Objectives

• Describe the evolution of pharmacy services and the current state of pharmacy practice
• Describe the changing environment of healthcare
• Describe the implications for pharmacy practice in the future
• Discuss opportunities for pharmacy and strategies for pharmacy leaders

Drivers of practice change

• Professional leadership
• Professional Education/Development
• Practice Standards
• Changes in pharmacy education
• Advances in drug therapeutics
• Growth in post graduate residency training
• Practice initiatives
• Changes in payment for health care
• Accreditation standards

Diffusion of Innovation

Source: https://matthewsonmarketing.files.wordpress.com/2012/11/chap-1.png | everett-rogers-diffusion-innovation-model1.png

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How long does it take for changes to become adopted in pharmacy?

A. 75 years  
B. 35 years  
C. 25 years  
D. 10 years

Diffusion of Pharmacy “Innovations”

- Unit Dose Drug Distribution – 35 years (1960 – 1995)
- IV Admixture Programs – 35 years (1965 – 2000)
- Pharmacist on Patient Care Team – 40 years (1970 – 2020)
- Pharmacist Order Review 24/7 – 10 years (2005-2015)
- Pharmacists in Ambulatory Clinics – ??

Data from ASHP National Survey – Beginning year represents early adopter stage; End year represents laggard stage.

Where are we now?

24-Hour Review of Medication Orders by Pharmacists

- No review
- On call
- Affiliated Hospital
- Company
- 24 hour service

ASHP national survey of pharmacy practice in hospital settings - 2015
Adoption of medication-related technologies

- 65% use automated dispensing cabinets (ADCs) as primary method of dispensing
- 10% use robotics as their primary means of dispensing (mostly large hospitals)
- 98% use ADCs in some capacity (e.g. floor stock)
- Bar code verification during sterile compounding used in 20% of hospitals
- Robotic compounding devices are used in 2.8% of hospitals for sterile preparations and 0.3% for chemotherapy preparations
- Just 6.5% use sterile product workflow technology


Adoption of medication-related technologies

- Bar Coded Medication Administration now at 94%, up from 9% in 2005
- Computerized Prescriber Order Entry now at 88%, up from 4% in 2005
- Smart Pumps now used in 86% of hospitals, up from 32% in 2005


Clinical Pharmacists Assigned to Most Patients
8 Hours/day, 5 Days/week or More

<table>
<thead>
<tr>
<th># of Staffed Beds</th>
<th>2012</th>
<th>2015</th>
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<tbody>
<tr>
<td>&lt;50</td>
<td>38%</td>
<td>53%</td>
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<tr>
<td>50-99</td>
<td>45%</td>
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<tr>
<td>100-199</td>
<td>48%</td>
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<td>400-599</td>
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<td>85%</td>
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<tr>
<td>&gt;=600</td>
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</tr>
</tbody>
</table>

ASHP national survey of pharmacy practice in hospital settings - 2015

Pharmacists involvement in patient care

How Pharmacists Are Authorized to Write Orders

- Prescribe*
- Modify/Initiate by protocol

* Includes selection, initiation, monitoring and adjustment of medication therapy pursuant to diagnosis of a medical disease or condition

Source: 2013 ASHP National Survey of Hospitals

Staying Ahead of the Curve: Anticipating the Future of Pharmacy Practice
21th Annual ASHP Conference for Pharmacy Leaders

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Pharmacists Involvement in Therapeutic Drug Monitoring for Inpatients

- Pharmacists Routinely Monitor Medication Levels:
  - 2000: 76%
  - 2003: 78%
  - 2006: 82%
  - 2009: 83%
  - 2012: 82%
  - 2015: 89%

- Authority To Order an Initial Serum Medication Level:
  - 2000: 59%
  - 2003: 61%
  - 2006: 79%
  - 2009: 80%
  - 2012: 79%
  - 2015: 82%

- Authority To Adjust a Dosage for a Routinely Monitored Medication:
  - 2000: 63%
  - 2003: 69%
  - 2006: 85%
  - 2009: 83%
  - 2012: 82%
  - 2015: 95%

Medication Therapies Pharmacists have Responsibility for Ordering, Dosing, and Monitoring Outcomes

- Vancomycin: 89%
- Aminoglycosides: 80%
- Renally Dosed Antibiotics: 80%
- Anticoagulation: 63%
- Nutrition: 43%
- Antibiotic Selection: 21%
- Pain Management: 12%

Other hospital pharmacy shifts

- Overall staffing levels increasing, with new services in:
  - Discharge prescription services
  - Transitions of care programs (eg. med reconciliation)
  - Specialty pharmacy
  - Anticoagulation programs
  - Ambulatory clinics
  - Informatics/technology
  - Antimicrobial stewardship
  - Emergency department
  - Other clinical specialties

Antimicrobial Stewardship

- 66% have an Antimicrobial Stewardship program (up from 44% in 2010)
- Most use data, guidelines, formulary restrictions, clinical decision support as part of strategies
- New requirement from CMS and TJC in 2017
- Pharmacists Primary Role:
  - Leadership and Accountability: 57%
  - Clinical Support: 27%
  - Data Analysis: 14%
  - Pharmacist not actively involved: 2%
Pharmacists are more involved in transitions of care

- In 60% of hospitals, either pharmacists or pharmacy technicians perform medication reconciliation (nearly 80% in larger hospitals)
- In 37% of hospitals, pharmacists provide discharge counseling or follow up with high risk patients
- 21% provide a discharge prescription service
  - 70% by hospital
  - 30% by outside entity (e.g., Well Transitions)
- Many additional programs to facilitate discharge and reduce readmissions (prior authorization, handoff to Community Rx, manufacturer assistance programs, counseling, planning)

Expanding role of Pharmacists in ambulatory care clinics

- 42% of health systems have pharmacists practicing in ambulatory clinics* - up from 30% in 2006
- Of hospitals/systems greater than 300 beds:
  - 48% have a pharmacist managed anticoagulation clinic
  - 44% have a pharmacist in their oncology clinic
  - 32% have a pharmacist medication therapy management clinic

Current Hospital Practice

- Focus on Team-Based “Interprofessional” Pharmaceutical Care
- Greater Specialized Training: Pharmacy Generalists and Specialists
- Pharmacists provide hospital-wide clinical services:
  - Advising and planning medication therapy
  - Monitor for desired outcomes & adjust therapy
  - Ensure adherence
- Focus:
  - Evidence-Based Drug Therapy
  - Outcomes Driven, Cost Effective

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Where do you stand now?

Does your organization:

1. Have pharmacists in ambulatory clinics?
2. Operate a retail and/or specialty pharmacy?
3. Have pharmacists in Patient Centered Medical Homes?
4. Run your own PBM?
Environmental Trends

- Shift from cost cutting to improving value
- Population health, access to big data
- Aging population, societal factors
- Changes in the healthcare workforce
- Changes in the pharmacy workforce
- Evolution of health systems
- Growth of retail medicine and consumerism
- Availability of new technology, complex therapies

Focus shift from cost/quality/safety to quality/safety/value

- Moves away from just reducing cost
- Will need to show value: health outcomes achieved per dollar spent
- Need to align pharmacy activity with hospital quality measures
- An opportunity to embrace, improve, demonstrate pharmacists’ value to patients

Implications of Shifting Health Care Delivery Payment Models

- Incentives shift from volume to quality/outcomes
- Greater emphasis on population health
- New models for care delivery, payment (PCMH, ACOs)
- Focus on transitions of care
- Focus on ambulatory care
- Focus on safety, quality measures – Triple Aim
- Access to insurance, access to care
Availability of “Big Data” and Focus on Population Health

- Combination of growing use of EHRs, claims data, outcomes data, clinical trial data, coupled with technological advances, will facilitate big changes
- Impact of “machine learning”; predictive analytics
- New value pathway with big data:
  - Right living (med adherence, lifestyle choices)
  - Right care (regimen, dose, disease mgmt, decision support)
  - Right provider (RPh vs MD, specialist, team, care setting)
  - Right value (cost effectiveness of care, outcomes)
  - Right innovation (new drugs, tailoring, discovery)

Changes in the healthcare workforce

- Projected shortage of physicians
  - 40% of practicing MOs are 55 years or older
  - 800,000 physicians, shortfall of 75,000+ by 2025
  - Shortage of primary care providers
- Projected shortage of nurses
  - 30% of RNs are 55 years or older
  - 3,000,000 nurses, extent of shortage difficult to measure
  - 200,000 Nurse Practitioners; most focused on primary care
- Aging population and corresponding patient care demands presents opportunity for expanding role of pharmacists

Changes in the pharmacy workforce

- Growth in the number of graduates from 8,000 to 14,000 since 2007
- The number of graduates has plateaued in last five years
  - The Bureau of Labor Statistics projects a 14% growth by 2020, with a possible surplus of 48,900
- The number of PGY1 and PGY2 residency graduates each year now is more than 4,300 from over 2,100 programs – and it continues to grow each year
- There are more than 20,000 BPS board certified pharmacists
- We have and will continue to have a highly trained and competent pharmacist workforce

Population Shifts: 
Projected Change in Medicare Enrollment, 2000-2050

- Medicare Enrollment (in millions)
- Average Annual Growth in Enrollment
Current Pharmacy Workforce

- **Pharmacists**
  - 286,400 practicing pharmacists
  - 57% are female
  - 38% have Doctor of Pharmacy (Pharm.D.)
  - In hospitals, 24% have completed residency, 17% are BPS certified

- **Pharmacy technicians**
  - 396,540 pharmacy technicians/pharmacy aides
  - 17% work in hospitals/health systems
  - 78% are PTCB certified
  - In hospitals, just 15% have completed accredited training


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The number of pharmacists in hospitals, health systems and clinics

- A. Increasing
- B. Decreasing
- C. Staying steady
- D. No one really knows

Employment Settings of Pharmacists

- Independent Rx: 10%
- Chain Pharmacy: 10%
- Mass Merchandiser: 19%
- Supermarket Rx: 7%
- Hospital: 44%
- Other Patient Care: 46% Hospital /Other pt care
- Non Patient Care: 8%
- Other: 10%

Source: 2014 National Pharmacist Workforce Survey Commissioned by the Pharmacy Workforce Center

Growth of Pharmacists practicing in Health Systems

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Pharmacists</th>
</tr>
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<tbody>
<tr>
<td>2006</td>
<td>50,005</td>
</tr>
<tr>
<td>2007</td>
<td>50,309</td>
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<td>2008</td>
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<td>2014</td>
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<td>2015</td>
<td>58,311</td>
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</tbody>
</table>


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### Activities of Pharmacy Technicians

<table>
<thead>
<tr>
<th>Traditional Functions</th>
<th>Non-Traditional Functions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restocking floor stock and/or ADCs</td>
<td>Technician supervising other technicians</td>
</tr>
<tr>
<td>Replenishing unit dose carts</td>
<td>Medication reconciliation (attaining bill)</td>
</tr>
<tr>
<td>Purchasing</td>
<td>Order entry (for pharmacist verification)</td>
</tr>
<tr>
<td>Compounding sterile prep</td>
<td>Medication assistance program mgmt</td>
</tr>
<tr>
<td>Billing</td>
<td>Facilitating Transitions of Care</td>
</tr>
<tr>
<td>Quality Assurance act/unit inspections</td>
<td>Screening of medical records for MRPs</td>
</tr>
<tr>
<td>Compounding chemotherapy preps</td>
<td>Dispensing with remote video supervision</td>
</tr>
<tr>
<td>Controlled substance system mgmt</td>
<td></td>
</tr>
<tr>
<td>IT system management</td>
<td></td>
</tr>
</tbody>
</table>

% Hospitals with technicians performing activity: 6% Restocking floor stock and/or ADCs, 6% Replenishing unit dose carts, 8% Purchasing, 11% Compounding sterile prep, 11% Billing, 18% Quality Assurance act/unit inspections, 18% Compounding chemotherapy preps, 28% Controlled substance system mgmt, 38% IT system management, 61% Technician supervising other technicians, 62% Medication reconciliation (attaining bill), 61% Order entry (for pharmacist verification), 61% Medication assistance program mgmt, 61% Facilitating Transitions of Care, 61% Screening of medical records for MRPs, 61% Dispensing with remote video supervision.

Pharmacy Directors predict that the percentage of pharmacy technician time spent on non-traditional activities will DOUBLE in the future.

Source: 2014 ASHP National Survey of Hospitals

### Evolution of Health Systems

Mergers resulting in systems being:
- Horizontally Integrated
- Vertically Integrated
- Physician Integrated
- Insurance Integrated
- For Profit
- Not For Profit

Vertical integration results in broad range of services:
- Hospitals
- Long Term Care
- Ambulatory Care
- Home Health
- Rehabilitation
- Patient Transportation
- Long Term Acute Care

### Growth in Retail Medicine and Consumerism

- Growth in ambulatory care services by health systems is growing rapidly
- Many Health Systems developing their “retail strategy”
- Currently 28% of all hospitals have an outpatient dispensing pharmacy
  - 88% of large hospitals have one or more
- 66% of health system executives predict they will own a retail pharmacy in next three years
- Role of traditional Chain Pharmacies is evolving
- Role of pharmacy in ambulatory care varies outside of large systems

Source: 2015 ASHP National Survey

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**Percent of U.S. Population with a Chronic Condition**

![Graph showing the percentage of the U.S. population with a chronic condition over time.]

**Ambulatory Care in the Pharmacy Enterprise**

- Describes changes in ambulatory, retail environment
- Evaluating, expanding enterprise, bringing value
- Recommended essential strategies:
  - Bring a change perspective
  - Understand and participate in your ambulatory care strategic plan
  - Access revenue cycles
  - Invest in outpatient, specialty, and home infusion pharmacies
  - Manage population health
  - Transitions of care planning
  - Develop layered learning models, expand student and residency training in primary and ambulatory care
  - Market pharmacists’ value
  - Advocate for the profession


**Chain Pharmacies**

- Chain pharmacies represent more than 40,000 locations (23,000 traditional chain stores, 18,000 supermarket and mass merchants)
- 2.9 Billion prescriptions filled each year
- 90% of Americans live within 5 miles of a pharmacy
- More than 2,000 locations now have retail clinics, with over 10 million patient visits per year; expected to be fueled by physician shortage
- Have growing access to population health data
- Growing number of relationships forming between health systems and chain companies – many offering health system branded clinic within chain pharmacy
- Large player in healthcare space – role quickly changing

**What will Community Pharmacies Look like in the Future?**

![Diagram illustrating potential future of community pharmacies.]

Source: The pharmacy of the future: Hub of personalized health Price Waterhouse Cooper, May 2016
Where will Health Systems fit?

Need to look and think beyond the traditional four walls of the hospital and system

Availability of new technology, complex therapies

- Many new, high cost drugs already in the pipeline
- Specialty Pharmacy strategies and solutions being developed
- Technology will influence new drug development, mechanisms
  - Complex biologics
  - Nanomedicines and Nanotechnology in diagnosis
  - Bio monitors with real time feedback
  - Pharmacogenetics/genomics
  - Regenerative medicine
  - Personalized medicine
- Complexity of these new drugs and treatments will require knowledgeable pharmacists to assist in dosing, selection, monitoring

Specialty Pharmaceuticals

- Many, many drugs in pipeline that will be classified as specialty pharmaceuticals
- Need for a specialty pharmacy strategy
- Currently 84% of hospitals do not partner, outsource or have their own specialty pharmacy
- Many implications for patient management, continuity of care, revenue

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Forecast Survey

• Eight domains; eight questions in each domain
  • Health Care Delivery and Financing
  • Population Health Management
  • Drug Development and Therapeutics
  • Pharmaceutical Marketplace
  • Data and Technology
  • Pharmacy Work Force
  • Patient Empowerment
  • Ethics
• Survey to key opinion leaders
• Likelihood of a development within next five years
• Reference to “geographic region where you work”

What is likely to happen in the short term?

• Pharmacist clinical role shift continues
  o Driven by demonstrated impact, increasing need
• Pharmacists’ role in ambulatory care rapidly changing
  o Driven by demonstrated impact, increasing need
• Technicians’ role shifting rapidly
  o Supporting pharmacists’ changing role
  o Will manage preparation and dispensing w/pharmacists only in oversight capacity
• Automation playing bigger role
  o Widespread adoption
  o Improving safety, efficiency, supporting new roles
• Growth in specialized services/roles
  o Antimicrobial stewardship, emergency medicine

Into the Future

• Many, many opportunities and pharmacy is well positioned
• Highly trained pharmacist workforce
• Pharmacist workforce with capacity for growth and new roles
• Need to be adaptable; understand and embrace large scale change
• Great need for strong leadership
• Still do to:
  o Need standardized pharmacy technician training and certification
  o Need greater training of pharmacists in informatics and information systems, with both technical and clinical expertise
  o Understanding of human genome and how used in identifying patients, dosing, and monitoring – training of pharmacists
  o Need for clinical pharmacy experts in population-based drug information

Future of Pharmacy Practice

• Pharmacist is an essential member of every healthcare team
• Focus on complete spectrum of acute and chronic therapy in and across all sites of care
• Outcomes driven and cost effective drug therapy
• Sophisticated automation and advanced clinical information systems
• Majority of all pharmacist time spent in direct patient care
• Expanding roles for pharmacists: prescribing, health and wellness
Key Takeaways

- The future is bright – opportunities abound
- Extremely complex systems – use "systems thinking"
- Embrace new technology and be a leader, optimize HIT
- Understand the business of pharmacy – financials, workload, budgeting
- Critical to have the right people with the right skills in the right positions
- Take every opportunity to adapt to the changing environment, insert pharmacy expertise, and improve medication related outcomes for patients.
- Be a leader – with a vision!