



# Zeroing in on the Triple Aim

## Introduction

**Patients expect and deserve excellent care from their health care providers.** Hospitals are on the front lines of advancing this mission, and have made great strides in improving patient care quality while simultaneously promoting increased value. The launch of the Triple Aim in 2007 by the Institute for Healthcare Improvement provided a framework for categorizing the ongoing multifaceted quality improvement efforts providers are undertaking to achieve consistent, high-quality care. The Triple Aim calls for the

simultaneous pursuit of three goals: improving the patient experience of care (including quality and satisfaction), improving the health of populations and reducing the per capita cost of health care.<sup>1</sup> Hospitals throughout the country are aggressively tackling performance improvement within their own organizations, and evidence shows that their efforts are working. This paper highlights multiple areas where hospitals are improving care, encouraging healthier lifestyles and reducing costs.

## Aim #1: Improving the Patient Experience of Care

**Of the three goals included in the Triple Aim, hospitals have the most influence over the care they directly provide to patients.** Hospitals invest tremendous time and effort into understanding the root causes of quality problems and designing systems and

processes to prevent them. That work is paying off in a meaningful way. While more work remains, evidence shows that patients are receiving safer care and becoming more satisfied with their hospital providers.

## Patient Safety

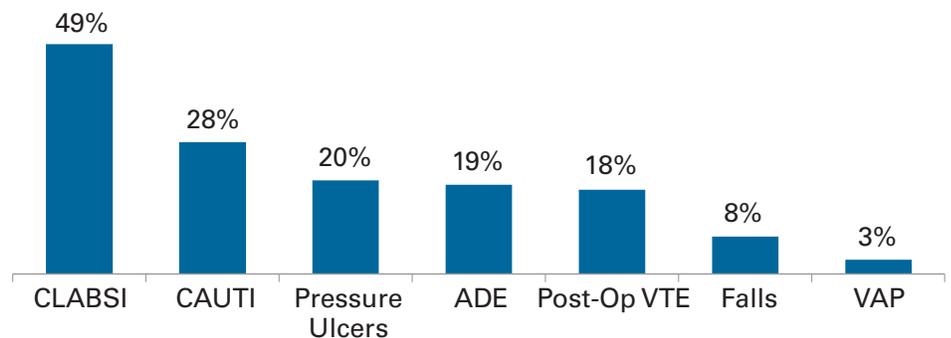
### Hospital-acquired Conditions (HACs)

A HAC is an injury or ailment that arises during a hospital stay, including various types of preventable infections, adverse drug events, falls and other problems. Each year, an estimated 3 million of these potentially preventable adverse events occur in U.S. hospitals, exacting a large human and financial toll.<sup>2</sup>

Hospitals have made significant progress in recent years in reducing the risk of HACs. Nationwide, a composite measure of 28 different HACs fell by 17 percent between 2010 and 2013, from 145<sup>3</sup> to 121 per 1,000 discharges.<sup>4</sup> This reduction translates into an estimated 1.3 million fewer HACs over this period, which in turn has prevented an estimated 50,000 deaths and saved \$12 billion (Chart 1).<sup>5</sup>

### Hospitals Are Significantly Reducing Hospital-acquired Conditions.

Chart 1: Estimated Reductions in HACs, for Selected Conditions, 2010-2013



Source: U.S. Department of Health and Human Services. Interim Update on 2013 Annual Hospital-acquired Condition Rate and Estimates of Cost Savings and Deaths Averted From 2010 to 2013. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/pfp/interimhacrate2013.pdf>.

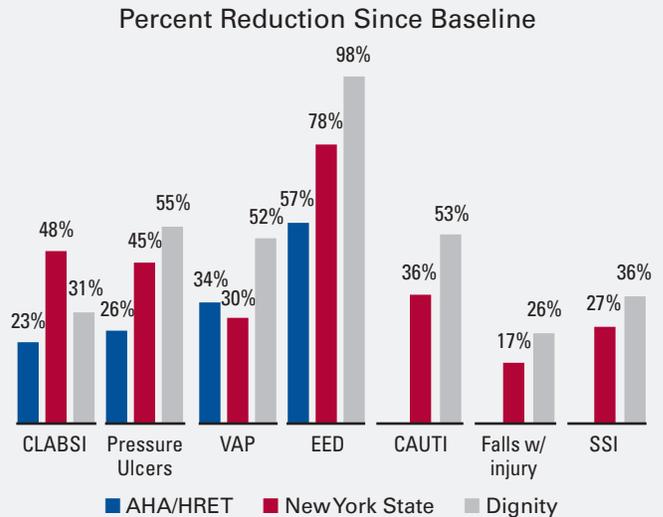
CLABSI=Central Line-associated Bloodstream Infection, CAUTI=Catheter-associated Urinary Tract Infection, ADE=Adverse Drug Event, VTE=Venous Thromboembolism, VAP=Ventilator-associated Pneumonia

## Hospital Engagement in CMS's Partnership for Patients

As hospitals work to reduce HACs, the Centers for Medicare & Medicaid Services (CMS) has provided important support through its Partnership for Patients campaign. Launched in April 2011 by CMS's Center for Medicare and Medicaid Innovation under authority of the Affordable Care Act (ACA), the Partnership set the goal of reducing preventable HACs by 40 percent over the three-year period from 2011 to 2014. To that end, the Partnership has provided more than \$218 million in funding to 26 Hospital Engagement Networks (HENs) that, collectively, include more than 3,700 hospitals, or roughly 70 percent of general acute care hospitals in the U.S. The largest of these was created by the AHA's Health Research & Educational Trust (HRET) and includes nearly 1,500 hospitals.<sup>6,7</sup> HENs work at various levels (hospital, system, region, state and/or nation) to identify solutions that are already working in some locations and disseminate them to other providers. To that end, they develop and sponsor learning collaboratives, provide intense training and technical assistance, establish and implement monitoring and tracking systems to gauge progress toward established goals, identify leaders of high-performing facilities to serve as coaches and advisers to peers in other hospitals, and otherwise support initiatives and activities that promote patient safety. The HENs have been very successful in their efforts to reduce HACs (Chart 2).

## HENs Have Helped Member Hospitals Significantly Reduce HACs.

Chart 2: Reduction in HACs Since the Start of HEN Programs



Sources: Veseley R, Collaboration and Shared Learning Help Hospitals Achieve Safety Metrics. Trustee Magazine. October 13, 2014. Available at: [http://www.trusteemag.com/display/TRU-news-article.dhtml?dcrPath=/templatedata/HF\\_Common/NewsArticle/data/TRU/Magazine/2014/Oct/cov-reducing-harm-patient-safety](http://www.trusteemag.com/display/TRU-news-article.dhtml?dcrPath=/templatedata/HF_Common/NewsArticle/data/TRU/Magazine/2014/Oct/cov-reducing-harm-patient-safety); U.S. Department of Health and Human Services. New HHS Data Shows Major Strides in Patient Safety, Leading to Improved Care and Savings. May 7, 2014. Available at: <http://innovation.cms.gov/Files/reports/patient-safety-results.pdf>. SSI=Surgical Site Infection, EED=Early Elective Delivery

## Central Line-associated Bloodstream Infections (CLABSIs)

Bloodstream infections are serious, potentially life-threatening infections. They also increase length of stay and costs. In the inpatient setting, bloodstream infections are often associated with the placement and use of central venous lines into vessels leading to the heart. These lines are used to administer medications or fluids, draw blood for tests or directly obtain cardiovascular measurements. The rate of such infections for many years had been approximately 3 percent, leading some to believe that level of infection was inevitable. However, a two-year research project funded by

the Agency for Healthcare Research and Quality (AHRQ) in Michigan that started in 2003 demonstrated that many more CLABSIs could be prevented. Participating hospitals implemented five relatively simple interventions known from research to significantly reduce the risk of infection: removing unnecessary central lines, washing hands prior to inserting central lines, using the maximum barrier precautions so as to keep the line sterile during insertion, cleaning skin with chlorhexidine, and avoiding the femoral site when inserting lines. Through these actions, participating hospitals virtually

eliminated CLABSIs over an 18-month period and subsequently sustained these gains.<sup>8</sup> These changes were disseminated and used nationally. AHRQ funded a project with HRET involving hospitals from 44 states, the District of Columbia and Puerto Rico that reduced the CLABSI rate by 40 percent (from 1.903 to 1.137 infections per 1,000 central line days), which translates into more than 2,000 fewer CLABSIs, 500 lives saved and more than \$34 million in avoided expenses each year.<sup>9</sup> In fact, between the 2006-2008 period and 2011, the national incidence of CLABSIs fell by roughly 40 percent.<sup>10</sup>

## Ventilator-associated Pneumonia (VAP)

VAP is a type of pneumonia that can occur in hospitalized patients receiving mechanical ventilation. Patients with VAP face an increased risk of death and generally end up spending longer on the ventilator and in the hospital, which drives up care costs.<sup>11</sup> VAP affects a significant number of patients receiving mechanical ventilation (with estimates ranging between 9 and 27 percent), with intensive care unit patients and those who are intubated being at highest risk.<sup>12</sup> VAP can be prevented through implementation of effective practices, including appropriate oral care, use of multidisciplinary rounds and daily goal-setting designed to wean the patient from the ventilator as quickly as possible.<sup>13</sup>

Hospitals have made progress in recent years in preventing VAPs. Among the more than 1,100 facilities that contribute

data to the National Database of Nursing Quality Indicators (NDNQI), VAP rates fell by 47 percent between 2011 and the third quarter of 2013.<sup>14</sup> Other data sets show a more modest level of improvement, including one suggesting a 17 percent decline between 2010 and 2012<sup>15</sup> and another estimating a 3 percent decline between 2010 and 2013.<sup>16</sup> Even the more modest 3 percent decline, however, translates into tangible benefits in terms of lives saved – 144 individuals – and \$21 million in avoided costs.<sup>17</sup>

Central DuPage Hospital in Winfield, Ill., launched a new set of care protocols in 2007 with the goal of eliminating VAP within the facility. Key changes included implementing a set of standardized practices related to oral care (e.g., cleansing and application of moisturizer every two hours, twice-a-day brushing of

teeth and gums with suction toothbrush), keeping beds elevated to at least 30 degrees at all times, daily “sedation vacations” (where the patient is weaned off of sedation so that he/she can wake up and follow simple commands), daily assessments of readiness for weaning, and regular checks of patient equipment, including cuff pressure and the stability of endotracheal tubes. To promote compliance with these protocols, the hospital developed training and education materials for clinicians and patients/family members (e.g., posters placed in patient rooms) and a tracking and monitoring system. The new approach proved to be quite effective. Compliance with the protocols jumped significantly, and the VAP rate fell by 85 percent by the end of 2008. Gains have been largely sustained since that time, with few if any VAP cases occurring in the hospital each year.<sup>18</sup>

## Adverse Drug Events (ADEs)

ADEs refer to injuries resulting from medication use, including physical harm, mental harm or loss of function.<sup>19</sup> In many cases, ADEs result from lack of information about all conditions and risk factors a patient may have, and/or all medications he or she may be taking. As a result, patients may develop side effects, drug-related symptoms and/or drug-drug interactions that lead to injury, either while still in the hospital or shortly after discharge.

In 2005, The Joint Commission, which accredits the majority of U.S. hospitals, established a national patient safety goal that requires health care organizations to implement comprehensive medication reconciliation at every transition point (e.g., admission, transfer across units, discharge home or to another facility) along the continuum of care.<sup>20</sup> Medication reconciliation is the process of comparing a patient’s medication orders to all of the

medications the patient has been taking; it is done to avoid medication errors such as omissions, duplications, dosing errors or drug interactions.<sup>21</sup> Computerized checks to ensure that the correct medication is going to the correct patient, including barcode scanning of each medication before administering the dosage, have been adopted by many hospitals to avoid such errors.

National trends suggest that hospitals have made progress in recent years in reducing ADEs, with the inpatient rate falling by 19 percent between 2010 and 2013. This decline means that roughly 301,000 ADEs were avoided during this time period, saving an estimated 6,020 lives and \$1.5 billion.<sup>22</sup> This progress has stemmed in large part from hospitals focusing closely on improving the medication reconciliation process, a strategy that reduces not only ADEs but related readmissions as well.

Hennepin County Medical Center in Minneapolis began a new multidisciplinary medication reconciliation process for patients when they were discharged to skilled nursing facilities, with the goal of ensuring that multiple reviews occur in a timely manner. As described on AHRQ’s Health Care Innovations Exchange, “As part of each discharge order, the physician writes medication orders and performs the initial medication reconciliation within four hours of a nursing home bed becoming available. A clinical coordinator and pharmacist then review the order, with the pharmacist meeting with the physician if needed to resolve discrepancies. As a final check, the bedside nurse reviews the orders and communicates pertinent information to the nursing home. The program has virtually eliminated medication errors and cut readmissions and ED visits nearly in half, benefiting patients and leading to significant cost savings.”<sup>23</sup>

## Falls and Fall-related Injuries

Falls are the most commonly reported adverse event in hospitals, with rates ranging from 1.3 to 8.9 falls per 1,000 patient days. While many falls do not result in patient injury or harm, fall-related injuries can and do occur, often leading to prolonged and/or more complicated hospital stays.<sup>24</sup>

The Partnership estimates that a quarter of all fall-related injuries that occur in the hospital can be prevented, and has set the goal of cutting preventable fall-related injuries in half, which would translate into 43,750 fewer injuries in U.S. hospitals over a three-year period.<sup>25</sup> Hospitals appear to be making meaningful progress toward this goal, with one dataset showing an 8 percent drop between 2010 and 2013.<sup>26,27</sup> This drop

translates into 20,000 avoided falls, which in turn translates into an estimated 1,100 lives saved and \$144 million in avoided costs.<sup>28</sup>

St. Catherine Hospital in East Chicago, Ind., established a falls prevention committee composed of nursing staff and their managers. Based on research into best practices, the committee created a falls risk assessment used by nurses on all patients, and introduced a series of interventions to reduce identified risks, including visual/audible cues to alert staff about high-risk patients (e.g., having them wear yellow armbands), bed alarms, non-skid footwear, medication reviews, keeping beds in a low position and placing call lights at the patient bedside. For high-risk patients, the hospital began

hourly rounding (i.e., staff checking on the patient every hour) with an emphasis on addressing pain, physical needs such as trips to the bathroom and repositioning for greater comfort. In a major cultural change, St. Catherine's also instituted a "no passing zone" that requires all hospital-based personnel (including physicians) to respond to any call light they see when walking by a patient's room in the halls. The program has worked, as total falls declined by 26 percent and the fall rate per 1,000 days dropped by 23 percent in the first year after program implementation. To build on this success, St. Catherine's instituted a root cause analysis for every fall. Whenever a systematic problem is uncovered through this analysis, the committee develops a plan of action to address the issue.<sup>29</sup>

## Early Elective Deliveries (EEDs)

The American Congress of Obstetricians and Gynecologists recommends that babies should not be delivered before at least 39 weeks gestation, unless there is a valid health reason or delivery starts on its own. EEDs are non-medically indicated births between 37 and 39 weeks of pregnancy, and they can increase the risk of both maternal and infant complications. Reports from the HENs suggest that substantial improvement has occurred since this recommendation was issued, with EEDs having fallen by 45 percent between the baseline period (the first

quarter of 2012 or earlier, depending on the HEN) and the follow-up period (usually the second and third quarter of 2013). This magnitude of decline translates into more than 16,000 EEDs avoided.<sup>30</sup>

To reduce EEDs, many hospitals have implemented "hard stops," including CoxHealth Systems in Springfield, Mo. Medical leaders at CoxHealth created a list of acceptable medical indications for delivering babies prior to 39 weeks, and now require all exceptions to be approved by the chief of obstetrics or a perinatologist. Any physician who

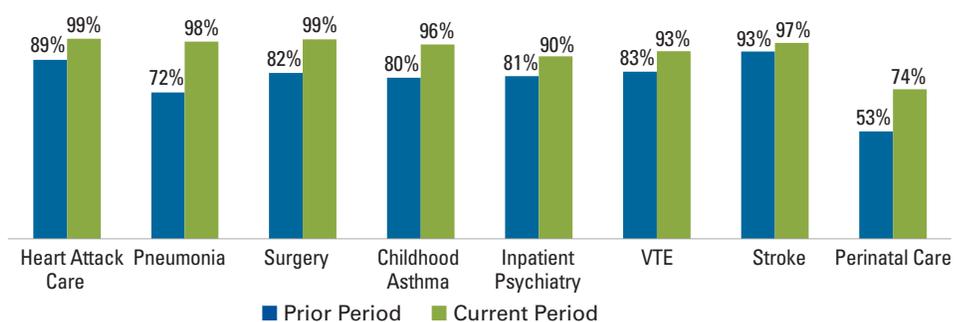
performs an elective delivery that does not meet hospital criteria receives a letter signed by the chief of obstetrics and the chief medical officer reiterating hospital policy and delineating possible consequences if more violations occur. Physicians receiving three such letters must appear before a peer review board. Within two months of implementing the new approach, the rate of elective EEDs fell from 9 percent to 2 percent, and within six months the rate fell to near zero (0.03 percent). The policy is now generally accepted as a best practice by most physicians in the system.<sup>31</sup>

## Greater Adherence to Evidence-based Care Processes

As a field, health care is doing a better job in providing patients with care that clearly leads to better health and outcomes (Chart 3). Across all care settings, Americans received 70 percent of recommended, evidence-based services for treating or preventing particular medical conditions in 2010, up from 66 percent five years earlier,<sup>32</sup> and well above the approximately 55 percent rate found in a landmark RAND study from the early 2000s.<sup>33</sup>

### Hospitals Are Increasing Adherence to Evidence-based Practices.

Chart 3: Percent Adherence to Evidence-based Practices



Sources: The Joint Commission. America's Hospitals: Improving Quality and Safety. The Joint Commission's Annual Report, 2014; The Joint Commission. Improving America's Hospitals. The Joint Commission's Annual Report on Quality and Safety, 2013.

Hospitals are leading the way when it comes to improving the provision of evidence-based care. For example, cardiac patients (especially those experiencing a heart attack) entering the hospital today have much better odds than they did a decade ago of receiving recommended care, as evidenced by the following improvements between 2005 and 2011:

- The proportion of heart attack patients receiving angioplasty within 90 minutes of their arrival at the hospital more than

doubled, from 42 to 94 percent (a level just below the accepted “achievable benchmark” of 96 percent).<sup>34</sup>

- The percentage of heart attack patients receiving drugs that break up blood clots blocking a major artery (known as fibrinolytic or thrombolytic therapy) rose from 38 to 58 percent.<sup>35</sup>
- The percentage of hospitalized heart failure patients given complete written discharge instructions increased from 57 to 92 percent, just below the achievable benchmark of 94 percent.<sup>36</sup>

In 2013, Joint Commission-accredited hospitals provided 98 percent of care processes closely linked to positive patient outcomes, as measured by a composite score that aggregates 44 separate care processes. This figure is up from 82 percent in 2002 on a similarly constructed measure that took into account only 15 care processes. Put another way, in 2013, accredited hospitals provided recommend care in 17,080,000 out of 17,500,000 opportunities to do so.<sup>37</sup>

## Higher Satisfaction with the Care Experience

In response to public reporting of performance data, hospitals are making strides in improving scores on various measures of patient experience. For example, between March 2008 and June 2012, nationwide scores reported by Medicare’s *Hospital Compare* website show modest, steady improvement across all measures of patient experience captured by the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)<sup>38</sup> survey (Chart 4).<sup>39</sup> This survey asks patients about factors such as how well care providers listened and treated them with respect, whether patients received timely help after pressing the call button, if they received timely assistance to the bathroom or with a bedpan, how well pain was controlled, whether the hospital was clean and quiet, whether caregivers explained possible side effects of new medication, and whether patients received information about side effects to look out for after discharge.

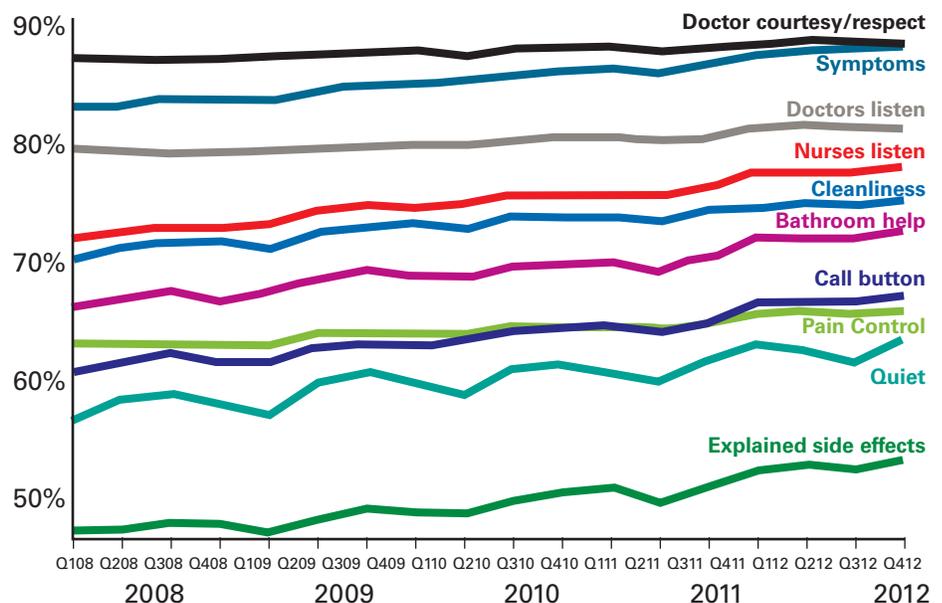
Hospitals have been working to improve HCAHPS scores in a variety of ways. Leaders at Long Island Jewish Medical Center looked outside of health care, to the hotel and restaurant industry, with the goal of transforming the hospital’s culture to one focused on hospitality. The hospital brought in a company to

design a customer-focused curriculum modeled after best practices from the hospitality industry (e.g., going out of one’s way to offer extraordinary service). All staff completed the course over a 13-month period, and each year all employees are evaluated for competency. A Hospitality Observation Team observes

staff on a real-time basis in the clinical environment. Since implementation of this program, patients are much more likely to recommend Long Island Jewish Medical Center to others. Scores for an HCAHPS “willingness to recommend” question rose from the 27th to the 86th percentile between 2011 and 2012.<sup>40</sup>

## Hospitals are Improving Performance on Patient Experience of Care Measures.

Chart 4: Quarterly Report of Top Box Score Measures



Source: Cohea C, Elliott MN, Lehrman WG, Goldstein E., Giordano LA. Presentation at Academy Health Research Meeting. June 2013. Washington, DC.

## Aim #2: Improving the Health of Populations

**Compared to their ability to improve patient safety, provide evidence-based care and ensure satisfaction with the hospital experience, hospitals have historically had less responsibility for influencing the overall health status of the population of patients they serve.**

However, that is changing as hospitals and health systems reach out to their communities in new ways.

Under the Triple Aim framework, improving the health of populations incorporates concepts such as disease incidence, life expectancy, years of potential life lost, risk status and health/functional status.

Many community-level issues, such as income levels, education and other sociodemographic factors, affect these health outcomes. In addition, a wider group of stakeholders, including primary care physicians, health plans, government leaders and others influence population health.

In recent years, some hospitals have taken on increasing levels of accountability and responsibility for population health. For example, hospitals are conducting community health assessments every three years and are developing

and implementing plans to address identified needs, as required by the ACA.<sup>41</sup> A growing number of hospitals are investing in community-based initiatives designed to improve the health-related behaviors of local residents by offering or sponsoring farmers markets, exercise classes, health fairs and other activities.

Hospitals also are focusing their efforts on patient populations where short-term improvements can be achieved, such as patients who suffer from one or more chronic illnesses and/or other conditions. These patients may use the hospital and/or emergency department (ED) on a regular basis or as their primary source of care. More hospitals proactively provide patient education in the hospital and various types of support after discharge, including home visits, care management, and access to needed community-based services (e.g., transportation services, affordable food and housing). The goal of these efforts is to help these patients get chronic and other medical conditions under control, thus ending their continued reliance on inpatient and ED care. One aspect of success in this area is the reduction in readmissions.

### Readmissions

Trend data suggest that efforts to reduce readmissions are working. After fluctuating between 19 and 19.5 percent between 2007 and 2010, the 30-day all-cause readmission rate among Medicare fee-for-service beneficiaries declined to approximately 18 percent in 2013. This decline translates into an estimated 150,000 fewer readmissions over a two-year period (2012 and 2013), as compared to the historical average.<sup>42,43</sup> Other datasets, including HEN-reported data, show similar or greater degrees of improvement over this time period, and trends in these data suggest that the pace of improvement

in reducing readmissions is accelerating.<sup>44</sup>

Palmetto Health in Columbia, South Carolina set a goal to reduce readmissions system-wide. They created a multidisciplinary team including representatives of post-discharge care services. The team broke into five subgroups including preventing readmissions, post-acute care planning, discharge, enhanced teaching and learning and follow-up. They partnered with post-acute care providers to standardize transitions in care. Post discharge, each patient is scheduled for a follow-up visit. Nurses

and social workers, trained in utilization review and discharge planning including post-acute care resources are stationed in the hospital ED. They work to prevent unnecessary readmissions. When they do experience a readmission within 30 days, the readmissions team performs a root-cause analysis and takes corrective action where needed. They have an Ambulatory Care Transition Team (ACTT) for high-risk patients that includes home visits, phone contacts and physician appointments. Of the 200 patients served by the ACTT, staff kept 90 percent from having a 30-day readmission.<sup>45</sup>

## Aim #3: Reducing the Per Capita Cost of Health Care

**Virtually all of the hospital progress described in the first two aims has not only resulted in higher quality care, a better patient experience and improved population health, but also has helped in achieving the third aim – reducing the per capita cost of health care.**

Safer care tends to be less expensive care. In other words, all of the aforementioned progress that hospitals have made in preventing HACs directly translates into cost savings for patients, insurers and government programs. Similarly, hospital efforts to reduce expensive readmissions among high-utilization users also translates into lower costs.

As a whole, these efforts are starting to make a difference at the national level. In fact, evidence is growing that a “bend” in the health care cost curve may be taking place. Between 2010 and 2013, annual growth in national health expenditures averaged 3.9 percent, well below the historical growth rate of 9.3 percent a year;<sup>46</sup> in 2013, national health spending grew by 3.6 percent, the lowest rate since CMS began tracking this figure more than 50 years earlier.<sup>47</sup> While many things have likely factored into this decline, the collective efforts of hospitals to provide safer, evidence-based care have contributed to this change.

## Conclusion

**Hospitals throughout the nation are working on their own and collaboratively to advance progress toward the Triple Aim.** Thanks to these diligent efforts, substantial progress is being made. In fact, a patient entering the hospital today is much more likely to receive evidence-based care and achieve a positive health outcome than a decade ago. Because of hospitals' proactive initiatives to ease the transition back into the community after discharge, patients are less likely to experience a relapse and need to visit the ED or be readmitted to

the hospital. Collectively, these hospital activities are making a major contribution to the nation's efforts to improve the patient care experience (including quality and satisfaction), improve the health of populations and reduce the per capita cost of health care. The work, however, is not yet complete, as ample opportunity exists for further improvement. To that end, hospitals will continue their efforts, working with other key stakeholders to build on the substantial progress made in recent years.

<sup>1</sup>More information on the IHI Triple Aim can be found at: <http://www.ihl.org/engage/initiatives/TripleAim/Pages/default.aspx>.

<sup>2</sup>Agency for Healthcare Research and Quality. National Healthcare Quality Report, 2013. Agency for Healthcare Research and Quality, Rockville, MD. May 2014.

<sup>3</sup>Agency for Healthcare Research and Quality. National Healthcare Quality Report, 2013. Agency for Healthcare Research and Quality, Rockville, MD. May 2014.

<sup>4</sup>U.S. Department of Health and Human Services. Interim Update on 2013 Annual Hospital-Acquired Condition Rate and Estimates of Cost Savings and Deaths Averted From 2010 to 2013. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/pfp/interimhacrate2013.pdf>.

<sup>5</sup>U.S. Department of Health and Human Services. Interim Update on 2013 Annual Hospital-Acquired Condition Rate and Estimates of Cost Savings and Deaths Averted From 2010 to 2013. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/pfp/interimhacrate2013.pdf>.

<sup>6</sup>Center for Medicare and Medicaid Innovation. Project Evaluation Activity in Support of Partnership for Patients: Task 2 Evaluation Progress Report. February 2014. Developed by Health Services Advisory Group and Mathematica Policy Research. Available at: [innovation.cms.gov/Files/reports/PFPEvalProgRpt.pdf](http://innovation.cms.gov/Files/reports/PFPEvalProgRpt.pdf).

<sup>7</sup>Centers for Medicare and Medicaid Services. About the Initiative: Hospital Engagement Networks. Available at: <http://partnershipforpatients.cms.gov/about-the-partnership/hospital-engagement-networks/thehospitalengagementnetworks.html>.

<sup>8</sup>On the Cusp: Stop HAI. About the Initiative. Available at: <http://www.onthecuspstophai.org/on-the-cuspstop-bsi/about-the-project/>.

<sup>9</sup>On the Cusp: Stop HAI. About the Initiative. Available at: <http://www.onthecuspstophai.org/on-the-cuspstop-bsi/about-the-project/>.

<sup>10</sup>Agency for Healthcare Research and Quality. National Healthcare Quality Report, 2013. Agency for Healthcare Research and Quality, Rockville, MD. May 2014.

<sup>11</sup>Institute for Healthcare Improvement. Available at: <http://www.ihl.org/topics/VAP/Pages/default.aspx>.

<sup>12</sup>Hunter JD. Ventilator associated pneumonia. British Medical Journal. May 29, 2012; 344.

<sup>13</sup>Institute for Healthcare Improvement. Available at: <http://www.ihl.org/topics/VAP/Pages/default.aspx>.

<sup>14</sup>Center for Medicare and Medicaid Innovation. Project Evaluation Activity in Support of Partnership for Patients: Task 2 Evaluation Progress Report. February 2014. Developed by Health Services Advisory Group and Mathematica Policy Research. Available at: [innovation.cms.gov/Files/reports/PFPEvalProgRpt.pdf](http://innovation.cms.gov/Files/reports/PFPEvalProgRpt.pdf).

<sup>15</sup>Center for Medicare and Medicaid Innovation. Project Evaluation Activity in Support of Partnership for Patients: Task 2 Evaluation Progress Report. February 2014. Developed by Health Services Advisory Group and Mathematica Policy Research. Available at: [innovation.cms.gov/Files/reports/PFPEvalProgRpt.pdf](http://innovation.cms.gov/Files/reports/PFPEvalProgRpt.pdf).

<sup>16</sup>U.S. Department of Health and Human Services. Interim Update on 2013 Annual Hospital-Acquired Condition Rate and Estimates of Cost Savings and Deaths Averted From 2010 to 2013. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/pfp/interimhacrate2013.pdf>.

<sup>17</sup>U.S. Department of Health and Human Services. Interim Update on 2013 Annual Hospital-Acquired Condition Rate and Estimates of Cost Savings and Deaths Averted From 2010 to 2013. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/pfp/interimhacrate2013.pdf>.

<sup>18</sup>Partnership for Patients. Successful and Sustained VAP Prevention. American Hospital Association and Health Research and Educational Trust. Available at: [http://www.hret-hen.org/index.php?option=com\\_phocadownload&view=category&id=215:ventilator-associated-pneumonia](http://www.hret-hen.org/index.php?option=com_phocadownload&view=category&id=215:ventilator-associated-pneumonia).

<sup>19</sup>Bates DW, Cullen DJ, Laird N, et al. Incidence of adverse drug events and potential adverse drug events. Implications for prevention. ADE Prevention Study Group. JAMA 1995; 274:29.

<sup>20</sup>National Patient Safety Goal on Reconciling Medication Information (NPSG.3.06.01). The Joint Commission, 2010. Available at: [http://www.jointcommission.org/sentinel\\_event\\_alert\\_issue\\_35\\_using\\_medication\\_reconciliation\\_to\\_prevent\\_errors/](http://www.jointcommission.org/sentinel_event_alert_issue_35_using_medication_reconciliation_to_prevent_errors/).

<sup>21</sup>Indian Health Service. Electronic Health Record: Medication Reconciliation. Available at: [http://www.ihl.gov/ehr/index.cfm?module=medication\\_reconciliation](http://www.ihl.gov/ehr/index.cfm?module=medication_reconciliation).

- <sup>22</sup>U.S. Department of Health and Human Services. Interim Update on 2013 Annual Hospital-Acquired Condition Rate and Estimates of Cost Savings and Deaths Averted From 2010 to 2013. Available at: <http://www.ahrq.gov/professionals/quality-patient-safety/pfp/interimhacrate2013.pdf>.
- <sup>23</sup>Agency for Healthcare Research and Quality. (AHRQ) Health Care Innovations Exchange. Collaborative Medication Reconciliation Significantly Reduces Errors and Readmissions in Patients Discharged to Nursing Homes. Available at: <https://innovations.ahrq.gov/profiles/collaborative-medication-reconciliation-significantly-reduces-errors-and-readmissions#.VF01XilxybU.email>.
- <sup>24</sup>Agency for Healthcare Research and Quality. Measure Summary: Acute care prevention of falls: rate of inpatient falls per 1,000 patient days. National Quality Measures Clearinghouse. Available at: <http://www.qualitymeasures.ahrq.gov/content.aspx?id=36944>.
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