The high-value pharmacy enterprise framework: Advancing pharmacy practice in health systems through a consensus-based, strategic approach

Supplementary material is available with the full text of this article at *AJHP* online.

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Purpose. The high-value pharmacy enterprise (HVPE) framework and constituent best practice consensus statements are presented, and the methods used to develop the framework's 8 domains are described.

Summary. A panel of pharmacy leaders used an evidence- and expert opinion–based approach to define core and aspirational elements of practice that should be established within contemporary health-system pharmacy enterprises by calendar year 2025. Eight domains of an HVPE were identified: Patient Care Services; Business Services; Ambulatory and Specialty Pharmacy Services; Inpatient Operations; Safety and Quality; Pharmacy Workforce; Information Technology, Data, and Information Management; and Leadership. Phase 1 of the project consisted of the development of draft practice statements, performance elements, and supporting evidence for each domain by panelists, followed by a phase 2 in-person meeting for review and development of consensus for statements and performance elements in each domain. During phase 3, the project cochairs and panelists finalized the domain drafts and incorporated them into a full technical report and this summary report.

Conclusion. The HVPE framework is a strategic roadmap to advance pharmacy practice by ensuring safe, effective, and patient-centered medication management and business practices throughout the health-system pharmacy enterprise. Grounded in evidence and expert recommendations, the statements and associated performance elements can be used to identify strategic priorities to improve patient outcomes and add value within health systems.

Keywords: best practices, consensus, high-value pharmacy enterprise, leadership, pharmacists, pharmacy practice advancement

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Over the past 2 decades, important initiatives galvanized advances in the practice of pharmacy in the United States as well as internationally. Within ASHP, these initiatives were the 2010 Pharmacy Practice Model Summit and 2014 Ambulatory Care Summit, consolidated in 2015 as the Practice Advancement Initiative and updated recently as the Practice Advancement Initiative (PAI) 2030 with recommendations to reach by the year 2030.[1-3] Other practice advancement initiatives during this period included the 2007 High-Performance Pharmacy initiative and Global Conference on the Future of Hospital Pharmacy.[4,5] Considering the rapidly evolving healthcare landscape and focus on value-based care, leaders in health-system pharmacy identified the need to supplement these initiatives with a strategic and tactical framework for advancing practice throughout the pharmacy enterprise.[6] Thus was born the High-Value Pharmacy Enterprise (HVPE) project. The goal of the project was to develop a strategic, evidence-based tactical roadmap, grounded in recommendations supported by literature and expert consensus, for preserving

core elements of pharmacy practice and advancing the pharmacy profession to provide safe, effective, and patient-centered medication management—defining the nature of an HVPE. The resultant HVPE framework is presented in this article.

Intended for use in synergy with the broad aspirational goals and recommendations for pharmacy practice detailed in PAI 2030 recommendations, the HVPE framework provides a detailed roadmap for advancing the profession by identifying 8 domains of both fundamental and aspirational elements of practice that should be established within the contemporary health-system pharmacy enterprise by calendar year 2025—a time horizon intended to motivate deliberate and intentional action while recognizing the impact of ongoing changes to the healthcare environment. The HVPE framework is intended to be achievable and to inspire development of the highest level of professional pharmacy practice to meet the evolving needs of patients and healthcare organizations.

This report describes the HVPE framework, an overview of the 8 domains, and the methods used in their development.

Developing the framework

An evidence- and expert opinion–based approach was used to develop the HVPE framework. This well-established method is used by the National Academies of Sciences, Engineering, and Medicine (the latter formerly known as the Institute of Medicine) to address critical national health topics, such as preventing medication errors, the future of nursing, and the opioid epidemic and pain management.[7] The HVPE project is an initiative of the Vizient University Health System Consortium Pharmacy Network along with ASHP as a collaborating partner.

The process for developing the HVPE statements and performance elements consisted of 3 phases:

KEY POINTS

- The high-value pharmacy enterprise framework provides a strategic roadmap to advance pharmacy practice in health systems.
- Core and aspirational elements of health-system pharmacy practice are articulated in 94 consensus statements across 8 domains.
- Health systems can assess their achievement of high performance using over 300 performance elements developed for the consensus statements.

- Phase 1: development of draft statements, performance elements, and supporting evidence for each domain by panelists
- Phase 2: an in-person meeting for review and development of consensus for statements and performance elements in each domain
- Phase 3: finalizing the domain drafts and incorporating them into a technical report titled "High-Value Pharmacy Enterprise Project: Literature Review, Consensus Statements, and Performance Elements"[8]

Phase 1 began in March 2019. The project cochairs (SR and RS) identified 8 domains as critical for an HVPE based on their years of experience in health-system pharmacy and extensive expertise in health-system pharmacy leadership. They recruited a diverse panel of strategic contemporary pharmacy leaders (all are included as authors of this paper) to serve as domain authors. Panelists were encouraged to engage a pharmacy resident to support their work (all residents who were involved in this work are also included as authors of this paper). An experienced and respected facilitator (LV) was selected to support the process and facilitate the in-person meeting.

Each panelist was responsible for performing a thorough review of the literature and supporting professional guidance documents pertaining to the assigned domain, focusing on literature within the past 10 years. The project facilitator provided standardized guidance on the literature search and review process, which was followed by each panelist. Based on this review and personal experience, each panelist was then responsible for writing a paper containing proposed evidence-based best practice consensus statements and performance elements, including a synthesis of the evidence, for full group review and debate. For each domain, the cochairs developed topic areas and questions to stimulate panelists in developing their initial literature reviews, consensus statements, and associated performance elements. They also provided written feedback on domain drafts that the panelists subsequently revised before the in-person meeting. During phase 1, three virtual meetings with all panelists were held, and these served as opportunities to share feedback, identify gaps, discuss potential overlap, and maintain momentum.

The phase 2 in-person meeting for panelists and residents was held in Chicago, IL, in August 2019. All participants received domain drafts for review in advance, and panelists were assigned to be lead reviewers for 2 domains they had not authored. During the 2-day meeting, the panelists debated all draft consensus statement recommendations and through discussion reached agreement on amended statements and performance elements within each domain. Vizient provided travel support for panelists (except for pharmacy residents). Two reactor panelists, well respected for their extensive contributions to the profession, attended the meeting and provided feedback in the closing session.

During phase 3, each domain draft was revised by the lead author and further edited by the project cochairs to achieve aspirational and consistently structured content. While efforts were made to avoid redundancy among

domains, some redundancy was kept if a concept was described from different perspectives or its importance warranted reinforcement.

HVPE framework

The final HVPE framework has a total of 94 statements (Box 1) and 336 performance elements (provided, along with the 94 statements, in eTable 1) in 8 domains:

1. Patient Care Services
2. Business Services
3. Ambulatory and Specialty Pharmacy Services
4. Inpatient Operations
5. Safety and Quality
6. Pharmacy Workforce
7. Information Technology, Data, and Information Management
8. Leadership

The following sections highlight some of the most relevant and impactful statements in each domain. The full technical report containing all statements, performance elements (PEs), and the full text of each literature review providing supporting evidence, is available online.[8]

Domain 1: Patient Care Services. Domain 1 highlights essential aspects of pharmacy patient care services that are considered standard expectations of an HVPE. One essential aspect is that pharmacists serve as providers of comprehensive pharmacy patient care services on the interprofessional care team in all settings of care (statement 1.1a). For instance, the pharmacy department is accountable for drug therapy services and outcomes independent of time, day, holiday, or individual providing care (PE 1.1a.b), and pharmacists prioritize which patients receive their care, with services not limited to a consult model (PE 1.1a.d). In the HVPE, pharmacy is accountable for comprehensive medication management across the continuum of care to optimize drug therapy and patient safety (statement 1.2a), as well as for clinical and financial stewardship of high-cost and high-risk medications to ensure their appropriate use in all patient care settings, thereby preventing the consequences of overuse and underuse (statement 1.3a). A proposed list of comprehensive inpatient and transitional care pharmacy services provided in a contemporary pharmacy enterprise is offered (eAppendix A).

The benefits of including a pharmacist on a service can be applied to a broad range of clinical specialties requiring complex medication management. For example, including pharmacists on interprofessional rounding teams in intensive care units is associated with avoidance of over 50 deaths per hospital annually.[9] Similarly, a pharmacy-managed vancomycin dosing service was shown to more than double the percentage of patients receiving optimal vancomycin therapy (from 40% before implementation to 97% after implementation), with corresponding decreases in average length of stay (8.4 days vs 10.0 days) and incidence of nephrotoxicity (3.2% vs 8.7%).[10]

These and other evidence-based pharmacist patient care services and interventions associated with improved patient care, safety, and/or financial outcomes are highlighted in the HVPE framework list of proposed pharmacy-sensitive indicators (PSIs) in eAppendix B.[11] While multicenter studies are needed to validate these and other proposed PSIs, they serve as a starting point for the pharmacy to establish a consistent, ongoing process and key performance indicators for comprehensive assessment and documentation of the impact of pharmacy patient care services on quality, safety, financial outcomes, and other organizational goals (statement 1.4a, PE 1.4a.a, PE 1.4a.c).

Domain 1 includes other statements related to pharmacy services, continuity of healthcare, and stewardship of resources and programs, primarily as they relate to inpatient services. Ambulatory pharmacy patient care services are addressed in domain 3.

Domain 2: Business Services. Domain 2 highlights the pharmacy enterprise's critical role in developing innovative business solutions for delivering patient care and creating value for the health system, including essential business services to improve medication revenue cycle performance, capture pharmacy-related business, and establish expertise in payer-contracting processes. A system-wide formulary management system (statement 2.1a) forms the base of medication cost management, with management of medication contracting, procurement, and distribution by the pharmacy for all sites of care (statement 2.1e).

In an HVPE, pharmacy is accountable for ensuring effective and efficient patient access to medications, including benefits review, prior authorization, and prescription refill services, to support patients and providers and to optimize revenue (statement 2.2a). The number and complexity of medication prior authorizations that providers and patients must manage have steadily increased over time and will likely continue to increase. Multiple studies have demonstrated the value of centralizing prescription management services. For example, a centralized, pharmacy-led prior authorization process was found to result in a higher prior authorization approval rate, faster times to prescription filling, shorter order processing times, and reduced staff time relative to a clinic-led process.[12] Centralizing the medication refill process through collaborative practice agreements can save provider time, which can then be reallocated to seeing more clinic patients.[13] The medication revenue cycle is unique and highly complex. In an HVPE, pharmacy is accountable for ensuring optimal medication revenue integrity, limiting medication-related financial liability, and ensuring appropriate site-of-care selection for high-cost medications (statement 2.3a). Steps that the health-system pharmacy enterprise can take to improve billing processes include implementing a collaborative pharmacy revenue integrity team (PE 2.3a.a), using revenue cycle monitoring tools (PE 2.3a.b), and reviewing trends in denials and billing

Box 1. Consensus Statements in Domains of the High-Value Pharmacy Enterprise Framework

Domain 1—Patient Care Services

Topic 1: Pharmacy services

1.1a. Pharmacists provide comprehensive pharmacy patient care services as providers on the interprofessional care team in all settings of care.

1.1b. Pharmacists are accountable for all patient medication-use needs to support safe and effective drug therapy management.

1.1c. Pharmacists ensure appropriate use of pharmacogenomic information and biomarkers to optimize drug therapy selection, prevent adverse events, and reduce the total cost of care.

Topic 2: Continuity of healthcare

1.2a. Pharmacy is accountable for comprehensive medication management across the continuum of care to optimize drug therapy and patient safety.

1.2b. Pharmacists are responsible for ensuring that patients understand and are proficient in using their high-risk medications.

1.2c. Pharmacy staff coordinates transitional and post-discharge drug therapy management for patients at high risk of readmission.

Topic 3: Stewardship of resources and programs

1.3a. Pharmacy is accountable for clinical and financial stewardship of high-cost and high-risk medications to ensure their appropriate use in all patient care settings, including inpatient, outpatient, and procedure settings, preventing the consequences of overuse and underuse.

1.3b. Pharmacists serve on organization-wide patient care committees to promote patient-centered, value-based care.

Topic 4: Clinical data analytics

1.4a. Pharmacy establishes a consistent, ongoing process and key performance indicators for comprehensive assessment and documentation of the impact of pharmacy patient care services on quality, safety, financial outcomes and other organizational goals.

Domain 2—Business Services

Topic 1: Medication cost management

2.1a. A system-wide formulary management system is implemented.

2.1b. Strategies for cost-effective, coordinated medication management are implemented that take into consideration patient care, patient satisfaction, and evolving payer requirements.

2.1c. Systems are established to reduce medication waste in all phases of the medication-use process.

2.1d. Medication inventory management systems are documented and implemented across the health system.

2.1e. Medication contracting, procurement, and distribution is managed by the pharmacy for all sites of care.

2.1f. For qualifying 340B-covered entities, the 340B program is effectively managed to assure compliance, with savings optimized across the health system.

Topic 2: Medication access

2.2a. Pharmacy is accountable for ensuring effective and efficient patient access to medications, including benefits review, prior authorization, and prescription refill services, to support patients and providers and to optimize revenue.

2.2b. Pharmacy is accountable for ensuring effective and efficient patient access to medications, including provision of comprehensive medication assistance program services to assist uninsured and underinsured patients in accessing free medications.

Topic 3: Revenue integrity

2.3a. Pharmacy is accountable for ensuring optimal medication revenue integrity, limiting medication-related financial liability, and ensuring appropriate site of care selection for high-cost medications.

Topic 4: Business growth

2.4a. Pharmacy identifies, evaluates, and implements new business ventures.

Domain 3—Ambulatory and Specialty Pharmacy Services

Topic 1: Pharmacy services that benefit population health and improve access to care

3.1a. Pharmacists collaborate with care providers across the health-system continuum to optimize patient health and well-being.

3.1b. Pharmacists have an active role in managing pharmacotherapy in all care settings and share responsibility and accountability for medication-related outcomes.

3.1c. Pharmacists provide comprehensive medication management services for patients with complex medical regimens and patients on high-risk therapies across the continuum.

3.1d. Pharmacists are actively involved in de-prescribing efforts for patients with polypharmacy or taking inappropriate high-risk medications.

Topic 2: Retail pharmacy services

3.2a. Retail pharmacy services are established to ensure patient access to medications and improve medication regimen adherence and affordability.

Topic 3: Specialty pharmacy and infusion care services

3.3a. Health system offers a comprehensive dual-accredited specialty pharmacy program to support optimal patient care and strong organizational financial performance.

3.3b. Pharmacy participates in comprehensive medication management services for patients receiving infusions and other high-cost, clinic-administered medications throughout the health system and affiliate locations.

Topic 4: Employer-funded health plans

3.4a. Pharmacy helps lead and oversee employer-funded health plan medication management practices to ensure formulary alignment, coordination with pharmacy benefit managers (PBMs), plan design, and use of health-system-owned specialty and retail pharmacies.

3.4b. The health plan uses pharmacists to provide preventive services through employer-sponsored wellness and disease state management programs.

3.4c. The health plan supports employees with complex diseases and conditions through comprehensive medication management services.

Domain 4—Inpatient Operations

Topic 1: Medication-use systems and operations pharmacists

4.1a. Inpatient operations employ pharmacists who are specially trained and credentialed in medication-use systems and operations.

Topic 2: Drug shortage management

4.2a. A system to prevent, manage, and mitigate medication shortages is implemented to reduce patient harm.

Topic 3: Drug diversion prevention

4.3a. Maintain an effective drug diversion prevention plan for controlled substances and high-cost medications.

Topic 4: Safety of medication storage, preparation, distribution, administration and disposal

4.4a. Pharmacy ensures drugs are procured, stored, prepared, dispensed, distributed and disposed in the safest possible manner.

4.4b. Systems are in place to monitor and evaluate the storage and distribution of medications across the organization to minimize waste, and to ensure they are delivered as close to due time as possible.

4.4c. Barcode scanning is used throughout the medication stocking, preparation, distribution, dispensing, delivery, and administration processes.

4.4d.	Technologies such as IV workflow management systems, picture taking, gravimetric technology, and robotics, in conjunction with barcode scanning, are used to support safe, efficient medication sterile compounding.
4.4e.	Contemporary quality improvement principles are leveraged to ensure the ongoing safe, timely, efficient, and effective provision of pharmacy services.
4.4f.	When self-administered medication processes are implemented, robust systems are in place to ensure patient safety.
Topic 5: Efficiency within a multihospital system	
4.5a.	Multihospital systems evaluate and implement strategies to improve the operational performance, efficiency, and integration of its internal pharmacy programs and services.

Domain 5—Safety and Quality

Topic 1: Cultural and organizational characteristics that define safety and quality	
5.1a.	A dedicated pharmacist medication safety officer is responsible for maintaining the organization's medication safety strategic plan and continuously evaluating its effectiveness.
5.1b.	Routine monitoring of national and local evidence-based best practices and gathering inter-organizational shared experiences related to medication safety and quality are routinely performed to maximize organizational engagement and improve safety.
5.1c.	Organization demonstrates a commitment to routine collection and analysis of medication-related adverse events and "near-misses" using provider reporting, data analytics, and reporting from other organizations to continuously and proactively improve patient safety and outcomes.
5.1d.	Organization cultivates a learning healthcare system as a framework to provide safe and effective care.
Topic 2: Role of pharmacy and therapeutics committees in ensuring evidence-based care	
5.2a.	Leverage the pharmacy and therapeutics (P&T) committee to promote evidence-based formulary management, drug use policy, and stewardship.
5.2b.	The pharmacy department leads stewardship efforts to optimize safety and quality of medications.
5.2c.	Pharmacy departments engage with the P&T committee for accountability over the routine evaluation of the safety and quality of the organization's medication-use process.
Topic 3: Accountability and monitoring for patient safety	
5.3a.	Align medication safety strategy and priorities with patient safety goals and objectives of the organization.
5.3b.	Leverage real-time reporting and alerting tools to monitor and support medication safety.
Topic 4: Accountability for monitoring for quality and value	
5.4a.	Pharmacy practice leaders engage with hospital and health-system safety and quality executives to identify continuous quality improvement priorities and opportunities.
5.4b.	A robust medication safety and quality dashboard is maintained and routinely shared with key stakeholders and staff to improve patient care.
Topic 5: Special considerations for patient and healthcare worker safety	
5.5a.	Implement strategies to support workforce resilience and well-being.

Domain 6—Pharmacy Workforce

Topic 1: Pharmacy education	
6.1a.	The health system engages in a collaborative relationship with associated schools of pharmacy.
6.1b.	Learners at each level of training (e.g., IPPE, intern, APPE, PGY1 Resident and PGY2 Resident) engage in activities at the highest level of their competence.
6.1c.	Interprofessional education occurs at all levels of learner education and training within the health system.
6.1d.	Pharmacy residency training programs advance the organization's patient care model.

Topic 2: Pharmacist scope of practice, staffing, and practice model
6.2a. The pharmacists' scope of practice is as a provider and is continuously expanding.
6.2b. Performance metrics and productivity measures are developed and maintained to ensure appropriate staffing models.
6.2c. The health system only hires and retains pharmacists competent for top of license practice.
6.2d. Innovative pharmacy positions are created to meet contemporary healthcare opportunities.
Topic 3: Pharmacy technicians
6.3a. Pharmacy technicians participate in advanced roles in all practice settings to expand the scope of pharmacist practice, promote efficiency and improve patients' access to care.
6.3b. Health systems attract new entrants into pharmacy technician careers and only employ competent technicians that are certified.
Topic 4: Scholarship
6.4a. Pharmacy-led scholarship is a highly valued output of the department.
6.4b. Pharmacists engage in the design, implementation, and evaluation of quality improvement initiatives.
Topic 5: Professional development
6.5a. Career ladders and other professional advancement programs are used to maximize growth and engagement of pharmacy personnel.
Domain 7—Information Technology, Data, and Information Management
Topic 1: Fundamental medication management supporting technologies
7.1a. Proven medication management technologies are leveraged to maximize patient safety and clinical practice effectiveness.
7.1b. Proven medication-system technologies are leveraged to support safe and efficient pharmacy operations.
7.1c. Employ available technologies to engage patients beyond the walls of healthcare facilities to allow them to be active owners in their care.
7.1d. Deploy real-time point-of-care technologies to assist clinicians in evaluating and managing patient care, such as clinical decision support, artificial intelligence, machine learning, and other algorithms.
7.1e. Prepare and participate in business continuity best practices for data integrity, security, and availability during technology downtimes.
Topic 2: Pharmacy workforce competency
7.2a. Maintain a medication management informatics team with accountability to pharmacy to support safe and effective use of medications.
7.2b. Engage in active workforce planning to ensure readiness for adoption of emerging medication-related technologies and ongoing workforce development needs.
Topic 3: Data, information, and analytic platform management
7.3a. Integrate and capitalize on existing big data and predictive analytics tools to measure and improve outcomes and efficiency.
7.3b. Pharmacists should have access to real-time aggregated inpatient and outpatient data to assist with care management.
7.3c. Dashboards are used to support patient care services, operations, and organizational initiatives.
Domain 8—Leadership
Topic 1: Attributes of the pharmacy leadership team
8.1a. A pharmacy leadership team is accountable for all aspects of the pharmacy enterprise.
8.1b. Members of the leadership team exhibit executive presence as an essential characteristic necessary to succeed in advancing pharmacy practice.

8.1c.	Pharmacy leaders demonstrate a high level of emotional intelligence.
8.1d.	Pharmacy leaders actively pursue productive and vibrant individual continuing professional development (CPD) plans.
Topic 2: Organizing for maximum effectiveness	
8.2a.	The most senior pharmacy leader reports to the highest level of organizational leadership (e.g., chief executive officer, chief operating officer).
8.2b.	Pharmacy maintains an organizational structure that supports its leaders' focus on strategy, priorities, tactics, and timely and effective decision making.
8.2c.	All pharmacists and pharmacy technicians in pharmacy practice roles report to leaders that report into the pharmacy leadership team.
8.2d.	Members of the pharmacy leadership team maintain effective working and personal relationships with leaders from other areas throughout the organization.
Topic 3: Strategy and innovation	
8.3a.	The pharmacy leadership team creates and maintains a contemporary strategic plan for pharmacy practice, aligned with organizational goals and strategic priorities.
8.3b.	Pharmacy leaders monitor the healthcare environment for new opportunities, take calculated risks, and encourage innovation that advances practice.
Topic 4: Leading for results	
8.4a.	Pharmacy leaders demonstrate business acumen to ensure the effective use of organizational and pharmacy resources to optimize patient outcomes.
8.4b.	Pharmacy leaders advocate for pharmacy services on an ongoing basis by influencing and demonstrating the positive impact of the pharmacy enterprise on achieving organizational goals and strategic priorities, including patient care outcomes and financial performance.
8.4c.	Pharmacy leaders are actively engaged in contributing to the profession by sharing successful practices with colleagues.
8.4d.	Pharmacy leaders share pharmacy department and team member successes within the department to engage and motivate pharmacy staff.
8.4e.	Pharmacy leaders actively participate, serve in leadership roles, and support staff involvement in local, state, and/or national pharmacy organizations.
Topic 5: Developing future leaders	
8.5a.	Pharmacy leaders inspire the development and success of future pharmacy leaders by teaching, modeling, coaching, facilitating, and mentoring in college of pharmacy curricula.
8.5b.	Pharmacy leaders engage in developing the leadership skills of future pharmacy leaders.
8.5c.	Pharmacy team members serve as leaders within the organization via effectively contributing to interdisciplinary teams and committees.
8.5d.	Leaders maintain a pipeline of future employees by connecting with local colleges of pharmacy to establish contemporary education and rotational sites for pharmacy students.
8.5e.	Pharmacy leaders have a dynamic succession plan that evolves to meet the needs of the organization and pharmacy enterprise.

Abbreviations: 340B, 340B Drug Pricing Program; APPE, advanced pharmacy practice experience; IPPE, introductory pharmacy practice experience; PGY1, postgraduate year 1; PGY2, postgraduate year 2.

errors and implementing action plans for prevention or improvement (PE 2.3a.d).[14]

Integral to domain 2 is business growth. In the HVPE, pharmacy identifies, evaluates, and implements new business ventures (statement 2.4a). It is necessary to have a leadership that identifies, implements, and monitors entrepreneurial opportunities for the pharmacy enterprise and develops the necessary processes and support, such as organizational business planning and strategic planning processes (PE 2.4a.a-c). As US healthcare transitions from acute care management to management of patients across the continuum of care, pharmacy-related

ambulatory business growth opportunities should be routinely evaluated and maximized (PE 2.4a.g). See domain 3 for growth opportunities in ambulatory and specialty pharmacy services and domain 8 for attributes of successful leaders.

Domain 3: ambulatory and specialty pharmacy services. As the pharmacy enterprise expands its ambulatory and specialty pharmacy practice as outlined in domain 3, it is important to focus on improving adherence, affordability of medications, and enhancing access to clinical resources to achieve optimal financial, quality, and satisfaction outcomes. Examples of programs and services documenting the positive impact of pharmacist collaborative practice on disease state management in the ambulatory care setting are offered (eAppendix C).

In an HVPE, the health system offers a comprehensive dual-accredited specialty pharmacy program to support optimal patient care and strong organizational financial performance (statement 3.3a). Specialty pharmacies build on the foundation of a strong retail pharmacy infrastructure. Although sole ownership of a specialty pharmacy is preferred (PE 3.3a.a), in some cases it may be advantageous to partner with other hospitals to ensure adequate prescription volume.[15] Specialty pharmacy accreditation is increasingly required to access certain payer networks or medications, and dual accreditation provides a competitive advantage. Insourcing a specialty pharmacy can reduce fragmentation of care, particularly through use of pharmacists in the health system's specialty clinics, providing a 24/7 drug therapy management call center, and leveraging advanced pharmacy technician roles (PE 3.3a.b-d; roles listed in eAppendix D). This integrated model may increase specialty pharmacy prescription volume, decrease time to medication approval, and provide financial aid for patients who require assistance.[16] It also supports prospective drug-use review, concurrent benefits investigation, patient education, and follow-up for tolerability and efficacy.

Another topic addressed in domain 3 is employer-funded health plans. In an HVPE, the pharmacy helps lead and oversee employer-funded health plan medication management practices to ensure formulary alignment, coordination with pharmacy benefit managers (PBMs), plan design, and use of health system–owned specialty and retail pharmacies (statement 3.4a). To do this, PBM services for direct-to-employer plans are separately carved out from the health plan third-party administrator contract, with pharmacy leadership participation in PBM selection and PBM agreement oversight (PE 3.4a.a-b). The carve-out approach has many advantages, including greater ability to manage pharmacy benefits costs separately from the rest of the medical plan. Including strategies to maximize employee use of employer-owned retail and specialty pharmacy services in the health plan design (PE 3.4a.d) can generate dramatic savings for the health system and help ensure employee medication appropriateness and adherence.[17]

Domain 3 also addresses the topics of retail pharmacy services, infusion care services, and pharmacy services that benefit population health and improve access to care.

Domain 4: Inpatient Operations. Domain 4 addresses the scope of inpatient pharmacy operations in the HVPE. Inpatient pharmacy operations are increasingly complex, regulated, and automated, requiring a highly specialized pharmacist and technical workforce to ensure safe and efficient delivery of medications for patients within the health system.[18,19] Inpatient operations should employ pharmacists who are specialty trained and credentialed in medication-use systems and operations (statement 4.1a). Because many schools of pharmacy do not prepare pharmacy students for these roles, nor do most postgraduate year 1 residency training programs, these pharmacists should have advanced training in medication-use systems and operations (PE 4.1a.a). Certification in sterile compounding and/or other areas pertaining to pharmacy operations should be required as certifications become available (PE 4.1a.b). Maintaining a highly trained and competent pharmacy technician workforce is also vital to inpatient pharmacy operations, and the discussion of pharmacy technicians has been centralized in domain 6 (Pharmacy Workforce).

In multihospital systems, centralizing select aspects of inpatient pharmacy operations can lead to decreased operating costs, efficient use of resources, and greater investment in pharmacy technology to improve patient care and safety.[20] Multihospital systems should evaluate and implement strategies to improve the operational performance, efficiency, and integration of internal pharmacy programs and services (statement 4.5a). One strategy is to develop a centralized consolidated pharmacy services center (CPSC) to meet the needs of the health system (PE 4.5a.a). Many factors go into the decision to develop a CPSC, including current inventory, medications frequently acquired and compounded in large quantities, ability to create a new space, the need for a backup supply plan to be implemented in the event of facility outages and shortages, and availability of personnel to comply with compounding standards, good manufacturing practices, and legal and regulatory requirements.[21]

Other topics addressed in domain 4 are drug shortage management, drug diversion prevention for controlled substances and high-cost drugs, and safety of medication storage, preparation, distribution, and administration. In particular, the use of technologies to support safe, efficient medication sterile compounding is addressed (statement 4.4d), as are contemporary quality improvement principles to ensure the ongoing safe, timely, efficient, and effective provision of pharmacy services (statement 4.4e). Technology and quality/safety considerations are also addressed in domains 7 and 5, respectively.

Domain 5: Safety and Quality. Domain 5 identifies critical areas in an HVPE to master in pursuit of safety and quality, both of which are essential to ensure optimal patient care outcomes. These areas are integrated in and dependent on the other HVPE framework domains. First and foremost is creating a culture and organizational characteristics that define safety and quality, including demonstrating a commitment to routine collection and analysis of medication-related adverse events and "near-misses" to continuously and proactively improve patient safety and outcomes (statement 5.1c).[22] This can be done using provider reporting, data analytics, and reporting tools from other organizations, such as the Medication Safety Self-Assessment for Hospitals developed by the Institute for Safe Medication Practices (ISMP) in 2000.[23] To meet this commitment, the pharmacy enterprise must have a dedicated pharmacist medication safety officer who is responsible for maintaining the organization's medication safety strategic plan and evaluating its effectiveness (statement 5.1a).

Another critical area is accountability for monitoring of quality and value. Pharmacy practice leaders in an HVPE engage with hospital and health-system safety and quality executives to identify continuous quality improvement priorities and opportunities (statement 5.4a). As part of this, the pharmacy aligns with the quality improvement and measurement priorities of the organization and demonstrates the value of medication management services to influence decisions related to the strategic direction of the institution (PE 5.4a.a,c). Despite the current lack of a formal method for attributing patient and quality outcomes to pharmacists' practice activities, the ASHP Pharmacy Accountability Measures (PAM) Work Group identified and prioritized existing national medication-related quality measures that health-system pharmacists can use to establish accountability for and demonstrate value in clinical outcomes.[24] Capturing performance data enables pharmacy leaders to not only stratify patient populations proactively to prioritize pharmacist services and ensure adequate staffing to meet safety and quality goals but also demonstrate the value of medication management services to influence decisions related to the strategic direction of their institutions, including value-based contracts with payers.

Other critical areas addressed in domain 5 are the role of pharmacy and therapeutics committees in ensuring evidence-based care; accountability for and monitoring of patient safety; special considerations for patient and healthcare worker safety; and the need for organizations to establish a "learning healthcare systems" approach to safety and quality improvement.

Domain 6: Pharmacy Workforce. Domain 6 explores critical elements of the pharmacy workforce that are present in an HVPE, starting with pharmacy education. Learners at each level of training engage in activities at the highest level of their competence (statement 6.1b). The health system educates all levels of student pharmacists, from introductory pharmacy practice experience (IPPE) rotations through postgraduate year 2 residencies, and has internship and longitudinal advanced pharmacy practice experience (APPE) programs that transition student pharmacists to direct patient care roles and residency training and/or fellowships, respectively (PE 6.1b.a-c). Most importantly, learners are positioned intentionally to instruct other learners below them at all levels (PE 6.1b.d). This layered learning model improves teaching, develops precepting skills, and facilitates top-of-license practice for all levels of pharmacy professionals and has resulted in improved clinical outcomes and measures, reduced medication costs, improved patient satisfaction, and increased pharmacist time for intensive clinical activities.[25-27]

Pharmacists' scope of practice in the enterprise is as a provider, and it is continuously expanding (statement 6.2a). Collaborative practice agreements are structured to allow pharmacists to manage patient medication therapy independently and with a degree of judgment commensurate with their education and training, and these roles are defined alongside those of other providers to minimize overlap (PE 6.2a.a-b). In addition, pharmacists in patient care roles are privileged similarly to other healthcare providers (PE 6.2a.d), which enables them to specialize and operate at the top of their license to improve the quality of care and patient outcomes.[28] Performance metrics and productivity measures, such as those defined by ASHP's PAM Work Group, are developed and maintained to ensure appropriate staffing models to optimize medication outcomes, improve medication safety, and maximize value (statement 6.2b).[24]

Technicians are a critical part of the pharmacy team, performing duties under the supervision of a pharmacist that do not require a pharmacist's clinical judgment. Within the HVPE, pharmacy technicians participate in advanced roles in all practice settings to expand the scope of pharmacist practice, promote efficiency, and improve patients' access to care (statement 6.3a). Looking beyond traditional dispensing and data-entry roles, examples of expanded roles include administrative support for medication management services, immunizations, and telephone follow-up and home visit services following hospital discharge (eTable 1).

Other topics in domain 6 include innovative roles for pharmacists, scholarship, and professional development.

Domain 7: Information Technology, Data, and Information Management. Domain 7 focuses on core technology expectations of the HVPE, including data management and technological requirements important for succeeding in the future.

In high-value pharmacies, proven medication management technologies are leveraged to maximize patient safety and clinical practice effectiveness (statement 7.1a) and to support safe and efficient pharmacy operations (statement 7.1b). These best practices have been previously described.[29]

Deployment of standard technology at an enterprise level across multiple sites within the same health system further strengthens benefits achieved at a local level while also maximizing efficiencies and fostering standardization.[30] Real-time point-of-care technologies, such as clinical decision support, artificial intelligence, and machine learning, are also used to assist clinicians in evaluating and managing patient care (statement 7.1d), with attention to interdisciplinary processes for development, oversight, and quality control (PE 7.1d.a-c).

Central to the success of all technology-driven performance elements in a high-value pharmacy is a medication management informatics team, with accountability to pharmacy personnel, to support safe and effective use of medications (statement 7.2a). This pharmacist-led team must oversee medication-use systems in all areas of the organization, and it is expected that both pharmacists and pharmacy technicians are members of the team and receive benefits supporting continuing professional development (PE 7.2a.a,c). To lead technology-associated healthcare redesign and support the initiatives and integration activities proactively, medication management informatics leaders must be located at the highest level of the department in which they reside, with accountability to the pharmacy executive (PE 7.2a.e).[31] Strong relationships within and outside pharmacy are the key to success for the informatics team.

Adoption of electronic health records has been instrumental in the generation and storage of large amounts of healthcare data, which can be used for clinical practice, quality improvement, research initiatives, and business oversight. In the high-value pharmacy, pharmacists should have access to real-time aggregated inpatient and outpatient data to assist with care management (statement 7.3b). For instance, pharmacists should have access to predictive analytics models to identify and manage hospitalized patients who are at high risk for hospital readmissions, specific diseases, or both (PE 7.3b.b). Similarly, patient registries are useful to identify outpatients eligible for interventions and target high-risk populations (PE 7.3b.b).[32]

The need to develop a workforce with the skill set to use emerging technologies and big data as outlined in domain 7 is further addressed in domains 6 and 8.

Domain 8: Leadership. Domain 8 highlights essential attributes of the leadership of the HVPE, building on leadership skills previously outlined for a high-performance pharmacy.[33] Only through effective pharmacy leadership will the HVPE vision and consensus statements in the other 7 domains be achieved.

In the HVPE, a pharmacy leadership team is accountable for all aspects of the pharmacy enterprise (statement 8.1a), including organization-wide responsibility for all aspects of medication management performance and for motivating all pharmacy staff to improve patient outcomes through medication management (PE 8.1a.a-b). A single governing structure responsible for both clinical and business objectives is essential to ensure optimal patient care and financial viability and to support the broader healthcare delivery system.[34]

The most senior pharmacy leader in the enterprise reports to the highest level of the organizational leadership, such as the chief executive officer or chief operation officer (statement 8.2a). In this way, the senior pharmacy leader is part of the highest governing, decision-making, and policy-making bodies of the organization (PE 8.2a.a) and can promote the pharmacy vision and strategic plan in alignment with the health system's goals for improving outcomes, quality, and patient satisfaction and for meeting financial objectives.

In tandem with creating and maintaining a contemporary strategic plan for pharmacy practice (statement 8.3a), pharmacy leaders monitor the healthcare environment for new opportunities, take calculated risks, and encourage innovation that advances practice (statement 8.3b), exhibiting unselfish commitment and refusal to make excuses.[35]

To ensure the effective use of organizational and pharmacy resources to optimize patient outcomes, it is essential that pharmacy leaders demonstrate business acumen (statement 8.4a). Leaders must be prepared to monitor, interpret, and act based upon the pharmacy's financial performance while also being transparent in sharing the organization's budget, fiscal goals, and financial forecasts with staff.[34] Using clinical quality outcome measures (as described in other domains} in addition to financial performance, pharmacy leaders routinely advocate for pharmacy services by influencing and demonstrating the positive impact of the pharmacy enterprise on achieving organizational goals and strategic priorities (statement 8.4b). Pharmacy leaders facilitate this advocacy by serving on multidisciplinary committees and sharing pharmacy's impact with senior health-system executives (PE 8.4b.a-b).

Domain 8 includes other aspects of the pharmacy leadership team, organizing for maximum effectiveness, leading for results, and developing future leaders.

Discussion

This article captures the essence of the HVPE framework as detailed in the list of almost 100 consensus statements (Box 1), and the descriptions of each domain provide a glimpse of how the statements are integrated with performance elements and evidence in the full HVPE technical report.[8] In the technical report, statements for each domain are grouped by topic area, and each statement has at least one PE that can be used to operationalize it (ie, identifies specific elements that a pharmacy enterprise needs to have or do to satisfy that statement). Text following each topic puts the statements and PEs into context, with support from the literature or expert consensus insights provided, as well as the available evidence showing their value to

patient care and the health system and a description of what a pharmacy enterprise must do to meet each consensus statement.

This format makes the content easily digestible, offering the opportunity to tackle one domain and one topic at a time, or several domains and topics concurrently, within an organization. The literature review also provides evidence and other justification that can serve as a starting point for new program development and implementation. The statements with PEs for each domain topic (eTable 1) constitute a useful checklist to record PEs already met and identify priorities for next steps in fulfilling the expert-identified statements and PEs of an HVPE. For example, domain 7 (Information Technology, Data, and Information Management), has 3 topics with a total of 10 consensus statements and 36 PEs supported by concise literature reviews. Used in synergy with the 11 consensus recommendations in the Technology and Data Science domain of PAI 2030, this tactical road map for HVPE domain 7 will be very useful in advancing practice throughout the pharmacy enterprise.[3]

As elements of the HVPE framework are implemented, not to be forgotten is the need to collect and analyze quality, safety, and financial outcomes data that demonstrate the value of HVPE services and then disseminate the results within the organization and through publication. This will contribute to the development of pharmacy-sensitive indicators associated with improved patient outcomes, such as those included in eAppendix C, which could ultimately be used to define and measure excellence for pharmacy services through HVPE status, just as the nursing profession created nursing-sensitive indicators and the Magnet Recognition Program.[11,36,37] Having an ongoing process for assessing and documenting the pharmacy's value can also serve as a catalyst for justifying additional services within the pharmacy enterprise, improving recruitment and retention of talented staff, and strengthening the health system's brand.

While most HVPE framework statements and performance elements are supported by literature, some were derived primarily through panelist consensus based on professional experience. Achieving consensus required respectful debate and compromise, and the collective contributions of all panelists resulted in a significant step in the journey toward defining an HVPE. The involvement of administrative residents not only assisted panelists in developing their domains but also enabled aspiring pharmacy leaders to be witness to the birth of the HVPE framework. As we move through the 2020s, especially with the uncertainties and challenges posed by the coronavirus disease 2019 pandemic, pharmacists, pharmacy leaders, and health systems can look to the HVPE framework as a roadmap for developing high-value pharmacy services throughout the enterprise.

Conclusion

The HVPE framework is a strategic roadmap to advance pharmacy practice by ensuring safe, effective, and patient-centered medication management throughout the health-system pharmacy enterprise. Grounded in evidence and expert recommendations, the statements and associated performance elements can be used to identify strategic priorities to improve patient outcomes and add value for the health system.

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