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.

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Recognized for Excellence

Christiana Care makes 100 Top Hospitals and Everest Award lists

Everest Award signals long-term improvement against national benchmarks

Christiana Care has again secured a place among the nation’s 100 Top Hospitals in the major teaching hospital category by Truven Health Analytics. We are also one of only 17 hospitals across the nation to win the 100 Top Hospitals Everest Award for being among the select few to set national benchmarks for the fastest long-term improvement among health systems over the last five years.

Only 15 major teaching hospitals earned 100 Top Hospitals ranking. Christiana Care is the only hospital in the Philadelphia region — and the only one in Delaware — to make the prestigious list.

The award singles out top hospitals among the nearly 3,000 evaluated for excellence in patient safety, patient engagement, affordability, adherence to clinical standards of care and average patient stay.

According to Virginia U. Collier, M.D., MACP, Hugh R. Sharp Jr. Chair of Medicine, the Everest Award mirrors progressive improvements on the core measures monitored internally by Christiana Care’s Clinical Excellence Committee.

“All indicators demonstrate that the multidisciplinary value improvement teams are taking the responsibility seriously to understand the measures and improve care, securing our place among the best of the best,” she said.

Truven Health reports that 100 Top Hospitals outperform their peers by demonstrating excellence and operating effectively across all functional areas.

“This honor is a recognition to every one of our staff — our physicians, nurses and all of the people at Christiana Care, including our board and trustees, our patient and family advisers — who are committed to partnering with those we are privileged to serve.”

JANICE E. NEVIN, M.D., MPH
President and CEO
Only 15 major teaching hospitals earned the 100 Top Hospitals ranking. Christiana Care has achieved excellence in 11 areas:

- Patient safety.
- Patient satisfaction.
- Affordability.
- Post-discharge mortality for heart attack, heart failure and pneumonia.
- Post-discharge readmissions for heart attack, heart failure, pneumonia and hip and knee surgery.
- Mortality.
- Adherence to clinical standards of care.
- Medical complications.
- Average patient stay.
- Profitability.
- Medicare spend per beneficiary.

“It is the staff on our patient care units, in procedural areas and in physician practices throughout our system who made this achievement possible with their dedication to creating a safe culture, achieving high reliability and leveraging technology to deliver the highest-quality, safest care.”

SHARON ANDERSON, MS, BSN, RN, FACHE
Senior Vice President for Quality, Patient Safety and Population Health Management
Director, Quality and Safety, Christiana Care Value Institute

Based on comparisons between the study winners and a peer group of similar high-volume hospitals that were not winners, they found that if all hospitals performed at Christiana Care’s level:

- Nearly 126,500 additional lives could be saved.
- Nearly 109,000 additional patients could be complication-free.
- $1.8 billion in inpatient costs could be saved.
- The typical patient could be released from the hospital a half-day sooner.
- Episode-of-illness expense would be 2 percent lower than the peer median.

The analysis is based on Medicare patients. If the same standards were applied to all inpatients, the impact would be even greater.
Christiana Care is enhancing its Quality and Safety operating structure to reflect advancements in an ongoing systemwide cultural transformation toward value.

As we look to the future, the focus will be on developing extraordinary people, using innovative tools and building strategic partnerships with and for the benefit of those we serve. Three key strategic aims guide this reorganization: ensuring optimal health, exceptional experience and organizational vitality.

Since 2010, Christiana Care has achieved a 66 percent reduction in patients harmed, translating to 6,000 fewer patients who were harmed. This includes a 59 percent decrease in central-line-associated bloodstream infections and a 79 percent decrease in ventilator-associated pneumonia cases. Average value scores increased from 81.0 to 86.4, with double the number of units earning a report card grade of “A.” Estimated cost savings exceeded $100 million.

Our new operating structure offers even greater promise for improving care delivered across the continuum and reducing unnecessary variation in care by organizing into nine service lines, including:

- Acute Medicine.
- Behavioral Health.
- Cancer.
- Heart & Vascular.
- Musculoskeletal Health.
- Neurosciences.
- Primary Care & Community Medicine.
- Surgical Services.
- Women’s & Children’s.

Coordinated through a Clinical Value Council, each service line has designated leaders and leadership structure to support safety, quality and population-based efforts. In addition, Integrated Practice Teams organize around medical conditions and processes that touch multiple service lines. Value improvement teams continue to drive accountability into daily work, promote immediate actions to resolve identified safety issues and encourage “Good Catches.”
“We need more institutes like this one to help our country achieve a health care system that values quality over quantity while spending our health care dollars more wisely.”

PATRICK CONWAY, M.D., M.Sc.
Deputy Administrator for Innovation and Quality and Chief Medical Officer, Centers for Medicare and Medicaid Services, in his keynote address at the Fall 2014 Value Institute Symposium
The Christiana Care Value Institute conducts real-world research on today’s most pressing health care issues. The goal is to develop, deliver and evaluate innovative practice and policy solutions that improve the experience, efficiency and effectiveness of health care for patients and providers alike. Following are some examples of this innovative work:

**Data-linking project improves care coordination for patients with chronic kidney disease**

A multidisciplinary team of investigators, system engineers, data analysts and biostatisticians from Christiana Care’s Value Institute, Nemours/Alfred I. duPont Hospital for Children, Nephrology Associates, P.A., and the University of Delaware is examining the effectiveness of providing and coordinating care — particularly addressing potential drug interactions and redundant testing caused by multiple conditions treated by multiple health care providers — for the more than 2,000 patients on chronic renal replacement therapy each year. The team is linking nonintegrated clinical data from multiple sources to create longitudinal records to better understand current care delivery processes and improve quality and coordination. Based on these data, the team will develop models for predicting hospital admission patterns following outpatient visits, and will examine the transitions from pediatric to adult care for chronic kidney disease.

The data-linking project is the first step toward building a unified operational platform that will decrease care fragmentation and improve both patient care coordination and outcomes.

**Team presents how CPOE and eMAR reduce costs, improve flexibility at Health IT and Economics workshop**

A team of Value Institute researchers and Christiana Care collaborators presented findings from their study, “Implementation of eMAR and CPOE Reduces Costs and Increases Flexibility on Hospital Units” at the Fifth Annual Workshop on Health IT.
and Economics (WHITE) in Washington, D.C., last October. WHITE is organized by the Center for Health Information and Decision Systems at the University of Maryland and is designed to showcase the latest research, inspire innovation and accelerate health care transformation at the intersection of health IT and economics.

This presentation was part of a larger body of ongoing work that includes, to date, a published manuscript and presentations at the 2014 Academy Health Annual Research Meeting and the 2014 Robert Wood Johnson Foundation Clinical Scholars’ Program National Meeting.

Value Institute is in the forefront of CMS drive toward innovative, wellness-based, patient-focused health care

In his keynote address at the Value Institute Fall 2014 Symposium, Patrick Conway, M.D., M.Sc., deputy administrator for innovation and quality and chief medical officer, Centers for Medicare and Medicaid Services (CMS), recognized Christiana Care — with its Value Institute — as a leader in the national effort to transform health care delivery and payment systems.

Conway cited Christiana Care’s selection for the highly competitive $10 million CMS innovation award for Bridging the Divides as an example of how the health system is helping to test models to improve quality.

“We made investments in places like this one where we believe we’re going to learn what works in health care,” he said.

Delaware is one of 16 states chosen for the design phase of the State Innovation Model Initiative, in which CMS is partnering with individual states to design, test and support new payment, service and delivery models to improve health systems.

continued
The Value Institute Academy

Through a formalized approach to staff education and training, the Value Institute Academy maximizes both individual and team abilities to innovate and lead change, and drive scientifically based improvements in health care delivery, with programs designed to promote basic through advanced skill levels. The Academy supports subscriptions to the Institute for Healthcare Improvement resources, including the IHI Open School, providing online, on-demand short courses, and the Passport Expeditions web-based programs available to individuals and teams throughout Christiana Care who wish to leverage improvement projects.

More than 1,000 learners have completed courses supporting care transformation through Value Institute Academy tracks in Improvement Science, Patient Safety, Research Methods, Patient Experience, Population Health and Clinical Team Effectiveness since September 2013.
ACT marks 10th anniversary

Christiana Care’s Achieving Competency Today (ACT) course, offered through the Value Institute Academy, provides the formalized Plan, Do, Check, Act (PDCA) approach to staff education, and significantly contributes to the culture of improvement at Christiana Care. ACT leaders and participants celebrated the 10th anniversary of the program in April.

“ACT is an interdisciplinary approach to experiential learning that teaches the science of improvement and asks participants to immediately use what they’re learning,” said Sharon Anderson, MS, BSN, RN, FACHE, senior vice president for Quality, Patient Safety, and Population Health Management. “This is key for health care, as we’re called on to reduce patient harm, standardize our approaches to treatment and drive outcomes that are measurable.”

Nearly 500 learners have completed the program this first decade, collaborating on 70 performance improvement projects, such as patient safety, population health, clinical team effectiveness and improvement science. Participants include resident physicians, physician assistants, pharmacists, nurses, social workers and other health professionals, such as pastoral care and laboratory scientists.

Over the years, ACT has received numerous awards, including a 2010 Innovation Award from the Alliance of Independent Academic Medical Centers, and has generated numerous Christiana Care Focus on Excellence Awards.

Originally, ACT was a four-week program funded with a grant from the Robert Wood Johnson Foundation, with a curriculum developed by Harvard University’s Partnerships for Quality Education. The program has since been extended to 12 weeks and is now funded internally.

“I can’t think of any other program that matches ACT in terms of the ability of folks from all parts of the health system to interact and develop projects centered on quality and safety.”

NEIL JASANI, M.D., MBA, FACEP
Chief Academic Officer
Vice President, Medical Affairs

continued
Expanding Lean Six Sigma Program develops home-grown quality-improvement leaders

Four years into its existence, Christiana Care’s Lean Six Sigma program — offered through the Value Institute Academy and sponsored in partnership with the internationally recognized Juran Institute — is rapidly expanding organizational capacity to deliver value within the health system. By training employees as quality-improvement experts, the program creates employees who can recognize opportunities, identify root causes of problems, develop quality-improvement interventions and deliver meaningful, sustained improvements in health care from the inside out.

In February, Christiana Care graduated its first class of Lean Six Sigma Yellow Belts, a group of about 100 employees from 11 departments introduced to Lean Six Sigma quality-improvement principles. About 30 members of the inaugural Yellow Belt class took an additional exam to earn certification as Rapid Process Improvement leaders.

The program also expanded this fiscal year to include its first Black Belt class — a group of eight Christiana Care employees working toward advanced Lean Six Sigma certification — as well as, for the first time, offering Green Belt and Yellow Belt training to candidates outside of Christiana Care to help expand organizational capacity among partner organizations.

Green Belt classes have resulted in the elimination of waste and errors; greater patient satisfaction, efficiency, effectiveness and affordability of care; improved patient outcomes; and a remarkable 15-to-1 return on investment.
### Ongoing Value Institute Academy offerings

<table>
<thead>
<tr>
<th>Quality TIPs: Teams Improving Process</th>
<th>TeamSTEPPS: Developing Effective Clinical Teams</th>
<th>Introduction to Improvement Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insight and consultation on project design, process flow analysis and how to measure effectiveness and quantify improvement.</td>
<td>Strategies and tools to enhance performance and patient safety.</td>
<td>Plan, Do, Check, Act (PDCA) problem solving methodology.</td>
</tr>
</tbody>
</table>

Last August, the Value Institute Academy hosted the two-day workshop, “Best-in-Class Case Management,” completed by 84 Christiana Care staff who manage the health of populations.

In December 2014, the Academy hosted a satellite webcast for the annual Institute for Healthcare Improvement’s (IHI) National Forum on Quality Improvement.

Along with the new Yellow Belt and Black Belt programs, Christiana Care is in its third year of offering intensive Green Belt training. About 60 employees have completed the months-long training; another 30 are in a current class. Projects conducted by Christiana Care’s first two Green Belt classes have resulted in the elimination of waste and errors; greater patient satisfaction, efficiency, effectiveness and affordability of care; improved patient outcomes; and a remarkable 15-to-1 return on investment.

For its investment of $200,000 in the two Green Belt classes, Christiana Care already has seen a $3 million return on investment.

Through a Lean Six Sigma project, service assistants are learning to more effectively engage more effectively with patients — ultimately improving the patient experience.
ED attending physician Jason Nace, M.D., and Christiana Hospital Emergency Department and observation unit staff perform a handoff protocol.
Creating a Safe Culture

TO REINFORCE A CULTURE FOCUSED ON PATIENT SAFETY, STAFF RECEIVE EXTRA TRAINING, TECHNOLOGY AND RESOURCES TO IMPROVE PATIENT CARE, AND UNITS ARE GRADED ON OUTCOMES. The result: reductions in mortality and morbidity, a decrease in the number and rate of medical errors and costs savings of more than $55 million.

“Creating a safe culture is fundamental and reflects our commitment to advancing The Christiana Care Way.”

SHARON ANDERSON, MS, BSN, RN, FACHE
Senior Vice President for Quality, Patient Safety and Population Health Management Director, Quality and Safety, Christiana Care Value Institute
Leaders, frontline staff trained in Just Culture principles

*Best practice toolkit advances learning culture*

As part of Christiana Care’s Culture of Responsibility, more than 900 leaders, physician leaders, and frontline employees in both inpatient and outpatient areas are now trained in Just Culture principles to address opportunities identified by the Agency for Healthcare Research and Quality’s (AHRQ) Hospital Survey on Patient Safety Culture in 2009.

Our Culture of Responsibility journey began in 2010, with the goal of positioning all employees to recognize “to err is human; to drift is human; risk is everywhere; we must manage in support of our values; and we are responsible for our behavioral choices.”

Educational efforts initially targeted medical patient care units, as well as the laboratory and pharmacy, and have since expanded to all inpatient and outpatient areas. Leaders received the first training. Frontline staff education, which began July 1, 2014, should be complete in the first quarter of Fiscal Year 2016.

This past year’s focus:

- Addressing local-level interventions related to preventing errors from happening again.
- Informing staff about errors that happen in their departments.
- Providing feedback about implemented changes based on event reports.

Through focus groups, managers and frontline staff shared ideas to create a best-practice library of tools and ideas that will advance our learning culture and promote an open and fair culture related to events.

**Culture of Responsibility**

is a critical component of Christiana Care’s approach to patient safety. Application of Culture of Responsibility principles demonstrates our commitment to preventing harm, improving systems and creating a learning environment that encourages colleagues to voice concerns, raise issues and report errors and near misses without fear of retribution or punitive action.

![Good Catch Program Submissions](chart.png)
Good Catch reporting soars; program keeps harm from reaching patients

The Good Catch Program is an essential component of a voluntary reporting system that averts harm by identifying unsafe conditions and events before reaching the patient, employee or visitor. More than 9,000 Good Catches have been submitted — a 54 percent increase in the last year, and a 272 percent increase since the program began at Christiana Care in 2012.
Value Score drives transformation of care

Scorecards now track performance compared to COTH peers

<table>
<thead>
<tr>
<th>CHRISTIANA CARE VALUE SCORE CARD</th>
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<tbody>
<tr>
<td>Quality</td>
</tr>
<tr>
<td>Mortality (Inpatient, In-Hospital)</td>
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<tr>
<td>Morbidity (Inpatient, Complications)</td>
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<tr>
<td>30-Day Readmission (emergent, all cause)</td>
</tr>
<tr>
<td>Hospital Acquired Infections</td>
</tr>
<tr>
<td>AHRQ Patient Safety Indicators</td>
</tr>
<tr>
<td>COTH Performance (Clinical &amp; Patient Experience)</td>
</tr>
</tbody>
</table>

Cost/Utilization

| Time Patients Spend in ED (min) | -18%  |               |         |
| Labor & Benefits Percent of Revenue | 54.9%  |               |         |

CURRENT VALUE SCORE 86.0 B

BASELINE 80.5 B-

Value has long been defined by the value equation: Quality ÷ Cost. Since fiscal year 2012, Christiana Care has tracked its progress toward goals via the Christiana Care Health System Value Score card. The score combines quality and cost or utilization metrics into a single measure that, when translated into a traditional A-B-C grade, helps drive transformation in the care of our patients.

To date this fiscal year, the Value Score has increased from 80.5, a B-, for fiscal year 2014, to 86.0, a B. The increase of 5.5 points exceeds the annual operating plan goal of a five-point increase.

The collaborative efforts of many value improvement teams, departments and committees have contributed to the improved score. Both in-hospital mortality and morbidity (complication rates) have improved, and are performing well below risk-adjusted expected rates. Decreases in the measures of preventable patient harm — including hospital-acquired infections and the patient safety indicators, which focus on post-operative complications — have exceeded our 10 percent goal.

Performance compared to our Council of Teaching Hospitals and Health Systems (COTH) peers is new to the Value Score card. The metric tracks our performance on more than 80 safety, clinical and patient experience publicly reported measures compared to the 90th percentile of COTH hospitals, in line with our strategic goal to be a national leader in quality and safety. To date, we have increased the number of measures at the 90th percentile to 32 from 16 at the end of fiscal year 2014. Thirty-two measures have improved by at least one quartile, while only 12 have decreased. The net improvement of 20 measures exceeds our annual operating plan stretch goal of 16.

To date, we have increased the number of measures at the 90th percentile to 32 from 16 at the end of fiscal year 2014.
Employee Safety to prioritize needlestick and sharps injuries

Over the past eight years, Christiana Care has made significant improvements in the safety of our employees. Our total recordable injury rate has decreased by 49 percent since fiscal year 2008, and at 5.07 incidents per 200,000 worked hours, is currently 21 percent below the Bureau of Labor Statistics’ national average of 6.4 incidents for hospitals.

Aggressive groundwork to address needlestick and sharps injuries, which account for about one third of all recordable injuries, are expected to significantly enhance employee safety within the next two fiscal years. Strategies include recruiting a laser safety/needlestick prevention officer; collaborating with the Resident Quality and Safety Council; meeting with department leadership to discuss incidents; creating a sharps committee to assess available technology, and continuing to promote needlestick safety.

OSHA requires companies to report the number of employee injuries per 100 full-time employees.

Total recordable injuries include lost time injuries, restricted workday cases and medical treatment cases.

INJURY RATE

<table>
<thead>
<tr>
<th>Year</th>
<th>Lost Time Injury Rate</th>
<th>Restricted Workday Case Rate</th>
<th>Medical Treatment Case Rate</th>
<th>Total Recordable Injury Rate</th>
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</thead>
<tbody>
<tr>
<td>FY08</td>
<td>9.90</td>
<td>2.54</td>
<td>5.36</td>
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</tr>
<tr>
<td>FY09</td>
<td>8.02</td>
<td>2.65</td>
<td>5.39</td>
<td>15.66</td>
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<tr>
<td>FY10</td>
<td>5.94</td>
<td>2.74</td>
<td>5.46</td>
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<tr>
<td>FY11</td>
<td>6.91</td>
<td>2.83</td>
<td>5.53</td>
<td>14.27</td>
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<td>FY12</td>
<td>5.70</td>
<td>2.92</td>
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<td>FY13</td>
<td>5.77</td>
<td>3.01</td>
<td>5.67</td>
<td>13.45</td>
</tr>
<tr>
<td>FY14</td>
<td>5.07</td>
<td>3.10</td>
<td>5.74</td>
<td>13.91</td>
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<tr>
<td>FY15 YTD</td>
<td>5.19</td>
<td>3.19</td>
<td>5.81</td>
<td>14.19</td>
</tr>
</tbody>
</table>

BLS National TRI: 6.3

* Bureau of Labor Statistics

Lost Time Injury Rate

Restricted Workday Case Rate

Medical Treatment Case Rate

Total Recordable Injury Rate

CURRENT BLS* HOSPITAL AVERAGE

3.2 incidents per 200,000 worked hours
Preventable harm reduction exceeds AOP goal

Hospital-acquired infections down more than 14 percent

The Institute for Healthcare Improvement (IHI) broadly defines harm as “the unintended physical injury resulting from or contributed to by medical care that requires additional monitoring, treatment, hospitalization or results in death. Such injury is considered medical harm whether or not it is considered preventable and whether or not it resulted from a medical error.”

When Christiana Care set out on its journey to eliminate preventable patient harm in 2010, we moved to a more patient-centric approach of counting the number of patients harmed, in addition to reporting the rate change. This had the powerful impact of making instances of harm more personal and helped drive change. Since 2010, preventable harm has been reduced by 66 percent, with more than 5,700 fewer patients experiencing harm during their hospitalizations.

Now in the fifth year of our journey, Christiana Care has again exceeded its annual operating plan (AOP) goal of a 10 percent improvement in harm with a decrease of 11 percent. One of the strongest areas of improvement is hospital-acquired infections, with 35 fewer cases of harm compared to the same period in fiscal year 2014. Within the complications category, consistent use of evidence-based prevention guidelines has reduced the number of patients with perioperative pulmonary embolism or deep vein thrombosis by 21 — a 23 percent improvement.

Five broad categories of harm are tracked monthly on Christiana Care’s Focus on Excellence Measurement Report:

- Hospital-acquired infections.
- Medication safety.
- Patient falls.
- Pressure ulcers.
- Complications.

![NUMBER OF PATIENTS HARMED](chart)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Patients</th>
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<tr>
<td>FY10</td>
<td>2,518</td>
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<tr>
<td>FY11</td>
<td>1,932</td>
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<tr>
<td>FY12</td>
<td>1,754</td>
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<tr>
<td>FY13</td>
<td>1,304</td>
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<tr>
<td>FY14</td>
<td>997</td>
</tr>
<tr>
<td>FY15*</td>
<td>858</td>
</tr>
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</table>

*Annualized
Zero Harm Award

The Zero Harm Award was created to recognize the achievement of Zero Harm for 12 consecutive months in a Focus on Excellence patient safety harm measure. To recognize this achievement, the Zero Harm Certificate is presented to the staff in a patient care unit, clinical department or specialty, or team. The certificate is prominently displayed on the health system’s Quality and Safety intranet site, and the award is featured in both Christiana Care’s monthly employee publication and the public Christiana Care News website. Awardees are recognized at Christiana Care’s annual Focus on Excellence Award Ceremony.

To date, 45 patient care units have earned the Zero Harm Award for achieving 12 months with zero hospital-acquired infections, such as central-line infections (CLABSI), C. difficile, catheter-associated urinary tract infections (CAUTI), and zero patient falls with major injury.

The first honorees to receive the award are the Wilmington Hospital Intensive Care Unit (WICU) and the Christiana Hospital Medical Intensive Care Unit for achieving zero central-line-associated bloodstream infections. WICU also achieved zero harm in CAUTI for 12 months.

“The Zero Harm Award supports the achievement of high reliability and innovative approaches in making care safer for our patients.”

MICHELE CAMPBELL, MS, RN, CPHQ, FABC
Vice President, Patient Safety and Accreditation
Hospital-acquired infections continue to decrease

Hospital-acquired infections cause patient harm and lead to increased morbidity and mortality, prolonged length of stay and increased costs of care. As a result of collaborative efforts of the Infection Prevention Committee and patient care unit value improvement teams, hospital-acquired infections have decreased 35 percent since fiscal year 2012. In addition to ongoing work to eradicate ventilator-associated events in our intensive care and stepdown units, initiatives include reductions in systemwide catheter-associated urinary tract infections (CAUTI), Clostridium difficile (C. diff), central-line associated bloodstream infections (CLABSI) and Ebola preparedness.
CAUTI

The number of catheter-associated urinary tract infections (CAUTIs) in the eight adult intensive care and stepdown units has decreased 22 percent fiscal year 2015 to-date, compared to the same time period last year. Looking back five years, improvements in the number of hospital-acquired CAUTIs exceed 80 percent.

Effective January 2015, the Centers for Disease Control’s National Healthcare Safety Network required expansion of surveillance and reporting to all patient care units. The UTI Reduction Team developed and implemented a multi-pronged approach to prepare all units for reporting while continuing to decrease the incidence of CAUTI. Efforts include:

- New kits: (March 2015) New Foley insertion trays that include all the items needed (in the order needed) to cleanse the perineum prior to insertion, to insert the Foley under sterile conditions, and to secure the catheter to the patient’s leg (to prevent dislodgement and trauma) replaced all the existing Foley catheter kits.
- New intermittent and indwelling catheterization clinical practice guidelines for bladder management, introducing the “A-B-C-D-E of CAUTI Prevention:”
  - Aseptic insertion and maintenance.
  - Bladder ultrasound.
  - Condom or intermittent catheterization, as appropriate.
  - Do not insert Foley unless necessary and meets criteria.
  - Early removal with PowerChart Foley catheter assessment.
- CAUTI prevention specialists: Each unit nominated staff to become specialists in Foley insertion, maintenance and other initiations related to CAUTI prevention, thus becoming resources to the remaining staff in the unit and assisting in hands-on training at the unit level.
- Systemwide education: Videos, simulation, hands-on training.

CLABSI

There is continued leadership commitment and accountability for reduction in central-line-associated bloodstream infections, which remain a safety priority. Physicians and nurses have partnered to avoid unnecessary central-line insertions, ensure proper insertion safety practices and maintenance, and ensure removal as quickly as possible. To date this fiscal year, there has been a 53 percent reduction in CLABSI in the intensive care and stepdown units. Four of the eight units have been CLABSI-free for more than 12 months and have received the health system’s Zero Harm Award.

NUMBER OF CLABSI HOSPITAL-ACQUIRED INFECTIONS: INTENSIVE CARE AND STEPDOWN PATIENT CARE UNITS
Hospital-acquired infections continued

NUMBER OF CAUTI HOSPITAL-ACQUIRED INFECTIONS: INTENSIVE CARE AND STEPDOWN PATIENT CARE UNITS

C. diff

Reducing the incidence of hospital-acquired Clostridium difficile infections is a priority area of the Safety First Committee. Fiscal year 2015 to-date, the number of C. diff infections has not shown improvement, due at least in part, to implementation of a newer, more sensitive test used to detect the infection in January 2015. Although systemwide rates have not improved, some patient care units do have success stories. The Wilmington Intensive Care Unit received the 2014 Focus on Excellence President’s Award for their project that led to nine months with zero cases of C. diff, following implementation of a five-point C. diff intervention bundle:

- Environmental monitoring of thoroughness of room cleaning with adenosine triphosphate swabbing.
- Improving staff awareness of C. diff rates and CDC swabbing results.
- Hand hygiene compliance above 90 percent.
- Antibiotic stewardship, which includes discontinuation or de-escalation to narrower-spectrum antibiotics whenever possible, and ensuring that antibiotics have stop dates recorded to avoid unintentional continuation longer than is necessary to treat the underlying infection.
- Minimizing use of proton pump inhibitors whenever possible.

The bundle is now expanding systemwide, including a trial of a new environmental monitoring program to ensure thorough room cleaning and provide feedback on the unit level. In addition, changes were made in PowerChart to flag patients with a history of C. diff, alert clinicians about recent laxative use (which can lead to misclassifying a patient as having C. diff), support proper testing of potential C. diff cases and encourage conservative use of proton pump inhibitors. Additional efforts are ongoing to improve antibiotic stewardship and provide clinical decision support at the point of antibiotic prescribing.
Following the Ebola virus diagnosis in a Texas hospital in October 2014, the Infection Prevention Committee established an Ebola Preparedness Committee to ensure that Christiana Care would be fully prepared to identify and safely treat patients infected with the Ebola virus. Work groups focused on personal protective equipment selection and training, communication, clinical care, emergency department and emergency medical system response, logistics and issues specific to women and children. A comprehensive Ebola virus response plan outlines the necessary steps to safeguard not only our patients, visitors and staff, but also the family members of our staff and the surrounding community as a whole. Christiana Care is currently considered an Ebola assessment facility, which means that we could potentially care for a patient suspected to have Ebola for up to five days while the diagnosis is being confirmed or ruled out. The response plan is reviewed frequently and updated as best practices are identified and new technologies and procedures are implemented to fight this disease. Christiana Care continues to work closely with the Delaware Division of Public Health and Department of Emergency Preparedness to monitor returning travelers from West Africa and respond appropriately.
Cultural competence at Christiana Care Health System is a set of attitudes, skills, behaviors, and policies that enables us to provide safe health care and interact effectively with a culturally diverse patient population and community. As Christiana Care’s patient population increases in diversity, providers face multiple challenges in effectively caring for patients with particular needs related to ethnic background, race, religion, linguistic ability, sexual orientation and certain forms of disability.

Language Services
In order to provide care as respectful, expert, caring partners, Language Services has expanded the spectrum of services available to improve safety for patients with limited English proficiency or who are deaf. During fiscal year 2015, the volume of monthly requests for interpreting increased 37 percent. The five most frequently requested languages are Spanish, American Sign Language, Mandarin, Haitian Creole and Arabic.

This year Language Services staff welcomed the first Mandarin Chinese interpreter in response to an increase in the volume of requests for this language.

Expanding the spectrum of services to improve safety for diverse patients

<table>
<thead>
<tr>
<th>NUMBER OF LANGUAGE SERVICE REQUESTS</th>
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<tbody>
<tr>
<td>Month</td>
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<tr>
<td>-----------</td>
</tr>
<tr>
<td>Jan-14</td>
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<tr>
<td>Feb-14</td>
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This year Language Services staff welcomed the first Mandarin Chinese interpreter in response to an increase in the volume of requests for this language.
LINCC (Language Interpreter Network at Christiana Care)

More than 70 Christiana Care employees now serve as qualified medical interpreters and patient access liaisons in 18 languages through the Language Interpreter Network at Christiana Care (LINCC).

The LINCC program was developed to evaluate, train and compensate bilingual staff as medical interpreters. LINCC interpreters ensure safe, effective communication with patients who have limited English proficiency or other unique communication needs.

Joint Commission Standard HR.01.02.01 requires health care organizations to assess the qualifications of the individuals who provide medical interpretation. Unqualified individuals — including family members, friends, other patients or untrained bilingual staff, — should not be used as interpreters for medical encounters. LINCC is an important step toward meeting this Joint Commission requirement.

LINCC interpreters and patient access liaisons speak: Akan-Twi, Arabic, Bengali, French, Gujarati, Haitian Creole, Hindi, Igbo, Korean, Malayalam, Mandarin Chinese, Portuguese, Russian, Spanish, Swahili, Urdu, and Yoruba. LINCC is making significant improvements to patient care by improving the quality of communication and increasing the level of cultural competency in our employees who interact with patients from a variety of ethnic backgrounds.

In the first six months of implementation, the LINCC program has completed over 800 interpreting encounters for patients with limited English proficiency.

Video Remote Interpreting

In order to increase the availability of qualified medical interpretation throughout Christiana Care, the Learning Institute’s Center for Diversity & Inclusion, Cultural Competence and Equity has implemented a system called Video Remote Interpreting or VRI. Using iPads with special stands, patients can see the interpreter on the iPad screen, and the interpreters are able to see the patient, resulting in more accurate, complete communication that includes sensitivity to visual cues and body language. While telephonic interpretation is available in all patient care areas, it is not appropriate for many encounters due to the complexity or the emotional impact of the information being exchanged.

In addition to the interpreting provided by the VRI vendor, both staff and LINCC interpreters are available to provide qualified medical interpreting to patients through a network of iPads and telepresence robots. Video Remote Interpreting will continue to grow as an important tool to provide qualified interpreting to patients in our facilities, in the community and even in patient homes through the Visiting Nurse Association.

VRI is available in Spanish, American Sign Language, Portuguese, Russian, Arabic, Somali, Korean, Mandarin, Haitian Creole, Cantonese, Nepali, Polish, and Vietnamese.

Using Video Remote Interpreting, both staff and LINCC interpreters are available to provide qualified medical interpretation for patients through a network of iPads and telepresence robots.
Innovative partnerships improve patient and family experience

Overall, patient experience scores on the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey continue to climb. Christiana Care realized improvements in seven of the 17 HCAHPS questions; five improving a percentile ranking compared to Council of Teaching Hospitals and Health Systems (COTH). This brings the total number of questions at the top decile to six, including nurse courtesy and explanations, staff responsiveness to call bells and calls for toileting help, pain management and medication information.

The system continues to design methods and tools to measure every aspect of a patient's experience to better understand and meet individual needs. Christiana Care’s overall hospital rating is up 8 percent — significant in that overall hospital rating is the strongest barometer of overall satisfaction. Daily team huddles, interdisciplinary rounds and bedside shift reports, a deepening partnership with patient and family advisers and a shared commitment to promptly respond to patient call lights all contribute to a steady rise. Continued focus is on improving the triple aim of patient experiences, which encompasses environment of care, doctor communication and nurse communication.

Other innovations moving the needle on patient experience scores include Christiana Care’s new partnership with the University of Delaware Lerner College of Business for the nation’s first accredited Patient Experience Academy; new iRound technology that allows nurses and leaders to collect real-time data via iPads and address needs important to patients and families on the spot; and a systemwide commitment to embedding patient and family advisers on every patient care committee.

From one committee’s desire back in 2008 to focus more intently on patient-centered care grew a systemwide commitment to center every aspect of service around the needs of patients and their families. Patient and family advisers now have a seat at the table, providing invaluable insight on proposed programs, policies and practices. Industry colleagues are taking note of how Christiana Care embeds these uniquely qualified advisers in both service-line and system-level committees — and the resulting indicators on national survey scores — increasing Christiana Care’s national reputation as a leader in patient- and family-centered care.
Patient Experience Academy creates outstanding first impression

Christiana Care’s Patient Experience Academy — a unique partnership with the University of Delaware Lerner College of Business and the first accredited program of its kind between a health system and a university — applies the hospitality industry’s best customer service and engagement strategies within the hospital setting. The 10-week program provides Christiana Care staff the skills and techniques to help create an outstanding first impression for patients and visitors. The pilot course led to a 73 percent improvement in post-test scores, and indicators point toward dramatic improvement in the patient experience.
As part of our participation in Project CANDOR (Communication and Optimal Resolution), Christiana Care has introduced a Care for the Caregiver program for colleagues who feel traumatized because of involvement in an unanticipated patient event while at work.

A volunteer Care for the Caregiver team — composed of attending physicians, residents, nurses, social workers and chaplains trained in critical incident stress management and selected for their high level of competence in helping second victims — offers a “safe zone” of peer support to physicians and staff following adverse patient events. The goal is to help health care team members understand what is known about the wounded healer phenomenon and help employees quickly return to their satisfying professional practice. To date, the team has already reached out to 20 colleagues in response to requests for support.

“Among the hallmark behaviors of The Christiana Care Way are respect and compassionate care for every person,” said Heather L. Farley, M.D., FACEP, medical director of the Middletown Emergency Department and director of the Care for the Caregiver Program. “This holds true when it is one of our own colleagues who is grieving due to the experience of a traumatic or unanticipated event. In these moments, Christiana Care responds with outreach and compassion when a colleague becomes a ‘wounded healer’ or ‘second victim,’” she said.

**Advances on Christiana Care’s Project CANDOR journey**

- Participated in change-readiness assessment and gap analysis by Project CANDOR faculty and shared results with senior leadership with action plans for successful implementation.
- Drafted an event-response checklist.
- Provided ongoing educational sessions with clinical departments to build awareness of CANDOR principles.
- Participated in interactive webinars with AHRQ and CANDOR faculty to learn an innovative team approach to event management and resolution.
- Engaged Rick Boothman, national expert in early resolution, as our National Patient Safety Week speaker and integrated his knowledge into our CANDOR plans.
- Participated in AHRQ stakeholder meeting to share best practices and lessons learned with the national CANDOR faculty and other implementing hospitals from across the country.

More than 150 Christiana Care participants and key stakeholders received training in the following areas of CANDOR in March 2015:

- Communication: Focusing on the importance of disclosure, patient and family communication and teaching others about disclosure.
- Event Reporting and Analysis: Detailing the CANDOR method for harm event reporting, review and analysis.
- Care for the Caregiver: Focusing on ways to identify and support second victims.
- Resolution and Leading the Change: Describing how to establish a robust resolution process, integrating all knowledge gained through event review and analysis.

In the coming months, the CANDOR Implementation Team will optimize Christiana Care’s event management process to incorporate CANDOR principles; develop curricula to support CANDOR implementation; continue to build awareness about CANDOR among all Christiana Care employees and staff; and test the tools in AHRQ’s CANDOR tool kit.

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**In addition to enhancing our commitment to patient- and family-centered care, Project CANDOR supports our culture of responsibility and promotes our learning and reporting culture.**

**STEPHEN PEARLMAN, M.D., MSHQS**

Director, Neonatal Quality Improvement, Co-Leader, Christiana Care’s Project CANDOR
Patient Safety Week looks at how to address harm from both system and family perspectives

In a keynote address at Christiana Care during National Patient Safety Week in March, Richard Boothman, executive director of clinical safety at University of Michigan Health System, shared his health system’s proactive approach to responding in a timely, thorough and patient-centered way to unexpected patient harm events.

The pioneering Michigan Model is based on three guiding principles:
- We will compensate quickly and fairly when inappropriate medical care causes injury.
- We will support staff vigorously when the health care involved was reasonable.
- We will reduce patient injury and claims by learning from our patients’ experiences.

The strategy has produced impressive results. In 2001, Boothman said the health system fielded about 300 malpractice cases. Last year, there were 65.

“The priority has to be around the safety and quality of the care we provide,” said Michele Campbell, MS, RN, CPHQ, FABC, vice president, Patient Safety and Accreditation for Christiana Care. “Patients have the right to reasonable care and safety, and to know what happened to them. Caregivers have a right to expect our support. This aligns with our strategy and participation in Project CANDOR to promote communication and optimal resolution when patients are unexpectedly harmed, and advances The Christiana Care Way.”

Speaking about patient safety from the family’s perspective, Helen Haskell, who founded Mothers Against Medical Error, told about the death of her son, Lewis Blackman, from internal bleeding caused by a perforated ulcer after elective surgery at another hospital.

Weekend staff at that hospital failed to recognize signs of clinical deterioration and ignored the family’s request to call in an attending physician when he stopped producing urine and complained of extreme pain. An autopsy revealed that medication had created a hole in his intestines.

After his death, the hospital apologized and eventually settled with the family without litigation. The family was not made aware of any immediate changes in protocols or procedures.

“We thought there needed to be significant changes,” said Haskell.

Under the Lewis Blackman Act, patients in South Carolina now have the right to discuss their care at any time with an attending physician. Upon request, a nurse will provide patients with the doctor’s telephone number and assist them in placing the call.

“The patient’s voice is the critical element in patient safety,” Haskell said.

What is a second victim?

A second victim is a health care team member who is involved in an unanticipated patient event, stressful situation or patient-related injury who becomes hurt in the sense that he or she is traumatized by the event.

Second victims often:
- Feel personally responsible for the patient outcome.
- Feel as though they have failed the patient.
- Second-guess their clinical skills and knowledge base.
Collaboration achieves full compliance with revised post-op blood glucose values

Collaborative efforts by the nursing-led Cardiovascular Critical Care Complex (CVCCC) Surgical Care Improvement Project (SCIP) Value Improvement Team achieved five months of full compliance with revised post-operative blood glucose values.

CVCCC partnered with colleagues from Endocrinology and Performance Improvement to address the guidelines revised by SCIP in January 2014. The revised guidelines call for post-operative serum glucose to be “less than, or equal to, 180 mEq/L within 18-24 hours after anesthesia end time” to prevent post-operative infections in patients undergoing coronary artery bypass grafting or heart valve surgery.

The team conducted retrospective data review of blood glucose levels to identify outliers and possible trends, and organized strategies to educate staff on new guidelines and actions necessary to troubleshoot outliers. Chart stickers triggered both the SCIP window and anesthesia end time.

“Timely data collection and real-time feedback to the interdisciplinary team are essential to achieving and maintaining compliance with blood glucose levels. Christiana Care’s Value Improvement Team structure provided the platform for a successful team approach and accountability for patient safety.”

ROBIN ELLIS, BSN, RN
Performance Improvement Coordinator
ICU collaboration keeps restraint use below NDNQI benchmark

A transformative collaboration is changing the culture and helping to maintain adult intensive care unit (ICU) restraint rates below the National Database of Nursing Quality Indicators (NDNQI) benchmark while improving patient safety. The collaboration includes critical care nurse specialists, nurse managers and value improvement teams from all adult ICUs, including the Cardiovascular Critical Care Complex, the Neurovascular Critical Care Complex, Surgical Critical Care Complex, the Medical Intensive Care Unit at Christiana Hospital (MICU) and the Wilmington Hospital Intensive Care Unit (WICU).

Representatives from the various ICUs formed a Restraint Collaborative in fall 2012 to study and address restraint use compared to the NDNQI mean benchmark. The result: a significant reduction in the number of patients restrained and a drop in the overall prevalence of restraint use to below the NDNQI mean benchmark for more than two full years.

Key to the culture change toward reducing restraint use was staff education on literature that associates restraint use with increased risk for delirium, unplanned extubation requiring the need for re-intubation, prolonged ICU length of stay, and post-traumatic stress disorder. Other initiatives:

- Using daily goals checklist during rounds — with providers present — to assess necessity of restraints.
- Encouraging early mobility and minimizing delirium.
- Educating staff one-on-one, relaying evidence in minimizing restraint use and encouraging use of alternatives.
- Monitoring of compliance with mitt or other restraint alternatives at the unit level.
- Holding ICU charge nurse and staff huddles to communicate restraint risks.

To maintain the below-NDNQI benchmark standard, routine restraints are removed from all ICU admissions. Mitts are readily available and encouraged as a restraint alternative, and restraint data and monitoring are reported via outcome dashboards, as well as in weekly newsletters and monthly meetings.

The ICUs continue to share ideas for minimal use of restraints through a clinical specialist workgroup, the Critical Care Committee and the Restraint Committee. Continued vigilance, culture change and ongoing education through unit-based value improvement teams indicate that minimal restraint use can be achieved without increased safety risk.

“Collaborative efforts have empowered the individual ICUs to change the culture and provide the support necessary to minimally restrain our patients.”

MAUREEN A. SECKEL, MSN, APN, ACNS-BC, CCNS
Lead Clinical Nurse Specialist
Medical Pulmonary Critical Care Sepsis Coordinator

*NDNQI = National Database of Nursing Quality Indicators
Patient-centered rounds reduce length of stay, improve satisfaction

Including patients and their families in the rounding process helped decrease length of stay (LOS) and improve patient satisfaction on Christiana Hospital’s 3D Pulmonary Stepdown Unit.

In one fiscal year, LOS decreased by 10.5 percent from 3.96 to 3.54 days. Patient satisfaction index scores increased from 52 to 68 percent in one year and, fiscal year-to-date, are now at 70 percent. Quality indicators have also improved. Falls have improved by more than 45 percent and unit-acquired pressure ulcers are down almost 60 percent.

Christiana Hospital’s 3D is a 32-bed stepdown unit that cares for a diverse population of acutely ill patients, each requiring complex care from a variety of specialties. Feedback from patients and families through our patient satisfaction and patient relations processes identified that the plan of care was not being effectively communicated to patients and their families. Multiple attending physicians, lack of a standardized rounding process that included the patient and family, and a fragmented plan of care all contributed to the increased LOS.

An interprofessional team representing Medicine, Nursing, Respiratory Care, Pharmacy, Social Work, Case Management, Organizational Excellence and the Patient and Family Advisory Council, developed a standardized patient rounding process to more effectively engage the patients and their families in the patient’s plan of care and facilitate care delivery. Their goals: to improve communication with patients and families regarding the plan of care, to improve patient flow and improve quality of patient care by using an interdisciplinary team approach that included active engagement of the patient and his or her family.

An interprofessional team representing Medicine, Nursing, Respiratory Care, Pharmacy, Social Work, Case Management, Organizational Excellence and the Patient and Family Advisory Council, developed a standardized patient rounding process to more effectively engage the patients and their families in the patient’s plan of care and facilitate care delivery.

**3D HCAHPS* INDEX**

*HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems*
Patient feedback to surveys helped refine the patient-centered rounding process. Improvements include standardizing the process for communicating the plan of care, rounding with critically ill/complex patients’ families, and obtaining feedback on the patients’ perspectives. A patient-centered rounding tool, which includes quality and safety measures, as well as patient and family updates, helps ensure consistency and standardization.

One key change involves the nurse determining patient and family preference for rounding. If team rounding is not appropriate, the rounding team converses away from the patient’s bedside, completes the rounding tool, and the nurse or physician communicates changes in the plan of care directly with the patient and family.

Nursing also now informs patients and families which members of the team will be rounding and when, allowing the patient and family to prepare for participation in rounds.

By having the entire team assess each patient on an individual basis, 3D was able to address pertinent patient needs, communicate the plan of care in a way that was understood, and discover possible barriers to discharge. Nursing’s partnership with patients provided valuable feedback in refining a patient-centered rounding process individualized by patient preference and the plan of care.
NICU innovations create better experience for patients and families

Christiana Care’s Neonatal Intensive Care Unit (NICU) Value Improvement Team earned Press Ganey’s 2014 Success Story Award for innovative, multidisciplinary initiatives focusing on partnering with families and centering expert, respectful care on babies and their loved ones.

The bottom-up approach to improve the patient and family experience raised the overall patient experience score from the 19th to the 74th percentile, and increased families’ willingness to recommend Christiana Care’s NICU from the 35th to 83rd percentile.

Enhancements were developed by surveying families and staff to identify opportunities, and by looking to best practices recommended by the Institute for Patient and Family Centered Care. They include:

- Informational whiteboards note baby’s and nurse’s name so the family always knows who is caring for their newborn.
- Patient-friendly communications, including revised brochures and website.
- Parent inclusion in care updates — at the cribside or via cellphone.
- Neonatologist calls home within five days after discharge to address parents’ concerns.
- The NICU Ambassador Program, in which volunteers escort families to the NICU and help with non-medical concerns.
- Personalized care delivery — babies are called by name and parents are encouraged to hold their babies.

Parent advisers played a key role in reviewing and helping to implement recommendations, following recommendation by the Stockholm Neonatal Family Centered Care Study (Pediatrics 2010), which reports patient- and family-centered care improvements decrease both NICU costs and length of stay.

“It was exciting to see the compassion and sincerity in establishing clear communication across our teams so that families get a consistent picture of the care their babies are receiving. The whole idea is to center care around the baby and family,” said Amanda Sleeper, who serves on both the NICU’s Family Centered Care Committee and the Christiana Hospital Patient and Family Advisory Council.

Babycams offer parents and families window to the NICU

Christiana Hospital is the first in Delaware, and only the 19th in the U.S., to install the NICVIEW babycam system, which enables authorized loved ones to view the baby anytime, day or night, from any web-enabled device, through a private, secure live video stream. Each of the 60 NICU bassinets has a camera, and 12 more babycams are installed on the pediatrics floor to accommodate the families of babies who have been discharged from the NICU, but still require a longer hospital stay. The average stay for a baby needing NICU care is 17 days, but can run from 48 hours to eight months. Christiana Care’s NICU cares for about 1,200 newborns each year, making it one of the highest-volume NICUs in the nation.

Families have logged in to the babycams more than 3,000 times, from as far away as India, Morocco and Singapore. NICVIEW is fully HIPAA compliant; images are never recorded or stored. User names and passwords are issued by the hospital only to parents, who can choose to share access with loved ones.
“Babycams enable parents to bond with their babies even when they cannot be by their sides. Being able to provide this technology takes our patient- and family- centered approach to the care of babies and their parents to an even greater level.”

DAVID A. PAUL, M.D.
Chair of Pediatrics
Physician Leader, Women’s and Children’s Service Line
Mitchell T. Saltzberg, M.D., FACC, FAHA, medical director of Christiana Care’s Heart Failure Program, talks with patient Carson Drake at the Heart Failure Clinic at Christiana Hospital. Christiana Care provides education, support, and case management to patients even after they leave the hospital.
Achieving High Reliability

THE NEED FOR POPULATION HEALTH MANAGEMENT HAS NEVER BEEN MORE URGENT. More than 43.8 million Americans are uninsured, and almost half — 45 percent — of the United States’ population suffers from at least one chronic condition.

Population Health programming includes a rigorous analysis of outcomes, coupled with the following strategies:

- Hospital-based interventions coordinated with community stakeholders and other key partners.
- Increased preventive health services across the continuum.
- Longitudinal, evidence-based chronic disease management programs coordinated with all of the patient’s health care providers.
- Culturally and linguistically appropriate care and health education.
- Enhanced information technology infrastructure with data analytics, predictive modeling and risk stratification.

“Understanding the population-based needs in our community is critical to becoming a value-based health system and helping Delawareans live healthier, more productive lives.”

TIMOTHY GARDNER, M.D.
Director, Christiana Care Value Institute
Medical Director, Christiana Care’s Center for Heart & Vascular Surgery
Early results of Bundled Payments for Care Improvement show improved population health management

In January 2015, Christiana Care began the journey from volume to value-based payment by implementing two “bundles” — total joint replacement and cervical spine surgeries — under Model 2 of Medicare’s Bundled Payments for Care Improvement (BPCI) initiative.

BPCI is an innovative payment model that combines reimbursement for defined episodes of care, along with financial and quality accountability. Under the traditional Medicare payment model, hospitals, physicians, and post-acute providers, such as skilled nursing facilities, are each paid separately for the services provided to Medicare beneficiaries. This structure rewards the quantity of services provided rather than quality, and leads to fragmented care with minimal coordination across settings. Bundling payments better aligns incentives, leading to higher-quality, better-coordinated care at a lower cost.

In preparation for the January start, clinicians and key stakeholders redesigned clinical care and developed a longitudinal care management infrastructure. Clinical redesign included developing instruments to identify patients at higher risk for complications or readmission, implementing evidence-based care pathways incorporating quality and timeliness standards, and algorithms for post-discharge follow-up by Care Link (see article, page 66) based on patient-specific intensity of service levels. Throughout each step, automated tracking tools in Christiana Care’s PowerChart and Aerial (the Care Link software system) allow team members to continually monitor patient and population progress.

In the first three months, the Care Link team served more than 370 Medicare joint replacement and cervical spine patients. Early results indicate a slight reduction in hospital length of stay, a greater than 10 percent increase in the percent of patients discharged to the community, and a 25 percent reduction in 30-day readmissions.

Christiana Care is moving quickly to expand our participation in the BPCI initiative.
Key quality and safety measures also show initial improvement. More than 92 percent of patients having joint replacement ambulate within 24 hours of surgery, and the percentage of patients receiving blood is below the baseline period. A full 100 percent of patients having cervical spine surgery receive prophylaxis to prevent blood clots. Longer-term functional outcomes, such as improvement in pain and ability to walk without a walker, are also being monitored. The Care Link team has established relationships with post-acute skilled nursing facilities and acute rehab centers to coordinate the patient’s transition from the hospital to the post-acute setting, and home.

Christiana Care is moving quickly to expand our participation in the BPCI initiative. Cardiac valve surgeries were added in April 2015, and non-cervical spine and coronary artery bypass grafting (CABG) procedures will be added in July. In October, the health system will move into two medical episodes of care — heart failure and stroke — encompassing some of its highest-volume and highest-risk Medicare patients.

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### DISCHARGE TO THE COMMUNITY*

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### 30-DAY READMISSION RATE

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*BPercent of patients discharged to home with home care or with home health services.

BPCI = Bundled Payments for Care Improvement
Gone in 60 minutes

Super Track revitalization significantly reduces lower-acuity ED length of stay

Revitalization of the Christiana Emergency Department (ED) Super Track process applying Lean Six Sigma concepts reduced length of stay for low-acuity ED patients by 44 percent in the first three months, shortening door-to-disposition time by 64 minutes. The improved efficiency has enabled the team to care for 73 percent of the original program’s patient volume in a space half the size and with half the number of staff, permitting redeployment of resources to open additional higher-acuity treatment areas in the ED.

Christiana Hospital first introduced Super Track as a Lean process in 2008, achieving an impressive 60-minute average length of stay — from a baseline of 150 minutes — for those with lower acuity needs, who account for about 20 percent of all ED patients. But six years later, staff turnover and “performance drift” from standard work resulted in degradation of the process. Average length of stay soared to 145 minutes, with a baseline consistently greater than 135 minutes. Lean principles were once again implemented as a Green Belt project in which rapid-cycle tests were performed to increase operational and fiscal efficiency, create a more responsive system, raise overall performance to a higher level and achieve greater patient and staff satisfaction. The goal was set to reduce once again Super Track average length of stay to less than 60 minutes from door to disposition.

A new two-bed Super Track area, opened in April 2014, is situated strategically next to the ED waiting room to allow for ease of access and discharge. This space was half the size of the original Super Track four-bed area based on decreased ED lower-acuity census resulting from the opening of community-based urgent care centers and medical aid units. A Super Track team received specialized training, consistent staffing patterns were assured and efforts were aligned between Nursing and provider teams.

Greater Super Track efficiency is also permitting redeployment of resources to open additional higher-acuity treatment areas in the ED.
Visual cues, such as purple admission tickets, list criteria to guide triage decisions. Red, yellow and green placards indicate readiness for disposition during volume surges. Footprints on the floor guide independent patients to and from radiologic tests.

The team continues to focus on length of stay and refining goals through ongoing analysis and modification, and is now working to determine the feasibility of a less-than-60-minute length of stay goal in consideration of higher patient acuity levels and current Super Track capacity.

“...The unpredictable nature of the ED environment — with surges in patient arrivals and high acuity — can create challenges to maintaining smooth operations. Yet the reduced Super Track census and shift toward higher acuity patients presents an opportunity to identify additional ED patient populations who might benefit from management in the Super Track area. Application of focused, Lean-based concepts can be expanded to any area within the health care realm. Educating and empowering a consistent team of professionals is the key to success.”

LINDA LASKOWSKI-JONES, MS, RN, ACNS-BC, CEN, FAWM
Vice President, Emergency & Trauma Services
A Pharmacy and Nursing Lean Six Sigma team implemented a regular process for inventory optimization and expanding AcuDose storage capacity in the busiest Emergency Department cores. The new process reduced the rate of “stock outs” per dispense by 46 percent, from 1.54 to 0.87 percent.

The Lean process was implemented to address 1.54 percent of dispenses from the automated medication dispensing cabinets resulting in a “stock outs,” or unavailability of medication during a two-month study cycle. Stock outs lead to delays in patient care, workflow interruptions and selection of suboptimal medication therapies.

Following the SIPOC high-level process (supplier, input, process, output, customer), the team studied the voice of the customer. They performed a fishbone cause and effect analysis, identified root causes and tested a number of theories of why stock outs were occurring at such a high rate per million dispenses. They created process and structural changes, including revisions to the restocking process, relocation of the AcuDose cabinet and additional staff training. The rate of stock outs per dispense dropped from 0.016 to 0.00873 (1.60 percent to .87 percent). The team created a control plan to sustain the gain.

“Lean Six Sigma Green Belt training and certification supported by Organizational Excellence provides tools and leadership training to help staff tackle challenging clinical and operational problems in a thoughtful and structured way, leading to sustainable, significant improvements.”

SCOTT SAMPLES, PharmD, MBA
Director of Pharmacy Operations

Lean Six Sigma process helps ED reduce AcuDose “stock outs”
Vancomycin Dosing by Pharmacy significantly improves guideline adherence

The Antimicrobial Stewardship Committee implemented a pharmacist-led program to improve compliance with initial vancomycin dosing and therapeutic drug monitoring guidelines. Adherence to initial vancomycin dosing guidelines increased from 29 to 95 percent, and therapeutic drug monitoring was appropriately ordered in 98 percent of cases.

The team set out to implement a provider-initiated, pharmacist-managed Vancomycin Dosing by Pharmacy (VDBP) program. Their goal: to improve initial vancomycin dosing and achieve targeted therapeutic drug levels, while reducing the incidence of vancomycin-associated nephrotoxicity.

Once the provider indicates VDBP on the computerized provider order entry (CPOE) system — providing both indication and target trough — the pharmacist reviews the medication administration record, renal function, weight and allergies, enters the vancomycin dose, and begins therapeutic drug monitoring following Christiana Care guidelines. The pharmacist follows up on serum drug levels, modifies the dose, if necessary, and documents the process via Progress Notes. The pharmacist also monitors renal function, adjusting dosing accordingly, assesses planned duration, and communicates with the provider via Progress Notes. When treatment is complete, the provider orders discontinuation of therapy.

Results represent guideline adherence improved 2.2 times from baseline. Ninety-five percent of VDBP orders followed Christiana Care initial dosing guidelines, and when dosing deviated from guidelines, the pharmacist indicated the clinical reason for deviation in the medical record 95 percent of the time. Initial vancomycin serum concentration was drawn before the third to fifth dose (steady state) in 95 percent of cases, and initial vancomycin serum concentration met the defined goal of 10-20 mcg/mL in 56 percent of the cases. Finally, the incidence of vancomycin-associated nephrotoxicity was less than 14 percent.

The team continues to promote VDBP with ongoing education to address patient safety issues, such as weight entry on admission in CPOE, and inappropriate discontinuation or re-timing of vancomycin serum levels.

They are re-evaluating recommendations for patients who fall outside the therapeutic range and considering guideline modifications for select patient populations. They also hope to expand the program to include aminoglycosides.

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**Vancomycin Dosing and Monitoring**

![Graph showing guideline adherence and target concentrations](image)

- **Baseline**
- **Target**
- **Results**

<table>
<thead>
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<th>Measure</th>
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<th>Target</th>
<th>Results</th>
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<tr>
<td>Initial vancomycin dosing guideline adherence</td>
<td>29.5%</td>
<td>95%</td>
<td>95%</td>
</tr>
<tr>
<td>Initial vancomycin serum concentration drawn before dose 3-5 (steady state)</td>
<td>25%</td>
<td>95%</td>
<td>56%</td>
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<tr>
<td>Initial vancomycin serum concentration at goal</td>
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Venous thromboembolism rate compares favorably to like hospitals nationally

*VTE-prevention measures up 26 percent*

Christiana Care increased the number of patients meeting all evidence-based standards of care for preventing venous thromboembolism (VTE) by 26 percent, from 74 percent of eligible patients to 93 percent. For several years, the Centers for Medicare and Medicaid Services (CMS) has encouraged hospitals to reduce the incidence of perioperative deep vein thrombosis (DVT) and pulmonary embolism (PE) through the value-based purchasing and hospital-acquired conditions program. These programs use the Agency for Healthcare Research and Quality (AHRQ) patient safety indicators to monitor DVT/PE rates for all hospitals nationally, while prevention of DVT/PE is tracked via the VTE process indicator set.

VTE includes both DVTs, which are blood clots of the large veins — particularly of the lower extremity — and PEs, which are blood clots that travel to the lungs and block pulmonary arteries.

Christiana Care includes perioperative DVT/PE in its rate of preventable patient harm. Efforts to reduce this rate are a priority area of our patient safety efforts. Fiscal year-to-date, the system achieved a 23 percent decrease in the number of surgical patients with a DVT or PE (from 92 to 71 patients), exceeding the annual operating plan goal of a 10 percent reduction.

Pulmonary embolism is the third most common cause of hospital-related death, and the most common preventable cause of hospital-related death. Patients are at increased risk of developing VTE if they have surgery, cancer, infection or a history of VTE, or are over age 75.
Although VTE is more likely to occur after surgical procedures, Christiana Care’s VTE Steer Committee is focused on reducing the incidence among all hospitalized patients through consistent application of evidence-based practices around assessment of patient risk for VTE at admission, as well as appropriate prevention strategies based on patient risk. The committee’s efforts have contributed to a 26 percent improvement in the percentage of patients meeting all VTE measures (composite score). The steer reviews all cases of confirmed VTE, on an ongoing basis, to identify opportunities for improvement across service lines, and is now evaluating an electronic risk assessment and prophylactic ordering system called the VTE Advisor (through PowerChart).

**VTE CORE MEASURES COMPOSITE: PERCENT OF PATIENTS MEETING EACH MEASURE**

![Graph showing improvement in percentage of patients meeting VTE measures](image)
Through education, standardization of processes and transparent sharing of individual physician and group results, a multidisciplinary team from Women’s and Children’s Health reduced the low-risk primary Cesarean delivery rate by 19 percent, from over 32 percent to 26 percent, with a cumulative cost savings of more than $490,000.

Nationwide, Cesarean delivery rates soared 60 percent from 20.7 in 1996 to 32.9 percent in 2009, prompting both The Joint Commission and Healthy People to begin looking for ways to reduce the potential overuse of Cesarean deliveries. A Healthy People 2020 goal is to decrease the Cesarean delivery rate in low-risk, first-time mothers to 23.9 percent. In 2012, The Joint Commission began requiring hospitals with more than 1,100 births per year to report Cesarean delivery rates in low-risk, first-time mothers as one in a set of five perinatal core measures.

While Cesarean deliveries are the most common operating room procedure in the U.S., a number of risks are still associated with the procedure, including surgical complications, readmissions and newborn admissions to the neonatal intensive care unit. Induction of labor — medical or elective — is associated with an increased risk of Cesarean delivery, an association strengthened with induction of labor in first-time mothers.

The multidisciplinary team conducted a 90-day rapid-cycle test, standardizing the Oxytocin order set and mandating a Bishop score of at least eight to schedule an elective induction. They reinforced existing guidelines, rested mothers not in active labor, and defined a labor algorithm adopted by physicians.

Transparency was key to the project’s success. Posters promoted “going the full 40 weeks,” while data were shared by both individual and provider groups via quarterly dashboard. Chart reviews assess ongoing efforts.

“Multiple factors contribute to the decision to deliver a woman by Cesarean. Transparency and transformational leadership are fundamental to foster adoption of best practices.”

LINDA DANIEL, MSN, RN, CPHQ
Director, Quality and Patient Safety, Women’s and Children’s Health, Team Co-Leader
The average number of NTSV mothers delivering by Cesarean is now reduced to one out of four (down from one out of three just a year ago). The team will continue to assess opportunities to follow evidence-based practices to optimize vaginal deliveries. They will research pain control alternatives to provide more options to women in labor, develop educational resources to guide and support laboring patients and significant others on low-intervention comfort measures and continue to track and refine reporting of Cesarean deliveries in the NTSV population.
Christiana Care among nation’s top for employee influenza vaccination

The World Health Organization (WHO) reports that, throughout the world, annual outbreaks of influenza (flu) result in 3 – 5 million severe cases and between 250,000 and 500,000 deaths. In the United States, most deaths from the flu occur in people over the age of 65. These statistics are concerning, especially because there is evidence that influenza is preventable through vaccination.

Christiana Care takes an active role in preventing the spread of flu. The now annual flu station “blitzes” in October helped Christiana Care reach greater than 98 percent compliance with our policy to complete the vaccination, exemption or declination forms. More than 94 percent of employees received the flu vaccine, placing Christiana Care among the top performers nationally.

More than 94% of employees received the flu vaccine, placing Christiana Care among the top performers nationally.
VNA impact on rehospitalization tops national benchmark

Patient engagement reduces rehospitalization

The 30-day rehospitalization for nearly 5,000 Medicare patients cared for by Christiana Care’s Visiting Nurse Association (VNA) is 10.9 percent compared to the national reference through vaccination of 12.4 percent for the 12-month period ending Jan. 31, 2015 (Strategic Healthcare Programs, LLC). This places the VNA in the 70th percentile ranking and supports excellent outcomes for current and future patients. There was significant impact for the inpatient diagnoses of acute myocardial infarction, heart failure, pneumonia, chronic obstructive pulmonary disease (COPD), and for home-based care following joint replacement. Rehospitalization for these patients, based on a 60-day episode of care, was 8.4 percent, compared to the national benchmark of 11.8 percent, placing the agency in the 78th percentile.

Integrated care management

Patients discharged from the hospital to VNA may expect a conference call with the clinician and manager to develop an effective plan of care. This might include a number of strategies, including frequent visits during the first 10 days of service, as well as the use of telehealth. Rhonda Combs, MSN, RN, chief operating officer, stated that understanding the patient’s goals and preferences are key to integrated care management. VNA’s new evidence-based model of care that is both person-centered and focused on care coordination. The start-of-care calls to the patient facilitate transition to home through meaningful and timely information exchange.

Engaging patients and families at the start of care has also favorably impacted patient experience scores. Four months following implementation, the VNA reached its maximum goal of 89 percent on the Home Health Community Assessment of Health Care Provider Survey (HHCAHPS). VNA is committed to working with hospital partners to continue the improvement in care transitions.
Reducing daily chest X-rays lowers cost without compromising safety

Based on the “Choosing Wisely” campaign, which encourages conversation between patients and their providers about necessary medical tests and procedures, a team of medical intensivists, critical care physician assistants and radiology specialists took on the challenge to reduce utilization of portable chest radiograph (X-ray) in the Medical Intensive Care Unit (MICU) at Christiana Hospital and in the Wilmington Intensive Care Unit (WICU). After removing the daily chest X-ray option on ICU order sets and implementing “on-demand” orders, utilization decreased by 30 percent, with no adverse impact on clinical safety. The decrease has an annual estimated cost savings of $66,293. Since the initial six-month implementation, MICU and WICU have seen further decreases in chest radiograph, with a total drop in utilization of 43 percent.

Previously, a daily chest X-ray order for nearly all patients requiring mechanical ventilation was the common practice. However, accumulating medical evidence supports that a daily chest radiograph is not required for all patients, leading the critical care societies to endorse a more targeted approach to chest X-ray utilization.

“This project demonstrates that the number of ‘routine’ tests can be reduced without an adverse impact on clinical safety.”

VINAY MAHESHWARI, M.D.
Director, Medical Critical Care
Residents in Christiana Care’s Adult Medicine Office at Wilmington Hospital used a combination of standardized huddles and performance feedback to improve compliance with diabetic foot exams from 42 to 64 percent, and increase pneumovax vaccination rates to 70 percent.

A resident teaching clinic staffed by 62 residents and 14 faculty, the Adult Medicine Office provides primary care to nearly 5,000 medically complex and often under-resourced patients. Average patient age is 48 years, with 15 percent of patients 65 or older. The patient population has a high prevalence of diabetes (18.5 percent), with 15.1 percent of those patients having peripheral neuropathy, placing them at high risk for diabetic foot ulcers. Ongoing quality measures include pneumovax use and breast cancer screening, as well as glycemic, blood pressure and lipid control, annual foot and eye exams, HA1c testing and urine microalbumin testing for patients with diabetes.

After modest improvement in several measures, progress toward compliance with diabetic foot exams and pneumovax had stalled because of unrecognized or missed opportunities to affect care during the course of scheduled patient visits. A team, including Medicine attending firm chiefs and preceptors, Medicine Categorical, Med-Peds and Emergency Medicine/Internal Medicine residents, as well as medical assistants and staff from the Adult Medicine Office, convened to address the opportunity.

Key to their plan was initiation of a “huddle,” in which residents, faculty and medical assistants informally meet at the start of each day to discuss, anticipate and prepare for patient needs. Huddles typically take 10 – 15 minutes to complete. Block time is incorporated into the schedule each morning and faculty preceptors assume responsibility for making certain that huddles are completed daily. A standardized checklist provides process uniformity and efficiency.

Resident surveys indicate improvement in both communication with staff and efficiency in care delivery, attributed to the huddle process. The huddle is associated with a significant increase in the rate of foot exams in diabetic patients (increasing from 42.5 to 63.8 percent, p<0.001); but appeared to have no effect on pneumovax rates until physician reporting was instituted, after which the rate of immunization climbed significantly, from 58.3 to 70.4 percent (p<0.001).

“With its focus on communication and efficiency, the huddle can be an effective tool when combined with provider-specific feedback on performance.”

SARAH E. SCHENCK, M.D., FACP
Medical Director, Adult Medicine Office
Jeffry Zern, M.D. demonstrates the controls of the da Vinci Robotic Surgery System.
“We’re developing intelligent clinical management built on evidence and delivered through information technology.”

RANDALL GABORIAULT
Chief Information Officer
Senior Vice President, Innovation and Strategic Development

THE ACCESSIBILITY OF DATA IS FUELING AN INFORMATION TECHNOLOGY REVOLUTION THAT WILL IMPROVE THE ABILITY TO DELIVER THE RIGHT CARE TO THE RIGHT PERSON AT THE RIGHT TIME. Working closely with state and community partners, Christiana Care is at the national forefront on such innovations as the Delaware Health Information Network. We’re also actively creating the next generation of electronic care systems, as well as building and integrating algorithms to aid the provider in predicting patient risks. These, in turn, are used to build value-driven, evidence-based interventions.
Simulation training sharpens clinical skills and understanding

Christiana Care’s second simulation center opened this year, in response to a growing demand for clinical simulation training. Complete with two high-fidelity mannequins and many simulation programs, the new center housed on the Wilmington campus has become a hub of training for family practice, minimally invasive surgery, and oral and maxillofacial surgery, among other specialties.

The health system’s first Virtual Education and Simulation Training Center on the Christiana Hospital campus opened in 2009. In the last academic year, 6,893 people trained there.

Simulation technology helps novice clinicians to gain confidence and muscle memory from practicing skills, leading to greater expertise. Well-trained practitioners use simulation to master the growing array of new technologies, such as minimally invasive surgery and catheter-based therapies, without putting patients at risk.

Simulation training was recently expanded for speech pathologists learning to perform fiberoptic endoscopic evaluation of swallowing (FEES), a procedure that involves passing an endoscope transnasally to the hypopharynx.

“Simulation training brought our FEES program to a new level of excellence,” said Dale R. Gregore, MS, CCC SLP, BCS-P, program manager, Speech Pathology. “Overall, FEES competency was attained in six-to-nine months, versus more than a year using traditional teaching methods alone.”

Experienced laparoscopic surgeons who wish to use robotics, such as the da Vinci Robotic Surgery System, agree that simulation training is important. A committee of surgeons set up standards for training on the da Vinci system, requiring two scores of 90 percent proficiency ratings on a series of 10 dexterity drills. A study of post-training performance showed that real-world results were outstanding for eight surgeons who met the training requirements.

“Simulation helps embed safety into practice.”

SUSAN COFFEY ZERN, M.D., CHSE
Director of Simulation

6,893 practitioners from a wide range of medical disciplines trained at the simulation center last year.
Using a team-based, Lean electronic clinical decision support tool embedded within the health system’s existing electronic medical record and computerized provider order entry system, Christiana Care’s Emergency Department team increased ideal antibiotic regimen (IAbxR) compliance for patients admitted with community-acquired pneumonia from 55 to 90 percent. Immediate results far surpassed the pilot’s initial goal of 75 percent compliance, achieving the long-term goal of 90 percent in the first month of implementation.

Of the 185,000 total ED visits each year in Christiana Care’s three emergency departments, 2,000 are for patients presenting with symptoms of pneumonia. Sixty percent of those patients are admitted to the hospital and placed on an IV antibiotic regimen. Prior to introduction of the new antibiotic stewardship program, providers relied on various reference materials to determine which IAbxR to use. Thirteen care set options led to variation in care. Compliance was also impacted by errors in “classification” of pneumonia. Percentage of compliance required random chart review.

Championed by Emergency Medicine physician Paul Sierzenski, M.D., RDMS, the new electronic tool guides providers through such critical decisions as which antibiotic to use, when the patient may be safe for discharge and further steps in the care of complex disease. It also establishes electronic data and query capabilities for quality measurement, performance improvement and provider feedback.

The team hopes to expand the clinical decision support tool to standardize IV antibiotic regimen compliance for urinary tract infections, cellulitis and abdominal infection.

“Survival and quality of care are directly related to the selection of the ideal stewardship program. This is helping to address patient care, mortality, length of stay, cost of care and to reduce side effects.”

PAUL SIERZENSKI, M.D., RDMS
Emergency Medicine Physician
Sepsis advisory trigger tool identifies risk, improves care

An electronically driven sepsis advisory system piloted on five patient care units provides early warning of sepsis, improves nurse and provider awareness of risk, drives more timely treatment and is improving outcomes for many of Christiana Care’s most critically ill patients.

While Christiana Care has followed an award-winning sepsis alert process and pathway since 2004 in its Emergency Departments, no specific process existed to identify inpatients with — or at risk for — sepsis. Recognizing that sepsis is associated with higher mortality than acute myocardial infarction, stroke or trauma, a Christiana Care inpatient sepsis advisory trigger team set out in December 2013 to create a pathway to identify at-risk patients and ensure greater process compliance.

The sepsis advisory created by the Surviving Sepsis Inpatient Collaborative fires a trigger-based algorithm using PowerChart electronic medical record (EMR) data, monitoring Systemic Inflammatory Response Syndrome criteria, including temperature, heart rate, respiratory rate and white blood cell count, as well as signs of organ dysfunction, including creatinine, blood pressure, bilirubin and lactate levels.

Clinical evidence has shown that delays in the recognition and treatment of sepsis can result in adverse outcomes.

Every one-hour delay in antibiotics leads to a roughly 7% increase in mortality.

SEPSIS ADVISORY: OUTCOME MEASURES

* RRT = Rapid Response Team
A pop-up advisory on the patient’s EMR triggered by the sepsis alert system notifies the nurse, who notifies the physician for clinical decision making. The eCare telemonitoring system also receives a page message indicating either Tier 1 advisory (to be addressed within 30 minutes) or Tier 2 (to be addressed within 90 minutes).

The team also measured outcomes for Rapid Response Team calls, transfers to the intensive care unit, mortality and length of stay, all of which dropped as a result of more timely sepsis alerts.

The pilot resulted in 807 sepsis advisories; 426 of them first advisories for that patient. Median length of stay dropped to 11 days; mortality to 8.9 percent. Rapid Response Team calls 24 hours before or after the sepsis advisory decreased to 18.5 percent, and the number of patients transferred to intensive care was 12.7 percent. Antibiotic use rose to 69.2 percent.

The trigger tool launched over an eight-month period between December 2013 and August 2014. At the time of “go-live,” piloted units included surgical trauma unit 2C, medical pulmonary stepdown unit 3D, medical teaching unit 5A and oncology unit 6B, all at Christiana Hospital. Medical unit 5B, also at Christiana Hospital, joined the pilot in July 2014.

“An electronic trigger tool can be successfully implemented with minimal disruption in nursing workflow, but the true effectiveness of any early warning tool requires education and awareness on multiple levels,” said Vinay Maheshwari, M.D., director of Critical Care. “Obtaining data, data analysis and building rapport takes more time and manpower than anticipated, and active engagement of physicians and providers in such an undertaking is crucial. In the end, the process led to discussion, collaboration and learning.”
Christiana Care is leveraging technology to reduce an average of three unintentional acetaminophen overdoses per day with an electronic dose calculator and overdose alert system embedded in the existing electronic medication administration record (eMAR).

An interdisciplinary team representing Nursing’s Quality and Safety Council, the Medication Safety Committee and Information Technology developed and implemented the scanning technology to negate the need for nurses to manually calculate the amount of acetaminophen that a patient receives daily, whether as a single ingredient, or as part of combination medications, such as Percocet (oxycodone and acetaminophen) or Vicoden (hydrocodone and acetaminophen). Over a three-month pilot of the scanning technology, no acetaminophen overdoses were reported in the acute-care setting.

Acetaminophen is one of the most commonly used analgesic and antipyretic agents. Although safe when administered at therapeutic levels, adverse effects are associated with exceeding the FDA’s daily recommended four-gram dose. In fact, acetaminophen toxicity is one of the most common causes of unintentional poisoning, leading the FDA to update recommendations regarding acetaminophen use to help improve patient safety. To align with FDA recommendations, Christiana Care has reduced the amount of acetaminophen in combination products to 325mg.

Prior to the eMAR scanning technology, the acetaminophen calculation process required the nurse to manually calculate the total doses of acetaminophen given in the previous 24 hours from all acetaminophen-containing medications (including both PRN and scheduled doses) before giving a medication containing acetaminophen.

“Manual calculations are inefficient and have potential for error,” said Dean Bennett, RPh, CPHQ, Christiana Care’s medication safety officer, referring to the 633 calculations that occur each day. “Leveraging technology to prevent human error is vital to improve patient safety.”

Gwen Ebbert, MSN, BA, RN-BC, staff education specialist from Nursing’s Quality and Safety Council, added, “By leveraging technology with safety features already embedded in the normal nursing workflow, we were able to implement a high-reliability process that signals a ‘hard stop’ when the recommended daily dose of acetaminophen has been reached. This Lean process offers an increased safety layer that improves patient safety outcomes.”

In the 11 months following implementation, there was only one report of acetaminophen exceeding the four-gram daily recommended dose. Chart review of that case indicated that proper medication administration procedures were not followed — the medication was administered prior to being scanned, bypassing both calculation and alert.

“This underscores both the value and importance of following the proper scanning procedure prior to administering medications,” Bennett said. ■

**In June and July 2014, 38,038 doses of acetaminophen were screened by electronic calculation. Alerts prevented 187 acetaminophen overdoses.**
Bridging the Divides fully integrated with Delaware Health Information Network

Pioneering technology enables preemptive intervention

Christiana Care’s transformative Bridging the Divides program, which helps patients with ischemic heart disease transition successfully from hospital care and improve their long-term health, is now fully integrated with the Delaware Health Information Network (DHIN).

This monumental achievement allows care managers to obtain updates on any new medical information, at any time, from any one of the 2,000 patients in the Bridges program — from any place within the state of Delaware.

“This is by far the most innovative step in the development of Bridges,” said Terri Steinberg, M.D., MBA, chief medical information officer for Christiana Care. “We are now able to act on data that are generated both within our walls and anywhere in the state of Delaware outside our walls.”

This milestone also represents significant progress toward the program’s fundamental goal of achieving medicine’s Triple Aim: better health care, better patient experience and reduced costs.

“This technological breakthrough is vital to the creation of a new standard of care delivery,” said Randall Gaboriault, chief information officer and senior vice president of innovation and strategic development, and chair of DHIN. “Bridges now has accomplished the goal of advancing information through pioneering technology to enable preemptive intervention in the lives of patients who would otherwise be at risk of readmissions and the costs and disruptions they produce.”

Created through a public/private partnership in 1997, DHIN is the first operational statewide health information exchange in the nation. Led by Christiana Care, it was funded, in part, by a three-year $10 million award from the Center for Medicare and Medicaid Innovation (CMMI).

Through the project, Christiana Care uses big-data plying technology — powerful enough to tap into all available sources of data — including clinical activity, lab results and pharmaceutical use — on each individual patient to unearth relevant predictive patterns and facts to improve patient care. Christiana Care uses the information provided through this technology to ensure patients can safely transition from acute-care settings to their homes for follow-up care.

Learnings from this work serve as the foundation for efforts in population health management.
ECRI Institute honored Christiana Care with its 9th annual Health Devices Achievement Award for a new national guideline-driven provider ordering process leading to more appropriate telemetry use in non-intensive-care settings.

The new process achieved an immediate 43 percent reduction in the number of weekly telemetry orders for patients, a 47 percent reduction in the average telemetry hours per monitored patient, a 70 percent reduction in the daily telemetry census, and an estimated annual savings of $4.8 million — numbers all sustained to date with no increase in cardiac/respiratory arrest codes or Rapid Response Team calls.

While the benefits of telemetry are real in appropriate patients, studies indicate that cardiac and respiratory codes are rare events outside of the intensive care unit (ICU). An interdisciplinary telemetry
“This redesign helps us provide the right care for the right patient for the right amount of time, and allows staff to focus their tasks at the bedside without interruption.”

ANDREW J. DOOREY, M.D.
Cardiologist and Process Champion for Telemetry Ordering Redesign

In one study period, fewer than 1 percent of alarms from the central telemetry monitoring system were for emergent issues — the vast majority were for technical malfunctions such as loose leads or low batteries. Interruptions caused by these false alarms pull nurses from necessary bedside clinical care duties. Being tethered to a telemetry unit disrupts patient sleep, restricts mobility and increases risk of patient falls, especially among the elderly.

“Responding to false alarms is not only a huge drain on nursing resources, it’s detrimental to the care of the average patient,” said medical cardiologist Andrew J. Doorey, M.D., who championed the process redesign. “Reducing telemetry use by 70 percent on a daily basis equates to more than 115 hours of nursing time saved every day at Christiana Care alone. That’s massive, and we didn’t see any increase in harm to patients.”

In cases where telemetry does not have clinical benefit, the team took the ability to order it out of the order set, creating a category called “other” so doctors can still order telemetry if they have a bedside clinical concern. It’s limited to 24 hours in duration and can be reordered if clinical concerns persist.

Christiana Care published its telemetry management study as a Research Letter in the Sept. 22, 2014 issue of JAMA Internal Medicine.

**IMPACT ON CARDIAC TELEMETRY UTILIZATION:**

*NUMBER OF TELEMETRY HOURS PER MONITORED PATIENT*

*When AHA guidelines applied to order sets in PowerChart*
Secure messaging system improves staff communication

The future is mobile

Early adopters in Christiana Care’s Communications Improvement Project report that a new secure messaging system is fast, efficient and easy to use.

The Vocera Secured Messaging system allows users to send, receive and share texts and images that are compliant with HIPAA regulations. Users can receive and send text messages and alerts via smartphones or a web-based console, eliminating the uncertainty of paging.

“A big improvement is two-way messaging, versus one-way paging,” said Lonie Sculley, project manager, Information Technology. “There’s also a mechanism so users can see if the message was sent, delivered, opened and responded to.”

In a pilot, 22 members of the Visiting Nurse Association (VNA) — a mix of clinicians in the field using smartphones and schedulers on PCs in the office — tested the system.

“Secure messaging is much faster and gets answers to our patients faster,” said Jennifer Rittereiser, MPH, VNA branch director.

The system is already showing results, with 58 percent of chats receiving a response in two minutes or less.

Anesthesiology is one of the groups who will benefit from the technology that eliminates the delays sometimes associated with overhead pages, which are not always heard clearly.

“We can text a number of people if we need help in a hurry,” said Elias T. Chua, M.D. “An anesthesiologist may be covering as many as three rooms at a time,” he said. “This helps us to be more efficient in caring for patients, and also adds to patient safety.”

“The future is mobile,” said Karen Gifford, director of Information Technology. “Don’t be surprised in the coming years when you see clinicians using an iPhone to access clinical information, administer meds, monitor alarms and communicate.”
New technology, second-generation upgrades improve medication safety

Improved medication preparation and dispensing technologies, including DoseEdge, implemented by Christiana Hospital’s Intravenous (IV) Admixture Service, and PROmanager-Rx, a second-generation bar-code-driven robotics storage and dispensing system, are increasing the accuracy and safety of preparing and dispensing medications at Christiana Care.

**DoseEdge streamlines workflow, enhances sterile product preparation**

DoseEdge introduces bar-coded ingredient identification, automatic dose and dilution calculations, and remote video verification technology into the IV room production process. This technology enhances the safety of sterile product preparation, while streamlining the workflow.

Pharmacy Services plans to expand DoseEdge technology to the Wilmington Hospital campus and to the preparation of oral medication syringes for the Neonatal Intensive Care Unit (NICU) at Christiana Hospital.

**The combined nightly prescription cart fill at Christiana and Wilmington hospitals is about 7,500 doses — 95 percent of which are filled by PROmanager-RX automation system.**

**74,000 adult IV DoseEdge doses are prepared each year at Christiana Hospital.**

**PROmanager-RX upgrades unit-dose repackaging device**

PROmanager-Rx, a second-generation bar-code-driven robotics system, fully automates storing and dispensing of up to 12,000 unit-dose tablets and capsules. The new technology integrates seamlessly with bar-coded medication administration (BCMA) currently used by Nursing. It will not dispense an expired medication or a dose with a missing bar code.

**Carefusion Alaris Infusion Pumps/GuardRails prevent infusion errors**

By replacing more than 1,500 large-volume infusion pumps and completely transitioning to CareFusion Alaris Smart Pump technology, Nursing is now able to fully leverage GuardRails, a mature Smart Pump drug library platform, to help prevent infusion errors. The transition also lays the foundation for additional high-priority medication safety systems improvements.

In fiscal year 2016, GuardRails will become fully interoperable with Cerner PowerChart, the BCMA scanning process and the electronic medication administration record (eMAR). This upgrade will push programming to the pump directly from the computerized provider order entry (CPOE), nearly eliminating the need for manual programming. Infusions will be directly documented to the eMAR from the pump. Adult dumb syringe pumps are projected to be replaced with CareFusion Alaris smart syringe delivery in FY16-17.

**CareFusion Alaris “smart” syringe modules replacing “dumb” syringe pumps are helping to prevent medication errors in one of our most vulnerable populations.**

**Usability testing leads to safer use of technology**

Researchers in the Value Institute’s new usability lab are using simulation technology within the Virtual Education and Simulation Training (VEST) Center to detect and analyze potentially dangerous conditions inherent in the complex design of infusion pumps that can cause, or allow, avoidable errors. Answers will help the team develop a systemwide expansion of the technology.

Human factors approaches underpin current best practices in patient safety and quality-improvement science, offering an integrated, evidence-based, coherent approach to improving the science behind health care delivery. The demand for usability testing, which is the formal method of systematically observing and recording representative members of real end-users performing real tasks, is becoming increasingly important as health care moves toward a commitment to zero patient harm and higher-value care.

Evidence discovered in usability testing will be used to support the selection and implementation of safe, user-friendly medical products and develop solutions that improve the usability of tools and systems.
Consortium membership improves performance benchmarking

In 2014, Christiana Care joined the University HealthSystem Consortium (UHC), an alliance of more than 460 academic medical centers, teaching hospitals and faculty practice plans that collaborate to drive advancements in patient care, medical knowledge and fiscal acuity. Collaboration starts with transparency in the Clinical Data Base/Resource Manager (CDB/RM). UHC members openly share patient-level clinical, safety and financial data, allowing accurate benchmarking of performance with peers. Rigorous risk-adjustment methodologies assure “apples-to-apples” comparison.

Since implementing the CDB/RM in July 2014, Christiana Care has submitted more than 126,000 inpatient, and more than 1 million non-inpatient records, covering discharges from January 2013 through March 2015. UHC provides several sets of reports that enable leaders to monitor quarterly performance of quality, safety and financial performance relative to other academic medical centers.

In addition to the standard reports, 160 users have run more than 2,000 ad hoc reports, analyzing everything from patient outcomes to resource utilization. The reports provide extensive data to identify opportunities and support the improvement efforts of value improvement teams, departments and service lines throughout the health system.
Patient Safety launches intranet website

In November, 2014, the Office of Quality & Patient Safety launched a new Patient Safety website to keep staff informed and provide resources to advance patient safety efforts and reduce preventable harm.

The site includes the following patient safety-related information:

- Progress with preventable harm goal.
- Safety First alerts.
- Post-event debriefs.
- Safe practice behavior tools.
- Frequently asked questions.
- Educational resources.
- Root-cause analysis toolkit.
- “No Harm Intended: Lessons Learned” in patient safety video archives.

As of April 2015, there were already more than 12,000 page views, with an average of 96 pages viewed per day. The top pages viewed include Safety First Alerts, Safe Practice Behaviors and Post-Event Debriefs.
Care Link hub supports safe transitions

Care Link, which pairs patients with care managers who help navigate and coordinate hospital, physician, community and support services, stems from the Center for Medicare and Medicaid Innovation’s $10 million grant for the Bridging the Divides project, an important population health effort to improve patient outcomes and lower costs for patients with ischemic heart disease.

In the first four months, a virtual hub of interprofessional Care Link professionals contributed to significant reductions in the percentage of patients with unplanned returns to the hospital after discharge. The seven-day readmission rate for 650 Care Link-managed patients was 1.4 percent between November 2014 and March 2015, compared to 2.8 percent for elective surgical patients not managed by Care Link (p=0.04). Fewer than 2 percent of patients had any planned return, including observation and emergency room visits, compared to 4.5 percent of other elective surgical patients (p=0.0007).

Care coordination workflow and documentation is managed through the Aerial IT platform, a population health management

READMISSIONS AND REVISITS: WITHIN SEVEN DAYS OF DISCHARGE

Readmission Rate: Percent of patients with an unplanned (urgent or emergency) inpatient admission.

Unplanned Revisits: Percent of patients with an unplanned inpatient, observation or emergency room encounter.
system offering evidence-based enrollment, follow-up questionnaires and tasks, evidence-based care plans and reporting. Aerial supports innovative bi-directional flow of real-time data from sources both within, and outside of Christiana Care, such as physician offices, the Delaware Health Information Network and patients themselves.

These real-time data are housed in a platform called Neuron, which uses artificial intelligence and machine learning technology to construct predictive models. As Care Link advances beyond Bridging the Divides, the predictive analytics will provide real-time levelling, triggers, alerts and tasks to Care Link team members.

Launched in November 2014, Care Link Surgery provides patient-centered coordination for patients having elective surgery who are deemed at high risk due to complex medical or psychosocial factors. The Care Link team supports patients from pre-admission through 30-days-post-hospital-discharge, focusing on evidence-based practice guidelines and patient-empowerment strategies to help improve outcomes.

Strategies include:
- Integration with the patient and perioperative services, acute care services, post-discharge services and the patient’s physicians to provide a seamless, high-quality experience throughout their episode of care.
- Proactive identification and management of the patient’s expectations and coordination of services post-discharge.
- Pharmacist review, reconciliation and intervention to more effectively manage medications.

Patients are screened and assessed for risk by the Perioperative Evaluation and Preparation (PEP) Department, Care Link hub care managers, or referred by surgeons. The risk process assigns an intensity of service level based on medical and psychosocial factors, such as insurance status, number of medications, primary language and co-morbid conditions.

During the pre-operative phase, the team focuses on patient optimization for surgery. While in the hospital, the team facilitates patient care via evidence-based pathways, and manages variance to the care path. Care managers then assist with transition planning by coordinating post-discharge needs, services and appointments. Patients are followed longitudinally, based on the determined intensity of service level, for 30 days post-discharge.

In January 2015, Care Link Surgery was expanded to focus on Medicare patients having joint replacement, cervical spine or cardiac valve surgery as part of the CMS bundled payment program. In July, Care Link will assume responsibility for a population of Medicaid patients, and a myriad of population health programs will move under the Care Link umbrella.

<table>
<thead>
<tr>
<th>MEDICATIONS ADDRESSED BY PHARMACIST</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspirin 57%</td>
</tr>
<tr>
<td>Pain Meds 5%</td>
</tr>
<tr>
<td>Morphine 5%</td>
</tr>
<tr>
<td>Flagyl 5%</td>
</tr>
<tr>
<td>Brilinta 5%</td>
</tr>
<tr>
<td>ARB 5%</td>
</tr>
<tr>
<td>Acetominophen 5%</td>
</tr>
<tr>
<td>Pradaxa 10%</td>
</tr>
<tr>
<td>Warfarin 5%</td>
</tr>
</tbody>
</table>

**PHARMACIST INTERVENTION REASONS**

- Pre-Op Hold of Medications
- Discharge Medication List
- Oversedation
- Pain
- Restarting Medications after Discharge
- Medication Tolerance
- Help Obtaining Medications

Care Link pharmacist review of patient medications before and after surgery help assure patient safety.
New iRound technology on mobile devices helps nurse leaders engage in more purposeful interactions with patients during daily rounds and leads to care that is more responsive to patient needs.

Piloted on 31 patient care units in 2014, the iRound Patient Experience allows nursing leaders to collect real-time data and respond immediately to patient needs. Rounds logged to-date have already exceeded 100,000.

While rounding with patients and their families, nurses record answers to structured questions on iPads. When problems are identified, iRound sessions allow the nurse to respond immediately with empathy, apologize for what has occurred and work with staff to set the matter right.

“With the iRound, we have a data collection device that allows us to react in the moment to improve patient care,” said Pamela Boyd, MSN, RN, CNOR, senior program manager, Patient Experience.

For example, if a nurse discovers a physical problem in a patient’s room, she or he can take a picture with the iPad and send it to the appropriate department, giving the repair team members a clear sense of what they are called on to do. The goal is to address the issue quickly and communicate to the patient that it is being corrected, preferably before the patient leaves the hospital.

While iRound standardizes the process of asking about a patient’s experience, “It’s the human touch of entering into a conversation, where we show our concern, that makes all the difference,” said Dennis Harris, MSN, RN-BC, nurse manager on 6A.
The new rounding process is helping improve scores on the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) national survey of patient experience. Patients who have at least one interaction with a member of the senior nursing staff during iRounds are four times more likely to return their HCAHPS surveys, according to a study by the Patient Experience team and Value Institute. They are also more likely to give us “top box” scores for the following key questions: Rate the Hospital 0-10; Recommend the Hospital to Friends and Family; and Nurses Listening Carefully.

The Christiana Care Value Institute is conducting research regarding optimal training for learning to iRound. One aspect of research looked at the effects of an innovative nurse training module carried out by the Virtual Education and Simulation Training Center. The team created videos featuring standardized patients — individuals trained to act as hospital patients in simulation training — showing nurse leaders giving three types of the iRound experience: poor, mediocre and excellent. The “patients” wore Google Glass, with a head-mounted display, to record the patient’s-eye-view of the varying experiences.

“It was exciting to bring that kind of technology into a training event like this,” said Michael Azzolina, simulation technology specialist, who provided technical support in the use of Google Glass. “It helped give the learners a different perspective, allowing them to see themselves from the patients’ point of view, which can be a very valuable tool in training someone how to interact with the public. We’re always looking for ways to leverage technology such as Google Glass to make education more engaging and more effective.”

“The unique design of this project allowed us to combine cutting-edge technology and simulation to train for an optimal interaction with patients,” said Susan Coffey Zern, M.D., CHSE, director of the Virtual Education and Simulation Training Center.

“Equipping our nurse leaders with this easy-to-use technology is the perfect way to balance purposeful rounding while building relationships with patients and their families.”

SHAWN R. SMITH, MBA
Vice President, Patient Experience
Christiana Care’s annual Focus on Excellence Awards program, which highlights the best efforts and improvements and successes achieved during the past year, marked its 12th anniversary at the January 2015 celebration.

The President’s Award recognized a team from the Wilmington Intensive Care Unit for their successful effort in reducing Clostridium difficile.
Wilmington Intensive Care Unit wins President’s Award for C. diff reduction

The Wilmington Intensive Care Unit (WICU) won the 2014 President’s Award for “The Brown Battle Reduction of WICU-Acquired Clostridium difficile Rates.”

Clostridium difficile (C. diff) is recognized as the most common cause of nosocomial infectious diarrhea. According to the National Institutes of Health, the morbidity and mortality associated with C. diff is increasing at an alarming rate, especially among the critically ill. After identifying an increasing incidence of hospital-acquired C. diff, the WICU team went on the offensive, introducing the WICU C. diff Bundle, which includes environmental monitoring with swabbing, improving staff awareness of C. diff and swabbing results, hand hygiene, antibiotic stewardship and stop dates, and proton pump inhibitor (PPI) stewardship.

WICU achieved environmental monitoring results of “safe” for all swabbed items, 95 percent hand-hygiene compliance, a 29 percent reduction in antibiotics and a 22 percent reduction in dispensed proton pump inhibitor. WICU has had no cases of C. diff since implementing the bundle in March 2014.

The team took top honors among 35 awards culled from 146 plan-do-check-act projects representing the system’s best interdisciplinary performance improvement efforts.

The keynote speaker at the award ceremony was teen patient advocate Morgan Gleason, who offered her powerful perspective on what it truly means to provide patient-centered health care. Gleason, 16, of Florida, gained national attention when her YouTube monologue, “I am a patient and I need to be heard” went viral in 2014.

“The quality of the work just keeps getting better and better, and reflects our understanding as an organization of what it means to live The Christiana Care Way… helping our neighbors live the lives they want to live and doing it in ways that are affordable, safe and valuable. These awards exemplify the concept of innovation in creating value for patients and their families.”

JANICE E. NEVIN, M.D., MPH
President and CEO

The WICU team took top honors among 35 awards culled from 146 plan-do-check-act projects representing the system’s best interdisciplinary performance improvement efforts.

Patient advocate
Morgan Gleason
### Focus on Excellence awards

<table>
<thead>
<tr>
<th>2014 AWARD</th>
<th>PROJECT TITLE</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRESIDENT’S AWARD</td>
<td>The Brown Battle: Reduction of WICU - Acquired Clostridium difficile Rate</td>
<td>The WICU Value Improvement Team focused on increasing staff awareness and minimizing contributing factors through a C. diff “bundle.” Environmental monitoring results of “safe” for all items swabbed, 95 percent hand hygiene compliance, 29 percent reduction in antibiotics and a 22 percent reduction in dispensed proton pump inhibitor. After implementing the bundle, WICU had zero cases of C. diff for more than nine months.</td>
</tr>
<tr>
<td>VALUE AWARD</td>
<td>Is that Chest Radiograph Really Needed? Let’s Choose More Wisely</td>
<td>This team of medical intensivists, critical care physician assistants and radiology specialists sought to reduce portable chest radiograph utilization in MICU &amp; WICU based on the “Choosing Wisely” campaign. After removing the daily chest X-ray option on ICU order sets and implementing on-demand orders, utilization dropped by 30 percent, with no adverse impact on clinical safety. The decrease has an annual estimated cost savings of $66,293.</td>
</tr>
<tr>
<td>CLINICAL EXCELLENCE AWARD</td>
<td>Gold</td>
<td>Christiana Care Cardiology Consultants Transitional Care Program</td>
</tr>
<tr>
<td>VALUE AWARD</td>
<td>The Impact of Performing Active Surveillance on Known MRSA+ Patients Admitted to Christiana Hospital</td>
<td>Infection Prevention, Nursing and the Value Institute investigated the clinical, psycho-social and cost impacts of performing active surveillance on known MRSA+ patients on seven patient care units to allow discontinuation of contact isolation. Over a nine-month period, the units admitted 211 patients previously identified as MRSA+. Of the 162 patients able to complete screening, 80 percent were cleared. A total savings of more than $101,000 is attributed to the project.</td>
</tr>
<tr>
<td>CLINICAL EXCELLENCE AWARD</td>
<td>Silver</td>
<td>Impact of Multidisciplinary Team Approach on Cardiac Care Unit Patient Outcomes</td>
</tr>
<tr>
<td>CLINICAL EXCELLENCE AWARD</td>
<td>Bronze</td>
<td>Let’s Get Rid of Those Bugs: Organizing a VIT to Improve Outcomes Related to Sepsis</td>
</tr>
<tr>
<td>CLINICAL EXCELLENCE AWARD</td>
<td>Honorable Mention</td>
<td>Chronic Obstructive Pulmonary Disease (COPD) Care Improvement</td>
</tr>
<tr>
<td>SAFETY FIRST AWARD</td>
<td>Vancomycin Dosing by Pharmacy Project</td>
<td>The Antimicrobial Stewardship Committee implemented a pharmacist-led program to improve compliance with initial vancomycin dosing and therapeutic drug monitoring guidelines. Adherence to initial vancomycin dosing guidelines increased from 29 to 95 percent, and therapeutic drug monitoring was appropriately ordered in 98 percent of cases.</td>
</tr>
<tr>
<td>SAFETY FIRST AWARD</td>
<td>Implementation of an Electronic Sepsis Advisory Trigger</td>
<td>The Sepsis Advisory Trigger Team implemented an electronic trigger that pulls patient data from the electronic health record to assist in the early identification and treatment of patients with sepsis. The trigger identified 426 patients; 27 percent had lactates measured, 69 percent received antibiotics, a Rapid Response Team was called for 18 percent of cases, and 13 percent were transferred to an ICU.</td>
</tr>
<tr>
<td>2014 AWARD</td>
<td>PROJECT TITLE</td>
<td>RESULTS</td>
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<tr>
<td>EMPLOYEE SAFETY AWARD</td>
<td>10-Year Longitudinal Study on the Effectiveness of Ceiling-Mounted Lifts</td>
<td>A PEEPS team measured the effectiveness of ceiling-mounted lifts in reducing work-related pain resulting from patient mobilization tasks over a 10-year period on 5B. The number of staff reporting no pain at the end of shift increased from 28 percent three months post-installation to 40 percent at 10 years. Pain less than or equal to four on a scale of 10 increased from 65 to 81 percent.</td>
</tr>
<tr>
<td>THINK OF YOURSELF AS A PATIENT AWARD</td>
<td>Patient Relations Ambassadors: Making Connections One Patient at a Time!</td>
<td>Volunteer Services, Patient Relations and Patient Experience staff teamed to combine two existing programs into one that uses qualified volunteers to warmly welcome all patients within 48 hours of admission. In the first seven months of the program, 21 Patient Relations ambassador volunteers welcomed more than 10,000 patients systemwide.</td>
</tr>
<tr>
<td>THINK OF YOURSELF AS A PATIENT AWARD</td>
<td>Communication Innovation: Patient-Centered Bedside-Shift Report</td>
<td>4N enhanced the format of bedside shift report, changing their focus from a nurse-to-nurse report to a patient-centered conversation. Nurse communication scores increased by 5.3 percent, from 76 to 80 percent, and both nurses and patients reported increased satisfaction with bedside shift report.</td>
</tr>
<tr>
<td>THINK OF YOURSELF AS A PATIENT AWARD</td>
<td>Improved Hospital-to-Community Transitions</td>
<td>Christiana Care’s Complex Discharge Team collaborated with state and community colleagues through the Delaware Care Transitions Team to improve the discharge resource options and decrease the number of non-acute days complex patients spend in the hospital. Successful partnerships led to a 10 percent decrease in the average number of patient days for long-stay patients.</td>
</tr>
<tr>
<td>THINK OF YOURSELF AS A PATIENT AWARD</td>
<td>A NICU Journey Toward Patient- and Family-Centered Care</td>
<td>The NICU Patient- and Family-Centered Care team was formed to improve patient/parent experience in the NICU. Changes included group discharge classes, a volunteer ambassador program to orient new families to the NICU, physical environment improvements, post-discharge phone calls and change leaders to model staff behavior. Patient satisfaction improved from the 19th to the 74th percentile.</td>
</tr>
<tr>
<td>FINANCIAL STRENGTH AWARD</td>
<td>Increase the Admissions Conversion Rate for the Center for Rehabilitation at Wilmington Hospital</td>
<td>The Center for Rehabilitation at Wilmington Hospital increased the percentage of rehabilitation consults that convert to inpatient admissions from 30 percent to more than 32 percent, an annual increase of 30 admissions. The improvements were the result of a Rehab huddle, an admission algorithm and care coordinator rounding.</td>
</tr>
<tr>
<td>EMPIRICAL OUTCOMES AWARD</td>
<td>Possible Side Effects Include Patient Satisfaction and Knowledge</td>
<td>4E Cardiovascular Stepdown implemented a teach-back patient evaluation tool and inservice program to improve patients’ understanding regarding medications and their side effects. HCAHPS top box scores for “nurse explains in a way you can understand” increased from 64 to 81 percent, and the Medication Communication domain score increased from 53 to 66 percent.</td>
</tr>
<tr>
<td>NEW KNOWLEDGE, INNOVATIONS &amp; IMPROVEMENTS AWARD</td>
<td>Leveraging Technology to Provide Safe Care with Acetaminophen Administration</td>
<td>Medication Safety, Nursing and IT eliminated the incidence of unintentional acetaminophen overdoses through electronic running-dose calculations and a handheld scanner alert that prevents excess doses from scanning.</td>
</tr>
</tbody>
</table>
## Focus on Excellence Awards

<table>
<thead>
<tr>
<th>2014 Award</th>
<th>Project Title</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NEW KNOWLEDGE, INNOVATIONS &amp; IMPROVEMENTS AWARD</strong></td>
<td>Controlling Blood Glucose Levels of Post CABG/Valve Replacement Patients</td>
<td>The Cardiovascular Critical Care Complex unit-based Surgical Care Improvement Project (SCIP) team implemented new processes to meet changing Centers for Medicare and Medicaid Services requirements for controlled blood glucose levels following open-heart surgery. The team reached 100 percent compliance in three out of five months following the definition change.</td>
</tr>
<tr>
<td><strong>NURSING – EXEMPLARY PROFESSIONAL PRACTICE AWARD</strong></td>
<td>Successful Integration of the Palliative Care and Heart Failure Teams</td>
<td>The Heart Failure and Palliative Medicine teams collaborated to enhance supportive care for patients at high risk for heart failure. Palliative Medicine consultations increased from 2.5 to 19 percent; documentation of goals of care occurred two days earlier in the hospital stay and hospice referrals increased from 4.5 to 9.5 percent of heart failure patients receiving the supportive care consult.</td>
</tr>
<tr>
<td><strong>NURSING – EXEMPLARY PROFESSIONAL PRACTICE AWARD</strong></td>
<td>Call Backs to Reduce Come Backs</td>
<td>The Center for Advanced Joint Replacement implemented post-discharge phone calls by a registered nurse to improve the transition from hospital to home and reduce readmissions. Following implementation of the calls, the readmission rate decreased from 3.8 to 2.7 percent.</td>
</tr>
<tr>
<td><strong>NURSING – EXEMPLARY PROFESSIONAL PRACTICE AWARD</strong></td>
<td>Decreasing ED Blood Culture Contamination</td>
<td>The Microbiology Lab teamed with the Christiana Emergency Department to reduce contamination during blood draws using Lean Six Sigma. By changing the skin preparation process to include an additional cleansing step, the team reduced the blood culture contamination rate to 0.8 percent, compared to 4.2 percent for a control group.</td>
</tr>
<tr>
<td><strong>NURSING – STRUCTURAL EMPOWERMENT AWARD</strong></td>
<td>Demystifying the Certification Process</td>
<td>The Surgical Critical Care Complex Professional Nurse Committee and staff development specialist simplified the process of certification payment and application, made study resources available, and offered encouragement and support to those interested in certification, resulting in the certification of 14 additional nurses within nine months.</td>
</tr>
<tr>
<td><strong>NURSING – TRANSFORMATIONAL LEADERSHIP AWARD</strong></td>
<td>Transparency Drives Results “Reducing C/S Delivery Rates for New Moms”</td>
<td>Through education, standardization of processes and transparent sharing of individual physician and group results, this Women &amp; Children’s team reduced the low-risk Cesarean delivery rate by 20 percent, from over 32 percent to 25 percent, with a cumulative cost savings of more than $490,000.</td>
</tr>
<tr>
<td><strong>NURSING – TRANSFORMATIONAL LEADERSHIP AWARD</strong></td>
<td>On-site Ultrasound Improves Patient and Staff Experience</td>
<td>The OB Triage Value Improvement Team eliminated 40 minutes of transport time, reduced wait times and provided immediate access to diagnostic studies by embedding ultrasound within OB Triage, with no capital outlay and no additional full-time employees.</td>
</tr>
<tr>
<td><strong>NURSING – TRANSFORMATIONAL LEADERSHIP AWARD</strong></td>
<td>Changing the Culture of Restraining Patients</td>
<td>The Adult Critical Care Unit Value Improvement Team collaborated to reduce restraints while maintaining patient safety. All five ICUs maintained restraint prevalence below national benchmarks for more than a year; decreased self-extubations associated with restraints by 42 percent; and decreased the number of patients requiring reintubation by 28 percent.</td>
</tr>
<tr>
<td>2014 AWARD</td>
<td>PROJECT TITLE</td>
<td>RESULTS</td>
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</tr>
<tr>
<td>LEARNING EXCELLENCE AWARD Gold</td>
<td>Simulation: Right Under Your Nose!</td>
<td>Speech pathologists worked with the Virtual Education and Simulation Training Center to assess the impact of simulation training using human patient simulators on fiberoptic endoscopic evaluation of swallowing assessments. Simulation training increased the group’s ability to pass the endoscope and reduced the amount of time the procedure took.</td>
</tr>
<tr>
<td>OPERATIONAL IMPROVEMENT AWARD Gold</td>
<td>Reduce AcuDose Stock Outs in the Christiana Emergency Department</td>
<td>A Pharmacy and Nursing Lean Six Sigma team implemented a regular process for inventory optimization and expansion of AcuDose storage capacity in the busiest Emergency Department cores, reducing the rate of stock outs per dispense from 1.60 to 0.87 percent.</td>
</tr>
<tr>
<td>OPERATIONAL IMPROVEMENT AWARD Gold</td>
<td>Gone in 60 Minutes: ED Super Track Door to Disposition</td>
<td>The Christiana Emergency Department applied Lean Six Sigma concepts to improve Super Track processes and reduce ED length of stay. SuperTrack length of stay decreased by 64 minutes, and the improved efficiency permitted redeployment of resources to open additional higher-acuity treatment areas in the ED.</td>
</tr>
<tr>
<td>EXCELLENCE IN COMMUNITY HEALTH AWARD Gold</td>
<td>Integration of Behavioral Health in Primary Care</td>
<td>The Adult Medicine Office and Internal Medicine Faculty Practice created a model of care that integrates behavioral health into the primary care setting to improve access to mental health care and identify the social needs of patients. Over nine months, an embedded behavioral health consultant had contact with more than 300 patients in 710 encounters. More than 90 percent of patients and providers were satisfied with the on-site services.</td>
</tr>
<tr>
<td>EXCELLENCE IN COMMUNITY HEALTH AWARD Silver</td>
<td>Nutrition Coaching Reduces Adolescent Obesity</td>
<td>Christiana Care’s 15 school-based health centers reduced adolescent obesity, with a decrease in average Body Mass Index from 33.41 to 31.8, through nutrition coaching by a registered dietitian to more than 1,600 students.</td>
</tr>
<tr>
<td>EXCELLENCE IN COMMUNITY HEALTH AWARD Bronze</td>
<td>Community Outreach for the Homeless</td>
<td>Social Work and the Wilmington Health Center, Public Safety and others partnered with the community through meetings to support the homeless. The number of homeless seen in the Emergency Department for non-medical needs decreased 83 percent, while patients associating themselves with a shelter increased 38 percent.</td>
</tr>
<tr>
<td>RESIDENT’S AWARD</td>
<td>Embracing the Huddle in a Resident Teaching Clinic</td>
<td>Residents in the Adult Medicine Office used a combination of standardized huddles and performance feedback to improve compliance with diabetic foot exams from 42 to 64 percent, and increased pneumovax vaccination rates to 70 percent.</td>
</tr>
<tr>
<td>DIVERSITY, INCLUSION &amp; CULTURAL COMPETENCY EXCELLENCE AWARD</td>
<td>Be Sensitive! Discreet Weight Labeling System</td>
<td>To provide a bariatric-friendly environment and instill a culture of safety and sensitivity for all patients who are morbidly obese, 4W developed an easy orange striping system for staff identification of the weight capacity on 115 unlabelled pieces of equipment. They also placed safety supports on 50 public and patient toilets.</td>
</tr>
<tr>
<td>PEOPLE’S CHOICE AWARD &amp; GREAT PLACE TO WORK AWARD</td>
<td>A Fun and Collaborative Approach to Improve Health and Wellness</td>
<td>An employee fitness team created a 12-week physical fitness program for Public Safety and Facilities &amp; Services personnel. Participants lost a collective 52 pounds of fat, increased lean body mass by 13 pounds, reduced their body fat percentage by 24 percent, lowered their Body Mass Index by 2.2 points and increased their muscular strength and endurance by 22 percent.</td>
</tr>
</tbody>
</table>
Awards In the National Spotlight

National honors and recognition for our quality and safety leadership initiatives demonstrate our commitment to delivering value in The Christiana Care Way.

THE AMERICAN COLLEGE OF SURGEONS CLINICAL CONGRESS “MERITORIOUS” OUTCOMES IN SURGICAL PATIENT CARE. Christiana Care is one of only 44 institutions out of 445 to achieve this honor.

BECKER’S HOSPITAL REVIEW 100 GREAT HOSPITALS IN AMERICA for the second year in a row.

THE JOINT COMMISSION DESIGNATIONS:

- ADVANCED CERTIFICATION IN HEART FAILURE to the Center for Heart & Vascular Health.
- COMPREHENSIVE STROKE CENTER CERTIFICATION to Christiana Hospital.
- DISEASE-SPECIFIC CERTIFICATION to the Left Ventricular Assist Device Program.
- GOLD SEAL OF APPROVAL to the Center for Advanced Joint Replacement for its Hip and Knee Replacement programs.
- PRIMARY STROKE CENTER CERTIFICATION to Wilmington Hospital.

ECRI INSTITUTE’S NINTH ANNUAL HEALTH DEVICES ACHIEVEMENT AWARD for a new national guideline-driven provider ordering process leading to more appropriate telemetry use in non-intensive-care settings.

THE LEAPFROG GROUP HOSPITAL SAFETY SCORE OF “A” to Wilmington and Christiana hospitals.

U.S. NEWS & WORLD REPORT NO. 1 IN DELAWARE, NO. 3 IN THE PHILADELPHIA REGION AND ONE OF THE NATION’S BEST HOSPITALS in the specialties of Obstetrics & Gynecology (No. 24) and Endocrinology and Metabolic Diseases (No. 33). Also a high-performing hospital in 10 specialties: Cancer, Cardiology & Heart Surgery; Ear, Nose & Throat, Gastroenterology & GI Surgery; Geriatrics, Nephrology; Neurology & Neurosurgery; Orthopaedics; Pulmonology and Urology.

DELAWARE OFFICE OF EMERGENCY MEDICAL SERVICES AND EMERGENCY MEDICAL SERVICES FOR CHILDREN OF THE DELAWARE DIVISION OF PUBLIC HEALTH RECOGNITION FOR PEDIATRIC EMERGENCY CARE FACILITY: Christiana Hospital’s Emergency Department as a Level II pediatric facility and Wilmington’s Emergency Department as a Level III pediatric facility.

THE HUMAN RIGHTS CAMPAIGN FOUNDATION LEADER IN HEALTHCARE EQUALITY and, for the third time, listing in the Healthcare Equality Index.

IDG’S CIO MAGAZINE’S CIO 100 AWARD for the third consecutive year for national leadership in innovation for the eSignout tool that transforms the patient handoff.

THE INSTITUTE FOR DIVERSITY IN HEALTH MANAGEMENT BEST IN CLASS HOSPITAL. The institute is an affiliate of the American Hospital Association.

THE NATIONAL CANCER INSTITUTE’S COMMUNITY ONCOLOGY RESEARCH PROGRAM (NCORP). In August 2014, Christiana Care’s Helen F. Graham Cancer Center & Research Institute earned a five-year, $8.2 million grant from NCI’s NCORP to bring leading-edge cancer screenings, prevention, control, treatment and clinical research trials to more people in the places closest to where they live.

PRESS GANEY 2014 SUCCESS STORY AWARD to Christiana Care’s Neonatal Intensive Care Unit.

THE SOCIETY FOR SIMULATION IN HEALTHCARE ACCREDITATION to Christiana Care’s Virtual Education and Simulation Training Center.

TRAINING MAGAZINE TOP 125 TRAINING EXCELLENCE AWARD for the fourth consecutive year. Christiana Care placed in the top 50 on the list of all industries and in the top 10 of health care organizations.
The Christiana Care Quality & Safety Program strives to achieve care that is safe, effective, patient-centered, timely, efficient and equitable.

To achieve these goals, the program targets three strategic areas: creating a safe culture, achieving high reliability and leveraging technology.
### Program Initiatives 2010 to 2015

<table>
<thead>
<tr>
<th>2010</th>
<th>2011</th>
<th>2012</th>
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<tbody>
<tr>
<td>Culture Survey (October)</td>
<td>Culture of Responsibility Phase II (October)</td>
<td>Culture Survey (April)</td>
</tr>
<tr>
<td>Culture of Responsibility Phase I (June)</td>
<td>Standardized Handoffs for Transitions of Care in Women’s Health</td>
<td>Culture of Responsibility Phase III (October)</td>
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<tr>
<td>SAFE Weekly Huddles</td>
<td>Embracing Patient-Centered Care through Implementation of AIDET</td>
<td>Employee Safety Handbook</td>
</tr>
<tr>
<td>Human Factors Analysis for Radiation Oncology</td>
<td>Unit-Based Clinical Leadership Teams</td>
<td>Workplace Violence Committee</td>
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<tr>
<td>Disclosure Policy &amp; Process</td>
<td>5C Nursing Home Project</td>
<td>VP-Level Monthly Injury Summary Reports</td>
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<tr>
<td>Interdisciplinary Rounds</td>
<td>Bedside Shift Report</td>
<td>Contractor Safety Training Video Updated</td>
</tr>
<tr>
<td>Cultural Diversity &amp; Inclusion</td>
<td>Employee Wellness</td>
<td>Workplace Safety Risk Review Evaluation Completed by Conner Strong</td>
</tr>
<tr>
<td>Quarterly Environment of Care Consultant Assessments</td>
<td>TRP Safety Education Module</td>
<td>Formalized Systemwide “Good Catch” Program (March)</td>
</tr>
<tr>
<td>Specialized Training on Compressed Gas Safety</td>
<td>Facilities and Services Safety Committee</td>
<td>Patient Safety Organization-PSES Evaluation</td>
</tr>
<tr>
<td>Disease-Specific Certification</td>
<td>Slip, Trip, Fall Workgroup</td>
<td>Value Improvement Team Addresses Needlesticks, Sharps, and Exposure Injuries</td>
</tr>
<tr>
<td>- Stroke Program</td>
<td>Department-Level Focused Safety Training</td>
<td>Improvements to Reduce Risk of Slips, Trips and Falls</td>
</tr>
<tr>
<td>Comprehensive Unit-Based Safety Program (CUSP)</td>
<td></td>
<td>Communications Strategy for Employee Safety</td>
</tr>
<tr>
<td>Magnet Recognition</td>
<td>Disease-Specific Certification (May): - Heart Failure - Hip - Knee</td>
<td></td>
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<tr>
<td>2013</td>
<td>2014</td>
<td>2015</td>
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<tr>
<td>Focus Groups on Speak Up (April)</td>
<td>Workgroup Assessing Blood and Body Fluid Splashes</td>
<td>Culture of Responsibility Staff Education</td>
</tr>
<tr>
<td>Culture of Responsibility Phase IV (June)</td>
<td>Consultant Observing Behaviors Related to Handling Needles and Sharps</td>
<td>Manager and Staff Focus Groups to Develop Best Practice for Sharing and Learning from Events</td>
</tr>
<tr>
<td>Event Investigation Management Training</td>
<td>Injury Investigation/Safety Behaviors Introduced into New Leader Orientation, Frontline and Working Courses</td>
<td>CANDOR Implementation</td>
</tr>
<tr>
<td>Integration of Medication Safety Concepts into VEST Center Simulation Training</td>
<td>Creation of a Workplace Safety Intranet Site</td>
<td>Zero Harm Award</td>
</tr>
<tr>
<td>Implementation of MedMax Database and Each Medication Error Benchmarking Capability</td>
<td>Restraint Reduction</td>
<td>Patient Advisory Council Members on System Committees</td>
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<tr>
<td>Pilot AU Meds (September)</td>
<td>Phase IV CoR Manager Training</td>
<td>Culture of Responsibility Video</td>
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<tr>
<td>Tram Safety Program Improvements to Reduce Risk of Accidents and Injuries</td>
<td>Administration of AHRQ Culture Survey</td>
<td>Medication Safety Program Video</td>
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<tr>
<td>Levels of Complexity of VI Projects</td>
<td>Engaged in Health Care Safety Hotline Project with AHRQ &amp; Rand</td>
<td>Quality and Safety Unit Transparency</td>
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<tr>
<td>VTE Prophylaxis Surveillance</td>
<td>Engaged in CANDOR (Communication and Optimal Resolution) Demonstration Project</td>
<td>EWS Pilot Using Nursing Assessment</td>
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<tr>
<td>Deep Dive for Lab Events</td>
<td>Vendor Selection for Event Reporting &amp; Management</td>
<td>Lean Six Sigma Fall Reduction</td>
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<tr>
<td>Creation of an Acute Pain Treatment Service</td>
<td>Focus Groups on Speak Up (April)</td>
<td>Lean Six Sigma Hospital-Acquired Pressure</td>
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<tr>
<td>Evaluation of Network Downtime Procedures and Operations</td>
<td>Focused Safety Assessments in High-Risk Departments</td>
<td>Ulcer Reduction</td>
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<td></td>
<td>Pilot Program for Slip-Resistant Shoes</td>
<td>RISC Committee</td>
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<td>Adoption of National Telemetry Guidelines</td>
<td>(Recognition/Rescue/Implementation/Strategies)</td>
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<td>Post Rapid Response Team Huddles</td>
<td>In-Situ Mock Codes</td>
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<td>Lean Six Sigma Fall Reduction</td>
<td>CAUT Best Practice</td>
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<td></td>
<td>Hand Hygiene Campaign</td>
<td>Lean Six Sigma Bar Code Medication Administration (BCMA) Redesign</td>
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<td>Scenario-Based Interprofessional Simulation Training</td>
<td>Smart Pump Human Factors Assessment</td>
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<td>Video Surveillance Project (5A)</td>
<td>STOP-Bang Assessment Tool Pilot</td>
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<td>Collaboration with Value Institute on Predictive Modeling for EWS, Sepsis, and Oversedation with Pilot of Early Warning System</td>
<td>Adverse Drug Reaction Team</td>
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<td>Adoption of PASERO Sedation Assessment</td>
<td>New Anaphylaxis “Virtual Kit” in EDs</td>
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<td>Collaborative for Improving Transitions of Care</td>
<td>IV Safety Team</td>
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<td>Developed Anticoagulation Management Guidelines</td>
<td>Ebola Preparedness</td>
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<td>Created Acute Pain Management Service</td>
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<td>Expansion of Antimicrobial Stewardship Program</td>
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<td>PowerChart Upgrades (August)</td>
<td>Vendor Selection for Occupational Health and Safety Management Software</td>
<td>Sotera Pilot for Improved Vital Sign Collection</td>
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<td>OBIS Interface</td>
<td>Vendor Selection for Emergency Mass Notification System</td>
<td>Alaris Smart Pump</td>
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<td>Microtab for Infection Prevention</td>
<td>Creation of a Network Downtime Census</td>
<td>Sapphire Multi-Therapy and Epidural Pumps</td>
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<td>Dose Edge IV Production</td>
<td>Electronic Standardized Rapid Response Team Documentation</td>
<td>DoseEdge Technology Adopted in CH IV Lab</td>
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<td>Enterprise Rx Outpatient Pharmacy Bar</td>
<td>Electronic Schmid Fall Risk and High Risk for Injury Assessment</td>
<td>Integrated Platform for Event Reporting, Patient Relations, Peer Review, Claims and Employee Safety</td>
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<td>Coded Dispensing Verification</td>
<td>New Quality &amp; Safety Intranet Site</td>
<td>NICVIEW Babycam System</td>
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<td>Promanger Inpatient Initial Dose Automation</td>
<td>Vendor Selection for Smart Pump Replacement</td>
<td>Sepsis Alert System</td>
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<td>AcuDose Bar Code Restocking Processes</td>
<td>eMar/BCMA/CPOE Implemented in Women’s &amp; Children’s Service</td>
<td>iRound</td>
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<td>Oncology CPOE</td>
<td>Electronic Progress Notes</td>
<td>Powerchart Progress Notes Upgrade</td>
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<td>Electronic Critical Test Results Sticker</td>
<td>Discern Alert Rules Preventing Overlap of New Oral Anticoagulant Medications with Traditional Therapy</td>
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<td>Zolpidem (Ambien®) Discern Alert Rule to Limit Ceiling Dose</td>
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<td>DHIN Integration</td>
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<td>ED Electronic Medical Record</td>
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<td>NICU CPOE, Bar Code Scanning</td>
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<td>MPage with ED Story Handoff</td>
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<td>DNR Status and Patient Weight Added to</td>
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<td>PowerChart Banner</td>
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<td>Color Coding Vital Signs</td>
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</table>
Christiana Care Health System, headquartered in Wilmington, Delaware, is one of the country’s largest health care providers, ranking 21st in the nation for hospital admissions.

We are a major teaching hospital and recognized as a regional center for excellence in cardiology, cancer and women’s health services. We operate Delaware’s only Level I trauma center — the only center of its kind between Philadelphia and Baltimore — and a Level III neonatal intensive care unit — the only delivering hospital in the state to offer this level of care for newborns.

A not-for-profit, nonsectarian health system, Christiana Care includes two hospitals with more than 1,100 patient beds, a home health care service, preventive medicine, rehabilitation services, a network of primary care physicians and an extensive range of outpatient services.

### OUR RANKING BY VOLUME*

<table>
<thead>
<tr>
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<th>EAST COAST</th>
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<tr>
<td>Admissions</td>
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<td>21</td>
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<tr>
<td>Emergency Visits</td>
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<td>24</td>
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<tr>
<td>Births</td>
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<td>29</td>
</tr>
<tr>
<td>Total Surgeries</td>
<td>12</td>
<td>24</td>
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*American Hospital Associations survey of more than 6,000 U.S. hospitals.