

PhysicianUpdate

NEWS FOR PHYSICIANS FROM JOHNS HOPKINS MEDICINE

SPRING 2018



The Heart Transplantation and Mechanical Circulatory Support Program team counterbalances inconsistent recoveries and long-term survival rates with innovative surgical approaches, improved devices and new hospital policies.

A Reinvigorated Heart Transplant Program



Ahmet Kilic

Cardiothoracic surgeon **Ahmet Kilic** is sharply aware that he stands at the midpoint of a see-saw, one tilting downward.

New to Johns Hopkins, Kilic was hired both for his art and skill in transplanting hearts and for his expertise in the specifics of matching recipients with donors. If an organ is unavailable in a timely manner, the decision can be made to pursue surgical therapy in the form of a ventricular assist device (VAD) or other type of mechanical circulatory support system.

Kilic (pronounced “KIL-itch”) directs Johns Hopkins’ Heart Transplantation and Mechanical Circulatory Support Program. The goal: Protect patients’ overall tissue perfusion and restore a quality of life to patients facing chronic or end-stage heart failure.

Still, he says, even with some two decades of worldwide research on VAD surgical implants, statistics on long-term survival fall short of perfect.

Donor hearts remain scarce, and adverse events from VADs, though fewer, dog the various mechanical circulatory support devices. The pumps can malfunction from clotting, with a subsequent risk of bleeding or stroke.

Moreover, fundamental questions persist: Why, in like patients in similar stages of cardiogenic shock, for example, does one patient achieve better than a one-year survival, while the other doesn’t?

Do the devices themselves remodel still-normal, adjacent heart tissue? Do they sensitize patients’ immune systems? Can early insertion of a left ventricular assist device (LVAD) slow right-ventricle cardiomyopathy?

Kilic, however, is confident that, in the near future, surgical therapy can level the see-saw of outcomes for sicker patients and likely start its tilt in the other direction. LVAD design is steadily improving, for example. Also, Kilic says, there’s research on new materials—hybrids of biological and manmade agents to line the pumps—which seem patient-friendlier and discourage blood clots.

He ticks off other changes: “By using better criteria to select recipients, we have significantly changed patient responses to LVADs. And we’re more often introducing the pumps earlier, when people are less sick and better able to cope with the morbidity of surgery.”

That tactic goes hand-in-hand with an overall policy change in Johns Hopkins’ surgical heart failure therapy group. “We now see our advanced patients earlier as a team,” Kilic explains. That means we do rounds together, bringing in the heart failure cardiologists, coordinators, nurses, intensivists and, of course, the surgeons to the bedside.”

A last improvement comes as LVADs have become smaller, namely, using best practices to guide their insertion. While Kilic was program

head at Ohio State’s Wexner Medical Center, for example, his lab fine-tuned placement of the HeartMate II, a “workhorse,” second-generation pump. It became the first one FDA-approved both as a lasting or “destination therapy” and as a temporary bridge to buy time for patients with refractory disease still on heart transplant lists.

Positioning the pump lower and securing it more tightly—part of the national PREVENT clinical trial—significantly discouraged in-pump clots.

Last fall, HeartMate III won approval as smaller, still, and even better-tolerated. “We’ve introduced this new pump to Johns Hopkins, along with the competitor HeartWare HVAD,” he says. Though each has its own niche, both pumps work by a new principle, Kilic says, where internal parts that might wear unduly are magnetized to repel each other.

Because the HeartWare HVAD is the smallest yet, Kilic could introduce mini-sternotomies at Johns Hopkins. “The incision—shorter than the full sternotomy—lessens patients’ recovery time, with less discomfort,” Kilic notes.

Over the past several years, Johns Hopkins surgeons performed 10 to 25 heart transplants a year—around the average volume for a major center.

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Johns Hopkins Pediatric Surgeons Now See Patients in York, Pennsylvania

For general pediatric surgeon **Daniel Rhee**, Thursday, Nov. 2, 2017 was not a typical clinic day to assess children who may need surgery or to follow up with patients who have undergone surgery. He usually sees patients in his outpatient clinic at Johns Hopkins Children's Center, but this was one of the five days each month when he travels 50 miles north from East Baltimore to an ambulatory center near WellSpan York Hospital in south central Pennsylvania. There, along with seven other Johns Hopkins pediatric surgeons who rotate at WellSpan, Rhee sees patients who until a year ago had to travel long distances and navigate unfamiliar children's hospitals for surgery. Now, thanks to a collaboration with WellSpan Health launched in September 2016, Johns Hopkins is bringing that specialized care to them.

"Previously a lot of pediatric patients in the York area had to travel an hour or more to a children's hospital for pediatric surgical care," says Rhee. "Now the surgeons in our group share time in their clinic each week and are on call for consultation. We're virtually available anytime for York's pediatric patients."

The joint initiative is a novel, fresh approach to improving local access to high-level surgical care, notes David Turkewitz, chief of pediatrics at WellSpan. While the community hospital includes a 34-bed neonatal intensive care unit and an inpatient pediatrics unit staffed by pediatric hospitalists and residents, it lacks an

in-house pediatric surgery service. In the past, partial pediatric surgery coverage for WellSpan patients was provided at hospitals in the region, but these arrangements were found not to be ideal or sustainable.

"When kids are sick, it's a struggle for families to move their hub of care away from home," says Turkewitz. "We heard from the families in our community, and we knew they had a great desire for appropriate levels of surgical care for their children in York."

Looking for a partner receptive to that need, WellSpan found Johns Hopkins pediatric surgeon-in-chief **David Hackam**, who had developed a similar model while at Children's Hospital of Pittsburgh. Joining Hopkins in 2012, Hackam immediately set out to recruit top, nationally known surgeons and develop six pediatric surgical centers in fetal medicine, colorectal/bowel, short gut/intestinal care, trauma/burn, oncology and vascular anomalies.

At WellSpan, Johns Hopkins pediatric surgeons manage several conditions that commonly afflict children, including appendicitis, esophageal atresias, hernias, pyloric stenosis and skin lesions. Patients with more complex conditions, or who have special anesthesia needs or who require extracorporeal membrane oxygenation—or non-neonate patients who need post-operative intensive care—can be treated at Johns Hopkins Children's Center.

Because WellSpan has a high-level neonatal ICU, newborns with complex



At Johns Hopkins' ambulatory pediatric surgery clinic in York, pediatric surgeon Daniel Rhee evaluates the post-operative status of one of his patients.

conditions can now be surgically treated there.

In addition to improving local access to high-level pediatric surgical care, Johns Hopkins pediatric surgeons are aiding the education and training mission for pediatric and surgical residents who rotate through WellSpan. For Turkewitz, the opportunity to bring the academic rigor of a children's hospital to the York community has been yet another value of the collaborative.

"Having the Hopkins surgeons here has been a great complement," says

Turkewitz. "Previously our general surgery residents would go elsewhere for pediatric surgery training but now, with the increased volumes and surgeries here, they are working closely with the Hopkins pediatric surgeons on every pediatric surgery admission. The feedback I've gotten from the surgical residents has been excellent."

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NEUROLOGY

A Deeper Understanding of MS and Vitamin D

When Johns Hopkins neurologist **Ellen Mowry** was beginning her fellowship in 2007, she already knew about the possible link between vitamin D and multiple sclerosis (MS). A study that came out around that time connected low vitamin D levels in U.S. military members with a higher risk of MS. Those findings supported previous observations that MS prevalence is higher the farther populations live from the equator, where sunlight exposure is lower, resulting in lower vitamin levels.

Today, she and her colleagues at the Johns Hopkins Multiple Sclerosis Center have strengthened the understanding of the relationship between vitamin D and MS and use these findings to improve patient care.

In a recent talk at the Americas Committee for Treatment and Research in Multiple Sclerosis 2017 meeting, she presented an overview of research in this area led by herself and colleagues at other institutions. These include work that Mowry and her team published in 2010 showing that children with pediatric-onset MS who had

low blood concentrations of vitamin D levels are more likely to experience relapses than those with higher levels of this vitamin. Later research showed that low circulating vitamin D is associated with more areas of demyelination revealed by MRI.

She also collaborated with MS Center Director **Peter Calabresi** on a study he led to understand how differences in vitamin D supplementation dose might affect patients' immune regulation. The findings of that 2015 study show that patients on a higher dose of vitamin D experienced beneficial immunomodulatory effects, which could in turn lead to better outcomes for this autoimmune disease.

She's currently leading the VIDAMS (Vitamin D to Ameliorate MS) trial, a multicenter effort to understand how vitamin D supplementation, along with a standard MS drug, might affect MS progression.

Says Mowry, "By developing a better understanding of how vitamin D is important in this disease process, it could lead us to identify new targets that could offer a whole new way of treating this disease." ■

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"BY DEVELOPING A BETTER UNDERSTANDING OF HOW VITAMIN D IS IMPORTANT IN THIS DISEASE PROCESS, IT COULD LEAD US TO IDENTIFY NEW TARGETS THAT COULD OFFER A WHOLE NEW WAY OF TREATING THIS DISEASE."

—ELLEN MOWRY

A New Center for Children with Complex Cranial Conditions

Tanya Mewmaw recalls her son Tobin's head injury in February 2015 like it was yesterday. From the living room of their poorly constructed rental home near the American University of Iraq, where Tanya's husband worked, she could see then 1-1/2-year-old Tobin crawling along a railing upstairs. The railing would keep him safe, she figured, but somehow he slipped through it.

"We watched him fall 15 feet to a tile and concrete floor where he landed head first, says Mewmaw. I still see him falling."

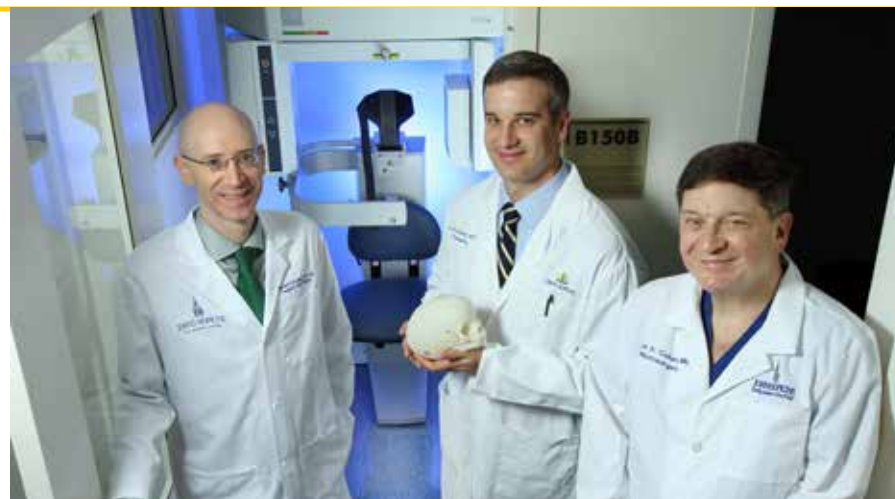
They rushed him to the nearest hospital, where X-rays showed a skull fracture. Doctors there did not know how to treat traumatic head injury, so Mewmaw and her husband took Tobin to a hospital in Turkey. Neurosurgeons there performed a craniotomy to relieve the pressure on the brain and the bulging eye socket. A few days later, the swelling had subsided and Tobin was discharged.

A year later, Tanya and her family moved back to the U.S.—to Annapolis, Maryland— where a pediatrician recommended Tobin be evaluated by craniofacial specialists at Johns

Hopkins Children's Center in the recently established Pediatric Cranial Reconstruction Center.

In reviewing Tobin's care and imaging his skull, the Johns Hopkins specialists determined that Tobin had suffered a subdural hematoma and two skull fractures from his fall. The craniotomy that surgeons in Turkey performed was the same approach surgeons at Johns Hopkins would have taken. But Tobin had a small defect at the site of the fracture on his forehead. Pediatric neurosurgeon **Eric Jackson** recommended waiting until he was of school age before considering surgery to give the boy a chance to grow and fill the defect in with bone.

Several months later, Mewmaw noticed swelling over the site of the defect. Jackson suspected the source of the swelling was spinal fluid leaking out of an opening of the dura mater, creating a leptomeningeal cyst associated with a "growing" skull fracture. Jackson consulted with pediatric plastic reconstructive surgeon **Richard Redett**, and the two surgeons planned to correct the bone defect, repair the cyst and perform the cranial reconstruction.



Surgeons in the multispecialty center for cranial deformities include, from left to right, Jordan Steinberg, Eric Jackson and Alan Cohen.

In the operating room, however, rather than a leptomeningeal cyst, Jackson uncovered an infectious collection that had compromised the bone. He removed the diseased bone and brought in an infectious disease specialist. The planned reconstruction was delayed.

"Instead of repairing the bony defect, we had to drain the infection and remove additional bone, creating an even larger defect," says Jackson.

After treatment with intravenous antibiotics, the patient returned six months later for repair of the bone defect. In the operating room, Jackson performed a craniotomy farther back on the skull to obtain a bone graft, which Redett used to make a split cranial bone graft to fill the defect. Using a very precise saw, Redett explains, he divided

the two layers of a piece of skull bone for the graft.

Today, "Tobin is doing really amazing," says Mewmaw, explaining that he successfully completed physical therapy and rehabilitation at neighboring Kennedy Krieger Institute. "Doctors at Kennedy Krieger checked his milestones and reported no deficits or residual damage. It's a pretty crazy miracle—not only is he alive but he's fully functioning."

This case, like others they see, Jackson and Redett say, illuminates the benefit of a multispecialty center in treating cranial deformities in children. ■

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OBESITY MEDICINE

Weight-Loss Team Aims to Change the Way Patients Think About Eating

If promoting weight loss in patients was as easy as telling them to eat fewer calories and exercise more often, **Zoobia Chaudhry**'s job would be very different.

"It's easy to tell people what to do," says the Johns Hopkins Digestive Weight Loss Center obesity medicine specialist. "It's not so easy to tell them how to do it."

In addition to various endoscopic outpatient procedures that mimic the effects of bariatric surgery, the weight loss center offers programs aimed at helping patients change the way they think about food and nutrition.

Chaudhry cites lifestyle change as the cornerstone of weight-loss management.

"It's not simply what you eat and how much you exercise," she says. "This is about a fundamentally different approach to think about the role of food in our lives."

Chaudhry works with patients both individually and in groups. She tailors weight-loss programs individually for each patient, based on that patient's history and life situations.

A common mistake in weight loss, Chaudhry says, is too much ambition too soon. A patient accustomed to consuming large portions of food high in calories slams on the brakes, making radical cuts in calories and eating foods that are unfamiliar and, often,

unappealing. Chaudhry calls that a recipe for failure.

"You don't completely take away things from people," she says. "Because you are making people deprived. And they're going to get frustrated and they're going to give up. It's just not achievable."

Chaudhry recalls a recent patient who reported that fried chicken and ice cream were among the high-calorie foods he ate most frequently.

"We can't cut those foods out entirely, though it may be more acceptable to him if I suggest that he eats these high-calorie foods once or twice a week or in smaller portion sizes" she says. "Without behavioral change, which is gradual and is based on patients being motivated by the results they see, that patient will not succeed."

She adds that when patients are not successful in weight loss, they too often become discouraged and resigned to unhealthy habits.

"We set goals that are realistic and achievable," says Chaudhry.

Both Chaudhry and her colleague **Kimberly Gudzone** have published oft-cited research on the effectiveness and scientific basis for various commercial diets. They found that very few of the popular commercial programs on the market produced sustained weight loss. The two physicians are leading a new meal-replacement program at the Digestive Weight Loss Center that, in coordination

with other strategies, can help certain patients lose extra pounds.

"It's not for everyone," says Chaudhry. "But for some people, it will be exactly right."

The meal replacements simplify weight loss by decreasing the guesswork in nutrition.

Patients are expected to consume meal replacement products, but continue to eat one meal per day with family and friends. As part of the twice-a-month program, patients attend physician-led group sessions and receive education on key principles and skills for weight management.

"This really is about comprehensive lifestyle intervention and finding the right combination of what works," she says. "So that neither unhealthy behaviors nor the weight come back." ■

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Zoobia Chaudhry

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A Reinvigorated Heart Transplant Program *continued from cover page*

Fewer LVAD surgeries happened last year, but Kilic notes, "We deal with the sickest of the sick patients, and we will always perform whatever the patient's body tells us to do."

"As we solve the shortcomings of device therapy, guided by our outcomes research, we can expect procedures to become more routine," he adds. "So far, I like best care as opposed to most care, and that is absolutely what we strive for at Hopkins—it's our bottom line." ■

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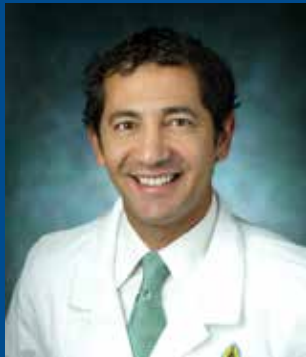
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