

# FOCUS

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*Focusing on the people and initiatives that distinguish Christiana Care Health System*

## INSIDE

### 12 BEST FOR BABY

Christiana Care and DE lead in maternity care

### 18 CARING FOR NJ

Carney's Point, Woodstown practices' innovative CPC+

### 26 'WINTERFEST'

First-year residents learn the ropes of how to cope



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Cardiac surgeon Franjo Siric, M.D., inspects an artificial heart valve before deploying the device via catheter during a transaortic valve replacement procedure.



## Culture of innovation guides Center for Heart & Vascular Health

With breakthrough technology and extraordinary community partnerships, Christiana Care is helping to build a heart-healthier Delaware

**A**cross the nation, more than one in 10 patients who undergo bypass surgery are readmitted to the hospital within 30 days of their operation. Common reasons for readmission include complications from the procedure or infection. But for recent patients at Christiana Care's Center for Heart & Vascular Health, the need for hospital readmission has been drastically lower — closer to 1 in 20.

CONTINUED INSIDE



## A CULTURE OF INNOVATION | CONTINUED

These good results didn't happen by chance. Through a focused, multidisciplinary campaign to prevent re-hospitalizations, Christiana Care has demonstrated extraordinary improvement on rates that at one time were slightly worse than the national average. These readmission rates aren't merely numbers — they represent patients and family members who experience better health and a better quality of life because of the intense focus that Christiana Care has put on their safety and quality of care.

“It's a nice example of how multidisciplinary teams can have a real and positive impact,” said Kirk Noel Garratt, M.D., MSc, chief of Cardiology and associate medical director of the Center for Heart & Vascular Health. He explained how physicians and leaders partnered with patient care teams in the hospital, skilled nursing facilities, the Visiting Nurse Association and others to understand what was causing readmissions. They then put in place specific measures to help head off those problems.

“Part of our responsibility is to do all we can to prevent patients from coming to the hospital,” Dr. Garratt said. “We achieve this by forming strong partnerships with outside providers and our community.”

This kind of big-picture thinking is the hallmark of today's Center for Heart & Vascular Health. The team is working on all fronts to embrace the most advanced, most effective techniques and technologies to diagnose and treat heart disease, while at the same time reaching out across the community to help people take control of their heart health and potentially prevent the need to ever see a heart surgeon or a cardiologist.

“Innovation arises from a culture that values communication, collaboration and a sense of unity among team members,” said Timothy J. Gardner, M.D., medical director of the Center for Heart & Vascular Health and executive director of Christiana Care's Value Institute. “We've worked to create a structure that fosters the circulation of new ideas that bring cutting-edge technology to our facilities and form partnerships that help our patients stay healthy in their communities.”



**“Innovation arises from a culture that values communication, collaboration and a sense of unity among team members.”**

TIMOTHY J. GARDNER, M.D.

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## The disappearing stent

That spirit of innovation is evident in Christiana Care's participation in a study of the first absorbable coronary scaffold, a stent-like device that dissolves into carbon dioxide and water over about two years.

"I think the technology sounds brilliant," said principal investigator Wasif Qureshi, M.D., medical director of the Structural Heart Program at the Center for Heart & Vascular Health. "Who wants something in their heart or arteries that will last forever?"

Since the introduction of intracoronary stents in the mid-1980s, these tube-shaped devices have been implanted in millions of Americans. They are wrapped around balloon catheters and inserted into blood vessels through small incisions, often in the leg. Once the stent is in place, the balloon is inflated, causing the wire mesh to expand, compressing the plaque and restoring blood flow. These

stents stay inside the patients for the rest of their lives.

Since regulatory approval in July 2016 following the ABSORB III trial, which included about 20 Christiana Care patients, biodegradable scaffolds that absorb into the body are a new option. Data from the trial show that the absorbable scaffolds performed similarly to traditional stents.

## New heart surgery technology changes lives

Most new medical devices offer gradual improvement, but some advances disrupt their field and change the way care is delivered. One such disruptive technology goes by the acronym TAVR, which stands for transcatheter aortic valve replacement. At Christiana Care, TAVR technology plus innovative partnerships among care teams are transforming care — and patients' lives.

Aortic stenosis is a heart condition in which calcium accumulates on the aortic valve, the main pumping chamber

through which all of the body's blood travels. The effect is akin to putting your finger over a garden hose — blood that travels through a narrowed aortic valve has to speed up tremendously to get through a smaller hole.

"People live probably no more than one to three years with severe aortic stenosis," said cardiologist Neil J. Wimmer, M.D.

In the past, open-heart surgery was the only treatment option for this condition. But TAVR has given new hope to patients for whom open-heart surgery presents too many risks.

The procedure is well suited to higher-risk patients primarily because it is less invasive. The artificial valve is attached to a small balloon and inserted through a blood vessel, usually in the leg, similar to a stent procedure. The catheter and balloon are positioned inside the calcified valve, and the balloon is inflated to implant the artificial valve. Often, the patient can go home the day after the procedure.

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Wasif Qureshi, M.D., medical director of the Structural Heart Program, is a principal investigator in a study of a new coronary stent that absorbs into the body.



## A CULTURE OF INNOVATION | CONTINUED

At the same time, doctors know that TAVR is not for everyone, including those whose quality of life won't dramatically increase even with a new valve.

"We often have very frank conversations with patients," Dr. Wimmer said. "I ask, 'If I could fix your heart valve by magic, how would you feel tomorrow?'"

Dr. Wimmer consults with his colleagues at Christiana Care's Swank Memory Care Center to help answer patient quality-of-life questions. This collaboration helps the care team to understand whether the patient's symptoms are caused by the faulty valve or by an unrelated condition. Often, the core question isn't whether TAVR would fix the valve, but whether it would truly improve the patient's daily life.

"It's another example of how taking care of these patients is a team effort across the institution," Dr. Wimmer said. "It's a nice model for an integrated service line."



**"We often have very frank conversations with patients. I ask, 'If I could fix your heart valve by magic, how would you feel tomorrow?'"**

NEIL J. WIMMER, M.D.

Just as TAVR is an effective alternative for those who can't undergo open-heart surgery, Christiana Care doctors are using a new left atrial appendage occluding device to help patients at risk of stroke who can't take blood-thinning medications.

"There were many patients coming into the hospital with bleeding issues, but previously there were no options for them," Dr. Qureshi said. Preventing stroke is a high priority for these patients, many of whom have seen friends and family debilitated by the condition.

For people with a typical heartbeat, blood is regularly pumped out of a small pouch in the upper left chamber of the heart called the left atrial appendage. But for people with atrial fibrillation, or an irregular heartbeat, blood can pool here and form clots, which may eventually travel to the brain. Patients with this condition are several times more likely than others to have a stroke.

Christiana Care doctors can now implant the parachute-shaped device through a blood vessel in the leg and guide it to the entrance of the left atrial appendage, where it expands and prevents blood from entering the chamber, reducing the risk of stroke.

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Neil Wimmer, M.D., Franjo Siric, M.D., and James Hopkins, M.D., collaborate during a TAVR procedure at Christiana Hospital.





Cardiothoracic surgeon Paul K. Davis, M.D., uses a robotic assisted approach to perform bypass surgery.

### Robot assistance makes surgery less invasive

Innovation can take the form of devices, but sometimes it means learning how to perform familiar procedures in a new way. For cardiothoracic surgeon Paul K. Davis, M.D., that meant using robotic technology to help him perform bypass surgery through incisions much smaller than he could perform by hand.

“Being able to operate through a small, 2.5 cm incision is exceedingly useful, especially in patients who are not good candidates for standard open-heart surgery,” Dr. Davis said.

Most patients who undergo robotic surgery are out of the hospital in two or three days and back to work within three weeks. The back-to-work time for open-heart surgery is typically closer to two months.

Robotic surgery, at least in the cardiac realm, is a bit of a misnomer, according to Dr. Davis. A more descriptive term would be robotic-assisted surgery. The robot,

called the da Vinci Surgical System, is controlled by a surgeon at a console; it is not programmed to act autonomously.

At the same time, traditional surgery without robotic assistance continues to be a vital part of Christiana Care’s program. Michael K. Banbury, M.D., W. Samuel Carpenter III Distinguished Chair of Cardiovascular Surgery, said patient care improves with the interrelation of robotic and non-robotic surgery at Christiana Care, supporting optimal care for each patient.

“Careful use of new technologies in cardiac surgery is helping many patients live healthier lives with better quality outcomes,” Dr. Banbury said.

### New option for heart failure

Technological innovation is changing treatment for heart failure, and Christiana Care is bringing it closer to home.

There are only about 2,000 heart transplants a year in the United States.

For those with heart failure who can’t get a transplant, there are few long-term options.

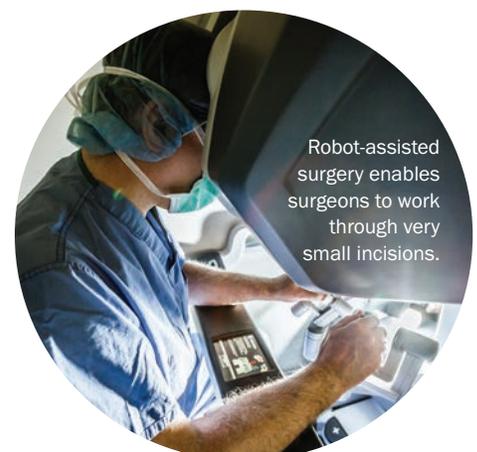
“Heart failure patients are managed with lifestyle modifications, diet, exercise, medications and surgery,” said heart surgeon Ray A. Blackwell, M.D. “Despite these treatments, some patients will develop advanced heart failure. There are other options for these patients.”

One of those options is called LVAD, which stands for left-ventricular assist device. This battery-powered machine is implanted during open-heart surgery and replaces the heart’s pumping action. For some LVAD recipients, the device is a way to be healthy while they’re waiting for a transplant. For others, the LVAD is itself a destination. In either case, the LVAD is a major responsibility for the patient and family. At least one family member must learn how to take care of the device and the patient, and must join the patient for weekly hospital visits after the surgery.

“LVAD requires a lot of education for both patients and family members,” Dr. Blackwell said. “Being able to do it in Delaware reduces stress for the family.”

Since the program began in 2011, 24 LVADs have been implanted at Christiana Care. In addition, Christiana Care cares for about 15 LVAD patients whose devices were implanted at other institutions.

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**“Being able to operate through a small, 2.5 cm incision is exceedingly useful, especially in patients who are not good candidates for standard open-heart surgery.”**

PAUL K. DAVIS, M.D.

**First in heart health across the First State**

Health care innovation isn't always about technology. Sometimes it means reaching beyond the hospital walls to find partners who can help people where they live. Christiana Care's Blood Pressure Ambassadors are a shining example of how these kinds of partnerships can improve the health of a community.

Cardiovascular disease is the leading cause of death in the United States for both men and women. High blood pressure is often the silent harbinger of heart problems, especially for African-Americans, about two in five of whom have the condition. The ailment is often asymptomatic, so a high reading may be the first sign that something is wrong. It is nonetheless serious — about 70 percent of people having their first heart attack have high blood pressure, according to the American Heart Association.

The Blood Pressure Ambassadors are volunteers trained to be peer-to-peer educators for their communities, said Angela M. Parker, MSN, RN-BC, project manager. Since July 2015, Christiana Care's Blood Pressure Ambassadors have performed more than 4,300 blood pressure screenings in the community. They also partner with Christiana Care health guides to help people connect to a primary care provider if they don't already have one.

Another successful community partnership, Project Connect, links hospital patients with free tobacco-cessation counseling and medication.

"There's nothing you can do that's worse for your coronary arteries than smoke," said Dr. Davis. "Everybody talks about the risk of getting lung tumors, but your chances of getting a cardiovascular blockage are much higher."

Hospitalization presents a key opportunity to help smokers to quit. They are required to quit while they're in the hospital, and people who are undergoing a health crisis are often motivated to make changes in their life, said Denise Taylor, MS, RD, project manager for Project Connect.

Tobacco cessation often requires multiple attempts, and Project Connect aims to overcome the barriers to care that arise after discharge from the hospital. Preliminary results of a pilot study are promising. Of patients who were connected to the smoking-cessation service Delaware Quitline by Project Connect, one in three enrolled in services.

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Christiana Care's Blood Pressure Ambassadors have conducted more than 4,300 blood pressure screenings since July 2015.



**"Part of our responsibility is to do all we can to prevent patients from coming to the hospital. We achieve this by forming strong partnerships with outside providers and our community."**

KIRK NOEL GARRATT, MSC, M.D.



Blood Pressure Ambassadors

## A culture of innovation

Clear and obvious heart-health messaging throughout Delaware will continue to be a focus for the Center for Heart & Vascular Health, Dr. Garratt said.

“We’ve launched initiatives aimed at demonstrating to Delawareans that we have their heart health in mind,” he said.

**“Careful use of new technologies in cardiac surgery is helping many patients live healthier lives with better quality outcomes.”**

MICHAEL K. BANBURY, M.D.

Meanwhile, patients at Christiana Care can expect to benefit from innovations across the spectrum of cardiac technology, as long as they provide real value to patients. The culture of innovation is about more than staying current. It’s about curiosity and a willingness to change.

As Dr. Qureshi put it, “We embrace new technology, and we love to learn.”

**“We embrace new technology and we love to learn.”**

WASIF QURESHI, M.D.



## Virtual Medicine Ball to support Blood Pressure Ambassadors

Because 2017 is an odd-numbered year, by tradition the Junior Board Medicine Ball – the signature annual fund-raising event of the Junior Board of Christiana Care – will be a virtual event. Instead of the formal gala that happens in even-numbered years, this year members of the community are invited to make a tax-deductible donation to support Christiana Care’s successful Blood Pressure Ambassadors community outreach program.

Christiana Care Blood Pressure Ambassadors bring screenings and health education directly to people who otherwise would have little access to preventive care. Blood Pressure Ambassadors are volunteers, trained and supported by Christiana Care Health System’s Center for Heart & Vascular Health. Their work is an integral part of Christiana Care’s ongoing partnership with underserved populations in the community, such as St. Patrick’s Center, which serves senior citizens and homeless people in the heart of the city. “We are grateful to the Junior Board of Christiana Care for selecting the Blood Pressure Ambassadors program as the recipient of this year’s Medicine Ball, said Ray Blackwell, M.D. “Philanthropy provides training, equipment and educational



materials for our volunteer Ambassadors, many of whom live and work in these medically underserved neighborhoods, to effect meaningful change.”

“The Junior Board is delighted to build on our 20 years of supporting Christiana Care’s innovative programs through the Medicine Ball,” said Board Chair Georgianna Riley, president of the not-for-profit Junior Board of Christiana Care, which gives its time and talents to support Christiana Care’s mission.

“The Blood Pressure Ambassadors are actively helping our neighbors achieve optimal health by extending the hospital’s reach into the community with the help of its dedicated and dynamic volunteers,” Riley said. ●

**Questions? Contact Elizabeth Dougherty at 302-327-3364 or [Elizabeth.Dougherty@ChristianaCare.org](mailto:Elizabeth.Dougherty@ChristianaCare.org).**

**You can make a donation to the Medicine Ball online at [events.christianacare.org/medicineball](https://events.christianacare.org/medicineball) or mail a check payable to the Junior Board of Christiana Care Inc. to:**

**The Junior Board of Christiana Care Inc.  
c/o Paula Flynn, Treasurer  
The 2017 Medicine Ball, PO Box 1668, Wilmington, DE 19899**



## 28th Annual Update in Cardiology explores heart-health science and innovation

Patients with valve disease have a new alternative to open-heart surgery. Chest pain that's ruled out as a heart attack shouldn't be ignored. Absorbable stents are the new interventional cardiology tool on the block. These were among the topics explored by 13 speakers before an audience of more than 100 health professionals at the 28th Annual Update in Cardiology, held March 3 in the John H. Ammon Medical Education Center at Christiana Hospital.

### TAVR: Transcatheter aortic valve replacement

Neil Wimmer, M.D., clinical cardiologist with Christiana Care Cardiology Consultants, introduced a procedure that has become widely available only in the past five years. Transcatheter aortic valve replacement (TAVR) enables patients who aren't good candidates for open heart surgery to receive a new heart valve inserted through a catheter.

TAVR is a product of "disruptive technology" and a noteworthy collaboration among several medical disciplines, Dr. Wimmer said in his presentation, which included the title "The Experimental Becomes Routine." In its three iterations, the device has been made significantly smaller — in line with an average person's artery size, he said. "We've gotten better at the procedure, and the materials are better," he said.

"We've gotten better at the procedure, and the materials are better."

NEIL WIMMER, M.D.

Open-heart surgery requires a sternotomy. This is an invasive operation and is accompanied by an average hospital stay of four to five days. TAVR may be performed using only conscious sedation, and 50 percent of TAVR patients return home the next day, Dr. Wimmer said. Initially, the TAVR procedure was targeted to patients who were too high-risk for open-heart surgery. Now it may be considered for those at intermediate risk.

### Unexplained chest pain

Karin H. Humphries, MBA, DSc, scientific director at the British Columbia Centre for Improved Cardiovascular Health, presented on the perplexing issue of unexplained chest pain, the diagnosis of about 85 percent of those presenting for the complaint at the emergency department.

The cause could be coronary microvascular dysfunction, or CMD, which standard testing won't detect, she said.

"It's not a benign condition," she added, noting that such patients have quite an impact on the health system, because they return to the emergency department at the same frequency as patients with known coronary artery disease. Her conclusion: "We need to optimize and standardize the assessment of CMD. A non-invasive cardiac MRI holds great promise."

### Bioresorbable stents

The most cutting-edge topic of the day was presented by Kirk N. Garratt, M.D., MSc, associate medical director for the Christiana Care Center for Heart and Vascular Health: "Bioresorbable Stents. The Next Best Thing in Interventional Cardiology, or Not Enough Backbone to Survive?"

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"It's too early to tell if these biodegradable devices, approved for use in the U.S. just last July, will replace metal stents. But they hold promise in treating 'repeat offenders' in the cath lab, removing the need to navigate around metal obstructions within a patient."

KIRK N. GARRATT, M.D., MSC





Visiting lecturers Matthew Weir, M.D., Deirdre E. Mylod, Ph.D., and Karin H. Humphries, MBA, DSc, and program chair Andrew Doorey, M.D., clinical cardiologist with Christiana Care Cardiology Consultants, were key speakers at the 28th Annual Update in Cardiology.

### Heart disease in women

Sandra A. Weiss, M.D., FACC, clinical cardiologist with Christiana Care Cardiology Consultants, educated the audience about important differences in heart disease in men and women.

In younger adults, men are at higher risk for heart disease, but the risk “catches up with women after menopause,” Dr. Weiss said, noting that one in three women has some sort of cardiovascular disease, and the mortality rates are higher for women.

Premature onset of menstruation and early menopause also heighten a woman’s risk, she said. Women who have experienced hypertension, pre-eclampsia or gestational diabetes during pregnancy may be at higher risk, as well, but primary physicians don’t necessarily know to assess patients for such a profile. Dr. Weiss encouraged practitioners to keep this in mind, and she encouraged women to become educated advocates for their own health.

### Keeping abreast of clinical research

Other speakers included Christiana Care’s William Weintraub, M.D., MACC, FAHA, FESC, who provided some tips on interpreting clinical research studies.

“You should follow major research broadly — and in detail in your area of practice,” Dr. Weintraub said, adding that the “methods” and “results” sections are most important, in that order. He cautioned against following non-peer-reviewed journals, mainstream media and Internet reports.

Other presenters from Christiana Care included: Ronald L. Lewis Jr., D.O., FACC, clinical cardiologist with Christiana Care Cardiology Consultants, who spoke on cardiac screening before exercise or athletic participation; cardiologist Roger Kerzner, M.D., FACC, clinical director for specialty services in the medical group, who presented “Stroke Without Obvious Cause. When — and How — Should We Search for ‘Occult’

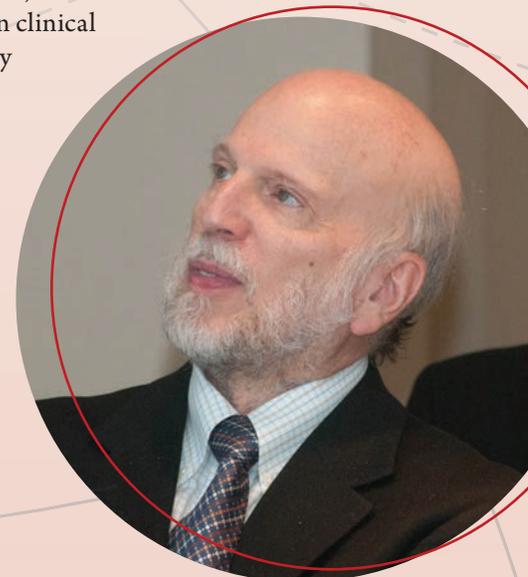
Atrial Fibrillation?” as well as atrial fibrillation ablations; and Andrew J. Doorey, M.D., FACC, FACCP, chair of the conference, who discussed the pros and cons of interrupting anticoagulation therapies in preparation for surgical procedures.

Clinical cardiologist Henry L. Weiner, M.D., FACC, highlighted the dangers of driving for cardiac patients, and Sourin Banerji, M.D., director of Advanced Heart Failure and Transplant Cardiology, gave an overview of where Christiana Care stands in the landscape of advanced heart failure treatment.

Among the invited speakers were: Matthew R. Weir, M.D., from the University of Maryland School of Medicine, who shared practical tips for treating hyperkalemia; Deirdre E. Mylod, Ph.D., from Press Ganey Associates, who spoke of the importance of capturing patient satisfaction; and Eric R. Bates, M.D., a cardiology professor from the University of Michigan, who advised that guidelines in clinical practice aren’t necessarily “carved in stone.” ●

“You should follow major research broadly — and in detail in your area of practice.”

WILLIAM WEINTRAUB, M.D.,  
MACC, FAHA, FESC



## Heart Month community lecture draws scores of engaged neighbors

Timothy Gardner, M.D., medical director of the Center for Heart & Vascular Health, opens the 2017 Annual Heart Month Community Lecture Feb. 17 at the John H. Ammon Medical Education Center, featuring Christiana Care speakers and panelists Kirk Garratt, M.D., MSc., Anand Kenia, M.D., and Neil Wimmer, M.D.



Christiana Care's annual Heart Month community lecture, "Matters of the Heart," drew more than 200 members of the community to the John H. Ammon Medical Education Center Feb. 16 to hear three Christiana Care heart specialists deliver presentations on current topics in heart medicine:

- Kirk N. Garratt, M.D., MSc., John H. Ammon Chair of Cardiology and associate medical director of the Center for Heart & Vascular Health, who is board certified in internal medicine and cardiovascular disease with added qualifications in interventional cardiology, moderated and spoke on the topic of "Changes and Challenges in Cardiovascular Care."
- Anand Kenia, M.D., a cardiac electrophysiologist with Christiana Care Cardiology Consultants, who is board certified in internal medicine, cardiovascular disease, echocardiography and clinical cardiac electrophysiology, presented "Modern Heart Pacemakers — Smaller, Simpler, Better."
- Neil Wimmer, M.D., an interventional cardiologist with Christiana Care Cardiology Consultants, who is board certified in internal medicine, cardiovascular disease and interventional cardiology, discussed "A New Standard for Aortic Stenosis — Non-Surgical Heart Valve Replacement."

The audience was actively engaged in asking questions about health care and heart medicine following the presentations.

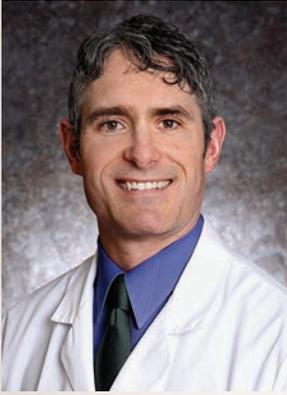
"We really look forward to this event each year. It's a chance to talk not just with our patients and their families, but with the broader community," said Dr. Garratt. "We appreciate the chance to show off what we're doing, and we really enjoy connecting with our neighbors." ●

**"We really look forward to this event each year. It's a chance to talk not just with our patients and their families, but with the broader community."**

KIRK N. GARRATT, M.D., MSc

## Faculty volunteers are key partners in delivering optimal dental and oral health services to our community

By Daniel J. Meara, M.D., D.M.D., Chair, Oral and Maxillofacial Surgery & Hospital Dentistry



Partnership is key to delivering on the promise of The Christiana Care Way, and our dental clinic at Wilmington Hospital is an excellent example, where Christiana Care faculty, staff and residents partner with faculty volunteers from the community to provide an exceptional dental and oral health care experience for our neighbors.

The success of our mission to provide high-quality, accessible, affordable dental care and maxillofacial surgery care depends on more than 90 general dentists, dental specialists and oral and maxillofacial surgeons who volunteer as faculty members within the Department of Oral and Maxillofacial Surgery & Hospital Dentistry. Our residents thrive on their mentorship and expertise. Our colleagues are empowered by their diligence and diverse points of view.

Partnership benefits our community, our patients and our institution, and supports our mission to provide optimal health and an exceptional experience to our patients, and a superior education for our residents.

What makes this partnership so successful?

Collaboration and teamwork succeed on multiple levels.

Many volunteer faculty members treat patients several hours a week in our clinic at the Edwin L. Granite, D.M.D., OMS & Hospital Dentistry Clinic at Wilmington Hospital and in the Christiana Care operating rooms. Our highly integrated model of patient care leverages the expertise of both our employed and volunteer faculty to broaden perspectives on treatment strategies based on individual patient needs.

Our implantology team is one example. Their collaborative approach to case reviews, treatment planning and post-clinical didactic sessions brings multiple voices to the table and fosters the most robust treatment plans, particularly for highly complex patients.

Volunteer faculty are board-certified or board-eligible in their respective specialties who have completed the process of credentialing and privileging required for all members of the Christiana Care Medical-Dental Staff. Some are homegrown, having completed their dental or OMS training here at Christiana Care.

Many hold leadership positions within the department, chairing the Professional Excellence Committee, for example, to ensure patient safety and high-quality care within our institution. Others serve on the Credentials Committee that reviews all applications for potential new faculty, promoting a fair and transparent process to enlist the most qualified professionals for our team. Still others participate in resident recruitment, helping to select the best and the brightest to train in our nationally recognized graduate education programs.

Our faculty volunteers serve as clinical educators, giving lectures and grand rounds presentations a few times a year, or more extensively, as clinical preceptors and mentors to our residents. They are role models for service learning and bring diverse experience from their real-life private practices, where most of our residents will eventually follow. They share unique perspectives on patient and practice management and in many cases foster lasting professional relationships with residents that often lead to practice partnerships upon graduation.

As department chair, I can confirm that our faculty partnership model adds immeasurable value to resident education, to our patients, to our department, and our to institution. Without our faculty volunteers as partners, the size and scope of our clinical and academic programs would be greatly diminished.

Our partnership is a shining example of The Christiana Care Way. ●

## Christiana Care and Delaware: national leaders in maternity care



*Christiana Care Health System, the largest delivering hospital in Delaware with more than 6,500 births in 2016, is a national leader in the best practices in infant feeding care.*



*“There is an abundance of evidence that points to lower risks for certain diseases and improved health outcomes for mothers and babies who breastfeed.”*

DAVID A. PAUL, M.D.

The State of Delaware ranks among the best in the nation for exemplary maternity practices, according to the Maternity Practices in Infant Nutrition and Care survey conducted by the Centers for Disease Control and Prevention (CDC). Christiana Care Health System, the largest delivering hospital in Delaware with more than 6,500 births in 2016, is a national leader in the best practices in infant feeding care.

In the survey, Delaware ranked second nationally after Rhode Island and tying with New Hampshire. Delaware received perfect scores of 100 percent for including breastfeeding in prenatal patient education, employing designated staff members for lactation support, and keeping newborn babies together with their mothers in their hospital room.

A champion of these best practices, Christiana Care earned Baby-Friendly designation in 2016 from the Baby-Friendly Hospital Initiative — a global program of the World Health Organization (WHO) and the United Nations Children’s Fund (UNICEF). Only 10 percent of birthing facilities in

the U.S. achieve this designation, which recognizes dedication to breastfeeding practices and support. Both the CDC and the Baby-Friendly Hospital Initiative emphasize breastfeeding as a public health priority.

“There is an abundance of evidence that points to lower risks for certain diseases and improved health outcomes for mothers and babies who breastfeed,” said David A. Paul, M.D., clinical leader of the Women and Children’s Service Line and chair of the Department of Pediatrics at Christiana Care. “Breastfeeding reduces the risk of sudden infant death syndrome, childhood cancers and diabetes for children, and decreases the risk of breast cancer, ovarian cancer, anemia and osteoporosis for mothers. When evidence-based maternity care practices are implemented, breastfeeding rates rise.”

Christiana Care’s nurses and lactation consultants provide education and instruction for new mothers, including one-on-one guidance and a tracking journal with tips for breastfeeding success. The health system’s practices incorporate WHO’s internationally recognized Ten Steps to Successful Breastfeeding.

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“Research shows that mother-infant bonding is critical to successful breastfeeding,” said Elizabeth M. Zadzielski, M.D., MBA, FACOG, associate physician leader, Women and Children’s Service Line. “Bonding begins immediately following birth, when the labor and delivery nurse gives the baby to the mother to hold on her bare chest, skin-to-skin. This contact helps stabilize the baby’s temperature and blood sugar, and encourages mother-baby bonding.”

The comprehensive Breastfeeding Education and Resource Center at Christiana Care offers emotional support and encouragement, advice for handling physical discomfort, tips for breastfeeding multiples, help for mothers with babies receiving special care and breastfeeding supplies. Daytime and evening breastfeeding support groups are offered free of charge. Christiana Care also supports employees by providing access to breastfeeding services and private lactation lounges.

At Christiana Care, family-centered care allows the baby to stay at the mother’s bedside 24 hours a day.

Christiana Hospital is the only high-risk delivering hospital in Delaware with a Level III neonatal intensive care unit (NICU), with board-certified neonatologists on-site around the clock. Obstetricians also are board-certified and equipped with the most advanced technology to provide the highest standards of care. ●



*“Bonding begins immediately following birth, when the labor and delivery nurse gives the baby to the mother to hold on her bare chest, skin-to-skin. This contact helps stabilize the baby’s temperature and blood sugar, and encourages mother-baby bonding.”*

ELIZABETH M. ZADZIELSKI, M.D., MBA, FACOG

## Christiana Care researchers reveal advance in breast cancer detection

A research team at Christiana Care Health System's Helen F. Graham Cancer Center & Research Institute found that a new mammography approach, synthesized 2D digital breast tomosynthesis (DBT-s2D), had lower recall rates and less radiation exposure to patients, while maintaining a high standard for cancer detection.

The five-year study, "Clinical Performance of Synthesized Two-dimensional Mammography Combined with Tomosynthesis in a Large Screening Population," published in the February issue of the peer-reviewed journal *Radiology*, compared the new DBT-s2D mammography approach to those used today, 2D and 3D — or full-field digital mammography alone and digital breast tomosynthesis with full-field digital mammography.

The results surprised and pleased the researchers, said Jacqueline S. Holt, M.D., FACR, director of Breast Imaging at the Helen F. Graham Cancer Center & Research Institute, senior author of the study.

"Not only did fewer women have to return for biopsies and additional testing with the new synthesized DBT approach, but a greater percentage of invasive cancers, which are the more lethal cancers, were found," Dr. Holt said. "The cancer detection rate overall was similar between the synthesized approach and 3D, and the synthesized DBT approach exposed the women to less radiation."

In the study, 78,810 mammograms were performed at the Breast Center between October 11, 2011, and June 30, 2016. Of those mammograms, 16,173 used the new

synthesized method, 30,561 used 3D, and 32,076 used 2D. The call-back rate for the new synthesized method was 4.3 percent, compared to 5.8 percent for 3D and 8.7 percent for the 2D. One result that stood out was that the new synthesized method detected a statistically significant increase in the percentage of invasive cancers when compared to 3D — 76 percent compared to 61.3 percent.

"The significance of the results and what makes them so impressive is the number of mammograms in the study," Dr. Holt said. "We could be seeing an important advancement globally in the quality of cancer care."

"The entire staff at the Breast Center at the Graham Cancer Center is conscientious about optimizing patient care and adding value," Dr. Holt said. "Lowering

CONTINUED

Co-authors of the research study Sara C. Gavenonis, M.D., Jacqueline S. Holt, M.D., FACR, and Mireille P. Aujero, M.D. Not pictured are Ron Benjamin, D.O., and Zugui Zhang, Ph.D.

*"With our focus of providing our patients with the best care available, we adopt the latest technologies if they prove themselves."*

JACQUELINE S. HOLT, M.D., FACR



recall rates and biopsies is very important to us. Radiation exposure and additional testing are the so-called ‘harms’ of mammography, and we have them now down to the absolute lowest rate while continuing to maintain cancer detection rate.”

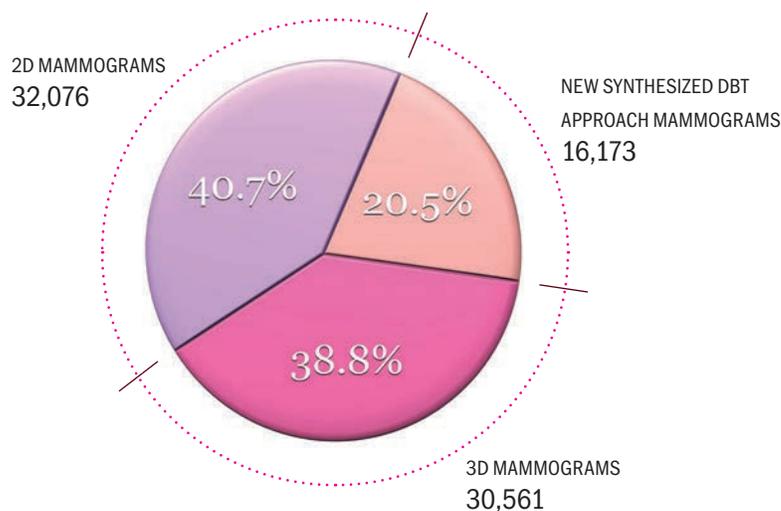
Dr. Holt said researchers at the Graham Cancer Center had expected the study would show the new synthesized mammography method to be equivalent to 3D, rather than to outperform it.

“Our radiologists at Christiana Care have embraced the new approach after seeing the results of this study,” Dr. Holt said.

The U.S. Food and Drug Administration approved the 3D digital breast tomosynthesis with full-field digital mammography (DBT-FFDM) approach in 2011 after multiple research studies showed a reduction in the rate of call-backs, reduction in false positives and an increase in detection rate when compared to 2D full-field digital mammography (FFDM), the existing technology. The drawback with the DBT-FFDM approach is that it requires a second radiation exposure to the breast. Although this dual exposure does not exceed recommendations by American College of Radiology Mammography Quality and Standards, it is still 39 to 45 percent above that of FFDM. It also

**MAMMOGRAMS PERFORMED AT THE BREAST CENTER: 78,810 TOTAL**

OCTOBER 11, 2011 - JUNE 30, 2016



requires the patient to undergo increased time in breast compression.

Diagnostic imaging manufacturers began to develop new software techniques capable of producing a synthesized 2D image from 3D DBT data. In 2013, the FDA approved a version of synthesized 2D software (C-View, Hologic) designed to be used as an adjunct to DBT for breast cancer screening rather than FFDM.

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**The Breast Center earned a 2016 Guardian of Excellence Award from Press Ganey for patient experience in outpatient services.**

CHRISTIANA CARE RESEARCHERS | CONTINUED

**To support cancer prevention and women's health, Tatiana Copeland funded two breast tomosynthesis – or 3-D mammography – units at the Helen F. Graham Cancer Center & Research Institute.**



Researchers at Christiana Care decided to study the new technology.

“With our focus of providing our patients with the best care available, we adopt the latest technologies if they prove themselves,” Dr. Holt said, predicting DBT-s2D will become a standard of care for those cancer centers with the technology because of the many clinical and cost benefits it brings. “I think we have shown at the Graham Cancer Center that we have decreased the risks in our mammography as much as possible and also have improved our overall clinical performance. The bottom line is we have proven that we provide a higher quality of care for our patients.”

Christiana Care’s Breast Center is a model for care across the country. It is the only facility in the region devoted exclusively to breast care, diagnosis and treatment. The Breast Center is available to all women who need routine screenings or further diagnostic procedures and treatments. Specialized

services include the only dedicated breast MRI unit in the region, breast ultrasound, minimally invasive breast biopsies and clinical breast exams. Images are read on-site at the Breast Center, surgeons are available for consultation, and urgent cases are evaluated within 24 hours.

Thanks to a generous gift from philanthropist and businesswoman Tatiana Copeland, the Breast Center installed two 3-D mammography units in 2016.



In December 2016, the Breast Center earned a 2016 Guardian of Excellence Award from Press Ganey for patient experience in outpatient services.

The Graham Cancer Center is a national leader in research clinical trials and forms part of a select group of 51 research centers in the United States and Puerto Rico funded by the National Cancer Institute to participate in the NCI Community Oncology Research Program (NCORP). It also ranks 23rd among the 124 sites across the United States and Canada of the Alliance for Clinical Trials in Oncology for enrolling patients into trials.

Dr. Holt is grateful to Christiana Care for recognizing the value in pursuing the latest advances and technologies in cancer research and in supporting her and her co-authors Mireille P. Aujero, M.D., Sara C. Gavenonis, M.D., Ron Benjamin, D.O., and Zugui Zhang, Ph.D., as well as the entire research team and Christiana Care’s Value Institute for its contributions and statistical analysis. ●

**The Graham Cancer Center is a national leader in research clinical trials and forms part of a select group of 51 research centers in the United States and Puerto Rico funded by the National Cancer Institute.**

## Neurodiagnostic testing lab welcomes new technology and added convenience



A new scanning room and a designated inpatient EMG room have expanded the capacity to test EEG/EMG patients and monitor 24-hour EEG testing throughout the hospital.

**A**t Christiana Hospital, a new laboratory suite enhances convenience and comfort for patients undergoing tests related to a wide range of neurological disorders.

The neurodiagnostic lab brings together doctors, technicians and state-of-the-art testing equipment for tracking brain wave patterns during electroencephalography (EEG) and for carrying out electromyography/nerve conduction studies (EMG/NCS), measuring the electrical activity of muscles and nerves.

New technology broadens the scope of EEG and EMG testing to meet the growing clinical need for neurodiagnostics. A new scanning room and a designated inpatient EMG room have expanded the capacity to test EEG/EMG patients and monitor 24-hour EEG testing throughout the hospital.

“Because so many patient disorders can be traced to the central nervous system, we are fully committed to the continued growth of our Neurosciences Services and programs,” said Melissa Bollinger, MBA, BSN, RN, the service line operations leader.

An often-used hospital tool, EEG detects electrical activity in the brain and assists

in identifying seizures, clarifying epilepsy syndrome and evaluating other brain conditions, said Huijun Wang, M.D., Ph.D., medical director for EEG.

EMG/NCS are common outpatient procedures, but they are not used as often as EEG in the hospital setting. However, electrodiagnostic studies are particularly helpful in diagnosing acute and life-threatening peripheral nervous system disorders, such as polyneuropathies, myopathies and motor neuron disorders, said Yadira Velazquez-Rodriguez, M.D., EMG medical director.

Technicians also have the ability to conduct 24/7 EEG studies of critically ill patients, and they can monitor patients from an intensive care unit in real-time, using portable devices.

“Because of our leadership within the Neuroscience Service Line, our staff is already working with a better pace and achieving higher quality in our testing,” Dr. Velazquez-Rodriguez said. ●



Yadira Velazquez-Rodriguez, M.D., EMG medical director, John Pollard, M.D., neurologist, and Huijun Wang, M.D., Ph.D., medical director for EEG.

## CPC+ fuels innovation in Woodstown and Carney's Point primary care practices

**C**hristiana Care Health System's primary care practices in southern New Jersey are part of the nation's largest-ever program to improve access to primary care while lowering its cost.

The practices, which together serve more than 6,200 patients, are participating in Comprehensive Primary Care Plus, or CPC+, an innovative program that is a public-private partnership between the Centers for Medicare and Medicaid Services and private insurers. Providers in CPC+ receive funding for enhanced, coordinated services.

David C. Bauman, M.D., who practices in Woodstown, said CPC+ helps his practice reach patients in new ways. Possibilities include extended hours, telemedicine and home visits. In addition, patients may benefit from more comprehensive and individualized care. For example, CPC+ funds can support social workers, nutritionists and case managers.

"So many medical illnesses have psychosocial implications," Dr. Bauman said. "To truly help our patients achieve optimal health, we need to address the whole patient."

The strategic partnership helps Christiana Care to focus on achieving quality metrics, further improving access to care and easing transitions across health care settings, said Doug Azar, senior vice president, The Medical Group of Christiana Care.

"It's an excellent opportunity to support primary care clinicians in their efforts to innovate toward more effective and affordable systems of care," Azar said.

The program can also help doctors provide individualized, enhanced care for patients living with multiple chronic diseases.

"If we demonstrate improved outcomes, CPC+ provides incentives that we can reinvest in our practice so we can help patients even more," said Craig B. Quiqley, M.D., who practices in Carney's Point. "We are a home base for our patients, so success will generate more success and a healthier community."

Outcome measures tracked by CPC+ include falls prevention, wellness visits, smoking cessation rates, vaccination rates and blood pressure levels among patients with diabetes.

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A primary care office can serve as a "home base" for patients like Michelle Peverelle, here with Craig B. Quiqley, M.D., of Christiana Care's primary care practice in Carney's Point, New Jersey.



David C. Bauman, M.D., here with the team from Christiana Care's Woodstown practice, said CPC+ helps the practice reach its patients in new ways. In 2016, the Woodstown practice was named Best Physician Practice in the "Best of Salem County" contest by the Salem County Chamber of Commerce, the South Jersey Times and the County of Salem, New Jersey.

*"This is a collaborative effort with great potential to improve the health of our communities."* DAVID C. BAUMAN, M.D.

The first of two five-year CPC+ rounds started January 1 in some 2,900 primary care practices. Public and private health plans in 10 states and four regions are now participating. Delaware is not currently enrolled in the program.

Eligible primary care practices in each market were invited to apply to participate in the winter of 2016. Through a competitive application process, CMS selected primary care practices within the selected markets to participate in CPC+. Practices were chosen based on their:

- Use of health information technology.
- Ability to demonstrate recognition of advanced primary care delivery by leading clinical societies.
- Service to patients covered by participating payer partners.
- Participation in practice transformation and improvement activities.

- Diversity of geography, practice size and ownership structure.

The program also places requirements on participating clinics. For example, the practices in Woodstown and Carney's Point have committed to increasing the number of non-traditional patient visits — such as over-the-phone or on video — in 2017.

The program's insurance partners are hoping that in addition to advancements in quality of care, investing in primary care providers will save them money on costlier services, such as hospitalization and emergency room visits.

"This is a collaborative effort with great potential to improve the health of our communities," Dr. Bauman said.

Christiana Care Health System operates 16 primary care practices in Delaware, Pennsylvania and southern New Jersey. ●



## Young Friends learn how genetic editors rewrite DNA code to save lives

**H**igh school students can uniquely appreciate the benefits of spell-check. After all, one misspelled word can ruin an otherwise perfect grade on a paper that took days or weeks to write. At a meeting last month with the Young Friends of Christiana Care, Eric Kmiec, Ph.D., director of the Gene Editing Institute at the Helen F. Graham Cancer Center & Research Institute, likened the science of gene editing to using spell-check on human cells. Just as students cut, paste and change letters to perfect their assignments, he explained, gene scientists delete, insert or replace a wrong letter in the genetic code to prevent or cure physiologic abnormalities.

“Biomedical research using gene editing promises exciting technological implications to treat patients beyond cancer in such fields as fuel, agriculture and transplant surgery,” Dr. Kmiec told the group of high school students. “You are hitting high school, college and medical school exactly when this revolutionary progress we’re seeing in gene editing will impact cancer and genetic research. I wish I had the tools that are available to you today even five years ago.”

The visit to the Graham Cancer Center, which included a tour of Dr. Kmiec’s pioneering laboratory, was the latest in a series of meetings of the Young Friends, which launched in 2016. The high school students, who are children and grandchildren of Christiana Care board, trustees, Junior Board and Leadership Council members, gather quarterly for an inside look at health system programs and to garner valuable insight about leadership, community service and philanthropy.

“Progress in cancer care and research can’t be achieved unless the next generation of philanthropic and biomedical leaders steps up to the plate,” said Nicholas Petrelli, M.D., the Cancer Center’s Bank of America endowed medical director. “The Young Friends have the potential to be the next generation of Delawareans to help move that progress forward.”

While teens need not be heading toward a career in health care to be part of the Young Friends, Dr. Kmiec’s talk on gene editing definitely resonated with Emily Coughenor, a Pennsylvania Leadership Charter School student who hopes to pursue a career researching food allergies. It was also interesting for Trixie Moore of Archmere Academy, considering a career in neurosurgery, and timely for Salesianum student Salem Shreve, whose newfound interest in becoming a pathologist after reading a bestseller on the origins of the Ebola virus could land him in a gene editing lab not unlike Dr. Kmiec’s one day.

Whatever their chosen career path, a key piece of advice for the Young Friends was to experience college with a mind open to possibilities and to pursue a career for which they have passion.

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The Young Friends of Christiana Care learned about the innovative work in gene editing at the Helen F. Graham Cancer Center & Research Institute with Eric Kmiec, Ph.D., the pioneering director of the Gene Editing Institute. During a tour of Dr. Kmiec's laboratory they saw cancer stem cells, stored at minus 80 degrees Celsius, for research.

“As do most professionals, scientists work all of the time,” Dr. Kmiec said. “This is not a 9-to-5 job, but the rewards are incredible. Whatever you choose to do, if you have passion for your work, you will be happy and successful.”

To encourage the next generation of scientists in Delaware, Dr. Kmiec and his team are using a \$1 million National Science Foundation grant to introduce gene editing kits to middle- and high-school science curricula. The grant will allow students to genetically engineer baker's yeast colonies to isolate and map DNA.

In their first year, the Young Friends coordinated activities that raised \$15,000 to support Christiana Care's innovative First State School for chronically ill children, Camp FRESH for Wilmington teens and the Emergency Department Special Needs Fund. Now in their second year, these young philanthropists and leaders-in-training will embrace a new challenge. They are forming a grant-making committee responsible for reviewing requests from 10 health system programs and determining how \$25,000 in funds will be distributed.

Beginning in April, the Young Friends will review submissions and perform site visits, then meet as a group in August to discuss the merits of each request and decide where the money will make the most impact. The group received a lesson in “Philanthropy 101” from Christiana Care's Vice President for Development Gordon Brownlee.

Co-chairing and guiding the Young Friends are Trustee Chair Penny Saridakis and Trustees Diane du Pont, Margaret O'Dwyer and Beth Moore.

“We expect that this process will be a challenging and rewarding experience for the Young Friends as they work through this unique opportunity to make a measurable impact,” said Moore. “Leadership, community service and philanthropy are important engines in our state and our society.” ●



Nicholas Petrelli, M.D., the Cancer Center's Bank of America endowed medical director, emphasized that the next generation of philanthropic and biomedical leaders are essential to progress in cancer prevention and cancer care.

**“Leadership, community service and philanthropy are important engines in our state and our society.”**

TRUSTEE BETH MOORE



## Promotoras engage Hispanic community in diabetes awareness and prevention

**M**ilagros Martinez, who moved to New Castle from Puerto Rico, remembers her grandfather, who struggled with diabetes for many years.

“He had diabetes from the age of 16 and later in life had both legs amputated,” she said.

Martinez is reaching out to people in her community to help them avoid what her grandfather went through. She is working with the Promotoras, a group of specially trained volunteers who connect with people in the Hispanic community to help them prevent or successfully manage diabetes.

The Promotoras group was founded in 2008 to educate women to be community health workers and promote cancer screenings in the Hispanic community. Juanita Ramos is the Promotoras coordinator at Christiana Care.

“Over the years the Promotoras have proven to be dedicated and effective volunteers who play an important role in the Healthy Families program in bringing outreach and education directly to the people,” said Nora Katurakes, MSN, RN, OCN, Community Outreach and Education manager at the Helen F. Graham Cancer Center & Research Institute.

Hispanics are almost twice as likely as non-Hispanic whites to develop diabetes, according to the Centers for Disease Control and Prevention. Initiatives focused on helping people in a vulnerable group have a significant positive impact on population health.

Through funding from the Harrington Trust, the Promotoras program was expanded to include outreach on diabetes and mental health. Promotoras learn about healthy eating and exercise, checking glucose and taking medications as directed. Dressed in bright pink T-shirts, they reach out to educate friends, neighbors and family members and distribute information on preventing diabetes and its complications.

“Depression and diabetes often go hand-in-hand,” said Lorraine Nowakowski-Grier, MSN, APRN-BC, CDE, a diabetes nurse practitioner and educator who developed a four-part diabetes program to train the Promotoras to work effectively in their communities.

“The Promotoras play a pivotal role in diabetes outreach. If people do not have the resources to manage their diabetes they wind up in the hospital,” she said.

The Promotoras’ first outreach event was a food festival last summer at Holy Angels church in Newark, which has more than



Luisa Ortiz-Marquez, Christiana Care Community Health Outreach & Education program manager, and Promotora Milagros Martinez provide diabetes group education to a class at Christiana Care.

800 Hispanic families in the congregation. People who needed help were connected to Medicaid or other resources.

Now they are reaching out in the community every day, looking for opportunities to talk about diabetes and prevention.

Promotora Rosa Juarez of Newark said she encourages neighbors to cut sugar and fat from their diets and eat more greens, because obesity is linked to diabetes. She said people in the community are eager to learn more about ways to stay healthy.

“As soon as we get into a conversation, the questions come,” said Juarez.

“The Promotoras program teaches volunteers to reach the nucleus of the community, where often information doesn’t reach because of barriers like income and language. At the same time, they actively educate their families, friends and neighbors,” said Luisa Ortiz-Marquez, Healthy Families/Promotoras program manager. “We know that the program is working because on average we have had about 150 people arrive at our offices because of the Promotoras.”

“Health outcomes — particularly for the underserved — are impacted mostly by what we do in the community rather than just in the clinical setting,” said Omar Khan, M.D., MHS, FAAFP, physician leader of Christiana Care’s Primary Care & Community Medicine Service Line and medical director of the Eugene du Pont Preventive Medicine & Rehabilitation Institute. “We are partnering with our neighbors to provide education, outreach and robust linkages to the variety of programs at Christiana Care.” ●

Milagros Martinez works with the Promotoras, specially trained volunteers who reach out to people in the Hispanic community so more individuals can prevent or successfully manage diabetes.

*“The Promotoras play a pivotal role in diabetes outreach. If people do not have the resources to manage their diabetes they wind up in the hospital.”*

LORRAINE NOWAKOWSKI-GRIER,  
MSN, APRN-BC, CDE



Promotoras volunteers receive formal training from key staff, including Community Outreach Coordinator Juana Ramos, that prepares them to speak effectively about diabetes awareness and prevention with neighbors, friends and family.

## Danielle Weber honored with inaugural DAISY Leader Award

**D**anielle Weber, MSN, MS, RN-BC, nurse manager of both the Neurocritical Care Unit and Transitional Neuro Unit and Neurosciences Service Line nursing leader, received the inaugural DAISY Leader Award at a Professional Nurse Council celebration on Feb. 10.

The DAISY Award, an international nurse recognition program, honors nursing excellence. The Professional Nurse Council oversees the highly successful DAISY program at Christiana Care, which honors individual nurses for exceptional care and this year added the DAISY Nurse Leader Award to its recognition.

“Danielle is a role model of caring who provides a safe, nurturing environment so her staff and colleagues can perform at their best and continue to grow

professionally,” said Chief Nurse Executive Ric Cuming, Ed.D., RN, NEA-BC, FAAN. “Even while working under pressure, a nurse leader sets the tone for an empathetic, compassionate environment where nurses can work at the top of their license to provide care our patients value.”

Cuming also congratulated DAISY Leader nominees Dennis Harris, MSN, RN-BC, nurse manager of the ACE Unit, and Christie Williams, MSN, RN-BC, assistant nurse manager of the Cardiac Short Stay Unit as “expert, caring partners to our patients and exemplary leaders to your staff and colleagues.”

Neurocritical nurse Tara Miles, BSN, RNIII, CCRN, nominated Weber, citing her leadership in creating an environment where nurses feel valued, are comfortable voicing their concerns and opinions,

and work in partnership to help patients achieve optimal health.

Under Weber’s leadership, staff satisfaction ratings are high. Nurses also work to improve their skills. On the Neurocritical Care Unit, 63 percent of nurses are certified in a specialty; 83 percent of nurses hold their Bachelor of Science in nursing, which is above the national average; and more nurses are studying for bachelor’s and master’s degrees.

“Danielle genuinely cares about her staff, and seeing them become successful is a goal of hers,” Miles wrote in her nomination. “There have been several times where I have just walked in her office, plopped down and started asking questions about my master’s degree. She always takes the time to guide me in the right direction.”

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Congratulating inaugural DAISY Nurse Leader honoree Danielle Weber, MSN, MS, RN-BC, nurse manager of the Neurocritical Care Unit and the Transitional Neuro Unit (with certificate), are Chief Nurse Executive Ric Cuming, Ed.D., RN, NEA-BC, FAAN; nurse Tara Miles, BSN, RNIII, CCRN, who nominated Weber; and Donna Casey, DNP(c), MA, RN, NE-BC, FABC, vice president, Patient Care Services.

Weber says she, too, benefited greatly from mentors Joan Pirrung, MSN, RN, ACNS-BC, manager, Trauma Program, and Donna Casey, DNP(c), MA, RN, NE-BC, FABC, vice president, Patient Care Services, “who truly want me to be the best that I can be.”

Even as a leader, Weber also is a hands-on nurse, working directly at the bedside with patients and families.

“She sets an amazing example for her staff, which makes us all want to provide the best care possible for our patients,” Miles said.

Weber said creating a culture of collaboration and caring contributes to better outcomes.

*“Nurses often work quietly, without expecting recognition. Through the DAISY program we have the opportunity to thank nurses for bringing their all every day.”*

MARIA BROWN, BSN, RN, PCCN

“When your staff is happy, the patients and families are happy, as well,” she said. “They are more participatory in their care when they feel that the staff truly cares for them. I have a wonderful, engaged and caring staff. I learn as much from them as they learn from me.”

A Christiana Care nurse since 1995, Weber became a patient care coordinator in 2003 and was promoted to manager of the Transitional Surgical Unit in 2011. She earned her bachelor’s degree in nursing from Neumann University and a dual master’s degree in nursing leadership and health care administration from Wilmington University.

“Nurses often work quietly, without expecting recognition,” said Maria Brown, BSN, RN, PCCN, of the Transitional Surgical Unit and chair of the Professional Nurse Council. “Through the DAISY program we have the opportunity to thank nurses for bringing their all every day.”

The Professional Nurse Council at Christiana Care selects DAISY Award recipients using a blind selection process based on nominations from patients, families, staff and volunteers. All nurses — inpatient, outpatient and VNA — are eligible. The Professional Nurse Council will name the first DAISY Team Award recipients in April. ●

Celebrating nursing excellence are DAISY Leader nominee Christie Williams, MSN, RN-BC, assistant nurse manager of the Cardiac Short Stay Unit; DAISY Leader honoree Danielle Weber; Cynthia D. Sweeney, MSN, RN, CNOR, NEA-BC, executive director of the DAISY Foundation; and DAISY Leader nominee Dennis Harris, MSN, RN-BC, nurse manager of the ACE Unit.



## Winter break for interns explores mindfulness, relaxation, coping skills

The life of an intern — a doctor in the first year of post-medical-school training — includes plenty of hard work and stress. In February, interns at Christiana Care were treated to a special time-out to focus on their own health, wellness and work/life balance at an event called Winternfest.

“We want to help you thrive in your residency and have a productive, fulfilling career,” said Heather Farley, M.D., FACEP, director of Provider Wellbeing.

At the event, young doctors explored mindfulness, gratitude and a variety of life skills.

Mary Williams, a registered dietitian, showed interns how to put together a healthy meal in 15 minutes or less. She demonstrated how to combine oats with a few simple ingredients that go in the refrigerator overnight to provide a healthy grab-and-go breakfast in the morning. She sautéed frozen grilled vegetables with boneless chicken strips for a quick, low-fat dinner. “Make extras for leftovers,” she advised.

Mary Sweeney, LPCMH, a behavioral health consultant in Adult Medicine, led interns in breathing exercises that reduce stress and enhance awareness.

“We aren’t used to being alert and relaxed,” she said. “But the more you practice, the more you realize that alert and relaxed go together.”

Margaret Keenan, Ph.D., clinical psychologist and behavioral health faculty member for the Family Medicine Residency Program, led an exercise on narrative medicine. She invited the interns to distill an experience into a six-word story or memoir. Among their responses:

“My amazing peers keep me going.”

“Drugs are bad. Dead at 34.”

“Will I ever know it all?”

It’s a practice that many of the interns said they want to continue.

“We want to start posting six-words memoirs on the call-room wall,” said participant Beth Leopold, M.D.



Mary Williams, RD, presented a Winternfest teaching module to show interns how to make nutritious grab-and-go breakfasts and low-fat dinners and stressed the importance of being able to rely on leftovers for healthy meals.



Mary Sweeney, LPCMH, a behavioral health consultant in Adult Medicine, leads interns in breathing exercises that reduce stress and enhance awareness.

## Best practice review

### PHARMACY INSPECTION

#### Q. DOES CHRISTIANA CARE HAVE A POLICY ON THE INSPECTION OF DRUG STORAGE AREAS?

- A. Yes. Christiana Care's "Pharmacy Inspection of Drug Storage Areas" policy states all inpatient areas are inspected monthly for expiring medications. The primary focus of these inspections include: the AcuDose cabinets, code carts, emergency boxes and refrigerators.

#### Q. WHAT OTHER ITEMS ARE INSPECTED MONTHLY?

- A. The pharmacy also performs a spot check on storerooms items on each unit to identify expiring blood tubes, IV fluids and certain types of syringes. Pharmacy works with the equipment room staff to keep all medical supplies in date. Items that are expired in the storeroom should be reported to the equipment room staff (302-733-2946 at Christiana or 302-320-4985 at Wilmington).

#### Q. HOW OFTEN ARE OUTPATIENT AREAS INSPECTED?

- A. Christiana Care-owned physician office practices and Medical Aid Units are inspected every 90 days per Delaware Board of Pharmacy Regulations. Pharmacy routinely inspects areas to remove drug samples and remove multidose vials that are nearing their expiration date (28 days after opening), and will evaluate medications for proper storage.

#### Q. HOW DOES THE PHARMACY USE INSPECTIONS INFORMATION?

- A. The pharmacy uses the inspections data to change PAR levels in the AcuDoses, to remove items that are not being used in each unit, and to identify any other deficiencies that could be problematic during a regulatory survey. ●

*If you have questions about this Best Practice Review, please contact content expert Sam Wetherill at 302-733-5909 or call the Safety Hotline: dial 7233 (SAFE) from within Christiana or Wilmington hospitals, or 623-7233 from outside.*

Vanessa Downing, Ph.D., a psychologist with a dual appointment in the Center for Provider Wellbeing and the Center for Heart & Vascular Health, led a session on gratitude.

"We reflected on one person who was always there for us," said participant Robert DeGrazia, M.D. "That would be my wife," he said.

The event concluded with some time to share a meal, relax and play games.

Lisa C. Maxwell, M.D., associate chief learning officer, encouraged them to practice good self care and to reach out whenever they need help.

"We want to know how it's going with you," Dr. Maxwell said. "We want to remind you to take care of yourself." ●



## **Kert Anzilotti named interim president, CEO and board chair of eBrightHealth ACO and Christiana Care Quality Partners**

Kert Anzilotti, M.D., MBA, physician leader in the Neurosciences Service Line and chair of the Radiology Department, has been named interim president, CEO and chair of the board of the eBrightHealth ACO and Christiana Care Quality Partners. In this role Dr. Anzilotti is responsible for the physician leadership and network operations of the ACO, which includes close to 300 primary care physicians from five health systems, covering almost 48,000 lives statewide. He also oversees the Christiana Care Quality Partners network of physicians.

To strengthen the integration of clinical operations and strategic aims, Dr. Anzilotti now reports to Chief Clinical Officer Ken Silverstein, M.D., MBA.

Dr. Anzilotti received his medical degree from Sydney Kimmel Medical College at Thomas Jefferson University, followed by residency training and fellowship at Yale – New Haven Hospital, Connecticut. He is board certified in neuroradiology and radiology. He received a Master of Business Administration from the University of Delaware Alfred Lerner College of Business & Economics in 2011. ●



## **Mona Liza Hamlin named nurse manager for Parent Education and Lactation Services**

Mona Liza Hamlin, MSN, RN, IBCLC, has been named nurse manager for Parent Education and Lactation Services in the Women and Children's Service Line.

She joins Christiana Care Health System coming from Nemours A.I. duPont Hospital for Children, where she began building the

hospital's parent education and lactation services program in 2010. She is an international board-certified lactation counselor and managed two programs worth approximately \$250,000 in grant funding from state and national agencies while in her leadership role at Nemours. Prior to that she was a neonatal intensive care unit registered nurse.

As the lactation support program manager at Nemours, Hamlin was instrumental in the development of the hospital's lactation-support program, utilizing evidence-based best practice. She assisted with updating enterprise-wide policies regarding human lactation support practices. She provided lactation services for inpatient and outpatient breastfeeding, managing three outpatient lactation clinics in the Nemours Delaware service area. She performed community awareness and outreach

activities focused on breastfeeding and collaborated with Nemours Health Prevention Services Early Feeding Team for enterprise and statewide breastfeeding support and promotion. Hamlin has an interest in advocacy and policy, and is currently serving as chair elect to the United States Breastfeeding Committee.

Hamlin was a Delaware Healthy Mother and Infant Consortium 2017 Kitty Esterly Health Equity Award recipient for her work in providing access to breastfeeding support to African-American mothers throughout the city of Wilmington. As a Center for Social Inclusion First Food Equity Cohort member, Hamlin has provided health equity trainings nationally.

Hamlin has many professional presentations to her credit, including the following in 2016: "Supporting the Breastfeeding Dyad through Complex Cases"; "Seeking First Food Justice: Applying an Equity Lens to the BFHI"; "Pursuing Cultural Competency"; "GEM Project Journey"; and "Addressing Barriers."

She received her Bachelor of Science in nursing from Chamberlain College of Nursing and her Master of Science in nursing from Western Governors University. Her fundamental belief is that equitable access and high-quality care must be afforded to all families at all times. ●



### Nicole Harris promoted to administrative director, Care Now Medical Aid Units

Nicole Harris, BS, RT (R)(MR)(CT)(M), has been promoted to administrative director, Care Now Medical Aid Units.

Harris provided interim management support for the Medical Aid Units over the past three months and supported the successful completion of the three-year accreditation renewal from the National Urgent Care Center Accreditation (NUCCA) in December 2016. Her new role will expand her leadership and oversight to include our five community-based Care Now Medical Aid Unit locations including Glasgow, Christiana, Middletown, Smyrna and STAR Campus.

Harris has served Christiana Care Health System for 16 years in various capacities as a staff and charge MRI/CT technologist, MRI

section supervisor and most recently operations manager, Outpatient Imaging. She has been a vital member of the Imaging administrative team and instrumental in improving and advancing the goals of Imaging Services and Christiana Care. With Harris's leadership, Imaging Services successfully implemented low-dose lung screening services and expanded ultrasound and mammography services at several outpatient imaging locations.

Harris holds advanced imaging board certifications in radiology, magnetic resonance imaging, CT scan and mammography. She has completed the Healthcare Leadership Certificate Program in partnership with the University of Delaware and received her Bachelor of Science in allied health from Wilmington University. ●

### Human Resources announces leadership appointments

New appointments within the Christiana Care Human Resources Department were announced recently by Audrey Van Luven, senior vice president and chief human resources officer.



Christopher J. Cowan is promoted to vice president, HR operations. In addition to his current responsibilities for HR technology and shared services, Cowan assumes responsibility for talent acquisition, talent assessment and employee relations.



Kerry Delgado transitions to corporate director, HR business partners, from her role as corporate director of talent optimization. In this newly created role, Delgado will function as a strategic consultant to business leaders in developing people strategies to drive organizational outcomes. The initial focus of this HR service delivery expansion will include The Medical Group of Christiana Care and the Department of Nursing. She will partner with the other HR centers of expertise to integrate solutions.



Pamela Ridgeway, corporate director, talent acquisition, assumes accountability for systemwide recruiting. This transition allows Christiana Care to integrate and maximize internal resources. ●

## Publishing

**Jennifer C. Goldsack, MChem, MBA, MA, Christopher J. Mascioli, Seema S. Sonnad, Ph.D., and Susan Mascioli, MS, BSN, RN, CPHQ, NEA-BC.** “Data Transparency at the Point of Care: Results of Patient and Visitor Interviews.” *Nursing* 2017. February 2017.

**James M. Ellison, M.D., MPH.** “A Cross-Validation Delphi Method Approach to the Diagnosis and Treatment of Personality Disorders in Older Adults.” *Aging & Mental Health*. December 2016.

**Matthew K. Hoffman, M.D., MPH,** et al. “Predictive Accuracy of Serial Transvaginal Cervical Lengths and Quantitative Vaginal Fetal Fibronectin Levels for Spontaneous Preterm Birth Among Nulliparous Women.” *JAMA* March 14, 2017.

**Matthew K. Hoffman, M.D., MPH,** et al. “A Comparison of Colorimetric Assessment of Vaginal pH with Nugent Score for the Detection of Bacterial Vaginosis.” *Infectious Diseases in Obstetrics and Gynecology*. February 2017.

**Meghan Lane-Fall, M.D.,** et al. “Veno-venous Extracorporeal Life Support in Hemodynamically Unstable Patients with ARDS.” *Anesthesia & Analgesia*. March 2017.

**Kristen E. Miller, Dr.PH., MSPH, Ryan Arnold, M.D., MA, Muge Capan, Ph.D., Michele Campbell, BSN, RN, MSM, CPHQ, FABC, Susan Coffey Zern, M.D., CHSE, Robert Dressler, M.D., MBA; Ozioma O. Duru, Pharm.D., BCPS, Gwen Ebbert, MSN, BA, RN, RN-BC, Eric Jackson, Jr., M.D., MBA, John Learish, CHTM, CBET, CRES, Pan Wu, Ph.D., Dean A. Bennett, RPh, CPHQ,** et al. “Improving Infusion Pump Safety Through Usability Testing.” *Journal of Nursing Care Quality*. April/June 2017.

**Jeffrey M. Rodney, D.M.D., FACP,** et al. “Digital Design and Fabrication of Surgical Obturators Based Only on Preoperative Computed Tomography Data.” *The International Journal of Prosthodontics*. Volume 30, Number 2. 2017

**Yukiko Washio, Ph.D.,** et al. “Incentive-Based Breastfeeding Intervention Study Among Low-Income Puerto Rican Women.” *Pediatrics*. March 2017.

## Presentations

**Donna Casey, DNP(c), MA, RN, NE-BC, FABC.** “Promising Interventions for Building Individual Capacities for Moral Resilience.” Panel Discussion. *American Journal of Nursing*. February 2017.

At the Society for Healthcare Epidemiology of America. St. Louis, Missouri. March 2017:

- **Marci Drees, M.D., MS, FACP, DTMH.** “Improving Urine Culture Ordering and Collection Practices Using a UARC Order set.”
- **Marci Drees, M.D., MS, FACP, DTMH.** “Implementing an Environmental Cleaning Monitoring Program: Successes and Pitfalls.”

**Stephen Hoover, MS, Muge Capan, Ph.D., Eric V. Jackson, Jr., M.D., MBA, Robert Locke, D.O., MPH.,** et al. “Predicting Pediatric Asthma-Related Admissions Using Public Air Quality Data.” Eastern Society for Pediatric Research Annual Meeting. Philadelphia. March 2017.

**Marybeth Glasheen-Wray, PT, MMSc., Rossana P. Tocci, MSN, RN, Naomi Stump,** et al. “It Takes a Village to Stay at Home Safely.” shpdata.com Online presentation Feb. 22, 2017

**Matthew K. Hoffman, M.D., MPH.** “Emerging Perspectives on Prematurity.” Grand Rounds, Robert Wood Johnson Medical Center. New Brunswick, New Jersey. March 2017.

**Denise Lyons, MSN, RN, GCNS-BC, Patricia M. Curtin, M.D., FACP, CMD, Richard Caplan, Ph.D.,** et al. “Measuring Staffs’ Knowledge, Attitudes and Perceptions Regarding the Care of the Hospitalized Older Adult.” *Nursing Improving Care for Health System Elders (NICHE) Annual Conference*. Austin, Texas. April 2017.

**Maureen A. Seckel, APRN.** “Updating Your Practice: 2017 Sepsis Guidelines.” Webinar presentation.

## Appointments

The Professional Advancement Council congratulates the following new RN III nurses for February:

**Ma-Rowena Reyes-Rigor, BSN, RN, CCRN,** 3E MICU; **Nicholas Tricarico, BSN, RN, CCRN,** 2D; **John Chambers, BSN, RN, CEN,** Flight Nurse; **Tania Sophia Dossantos, BSN, RN-BC,** 5B; **Elisabeth Peck, BSN, RN, CEN,** Christiana ED; and **Bethany C. Hiriak, BSN, CCRN** from SCCC.

## Awards & Achievements

**Reynold S. Agard, M.D., FACP,** received the 2016-2017 Oscar E. Edwards Memorial Award for Volunteerism and Community Service from the American College of Physicians.

**Matthew K. Hoffman, M.D., MPH,** was recognized by the British Journal of Obstetrics and Gynaecology for being a top reviewer for the Journal since 2015. Recognition is awarded to the top 50 reviewers for submitting high quality reviews.

**Jennifer Kelly McCoy, PAC,** received the 2016 Drexel University Physician Assistant Program’s Award for Teaching Excellence Physician Assistant Preceptor of the Year, recognizing her “exemplary preceptor’s positive impact upon the educational value received by the physician assistant students and to honor her numerous contributions to students’ training.” The award was presented in December 2016 during the Drexel Physician Assistant Program Class of 2016 Graduation.

**Jason Nomura, M.D., FACP, FACEP, FAHA,** was elected a Fellow of the American Heart Association. ●

## Group fitness classes at the employee fitness center — for the beginner to the advanced exerciser

At least two days a week during her lunch break, Linda Sigman, project manager in Design and Construction, enjoys Zumba and Tabata aerobics classes at Christiana Hospital's Employee Fitness Center.

"It's nice to get up from my desk in the middle of the day and come back invigorated," she said. "It's a good break from the elliptical trainer, working different sets and muscles, and enjoying the camaraderie."

Zumba gives participants an opportunity to kick up their heels and dance. Tabata combines weights, cardio and floor exercises. They're among more than 30 group fitness classes held each week at the Employee fitness centers at Christiana and Wilmington hospitals. Classes are offered in the early morning, lunchtime, early evening and Saturday.

"We are mindful of times when people are changing shifts so people can take classes before or after work," said Maryann Quinn Hendrix, an instructor who leads employees in such mind-body practices as yoga, pilates, tai chi and mediation.

Classes don't require any special equipment. Fitness center membership is free. And the group energy is priceless.

"We are connected to the others in the room, to the experience," she said. "That's the benefit of a class."

Aerobic classes such as Tabata, Total Body Burn and Cardio, Core & More focus on getting heart rates up while performing a variety of exercises. Strength classes, including Get Pumped and Flex & Strength, encourage increasing strength and toning muscles while burning calories.

Mind and body classes include Morning Yoga, Qi Gong and Restorative Yoga, emphasizing gentle movements and

breathing techniques to help reduce stress and energize the mind and body.

Classes are designed for all body types and all levels of fitness. To accommodate busy schedules, classes range from 30 minutes to an hour.

Lizzy Helm teaches yoga and classes that focus on cardio fitness and strength training.

"If you can only stay for part of the class, that's OK," she said. "Fifteen minutes is better than nothing. Do what you can. Just move."

Instructors realize it can be intimidating to try a group class. They provide personalized attention and ensure a safe workout by correcting exercise form and making modifications to fit the need of the individual. Everyone can exercise at his or her own pace and can talk with an instructor before or after class if they have questions.

Helm and other instructors offer encouragement and advice for maintaining healthy habits. She often recommends a regimen involving four exercises — jumping jacks, squats, pushups and crunches — each performed for 30 seconds. Do once, then repeat, for a total of six minutes.

"It gives you a nice burst of energy to start the day," she said. ●

### Want to learn more?

Visit the Employee Fitness section of the My Wellness employee website to learn more and see the schedule of group exercise classes.

Lizzy Helm teaches group fitness classes and offers healthy advice at the Employee Fitness Center.

## April 11

### FROM GOLF TO TENNIS

**LECTURE BY ARON MCCONNELL, PT, DPT, COMT, CSCS.**

**6:30 – 8 p.m.**

**John H. Ammon Medical Education Center, Main Auditorium**

Learn how to protect your elbows and shoulders from injury during your favorite sport or hobby. This lecture covers golf and tennis elbow, as well as general shoulder health for participants of the two sports. Call 800-693-CARE (2273) or register online at [events.christianacare.org/event/rehab-lecture-series-2017](http://events.christianacare.org/event/rehab-lecture-series-2017).

## April 12

### DONATE LIFE FLAG RAISING CEREMONY

**Noon – 1 p.m.**

**Christiana Hospital main entrance**

The Christiana Care Kidney Transplant Program and Gift of Life Donor Program will celebrate donors, their families and transplant recipients during National Donate Life Month, and invites anyone interested to join in a flag raising ceremony. Light refreshments to follow in Room 1303 (Christiana Hospital cafeteria). To RSVP call the Transplant Program at 302-623-3866 by April 7.

## April 21

### NEUROVASCULAR SYMPOSIUM

**8 a.m. – 3:30 p.m. (registration begins at 7 a.m.)**

**John H. Ammon Medical Education Center**

The 5th Annual Neurovascular Symposium, hosted by Christiana Care Health System, will begin with stroke imaging and treatment decision-making for intravenous versus mechanical thrombectomy treatment, including decision-making case studies. Subsequent sessions will explore medical and surgical management of brain hemorrhage and trauma, including image-guided removal of cerebral hemorrhages. Lectures on venous lesions of the brain will be followed by talks related to the risk assessment, genetics, surveillance and endovascular treatment of brain aneurysms. Pre-registration is required: <http://www.planetreg.com/NeurovascularSymposium2017>.

## April 29

### CLEAN OUT YOUR MEDICINE CABINET

**10 a.m. – 2 p.m.**

**Christiana SurgiCenter parking lot**

Unwanted or expired medications cause thousands of accidental poisonings each year and have been detected in municipal water supplies. Bring these old medications to Christiana Care for proper disposal. All medications will be disposed of in an environmentally responsible manner.

- Do bring: Prescriptions, vitamins, over-the-counter pills, liquid medications and creams, in their original containers.
- Don't bring: Syringes and sharps.

A joint partnership of Christiana Care Health System, the Drug Enforcement Administration, the Delaware Division of Public Health and the Delaware State Police.

## May 4

### DELAWARE TRAUMA SYMPOSIUM

**7 a.m. – 3:30 p.m.**

**Chase Center at the Riverfront, Wilmington**

Registration is now open for the Delaware Trauma Symposium. The agenda, poster abstract submission and registration information is available online at <http://delawaretraumasymposium.org> where registration payment by check or through PayPal is accepted.

## May 15

### ACCEL COMMUNITY RESEARCH EXCHANGE

**7 a.m. – 4 p.m.**

**University of Delaware  
Clayton Hall Conference Center**

Conference features include:

- Invited guest speakers — members of the 2014 Team Science Award winners from the Association for Clinical and Translational Science — including Bowen Chung, M.D., MS, associate professor-in-residence, Department of Psychiatry and Biobehavioral Sciences, Harbor-UCLA Medical Center; and Loretta Jones, MA, founder and CEO of Healthy African-American Families.
- A panel discussion on behavioral health will include local experts Rita M. Landgraf, Department of Health and Social Services/ University of Delaware; and Gerard Gallucci, M.D., MHS, Delaware Department of Health and Social Services; and Jim Martin, CPSS Council Chairperson, Governor's Advisory Council of Division of Substance Abuse and Mental Health.
- Five afternoon workshops.

Contact [accelceo@de-ctr.org](mailto:accelceo@de-ctr.org) or 302-320-6796 with questions.



## June 1

### NOMINATIONS DUE FOR MEDICAL-DENTAL STAFF 'COMMENDATION FOR EXCELLENCE'

The Commendation for Excellence honors current and former members of the Medical-Dental Staff who have made exceptional contributions to the community through their clinical, scholarly, educational or humanitarian activities. Medical-Dental Staff members can nominate an eligible physician or dentist for the award. Nominations require:

- A letter outlining the reasons for the nomination.
- Qualifications of the nominee.
- The nominee's curriculum vitae.

Send nominations via e-mail to Cheryl Klecko at [cklecko@christianacare.org](mailto:cklecko@christianacare.org).

## June 26

### 11TH ANNUAL CONCEPTS IN RESPIRATORY CRITICAL CARE CONFERENCE

7 a.m. – 3 p.m.

John H. Ammon Medical Education Center

This conference will provide respiratory care practitioners and other health care professionals continuing education on cutting edge critical care topics.

Register online at <https://www.eventbrite.com/e/11th-annual-concepts-in-respiratory-critical-care-conference-tickets-31751798484>. Contact [Jmixell@christianacare.org](mailto:Jmixell@christianacare.org) with questions.

## May 17

### 87TH ANNUAL MEETING OF THE DELAWARE ACADEMY OF MEDICINE / DELAWARE PUBLIC HEALTH ASSOCIATION

5:30 – 9:30 p.m.

DuPont Country Club

Keynote Speaker: Victor Dzau, M.D., President, National Academy of Medicine. For additional information and to register: [www.delamed.org/2017](http://www.delamed.org/2017).

## May 25

### CHRISTIANA CARE GOLF CLASSIC

Registration opens: 9 a.m.

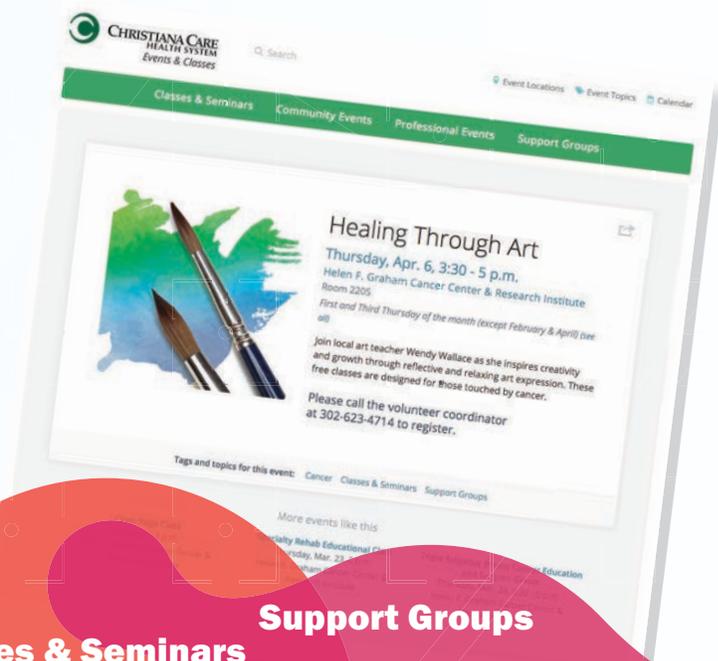
Shotgun start: 11:30 a.m.

DuPont Country Club



This annual event is in its 26th year and will support the Swank Memory Care Center at Christiana Care Health System. Register at <https://www.christianacare.org/classic>.

Learn about upcoming events at  
Christiana Care and register online at  
<https://events.christianacare.org/>.



Support Groups  
Classes & Seminars  
Professional Events  
Community Events

## THERAPEUTIC NOTES

## Serious cardiac adverse effects associated with high dose of loperamide

Roman Steiner, Pharm.D.

In June 2016, the FDA issued a safety warning about serious cardiac adverse events associated with the anti-diarrheal medication, loperamide (Imodium). These reports came after patients were found to abuse or misuse the product. In the alert, the FDA warned health care professionals to be aware that taking higher than recommended doses of loperamide can cause serious heart problems including QT prolongation, Torsades de Pointes, syncope and cardiac arrest.

Abuse of an anti-diarrheal medication does not make sense at first glance until loperamide's mechanism of action is considered. Loperamide works locally within the gastrointestinal (GI) tract through  $\mu$ -opioid receptor agonism to slow GI movement. If taken at high enough doses, this  $\mu$ -opioid receptor agonism can replicate the central nervous system effects of other opioids such as morphine. The pharmacokinetic properties of loperamide are prohibitive of abuse and allow for safe use within the majority of users. At typical doses, between 2 mg and 4 mg, very little of the drug is absorbed and only about 0.3% of the dose actually reaches the blood. In order for loperamide to reach the brain it has to overcome significant metabolism in the liver and efflux proteins within the GI tract. Taking these factors into consideration, most patients won't experience cardiac side effects below the FDA approved maximum daily dose of 16 mg. The abuse potential is further blunted by its poor penetration of the blood-brain barrier where additional efflux proteins keep the drug from entering. This provides for a relatively benign set of adverse effects including nausea, constipation, drowsiness and headache. At supratherapeutic doses, central nervous system opioid effects can occur and patients can get a euphoric effect. Although loperamide was thought to have minimal potential for abuse, recent reports indicate loperamide has been increasingly used as an opioid substitute by patients looking to self-treat opioid withdrawal or abused for a euphoric effect.

Between 1976 and 2015, 48 cases of serious cardiac events have been linked to loperamide use. Of these events, 31 resulted in hospitalization and 10 resulted in patient mortality. While the majority of the reported cases have been associated with patients taking a higher than recommended dose, events have been seen at lower dosing in patients who were concomitantly taking interacting medications.<sup>3</sup> Interacting medications include CYP3A4 and CYP2C8 inhibiting medications such as gemfibrozil, itraconazole, and amiodarone. Taking interacting medications can increase plasma concentrations by 2-4 fold and p-glycoprotein efflux pump-inhibiting medications (e.g., clarithromycin, ketoconazole, amiodarone, etc.) have been found to increase both the plasma concentration and the penetration of drug through the blood brain barrier.<sup>5,6</sup> These interactions are known to some of the patients who abuse loperamide and have been abused to obtain euphoric effects.

Given the known mechanism of loperamide, how is this cardiac toxicity occurring? Further investigations looking at loperamide's mechanism of action have found additional properties beyond that of  $\mu$ -opioid receptor agonism. The other mechanisms of action that are thought to be the culprit include inhibition of cardiac sodium channels, potassium channels, and calcium channels.<sup>2</sup> These off-target effects explain both the QRS and QTc interval prolongation that have been reported in overdose case reports.<sup>4</sup>

At this time, the FDA continues to evaluate the safety issue to determine if additional actions are needed. While further investigation is ongoing, providers, physicians, and pharmacists should be aware of the potential dangers associated with loperamide and continue to utilize it within the FDA's maximum daily dose limit of 16 mg. Until more information is available, precautions should be considered when interacting medications are being taken and for those patients with baseline cardiac risks factors including prolonged QTc and QRS intervals. ●

### References

1. Daniulaityte R, Carlson R, Falck R, et al. "I just wanted to tell you that loperamide WILL WORK": a web-based study of extra-medical use of loperamide. *Drug Alcohol Depend* 2013;130:241-244.
2. Eggleston W, Clark KH, Marraffa JM. Loperamide Abuse Associated With Cardiac Dysrhythmia and Death. *Ann Emerg Med* 2016.
3. U.S. Food and Drug Administration. (2016, June 8). FDA Drug Safety Communication: FDA warns about serious heart problems with high doses of the anti-diarrheal medicine loperamide (Imodium), including from abuse and misuse [Press Release]. Retrieved from [http://www.fda.gov/Drugs/DrugSafety/ucm504617.htm?source=govdelivery&utm\\_medium=email&utm\\_source=govdelivery](http://www.fda.gov/Drugs/DrugSafety/ucm504617.htm?source=govdelivery&utm_medium=email&utm_source=govdelivery)
4. Wightman RS, Hoffman RS, Howland MA, et al. Not your regular high: cardiac dysrhythmias caused by loperamide. *Clin Toxicol* 2016;54:454-458.
5. Niemi M, Tomio A, Pasanen MK, et al. Itraconazole, gemfibrozil and their combination markedly raise the plasma concentrations of loperamide. *Eur J Clin Pharmacol* 2006;62(6):463-472.
6. Kim TE, Lee H, Lim KS, et al. Effects of HM30181, a P-glycoprotein inhibitor, on the pharmacokinetics and pharmacodynamics of loperamide in healthy volunteers. *Br J Clin Pharmacol* 2014;78(3):556-564.

## CHRISTIANA CARE COMPLIANCE HOTLINE



Christiana Care's Compliance Hotline can be used to report a violation of any regulation, law or legal requirement as it relates to billing or documentation, 24 hours a day, 7 days a week. Callers may remain anonymous. The toll-free number is: 877-REPORT-0 (877-737-6780).

✓ To learn more about Corporate Compliance, review the Corporate Compliance Policy online or contact Christine Babenko at 302-623-4693.

## FORMULARY UPDATE | FEBRUARY 2017

## FORMULARY ADDITIONS

Medication – Generic/Brand Name	Strength/Size	Use/Indication	Comment
<b>Defibrotide Injection/ Defitelio</b>	80 mg/mL 200 mg/2.5 mL vial	Treatment of hepatic sinusoidal obstruction syndrome (SOS; formerly called veno-occlusive disease [VOD]) with renal or pulmonary dysfunction following hematopoietic stem cell transplant (HSCT).	Prescribing limited to hematologists & medical oncologists.
<b>Polidocanol injection</b>	0.5% 2 mL ampule	Treatment of uncomplicated spider veins in the lower extremity.	Line-item extension.

## CHRISTIANA CARE MEDICATION POLICY CHANGE

<b>Ceftazidime/Avibactam Injection / Avycaz</b>	Prescribing of ceftazidime-avibactam must be authorized by an infectious disease provider.
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## UPDATED STANDARD ADULT MEDICATION INFUSION CONCENTRATIONS

Dextrose 5% / NaCl 0.45% 1 L + sodium acetate 80 mEq/40 mL

Dextrose 5% / NaCl 0.45% 1 L + sodium acetate 40 mEq/20 mL

NaCl 0.45 % 1 L + sodium acetate 80 mEq/40 mL

## FORMULARY DELETIONS

<b>Amobarbital Injection / Amytal</b>	Removed because of low utilization.
<b>Dinoprostone</b>	Removed because of low utilization.
<b>Droperidol Injection</b>	Product has been unavailable since 2013.
<b>Imipramine 75 mg capsule</b>	Removed because of low utilization. Other strengths remain available.
<b>Methyldopa/ Hydrochlorothiazide Tablets / Aldoril</b>	Removed because of low utilization.
<b>Montelukast 4 mg chewable tablet</b>	Removed because of low utilization. The 10 mg tablet and 5 mg chewable tablet remain available on the Christiana Care Formulary.
<b>Niacin 750 mg extended-release tablet</b>	Removed because of low utilization. The 500 mg and 1000 mg extended-release tablets remain available on the Christiana Care Formulary.
<b>Niacin immediate-release tablet</b>	Removed because of low utilization.
<b>Paromomycin</b>	Removed because of low utilization.
<b>Phenelzine / Nardil</b>	Removed because of low utilization.
<b>Polidocanol foam / Varithena</b>	Removed because of low utilization.
<b>Potassium Acetate riders in 100 mL IV fluid (adults)</b>	Removed because unavailable.
<b>Quinupristin/Dalfopristin Synercid</b>	Removed because of low utilization and availability of alternative antibiotics.
<b>Sodium Acetate riders in 100 mL IV fluid (adults)</b>	Removed because of low utilization.
<b>Thiothixene 1 mg &amp; 20 mg capsules / Navane</b>	Removed because of low utilization. The 2 mg capsule remains available on the Christiana Care Formulary.
<b>Tranylcypromine / Parnate</b>	Removed because of low utilization.



**CHRISTIANA CARE  
HEALTH SYSTEM**

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*Christiana Care is a private, not-for-profit regional health care system that relies in part on the generosity of individuals, foundations and corporations to fulfill its mission. To learn more about our mission, please visit christianacare.org/donors.*

# Register today for the Golf Classic



**Presented by the Cerner Corporation, the 26th annual Christiana Care Golf Classic, scheduled for May 25 at the DuPont Country Club in Wilmington, Delaware, will support the Swank Memory Care Center.**

## CHRISTIANA CARE GOLF CLASSIC

The Swank Memory Care Center at Christiana Care is Delaware's first and only comprehensive outpatient program for patients with Alzheimer's disease and other memory disorders. Led by James M. Ellison, M.D., MPH, The Swank Foundation Endowed Chair in Memory Care and Geriatrics, the center provides support, education and guidance for patients and families, from diagnosis through treatment. In Delaware, more than 26,000 people have a memory disorder. The number of people age 65 years and older with Alzheimer's is expected to grow more than 33 percent by 2025. ●



**To register for the 2017 Christiana Care Golf Classic, visit <https://christianacare.org/classic>.**

With leadership support from Cerner, Christiana Care's 2016 Golf Classic raised \$155,000 toward Project Engage, an innovative early-intervention substance abuse program.