



CHRISTIANA CARE
HEALTH SYSTEM



...ding value-based care to our community,

ONE PERSON AT A TIME.

{ on the cover }

Providing value-based care to our community, ONE PERSON AT A TIME.

Achieving optimal health is not about treating isolated illnesses and injuries. It's about the increasingly important partnership between patient and physician, a partnership that takes a 360-degree view of the patient's medical history, lifestyle and personal goals — and breaks down barriers to getting and staying well. For 26,000 patients, that partnership includes Christiana Care's Care Link, a program in which patients get the extra help they need to manage their conditions, reduce complications, stay out of the hospital and achieve optimal health.



Christiana Care ranks at the top in volume among leading health care systems.

Admissions **53,259**

Ranking: East Coast: 11 | United States: 22

Surgical Procedures **39,102**

Ranking: East Coast: 16 | United States: 28

Births **6,545**

Ranking: East Coast: 16 | United States: 31

Emergency Department Visits **197,340**

Ranking: East Coast: 13 | United States: 21

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DEAR NEIGHBORS,

At Christiana Care, our mission is simple and profound — we take care of people.



We are deeply committed to improving the health of our community in new and broader ways. We strive to achieve optimal health and an exceptional experience for all of the people we serve, while ensuring organizational vitality so that we can provide for our community now and in the future.

We are guided by The Christiana Care Way: We serve our neighbors as respectful, expert, caring partners in their health. We do this by creating innovative, effective, affordable systems of care that our neighbors value.

“Value” means making a measureable difference in people’s lives through what we do, in ways that people appreciate and can afford.

Over the past year, we made tremendous strides in our ability to create value and to deliver on our promise. We have transformed the way that we work, organizing into a new structure of service lines and essential services. We embarked on a new process of developing clinical pathways that support our clinicians in delivering highly coordinated, optimal care to all of our patients. We embraced new payment models that support a focused drive toward high-value care in which people get the right care, with the right team working together, at the right time.

This year, we also launched Christiana Care Care Link, an innovative new system that helps us to coordinate care and reach out to our patients, assisting them in managing their health with a team of Christiana Care experts behind them. And through Quality Partners Accountable Care Organization and our participation in eBrightHealth, we are forging partnerships among providers across the entire state to achieve better health outcomes, better experience of care and lower health care costs.

All of these efforts and many more are made possible through the work of our extraordinary people — our care providers and support staff, our volunteers, trustees and community partners — who continually deliver on the promise of The Christiana Care Way. I am inspired by my colleagues every day, and I am deeply grateful for the privilege to serve our wonderful community. ☺

Janice E. Nevin MD
JANICE E. NEVIN, M.D., MPH
President and Chief Executive Officer





THE VALUE OF health

The ability to deliver innovative medicine and compassionate care has never been more valuable than now. We work diligently to break through social and economic barriers with innovative programs such as Care Link, which helps high-risk patients avoid hospitalization.

Through every measure, we are improving the efficiency and effectiveness of health care. Our newly designed clinical pathways reduce waste and, with individualized care plans, optimize the health and experience of patients with chronic conditions.

We are ranked among the best in specialized care in cancer, cardiology, orthopedics and women's health. And we offer enhanced access to the growing need for behavioral health services with embedded specialists. Our Magnet designation is the gold standard in nursing excellence, an honor achieved by less than 7 percent of hospitals nationwide.



taking good care

An innovative way to help patients get healthy and avoid hospitalization through Care Link

Esther Austin, 66, of Wilmington, has Type 2 diabetes and trouble with her legs. Her blood pressure and cholesterol are high, and she suffers from anxiety. A few years back, she had a heart attack.

Often, she doesn't feel well. Almost every other week, she went to the Emergency Department at Wilmington Hospital, usually when she had a headache or was short of breath.

Esther has learned to become a better partner in her health through Care Link, an innovative program that supports patients with chronic or high-risk illnesses to navigate and coordinate hospital, physician, community and support services. It is keeping her well at home — and out of the ED.

"I love having someone looking out for me," she said. "I watch my two little great-grandchildren and I need to be at my best so I can take good care of them."

Brenda Walsh, MSN, MBA, RN-BC, Esther's Care Link coordinator, calls Esther at her home in Wilmington every week or so. She helps Esther understand her care and medications, and offers advice on healthy habits.

"I talk with her about a heart healthy diet and exercise," Walsh said. "Are you eating more vegetables, are you

drinking enough water? Are you walking around, getting some exercise?"

Esther also partners with Martha Zazzarino, RN, a care coordinator in her primary care provider's office. Care coordinators encourage Esther to keep regularly scheduled appointments with her psychiatrist to ensure her medications are up to date. They make certain Esther has a ride to her doctor's office. Christiana Care social workers have connected her to Easter Seals and other community resources that provide goods and services at little or no cost.

Most recently, Walsh scheduled a mammogram for Esther. She is making arrangements for an upcoming colonoscopy and also has enrolled Esther in a diabetes clinic at Wilmington Hospital, which is near her home. She and the other enrollees will learn to better manage their disease.

"The goal of Care Link is to improve outcomes, to provide better patient experiences and to ensure the best use of resources," said Sharon Anderson, MS, BSN, RN, FACHE, chief officer, Population Health, and senior vice president Quality & Patient Safety at Christiana Care.

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"We're trying to help patients overcome the barriers that traditionally have prevented them from achieving their highest level of good health. Some of the barriers are clinical, but a high percentage are related to social aspects...we are going to address them all"

TABASSUM SALAM, M.D.
Medical director, Care Link Services



26,000
patients use the
CARE LINK PROGRAM
and there are **40**
population
care nurses
navigating their care.

A virtual hub of interdisciplinary Care Link professionals, including more than 40 population care nurses, is reducing trips back to the hospital by navigating patients through transitions of care. It's part of a value-based, bundled care model in which the health system is accountable for the patient's journey, instead of Medicare paying separately for various services.

This innovative model is working for Esther and many other patients. In January 2015, Care Link began supporting more than 2,500 Medicare beneficiaries. Fewer than 8 percent were readmitted to the hospital within 90 days after discharge, compared to 14 percent before Care Link. The program now serves more than 26,000 patients, including patients requiring post-op care.

Esther, who has worked with Care Link since January 2016, was able to avoid the ED for 92 days. She and Walsh communicate by phone. But the model also harnesses newer technologies. A number of patients who work with Care Link through the Visiting Nurse Association communicate via laptop.

"We're trying to help patients overcome the barriers that traditionally have prevented them from achieving their highest level of good health," said Tabassum Salam, M.D., medical director, Care Link Services. "Some of the barriers are clinical, but a high percentage are related to social aspects — their own environment, literacy level, the psychological burden of illness. We're going to address them all."

The support she receives from Care Link has helped Esther to improve her health and enjoy a better quality of life.

"I am impressed with the improvements she is making with managing her care," Walsh said. "She has a positive outlook on doing whatever she can for others, as well as herself."

Keeping her medical appointments, watching her diet and taking her medications as directed is helping her to achieve optimum health.

"I can keep up better with my great-grandchildren. I can do more things," she said. "That makes me happy." ☺

Making great care even better through clinical pathways

Christiana Care has rolled out new clinical pathways designed to reduce waste and optimize the health and experience of patients with certain conditions and diseases. Pathways help doctors, nurses and other care providers implement comprehensive, individualized care plans for their patients using the most up-to-date information and connections to resources in the community.

Each clinical pathway provides a road map to guide patients to an optimal health outcome, engage them as partners in their care and connect them with the follow-up services they need to manage their conditions. A typical pathway might include algorithms for screening, evaluation, diagnosis and treatment, answers to common questions or concerns that patients might have, recommendations for appropriate patient-education materials, information about services and resources available to patients and their families and recommendations for follow-up and preventive care.

Christiana Care's nine service lines, in partnership with essential services, have worked to develop the clinical

pathways. Although a care delivery model may be standardized as a clinical pathway, the way it is applied to each patient is personalized.

The diseases chosen by the service lines range from Stage 2 non-small-cell lung cancer, which impacts about 35 patients per year, to Type 2 diabetes, for which Christiana Care sees about 25,000 people annually.

What the pathways have in common is their potential to make a positive impact on people's lives — and to inform the development of future clinical pathways.

"When you reduce variation, you achieve better outcomes for your patients," said Mike Eppehimer, MHSA, FACHE, senior vice president for service line operations. "Being able to give patients a more predictable pathway and engage them as partners in their care will improve overall patient experience because they'll understand what's happening now, what's happening next and what their role is."

The final piece is the value equation, he said. Organizations that reduce variation and improve their outcomes also save costs, enhancing organizational vitality.



"Being able to give patients a more predictable pathway and engage them as partners in their care will improve overall patient experience because they'll understand what's happening now, what's happening next and what their role is."

MIKE EPPEHIMER, MHSA, FACHE
Senior vice president, Service Line Operations

Enhanced access to behavioral health care

Christiana Care is leading innovation in behavioral health services in the state and increasing access to mental health services for all Delawareans.

Our integrated behavioral health model — embedding therapists within specialty and family medicine practices — is expanding access to care and opening the door to mental health for many children, adolescents and adults in our community who might otherwise never seek help.

Christiana Care began integrating behavioral health consultants in 2014. The model now includes primary care practices as well as neurology and cardiology practices, offering patients ready access to behavioral health care, often the same day.

Early warning system alerts care team

The Christiana Care Early Warning System (CEWS) is designed to alert the care team early if a patient's condition begins to deteriorate.

Guided by Christiana Care's Value Institute, CEWS uses data from electronic health records to identify at-risk patients who are not in the intensive care unit and facilitate a proactive rescue system. The goal is to reduce code blues, called when a patient goes into cardiac arrest, through predictive surveillance.

Embedded hospitalists enhance trauma service

Christiana Care is one of the nation's first health care systems to embed hospitalists in the trauma service. A new study is showing that the program, begun in January 2013, adds value by reducing patient mortality and 30-day trauma-related hospital readmissions for patients with multiple co-morbidities.

The study also showed that patients seen by the hospitalist group had longer hospital stays (median of 3.5 days vs. 5 days) and more upgrades to the intensive care unit (2.1 percent of patients vs. 4.3 percent) when compared with the non-hospitalist group.

That is likely because many of the trauma admissions involve older adults who arrive after a fall and have complex medical issues, such as chronic kidney disease, diabetes and hypertension. Often during a patient's stay, a hospitalist will address these conditions so patients are discharged with their chronic diseases at baseline or under better control than when they arrived.

Study finds city neighborhoods with minorities lack access to doctors

Urban neighborhoods with high percentages of African-Americans and Hispanics face poorer access to doctors, according to a study led by a Christiana Care Value Institute physician researcher published in the August issue of the journal *Health Affairs*.

Focusing on the doctor-to-population ratios in Philadelphia, the study is the first major one of its kind to drill down to census tract data to ascertain the ratios and consider how geography may create distinct barriers to care within city neighborhoods.

"Primary care is the gateway to improved health outcomes and forms the base of efficient health systems," said Elizabeth J. Brown, M.D., MSPH, the Harrington Clinician Scholar at the Value Institute and a primary care physician with Christiana Care's Department of Family and Community Medicine. "Considering the results of our study, policymakers may consider how accessible primary care is, even in densely populated neighborhoods, when assessing ways to improve the health of our communities."



U.S. NEWS & WORLD REPORT named us the
best hospital in Delaware
and number 3 in the
Philadelphia region.



TRUVEN HEALTH ANALYTICS named Christiana Care
100 Top Hospitals in the U.S.
*and the only major teaching hospital in the U.S.
to win the Everest Award in 2015 and 2016.*



The American Nursing Credentialing Center
has awarded us **Magnet** redesignation for
excellence in nursing

only 7 percent of U.S. hospitals meet this achievement.

For the third year in a row we've
been named a **NICHE EXEMPLAR**
**for the care
we provide to
older adults**

by Nurses Improving Care for
Healthsystem Elders.



THE VALUE OF expert care

The pursuit of clinical excellence is something we strive for everyday. It takes constant study, intellect and most importantly, a collective commitment to exceed the expectations of our patients and their families.

We are a leader in exceptional primary and complex care. As one of the nation's top stroke centers, we are delivering highly specialized, effective treatments to patients faster than the national average. We are the top enroller in cancer clinical trials and, through screenings and advanced care, have seen a reduction in cancer rates in our state. Our busy joint replacement program gains high marks in patient satisfaction, and we are recognized for excellence in bariatric surgery and women's health. We have designed an innovative program to slow the epidemic of addiction by engaging patients in their recovery and reducing rehospitalization.

At Christiana Care, we are dedicated to delivering transformative medicine and unparalleled care to all of our neighbors.





minutes count

In a moment of crisis, advanced stroke treatment and dedicated care are critical

As one of the top 10 stroke centers in volume in the country, Christiana Care treats nearly 2,000 stroke patients each year and joins an elite group of hospitals recognized for commitment and success in implementing a higher standard of stroke care.

A key Christiana Care objective is reducing the time that elapses between entry to the Emergency Department and administration of a clot-dissolving drug called tissue plasminogen activator, or tPA — referred to as “door-to-needle time.” The national target is an average of 45 minutes. Christiana Care has reduced the time to 35 minutes on average.

Because stroke treatment is about saving brain cells — which don’t regenerate once they die — fast treatment is crucial. For every 15 minutes faster tPA is administered, there is a 4 percent decrease in mortality prior to discharge and 4 percent greater odds of walking independently at discharge.

Though fast administration of tPA is elemental in stroke care, a CT scan is required before it can be used. That’s partly because the drug cannot be administered in someone with a hemorrhagic stroke. In addition, if too much time has elapsed, there may not be enough healthy brain tissue near the stroke to salvage, so tPA is best administered within four and a half hours of symptom onset.

Analyzing the workflow involved in stroke care revealed which tasks could be performed safely after the acute phase of treatment was over, said Kert Anzilotti, M.D., MBA, physician leader in the Neurosciences Service Line and chairman of Radiology.

For example, detailed ED registration doesn’t need to be done at admission. When brain cells are dying with each passing second, the paperwork can wait. Another precious minute is gained by simply moving the IV kit out of a storage area.

After a stroke alert is issued, there is an overhead announcement in the ED and a page to the stroke team to let them know a patient is en route. The alert also informs radiology technologists to free up a CT scanner.

When the patient arrives at the ED, she receives evaluation to ensure she’s stable enough to proceed to imaging. The stroke team performs a limited number of tests, including a neurological examination to help determine the severity of the stroke. Next, we obtain a non-contrast head CT and a CT angiogram of the head and neck.

A neuroradiologist will interpret dozens of images as they first appear on the screen. If the analysis finds no intracranial bleeding, intravenous tPA administration begins immediately, while the patient is still on the CT scanner table.

Meanwhile, a parallel investigation determines whether mechanical thrombectomy is appropriate. If it is, a stent is threaded into the affected intracranial artery. As the stent reaches the clot, it expands and becomes enmeshed with the clot so that when the stent is removed the clot also is removed.

Christiana Hospital is designated as a Comprehensive Stroke Center, the most advanced level of expertise in stroke care by The Joint Commission, a national certifying organization, and is the only program in Delaware and the surrounding area to achieve that status. *//continued*



**American Heart Association
American Stroke Association
CERTIFICATION**
Meets standards for
Comprehensive Stroke Center

Enhancing care for patients and getting care to patients in the ED faster have resulted in two honors: the American Heart Association/American Stroke Association's Get With The Guidelines Stroke Gold Plus Achievement Award and Target: Stroke Honor Roll Elite Plus.

"These awards recognize that Christiana Care provides excellent stroke care in three important areas: the Emergency Department, during the hospital stay and on discharge from the hospital," said Jonathan Raser-Schramm, M.D., Ph.D., Stroke Program medical director. "In particular, we have exceeded the most stringent national standards in our ability to rapidly treat stroke symptoms."



To receive the Gold Plus Quality Achievement Award, hospitals must achieve 85 percent or higher adherence to all Get With The Guidelines-Stroke achievement indicators for two or more consecutive 12-month periods and achieve 75 percent or higher compliance with five of eight Get With The Guidelines Stroke Quality measures.

1,413
ischemic stroke cases

246
intracerebral stroke cases

83
subarachnoid cases

327
transient ischemic attack cases

Our care team at the Christiana Care Comprehensive Stroke Program offers our patients the most advanced stroke treatment options.

To qualify for the Target: Stroke Honor Roll Elite Plus, hospitals must meet quality measures developed to reduce the time between the patient's arrival at the hospital and treatment with tPA.

"With The Lanny Edelsohn, M.D., Neuro Critical Care Unit and the creation of the Neurosciences service line we are able to advance even further in acute stroke care," Dr. Anzilotti said. "Our commitment to comprehensive stroke care also has allowed us to attract some of the top specialists in the nation, including stroke neurologists, neurosurgeons, neurocritical care specialists and interventional neuroradiologists." 🐾

Convenient, expert care for electric heart pump patients

Patients with heart failure who receive a left-ventricular-assist device (LVAD) are now receiving care close to home through the Center for Rehabilitation at Wilmington Hospital.

Previously, patients had to travel to a rehabilitation facility in another state to learn the special skills they will need to live the rest of their lives or until they receive a heart transplant, such as charging and changing the batteries that power their LVAD.

Christiana Care is the only heart failure program in Delaware to receive the Joint Commission certification in heart failure. The program provides comprehensive services to heart failure patients including access to care by physicians, nurse practitioners, nutritionists, behavioral health specialists and social workers, all with expertise in caring for people with heart failure.



Leading the way in joint replacement volume and patient care

The Center for Advanced Joint Replacement is the region's leader, with more than 3,000 hip and knee replacement surgeries performed in 2015 — more than any local hospital, including those in Philadelphia. Patients from Delaware, Maryland, southern New Jersey and southeastern Pennsylvania give the center high marks for the comprehensive care they receive, with patient satisfaction scores consistently topping 97 percent.

Since opening its doors in 2000, the center's team, composed of surgeons, nurses, care coordinators, physical and occupational therapists and other staff, has honed its process to create an excellent patient experience. It starts with an evaluation by an orthopaedic surgeon, followed by a pre-hospital assessment, a mandatory patient education class, admission, surgery, post-surgical rehabilitation in the hospital and — for more than 80 percent of patients — discharge directly to home after a hospital stay of less than three days.

The Center for Advanced Joint Replacement is one of only 300 hospitals nationwide to achieve the Joint Commission's Gold Seal of Approval for its hip and knee replacement programs. The rigorous standards for health care quality and patient safety address three core areas: compliance with national best practice standards; use of evidence-based clinical practice guidelines; and an organized approach to performance measurement and improvement activities.

Integrating technology to deliver better care earns 'Most Wired' status

Christiana Care has earned a new distinction as one of the nation's "Most Wired" hospitals, according to the 18th Annual Health Care's Most Wired® survey released by the American Hospital Association's Health Forum.

"This recognition shows how we are leading the nation in the integration of care and technology to connect with the people we serve in new and very different ways to help them achieve optimal health," said Randy Gaboriault, MS, chief information officer and senior vice president of Innovation and Strategic Development.

According to the survey, technology is improving the efficiency of care delivery and creating a new dynamic in patient interactions. Most Wired hospitals are using telehealth to fill gaps in care, provide services 24/7 and expand access to medical specialists.


Endowed Chair funded at Swank Memory Care Center

James M. Ellison, M.D., MPH, was named The Swank Foundation Endowed Chair in Memory Care and Geriatrics thanks to a generous \$2.5 million gift from the Swank Foundation.



In his role, Dr. Ellison leads Christiana Care's Swank Memory Care Center, a unique resource in Delaware and the region for patients with Alzheimer's disease and other cognitive disorders. Founded in 2011 with a \$1.25 million grant from the Swank Foundation, the Swank Memory Care Center includes a team of geriatricians, nurses, social workers and others who work with patients and families to provide support, education and guidance from diagnosis through treatment. The Swank Memory Care Center is the first and only comprehensive outpatient program in Delaware for patients with memory disorders and their families.





Christiana Hospital is the only
delivering hospital in Delaware that
has a **LEVEL III NICU UNIT** —
**the highest level
of neonatal
critical care.**

6,565 babies were born at
Christiana Hospital.



The Center for Advanced Joint Replacement

HAS RECEIVED **THE JOINT COMMISSION'S
GOLD SEAL OF APPROVAL** — *one of only
300 hospitals nationwide.*

3,000 **HIP AND KNEE
REPLACEMENT SURGERIES** in 2015 —
leading the region in volume and scoring
97% *in patient satisfaction.*

\$260 million commitment to women and children

Christiana Care will transform health care for women, children and infants throughout the state with a \$260 million Women and Children's Building at Christiana Hospital, anticipated to open in 2020.

Developed in collaboration with patients and their families, Women and Children's will better integrate specialty care services for mothers and babies and continue to provide an exceptional birth experience for families in Delaware and the region.



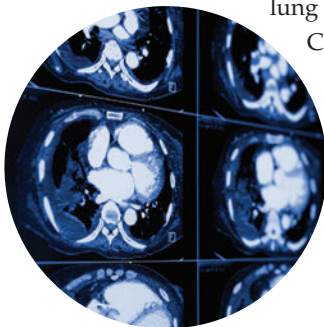
Turning the tide on lung cancer

Lung cancer is the No. 1 cause of cancer deaths in both men and women in Delaware and the United States. Christiana Care is leading the way in a multi-pronged effort to turn the tide on this killer.

"Cancer rates are declining, thanks in part to our medical interventions and statewide education and screening partnerships," said Nicholas J. Petrelli, M.D., Bank of America endowed medical director of the Helen F. Graham Cancer Center & Research Institute.

The Graham Cancer Center and the Christiana Care Medical Group are partnering with the Delaware Division of Public Health's Screening for Life program to offer Delawareans who qualify low-dose CT scan

lung screening. The Graham Cancer Center also offers counseling and help to quit smoking. Further, people diagnosed with lung cancer are receiving advanced treatment options and hope from promising new research.



Project Engage connects patients to substance use disorder treatment programs

Project Engage, an early intervention and referral to substance use disorder treatment program in partnership with Brandywine Counseling & Community Services, helps hospital patients connect with community-based treatment programs. Hospitals provide "a reachable moment" when an engagement specialist can meet with patients and guide them to early recovery. Hospital engagement specialists conduct more than 2,000 engagements each year and link about 25 percent into treatment. Initial results from program evaluation conducted in collaboration with Christiana Care's Value Institute and the University of Pennsylvania showed a decrease in patients' alcohol and drug consumption up to six months after enrollment in Project Engage.

In 2016, Project Engage added a program built on its successful model and uniquely designed for the construction industry, which has one of the highest rates of addiction in all fields. The initiative is led by Stephen M. Mockbee, founder, chairman and former president of Bancroft Construction Company and a Christiana Care trustee, in partnership with Brandywine Counseling, Associated Builders and Contractors, Delaware Contractors Association and the Delaware chapter of The American Institute of Architects and funded by participating construction companies in the region. The program provides education and referrals to treatment to employees and their family members as well as recovery support for employees.



In another initiative begun in 2015, Project Engage Mother & Child uses an engagement specialist to provide recovery support and case management to opioid-dependent pregnant women. This includes helping them connect with treatment, including counseling and medication-assisted treatment, prenatal care, mental health services, safe housing, parenting classes and other community-based resources.





THE VALUE OF partnership

We are transforming care through new alliances partnering to improve the health of our neighbors through engagement, initiatives and action.

Volunteers organized and trained by Christiana Care go into our neighborhoods and community centers and participate in events to reach more people, making sure our neighbors receive the potentially life-saving screenings they need and deserve.

Our collaboration with a internationally renowned research institute, health care systems throughout the state, community groups and employment training initiatives demonstrate that working together strengthens our community's health and wellness.

Our philanthropic partners, who include our board, trustees, grateful patients, foundations, corporations, and others have been incredibly generous to support high-tech diagnostic and treatment equipment, transformational community outreach programs and recruitment of the most qualified clinical leaders.

CHRISTIANA CARE
HEALTH SYSTEM



working
together

Bringing blood pressure screenings directly to the African-American community

For many years, Jocelyn Dixon was an educator. As a Blood Pressure Ambassador she is still teaching, going out into the African-American community to educate individuals on the importance of knowing their numbers and managing their blood pressure.

Blood Pressure Ambassadors are volunteers, trained and supported by Christiana Care Health System's Center for Heart & Vascular Health.

"We don't just take people's blood pressure readings," said Dixon, 66, of Claymont. "We talk about exercise, diet and healthy eating. In African-American culture, we often gravitate toward foods that are fried."

The Blood Pressure Ambassadors Program began in 2011 with 20 volunteers in Wilmington's African-American communities. Today, there are nearly 100 volunteers who are expected to provide a collective 3,000 screenings this year.

People of African descent are at higher risk of hypertension than their counterparts of European and Asian ancestry. If not controlled, high blood pressure is a serious health issue, contributing to stroke, cardiovascular disease, diabetes and kidney problems.

"We began the ambassadors because we are committed to improving the health of the community," said Timothy Gardner, M.D., medical director of the Center for Heart & Vascular Health and executive director of Christiana Care's Value Institute. "If we can help people become aware of their risks, we believe they will make contact with health providers and get their blood pressure treated, reducing the potential for stroke and heart attack."

The Center for Heart & Vascular Leadership Council, chaired by Trustee Michelle Schwandt, has raised nearly \$250,000 for the Blood Pressure Ambassadors program

from area businesses, foundations and individuals in the community. As the program looks to expand into medically underserved neighborhoods in the City of Wilmington and surrounding areas the Leadership Council has a goal to raise an additional \$200,000 to recruit and train additional ambassadors and to provide them with Blood Pressure Ambassador kits and educational material.

At St. Patrick's Center, located in one of Wilmington's poorest neighborhoods, Blood Pressure Ambassadors bring screenings and health education directly to people who otherwise would have little access to preventive care.

"We are trying to get poor and homeless people, many of whom haven't seen a doctor in years, into a routine of getting screened," said Joseph Hickey, executive director at St. Pat's. "We want them to know their numbers so they can take preventive measures to avoid going to the Emergency Department."

Hickey has seen firsthand the devastating impact of untreated hypertension.

"We had an employee who was diagnosed with high blood pressure when he went to the doctor for a headache," he said. "But he didn't like his medications and stopped taking them. Then his kidneys shut down. He is now on dialysis, which means that he can't work any more."

The partnership between Christiana Care and St. Pat's makes it more likely that people with hypertension will seek treatment and stick with their plan of care, Hickey said.

Screenings also are held at festivals, health fairs and other special events, as well as neighborhood locations such as the Police Athletic League, Wilmington Shoprite and a number of churches, which often offer a monthly schedule of screenings. Some volunteers take their blood pressure cuffs to bridal showers and family picnics. *//continued*

“If we can help people become aware of their risks, we believe they will make contact with health providers and get their blood pressure treated, reducing the potential for stroke and heart attack.”

TIMOTHY GARDNER, M.D.

Medical director, Center for Heart & Vascular Health



In September, Blood Pressure Ambassadors staffed the Heart Walk on the Wilmington Riverfront.

“The Ambassadors’ role goes beyond high blood pressure management to help improve the way their neighbors look at overall health,” said Angela Parker, MSN, RN-BC, project manager for the Blood Pressure Ambassador Program.

Ray Blackwell, M.D., a cardiovascular surgeon, chairs the Blood Pressure Ambassador Advisory Committee.

He noted that about 40 percent of African-Americans have high blood pressure, an issue that resonates personally with him.

At 20, he learned he had high blood pressure during a screening for the military.

“Luckily, I learned early, went to see a physician and started taking medication,” he said. “Now I take one pill a day and so far have had no long-term effects of hypertension.”

Dr. Blackwell said the partnership between Christiana Care and the Blood Pressure Ambassadors personifies an African proverb: “If you want to go fast, go alone. If you want to go far, go together.” 🌍

Project SEARCH grads celebrate success

For the past five years, Project SEARCH has provided internships for high school students with cognitive disabilities, often leading to employment. Since its inception, Christiana Care has hosted 41 interns, 30 of whom have secured employment, with 17 being hired by the health system.

The program gained national attention when a barcode scanning device that enables interns with disabilities to categorize unused medicines was the winning idea in SourceAmerica’s Design Challenge, an engineering competition where students develop assistive technology for nonprofit agencies employing people with disabilities. Students from Concord High School partnered with Christiana Care to create Scan ‘n Sort, a device programmed to alphabetically categorize medications.





An historic partnership in cancer research

Christiana Care's Helen F. Graham Cancer Center & Research Institute and The Wistar Institute in Philadelphia are pursuing the next phase of their historic four-year partnership by applying to become a National Cancer Institute (NCI) designated Cancer Center. Wistar has been NCI-designated since 1972.

If the status is granted in 2018 following on-site program evaluations, the Graham Cancer Center and Wistar will be recognized as partners with a cohesive research agenda and defined clinical goals. The partnership would be the first cancer consortium program between an NCI-designated research institute, such as Wistar, and an NCI-selected community center, such as Christiana Care.

eBrightHealth Network builds on ACO strengths to provide brighter health care future

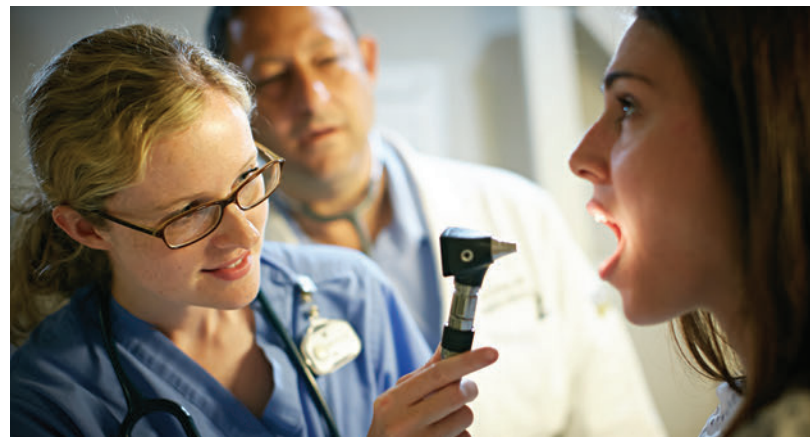
Christiana Care has joined a unique statewide strategic partnership to increase access to health care services, improve the quality and affordability of care and offer all Delawareans an even brighter health care future through collaboration and innovation.

The eBrightHealth Network is the first-of-its-kind alliance of four hospital systems (consisting of six total hospitals) in the First State that serve more than 935,000 Delawareans. Under the alliance, each of the health systems maintains its operating independence. Participating health systems are:

- Bayhealth Medical Center
- Beebe Healthcare
- Christiana Care Health System
- Nanticoke Health Services

eBrightHealth builds on the foundation and strengths of the statewide Quality Partners Accountable Care Organization (ACO) Medicare Shared Saving Program begun in January 2016. While the ACO is focused on Medicare populations, this alliance will allow us to apply the same care transformation strategies across other populations.

Named for Ebright Road, the highest geographic point in the state, eBrightHealth strives to achieve the pinnacle of health for Delawareans by sharing best practices and innovations to raise the quality of care. By joining together in this innovative partnership, we will enable Delaware to take its next big step into population health and provide outstanding high quality, safe and effective care that is affordable and valued by those we serve. The alliance supports the objectives of the State plan to improve the health of Delawareans, enhance health care quality and patient experience and reduce health care costs.



Resident program enhances care for the underserved in Wilmington

Christiana Care and Westside Wilmington Health Center established a new family medicine residency training site that increases access to care and promotes continued support for underserved populations by medical providers in Delaware.

"This partnership enables our physician residents to pursue meaningful careers in underserved communities. It will result in better physician-to-patient ratios and more access to care for our neighbors in Wilmington for years to come," said Neil Jasani, M.D., MBA, FACEP, Christiana Care's chief academic officer, chief learning officer and vice president of Medical Affairs.

The first-of-its-kind partnership in Delaware enables Christiana Care residents to perform clinical rotations at Westside Family Healthcare, the largest nonprofit federally qualified health center in the state. It represents the latest milestone in physician education for Christiana Care, which has been involved in graduate medical education for more than 100 years and is the largest teaching hospital affiliated with Sidney Kimmel Medical College at Thomas Jefferson University.

Clearer mammograms through tomosynthesis



To support cancer prevention and women's health, philanthropist and businesswoman Tatiana Copeland has given a generous gift of \$800,000 to fund two breast tomosynthesis — or 3-D mammography — units at the Helen F. Graham Cancer Center & Research Institute to provide clearer, more precise mammograms.

"Uncertain mammogram results can be terrifying," said Copeland, a breast cancer survivor who received her treatment at the Graham Cancer Center. "Tomosynthesis can alleviate avoidable scares and take the Graham Cancer Center's already outstanding Breast Center to a new level."

Clinical trials have shown that tomosynthesis detects an additional one to four breast cancers per 1,000 women screened and decreases recalls for repeat mammograms and biopsies by 15 percent.

'We Are the Why' takes aim at gun violence

Christiana Care is collaborating with the community and other groups to deliver a sober message about making good life choices to avoid becoming a victim of gun violence.

The presentation called "We Are the Why" is a result of a partnership that includes Christiana Care, the United Way of Delaware, Wilmington Police Department, Seaford Police Department, Dover Police Department and the Boys & Girls Club of Delaware.

Presented at various locations throughout the state, the program gives young men a chance to learn about the consequences of gun violence and the dangers of being confrontational during police interactions.

Harrington Fund focuses on grassroots issues impacting health

In the spirit of paying it forward, Christiana Care Health System has designated a \$13 million bequest from the estate of a legendary champion of the health system and its community to advance scholarship and support innovative projects that help reduce health care disparities for underserved and disadvantaged populations.

The gift establishes the Charles J. Harrington Fund, named for its benefactor, the late director emeritus of the Christiana Care Board of Directors and former Christiana Care trustee who was a strong proponent of service and philanthropy.

With the delivery of health care transitioning rapidly toward a population health approach — where the focus shifts to effective and meaningful ways of keeping groups of individuals healthy through primary care and prevention — addressing economic, environmental, employment and other social factors that impact health is essential. The Harrington Fund supports programs that delve into grassroots issues facing our community and promise greater value in health care by removing obstacles that keep people from achieving optimal health.



A photograph of two young minority students, a male and a female, wearing white lab coats and blue hairnets. They are both smiling and giving a thumbs-up gesture. The background is a blurred hospital or laboratory setting.

AWARDED THE 2016
Leading Disability
Employer Seal –
*recognizing companies
that demonstrate
exemplary hiring and
employment practices
for people with
disabilities.*

Christiana Care's Office of Health Equity partnered with United Way for STEM Up Delaware! The grant-funded program **inspires high school minority students** to go into the science, technology, engineering and math fields.

American Hospital Association, Institute of Diversity in Health Management, recognized us as a **Best in Class Hospital** for increasing diversity and reducing disparities in care.





THE VALUE OF innovation

Through hard work, research and innovation Christiana Care is blazing a trail to the future of medicine by exploring treatments and technology that enhance the quality of life and give people hope.

Pioneering work by our researchers is unlocking the key to finding cures and transforming the way we treat disease. We are engaged in advanced research in all areas of medicine including cancer, cardiovascular and women and children's health. We are developing technology that helps clinicians with comprehensive data and analytics so they can see trends in patient care and act on them to improve outcomes. And we design and implement technology to engage patients, increase their access to care and optimize their health.

At every level, we are implementing methods and modalities in ways that help our neighbors through every stage of life.



game changer

Researchers are unlocking the genetic toolbox in the fight against cancer

The Gene Editing Institute at the Helen F. Graham Cancer Center & Research Institute at Christiana Care is unlocking the genetic mechanisms that drive cancer, a significant step forward toward revolutionary new therapies and treatments.

Exciting new tools and historic partnerships are putting Christiana Care on the fast track to discoveries that will ultimately transform the prevention and treatment of inherited diseases.

“The Gene Editing Institute places our translational science program on equal footing with the very best in the nation, perhaps even the world,” said Nicholas J. Petrelli, M.D., Bank of America endowed medical director of the Helen F. Graham Cancer Center & Research Institute.

Researchers at the Gene Editing Institute recently made a dramatic, game-changing discovery that short pieces of synthetic single-stranded DNA, known as oligonucleotides, when used in gene editing with the CRISPR/Cas9 technique, can promote the repair of genetic mutations, help achieve a cleaner “cut” of the gene, and reduce the degree of genetic fraying, or heterogeneity, that occurs during gene editing.

“The Gene Editing Institute places our translational science program on equal footing with the very best in the nation, perhaps even the world.”

NICHOLAS J. PETRELLI, M.D.

Bank of America endowed medical director
Helen F. Graham Cancer Center & Research Institute

In one of their most recent publications, published in the journal *Scientific Reports*, they show that oligonucleotides can act to hold together the ends of the cut DNA and reduce heterogeneity. The article, titled “Analyses of point mutation repair and allelic heterogeneity generated by CRISPR/Cas9 and single stranded DNA oligonucleotides,” also maps in new detail, through high-level bioinformatics, what takes place in each part of the gene when a CRISPR cut is made.

“It’s astonishing how quickly the field is moving, from a blunt instrument to a very precise pair of scissors,” said world-renowned molecular biologist and gene-editing pioneer Eric Kmiec, Ph.D., director of the Gene Editing Institute. Barriers we thought were there six months ago are now gone, he said.

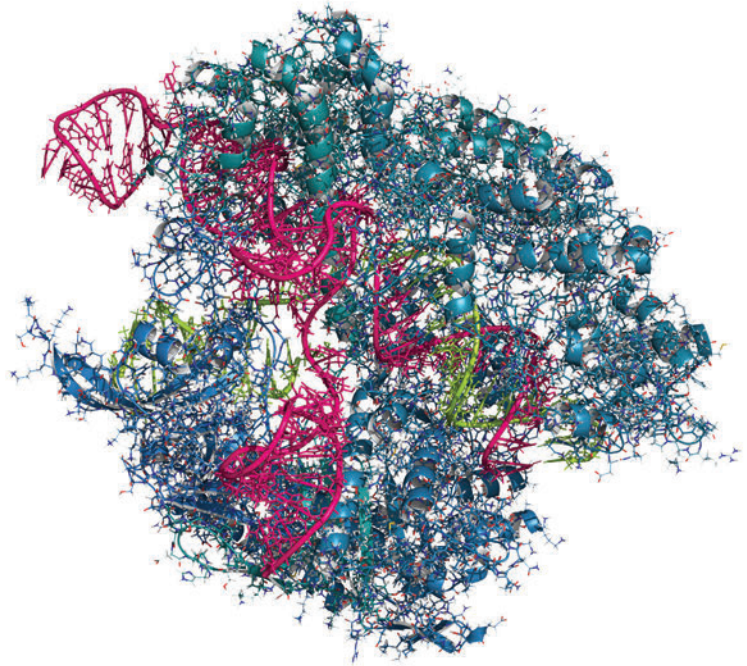
“The applications for this in genetic and cancer research are vast,” said Dr. Kmiec, lead author of the study. “If you want to repair a genetic mutation, you can’t allow the DNA to be ripped apart when CRISPR makes a cut. You need it to remain intact to execute the repair, and that’s what the oligonucleotide enables us to do.”

Gene editing can be thought of as analogous to a word processor’s spell-check and cut-and-paste functions, he said. “First you have to locate, cut and excise the genetic base, or letter. That’s what the CRISPR does. Then the oligonucleotide enables us to repair and insert the right base.”

The next step for the research team will be to move from laboratory model cells to human progenitor cells. A federal biosafety and ethics panel recently approved the first use of the CRISPR-Cas9 technique in human patients, and Dr. Kmiec looks forward to that stage in his own research. *//continued*

***“The applications for this in genetic
and cancer research are vast.”***

ERIC KMIEC, Ph.D.
Director, Gene Editing Institute



To accelerate breakthrough cancer research in the human genome, the Gene Editing Institute has entered into an agreement with The Wistar Institute. The agreement expands the historic partnership between the Graham Cancer Center, one of the nation's largest community cancer centers, and Wistar, the nation's first National Cancer Institute-designated cancer center dedicated solely to biomedical research.



In this partnership, the Gene Editing Institute will be integrated into Wistar's Molecular Screening Facility, which will allow its innovative gene-editing technologies to be made available to research projects at Wistar and to external users.

The Gene Editing Institute will retain its management structure and will remain at the Graham Cancer Center. The Molecular Screening Facility will remain housed at Wistar in Philadelphia.

“There was a natural coming together between the research groups at Wistar and the Gene Editing Institute,” Dr. Kmiec said. “We each bring something unique to the table with complementary skill sets. This is a significant step forward in developing gene editing protocols for cancer therapeutics.”

The Gene Editing Institute currently is assembling two teams: one to work with Wistar to develop gene editing for lung cancer; and one working toward clinical trials in leukemia and Sickle Cell Anemia, the latter of which is already funded by a major research award from the National Institutes of Health, with long-term partner Nemours/Alfred I. duPont Hospital for Children.

“Being part of the Graham Cancer Center and Christiana Care has elevated our research immensely,” Dr. Kmiec said. “We now work with physicians, on the ground, in a clinical setting, which has brought us to a new level of investigation, dramatically advancing our work in translational medicine.” ●

Health & Technology Innovation Center launches

Launched in 2016, the Health & Technology Innovation Center at Christiana Care explores ways to research, develop and apply new technologies and devices to make health care safer, more effective and more efficient.

A team of software developers, designers, engineers, user experience experts and analysts collaborates with staff and also serves as a bridge for startups by hosting demonstrations for inventors in the community.

The Innovation Center has a portfolio of 35 custom applications. Apps help patients to refill prescriptions, prepare for doctor visits, understand the wait times for services and learn about their health. System-wide, apps include such innovations as a tool for recognizing outstanding employee performance and tracking how many employees have received flu vaccinations.



Value Institute examines impact of rounds

While team-based rounds are viewed by health professionals as an effective way to improve patient care, a Christiana Care-led analysis published in the *Journal of Hospital Medicine* found there is little evidence in medical literature that reveals the outcomes of these kinds of rounds.



“Our study shows that we have yet to know the true impact of these rounds on important care measures such as patient outcomes and patient experience,” said lead study author Surekha Bhamidipati, M.D., a hospitalist with Christiana Care Hospitalist Partners and a scholar with Christiana Care’s Value Institute. “We want to encourage researchers and providers to more thoughtfully design team-based rounds so they can measure their value.”

The researchers recommend that future team-based rounds — also known as interdisciplinary rounds — should be designed to ensure the most appropriate health professionals are participating in the rounds and should include discussions amongst the rounding team on patient outcomes and patient participation.

Nurses develop peppermint inhalers to treat nausea

Cardiovascular Critical Care Unit nurses Helen Hawrylack and Patricia Briggs are always looking for ways to improve their patients’ experience.

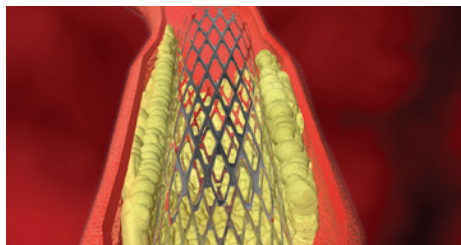
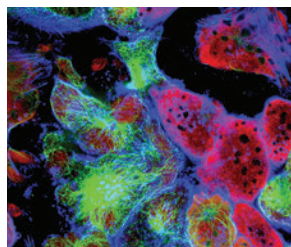
They found an article on treating nausea in post-operative patients using a nasal inhaler suffused with peppermint oil. At the same time, they were looking for an opportunity to do a simple study that would engage the nursing staff in research. So they purchased inhalers and peppermint oil and embarked on a study — one so successful that the surgeons in their unit immediately adopted the practice to relieve patients’ nausea.

Today, the devices are available throughout Christiana Care. The nurse researchers’ findings were published in the June issue of the journal *Nursing* 2016.

The study’s findings were striking. Among participants, 93 percent said they were satisfied with the inhaler’s effectiveness and would use it again.



At Christiana Care, we are passionate about exploring new frontiers, where scholarship meets science and practice to propel innovations in prevention, care and treatment from the bench to the bedside. We are dedicated and committed to research that contributes to value and high-quality care for our neighbors, here and around the world.



We've highlighted some of our research initiatives in Cancer, Heart & Vascular Health and Women & Children's Health.

Better control of chemotherapy-induced nausea and vomiting

Chemotherapy patients at Christiana Care's Helen F. Graham Cancer Center & Research Institute helped test a drug called olanzapine that proved highly effective in controlling symptoms of nausea and vomiting during treatment for ovarian, breast, lung and head and neck cancers.

Medical Oncology Section Chief David Biggs, M.D., was the top local enroller in the study and a co-author of the report published in the July 14, 2016 issue of the New England Journal of Medicine. The study evaluated 380 patients at multiple centers that participate in the National Cancer Institute's National Community Oncology Research Program (NCORP).

"Nausea and vomiting are two things patients fear most about chemotherapy," Dr. Biggs said. "We have made great strides in our ability to control chemotherapy-induced nausea and vomiting, but the results from the olanzapine study have already changed our routine practices here and no doubt will similarly benefit patients around the country."

Unlocking a marker to identify cells that block natural defenses against cancer

Medical and surgical oncologists at the Helen F. Graham Cancer Center & Research Institute collaborated with research scientists at The Wistar Institute in Philadelphia to discover a marker for myeloid-derived suppressor cells, implicated in tumor resistance to various types of cancer treatments.

"Until now and prior to our productive collaboration with Wistar, myeloid-derived cancer cells have been very difficult to identify," explained Robert Witt, M.D., FACS, director of the Graham Cancer Center's Head and Neck Multidisciplinary Clinic. "These cells multiply in patients with cancer and prevent the body from forming an immune response to fight it. The identification of genes that help identify these cells is key to finding a targeted treatment to improve patient outcomes."

Dr. Witt, an internationally recognized surgeon and researcher, joined with head and neck surgeon Neal Hockstein, M.D., thoracic surgeon Brian Nam, M.D., and lung cancer expert Greg Masters, M.D., as co-authors on Wistar's study, published in the journal Science Immunology.

New strides in treatment for ovarian cancer

Gynecologic oncologists at the Helen F. Graham Cancer Center & Research Institute collaborated with research scientists at The Wistar Institute to discover a promising new treatment target for ovarian cancer.

"This discovery may allow us to overcome one of the greatest obstacles in using immunotherapy to treat ovarian cancer by identifying a marker that is present only on the cancer cells," said Mark Cadungog, M.D., gynecologic oncologist and co-director of robotic surgery at Christiana Care, and a co-author on the study published in the journal Clinical Cancer Research.

The majority of immunotherapies available have significant side effects due to the immune system also attacking a patient's normal healthy cells. This discovery could allow us to target only the cancer cells, while sparing the patient's normal cells and lead to an elimination of treatment side effects. If the immune system can be used to recognize and destroy residual ovarian cancer cells this could lead to a drastic reduction in ovarian cancer recurrence.



A program of the National Cancer Institute
of the National Institutes of Health

THE NATIONAL CANCER CENTER INSTITUTE has selected us for its
Community Oncology Research Program,
an elite network of cancer centers.



220,613

patient visits

3,253

newly diagnosed and/or
newly treated patients

32,850

external beam treatments

678

patients in clinical trials

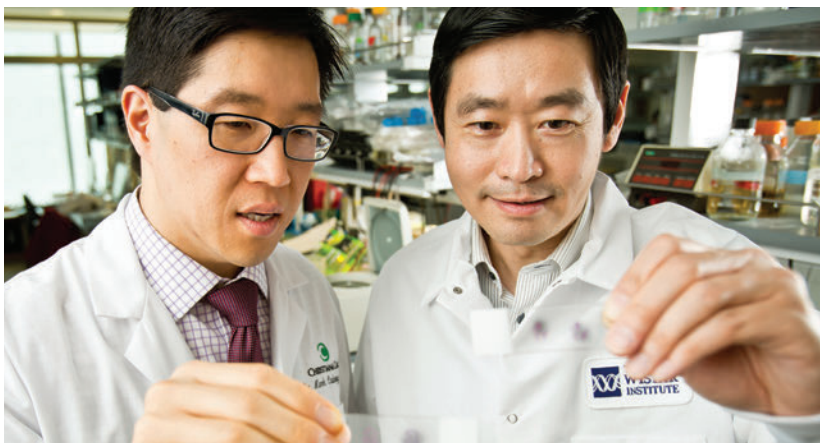
The Graham Cancer Center is a national model of care, prevention, outreach and research. We are a leader in the fight against cancer in Delaware.

A leader in screening guidelines for women with dense breasts

Diana Dickson-Witmer, M.D., FACS, surgeon and medical director of the Christiana Care Breast Center and Breast Program at the Helen F. Graham Cancer Center & Research Institute, is the senior author on an article published in the *Annals of Surgical Oncology*, July 11, 2016, outlining an evidenced-based approach to counseling and screening patients with dense breasts.

Currently 27 states, including Delaware, have mandated that mammography reports include information about a woman's breast density and that she talk with her doctor about the benefits of additional screening with MRI, 3-D mammography or ultrasound.

Although both MRI and ultrasound can detect breast cancers not easily seen on a mammogram, the downsides are more false positive readings, more recalls, more benign biopsies and higher costs that may not be covered by insurance. There is also the potential for over diagnosis and treatment, since some cancers found with these adjunct imaging modalities may never become clinically significant.



Accelerating research to develop a blood test to detect lung cancer

The Helen F. Graham Cancer Center & Research Institute's partnership with The Wistar Institute for cancer research has led OncoCyte, a developer of new, non-invasive products for cancer detection, to announce a global licensing agreement to acquire exclusive commercial rights to a revolutionary non-invasive blood test to detect lung cancer at its earliest stages. Wistar scientists relied on patient samples provided by the Graham Cancer Center and the collaborative efforts of the Thoracic multidisciplinary team.

Wistar researchers identified a panel of biomarkers circulating in the blood that could detect lung cancer in high-risk patients. With this new assay in its final development stages, the hope is that this test can confirm a patient's diagnosis and address the high false positive rate obtained via low-dose computed tomography, currently the gold standard for early lung cancer diagnosis. If successful scientific results are achieved, OncoCyte will work with Wistar to fully validate the test and set up its commercial launch.

THE HELEN F. GRAHAM CANCER CENTER & RESEARCH INSTITUTE IS IN THE
top 10 in clinical trials with patient enrollment rates
5 times the national average.

Since opening in 2003 we have had more than

1,899,656
patient visits

Thanks in part to our
medical interventions and
statewide education and
screening partnerships,

cancer rates in
Delaware have been
on the decline,
dropping
by 10%
in the last 10 years.

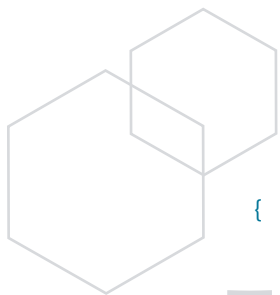


At the Graham Cancer Center

80 percent of our surgeries
are minimally invasive,

and we have **Delaware's first and only robotic radiosurgery system.**

Our designation as a **Breast Imaging Center of Excellence**
by the **American College of Radiology** certifies technology and expertise to ensure *the highest
level of image quality and patient safety.*



{ research highlights }

Heart & Vascular Health

Researching large-diameter stents for venous obstructions

Christiana Care is a leader in the VIVO trial, a study of treatment with the Zilver® Vena™ Venous Stent, intended to treat obstruction of the iliofemoral veins in the groin and pelvis. The purpose of this study is to assess the ability of the device to maintain an open iliofemoral vein to reduce morbidity and improve patients' quality of life.

The stent currently is an investigational device that has not been approved by the U.S. Food and Drug Administration and cannot be used without patient consent.

"The VIVO trial addresses one of the major problems in the management of chronic central venous obstructions, namely the lack of large-diameter stents to treat venous strictures involving the iliac veins and inferior vena cava," said Daniel Leung, M.D., a vascular interventional radiologist and principal investigator. "Chronic venous insufficiency and post-thrombotic syndrome are a major cause of morbidity and poor quality of life. Completing this trial will improve the clinical care of patients both within the trial and after the large-diameter stents are approved."



A pioneer in trials of absorbable vascular scaffolds

Christiana Care is among an elite group of institutions in the region to participate in ABSORB III, the first clinical trial in the United States of an absorbable vascular scaffold for patients with coronary artery disease.

Unlike traditional metallic heart stents, the Absorb Bioresorbable Vascular Scaffold device opens blocked arteries with a mesh tube made of polylactide, a naturally dissolvable material commonly used in dissolving sutures. After the device is implanted, the body absorbs it so that it no longer takes up room in the artery, allowing greater blood flow. The artery also regains its ability to contract and expand naturally.

Clinical trial for diabetic heart patients

Christiana Care is part of a trial to determine if a drug that has been used for decades to reduce inflammation and symptoms in patients with rheumatoid arthritis also reduces the risk of stroke and heart attacks.

The Cardiovascular Inflammation Reduction Trial (CIRT) focuses on patients with diabetes and/or metabolic syndrome who are at higher risk of developing major adverse cardiovascular events because of vascular inflammation. In the trial, patients randomly receive either a low dose of methotrexate or a placebo and are followed for stroke, heart attack or death for three to four years.

The innovative Center for Heart & Vascular Health is the only center in the region that integrates in a single location and under one roof cardiac surgery, vascular surgery, vascular interventional radiology, cardiology



and interventional nephrology. From prevention to planned care and emergency care, through

rehabilitation and ongoing support, we are partners with our patients in achieving their best heart and vascular health.

724

open-heart cases

7

ventricular assist device cases

82

transaortic valve replacements

4,673

cardiac-catheterizations

21,878

cardiac rehabilitation monitored visits

1,652

electrophysiology cases

1,351

vascular surgeries

4,358

vascular intervention cases

731

neuro intervention cases

20,048

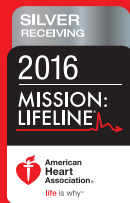
cardiovascular non-invasive studies

19,667

vascular ultrasound studies

OUR HEART FAILURE PROGRAM is the only program in Delaware awarded Joint Commission Certification.

We are a **2016 Mission: Lifeline® SILVER Recognition Award** recipient — *part of an elite group of hospitals* recognized by the AMERICAN HEART ASSOCIATION/AMERICAN STROKE ASSOCIATION for **our high quality of heart attack care.**



Recognized by the **National Cardiovascular Data Registry ACTION Registry-GWTG's Gold Performance Achievement Award**

for success in carrying out A HIGHER STANDARD OF CARE FOR HEART ATTACK PATIENTS.



Women & Children's Health

Evaluating neonatal simulation models to assess competency

Providing adequate bag-mask ventilation (BMV) is an essential skill for resuscitating newborns. Often this skill is learned using simulation manikins but currently there is no means of measuring the proficiency of the provider administering ventilation in simulated scenarios.

In a study published in the *Journal of Perinatology*, researchers evaluated BMV skills in different level providers including residents, fellows, neonatal nurse practitioners and neonatologists. The principal investigator was Stephen Pearlman, M.D., medical director, Pediatrics/Neonatal Quality Improvement.

By measuring pressure-volume characteristics in various methods they determined the feedback provided by chest-wall movement alone was the best method of distinguishing experienced from inexperienced providers during simulated BMV.

Studying variation in NICU admission rates

Admission to the Neonatal Intensive Care Unit is influenced by physiologic compromise and by hospital care protocols. Providing appropriate care must be balanced with adverse consequences of NICU admission,

such as interrupting maternal-infant bonding and unnecessary interventions.

A study of the variation in NICU admissions in term and late preterm infants among 19 hospitals showed that among infants 35 to 42 weeks' gestation and weighing less than or equal to 2,500 grams, infants without absolute or relative identified cause accounted for 9.1 percent of total NICU days.

Researchers concluded there is significant variation in admission rates among NICUs that cannot be explained by infant health conditions. Further analysis is needed to determine the cause of between-site variation and opportunities to refine protocols and optimize the use of NICU services. The study was published in *Hospital Pediatrics*. Investigators included David A. Paul, M.D., FAAP, clinical leader, Women and Children's Service Line, and chair, Department of Pediatrics, and Matthew Hoffman, M.D., MPH, the Marie E. Pinizzotto, M.D., endowed chair of Obstetrics and Gynecology.

Study focuses on preventing preterm births

Preterm delivery is the leading cause of infant mortality yet risk factors and biomarkers have traditionally failed to identify the majority of women at-risk for preterm deliveries.

In a study of 5,501 pregnant women, researchers found that a serum-based molecular predictor identifies asymptomatic pregnant women at risk of spontaneous preterm delivery. This predictor has the potential to target problems sooner so providers can develop strategies to prevent preterm deliveries. Matthew Hoffman, M.D., MPH, was an author of the study published in the *American Journal of Obstetrics and Gynecology*.

Research targets reducing respiratory problems in newborns

Infants who are born at 34 to 36 weeks of gestation (late preterm) are at greater risk for adverse respiratory and other outcomes than those born at 37 weeks of gestation or later.

Christiana Care played a leading role in a multicenter, randomized trial involving women with a singleton pregnancy at 34 weeks 0 days to 36 weeks 5 days of gestation who were at high risk for delivery during the late preterm period. The participants were assigned to receive two injections of the steroid betamethasone or a matching placebo 24 hours apart.

They found that giving betamethasone to women at risk for late preterm delivery significantly reduced the rate of neonatal respiratory complications. Those findings were published in the *New England Journal of Medicine*.



31st in the nation

in the number of babies born at Christiana Hospital in
FY 2016 and **16TH ON THE EAST COAST.**



Since our **Cuddlers Program** was introduced in 2014, **33 volunteers** have participated in comprehensive classroom and hands-on training. Research shows that the peaceful, loving interaction of cuddling leads to healthy weight gain and earlier discharge home.

Christiana Care has been recognized by the **U.S. Department of Health & Human Services** as the region's only **National Community Center of Excellence in Women's Health.**



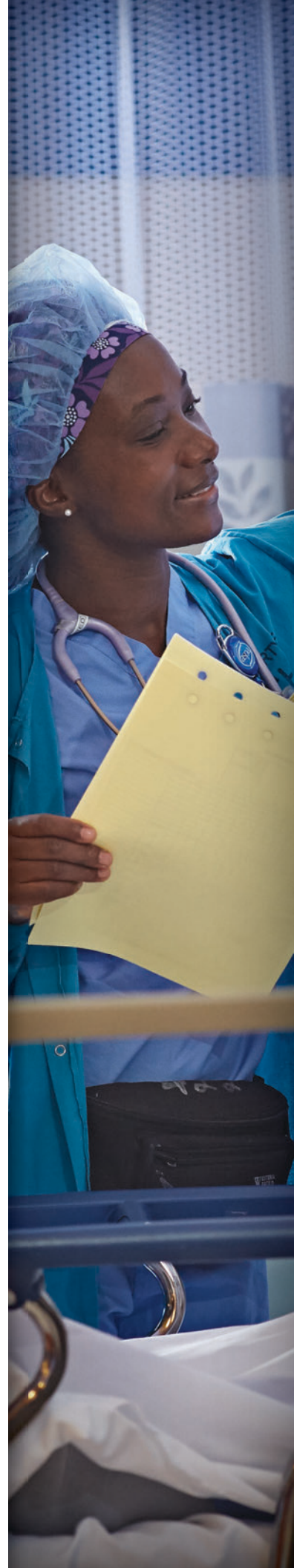
Christiana Hospital has earned Baby-Friendly™ designation from Baby-Friendly, USA, Inc. – a global program of the World Health Organization and the United Nations Children's Fund (UNICEF).

Only 10 percent of birthing facilities in the U.S. achieve this.

THE VALUE OF extraordinary people

Christiana Care exists to take care of our neighbors. Recognized as one of the nation's best hospitals, we receive high marks in surgical outcomes, and as a teaching hospital we are training the next generation of physicians. We know the critical importance of friendly, inclusive and equitable practices and care for our patients, their families — and our employees.

At the very core of our achievements are our people, our team of physicians, surgeons, nurses, health care professionals, technology experts, volunteers and staff members in each and every department and at each and every location. Their talent and dedication are truly extraordinary.





Our exceptional colleagues work together to give their personal best.

The greatest reward is the daily interaction with our patients and their families.

Our level of performance, dedication and quality is validated by the achievements we earn. But what is most important is the respectful, expert care we give.

{ national awards }



Among nation's Best Hospitals

Recognized for excellence as the best hospital in Delaware and No. 3 among the 91 hospitals in the entire Philadelphia region by U.S. News & World Report. Named among the top 50 in the nation in four specialties: Nephrology, Pulmonology, Diabetes & Endocrinology, and Gastroenterology & Gastrointestinal Surgery.

Top 100 Hospitals in U.S.

The only hospital in the greater Philadelphia region to earn a place on this year's Truven Health Analytics list of 100 Top Hospitals in the U.S., and the only major teaching hospital in the nation to win the Everest Award in both 2015 and 2016. The Everest Award singles out health systems demonstrating the highest performance and fastest long-term improvement over five years, exceeding benchmarks for quality, safety and efficiency of hospital care.

Meritorious surgical outcomes

Honored as one of only 52 institutions out of 517 by the American College of Surgeons (ACS) Clinical Congress for achieving meritorious outcomes in surgical patient care. This is the third consecutive year of recognition through the organization's National Surgical Quality Improvement Program — also known as ACS NSQIP — which is the only nationally validated quality-improvement program that measures and enhances the care of surgical patients.

A national leader in stroke care

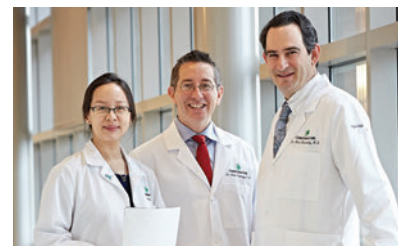
With a landmark Joint Commission recertification as a comprehensive stroke center and top marks from the American Heart Association (AHA), Christiana Care is earning national recognition in stroke care. This year, Christiana Hospital received a pair of recognitions from the AHA: the Get With the Guidelines Stroke Gold Plus Quality Award and the Target: Stroke Honor Roll Elite Plus. Both are tiered awards. Get With the Guidelines has four levels and Target: Stroke has three, and the hospital received the highest designation in each case.



Accredited in cancer care since 1951

The Helen F. Graham Cancer Center & Research Institute has received three-year reaccreditation from the Commission on Cancer of the American College of Surgeons. The cancer program has received Commission on Cancer accreditation since 1951.

To earn voluntary accreditation, a cancer program must meet or exceed 34 Commission on Cancer quality-care standards, be evaluated every three years through a survey process and maintain levels of excellence in the delivery of comprehensive, multidisciplinary patient-centered care.



Top ranked for community value

A nationally top-ranked Community Value Five-Star hospital by Cleverley + Associates, an independent health care data and consulting services firm in Ohio. Based on the firm's analysis, Christiana Care ranks as one of the top hospitals in the United States in terms of the value it provides to the community, scoring in the top 20 percent of facilities across the country. The analysis evaluated Christiana Care among its peers in the "high-intensity teaching hospital" category.

Exemplary care for older adults

Awarded Exemplar status for the third consecutive year for the care it provides to older adults under the national NICHE (Nurses Improving Care for Healthsystem Elders) program. NICHE sites can be found in 47 states across the nation and in five other countries, totaling over 670 sites. The only hospital in Delaware to achieve the award and one of only 82 nationwide.



One of the 'Most Wired' in technology

Named one of the Most Wired Hospitals in the United States by the American Hospital Association, underscoring the health system's success at leveraging technology to drive value for the people it serves. Christiana Care was one of only 363 hospital health systems selected as a 2016 Most Wired Hospital, based on results of the annual Health Care's Most Wired Survey that examined which health systems are most adroit at using technology to improve the efficiency of care delivery. There are 5,627 hospitals in the United States.



Highest honors in nursing

Redesignated as a Magnet organization for nursing excellence from the American Nurses Credentialing Center, the pre-eminent recognition for hospital systems in the United States. Only 7 percent of the nation's hospitals hold the prestigious Magnet designation. Christiana Care was first in Delaware to achieve Magnet status in 2010, and is now first in the state to attain redesignation, demonstrating sustained excellence in nursing practice and adherence to national standards.

Gold and Silver Beacon Awards in nursing

The Medical Intensive Care Unit (MICU) at Christiana Hospital has earned a Gold Beacon Award, the highest honor of the American Association of Critical-Care Nurses, the largest specialty nursing organization in the world. The recognition follows the Beacon Awards the unit received in 2012 and 2008.

Christiana Care is one of only 64 health care institutions in the nation to earn the prestigious award. The MICU is the only unit in Delaware to receive the award three times. The Cardiovascular Critical Care Complex also earned a Gold Beacon Award in 2013. In 2016, Wilmington Hospital's Intensive Care Unit earned a Silver Beacon Award.

Baby-friendly hospital designation

Christiana Hospital has earned Baby-Friendly™ designation from Baby-Friendly, USA, Inc., as part of the Baby-Friendly Hospital Initiative — a global program of the World Health Organization and the United Nations Children's Fund (UNICEF). This designation distinguishes hospitals and birthing centers that offer an optimal level of care for infant feeding and mother/baby bonding. Only 10 percent of birthing facilities in the U.S. have achieved this status.



A leader in LGBT care

For the fifth consecutive year, recognized as a Leader in LGBT Healthcare by the Human Rights Campaign Foundation, the educational arm of the country's largest lesbian, gay, bisexual and transgender civil rights organization.

The honor is given to institutions that meet LGBT-inclusive benchmarks that are part of the Healthcare Equality Index, which evaluates inclusive policies and practices related to LGBT patients, visitors and employees.

Leading Disability Employer Seal

One of only 27 organizations to earn the 2016 Leading Disability Employer Seal from the National Organization on Disability (NOD). This is the first year the Seal has been awarded, a new effort by NOD to recognize companies that demonstrate exemplary hiring and employment practices for people with disabilities.

Christiana Care is one of the country's largest health care systems including two hospitals, a major level I trauma center, emergency departments and the highest level neonatal intensive care unit. We offer an extensive range of outpatient services, a network of primary care physicians, medical and surgical specialists, home health care, preventive medicine, imaging and rehabilitation services.



Our multiple locations make it easy for patients in Delaware and throughout the tri-state region to receive expert care at the right place, at the right time.

Wilmington Campus

Wilmington Hospital (290 beds)
The Rocco A. Abessinio Family
Wilmington Health Center
Center for Advanced Joint Replacement
Center for Rehabilitation
Roxana Cannon Arsht Surgicenter
Swank Memory Care Center
First State School
Wilmington Hospital Gateway Building

Christiana Campus

Christiana Hospital (906 beds), Level I Trauma Center
and Level III Neonatal Intensive Care Unit
Center for Heart & Vascular Health
Helen F. Graham Cancer Center & Research Institute
Center for Translational Cancer Research
John H. Ammon Medical Education Center
Virtual Education & Simulation Training Center
Christiana Care Breast Center
Christiana Care Surgicenter
Medical Arts Pavilion

Regional Facilities

Concord Health Center
Eugene du Pont Preventive Medicine
& Rehabilitation Institute
HealthCare Center at Christiana
Middletown Emergency Department
Middletown Care Center
Smyrna Health & Wellness Center
Rehabilitation Services
School-Based Health Centers
Imaging Services
Primary Care Centers (in DE, PA and NJ)
Alzheimer's and Dementia Day Programs
Home Health & Community Services —
Visiting Nurse Association



Christianity Care has

11,308

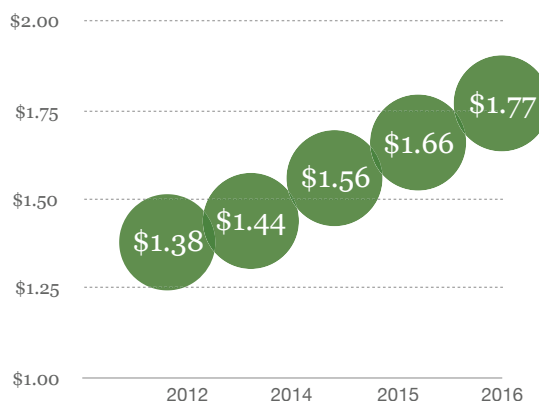
employees including:

3,860 Nurses and care technicians

1,528 Medical and dental staff

284 Residents and fellows

Total Operating Revenue (in billions)



Tax revenue paid to Delaware

\$32,490,970

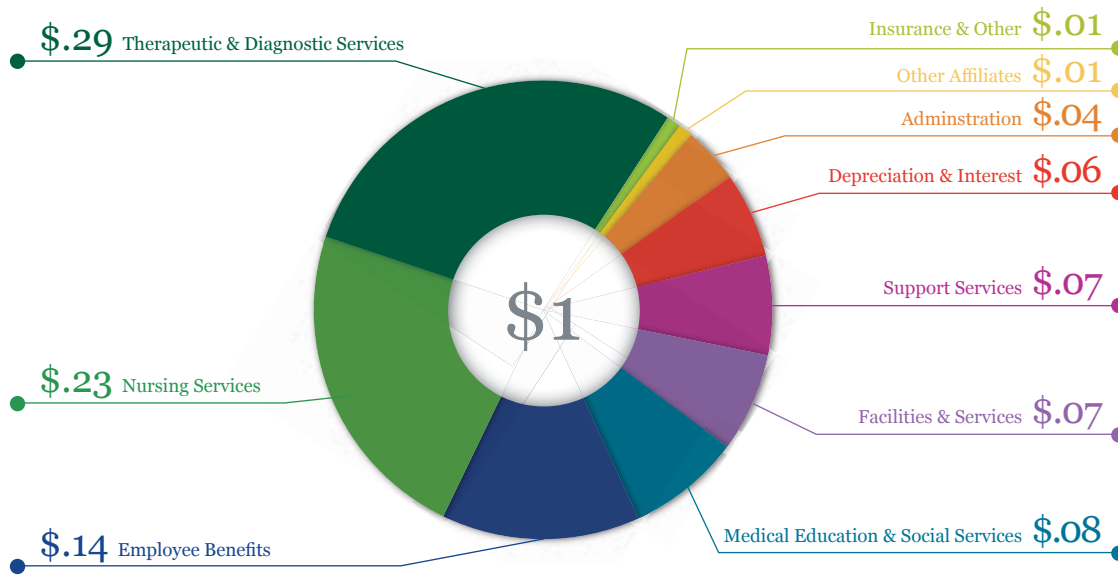


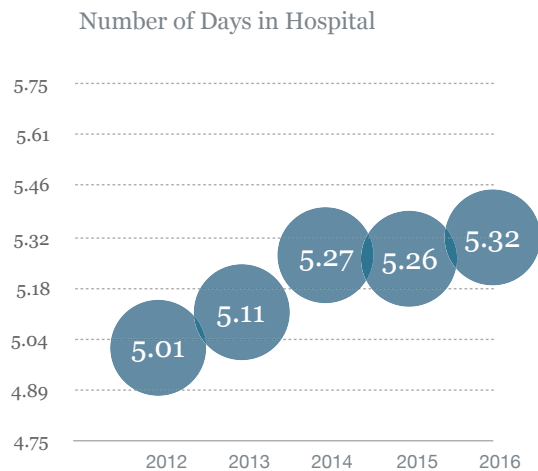
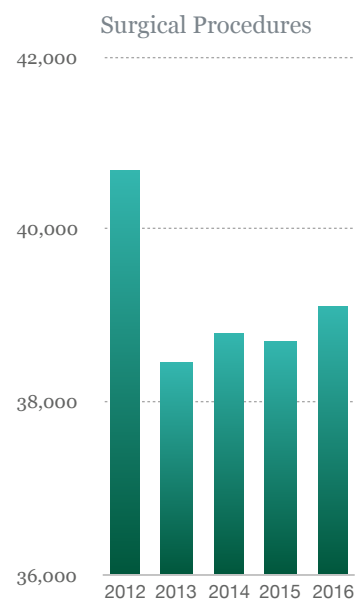
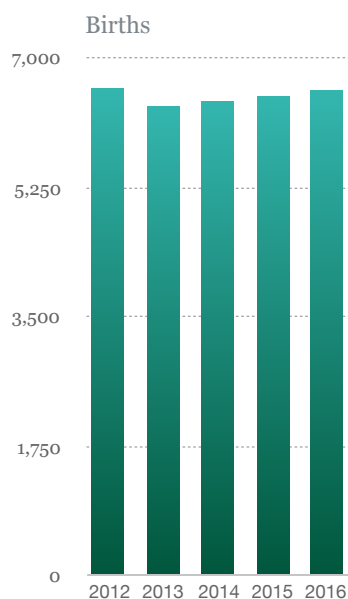
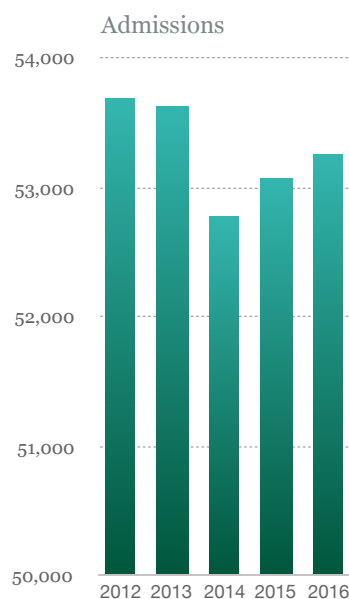
Charity care provided

\$16,400,000*

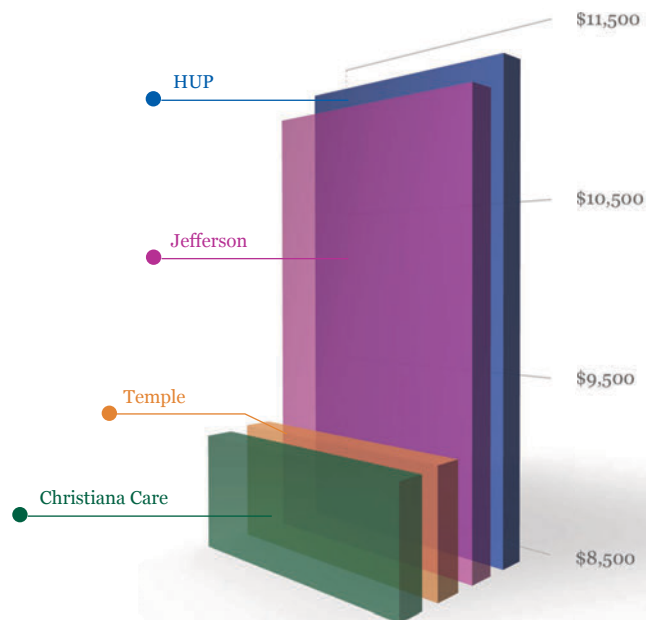
*estimated

Operating Dollar





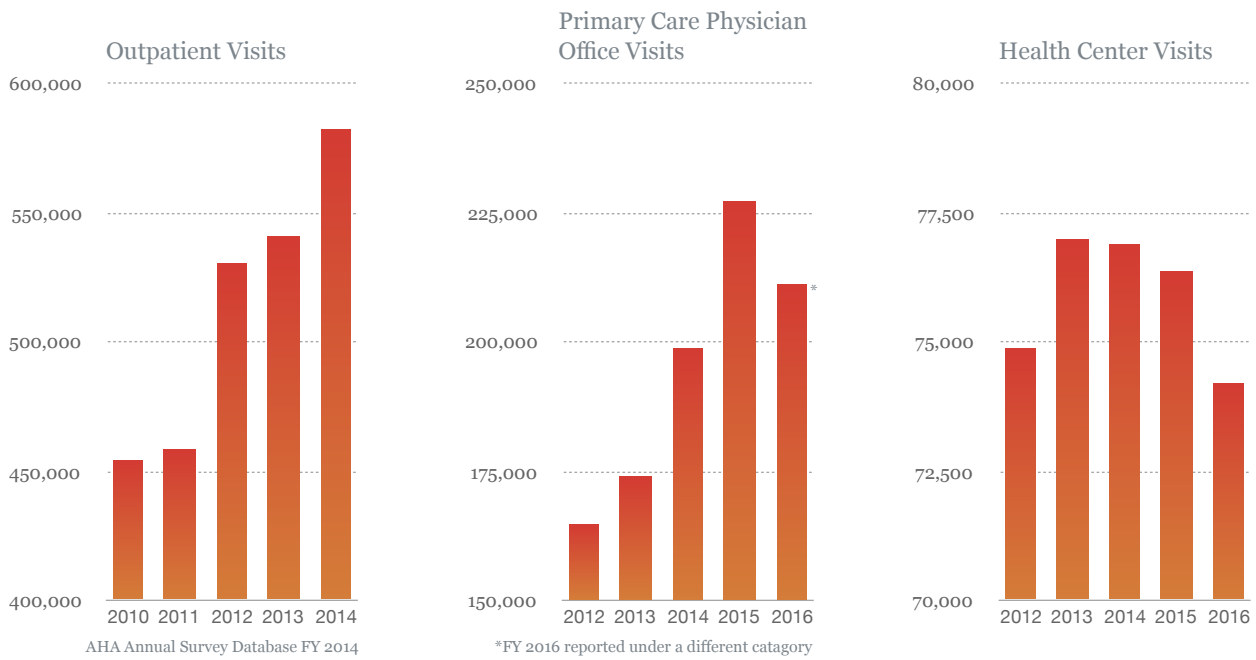
Comparative Cost of Patient Hospitalization



Source: COTH Autumn 2015 Databook



Average cost of patient hospitalization **\$9,143**



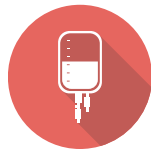
Outpatient visits in FY 2014

582,257



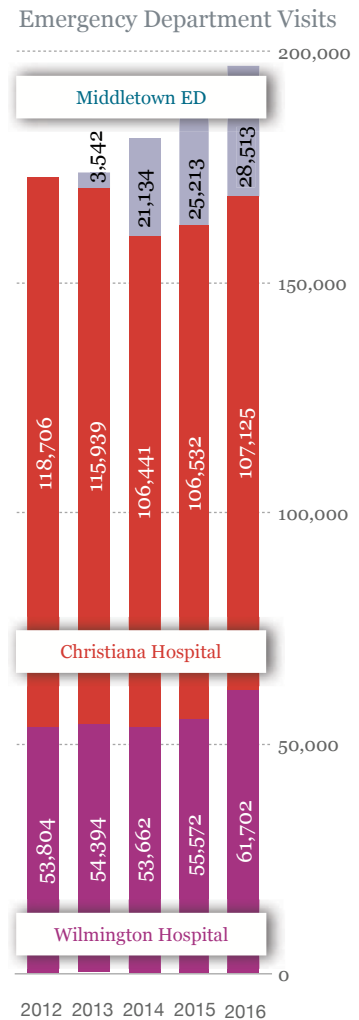
Total ED visits in FY 2016

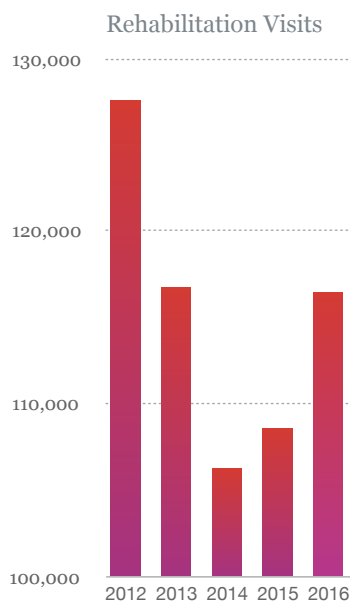
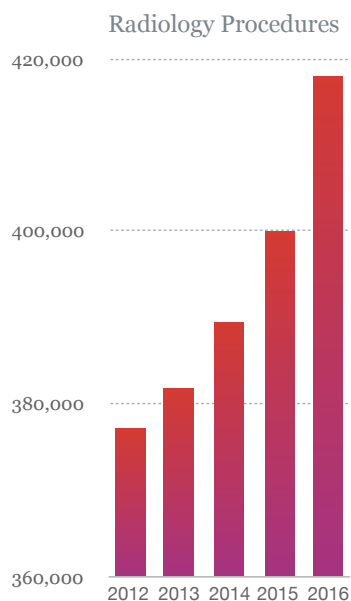
197,340



Knee and hip replacements

2,751





668
Center for
Rehabilitation
patients



Home Health & Community Services

Alzheimer's Day Program visits **5,497**

Home visits **312,537**



School-Based Health Centers

Centers staffed by Christiana Care **15**

Student visits **24,183**

Christiana Care volunteers **1,379**

78,901 Volunteer hours donated

\$1,858,908 Value of volunteer hours





Best of the best.

For the fourth time, Christiana Care Health System ranks among the “best of the best” hospitals in the nation based on independent comparison of quality data, value and performance.



CHRISTIANA CARE
HEALTH SYSTEM

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www.christianacare.org



To learn more about Christiana Care visit:

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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.