Pharmacy Practice in U.S. Hospitals

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Vice President
Practice Advancement
Objectives

• Discuss ASHP and its mission
• Discuss the goals of hospital pharmacy
• Describe the historical evolution of pharmacy services in the U.S. and outline the current state of pharmacy practice
• Describe current practice and how practice models are evolving for the future
American Society of Health System Pharmacists

- Founded 1942
- 43,000-member professional association
- Representing hospital, ambulatory and health-system pharmacists, residents, and students
- Official accrediting body for pharmacy residency programs and pharmacy technician training programs in the United States
ASHP’s Vision and Mission

ASHP’s vision is that medication use will be optimal, safe, and effective for all people all of the time.

The mission of pharmacists is to help people achieve optimal health outcomes. ASHP helps its members achieve this mission by advocating and supporting the professional practice of pharmacists in hospitals, health systems, ambulatory clinics, and other settings spanning the full spectrum of medication use. ASHP serves its members as their collective voice on issues related to medication use and public health.
ASHP’s Core Strengths

• Leadership on professional issues
  o Practice standards and guidelines
  o Driving force to advance practice and care

• Publishing
  o Evidence-based drug information resources
  o Books, eBooks, videos, electronic databases, journal (AJHP)

• Developing practitioner educational programs
  o Midyear and Summer Meetings, Leadership Conference, Preceptors Conference, other live and web based programs

• Accreditation
  o Pharmacy residency programs, Pharmacy technician training programs

• Membership services
  o Resources, tools, networking

• Advocating public policy for health-system pharmacists

• Consulting services
Overarching goal of Hospital Pharmacy: safe and effective use of medication

How do we accomplish this goal? Adopt a practice model that:

• Places pharmacists in roles where they use their drug knowledge to achieve the best medication-related outcomes and safe medication use

• Utilizes pharmacy technicians to perform technical tasks associated with product preparation and handling

• Optimizes the use of automation and technology in every step of the medication use process to improve safety and efficiency

• Utilizes other established, evidence-based safe practices.
Evolution of Pharmacy Practice
Drivers of change in pharmacy practice

• Professional leadership

• Professional Education/Development
  o ASHP Institutes, Midyear Clinical Meetings, Specialty Conferences

• Practice Standards

• Medicare and conditions of participation, Joint Commission

• Changes in pharmacy education

• Advances in drug therapeutics

• Growth in post graduate residency training

• Key Pharmacy Conferences – setting a direction
  o ASHP Hilton Head Conference (1985); 21st Century Conference (1989)

• ASHP Pharmacy Practice Model Initiative (PPMI), 2010
How pharmacy impacts each step in the Medication Use Process
## Systems Analysis of Adverse Drug Events

<table>
<thead>
<tr>
<th></th>
<th>Error frequency</th>
<th>Error interception</th>
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</thead>
<tbody>
<tr>
<td>Physician ordering</td>
<td>39%</td>
<td>48%</td>
</tr>
<tr>
<td>Transcription/verification</td>
<td>12%</td>
<td>33%</td>
</tr>
<tr>
<td>Pharmacy dispensing</td>
<td>11%</td>
<td>34%</td>
</tr>
<tr>
<td>Nurse administration</td>
<td>38%</td>
<td>2%</td>
</tr>
</tbody>
</table>

Source: Leape et al. *JAMA.* 1995;274:35-43
ASHP national survey of pharmacy practice in hospital settings: Dispensing and administration—2011

CRAIG A. PEDERSEN, PHILIP J. SCHINDLER, AND DOUGLAS J. SIEBERHOF

The ASHP national survey of pharmacy practice in hospital settings focuses on practices and technologies for dispensing and administering medications. The survey includes questions on the use of computerized systems, automation, and other technologies that impact pharmacy operations. The results provide valuable insights into trends and best practices in hospital pharmacy practice.

In this report, we present the findings from the 2011 survey, which was conducted to assess the current state of pharmacy practice in hospitals across the United States. The survey data were collected through a web-based questionnaire distributed to members of the American Society of Health-System Pharmacists (ASHP). The data were analyzed using descriptive statistics, and the results are presented in tables and graphs.

Key findings from the 2011 survey include:

- **Dispensing:**
  - The majority of hospitals (85%) use automated dispensing machines (ADM) to dispense medications.
  - Electronic prescribing systems are used in 92% of hospitals.

- **Administration:**
  - Intravenous (IV) pumps are used in 98% of hospitals.
  - Intravenous (IV) therapy management systems are used in 62% of hospitals.
  - Computerized physician order entry (CPOE) is used in 96% of hospitals.

- **Automated Systems:**
  - Automated drug dispensing systems (ADDS) are used in 98% of hospitals.
  - Automated medication dispensing robots (MDR) are used in 65% of hospitals.

- **Patient Safety:**
  - The use of bar coding to reduce medication errors is widespread (98% of hospitals).
  - The majority of hospitals (87%) use patient identification bands.

These findings highlight the progress made in hospital pharmacy practice over the past decade, with a focus on improving efficiency, reducing medication errors, and enhancing patient care. The survey also identifies areas for improvement, such as the need for continued education and training for pharmacy staff.

In conclusion, the ASHP national survey of pharmacy practice in hospital settings is a valuable resource for understanding the current state of practice and identifying opportunities for improvement. The data can be used by healthcare organizations, policymakers, and researchers to drive evidence-based changes in pharmacy practice and patient care.
Hospital pharmacy practice in Saudi Arabia: Prescribing and transcribing in the Riyadh region


Hospital pharmacy practice in Saudi Arabia: Dispensing and administration in the Riyadh region


Hospital pharmacy practice in Saudi Arabia: Drug monitoring and patient education in the Riyadh region


Medication Use Process

1. **PRESCRIBING**
   - Evaluate patient
   - Establish need for medicine
   - Select right medicine
   - Determine interactions and allergies
   - Prescribe medicine

2. **DOCUMENTING**
   - Transcribe prescription/order
   - Transmit to pharmacy

3. **DISPENSING**
   - Review prescription order
   - Confirm transcription, if necessary
   - Contact prescriber for discrepancies
   - Prepare medicine
   - Distribute medicine

4. **ADMINISTERING**
   - Review prescription order
   - Confirm transcription, if necessary
   - Review warnings, interactions, and allergies
   - Evaluate patient
   - Administer medicine

5. **MONITORING**
   - Assess patient’s response to medicine
   - Report and document results

Source: United States Pharmacopeia (USP)
Clinical Pharmacist role in prescribing step

• Most pharmacists are “pharmacy generalists”, many having completed a PGY1 residency.
• Others are “pharmacy specialists” and many specialists having also completed a PGY2 specialty residency.
• Pharmacists make rounds with physicians and medical team
  - helps choose right drug, right dose
  - focus: high risk, highly complex, high volume pts.
  - pharmacist serves as drug knowledge expert:
    - Provides drug information
    - Pharmacist monitors response to drug therapy
    - Improves safety of medication use system
    - Improves outcomes from medication therapy
    - Lowers cost of therapy
### Types of Pharmacist Provided Consultations

<table>
<thead>
<tr>
<th>Consultation</th>
<th>2013</th>
<th>2001</th>
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</thead>
<tbody>
<tr>
<td>Dosage adjustment</td>
<td>98 %</td>
<td>88 %</td>
</tr>
<tr>
<td>Drug information</td>
<td>93 %</td>
<td>92 %</td>
</tr>
<tr>
<td>Pharmacokinetics</td>
<td>92 %</td>
<td>77 %</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>92 %</td>
<td>79 %</td>
</tr>
<tr>
<td>Anticoagulation</td>
<td>75 %</td>
<td>34 %</td>
</tr>
<tr>
<td>Nutrition support</td>
<td>56 %</td>
<td>47 %</td>
</tr>
<tr>
<td>Patient teaching</td>
<td>69 %</td>
<td>46 %</td>
</tr>
<tr>
<td>Pain management</td>
<td>46 %</td>
<td>38 %</td>
</tr>
<tr>
<td>Compliance</td>
<td>47 %</td>
<td>18 %</td>
</tr>
</tbody>
</table>
Methods of Providing Drug Information to Prescribers

- RPh routinely answer questions: 97% (2013), 97% (2001)
- On unit computers: 81% (2013), 81% (2001)
- Embedded in CPOE: 52% (2013), 52% (2001)
- Pharmacist attending rounds: 56% (2013), 56% (2001)
- Newsletters or bulletins: 50% (2013), 50% (2001)
- Disseminate MUE results: 46% (2013), 46% (2001)
- Continuing education programs: 32% (2013), 32% (2001)
- Handheld device: 28% (2013), 28% (2001)
- Formal drug information center: 6% (2013), 6% (2001)
- Academic detailing: 2% (2013), 2% (2001)

% Hospitals
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   - Evaluate patient
   - Administer medicine

5. **MONITORING**
   - Assess patient’s response to medicine
   - Report and document results

Source: United States Pharmacopeia (USP)
Primary Method of Pharmacy Receiving Medication Orders

- Digital image capture: 33% (2007), 35% (2010), 17% (2013)
- Fax: 24% (2007), 23% (2010), 9% (2013)
- Electronic via CPOE: 5% (2007), 16% (2010), 70% (2013)
- Handwritten order: 38% (2007), 25% (2010), 5% (2013)
Actions to Ensure Accurate Transcription

- Have electronic MAR: 89% (2013), 75% (2010)
- Standard physician order forms used: 83% (2013), 73% (2010)
- Have CPOE with pharmacy system interface: 75% (2013), 63% (2010)
- Verbal orders must be read back (spelling): 73% (2013), 65% (2010)
- Verbal orders must be countersigned: 63% (2013), 50% (2010)
- Clarify illegible orders before transcription: 63% (2013), 41% (2010)
- Reconcile MAR and pharmacy profile daily: 41% (2013), 12% (2010)
- Special procedures for high-risk drugs: 19% (2013), 6% (2010)
- 2nd RN double checks written changes to MAR: 12% (2013), 6% (2010)
- Physicians handwritten orders: 6% (2013), 0% (2010)
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5. **Monitoring**
   - Assess patient’s response to medicine
   - Report and document results

Source: United States Pharmacopeia (USP)
Pharmacist Role in Dispensing Step

- Primary goal – a system that is safe and efficient
- Pharmacist has oversight responsibility and legal accountability
- Pharmacy coordinated unit dose and IV programs in nearly all hospitals
- Pharmacy technicians and automation used to prepare medications

Shift from manual system to automated systems
Evolution of Pharmacy Unit Dose and IV Admixture Programs

- IV
- UD
- Both

Evolution of Pharmacy Computerization and Automated Dispensing Methods

- Pharmacy Computerization
- Centralized Manual (e.g., Unit Dose)
- Decentralized Manual (e.g., Satellite)
- Decentralized Automated (e.g., ADC)
- Centralized Automated (e.g., Robot)
24-hour Review of Medication Orders by Pharmacists

<table>
<thead>
<tr>
<th>Year</th>
<th>No review</th>
<th>On call</th>
<th>Affiliated Hospital</th>
<th>Company</th>
<th>24 hour service</th>
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<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
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<td>2008</td>
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<td>2013</td>
<td>26</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>6</td>
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</tbody>
</table>

Legend:
- No review
- On call
- Affiliated Hospital
- Company
- 24 hour service
Medication Use Process

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- Report and document results

Source: United States Pharmacopeia (USP)
Pharmacist role in medication administration step

Pharmacy system supports nurse who administers medication:
  - packages that are ready to use
  - labeling that is unambiguous
  - information on administration rates
  - information on compatibility

Most errors occur at this step, so technology solutions being implemented to prevent errors
  - Bar coded medication verification
  - Smart pumps

Pharmacy plays important role in helping technology function as intended
Bar Code Medication Administration

% Hospitals

Year

2005 2006 2007 2008 2009 2010 2011 2012 2013

9% 13% 20% 25% 27% 35% 50% 66% 80%

<50 50-99 100-199 200-299 300-399 400-599 >=600

76% 80% 80% 76% 78% 60%
Smart Infusion Pumps

- Year: 2005-2013
- # of Staffed Beds: <50, 50-99, 100-199, 200-299, 300-399, 400-599, >=600
- % Hospitals: 32%, 37%, 41%, 56%, 68%, 77%, 81%, 73%, 81%, 78%, 87%, 93%, 97%, 96%
Medication Use Process

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Source: United States Pharmacopeia (USP)
Pharmacist role in monitoring step

- Monitor drug use on medical team
- Adverse Drug Reactions
- Therapeutic Drug Monitoring
- Discharge Counseling

Big focus on improving transition of care from hospital into the home. Medications almost always a major factor.
Other Aspects of Pharmacy Practice
Pharmacist Practice Roles in Hospitals and Health-Systems

- Clinical practice
- Integrated clinical/distributive practice
- Drug distribution
- Management
- Ambulatory care
- Other specialty areas
  - Medication Safety
  - Information Technology
  - Emergency Care
### Philosophy of Practice Model

**Current Structure**

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Drug Distribution Centered</th>
<th>Patient-Centered Integrated</th>
<th>Clinical Specialist-Centered</th>
<th>Comprehensive*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staffed beds</td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
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<td>62.1</td>
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<td>1.9</td>
<td>18.9</td>
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**Future Direction**

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<th>Characteristic</th>
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<tr>
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<td>400-599</td>
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<td>20.0</td>
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<tr>
<td>≥600</td>
<td>0</td>
<td>17.0</td>
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</table>

<table>
<thead>
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<th>Patient-Centered Integrated</th>
<th>Clinical Specialist-Centered</th>
<th>Comprehensive*</th>
</tr>
</thead>
<tbody>
<tr>
<td>All hospitals - 2012</td>
<td>15.1</td>
<td>59.4</td>
<td>6.7</td>
<td>18.8</td>
</tr>
<tr>
<td>All hospitals – 2011</td>
<td>14.8</td>
<td>56.2</td>
<td>9.7</td>
<td>19.3</td>
</tr>
<tr>
<td>All hospitals – 2010</td>
<td>14.4</td>
<td>59.4</td>
<td>5.3</td>
<td>20.9</td>
</tr>
</tbody>
</table>

* - Comprehensive Model – Including pharmacists in distributive, generalist/integrated and specialist roles

Source: ASHP National Survey
Formulary Management Techniques used in Hospitals

- Therapeutic interchange policy: 91.9%
- Minimal duplication of multisource products: 91.3%
- Minimal duplication of therapeutically equivalent products: 82.8%
- RPh interventions designed to help monitor prescriber compliance with medication-use policies: 82.3%
- Regular review of new therapeutic agents: 69.4%
- Education of prescribers regarding medication costs: 62.6%
- Regular review of therapeutic categories: 57.4%
- Regular review of non-formulary drugs: 56.3%
- Comparative Effectiveness Research: 40.3%
- Prior approval required for non-formulary product use: 32.5%
- Regular evaluation of prescriber adherence to medication-use policies: 31%
Activities of Pharmacy Technicians

% Hospitals with technicians performing activity

- Restocking floor stock and/or ADCs: 100%
- Replenishing unit dose carts: 95%
- Purchasing: 94%
- Packaging activities: 93%
- Compounding sterile preps: 87%
- Quality Assurance act/unit inspections: 76%
- Billing: 76%
- Compounding chemotherapy preps: 69%
- Controlled substance system mgmt: 55%
- IT system management: 38%
- Technician supervising other technicians: 30%
- Tech-check-tech: 16%
- Order entry (for pharmacist verification): 15%
- Medication reconciliation (obtaining list): 14%
- Medication assistance program mgmt: 12%
- Preparation of clinical monitoring information: 9%
- Screening of medical records for MRPs: 8%
- Facilitating Transitions of Care: 8%
- Dispensing with remote video supervision: 2%

Traditional functions

Non-traditional functions
Advancing practice and closing gaps:

ASHP Pharmacy Practice Model Initiative (PPMI)
ASHP Pharmacy Practice Model Initiative

Imperative for a better defined practice model identified by members.

Planning commences for summit: assumptions developed, ASHP members, thought leaders, and participants queried, briefing papers developed.

Consensus summit held resulting in 147 recommendations to better define characteristics of the optimal practice model for the future.

- Summit Proceedings published in AJHP
- Briefing document webinar series conducted
- Presentations at MCM, SM, Residency Conferences
- Hospital Self-Assessment (HSA) developed, launched
- Demonstration and resident research grants issued
- PPMI Website with resources, links launched
- National dashboard developed to measure progress
- Complexity tool developed
- Policy issues from summit addressed
Transforming how pharmacists care for patients

PPMI is a **profession-led** initiative that is **empowering** the pharmacy team to take responsibility for **patient outcomes**.

<table>
<thead>
<tr>
<th>Care Team Integration</th>
<th>Leveraging Pharmacy Technicians</th>
<th>Pharmacists Credentialing &amp; Training</th>
<th>Technology</th>
<th>Leadership in Medication Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Promotes a team-based approach to health care</td>
<td>• Empowers the pharmacy team to ensure that pharmacy technicians perform all traditional preparation and distribution activities</td>
<td>• Elevates the reputation of the pharmacy team</td>
<td>• Evaluates the available technologies to support patient safety and quality of care</td>
<td>• Empowers pharmacists to take responsibility for patient outcomes</td>
</tr>
<tr>
<td>Shifts the roles of the health care team to enable pharmacists to optimize their time with patients across the continuum of care</td>
<td>• Urges technicians to handle non-traditional and advanced responsibilities and activities to allow pharmacists to take greater responsibility for direct patient care</td>
<td>• Ensures pharmacists, residents, and students have training and credentials for activities performed within their scope of practice now and in the future</td>
<td>• Encourages use of available automation and technology to improve patient safety, quality and efficiency, while also reducing costs</td>
<td>• Positions pharmacists to promote health and wellness, optimize therapeutic outcomes, and prevent adverse medication events</td>
</tr>
<tr>
<td>Enhances the relationship between pharmacists and patients by positioning pharmacists as providers</td>
<td>• Promotes technician training and certification requirements, such as the need for uniform standards for advanced technician roles</td>
<td>• Promotes the use of credentials to provide services at the top of the scope of practice</td>
<td>• Identifies emerging technologies to improve pharmacy practice</td>
<td>• Emphasizes that given their extensive education and training, pharmacists are integral in helping achieve the best outcomes</td>
</tr>
</tbody>
</table>
Welcome to the PPMI Hospital Self-Assessment

The PPMI Hospital Self-Assessment Tool was developed to assess an individual hospital’s conformity with the recommendations from the PPMI Summit. The tool consists of 106 questions assessing adoption of the PPMI recommendations at the hospital level. Upon completing the questions, the tool will allow the user to develop a list of priorities (an "Action List") individualized to their own hospital/health system. Hospitals will also have the opportunity to generate reports comparing their data with aggregated data collected from similar hospitals within and across their state. A list of tools and resources will also be provided to assist hospitals in implementing change in their institution.

Anyone can complete an assessment, but an individual hospital can only have one "official" submission that will be used for data comparisons. All data will be kept confidential and only aggregated data will be reported.
Goal 1
- Pharmacist roles, practices, and activities will improve medication use and optimize medication related outcomes.

Goal 2
- Pharmacy technicians will prepare and distribute medications and perform other functions that do not require a pharmacist's professional judgment.

Goal 3
- Pharmacists and pharmacy technicians will have appropriate training and credentials for the activities performed within their scope of practice.

Goal 4
- Pharmacy departments utilize available automation and technology to improve patient safety and improve efficiency.

Goal 5
- Pharmacists will demonstrate leadership in exercising their responsibility for medication use systems and will be accountable for medication-related patient outcomes.

2013:
- 64.5%
- 18.3%
- 26.8%
- 60.5%
- 48.4%

2012:
- 60.0%
- 16.6%
- 25.9%
- 52.7%
- 46.7%

2011:
- 58.6%
- 17.4%
- 23.8%
- 43.9%
- 54.7%
Advancing Practice, Safety, Services

Vision and Leadership

- Connect pharmacy patient care contributions to your institution’s quality/finance measures
- Develop effective measures of success based upon evidence & successful applications
- Be willing to change & reinvent practice at all levels within the pharmacy
- Model a passion for practice model change that is centered around strategic planning
Practice Spotlights

- Greenville Hospital System
- Greenville, SC
- 686 beds
- Developing all staff pharmacists to take on direct patient care
- Focus on integrated practice
- Pharmacist involvement with med histories, reconciliation
- BCMA, CPOE, HER
- Advice: Staff buy-in was key; developed staff and proactively sought ways to help them with change
- Advice: Start with a gap analysis
Practice Spotlights

- Banner Good Samaritan Medical Ctr
- Phoenix, AZ
- 638 beds
- Focus on involving pharmacist in team based care
- Pharmacist involved from admission to discharge
- Pharmacy Techs take med history
- Pharmacists manage therapy based on protocols with medical staff
- Advice: Change to new model focused on collaboration and improving patient outcomes
- Advice: Collect baseline data to show impact on outcomes.
Practice Spotlights

- Baystate Medical Center
- Springfield, MA
- 653 beds
- Department focuses on clinical and cost-effective pharmacotherapy using lean principles
- Efficiencies gained through Lean have provided for expanded clinical services
- EHR, CPOE, ADC
- Struggled for years to “get out of the basement”
- 3 critical success factors: collaboration, engagement, communication
Practice Spotlights

- Providence St. Peter Hospital
- Olympia, WA
- 337 beds
- Transitioned from “product” to “patient” centered model
- Developed a three year strategic plan to centralize operations and decentralize pharmacists to patient care units
- Advice:
  1) involve staff in strategic planning,
  2) assure staff have the clinical skills needed to do the job,
  3) individual and system accountability is essential
Practice Spotlights

- Martha Jefferson Hospital
- Charlottesville, VA
- 149 beds (102 ADC)
- Focused on balance of what pharmacists do, what technicians do, and how technology used
- Started residency program and has helped support changes
- All pharmacists rotate through all areas of practice
- Bar coded dispensing technology was a key success factor
- Staff happier with their new roles
- Advice: communication is key; staff need to know the vision, plans
Practice Spotlights

• Fauquier Health
• Warrenton, VA
• 92 beds
• Clinical services include pharmacokinetic dosing, TPN, antimicrobial stewardship, consults, rounding
• Developed active mentoring program.
• Big change in behavior of introverted pharmacists
• Advice: Gaining support from senior staff was critical – tailored to meet unique needs of each staff member
• Took time to win over medical staff – cost/outcomes data is what worked
Questions