Healthcare metrics: Where do pharmacists add value?

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National healthcare policy is affecting the way health systems provide care by mandating accountability through standardized performance measures and incentives for improvement. Health systems are responding by adopting management systems—in many cases, systems from other industries—to measure process and patient outcomes. Studying value streams to improve daily management systems and goal attainment is now becoming more common with increased efforts to measure and improve complex healthcare delivery systems. Many healthcare systems are focused on service improvement models to train and engage both employees and patients and to implement the changes needed to improve our healthcare system. These newly embedded "integrated practices" are designed to improve quality, safety, and value. As changes occur in healthcare, the missions and goals of healthcare systems are shifting. In fact, changes are occurring so rapidly that many systems may have difficulty articulating and achieving health-system goals effectively. However, there is no lack of suggested performance measures and metrics from many sources.

This article describes how pharmacy services and pharmacists can show value to the healthcare system through the use of performance metrics. Healthcare value can be defined in terms of health outcomes achieved per dollars spent. Everyone who receives, pays for, or participates in providing healthcare wants value. Consumers, healthcare systems, provider networks, healthcare professionals, and healthcare payers all have different expectations and measure value differently.[1] Here we will discuss performance measurement initiatives by a number of organizations in the United States and review widely used healthcare metrics they have developed, which reflect a wide range of stakeholder perspectives (Figure 1). To support metric implementation and broader quality-improvement and safe-practices initiatives, "Pharmacy leaders should have an active role on the administrative leadership team that reflects their authority and accountability for medication management systems performance across organizations."[2] In addition, individual pharmacists can contribute greatly to patient care teams that drive performance management systems within their departments and healthcare systems.

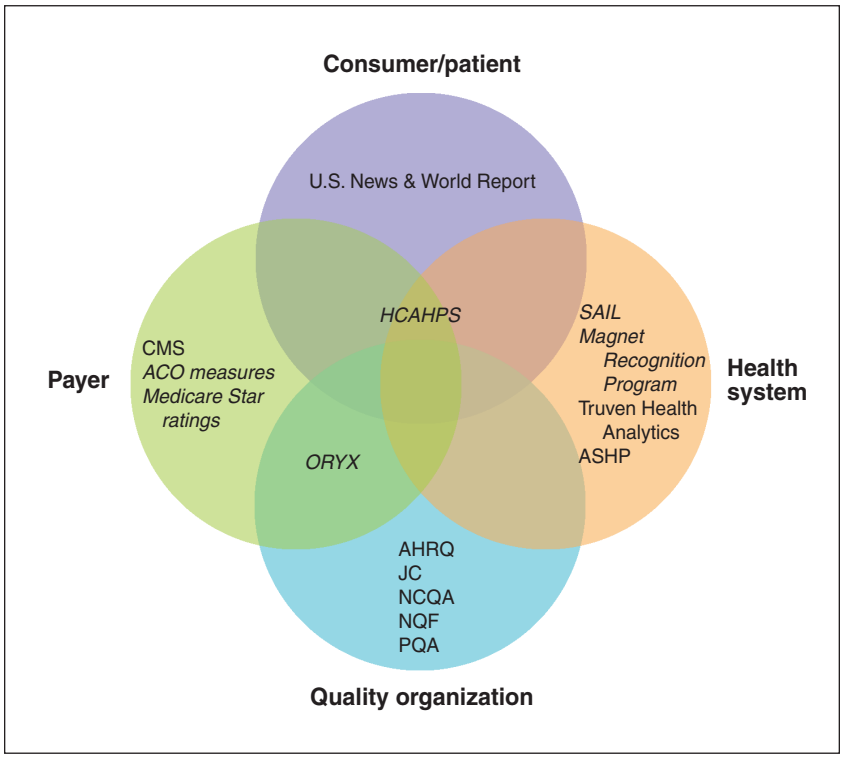
Performance management. After years of debate, there is general consensus that measuring performance is essential to performance improvement. While that sounds like a simple conclusion, it has led to the development of thousands of metrics, many of them inconsistent and duplicative, to help measure performance improvement. Some contributions of pharmacists may be recognized by measuring individual metrics in isolation. However, measurement is not an end in itself; it is a tool for achieving healthcare goals. Metrics must be built into a larger performance management framework that can be used to develop pharmacists' skill sets and recognize their patient care contributions.

Performance management involves determining strategic priorities, mapping and improving processes, and defining and reporting key performance indicators with supporting lead and lag metrics. Targets and goals for agreed-upon metrics can be built into management team objectives and drive individual performance on a daily basis. These same priorities should be built into performance plans and evaluated and reported to employees and patients regularly.

There is no single metric—or even a set of core metrics—that is universally accepted as optimal for measuring value in healthcare, let alone the contributions of pharmacists as healthcare service providers. The Institute of Medicine recently published a report to assist in the identification of core metrics for health and healthcare progress that may assist in compartmentalizing the thousands of metrics available for use.[3]

Organizations involved in metric development and performance measurement. Hundreds of organizations are developing or examining metrics to improve healthcare. These organizations and metrics are now driving accountability and reimbursement. Pharmacists are often involved in the achievement of many of these metrics; however, they may not understand where and how a given

Figure 1. Value perspectives (boldface type), representative organizations involved in development of performance measurement systems, and selected metrics (italic type). HCAHPS = Hospital Consumer Assessment of Healthcare Providers and Systems, SAIL = Strategic Analytics for Improvement and Learning Value Model, CMS = Centers for Medicare and Medicaid Services, ACO = accountable care organization, AHRQ = Agency for Healthcare Research and Quality, JC = Joint Commission, NCQA = National Committee for Quality Assurance, NQF = National Quality Forum, PQA = Pharmacy Quality Alliance.



metric fits in the overall performance management process in their health systems.

Among the organizations that work to improve quality for our healthcare system by developing, vetting, or supporting healthcare performance metrics are the Agency for Healthcare Research and Quality (AHRQ), the National Quality Forum (NQF), the National Committee for Quality Assurance (NCQA), the Pharmacy Quality Alliance (PQA), the American Society of Health-System Pharmacists (ASHP) Accountability Measures Work Group, and professional healthcare provider organizations.

AHRQ is a major federal agency that collaborates with the Department of Health and Human Services and other partners to improve the safety and quality of healthcare systems. It invests in research projects that elucidate strategies for making health delivery systems safer and develops educational plans to teach healthcare providers how to apply research results in daily practice.[4] AHRQ has a "National Guideline Clearinghouse" website that is a resource for metric selection and sorting.[5] This website offers a comprehensive review of the metrics landscape. Our search of the AHRQ clearinghouse identified 79 clinical quality metrics for which pharmacists have (or should have) primary responsibility as the health professionals most closely involved in service delivery.[5] Table 1 lists four of those metrics.

NQF is a nongovernmental organization that endorses evidence-based measures to make healthcare systems safer, more affordable, and accessible. NQF-endorsed metrics are nationally recognized as a gold standard for measurement of healthcare quality.[6] The organization's website lists recent NQF measure endorsement projects targeting various healthcare specialties, the context of the measures, and appropriate settings where measures may be applied. For example, one NQF project focused on cardiovascular measures aims to optimize care for coronary artery disease, atrial fibrillation, implantable cardioverter defibrillators, heart failure, and hypertension. In 2016, NQF's Measure Applications Partnership (MAP) provided outcome-driven recommendations on the Merit-Based Incentive Payment System (MIPS) to be launched by the Centers for Medicare and Medicaid Services (CMS) in 2017 and recommendations on crosscutting issues related to federal healthcare programs' efforts to align with performance-based payment systems, provide transparency for clinician measures, and measure gaps in both the MIPS and the Medicare Shared Savings Program. NQF has recommended that CMS pursue similar quality measures across all of its programs to provide consistency and goal alignment. One recommendation of the MAP program was to "measure gaps across clinician-level programs, especially in patient-centered areas such as patient-reported outcomes, functional status, and care coordination." Pharmacists can play a role in filling gaps across those programs to ensure better care coordination and patient outcomes.[7]

Founded in 1990, NCQA is a private nonprofit organization that strives to improve healthcare quality. Based on performance measures and quality metrics, it offers six accreditation programs, including one for accountable care organizations (ACOs); five certification programs, including one focused on disease management;

Table 1. Examples of Pharmacy-Oriented Measures From National Quality Measures Clearinghouse (NQMC)[5,a]

Date of Most Current Version	Identifier	Title
January 2013	NQMC:008655	Influenza vaccination: percentage of healthcare personnel who receive the influenza vaccination.[b]
November 2014	NQMC:009954	Follow-up care for children prescribed ADHD medication (continuation and maintenance phase): percentage of patients 6 to 12 years of age as of the index prescription start date with an outpatient ADHD medication who remained on the medication for at least 210 days and who, in addition to the visit in the initiation phase, had at least two follow-up visits with a practitioner within 270 days (9 months) after the initiation phase ended.[c]
November 2014	NQMC:009965	Use of high-risk medications in the elderly: percentage of patients 66 years of age and older who received at least two different high-risk medications.[c]
July 2015	NQMC:009261	Antipsychotic use in children: percentage of children under age 5 using antipsychotic medications during the measurement period.[d]

[a]ADHD = attention-deficit/hyperactivity disorder.
[b]Developed by Centers for Disease Control and Prevention.
[c]Developed by National Committee for Quality Assurance.
[d]Developed by Pharmacy Quality Alliance.

and physician recognition programs to help patients identify physicians who meet NCQA quality standards in specific clinical areas (e.g., diabetes care) or practice environments (e.g., patient-centered medical homes).[8,9] In the early 1990s, NCQA developed the Healthcare Effectiveness Data and Information Set (HEDIS), a nationally recognized set of performance measures that are used by more than 90% of America's health plans to assess care and service. Now HEDIS measures have been further developed to include measures for physicians, preferred provider organizations, and other organizations. Some HEDIS measures that pharmacists can influence include those pertaining to comprehensive diabetes care, blood pressure control, antidepressant medication management, immunization status, asthma medication use, and persistence of β-blocker treatment after a heart attack.[10]

In the Veterans Health Administration (VHA) system, pharmacists are providing population management services under VHA's Patient Aligned Care Team initiative, assisting physician-led teams in meeting HEDIS goals.[11] Figure 2 shows a screenshot of a VHA-developed population management dashboard that provides daily actionable reports to assist clinicians in assessing and improving population metrics.

Created in 2006, PQA is composed of over 100 member organizations that develop and promote pharmacy-specific performance quality standards. One of its objectives is to increase the uptake of PQA measures by health plans, pharmacy benefit managers, pharmacies, and state-based agencies (e.g., Medicaid programs) as well as assist them with quality measurement and improvement activities related to medications.[12] PQA metrics have a direct pharmacy department impact due to their inclusion in Medicare Advantage insurance plans. Metrics endorsed and submitted by PQA were adopted by the Medicare Part D program; these have related to medication-use issues such as cholesterol management in coronary artery disease, diabetes medication dosing, statin use in persons with diabetes, and the "proportion of days covered" (PDC), or percentage of highly adherent patients (target, ≥80%), during treatment with antivirals, antidiabetic, or antihypertensive medications.[13] PQA also submitted or endorsed measures included in the Medicare Star Ratings initiative (appendix).

The ASHP Pharmacy Accountability Measures Work Group was established to identify measures that establish accountability and demonstrate the value of health-system pharmacists in keeping patients safe and improving outcomes. The first selected measures were published in 2014 as a suite of inpatient and outpatient measures in four areas: anticoagulant safety, glycemic control, antimicrobial stewardship, and pain management.[14]

Professional healthcare provider organizations have been called upon to identify ways to reduce the overuse of medical resources that offer little or no benefit but carry significant risk of harm. To date, 415 evidence-based recommendations have been developed by more than 70 professional organizations.[15] Over 100 of these recommendations are related to medications. The focus of these recommendations and initiatives such as the "Choose Wisely," "Less Is More," and "Top Five" campaigns is to help patients choose wisely and healthcare providers prescribe appropriately when selecting treatment options.[15-17] One area of evidence-based practice where pharmacists can assist in improving medication-use quality and outcomes involves "deprescribing," or the reduction of inappropriate polypharmacy[18] (Table 2).

Figure 2. Example of an ambulatory care performance measurement dashboard from a Veterans Health Administration facility.

CPG Dashboard > Clinical Performance Measures

Location and Providers VISN 21

Age All Gender All eGFR Value All EPRP Eligibility All Apply Filters

Remember my selections

Patient Populations

	Patients	Definitions
Total	237,181	
Diabetes	57,481	Definitions
Ischemic Heart Disease	39,285	Definitions
Hypertension	133,400	Definitions
No Hypertension	87,586	
Chronic Kidney Disease (CKD) Stage 3	31,318	Definitions
Chronic Kidney Disease (CKD) Stage 4,5	3,253	Definitions

Patients Requiring Followup

	Patient Report
Entire Panel with Comments	Patient Report
PACT Look-Up	Patient Report
Distance from Medical Center	Patient Report
CKD 4-5 Management Report	Patient Report

Performance Measures-DM and IHD

	Actual	Target	Not Met	No Measure	Definitions
Diabetes Mellitus (Composite)	**77%**	**82%**			
Diabetes-Outpt-HBA1C Measured Annually	85.9%	96%	8,111		Definitions
Diabetes Outpt and HBA1C > 9 (lower is better)	26.9%	19%	7,361	8,111	Definitions
Diabetes Cardiovascular Risk Management	80.2%	48%	8,666		Definitions
Diabetes and BP < 140/90	66.9%	78%	14,495	4,545	Definitions
Diabetes Outpt and Timely Retinal Exam	96.9%	99%	1,760		Definitions
Diabetes Outpt and Renal Function Testing	78.9%	92%	12,122		Definitions
Ischemic-Heart-Disease					
IHD Cardiovascular Risk Management	83.5%	69%	4,040		Definitions
Approprate Blood Pressure by Age	76.3%	72%	28,059	14,029	Definitions
No Hypertension and BP < 140/90	82.1%	72%	15,720		Definitions

The value proposition. The regulatory and policy framework of healthcare in the United States reflects the input of a wide array of organizations, including those discussed in this article, which can be categorized by perspective (consumer/patient, health system, payer, and quality organization), as illustrated in Figure 1.

Organizations that represent the consumer/patient perspective are dedicated to collecting publicly available information and synthesizing it into a marketable form consumers can understand. Hospital reimbursement is not tied directly to this category of information.

Organizations that represent the health-system perspective aim to measure metrics that focus on the achievements of hospitals and subsequent patient outcomes. The data generated by these organizations are important to hospitals and health systems, as they may directly affect reimbursement.

Payer-perspective organizations are insurers and other payers of healthcare services. These organizations deal mainly in quality assurance of processes. Reimbursement is directly affected by these organizations' quality assurance activities.

From the perspective of the quality organization, performance measurement is aimed specifically at ensur-

Table 2. Healthcare Professional Society Recommendations Reviewed or Adopted by VA Sierra Pacific Network to Improve Medication-Use Outcomes[15-18,a]

Agents to Consider for "Deprescribing"[b]	Recommendation	Source(s)
Benzodiazepines	Do not use benzodiazepines or other sedative–hypnotic agents in older adults as first choice for insomnia, agitation, or delirium.	American Geriatrics Society
Antipsychotics	Do not routinely use antipsychotics as first choice to treat behavioral and psychological symptoms of dementia.	American Psychiatric Association
Antilipemics	Do not routinely prescribe lipid-lowering medications in individuals with limited life expectancy	AMDA: The Society of Post-Acute and Long-Term Care Medicine
Hypoglycemics	Avoid using medications other than metformin to achieve an HbA_{1c} value of <7.5% in most older adults; moderate control is generally better.	American Geriatrics Society
Testosterone	Do not prescribe testosterone to men with erectile dysfunction who have normal testosterone levels unless there is laboratory evidence of testosterone deficiency and biochemical evidence of testosterone deficiency	American Urological Association, American Society of Clinical Pathology, Endocrine Society
Blood glucose strips	Avoid routine use of multiple daily self-glucose monitoring in adults with stable type 2 diabetes taking agents that do not cause hypoglycemia; do not recommend daily home finger-stick glucose testing in patients with type 2 diabetes not using insulin	Endocrine Society, Society of General Internal Medicine
NSAIDs	Avoid NSAIDs in individuals with hypertension or heart failure or CKD of all causes, including diabetes	American Society of Nephrology
Cholinesterase inhibitors	Do not prescribe cholinesterase inhibitors for dementia without periodic assessment for perceived cognitive benefits and adverse gastrointestinal effects	American Geriatrics Society

[a] HbA_{1c} = glycosylated hemoglobin, NSAID = nonsteroidal antiinflammatory drug, CKD = chronic kidney disease.
[b] Generally defined as reduction of inappropriate polypharmacy.

ing that healthcare entities participating in government-funded healthcare programs are providing high-quality services to the public. Quality organizations can be official accrediting bodies or think tanks that contribute to accrediting bodies.

Selected organizations representing each of these four perspectives and performance measurement systems developed by these organizations are described below.

Consumer/patient perspective. *Hospital Consumer Assessment of Healthcare Providers and Systems.* Developed by CMS and AHRQ in 2002, the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) is a survey that assesses patients' viewpoints regarding their hospital stay. This survey incorporates the payer, consumer/patient, and health-system perspectives, and the survey results play a large part in many pharmacy department decisions. In May 2005, NQF endorsed the survey.[19] Nine key areas are measured: communication with doctors, communication with nurses, responsiveness of hospital staff, pain management, communication about medicines, discharge information, cleanliness of the hospital environment, quietness of the hospital environment, and transitions of care. Moreover, CMS publishes its HCAHPS Star ratings to the "Hospital Compare" website to facilitate comparisons of hospitals. There are 12 HCAHPS Star ratings: 1 for each of the 11 publicly reported HCAHPS measures and an HCAHPS summary Star rating.[20] The metric linked most closely to pharmacy services is communication about medications. However, in many hospitals pharmacists are not the sole process owners of this metric due to resource limitations; indeed, the HCAHPS survey has specific sections titled "Your Care from Nurses" and "Your Care from Doctors" but makes no mention of pharmacists' care at all. One survey item asks respondents to rate their agreement with the statement "When I left the hospital, I clearly understood the purpose for taking each of my medications"[21]; however, there is no specific reference to pharmacist–patient communication about medications. Providing safe and effective care is a team effort; however, as key players in the medication-use process, pharmacy departments should view this important survey item as an opportunity to demonstrate their value to patients and the organization.

U.S. News & World Report. Since its founding in 1933, U.S. News & World Report has evolved from the publish-

er of a weekly newspaper to become a nationally recognized organization that provides news and information through its rankings and reports on health, personal finance, education, travel, cars, news, and opinion. Within the healthcare setting, U.S. News & World Report's annual "Best Hospitals" rankings provide scorecards for best adult and children's hospitals.[22] For adult hospitals, the organization analyzed data points from nearly 5,000 hospitals and survey results from at least 14,000 physicians to rank the best centers in 16 adult specialties; some examples of specialties include cancer, geriatrics, orthopedics, urology, psychiatry, and gynecology.[23] For the "Best Children's Hospitals 2015–16" rankings in 10 specialties, data from 184 pediatric centers and survey results from at least 10,000 pediatric specialists were analyzed.[24] U.S. News & World Report ranks hospitals based on major outcomes that not only consumers but individual hospitals would be concerned about, such as length of stay, mortality rates, 30-day readmissions, patient safety, and clinical measures based on infections, major surgeries, and common chronic conditions such as heart failure and chronic obstructive pulmonary disease.[25]

The intent of these consumer-oriented public reports is to educate and assist patients in making appropriate healthcare choices. Critics of the reports cite potential conflicts of interest in hospitals' funding of the U.S. News & World Report ranking services and purchases of the organization's products to promote ratings. After comparing five public ranking websites, including the U.S. News & World Report site, Rothberg and colleagues[26] found that these public quality reports did not use consistent patient definitions and reporting periods for assessing different measures of outcomes, process, and structure, which may result in disagreements in hospital rankings. The authors concluded that these inconsistencies and the variability of metrics may be more confusing than informing to consumers. However, hospitals may use these public reports to demonstrate values to patients, attract new employees, and compete with peer hospitals. U.S. News & World Report mainly targets consumers as its audience and has no pharmacy-specific metrics tied to outcomes.

Health-system perspective. *Truven Health Analytics.* Truven is an independent company that provides services to various healthcare firms. It offers a suite of products specifically tailored for health systems to compare their organizations to comparable systems nationwide.[27] The company's products are aimed specifically at healthcare systems that need consulting solutions or want to improve efficiencies by benchmarking their operations against other hospitals'. Pharmacy departments can use various functions within the Truven Health Analytics suite to determine ideal staffing levels, optimize workload among their staff, and determine if organizational drug costs are above or below average relative to comparable hospitals' costs. The suite of products is aimed primarily at the health system, and the data available to users are not readily available to the consumer. The availability of benchmarking data is limited to the pool of participating hospitals; however, these metrics are often used by health-system administrators in evaluating the performance of pharmacy departments. Those administrators may not fully understand the limitations of the product.

Medicare Star ratings system. CMS has focused on ensuring that quality services are provided to Medicare beneficiaries via its Star rating system.[28] The Medicare Star rating system is designed to assist consumers in differentiating quality provided by Medicare Advantage and Medicare prescription drug programs. Ratings range from one star (poor) to five stars (excellent); the Star ratings are tied to reimbursement rates, marketing efforts, and patient enrollment for qualified insurance plans. There are many different factors taken into consideration to create these ratings; however, the rating methods incorporate three measures of medication adherence: (1) avoidance of high-risk medications in the elderly based on the "Beers criteria" for potentially inappropriate medication use in older adults,[29] (2) medication therapy management completion rate, based on documentation of a standardized comprehensive medication review, and (3) adherence values for patients receiving long-term therapy with selected medications. The last metric is particularly geared toward pharmacists, as it aims to ensure that patients have high (≥80%) adherence for particular medications such as oral antidiabetic therapies in the absence of insulin therapy, renin-angiotensin system antagonists for hypertension management, and statin drugs for cholesterol lowering.

In a related development, a report on a 2013 stakeholder summit of community pharmacy and payer organization thought leaders, published by the American Pharmacists Association and the Academy of Managed Care Pharmacy,[30] concluded that community pharmacists are essential for ensuring medication adherence. Even though that is not news to any practicing pharmacist, there is now compensation tied to work done by pharmacists. The hospital pharmacy sector can proactively create links between interventions done by institutional pharmacists and specific patient outcomes. Due to mergers and acquisitions in the healthcare industry, many health systems are expanding into outpatient services. Pharmacists are the ideal candidates to manage transitions of care for Medicare Advantage patients who are discharged from the hospital and receive follow-up care at the institution's outpatient clinics. In this role pharmacists would ensure that patients with diabetes, hypertension, and hypercholesterolemia were immediately started on the correct medications to achieve optimal outcomes and medication adherence.

Those three disease states are also the most heavily weighted components of the Medicare Star rating system.

Strategic Analytics for Improvement and Learning value model. VHA has also established a Star ratings–type measurement system, the Strategic Analytics for Improvement and Learning value model (SAIL), to summarize hospital system performance.[31] Similar to private sector models such as Truven Health Analytics' "Top Health Systems Study," SAIL emphasizes significant quality metrics. The concept underlying SAIL was to develop a prototype to allow Veterans Affairs (VA) medical centers to benchmark internally with peer hospitals and externally with the private sector. The model focuses on inpatient, outpatient, and specialty care; employee satisfaction; access to care; and hospital efficiency and takes into account the hospital complexity level. SAIL assesses 22 quality measures, including acute care mortality, avoidable adverse events, readmissions, length of stay, mental health, HEDIS and Joint Commission ORYX performance measures, patient and employee satisfaction, care transitions, accessibility to care, and overall clinical and administrative efficiency at individual VA medical centers. The data are updated every quarter and made available to the public. Dashboards are available to VA employees along with hospital star ratings. Tools and benchmark data in any category for analysis and improvement are also available. Overall, these dashboards do not provide an overall pharmacy patient care "impact factor." In addition, while some metrics are comparable to the aforementioned Truven Health Analytics model, some are specific to VA hospitals and some (e.g., measures in the mental health domain) may not be generalizable to nonfederal or private institutions, nor are they indicative of clinical and administrative cost-efficiency. However, SAIL does have internal validity and is an accessible pathway for pharmacists to showcase value within the VA system.

Magnet Recognition Program. The purpose of the Magnet Recognition Program, according to the American Nurses Credentialing Center website, is to "[recognize] healthcare organizations for quality patient care, nursing excellence and innovations in professional nursing practice"; the Magnet designation serves "as the ultimate credential for high quality nursing" to consumers.[32] Originally started as a tool to improve nurse retention and prevent nursing staff shortages at hospitals, the Magnet program has evolved into a tool used by health systems to differentiate themselves as elite institutions to both potential nursing hires and patients. Studies have demonstrated that Magnet hospitals have reduced rates of trauma-related mortality,[33,34] decreased rates of nurse burnout[35] and patient falls,[36] and improved HCAHPS scores.[37] The Magnet framework is currently organized into four domains: transformational leadership; structural empowerment; exemplary professional practice; and new knowledge, innovations, and improvements.

The journey to achieve Magnet status can be expensive and long. It has been reported to take an average of 4.25 years and cost as much as $100,000–$600,000 per year to achieve Magnet status.[38] A study that focused on the likely return on investment for a theoretical hospital found that achieving Magnet status would entail a predicted $193.43 increase in the cost per discharge, but that would be offset by a $320.48 increase in net inpatient revenue per discharge (thus, operating income would improve by $127.05 per discharge, on average).[39] This study illustrated an important aspect of Magnet: the connections of nurse staffing and nursing staff leadership with patient outcomes. Even the U.S. News & World Report "Best Hospitals" reports use Magnet status as a factor in ranking. As attaining the Magnet designation is a time- and resource-intensive proposition, it is not uncommon for pharmacists to be involved in attaining Magnet status as well as maintaining the credential. Pharmacists can use this opportunity as a great way to develop stronger relationships with nursing staff and managers and to demonstrate value to the executives of the hospital.

Payer perspective. *ACO quality measures.* The Affordable Care Act (ACA) aims to focus on improving the patient care experience, improving health at the population level, and reducing per-capita costs of healthcare. CMS established ACOs as a strategy to support ACA goals. ACOs are groups of healthcare organizations composed of physicians, hospitals, and other healthcare providers that provide cost-efficient, coordinated care to Medicare patients and, in return, receive reimbursements through shared savings by attaining quality metrics and reducing total healthcare costs per capita.[40] CMS allows ACOs to choose one of two shared savings programs: one-sided and two-sided. The one-sided model allows ACOs to obtain shared savings for the term of an ACO's first agreement; with the two-sided model, ACOs share both savings and losses for the term of the ACO agreement. CMS provides these two models to incentivize novice ACOs that want to pursue a shared-savings-only option and to attract more-experienced ACOs that want to gain greater savings but also agree to become accountable for shared losses if they fail to meet quality standards.[41] Therefore, there are more incentives to coordinate cost-efficient and high-quality care to obtain greater shared savings.

Established by the ACA, active ACO programs provide additional upfront financial support for physician-based and rural providers who participate in programs that build a care coordination infrastructure.[42] For the year 2016, a shared savings program must demonstrate that it attains 34 quality performance measures organized into four key domains for that year prior to receiving the shared savings. The four domains are patient/caregiver experience, care coordination and patient safety, preventive health, and at-risk

populations. For 2016, CMS added a new measure (stewardship of patient resources) within the patient/caregiver experience domain to 33 existing measures from 2015.[43] Of the 34 measures of patient/caregiver experience, 8 measures are collected via the Consumer Assessment of Healthcare Provider and Systems survey, 7 are calculated via claims, 1 is calculated from Medicare and Medicaid Electronic Health Record Incentive Programs data, and 18 are collected via the ACO Group Practice Reporting Option Web Interface.[44] Pharmacists can make an impact on many of the standards within these four domains. For example, pharmacists can intervene and manage at-risk populations by optimizing medication-related therapies for patients with diabetes, hypertension, heart failure, coronary heart disease, and ischemic vascular diseases.[45-47] The VA Evidence-based Synthesis Program conducted a systematic review of the effectiveness of pharmacists' interventions on chronic disease management by reviewing clinical outcomes and healthcare service utilization data from 63 studies.[48] The investigators concluded that patients managed by pharmacists were more likely than usual-care groups to attain blood pressure, cholesterol, and blood glucose goals. Pharmacists are involved with health promotion and education activities that fall under the patient care experience rubric. Pharmacists play a vital role in transitions of care and patient safety through medication history-taking, medication reconciliation, allergy identification, and postdischarge follow-up. Sanchez and colleagues[49] concluded that postdischarge phone follow-up by a pharmacist significantly ($p < 0.001$) reduced both 30-day hospital readmission rates and emergency room visits. Pharmacists have been demonstrated to have an impact on vaccination rates, a relevant metric within the CMS quality measures shown recently by Chun and colleagues,[50] who concluded that pharmacy-based vaccination programs have increased U.S. vaccination rates, especially among younger adults. A recent analysis of hypertension was intended to provide policymakers with data and information, gathered using the CAPTION study model, on the time and intensity of pharmacists' work so that they might better understand pharmacists' relative value contributions in the context of CMS financing and population management aims.[51] These studies demonstrated that a wide array of services pharmacists offer can be directly linked to CMS quality measures.

ORYX for hospitals. ORYX is the Joint Commission's initiative to integrate outcomes and other performance measurement data into the accreditation process. Currently, thousands of hospitals and long-term care organizations submit performance data to the Joint Commission. These requirements are intended to support Joint Commission–accredited organizations in their quality-improvement efforts. Accredited hospitals continue to have flexibility in meeting the ORYX performance measure requirements for reporting on a minimum of six measure sets. An example of an ORYX measure set for which pharmacists can play a strong role in raising an organization's scores is the venous thromboembolism measure set, which includes a specific measure regarding warfarin discharge instructions that addresses compliance issues, dietary advice, follow-up monitoring, and information about the potential for adverse drug reactions and interactions. Only one measure set—perinatal care—is mandatory as one of the six measure sets for hospitals.[52] Accredited hospitals have the flexibility of meeting ORYX reporting requirements through a variety of reporting options.

The role of the pharmacist. The pharmacists' role in quality, safety, and value in the healthcare system is important to both patients and healthcare organizations. Each health system focuses on certain outcomes, many of which can be affected by pharmacist interventions. Consumers, payers, and healthcare systems can benefit from the services of pharmacists in tangible, measureable ways. The value of a pharmacist can be demonstrated within the existing medical infrastructure by linking clinical activities with patient and financial outcomes. The measurement systems highlighted in this article are just a small sampling of the systems by which pharmacists can demonstrate their value to all stakeholders in the medication-use process.

Recommendations. In consideration of the quality measures and performance measurement initiatives discussed above, the following observations and recommendations can be made:

1. The number of quality measures today reaches well into the thousands. Pharmacy organizations should join with other healthcare organizations to begin a process of narrowing the field to a more manageable number and endorsing the most important measures. Further, there is a significant opportunity to align measure sets to improve benchmarking and reduce variability and redundancy.
2. Value is defined as health outcomes achieved per dollar spent. Pharmacy can assist in aligning metrics with better outcomes and understanding the dollars spent to both measure and produce outcomes. Many available performance metrics are focused on processes (e.g., measurement of glycosylated hemoglobin levels in a person with diabetes). Although process measures provide some insight into the value of care, they do not answer the most important question: Did the care result in an optimal health outcome? In a healthcare ecosystem where patients are responsible consumers, outcome measures must provide needed transparency and serve as the most effective tool for true outcome comparisons. Electronic tools will be the most cost-effective way to both provide outcome data and actionable reports to identify outliers.

3. Trends in healthcare emphasize interprofessional collaboration, particularly for the most complex patients. Pharmacists are currently helping healthcare organizations meet quality metrics. In addition, pharmacists are assisting with efforts to secure improved value-based payments under accountable care programs. Pharmacists will need to define more specifically not only *what* impact they can have but *who* is being measured with value metrics. They will also need to provide quality care to entire populations, not just individuals for whom provision of quality care is incentivized by payment structures.
4. Because of pharmacists' evolution into patient care providers and their involvement and understanding of health analytics, they are in a unique position to both identify patients for outcome improvement and provide the patient care services required to improve those outcomes. The pharmacy profession should focus additional resources on population management and population health efforts.

Discussion. Participants in the Hilton Head Conference 31 years ago expressed virtually unanimous agreement with a statement asserting that "a fundamental purpose of the profession of pharmacy is to serve as a force in society for safe and appropriate use of drugs."[53] That bold statement infers tremendous responsibility; however, the profession must now measure its impact as a force, in health systems and in society, in order for its practitioners to be recognized for major contributions to safe and effective medication use that ultimately result in better patient care. ASHP and the ASHP Foundation have furthered this discussion through the Practice Advancement Initiative (formerly the Pharmacy Practice Model Initiative). The goal of this initiative is to significantly advance the health and well-being of patients by supporting futuristic practice models that support the most effective use of pharmacists as direct patient care providers.[54]

Here we have reviewed and referenced a wide array of potential metrics that can be used to show pharmacists' value in rapidly changing healthcare environments. Providing good value to the patient is our ultimate aim. If we understand the many organizations and groups that develop and vet specific metrics, we will be better positioned to incorporate available metrics into organizational performance management systems to improve and measure the care we provide. The next steps for pharmacists are to embrace, improve, and demonstrate pharmacists' value to the patients in our healthcare systems, to key stakeholders in national healthcare quality initiatives, and to society.

Disclosures

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References

1. Blumenthal D, Stremikis K. Getting real about health care value (September 17, 2013). www.hbr.org/2013/09/getting-real-about-health-care-value (accessed 2015 Oct 30).
2. National Quality Forum. Safe practices for better healthcare—2010 update: a consensus report (April 2010). www.qualityforum.org/Publications/2010/04/Safe_Practices_for_Better_Healthcare_–_2010_Update.aspx (accessed 2015 Oct 30).
3. Institute of Medicine. Vital signs: core metrics for health and health care progress. Washington, DC: National Academies Press; 2015.
4. Agency for Healthcare Research and Quality. Agency for Healthcare Research and Quality: a profile (October 2015). www.ahrq.gov/cpi/about/profile/index.html (accessed 2015 Oct 13).
5. National Quality Measures Clearinghouse, Agency for Healthcare Research and Quality. Measures matrix. www.qualitymeasures.ahrq.gov/matrixResults.aspx?rowID=3032&rowValue=80&columnID=3025&columnValue=1002 (accessed 2015 Dec 13).
6. National Quality Forum. Endorsement summaries. www.qualityforum.org/News_And_Resources/Endorsement_Summaries/Endorsement_Summaries.aspx (accessed 2015 Oct 30).
7. Vora P. NQF releases measure recommendations for federal healthcare programs (April 18, 2016). www.ajmc.com/newsroom/nqf-releases-measure-recommendations-for-federal-healthcare-programs?utm_source=Informz&utm_medium=AJMC&utm_campaign=MC_Minute_4-19-16 (accessed 2016 Apr 25).
8. National Committee for Quality Assurance. About NCQA. www.ncqa.org/about-ncqa (accessed 2016 Jan 2).
9. National Committee for Quality Assurance. Disease management accreditation. www.ncqa.org/tabid/98/Default.aspx (accessed 2016 Jan 2).
10. National Committee for Quality Assurance. HEDIS and Quality Compass. www.ncqa.org/hedis-quality-measurement/what-is-hedis (accessed 2016 Jan 2).
11. Ho J, Mac A, Eulie P, Addagatha J. Team approach for utilization of a clinical performance dashboard: a transformation tool towards a primary care medical home model to improve patient outcomes. Presentation at Veteran Centered Medical Home Summit. Las Vegas, NV; 2010 Apr 14.
12. Pharmacy Quality Alliance. PQA mission and strategic objectives. www.pqaalliance.org/about/default.asp (accessed 2015 Aug 26).
13. Pharmacy Quality Alliance. PQA performance measures. www.pqaalliance.org/measures/default.asp (accessed 2015 Sep 1).
14. Andrawis MA, Carmichael JM. A suite of inpatient and outpatient clinical measures for pharmacy accountability: recommendations from the Pharmacy Accountability Measures Work Group. *Am J Health-Syst Pharm.* 2014; 71:1669-78.
15. ABIM Foundation. Choosing Wisely homepage. www.choosingwisely.org (accessed 2015 Nov 18).
16. Brody H. Medicine's ethical responsibility for healthcare reform—the Top Five list. *N Engl J Med.* 2010; 362:283-5.
17. Grady D, Redberg RF. Less is more: how less healthcare can result in better health. *Arch Intern Med.* 2010; 170:749-50.
18. Scott IA, Hilmer SN, Reeve E et al. Reducing inappropriate polypharmacy: the process of deprescribing. *JAMA Intern Med.* 2015; 175:827-34.
19. Centers for Medicare and Medicaid Services. Hospital Consumer Assessment of Healthcare Providers

and Systems. CAHPS hospital survey. www.hcahpsonline.org/home.aspx (accessed 2015 Sep 1).
20. Centers for Medicare and Medicaid Services. HCAPHS fact sheet (CAHPS hospital survey) (June 2015). www.hcahpsonline.org/Files/HCAHPS_Fact_Sheet_June_2015.pdf (accessed 2015 Sep 1).
21. Centers for Medicare and Medicaid Services. HCAHPS survey: survey instructions. www.hcahpsonline.org/files/HCAHPS%20V10.0%20Appendix%20A%20-%20HCAHPS%20Mail%20Survey%20Materials%20(English)%20March%202015.pdf (accessed 2015 Sep 1).
22. U.S. News & World Report. About U.S. News & World Report. www.usnews.com/info/features/about-usnews (accessed 2015 Sep 1).
23. U.S. News & World Report. Best hospitals rankings. www.health.usnews.com/best-hospitals/rankings (accessed 2015 Sep 1).
24. U.S. News & World Report. U.S. News best children's hospitals 2015–2016. www.health.usnews.com/best-hospitals/pediatric-rankings (accessed 2015 Sep 4).
25. U.S. News & World Report. U.S. News best pulmonary hospitals for adults 2015–2016. www.health.usnews.com/best-hospitals/rankings/pulmonology (accessed 2015 Sep 4).
26. Rothberg MB, Morsi E, Benjamin EM et al. Choosing the best hospital: the limitations of public quality reporting. *Health Aff.* 2008; 27:1680-7.
27. Truven Health Analytics. Truven norms and benchmarking. www.truvenhealth.com/solutions/norms-and-benchmarking (accessed 2015 Nov 13).
28. Centers for Medicare and Medicaid Services. Five-star quality rating system. www.cms.gov/medicare/provider-enrollment-and-certification/certificationand complianc/fsqrs.html (accessed 2015 Nov 13).
29. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults. *J Am Geriatr Soc.* 2015; 63:2227-46.
30. Academy of Managed Care Pharmacy and American Pharmacists Association. Medicare Star ratings: stakeholder proceedings on community pharmacy and managed care partnerships in quality. *J Am Pharm Assoc.* 2014; 54:228-40.
31. Department of Veterans Affairs. Strategic Analytics for Improvement and Learning (SAIL). www.va.gov/QUALITYOFCARE/measure-up/Strategic_Analytics_for_Improvement_and_Learning_SAIL.asp (accessed 2015 Sep 28).
32. American Nurses Credentialing Center. ANCC Magnet Recognition Program. www.nursecredentialing.org/magnet.aspx (accessed 2014 Dec 30).
33. Evans T, Rittenhouse K, Horst M et al. Magnet hospitals are a magnet for higher survival rates at adult trauma centers. *J Trauma Acute Care Surg.* 2014; 77:89-94.
34. Mchugh MD, Kelly LA, Smith HL et al. Lower mortality in Magnet hospitals. *Med Care.* 2013; 51:382-8.
35. Kelly LA, Mchugh MD, Aiken LH. Nurse outcomes in Magnet and non-Magnet hospitals. *J Nurs Adm.* 2011; 41:428-33.
36. Lake ET, Shang J, Klaus S, Dunton NE. Patient falls: association with hospital Magnet status and nursing unit staffing. *Res Nurs Health.* 2010; 33:413-25.
37. Chen J, Koren ME, Munroe DJ, Yao P. Is the hospital's Magnet status linked to HCAHPS scores? *J Nurs Care Qual.* 2014; 29:327-35.
38. Russell J. Journey to Magnet: cost vs. benefits. *Nurs Econ.* 2010; 28:340-2.
39. Jayawardhana J, Welton JM, Lindrooth RC. Is there a business case for Magnet hospitals? Estimates of the cost and revenue implications of becoming a Magnet. *Med Care.* 2014; 52:400-6.
40. Centers for Medicare and Medicaid Services. Accountable care organizations (ACO) (January 6, 2015). www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ACO/index.html?redirect=/Aco (accessed 2016 Apr 26).
41. Centers for Medicare and Medicaid Services. Methodology for determining shared savings and losses under the Medicare Shared Savings Program. www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/ACO_Methodology_Factsheet_ICN907405.pdf (accessed 2016 Apr 26).
42. Centers for Medicare and Medicaid Services. The Affordable Care Act: helping providers help patients. www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ACO/Downloads/ACO-Menu-Of-Options.pdf (accessed 2016 Apr 26).
43. Centers for Medicare and Medicaid Services. Accountable Care Organization 2016 program quality measure narrative specifications (January 13, 2016). www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/2016-ACO-Narrative Measures-Specs.pdf (accessed 2016 Apr 26).
44. Centers for Medicare and Medicaid Services. Quality measures, reporting

Appendix—Pharmacy Quality Alliance–endorsed medication-use metrics included in Medicare Part D plan ratings[13,a]

Focus of Metric	Description
Use of high-risk medications in the elderly	The percentage of patients 65 years of age or older with two or more filled prescription for a high-risk medication during a specified measurement period
Medication therapy management (MTM) completion rate	The percentage of patients who meet eligibility criteria for the MTM program and who receive a comprehensive medication review in a standardized format
Medication adherence (as measured by PDC)	The percentage of patients 18 years of age or older who met a PDC threshold of 80% during a specified measurement period for statins, renin-angiotensin system antagonists, and oral antidiabetes medications

[a]ACEI = angiotensin-converting enzyme inhibitor, ARB = angiotensin receptor blocker, PDC = proportion of days covered.

and performance standards. www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Quality-Measures-Standards.html (accessed 2016 Apr 26).
45. Isetts BJ, Buffington DE, Carter BL et al. Evaluation of pharmacists' work in a physician-pharmacist collaborative model for the management of hypertension. *Pharmacotherapy.* 2016; 36:374-84.
46. Traynor K. Pharmacists improve diabetes care. *Am J Health-Syst Pharm.* 2014; 71:1240-2.
47. Shepherd MR, Thomas D, Herald M, Adane ED. Evaluation of a pharmacist-managed heart failure education project: empowering patients to self-manage their disease. *J Pharm Technol.* 2015; 31:120-6.
48. Greer N, Bolduc J, Geurkink E et al. Pharmacist-led chronic disease management: a systematic review of effectiveness and harms compared with usual care. *Ann Intern Med.* Epub ahead of print. 2016 Apr 26.
49. Sanchez GM, Douglass MA, Mancuso MA. Revisiting Project Re-Engineered Discharge (RED): the impact of a pharmacist telephone intervention on hospital readmission rates. *Pharmacotherapy.* 2015; 35:805-12.
50. Chun GJ, Sautter JM, Patterson BJ, McGhan WF. Diffusion of pharmacy-based influenza vaccination over time in the United States. *Am J Public Health.* 2016; 14:e1-2.
51. Carter BL. Primary care physician–pharmacist collaborative care model: strategies for implementation. *Pharmacotherapy.* 2016; 36:363-73.
52. Joint Commission. Facts about ORYX for hospitals. www.jointcommission.org/facts_about_oryx_for_hospitals/ (accessed 2016 Jan 12).
53. Ray MD. Personal reflections 30 years after the Hilton Head Conference. *Am J Health-Syst Pharm.* 2015; 72:972-6.
54. American Society of Health-System Pharmacists. ASHP Practice Advancement Initiative. www.ashpmedia.org/pai/index.html (accessed 2016 Jul 14).