Insight and news from Johns Hopkins Medicine

FALL 2012

Discovery Channels

Breakthrough surgical innovations pave the way for new solutions to navigating—and healing—the body

Making MRI safe for all

A life-changing cure for excessive sweating

Jaw reconstruction offers a second chance
Interactive Video Games Play a Valuable Role in ICU Rehab

Interactive video game consoles, such as the Nintendo Wii, aren’t just for the family rec room these days. They are popping up in hospitals throughout the country, and at Johns Hopkins, you’ll see them in the medical intensive care unit (ICU), too. That’s because researchers Michelle Kho, P.T., Ph.D., and Dale Needham, M.D., Ph.D., have discovered that interactive video games may help with the rehabilitation of critically ill patients.

“One of the critical challenges long-term ICU patients face is muscle weakness,” Kho says. “Video games not only boost physical rehabilitation but also people’s desire to work harder without fatigue.”

Hoping to make interactive video games a regular part of physical therapy at Johns Hopkins, Kho and Needham tested the video game console on ICU patients, including people on life support. To play the games, patients sat or stood with assistance, if they could. The researchers determined that the use of interactive video games as part of physical therapy appeared safe. What’s more, they believe that activities such as boxing may improve balance and endurance while providing a welcome change from traditional therapy (walking and standing exercises).

“The innovation is using interactive video games as part of therapy in critically ill patients,” Needham says. “It lets patients participate in their own recovery in a unique way.”
CANCER CARE

How to Tell the Kids That You Have Cancer

When Lillie Shockney, R.N., administrative director of the Johns Hopkins Clinical Breast and Cancer Survivorship Programs, was diagnosed with breast cancer 20 years ago, one of her first concerns was breaking the news to her 12-year-old daughter, Laura. She knew the timing was critical.

“I waited until I had met with the surgical oncologist to have a confirmed treatment plan before I told her,” Shockney says. Children, especially girls with relatives who have had the disease, may worry about getting breast cancer themselves, so they need reassurance that research and treatments are improving all the time and that Mom is doing all she can to get well again.

Shockney cautions against waiting too long or keeping young children out of the loop altogether. “We assume because a child is 3 or 4 that they don’t need to know anything,” Shockney says. “But they’ll feel the stress around them. Establish trust with your children.”

Watch a video of Lillie Shockney, R.N., discussing the process of telling your family about your breast cancer and recalling her own experience talking to her daughter about the diagnosis and treatment. Go to bit.ly/lillie-breastcancer-video.

Will Cancer Treatment Affect My Fertility?

If you’re of childbearing age and recently received a cancer diagnosis, you need to think about your fertility before you undergo cancer treatment, says Melissa Yates, M.D., a reproductive endocrinologist at the Johns Hopkins Fertility Center. Radiation can put ovaries at risk, and some breast cancer treatments trigger premature menopause.

At Johns Hopkins, oncologists and fertility specialists work hand in hand. For example, depending on the type of cancer a woman has and the treatment prescribed, she might want to consider freezing her eggs or embryos.

With fertility preserved, cancer treatment can begin straightforward. “We work hard to get patients seen in a timely manner,” Yates says, “because we know time is of the essence.”

PROTECT YOUR KIDS’ SKIN ALL YEAR

When the shorter, cooler days of fall and winter arrive, it’s easy to be chilled into a false sense of security and forget about protecting your children’s skin from the sun. “Most of us think about sun exposure when it’s hot outside,” says Katherine Püttgen, M.D., assistant professor of dermatology and pediatrics at Johns Hopkins, the only medical institution in Maryland with board-certified pediatric dermatologists. But, Püttgen adds, sunlight’s skin-damaging ultraviolet radiation is constant year-round.

Melanoma, the deadliest form of skin cancer, affects about 425 people younger than 20 each year in the U.S., according to the National Cancer Institute. Girls are especially at risk, given that they are more likely to use tanning salons, which can emit ultraviolet radiation 10 to 15 times higher than that of natural sunlight.

Püttgen urges parents to be especially cautious with infants and toddlers, who receive more sun exposure per unit area than adults. To protect your kids’ skin, be vigilant throughout the year:

- Apply sunscreen with a sun protection factor (SPF) of 30 or greater before going outdoors.
- Avoid sun exposure during peak hours, 10 a.m. to 4 p.m.
- Wear sun protective clothing and hats.
- Do not use tanning salons.

Join Johns Hopkins reproductive endocrinologist Melissa Yates, M.D., as she discusses options for fertility preservation, what is involved, how important timing is, and how a woman can best prepare to have a family once she completes cancer treatment. To register, visit hopkinsmedicine.org/healthseminars.

Find more questions answered by Johns Hopkins experts and others at sharecare.com, a website designed to simplify your search for quality information on topics of health and wellness.

health insights
Safe Imaging for All

**MRI is now an option for millions who have cardiac devices**

MAGNETIC RESONANCE IMAGING (MRI) is a powerful tool for detecting cancer, kidney disease, orthopedic injuries and more. Until recently, millions of people with implanted cardiac devices were ineligible. That all changed when Henry Halperin, M.D., professor of medicine, radiology and biomedical engineering, and Saman Nazarian, M.D., assistant professor of medicine, led a study at Johns Hopkins that resulted in the creation of a safe MRI process for these people.

**Why would I need an MRI?**

MRI has made a huge difference in many lives. It can help us diagnose conditions that other imaging methods, such as CT (computed tomography) and ultrasound, cannot.

**What are the dangers of MRI to people with cardiac devices?**

People with implanted defibrillators and pacemakers have traditionally been unable to undergo the procedure because of the risk of the MRI’s heat, vibrations and magnetic field causing the cardiac device to malfunction. The overwhelming majority of people can undergo MRI safely, but we still need more data to make sure it is safe for everyone. We think it is just a matter of time before many of the restrictions regarding the use of MRI in people with cardiac devices can be removed.

**How do you make MRI safe for me?**

Most cardiac devices are actually safe during MRI, but Johns Hopkins takes several precautions to make sure no harm comes to the person or to the device. We first check to make sure your cardiac device is working properly, and then we program the device into a “safe” mode for use in MRI. As you undergo your MRI scan, a specialized nurse monitors you in case there are any problems. When the scan is over, we test the cardiac device again to make sure it is working properly, and then we revert the device to the mode it was in before the MRI.

**What should I do if I still have concerns?**

Here at Johns Hopkins, we have performed MRIs on more than 700 people with implanted cardiac devices. We have a specialized staff, including trained nurses, with whom you can discuss any concerns.

For more information, appointments or consultations, call 877-546-1872.

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NO Sweat

Surgery changes the life of a man who suffered from excessive perspiration

If it weren’t for Johns Hopkins, Denis Perrault might never have achieved his goal of going into politics. Now a member of the city council in his hometown of Swift Current, Saskatchewan, Perrault was reluctant to shake hands with people until a few years ago.

Perrault has a condition called hyperhidrosis, which causes excessive sweating, typically in the hands, feet and underarms. “It was very difficult to shake hands or swing a golf club or play tennis,” he says. “I’m an accountant, so it also made for messy papers because the sweat would stain the ink.”

In severe cases, people who have the condition have hands that drip with sweat, to the point that when they are anxious they can fill much of a small jar during a clinic visit, says Malcolm Brock, M.D., a thoracic surgeon at Johns Hopkins. He says experts don’t exactly know what causes the disease.

Perrault went through a number of treatment options before turning to Johns Hopkins. “He’d tried to manage his disease with all sorts of therapies, from topical ointments to medication—to no avail,” Brock says.

At Johns Hopkins, people are tested to determine the severity of their condition and to rule out other causes of excessive perspiration. If all other treatments fail, surgery is recommended, as it was for Perrault.

During the thoracic sympathectomy, a minimally invasive procedure, a small incision is made in the armpit and the sympathetic nerve is cut in a precise spot that stops the sweating. Most people are back to their routine in less than a week.

“After the surgery in 2007, my hands have felt amazing,” Perrault says. “It’s opened a lot of doors for me—including getting into politics, which involves a lot of handshaking—and it definitely improved my confidence.”

FREE ONLINE SEMINAR
DO YOU SUFFER FROM EXCESSIVE SWEATING?

Wednesday, December 5, 7–8 p.m. EST
Almost 3 million Americans suffer from hyperhidrosis, or excessive sweating. Join Johns Hopkins thoracic surgeon Malcolm Brock, M.D., as he discusses treatment options, including thoracic sympathectomy, an outpatient procedure that is minimally invasive and reduces or stops excessive sweating. To register, visit hopkinsmedicine.org/healthseminars.

For more information, appointments or consultations, call 877-546-1872.

REMEDIES THROUGH RESEARCH
Hyperhidrosis is a condition that people often don’t talk about, and many doctors may not be aware of it, either.

“The good thing about Johns Hopkins is that we not only offer a procedure that can resolve the problem,” says Malcolm Brock, M.D., a thoracic surgeon. “We’re also studying ways to provide even better treatment.”

In the past, before recent refinements, some people would develop compensatory sweating in other places such as behind the knees. Although this problem is less common, two goals of the research now being conducted are to find ways to combat the compensatory sweating and further improve treatment.
FOR SURGEONS, the landscape of the human body is fraught with potential obstacles at every angle, from bones that block vital organs to tissues and muscles that twist and turn in unpredictable ways. Similar to a navigator who must learn all possible routes to a destination, surgeons constantly explore alternative solutions for long-standing problems associated with traditional open techniques. Johns Hopkins has helped pioneer many of these methods and continues to push the boundaries of innovation to provide patients with the latest, safest and least-invasive forms of surgical care. >
Beyond Laparoscopy

Large incisions were once considered the norm for operations on the stomach and other digestive organs, but the booming popularity of laparoscopy in the 1980s provided a turning point.

“What we found about laparoscopic surgery is that it’s less invasive, uses smaller incisions, and allows patients to recover faster and with less pain,” says Anthony Kalloo, M.D., chief of the Division of Gastroenterology and Hepatology at Johns Hopkins. “But as a next step after that, the question became, ‘Where should we move forward from this point?’”

To Kalloo, the answer was deceptively straightforward: surgery without external incisions. In 1998, he and his colleagues entered uncharted territory by spearheading the development and study of an approach known as NOTES, or natural orifice translumenal endoscopic surgery. These procedures use the body’s existing openings—namely the mouth, anus and vagina—as access routes to internal organs and structures. Rather than a surgeon directly opening the abdomen, for instance, an endoscope could be placed into the mouth, down the esophagus and through the stomach via a small internal incision.

Initial support was lacking, largely because perforating the stomach was historically considered a gastroenterologist’s nightmare due to the potential leakage of gastric juices that could cause infection, inflammation and in some cases death. But Kalloo believed that the stomach could safely serve as a viable portal to surrounding organs without having to revert to abdominal incisions. Through a series of animal studies, he was able to demonstrate this, paving the way for use in people.

Today, there have been more than 3,000 human applications of the approach worldwide. At Johns Hopkins, the endoscopy unit contains two NOTES rooms, making it one of the few hospitals in the country with such spaces.

“I think that NOTES is a part of our future and is here to stay,” Kalloo says. “It is in a slow evolution, but that’s good because we don’t want to begin a new surgical procedure without making sure that it is completely safe.”

Choosing a Better Path

Although the mouth provides a natural pathway to the stomach, it also serves double duty as an access point for the head and neck. In fact, the mouth, nostrils and eye sockets are all ports for reaching the brain, a particularly well-protected organ encased by boney skull.

“For certain lesions, injuries and tumors along the skull base, traditional approaches that require lifting the brain to get to the target can be associated with a prolonged recovery,” explains Kofi Boahene, M.D., a head and neck surgeon at Johns Hopkins who works alongside the neurosurgeon in skull-base-tumor surgeries. “By accessing the brain more directly via the nose, cheek or orbit, we avoid manipulating the brain. Patients benefit from a shorter surgery, a quicker recovery and virtually no facial scars.”

These approaches to brain surgery have taken time to evolve because, as Johns Hopkins neurosurgeon Alfredo Quiñones-Hinojosa, M.D., says, “you have to have a surgeon who is very comfortable with the anatomy, because we’re talking about working within the brain through a very small hole.”

For instance, the walls of the eye socket, which form the rooms of the sinuses and intracranial spaces, facilitate repair of sinus leaks and removal of skull-base and brain tumors. And an additional pathway, developed by Boahene and used exclusively by Johns Hopkins surgeons, involves the lower jawbone,
anatomy provides a tiny window of entry to the infratemporal fossa, a narrow and tight space just below the cheekbone.

“These techniques have made our job a lot harder,” Quiñones-Hinojosa says, “but it’s also made it a lot easier, because now I get to see my patients smiling immediately after surgery, and getting to go home in a day or two after a surgery that otherwise would take weeks in the hospital to recover from. To see them smile is to know that the work we’re doing is making their quality of life better.”

**A NEW DIRECTION FOR HEART CARE**

The quest for minimally invasive surgical techniques is not limited to the use of natural orifices. Replacement of the aortic valve, the heart’s primary distributor of oxygen-rich blood, is relatively common but risky for about 15 percent of candidates because of advancing age and presence of other medical conditions. Traditional operations involve opening the chest and using a heart-lung bypass machine that maintains blood flow to the brain while the heart is stopped from beating, increasing the risk of stroke. But an effective alternative—transcatheter aortic valve replacement, or TAVR—uses a catheter to pipe the new valve through an artery in the leg or arm directly to the heart.

“The advantage is that no cardiopulmonary bypass is needed and we are not cross-clamping the aorta, so we are able to deliver the valve from the leg from a simple incision, and the patient is basically up and around the next day and can leave the hospital the day after that,” says Johns Hopkins cardiologist Jon Resar, M.D. “The recovery is much, much quicker. And the need for transfusions and blood products is significantly reduced.”

One recent patient at Johns Hopkins—an 86-year-old woman who was nearly bedridden—needed a new valve but was considered unsuitable for surgery because of her severe lung disease. With TAVR, she recovered and was back to her normal activities less than a week later. Another TAVR patient at Johns Hopkins recently underwent the procedure at 102 years old.

“This is evolving technology that I think is starting to become more and more common,” says John Conte, M.D., associate director of the Division of Cardiac Surgery at Johns Hopkins. “It’s faster recovery with minimal trauma to the patient. That’s the key.”

**Addressing Unmet Needs in Kidney Donation**

Since the world’s first laparoscopic live donor kidney removal was performed in 1995 at Johns Hopkins, potential donors have specifically requested the procedure because of its reduction in pain, recovery time and scarring. But Mohamad Allaf, M.D., director of minimally invasive and robotic surgery at Johns Hopkins, along with Robert Montgomery, M.D., director of the Johns Hopkins Comprehensive Transplant Center, pushed further to make kidney removal even simpler by refining a laparoscopic technique that uses only one incision rather than the usual three or four.

“We don’t want this to be a gimmick,” Allaf says. “We want to make sure that patients are benefiting. What are their pain requirements? Are they going back to work quicker? Are they healing sooner? Early data reveal that this single-port approach may be helping.”

In January 2009, Allaf and Montgomery performed the first kidney removal through the vagina. This approach is still being perfected, as the anatomy of the uterus somewhat complicates extraction. Allaf predicts that such innovations will encourage more donations.

“We want to increase the number of people who donate,” he says. “The challenge with novel approaches is that you want to push the envelope, but the number-one priority is always the patients’ well-being and safety.”
I've been on a long journey

since learning in 2007 that I had an ameloblastoma—a
tumor on my jaw. But I’m thankful my journey brought
me to Johns Hopkins, where they understood that pre-
serving my quality of life was just as important as saving
my life.

Ameloblastomas are benign but aggressive. They can
destroy everything where they grow, including the brain,
so they must be removed.

I had two surgeries in Israel, where I live, but doctors there were not able
to remove the tumor by operating from inside my mouth.

Surgeons would have to operate from the outside to remove the entire
tumor, which involved removing part of my jaw and TMJ [temporoman-
dibular joint]. The doctors I talked to only seemed to care that I would have
basic functionality, not that I would be disfigured. But I cared very much.
As a lawyer, a public activist, an active athlete, and a woman who is still
dating and interested in establishing a family, my image and my looks are
very important to me.

No one in Israel, or anywhere else I looked, could promise me that I would
not have damage to my jaw or lose part of my tongue. Not being able to speak
clearly or look presentable would be devastating to my career and my life.

My journey ended at Johns Hopkins, where they use a team approach that
combines the tumor removal with reconstruction. They used bone from my
leg [fibula] to reconstruct my jaw, and you can’t even see a scar except the one
on my leg.

I speak and look as I did before, and just four months after my surgery I went
on a first date and started swimming training. Since the surgery, I feel as if I have
a second chance at my life—and I believe that everything is possible.
Chronic pancreatitis is a rare and painful condition that compromises the pancreas and prevents the hormone insulin from helping regulate the body’s metabolism. The disease affects only about 40 out of 100,000 people, but traditionally the only option for some sufferers has been the full removal of the pancreas.

Now, there is a revolutionary operation known as islet autotransplantation, which gives hope to sufferers that they can keep at least part of their pancreas. Despite the condition’s rarity, Johns Hopkins performs about one of these procedures every month.

Islet autotransplantation is performed at several centers nationwide, but Johns Hopkins is the only one performing the laboratory isolation of islets, in which the pancreas is fully or partially removed from the patient during the operation. Islets, which are groups of cells in the pancreas that produce insulin, are removed and transplanted back into the liver, where they can grow in the liver’s plentiful blood supply and produce insulin, which the body desperately needs.

In the past, many people with chronic pancreatitis had few treatment options, and suffered through severe abdominal pain, nausea and fever.

“These patients have intractable and disabling pain to the point where they are desperate and are dependent on intravenous nutrition—sometimes for years,” says Marty Makary, M.D., director of the Johns Hopkins Pancreas Islet Transplant Center. “It is one of the most debilitating diseases in medicine. Other centers can require two separate procedures—one to isolate the islets and another to transplant them. We have now pioneered the procedure to develop a single-stage operation.”

People ideally suited for the procedure have what is known as small duct chronic pancreatitis and also have severe disability. Some insurers cover parts or all of the auto islet transplant; Medicare will cover the removal of the pancreas.

People who come to Johns Hopkins are carefully evaluated and then treated by a multidisciplinary team involving more than 15 specialists.

“This operation has dramatic results, and is a life-changing intervention,” Makary says.

Go online to learn more about auto islet transplants and to watch an animation of the transplant procedure. Visit bit.ly/auto-islet.
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