

MediMap VIP 360° assesses 18 genes and 118 medications to learn if the patient is at a higher risk for a side effect and if there is efficacy. Medication categories encompass anti-ADHD, anti-anxiety, anti-depressant, bladder control, cardiovascular, diabetes, gastrointestinal, neurology, pain, rheumatology and sleep.

“It does several things,” explains Craig Cheifetz, MD, FACP, Medical

Director for Inova VIP 360°. “It provides a medication wellness reference library so if a provider prescribes a medication, he or she can see if the patient is at higher risk for a side effect and whether the medication would be effective. Second, it allows us to compare current medication lists and see whether a patient may be having symptoms we can attribute to the medication. And third, it tells us if a patient could have a side effect down the road on a medication.”

MediMap VIP 360°, which does not indicate if a person is at risk for developing certain diseases, already has helped to steer medication decisions involving several patients. One patient of Dr. Cheifetz, for example, who had been placed on medication for a sleeping problem, started to have several side effects, including foggy thinking and peripheral nerve issues. The test found that she, in fact, was at a high risk for side effects from this medication, so Dr. Cheifetz opted to stop the medication. Three days later, the symptoms went away.



Watch Ben Solomon, MD, describe the process and benefits of using MediMap. Download the Inova Magazine app at inova.org/mobile or search “Inova Magazine” in Apple’s app store.

Learn more about MediMap at inova.org/MediMap-vip360.

Accelerated Growth

Inova invests in program to nurture companies with innovative technologies

Inova is investing in a number of initiatives to improve the quality and cost of the care it delivers. One such program, the Inova Personalized Health Accelerator (IPHA), aims to provide education, clinical validation, mentorship and starting capital to companies with early-stage technology prototypes. The goal is to create an environment that attracts leading healthcare entrepreneurs, clinicians and researchers. Together, they will bring unique expertise to bear in evaluating, developing and implementing technology solutions that add value to Inova's operations and improve outcomes.

IPHA, which is scheduled to initiate operations in early 2017, intends to accept five to eight companies a year using a rolling acceptance process. Applicants can apply and be accepted at any time. Starting with the first day of acceptance, the accelerator member will work with IPHA leaders to secure feedback and guidance on how their technology complements the Inova operating environment.

"Our program will ultimately be recognized as the go-to program for the creation of personalized healthcare related analytics, devices and

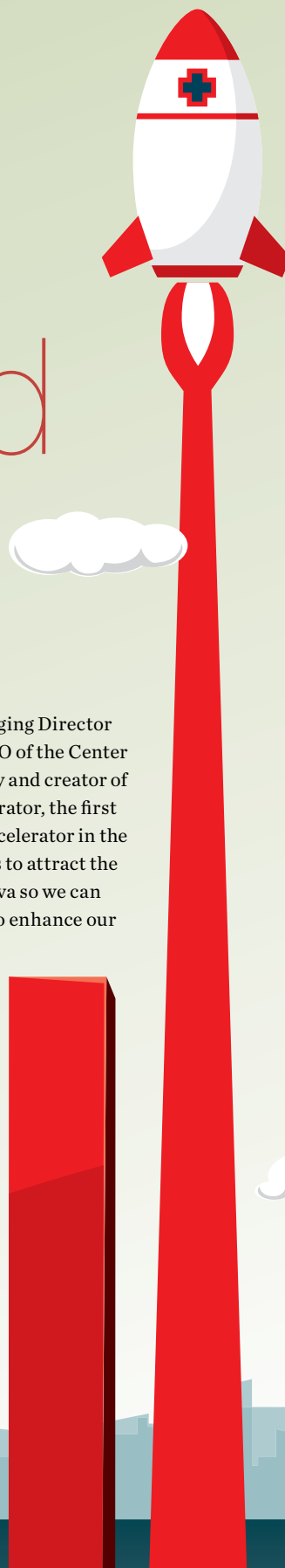
services," notes Co-Managing Director Pete Jobse, the former CEO of the Center for Innovative Technology and creator of the Mach37 Cyber-Accelerator, the first cyber security-focused accelerator in the United States. "The goal is to attract the best entrepreneurs to Inova so we can apply their technologies to enhance our best-practice health mission for patients and consumers while growing into new markets."

"The time is ripe for a project like IPHA as

Inova responds to major changes in both reimbursements and clinical practices," adds Co-Managing Director Hooks Johnston, formerly of Valhalla Partners, a Northern Virginia venture capital firm he co-founded. "The emergence of personalized medicine revolutionizes how providers diagnose, predict and prevent disease. Inova needs to prepare for the future. The accelerator is one way to ensure our long-term success — to make sure we can take better care of each patient at a lower cost."

In addition to the accelerator, Jobse and Johnston are managing Inova Strategic Investments (ISI), a strategic investing initiative through which Inova will make investments in healthcare-related venture funds and companies. ISI targets funds and companies that will deliver some strategic advantage to Inova in serving its healthcare mission. Examples of these advantages include lowering the cost of health services delivery, offering new services or technologies or improving health services outcomes. ISI was publicly announced in December of 2016.

& For more information about the Inova Personalized Health Accelerator, visit inovapha.org. For more information about the Inova Strategic Investment Initiative, visit inovastrategicinvestments.org.



Life After Breast Cancer

Seven ways to move forward and live well

by Sage Bolte, PhD, LCSW, OSW-C, CST

FROM
THE INOVA
NEWSROOM

After being diagnosed with breast cancer, it's an amazing feeling to finally get the "all-clear" diagnosis. But moving on from cancer is a process that doesn't happen overnight.

And for many women with early stage breast cancer, it isn't until after the treatment ends that the emotional and physical healing truly begins.

If you or a loved one is figuring out life after breast cancer, these tips can help you navigate the journey.



Sage Bolte, PhD, LCSW, OSW-C, CST, is a licensed clinical social worker and Executive Director of Life with Cancer®, which provides support and education to anyone affected by cancer. Life With Cancer is a program of Inova Schar Cancer Institute. In addition to her role as director, Bolte provides individual, couples and family counseling and facilitates several support groups and programs for people with cancer.

1 Have Realistic Expectations.

After cancer, survivors (and their family members) might expect to just pick up where they left off. In fact, it is common for depression and anxiety to occur when treatment ends. Body image issues are also common as people deal with scars, hair loss and weight changes. Fun? No. Normal? Totally. Remember, it takes time to feel like yourself again. Be gentle and gracious with yourself (or your loved one) in the meantime. Give yourself time to redefine your needs as often as you need to — sometimes, even daily.

2 Face Fear.

During treatment, patients often see their care team every

week. Afterwards, they might have appointments every three or six months. Many people worry whether they're truly OK. If you're worried, talk to your doctor, nurse or social worker to let them know you're having fears. They can help clear up myths and misconceptions and help find strategies that allow you to feel more in control.

3 Take Care of Yourself.

You've heard it before, but it bears repeating: Exercise, a healthy diet, sleep and limited alcohol contribute to a healthy recovery. Exercise is especially important, not just for overall good health but because it helps fight fatigue as you recover.

4 Ask For (or Offer) Help.

During treatment, friends and family members often help out by making meals, doing laundry or carpooling kids. Too often, that kind of practical help comes to a screeching halt when treatment ends. Truth is, fatigue lasts well after treatment — especially if you're suddenly returning to work or taking on more household tasks. Don't be too shy to ask for help.

Often, your friends want to help but are waiting for you to tell them what you need and may not understand that much of the recovery starts when treatment ends. And if you're that friend, ask what you can do to be helpful as your loved one gets back into a groove.

5 Talk to Someone Who Gets It.

Connecting with other survivors can be very helpful, both online and face-to-face. Support groups can also be a great way to connect. The key is finding a group that is moderated by a licensed professional. Support groups aren't for everyone, and that's okay. On the other hand, I've seen a lot of people who thought they weren't support-group types give it a try and get a lot out of them.

6 Treat Yourself.

Do something good for yourself every day, whether it's 5 minutes of deep breathing, 10 minutes walking outside or an extra 15 minutes of sleep. Whatever it is, ask for support from your family to make sure it gets done.

7 Learn More.

The Life With Cancer® program offers no-cost services to cancer patients and their families, regardless of where they live and where they're treated. We offer counseling, support groups, fitness classes, mindfulness and meditation, art therapy and more. **INOVA**

& Read more expert opinions at inovanewsroom.org. Learn more about Life with Cancer® at inova.org/lifewithcancer.



Innovations

WELCOME TO THE
FUTURE OF HEALTH

Clot Buster

Inova is the first system to pair groundbreaking drug-response tests as standard of care for cardiac stent patients



Paul Gurbel, MD, has developed tests that indicate the response to an anti-platelet drug for heart patients receiving stents.

To cardiac patient George Stern, Inova Heart and Vascular Institute (IHVI) Director of Cardiovascular Research Paul Gurbel, MD, practically walks on water.

The divine association is well-earned: Stern feels Dr. Gurbel saved his life three times in recent years by opening Stern's narrowed coronary arteries with cardiac stents. Notably, Dr. Gurbel also personalized the 72-year-old's treatment with two groundbreaking drug-response tests that steered Stern toward an optimal anti-platelet drug for his genetic makeup and clotting profile.

Dr. Gurbel's career-spanning work surrounding the popular anti-platelet drug clopidogrel (brand name Plavix) — and who it will and won't benefit — continues to flourish at Inova, which he joined in fall 2015. The drug-response tests, which he and his colleagues at Sinai Hospital in Maryland researched extensively, center on how effectively clopidogrel, the most-prescribed anti-platelet drug in the world after aspirin, will work in patients receiving stents.

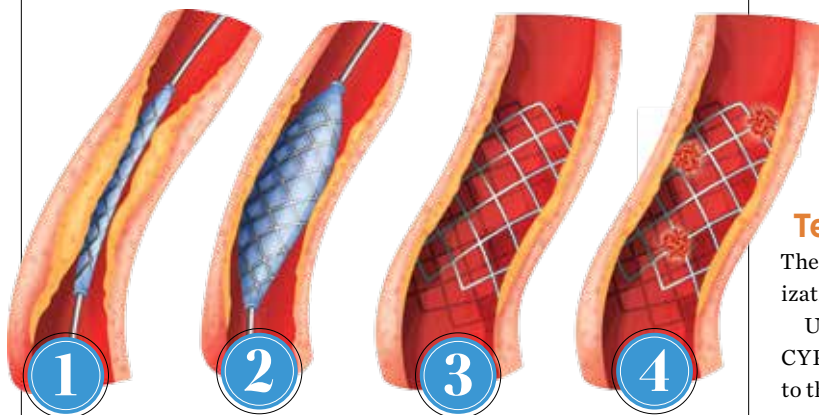
The first test is a genotyping test to determine if a patient has a mutation in his or her CYP2C19 gene, meaning the liver won't properly metabolize clopidogrel. The second test analyzes a blood sample to determine the "hypercoagulability" of a patient's blood, or its propensity to clot. For those with inherently strong clotting factors, the test will help physicians determine if additional anti-clotting therapies may be required besides clopidogrel.

IHVI — whose network of 50-plus heart and vascular doctors is the largest in the Washington, DC, metro area — is expected to launch the duo within the next several months. Then Inova will become one of the first health systems in the nation to pair the quick-result tests as standard of care for cardiac

Photo: Mike Morgan

When Good Stents Go Bad

Cardiac stents, which open up blocked coronary arteries, help to prevent heart attacks. But like all medical interventions, they carry risks and must be monitored.



- 1 A stent is a small tube that acts as a scaffold to support the inside of the artery. A balloon catheter, placed over a guide wire, puts the stent into the artery.
- 2 Once in place, the balloon is inflated, and the stent expands to the size of the artery and holds it open. The balloon is then deflated and removed while the stent stays in place. Over several weeks, the artery heals around the stent.
- 3 Stents can last for several years, and can successfully keep arteries open and prevent blockage from occurring.
- 4 Unfortunately, a small percentage of people who have stented arteries develop blood clots at the stent site. Blood clots can cause a heart attack, stroke or other serious problems.

catheterization patients receiving stents. Pinpointing the right anti-platelet drug for these patients is crucial to preventing clots from subsequently forming around the tube-shaped stent device. Several thousand Inova patients stand to benefit each year.

George Stern, meanwhile, has vowed to follow the esteemed cardiologist to Inova for his ongoing heart care despite the extensive drive from Stern's Baltimore home.

"If someone saved your life three times, what would you do?" the retiree asks.

"As far as I'm concerned, he's the only one I want to treat my husband," adds his wife of seven years, Sandy.

"A focus of my research lab for the last 15 years has been personalizing the therapy based on the biology of the patient."

PAUL GURBEL, MD

Newest Precision Medicine Initiative

Establishing the drug-response tests as standard of care at Inova fits perfectly with Inova's priority on precision medicine, says Dr. Gurbel, also Director of the new Inova Center for Thrombosis Research and Drug Development.

"This has been in the works since I came to Inova," Dr. Gurbel explains. "A focus of my research lab for the last 15 years has been personalizing the therapy based on the biology of the patient. It's what we're trying to do here at Inova, and personalized therapy is a major initiative throughout this great medical center."

Tests Offer Peace of Mind

The argument for implementing the pair of cardiac catheterization tests is particularly robust, Inova experts say.

Up to one-third of the total population carries the CYP2C19 gene, indicating they may not respond optimally to the drug; if these people undergo stent placement and are prescribed clopidogrel, their risk of experiencing a clot in their stent or a heart attack within a year is 2.5 times greater than those who don't carry the gene mutation, according to Dr. Gurbel. Additionally, a person's tendency to have strongly (or weakly) clotting blood is as individual as their fingerprint, says IHVI Director of Clinical Trials Kevin Bliden, MBA.

About 25 percent of patients who undergo angiogram testing at IHVI to determine if they suffer from coronary blockages end up receiving a stent. Within an hour of their procedure, cardiologists will know if clopidogrel is acceptable to prescribe for them or whether they need a stronger drug.

"The testing is very efficient and easy to use, and we'll be able to tell patients before leaving the hospital which drug they should take," says IHVI Laboratory Director Udaya Tantry, PhD.

The net result? Patients' peace of mind.

"Inova is really committed to personalizing medicine instead of using a one-size-fits-all approach," Bliden says. "Offering these tests and giving physicians information they can use pretty much in real time to prescribe initial therapy is a pretty cool thing." **INOVA**

& Learn more at
inovaheart.org/
MediMapSTAT.

Beyond Stents

A new genetic test Inova Heart and Vascular Institute (IHVI) plans to launch for all cardiac stent patients could end up extending into other areas of patient care, IHVI officials say.

Fitting squarely into Inova's existing pharmacogenomics

initiatives — genetic tests that indicate the likelihood of a patient's drug response — CYP2C19 genotyping will better pinpoint which patients won't respond to clopidogrel (brand name Plavix), therefore requiring a stronger anti-clotting agent.

But the popular anti-platelet drug is prescribed to patients other than those who receive stents to open clogged coronary arteries. People with other forms of cardiovascular disease also take it, such as patients with a history of stroke and those with artificial heart valves.

"This testing will grow outside the cath lab, such that any patient considered for Plavix at Inova will be genotyped," says IHVI Director Paul Gurbel, MD, who has spent a large part of his 26-year medical career researching different aspects of the drug.

NOT ALONE

Every teen has “the blues” or feels “stressed out” at some point. Adolescence is a bumpy ride, with physical, emotional, psychological and social changes colliding at warp speed. For the majority of 12- to 17-year olds, anxieties and minor bouts with depression naturally dissipate. However, according to the National Institute of Mental Health (NIMH), an estimated 3 million U.S. adolescents had at least one major depressive episode in 2015.

As the new year begins — or from an adolescent’s perspective, the start of second semester — the number of teens suffering anxiety disorders and/or a major depressive episode seems to escalate, suggests Rick Leichtweis, PhD, Senior Director, Inova Kellar Center, which provides a continuum of comprehensive mental health programs and services for children and young adults.

“We treat teens with anxiety and depression all year, but once first semester ends, high school pressures intensify for many students,” Dr. Leichtweis says. “If a student struggles academically during first semester and/or has experienced significant social-emotional challenges, second semester can be very challenging in dealing with the pressures to perform better academically. For some adolescents, it is during this time of year that they begin to show signs of increased depression and anxiety.”

How to Define the Problem

Treating anxiety disorders and/or depression begins with recognizing the symptoms, although this isn’t black and white, explains Sonia Thomas, MD, child and adolescent psychiatrist and medical director of the Inova Kellar Center. “Both disorders share symptoms,” Dr. Thomas says.

The **general** symptoms common to most anxiety disorders are:

- ▶ Nervousness, restlessness, irritability, problems with sleep, inability to concentrate, physical symptoms of headaches, stomach aches or muscle tension.



Inova Kellar Center helps teens deal with anxiety and depression

In addition, there are **specific** symptoms based on the type of anxiety disorder. For example:

- ▶ If they have a panic disorder, teens have panic attacks, which are sudden, severe anxiety attacks with several physical symptoms.
- ▶ If they have a social anxiety disorder, teens are gripped with fears of new or unfamiliar social situations with excessive worries about other people's judgment or expectations.

It is only when the fears and worries are **persistent** (i.e., lasting for more than six months), **pervasive** (i.e., affecting the teen's functioning at home and school), and leading to **distress** and **dysfunction** (i.e., seen as declining grades and school refusal), that a diagnosis is given.

As for a major depressive episode, NIMH defines it as "a period of two weeks or longer during which there is either depressed mood or loss of interest or pleasure, and at least four other symptoms that reflect a change in functioning, such as problems with sleep, eating, energy, concentration and self-image."

Beyond common symptoms, the two disorders often co-exist. The Anxiety and Depression Association of America stresses that nearly one-half of those diagnosed with depression are also diagnosed with an anxiety disorder. "Each disorder has its own causes and we must treat each disorder differently, yet simultaneously," Dr. Leichtweis says.

When to Call Inova Keller Center

Anxiety disorders and/or major episodes of depression need expert input, although Dr. Leichtweis cautions parents, teachers and fellow teens watching over their friends that "it's not so much the symptoms themselves as the degree of symptoms. All kids have bouts of anxiety and depression, but that doesn't necessarily mean they need treatment."

Dr. Thomas stresses that "anxiety during adolescence typically centers on changes in the way the teen's body looks and feels, social acceptance and conflicts about independence.



Watch one family's uplifting story of recovery with help from the Inova Keller Center. Download the Inova Magazine app at inova.org/mobile or search "Inova Magazine" in Apple's app store.

Stress Fractures

In deciding when an adolescent needs professional intervention to treat anxiety and/or depression, the key is identifying persistent, pervasive symptoms that trigger extreme distress and dysfunction.

At the opposite end of the scale, it appears that stress within reason may be positive. A 2013 study from the University of California, Berkeley, reports that moderate and brief periods of stress entice the brain to grow new cells that improve memory.

However, the study concludes, this effect is only seen when stress is intermittent. Once stress escalates into a prolonged, pervasive state, the brain's ability to develop new cells is repressed. At that point, it's time to call in a professional mental health expert.

They may appear extremely shy. They may avoid their usual activities or refuse to engage in new experiences. They may protest or fight whenever they are apart from their friends or outside of their comfort zone. Some teens, in an attempt to diminish or deny their fears or worries, may engage in risky behaviors like drug experimentation, etc."

To understand when it's time to call in an Inova Keller Center clinician, Dr. Thomas refers to the three F's: fight, flight or freeze response. In many cases, she says, the instinctive fight or flight reaction is healthy. If a tiger is chasing you, the urge to flee may save your life. Dr. Thomas adds, "Danger and fear is real. However, irrational fears and excessive worries in the absence of an actual threat is a disorder, and we need to intervene clinically."

What Can Be Done?

After diagnosing an adolescent's degree of anxiety and/or depression and determining if intervention is necessary, Dr. Leichtweis explains that there are best practices. "But how

we combine options depends on the individual," he notes. "We design treatment plans specific to individual patients."

Treatment options span a wide range, including outpatient individual therapy, group therapy and medication management, if indicated. In some cases, patients are brought into the center's intensive in-home services program, daily after-school intensive outpatient program or full-day partial hospitalization program.

With proper care, there is every reason to believe a patient can return to a healthy level of functioning, Dr. Thomas says. But because the Inova Keller Center clinicians see every child, teen and adult's journey as unique, there is no "cookie-cutter" treatment plan. It's an approach that echoes

Inova's systemwide patient-centric approach to health — whether referring to physical or mental health. inova.org



Learn more about the Inova Keller Center at inova.org/kellar. And help the center celebrate its 25th anniversary at inova.org/friendsofkellar.



Pathways

THE VANGUARD OF
GENOMIC MEDICINE

The New **Hub** of Innovation

*Inova partners with
Virginia, select universities
and the technology sector
on new Global Genomics and
Bioinformatics Research Institute*

Inova's global leadership in developing personalized health therapies takes another major step forward with a new initiative that will propel Virginia to international prominence in the fields of personalized medicine and bioinformatics and the commercialization of practical and effective new treatments for patients.

In a \$112 million, public/private partnership with the Commonwealth of Virginia, an impressive grouping of Virginia universities and the state's technology community, Inova is creating a Global Genomics and Bioinformatics Research Institute. Set to be located on the 117-acre Inova Center for Personalized Health campus in Falls Church, the institute will recruit world-class scientists to collaborate on several key objectives. These include advancing fields that maximize the pipeline of leading-edge treatments — such as genomics, bioinformatics (which uses computer technology to manage biological data) and precision medicine — and translating basic research into targeted therapies while commercializing new discoveries.

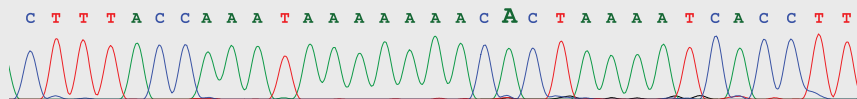
"The Commonwealth's investment is an extraordinarily strong endorsement of Inova's leadership in the areas of personalized health and precision medicine," says Todd Stottlemeyer, CEO of Inova Center for Personalized Health (ICPH). "We've certainly expanded our brand and reputation for being a leader in genomic science and data analytics and for being a go-to organization that knows how to build partnerships."

Vast Economic Impact

Serving as the institute's anchor and general partner, Inova and ICPH will collaborate with six public research universities: University of Virginia, George Mason University, Virginia Tech, Virginia Commonwealth University, Old Dominion University, and William and Mary. Additionally, Virginia's technology industry — rich with capabilities in software development, data analytics, modeling and simulation, and cybersecurity, among others — will be tapped to generate new opportunities to better predict, prevent and treat disease.

Among its many benefits for Virginia, the initiative will generate a life sciences "hot spot" that draws eminent researchers, outside investors, sponsored research and commercial partners to the region and create a host of new, high-paying jobs, Stottlemeyer explains.

"The potential here is to bring exceptionally smart men and women from across the country and the world to this campus to do interdisciplinary research that leads to new discoveries that fundamentally impact people's lives in a very positive way," he says. "The objective is to take research and turn it into targeted therapies, new devices or discoveries that can ultimately impact the health of our community,



Glossary: **genomics**

Mapping Uncharted Territory

The terms genetics and genomics are easily confused. Genetics refers to the study of a particular gene; genomics refers to the study of the entire genome of an organism. A bit of background:

- ▶ DNA is the chemical compound that contains the instructions needed to develop and direct the activities of nearly all living organisms.
- ▶ Genes are parts of the DNA that determine how the cells are going to live and function.
- ▶ An organism's complete set of DNA is called its genome.

In recent years, scientists discovered how to sequence the human genome. As a result, they have uncovered large numbers of disease-causing and/or associated genes. Mapping individual genetic codes has led to the birth of a new area of science called predictive medicine — using our grasp of genome sequencing and the vast amount of data this produces to predict health risks and disease along with reactions to treatments. The goal of Inova Center for Personalized Health is to discover causes of disease and tailor treatments to individuals.

either by better preventing disease or by helping people get back to health."

Changing Research Paradigm

Along with an ambitious set of goals, the new institute aims to shift the current paradigm of medical research, which has historically led scientists and investigators to work in specialized "silos" that don't confer with one another or share data.

"We're leaning forward and trying to conduct research in a new way," Stottlemeyer says. "Design isn't just about how things look; it's about how things work. We're designing the institute in a way that gets researchers out of their silos, working in interdisciplinary teams and crossing boundaries between institutions, all for the advancement of discovery, new clinical applications and commercialization."

The multiyear effort wouldn't be possible without financial and infrastructure commitments at many levels, Stottlemeyer notes. This includes major donations from individuals and support from many philanthropic organizations.

"The financial foundation you need in order to be great will require an investment by Inova, our partners and by the government — in this case the Commonwealth of Virginia and Fairfax County," he says. "It also takes philanthropic investments by our community, which includes the greater regional and national community. You can't look around and find a global leader that doesn't have a significant philanthropic component." **INOVA**

& Learn more about
the Center for
Personalized Health
at inova.org/icph.

Majority Report

*As today's largest generation, millennials
are redefining healthcare*





It's official. Millennials outnumber baby boomers, and with their commanding presence comes a voice that deserves to be heard. Healthcare in particular is an area where these 75.4 million 18-to-34-year-olds are expressing preferences — and Inova is listening.

“Key to providing the highly personalized healthcare we're known for is considering how a patient's medical needs and behaviors differ across generations,” explains David W. Gehring, MD, Inova internist.

Specific to millennials, Inova is focused on this generation's need for uber-convenience, low cost and healthcare information that reflects what they have found online. In addition, Inova recognizes this generation's apathy toward developing a relationship with a primary care physician and is dedicated to reversing this indifference.

Building Relationships

“Young adults are often less likely than other groups to visit a doctor unless they are sick,” Dr. Gehring explains.

The stats concur, according to two companies that track consumer behavior. Zocdoc, which specializes in online medical scheduling, reports that 93 percent of millennials do not schedule preventive physician visits with a physician. Salesforce, which produces a patient management and engagement software called Health Cloud, states that nearly half of millennials claim no personal relationship with a primary care physician.

Failing to see a doctor regularly, Dr. Gehring stresses, robs millennial patients of valuable time to cover topics not discussed during routine sick visits. “Regular annual visits allow primary care doctors to keep patients' medical histories up-to-date, check their vital signs and discuss high-risk behaviors

such as binge drinking, and texting while driving. We can also screen for behavioral health problems such as eating disorders, depression and anxiety — problems that are not uncommon in this age group, and which may not always be obvious.”

Without an established physician/patient relationship, it can also be difficult to find a doctor should illness strike, says Cindy C. Feely, MD, Inova internist. “Millennials often turn to walk-in medical clinics, which are convenient, but by definition impersonal. If you want to see a doctor who knows you, knows your medical history and is someone you know for sure you can trust, that relationship has to begin with an annual physical.”

To attract this generation's attention — and open the door for a discussion about the primary care provider's importance — Inova has instituted systemwide, millennial-friendly procedures and processes.

Convenience Tops the List

The ease of phone apps, emails and texts has the majority of millennials snubbing phone calls and voice mail. Salesforce's “2015 State of the Connected Patient” report reveals that 71 percent of millennial patients would rather use mobile apps to book appointments, check health data and manage preventive care.

With that in mind, Inova set up MyChart, a secure online system that allows patients to check their health information and communicate directly with their Inova physicians.

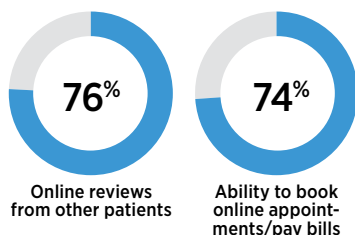
“My patients use the app to make appointments and email me with questions,” Dr. Feely says. “I may recommend an over-the-counter medication or advise an office visit. There's no calling my office and being put on hold, no voice messages and no phone tag. It's quick, convenient, immediate email communication.”

continued ▶



*Inova patients who prefer to keep track of their healthcare needs via mobile devices can download MyChart, a secure online information and communication system. Get it at **inova.org/mobile**.*

What criteria do millennials value when selecting a doctor?



Source: Salesforce, "2015 State of the Connected Patient" report

For Your Information

More than any other generation, millennials turn to the internet for medical guidance. They search WebMD, Mayo Clinic and Google before contacting doctors, and when they do see primary care physicians, they often arrive with information stored on their smartphones.

To help millennials feel respected and comfortable within its healthcare system, Inova providers embrace this generation's internet connection. "Much more than my older patients, millennials are very interested in how we doctors come to our conclusions and why we recommend specific medications. They want evidence-based medicine. They want to be educated," Dr. Feely says. And the doctor is ready, whether that means supporting a patient's online research or correcting misinformation and myths with medical evidence.

The millennials' penchant for education and reluctance to blindly follow a doctor's advice is why Dr. Feely dubs this "a great demographic to care for." There are discussions, intellectual connections and challenging questions that tap right into Inova's personalized, patient-centric approach to healthcare.

Respect for how a patient's medical needs and behaviors differ across generations, as Dr. Gehring puts it, may play a vital role in helping Inova's millennial patients mature into a healthier generation. **INOVA**

& Inova doctors are available for patients of all ages at inova.org/physicians.

Elsewhere for Healthcare

Millennials, who are less likely than other generations to make routine doctor appointments, are keen on nontraditional healthcare settings, such as retail walk-in health clinics and urgent care centers. While such locations cannot replace regular primary care office visits, these alternatives do offer several benefits, as described below.

RETAIL WALK-IN HEALTH CLINICS

Retail walk-in health clinics — primarily staffed by nurse practitioners or physician assistants — are typically tucked inside drugstores, supermarkets, "big box" stores or large retail chain settings and can be a good option for simple, non-urgent health matters.

BENEFITS

- ▶ **Affordability:** Visits typically range between \$40 and \$75.
- ▶ **Convenience:** An estimated 2,000 retail walk-in clinics dot the country and are generally open seven days a week, offer extended weekday hours and require no appointments. Visits generally take 15 to 20 minutes.
- ▶ **Illness- and injury-focused:** Services address minor injuries and illnesses, such as colds, minor cuts or rashes. Also, staff can write prescriptions.

CAVEAT

These clinics typically follow national guidelines of care regardless of age or gender, cannot address chronic medical issues and do not promote provider consistency.

URGENT CARE CENTERS

Urgent care centers offer high-quality care for common illnesses and non-life threatening events. Staff typically includes at least one medical doctor as well as a nurse practitioner or physician assistant. There are an estimated 7,100 urgent care centers in the U.S. Inova offers 15 urgent care locations to serve Northern Virginia residents.

BENEFITS

- ▶ **Affordability:** The average urgent care center visit costs around \$150 — compared to \$1,354 for an average ER visit.
- ▶ **Convenience:** Walk-in, after-hours and weekend availability give patients access to quality medical care when their primary care doctor's office may not be open.
- ▶ **Quick service:** The average wait time to see an urgent care center provider is 30 minutes or less.
- ▶ **Illness- and injury-focused:** Services generally focus on medical conditions in need of quick but not lifesaving care, such as sprains, flu, colds, burns or lacerations requiring stitches. In addition, patients can often receive vaccinations, prescriptions as well as a variety of tests, from X-rays to lab tests.

CAVEAT

Urgent care centers are never for life-threatening injuries or illnesses, which must be handled in a hospital emergency room (ER) or emergency care center (ECC). In addition, these centers are not the best option for chronic health conditions, which are better handled by a primary care physician who knows the patient's medical history, has knowledge of previous illnesses and provides continuity of care.

EMERGENCY ROOM

Emergency medicine is a fast-paced, team-oriented specialty for patients facing severe symptoms or a life-threatening medical condition. Inova offers Northern Virginia residents ER care at each of its five hospitals and at six freestanding emergency rooms.

BENEFITS

- ▶ **Knowledge, manpower and equipment:** ER and ECC teams are prepared to manage medical conditions or injuries that require rapid and advanced treatments, such as surgery.
- ▶ **Availability:** There is always 24/7 access.

CAVEAT

Depending on urgency, there may be a longer wait time before treatment.

Chairman of the Board

Timothy Cannon, MD, moderator of the Molecular Tumor Board, on what makes the board unique and how it helps patients

Timothy Cannon, MD, gastroenterologist at Inova, plays a pivotal role in the meetings of the newly created Molecular Tumor Board (MTB). This forum of oncologists, geneticists, scientists, experts from other medical institutions and cancer patients meets weekly. The doctors discuss particular cancer patients' cases and their options going forward. He explains.

"I don't know of any other board that allows patients to join the conversations."



Photo: Mike Morgan

How does this board operate?

It's a once-weekly meeting every Friday. We discuss two to four cancer patients who do not have a lot of treatment options. It's a forum; patients are welcome to come. I don't know of any other board that allows patients to join the conversations. The room has about 15 people; five people call in. We all give our input into each case. I prepare slides on the mutations and some information on the DNA findings. Then everyone discusses the best actions for the patient.

Who are the MTB's candidates?

It's really for people who have been on standard-of-care therapy and need something new. They have run out of standard options. This is another part of what makes our cancer board unique. There have always been tumor boards for people with new diagnoses of cancer; there haven't been tumor boards for people who have had a lot of different treatments.

What kinds of cancers are the subject of discussion?

We are interested in any type of cancer, so long as the patient has already received some treatment that did not keep the cancer in remission. The mutations we are typically discussing are somatic mutations — those that happen sporadically through your life to cause cancer. Sometimes we find hereditary mutations, and we discuss those in detail as well. We have amazing genetic counselors, like Sarah Ruppert and Tiffani Demarco, who come to our tumor board. They are very helpful for the cases in which we find a mutation that is likely inherited. To be on the tumor board's agenda, the patient has had a molecular test, which looked at 350 genes. We also

use peripheral blood testing. The meeting is centered on the results of the genetic testing.

What are the MTB's objectives?

Among the goals are to educate physicians like myself on molecular diagnostics. This includes DNA sequencing, RNA sequencing and other next-level diagnostics. Another goal is to improve clinical trial enrollment at Inova and elsewhere. The third goal is to help the patient find a successful treatment; ideally, it would be one with less treatment toxicity. In the year 2016, we are finding a successful treatment less than half the time. When we do, it is very exciting. I think our ability to detect and analyze mutations is ahead of our ability to find useful pills. But these patients have limited treatment options otherwise, so I think we are performing a great service. The last aspect about it is it's extremely popular with patients. Patients love participating, I believe. We are currently opening a survey-based satisfaction study to better evaluate what patients get out of live participation.

It sounds like treatments can be elusive for the patients on the MTB.

These folks don't have many treatment options, so the idea of the tumor board appeals to them. Those for whom we ultimately cannot find an effective treatment take comfort in the fact that we are building a platform for the day when there will be great targeted therapies. With each passing year, choosing therapies based on molecular diagnostics and discussing them in Molecular Tumor Board will become increasingly beneficial to patients. **INOVA**



Learn more about the Molecular Tumor Board at inova.org/mtb.

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