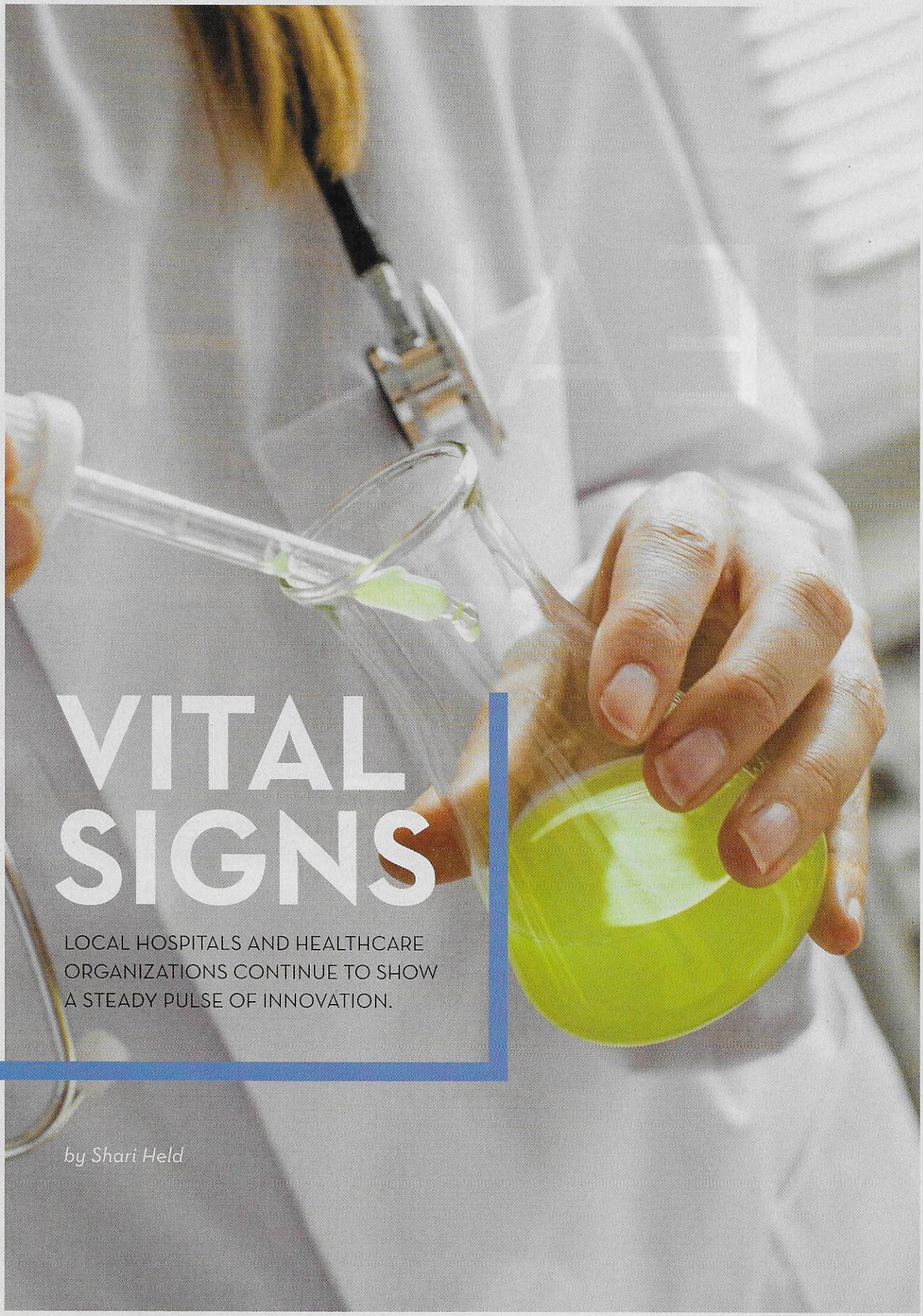


VITAL SIGNS

LOCAL HOSPITALS AND HEALTHCARE ORGANIZATIONS CONTINUE TO SHOW A STEADY PULSE OF INNOVATION.

by Shari Held

THINKSTOCK.COM

SOMETIMES NEGATIVE NEWS FROM THE healthcare sector—like ever-increasing costs and the shortage of doctors—seems to eclipse the positive breakthroughs that make life a little easier for those in need of care. Central Indiana boasts plenty such advancements. Here, five procedures, products, and programs whose ultimate goal can be pinpointed to one thing: improved quality of life.

NEW USES FOR EXISTING TECHNOLOGY

LUNA fluorescence angiography technology was originally introduced as a way for surgeons to evaluate blood flow through the skin in real time while performing delicate surgeries. But Tracey Ikerd, M.D., infectious-disease specialist with Riverview Health and medical director of Riverview Health Wound Care, saw its potential outside the operating room.

"We took this technology another step and rolled it into wound care," he says. "Ninety-nine percent of the time, wounds heal uneventfully. LUNA helps us evaluate blood flow into and out of an area that won't heal."

LUNA is used to complement, not replace, standard technologies like the arterial doppler, an ultrasound of the arteries.

A quick, correct diagnosis is crucial for wound care. The longer a wound or ulcer remains open, the more susceptible it is to infection, trauma, or affecting a bone or tendon.

"We're using LUNA to help verify that our diagnosis is correct, because as the cost of healthcare gets higher, we don't have the luxury of being wrong," Ikerd says. "Being able to sharpen our diagnostic pencil helps us to attack the problem more efficiently and to make better decisions early."

Riverview purchased the machine in July 2014, making it the first hospital in the state to incorporate fluorescent angiography into outpatient wound care. The process is extremely safe. The patient is injected with a harmless indocyanine green dye, which is captured on an infrared camera and shows the rate of blood flow in and out of the wound. It takes only a few minutes, allowing Ikerd to print out copies of the test and interpret them for patients and their families on the spot.

Being able to see what's actually going on in their bodies—versus being told—engages patients, enhances their understanding, and improves compliance with their prescribed treatments. Ikerd recalls a patient who was trying to quit smoking actually pumping his fist in the air when he saw how well he was progressing.

Riverview's LUNA system helps doctors tackle wounds more efficiently.

PHOTO COURTESY RIVERVIEW HEALTH

Ikerd is working with Novadaq, the company developing the LUNA technology, to begin some investigational studies.

"We want to see how far we can take this technology in evaluating and diagnosing patients with flow disorders," he says.

A PROMISING METHOD OF MENDING KNEE CARTILAGE

Jack Farr, M.D., an OrthoIndy knee surgeon and lead investigator in the Phase 3 trial for Histogenics's investigational cartilage tissue implant, NeoCart, hopes to provide patients with a better option for restoring damaged knee cartilage. Microfracture surgery, in which the underlying bone plate is perforated to release stem cells that migrate to the knee to repair it, is the gold standard for cartilage restoration in the U.S. today. In the randomized, controlled trial sponsored by Histogenics, some patients will receive NeoCart, while others will undergo microfracture surgery.

Candidates for these procedures are typically age 40 and younger—the age parameters for the trial are 18 to 55—with nearly normal X-rays.

"The road is basically in good shape," Farr says. "What we're doing with these cartilage procedures is filling in a few potholes."

> "The road is basically in good shape. What we're doing with these cartilage procedures is filling in a few potholes."
>
> JACK FARR, M.D., ORTHOINDY KNEE SURGEON

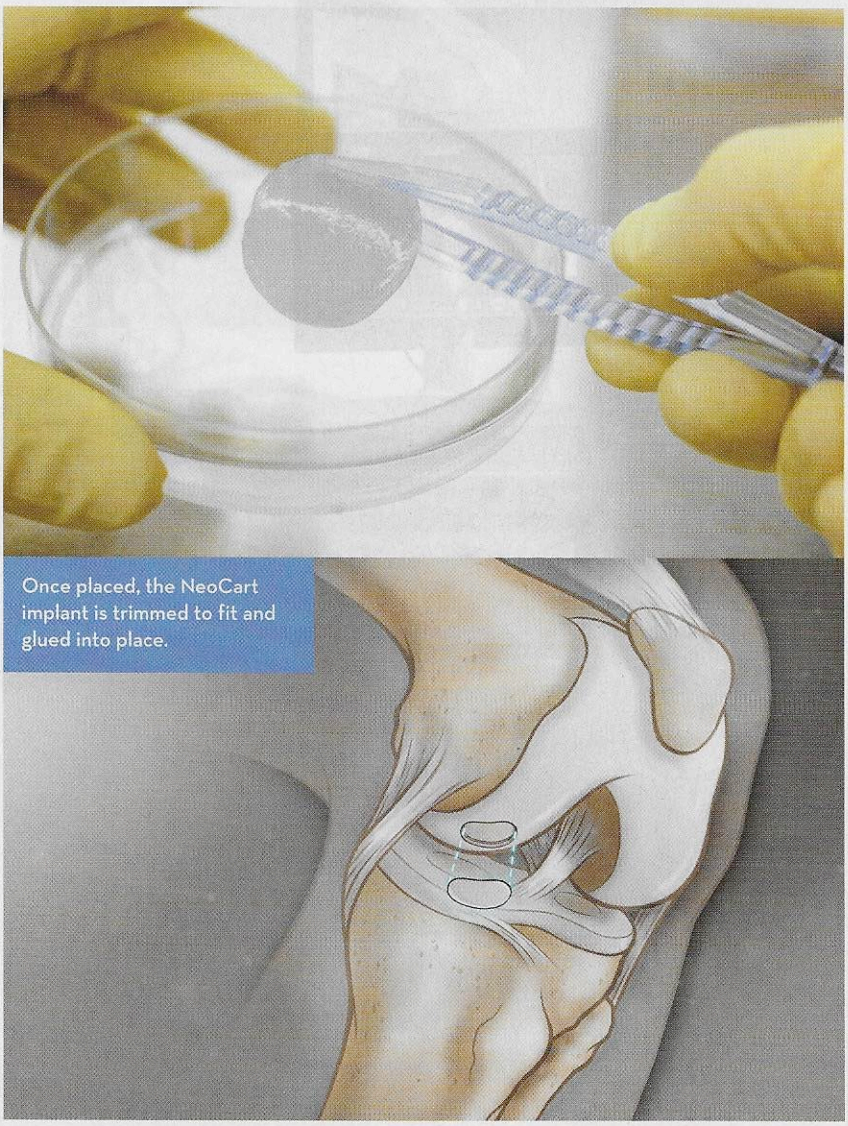
Cartilage can be damaged by acute or repetitive trauma or gradual wear and tear. Unfortunately, it can't repair itself. The associated pain can make participation in recreational activities impossible and can even interfere with basic activities of daily life.

With NeoCart, a small amount of a patient's healthy cartilage is harvested from his or her femur. The cartilage is sent to Histogenics's lab, where the cells are removed, cultured, and placed on a special honeycomb scaffold. Histogenics's Tissue Engineering Processor simulates the body's mechanics to stimulate cell formation throughout the scaffold. It takes about two to four weeks for the cells to develop into an immature form of cartilage that the orthopedic surgeon can trim to fit the defect and glue into place using Histogenics's special bioadhesive. The idea is that the new cartilage tissue, NeoCart, will mature and integrate with the patient's tissue.

"A good result would mean the patient has no pain when performing the activities of daily living," Farr says. "An excellent result would mean they have no pain with any activity and may be able to return to some level of sporting activities."

Farr also hopes that "filling a small pothole" will stop progressive deterioration of the knee cartilage.

"Based upon the first two phases, it appears that patients had a more lasting improvement with the NeoCart, but it's not proven," Farr says. "That's why we're doing the Phase 3 trial."



Once placed, the NeoCart implant is trimmed to fit and glued into place.

PHOTOS COURTESY HISTOGENICS CORPORATION

A SPECIALIZED MEANS TO HEALING WOUNDS

Witham Health Services' Wound Healing Center specializes in hyperbaric oxygen therapy, or HBOT. HBOT is used for non-healing wounds, such as bone infections, diabetic foot ulcers, and ulcers caused by radiation. Some patients are on the verge of sepsis (a severe blood infection) or already have sepsis, and amputation is a real threat.

"We help patients get back to a state where they can function and have a better lifestyle," says Becca Holloman, RN, BSN, CWOCN, director of the Witham Wound Healing Center.

Patients lie on a gurney in an enclosed, pressurized, 100-percent oxygen chamber for up to two hours at a time. It's that combination of oxygen and pressure that makes the treatment so effective: The pressure at that depth allows the blood to absorb oxygen at a higher rate than normal, which enhances healing.

Though it can differ for each patient, the standard plan is a minimum of 20 treatments, five days per week for four weeks.

"A lot of our patients have been dealing with horrific wounds for some time, and they may think amputation is the only cure," Holloman says. "This gives them hope."

And there are many successes, such as a young patient who had an extensive bone infection and a large ulcer on his hip. It took surgery, IV antibiotics, and 84 HBOT treatments, but he was cured.

> "We help patients get back to a state where they can function and have a better lifestyle."
>
> BECCA HOLLOMAN, DIRECTOR OF THE WITHAM WOUND HEALING CENTER

Patients receive a thorough checkup before entering the chamber, including chest X-rays to evaluate the lungs. Blood-sugar levels of diabetic patients are tested before and after treatment, as are a patient's ears and vision. Most experience only a little eardrum irritation. The most common eye issue is progressive myopia, but blurry eyesight is another possible side effect, says Dr. Herschell Servies Jr., FAAFP, WCC, chief medical officer for Witham Health Services.

"That goes away after they stop the treatments," he says.

The center can treat three or four patients per day because it staffs for safety. A technician is by the patient's side every minute. The center's three RNs are certified in wound care and trained in HBOT, and a supervising physician—also trained in HBOT—is always in the facility as well.

Those with serious wounds find hope in Witham's hyperbaric oxygen therapy.

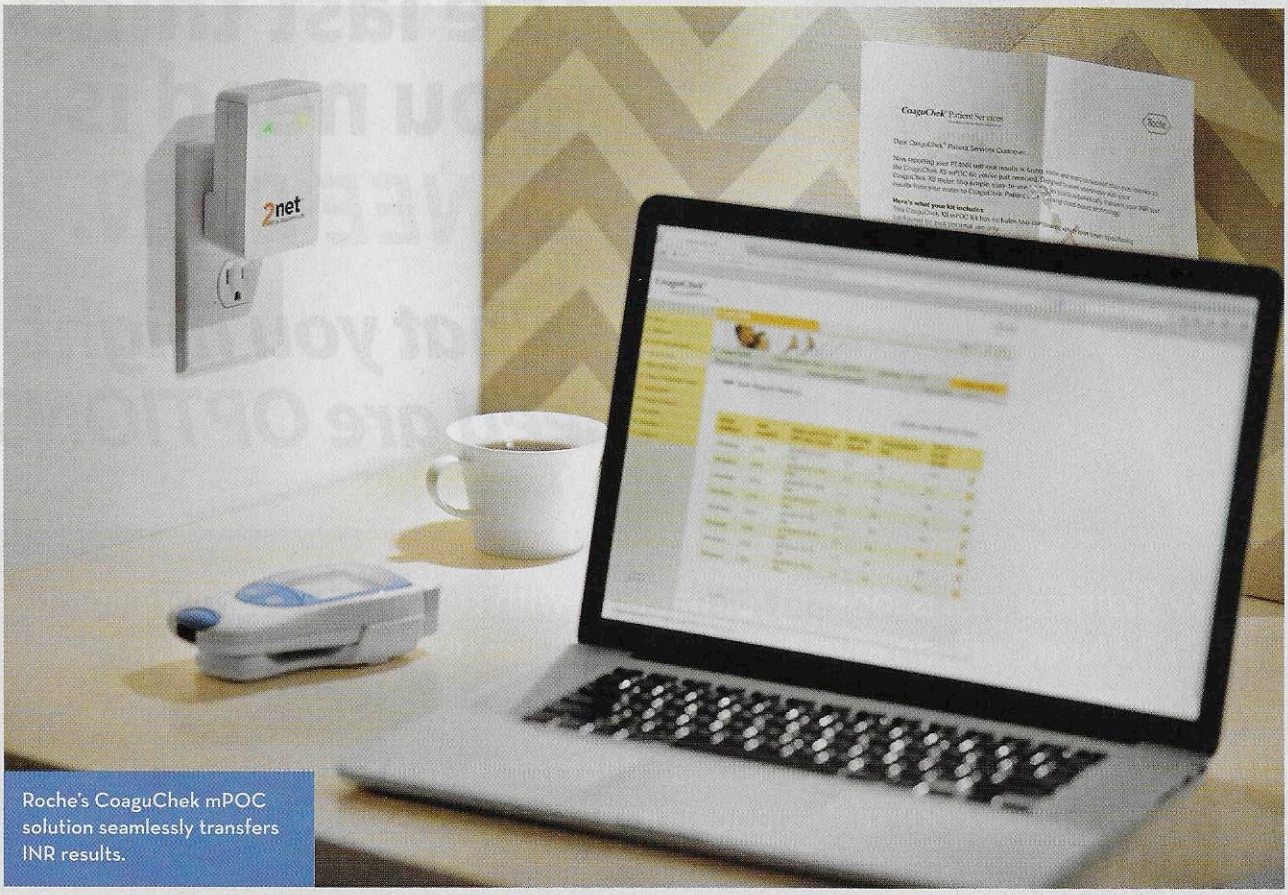
PHOTO COURTESY WITHAM HEALTH SERVICES

GAME-CHANGING TECHNOLOGY FOR WARFARIN PATIENTS

Warfarin (Coumadin) has long been the standard anticoagulation medication prescribed for patients with atrial fibrillation, deep-vein thrombosis, and mechanical heart valves. Today in the U.S. alone, it's estimated that 4 million people take warfarin. The powerful drug can prevent existing blood clots from growing and new ones from forming. But patients are faced with a continual juggling act that impacts their lifestyle.

Too heavy of a warfarin dose, and they're at increased risk for bruising or bleeding. Too little, though, and there's a greater risk for blood clots, stroke, or heart attack. Because of this, patients require regular monitoring, monthly or sometimes more frequently, via a PT/INR blood test (Prothrombin Time/International Normalized Ratio), while taking the medication. For most of them, that will be for life. Those regular trips to the lab or doctor's office for a blood test can take a toll on patients and families.

In 2007, Roche Diagnostics introduced CoaguChek® XS System, a portable monitor that enables patients to self-test their PT/INR via a finger stick in the comfort of their own homes. The



Roche's CoaguChek mPOC solution seamlessly transfers INR results.

company also founded CoaguChek Patient Services, an independent diagnostic testing facility that distributes the monitoring device (once prescribed), provides patient training and support, and reports test results to the patient's physician and/or healthcare team. CoaguChek Link, Roche's healthcare portal, gives patients the option of reporting results securely online or over the phone.

Physicians can monitor patients remotely with timely access to PT/INR results from CoaguChek Patient Services, including notifications if one's result is out of range. They can also review trends of a patient's results over time on the CoaguChek Link portal.

Because patients can enjoy the convenience and ease of self-testing, they may adhere more to their prescribed testing schedule and spend more time within their target PT/INR range. From an economic standpoint, keeping patients out of the emergency room can reduce overall healthcare costs.

"The things I continue to hear from patients are how CoaguChek self-testing solutions and services have made managing their therapy more convenient and given them peace of mind," says Howard Sams, vice president, project lead, point of care, Roche Diagnostics International Ltd.

Now Indianapolis-based Roche, through CoaguChek Patient Services, is bringing more innovation to these patients. With the CoaguChek XS mPOC kit (mPOC stands for mobile point-of-care), patients can test from their CoaguChek XS devices and have their results automatically, securely, and wirelessly sent to CoaguChek Link without having to call or manually enter the results. Roche collaborated with Qualcomm Life Inc. to leverage its cloud-based 2net™ Platform to make the CoaguChek XS mPOC system a reality. Feedback on this new, connected solution has been favorable, with early users giving high marks for improved accuracy, ease of use, and security features.

> "We believe the addition of mobile technology and cloud-based connectivity is a natural evolution for point-of-care and patient self-testing devices."
>
> ALAN WRIGHT, M.D., CHIEF MEDICAL OFFICER AT ROCHE DIAGNOSTICS

"We believe the addition of mobile technology and cloud-based connectivity is a natural evolution for point-of-care and patient self-testing devices," explains Alan Wright, M.D., chief medical officer for Roche Diagnostics. "At its core, point-of-care diagnostics have a singular and elegant focus—providing patients and their physicians with reliable, medically relevant results when and where they need them."

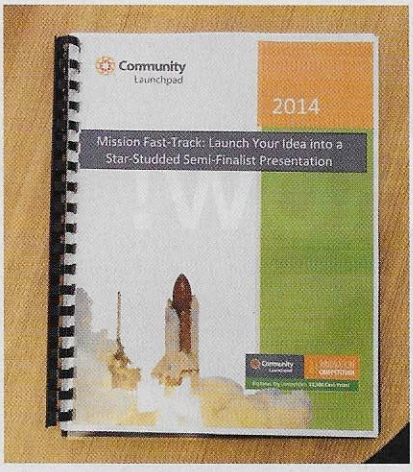
PHOTO COURTESY ROCHE DIAGNOSTICS

A SUPPORTIVE ENVIRONMENT FOR INVENTION

Great ideas are the lifeblood of innovation, but they often never materialize because people don't know how to market or implement them.

"The reality is, more often than not, it takes a tremendous amount of work, validation, and collaboration to actually get a product into the marketplace," says Pete Turner, vice president of innovation for Community Health Network.

That's why Community established a process and an infrastructure to give its physicians and staff an internal resource for exploring the feasibility of their ideas and implementing them more quickly. It's called Community Launchpad.



Left: Community Launchpad presentation guide. Right: Pete Turner of Community Health Network in the "war room."

Anyone in the organization can submit his or her idea through Launchpad's online portal. Not all proposals can be commercialized, but many offer suggestions on performance improvements and operational efficiencies, such as decreasing patient wait times, optimizing the electronic medical record, or improving the billing process. Those whose concepts are added to the commercialization pipeline participate in an incubation program, in which they examine the business viability of their ideas.

Launchpad's first commercial success was from Dr. Michael Guzman, who developed a peripheral nerve block kit, which uses less pain medication for those undergoing major abdominal, orthopedic, or spine surgery. The results are faster recovery times and a decreased risk of complications.

The provisional patent for Guzman's kit was licensed to a Fortune 500 company, and royalties on net sales will generate additional revenue streams that will help fund future innovations.

Still in the pipeline is an idea for a mobile workstation that provides home-care nurses an uncontaminated surface on which to conduct medical procedures.

One outcome that caught Turner by surprise is the reaction Launchpad has generated from other healthcare systems and even unrelated industries, such as the construction sector. They all want to find out how to replicate employee participation fostered by the Launchpad model. A recent contest, which generated 800 patient-centered ideas in just three weeks, showcases the extent of that worker engagement.

"The fact that every idea, big or small, would be followed up on sent a message that we're all important and our contributions matter," says Brandy Gordon-Smith, RN, one of the contest finalists. "I was thankful for the opportunity to share an idea in a safe place that could potentially make a difference in someone's life." ■

> **"The fact that every idea, big or small, would be followed up on sent a message that we're all important and our contributions matter."**
>
> BRANDY GORDON-SMITH, RN, COMMUNITY LAUNCHPAD CONTEST FINALIST

PHOTOS BY TONY VALAINIS