EVOLUTION OF PHARMACY: THE NEXT 50 YEARS

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SYSTEM DIRECTOR OF PHARMACY, LEE MEMORIAL HEALTH SYSTEM

PRESENTATION OBJECTIVES

• State at least three essential elements of the historic evolution of hospital and health system pharmacy practice.
• List five major drivers of change in healthcare and how pharmacists and pharmacy technicians should prepare for contemporary and future practice.
• Identify three current major medication related gaps in addressing patient care needs.
• Predict future directions for health system pharmacy practice on how pharmacists and pharmacy technicians may address a mission to optimize patient outcomes through interdisciplinary medication management.

LET'S START THIS LOOK AT THE FUTURE WITH A LOOK AT THE PAST

• Evolution of Pharmacy: The next 50 years

Jackson Memorial Hospital. Miami, Florida. 1949

April 1949

Annis Thiel and Staff. Jackson Memorial Hospital, Miami.

John Armitstead has no relevant disclosures relative to this presentation.
Munyer, Tom - Director of the Center for Computer Applications in Pharmacy at the University of Florida College of Pharmacy (est 1975).

1971 Northeast Florida Society of Hospital Pharmacists (NFSHP).

1975 FSHP. Florida Hospital Pharmacist of the Year. Lapp, Roger presents the award to Lapp, Roger.

MIRROR TO HOSPITAL PHARMACY

- Survey from sampling of U.S. Hospitals
- Findings published
- Recommendations in five categories, regarding:
  - Professional services/functions of the pharmacist (18)
  - Pharmacist advising and teaching role (21)
  - Pharmacy facilities, space, equipment, manpower (17)
  - Management or administrative functions (14)
  - Role of professional societies (13)

MIRROR TO HOSPITAL PHARMACY

Also established 6 goals for hospital pharmacy:
- Develop hospital pharmacists - accountability and responsibility for professional practice and caring for patients
- Strengthen the scientific and professional aspects of hospital pharmacy practice, as a consultant, as a teacher, and in investigation and research.
- Strengthen the administrative and management skills of the hospital pharmacist
- Attract a greater number of well-trained pharmacists into hospital practice, including specialists and those with training in hospital pharmacy.
- Promote payment of realistic salaries for hospital pharmacists, in both staff and management positions
- Utilize the resources of hospital pharmacy to develop the profession

PROFESSIONAL SOCIETY DRIVERS OF CHANGE SINCE THE MIRROR

- Professional Education/Development
- Practice Standards
- Evolution of Medicare and conditions of participation
- Changes in pharmacy education
- Advances in drug therapeutics
- Growth in post graduate residency training
- ASHP Hilton Head Conference, 1985
- Pharmacy in the 21st Century Conference, 1989
- Implementing Pharmaceutical Care Conference, 1993
- ASHP 2015 Initiative, 2003
- ASHP Pharmacy Practice Model Initiative (PPMI), 2010
- ASHP Practice Advancement Initiative (PAI), 2015
DIFFUSION OF INNOVATION THE “S CURVE”

5-10 years

15-20 years

SIGNIFICANT INNOVATIONS IN HEALTH SYSTEM PHARMACY

- Drug Information
- Unit Dose Drug Distribution
- Clinical Pharmacy
- IV Admixture Services
- Pharmacokinetic Dosing
- Pharmaceutical Care
- Automation (Automated Dispensing Cabinets)
- USP <797>
- Pharmacy Technician Certification
- Board Certification for Pharmacists
- Electronic Health Record
- Hand Held Computers (Phones)
- USP <800>
- Big Data/Population Health

EVOLUTION OF PHARMACY UNIT DOSE AND IV ADMIXTURE PROGRAMS

The Pharmacy 20+ year “S Curve”

PHARMACISTS IN U.S. HOSPITALS

<table>
<thead>
<tr>
<th>1957</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of hospitals by bed size</td>
<td>% with one or more PT pharmacist</td>
</tr>
<tr>
<td>Total number of hospitals by bed size</td>
<td>% with one or more PT pharmacist</td>
</tr>
<tr>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>&lt;50 beds</td>
<td>2,458</td>
</tr>
<tr>
<td>50 - 99 beds</td>
<td>1,966</td>
</tr>
<tr>
<td>100 - 199 beds</td>
<td>973</td>
</tr>
<tr>
<td>200 - 299 beds</td>
<td>461</td>
</tr>
<tr>
<td>300 - 399 beds</td>
<td>229</td>
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<tr>
<td>&gt;400 beds</td>
<td>277</td>
</tr>
<tr>
<td>Total</td>
<td>5,645</td>
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</table>

TOTAL PHARMACY STAFF IN U.S. HOSPITALS

*estimated
MEDICATION ORDER REVIEW

Growth of Board-Certified Specialists 2002-2015

MEDICATION ADMINISTRATION RECORDS ORDER REVIEW

Growth of Board-Certified Specialists 2002-2015

PHARMACISTS INVOLVEMENT IN THERAPEUTIC DRUG MONITORING FOR INPATIENTS
CURRENT HEALTH SYSTEM PRACTICE

• Team-Based interdisciplinary care with pharmacists
• Pharmacists provide hospital-wide clinical services:
  • Design drug therapy
  • Monitor for desired outcomes & adjust therapy
  • Ensure adherence
  • Evidence-Based Drug Therapy
• Specialized Training: Pharmacy Generalists and Specialists
• Outcomes Driven, Cost Effective

EXPANSION OF CURRENTLY AVAILABLE AUTOMATION AND TECHNOLOGY

• Continued growth in:
  • Automated dispensing systems
  • Computerized prescriber order entry
  • Bar coded medication administration
  • Smart pumps
  • E-prescribing
  • Robotic sterile preparations
• Enhancement of systems, capabilities
• Need for informatics pharmacists, technicians

EXPANSION OF PHARMACISTS IN AMBULATORY CARE SETTINGS

• By 2020, 50% of population will have a chronic condition
• Decades of factual evidence for improved outcomes when pharmacist on the team
• More pharmacists will work in clinics
  • Primary Care Clinics
  • Specialty Clinics
• Work across acute and ambulatory care
  • Enhance continuity of care
  • Manage transitions of care

CONTINUED GROWTH OF PHARMACISTS IN PATIENT CARE ROLES

• Pharmacist role on patient care teams
• Pharmacist specialty services will grow
• Pharmacist prescribing will expand
• Role in ambulatory and transitional settings will grow
• Need for pharmacy specialists
• Need for specialty trained, board certified

PHARMACISTS IN OUTPATIENT CLINICS

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Outpatient clinic setting exists</th>
<th>Pharmacists work in clinics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staffed beds</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>&lt;50</td>
<td>78.9</td>
<td>21.1</td>
</tr>
<tr>
<td>50-99</td>
<td>58.7</td>
<td>17.5</td>
</tr>
<tr>
<td>100-199</td>
<td>53.3</td>
<td>21.7</td>
</tr>
<tr>
<td>200-299</td>
<td>71.7</td>
<td>30.2</td>
</tr>
<tr>
<td>300-399</td>
<td>83.0</td>
<td>39.6</td>
</tr>
<tr>
<td>400-1000</td>
<td>77.9</td>
<td>37.4</td>
</tr>
<tr>
<td>&gt;1000</td>
<td>95.5</td>
<td>79.5</td>
</tr>
</tbody>
</table>

All hospitals – 2014: 78.1, 21.1
All hospitals – 2012: 75.8, 18.1
All hospitals – 2008: 58.9, 17.1

Anticoagulation
Cardiology
Dermatology
Emergency Medicine
Endocrinology
Family Medicine
Gastroenterology
Genetics
Geriatrics
Hematology
Infectious Diseases
Internal Medicine
Nephrology
Neurology
Obstetrics and Gynecology
Oncology
Pulmonary Medicine
Radiology
Surgery
Urology
Vascular Medicine
GREATER UTILIZATION OF SUPPORTIVE PERSONNEL

• Pharmacy technicians will expand role in managing preparation and dispensing; with pharmacists only in oversight capacity
• Standardized training and certification will elevate pharmacy technician competence and skills

DRIVERS OF CHANGE IN HEALTHCARE INFLUENCING PRACTICE CHANGE

• Costs
• Focus on quality, safety, outcomes
• Unique, patient specific, complex therapies
• Availability of smart technology
• Preventative care
• Diagnostic advances
• Changes to the health care delivery model
• Availability of big data

ACTIVITIES OF PHARMACY TECHNICIANS

Traditional functions

Non-traditional functions

FUTURE OF PHARMACY PRACTICE IN THE U.S.

• Practice will be influenced by new types of treatments changing healthcare dynamics, including:
  • Complex biologics
  • Big data
  • Smart technology
  • Personalized Medicine
  • Focus on ambulatory care
  • Nanomedicines
  • Biomarkers

“DRIVING MEDICINE BELOW THE SYMPTOM LINE”

Transforming how pharmacists in acute and ambulatory settings care for patients

This Practice Advancement Initiative (PAI) is a profession-led initiative that is empowering pharmacists and pharmacy teams to improve patient outcomes, support and promote better health, and deliver solutions for the future.

Drugs & Devices

Screening

Prophylaxis

Testing

Diagnosis

Prognosis

Symptoms Appear

Healthy

Fast "Treat"

Testing

Prevention

Drug / Device Identification
UNIQUE, COMPLEX NEW THERAPIES
• In the near term many new biologics are already in the pipeline, especially in cancer, diabetes, multiple sclerosis, heart failure, hepatitis C
• Many new therapies are oral or subcutaneous injections – placing patient in charge of taking
• In U.S., referred to as “specialty drugs” and often only distributed by specialty pharmacies
• Longer term, technology will influence new drug development, mechanisms
  • 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 pharmacist to assist in dosing, selection, monitoring

AVAILABILITY AND USE OF “BIG DATA”
• Combination of growing use of EHRs, claims data, outcomes data, clinical trial data, coupled with technological advances, will facilitate big changes
• 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 TO THE HEALTH CARE DELIVERY MODEL
• Need to control costs and increase quality and outcomes will continue to have focus
• In the U.S., controversy over role of government will continue
• Payment for health care will continue to be tied to quality and outcomes, and controlling cost
• These trends, while difficult to predict, all present opportunities for pharmacists

AVAILABILITY OF SMART TECHNOLOGY
• All aspects of electronic health records will incorporate artificial intelligence at much higher level,
• Prescribing systems will be able to identify drug of choice, dose, contraindications, labs, cost, condition, age, evidence, and make therapy recommendation.

IMPACT ON PHARMACY PRACTICE
• More pharmacist managed drug therapies
• Greater specialty training and specialization
• Understanding of human genome and how used in identifying patients, dosing, and monitoring
• Need for clinical pharmacy experts in population-based drug information
• Need for pharmacy experts in informatics – with both clinical and technical background

IMPACT ON PHARMACIST TRAINING
• Doctor of pharmacy training will need to adapt to changes in drug therapy
• Residency training will be needed on a larger scale
• Training will be needed in many new specialty areas, some not currently identified
FUTURE OF PHARMACY PRACTICE

- Pharmacist is 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

CHANGES IN SOCIETY

AGING POPULATION

- Longer lifespan and aging baby boomers will result in a large elderly population that will strain the healthcare system
- Needs for all healthcare sectors will be unprecedented; capacity will continue to be an issue
- A smaller, young workforce won’t be able to sustain the additional costs through taxes

INCREASING DISPARITIES

- The number of immigrants will continue to grow, and are more likely to be poor and uninsured
- Low income populations are disproportionately exposed to social and psychological conditions that negatively affect health
- Will result in growing number of patients with multiple barriers to receiving good health care – financial, cultural, language

CHANGES IN SCIENCE AND TECHNOLOGY

- Treatment of end-stage disease transforms into long-term, chronic disease management
- Advances in genetic testing will allow earlier detection, better staging, and more targeted therapy
- Much more specific and accurate information for diagnosis, treatment, monitoring
- Outcomes will improve

WHAT ARE THE IMPLICATIONS FOR PHARMACY?

- The number of large scale, blockbuster drugs are likely to be fewer than in past
- New drug therapies are likely to be more customized, very high cost
- Unique profile of these new therapies will require criteria, genetic testing, custom prescribing, and monitoring – beyond the capabilities of the current care and supply chain model
- The use of a “specialty pharmaceuticals” will continue to grow
EXPANDING USE OF TECHNOLOGY

- Use of technology in delivering care becomes commonplace, with small hospitals lagging behind
- Financing technology becomes “cost of doing business”
- Integration and interoperability become number one challenge
- Sophistication of vendor systems improves, but still lags behind software industry norms
- Industry standards begin to improve systems

IMPLICATIONS FOR PHARMACY

- Focus on patient will recognize need to educate the patient, address health literacy, and be held accountable.
- Pharmacy leadership in health-system IT decisions critical – decisions on systems and vendors will fundamentally change how care is delivered. Must be at the table.
- Pharmacy interface to system technology systems critical – nearly all interface with medication use directly or indirectly.

HEALTHCARE WORKFORCE CHALLENGES

- Staffing shortages impact safety, competition, retention, costs, care models, roles
- Demand for health care will exacerbate problem
- Nurse staffing challenges most significant issue
- Physician shortages and other professions also factor
- Hospitalists likely to be central to future care delivery models

TRENDS IN THE PHARMACY ENVIRONMENT

- The pharmacy enterprise, leadership
- Supply chain
- Dispensing models
- Automation/technology
- Physical facilities

GREATER FOCUS ON THE PATIENT

- Systems align with focus on the patient:
  - Focus on safety and quality
  - Scorecards
  - Payment for services
  - Further evolution of the “Patient- and Family-Centered Care” model
  - Dignity and respect
  - Information sharing
  - Participation in care
  - Collaboration on decisions

TRENDS IN THE PHARMACY WORKFORCE

- Pharmacist workforce trends
  - Changing demographics
  - Supply and demand
  - Credentialing
- Pharmacy technician trends
  - Expanding roles
  - Education/training requirements
  - Registration/Certification/Licensure
HOW DO YOU PREPARE FOR THE FUTURE?

CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD)

CONTINUOUS PROFESSIONAL DEVELOPMENT

Self-directed, ongoing, systematic and outcomes focused approach to lifelong learning that is applied into practice

CONTINUOUS PROFESSIONAL DEVELOPMENT (CPD)

SAMPLE CATEGORIES OF ACTIVITIES

- Continuing Education
- Certificates
- Academic Study
- Board Certifications
- Traineeships
- Scholarly Activities
- Teaching
- Precepting
- Mentoring
- Workplace Activities
- Professional Service
- Community Service

CONTINUOUS PROFESSIONAL DEVELOPMENT AT LEE MEMORIAL HEALTH SYSTEM

- Pharmacist or pharmacy technician completes self-reflection tool
- Employee completes initial plan developing SMART goals
- Pharmacy Director/Supervisor reviews plan (part of evaluation process)
- Entered by the employee into the Halogen Human Resource Computer System
- CPD program now moving to an ongoing process owned by the pharmacist or pharmacy technician
- Follow-up education on LEARN/ACT and EVALUATE steps throughout the year - recommend January, March and July
BE NOT AFRAID OF GROWING SLOWLY, 
BE AFRAID ONLY OF STANDING STILL.

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THE NEXT 50 YEARS

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