Practices in Action: Your Student is Doing What?!?

Thomas S. Achey, PharmD
Health-System Pharmacy Administration Resident
Cleveland Clinic
My Background
Objectives

- Describe current pressures for health-systems, pharmacy departments, and academia
- Identify current practices in action, both experiential and employment, utilizing students as pharmacist extenders
- Describe common barriers affecting incorporation of students into practice
At my institution, our pharmacy department:

- [A] Precepts pharmacy students on APPE/IPPE rotations
- [B] Employs pharmacy students to serve in an intern capacity
- [C] Both
- [D] Neither
My institution currently employs pharmacy students in the following setting(s):

- A Direct patient care (inpatient or outpatient)
- B Operations (inpatient or outpatient)
- C Retail
- D Other
At my institution, our department utilizes students in the following way(s):

- Medication history assessment
- Medication reconciliation
- Discharge counseling
- Dosing or IV to PO protocols
- Institutional longitudinal projects
Current Pressures on a Health-System

- Growing focus on ambulatory care and population health
  - Patient-centered medical home
  - Preventive healthcare
- A changing healthcare landscape
  - Accreditation and payments tied to quality outcomes
  - Penalties for readmission(s) [e.g. value-based purchasing]
  - Hospital quality measures reported to the public
- Demonstrating value of the integration arms race
- Varying reimbursement rates
Current Pressures on a Pharmacy Department

- Escalating cost of medications
- Involvement in medication reconciliation
- Minimizing medication errors
- Stewardship efforts
  - Antimicrobials
  - Immunizations
  - Opioids
- Anticoagulation education
- Reduced readmissions of select patient groups
Current Pressures on Academia

- Meeting accreditation standards for experiential education
  - Two introductory months (IPPEs): 300 hours
  - Nine advanced months (APPEs): 1440 hours
- Growing number of schools (and students enrolled!)
  - Maintaining quality of matriculants
- Finding quality rotation sites for students
  - Competition from schools
- Less total research dollars
  - More competition for those dollars

ACPE Standards 2016.
There exists a need to do more with less.
Challenge and Opportunity

**Challenge:** Our health system continues to design innovative clinical pharmacy practices; however, our ability to implement and sustain these practices with current resources is difficult.

**Opportunity:** A more financially stable consideration is expanding the role and expectations of pharmacist extenders to alleviate the workload pressure on clinical pharmacists.
Challenge and Opportunity

**Challenge**: Students are often limited to observer roles during experiential education which may lead to dissatisfaction of preceptors and students.

**Opportunity**: ACPE revised standards for professional doctor of pharmacy programs now require direct patient interactions with diverse patient populations.

Paradigm Shift

The utilization of students as pharmacist extenders changes student experiential education allowing for optimized patient care within a health system while also training a student to become a highly functioning and valuable practitioner.
Pharmacy Forecast: 2015 – 2019

In at least 50% of health systems, pharmacy students will provide essential patient care services (i.e., if the students were not there, additional pharmacist staff would have to be hired for these essential services).

- Very Likely: 25%
- Somewhat Likely: 41%
- Somewhat Unlikely: 31%
- Very Unlikely: 4%

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Pharmacy Forecast: 2015 – 2019

- The use of students in essential patient care activities can enable pharmacists to allocate their time to patients with complex medication-use needs.

- This will enrich students’ educational experiences and support development of a pharmacy work force that is better prepared for provision of patient care.
# Pharmacy Services Provided

<table>
<thead>
<tr>
<th>Service</th>
<th>&gt;75% Pts</th>
<th>Service</th>
<th>&lt;25% Pts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kinetics Monitoring</td>
<td>70%</td>
<td>Discharge Counseling</td>
<td>44%</td>
</tr>
<tr>
<td>Anticoagulation Monitoring</td>
<td>61%</td>
<td>Nutrition Assessment</td>
<td>32%</td>
</tr>
<tr>
<td>Antimicrobial Stewardship</td>
<td>48%</td>
<td>Med Histories Med Reconciliation</td>
<td>27%</td>
</tr>
<tr>
<td>Core Measures</td>
<td>47%</td>
<td>Pt. Care Rounding</td>
<td>27%</td>
</tr>
<tr>
<td>Therapeutic Consults</td>
<td>29%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**ASHP SOPIT CISSAG Survey; 2014.**

Pharmacist Extenders?  
Layered Learning Model?
# Patient Care Services Delivered

## Traditional Service-Based Practice Model Services

<table>
<thead>
<tr>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perform Order Verification</td>
</tr>
<tr>
<td>Round with Service</td>
</tr>
<tr>
<td>Perform Medication Review to Identify MRPs</td>
</tr>
<tr>
<td>Implement Plan to Optimize Medication Use</td>
</tr>
<tr>
<td>Monitor Response to Drug Therapy</td>
</tr>
<tr>
<td>Provide Drug Information</td>
</tr>
<tr>
<td>Perform Code Response</td>
</tr>
</tbody>
</table>

## Additional Layered Learning Practice Model Services

<table>
<thead>
<tr>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient Engagement</td>
</tr>
<tr>
<td>Medication Histories</td>
</tr>
<tr>
<td>Admission Medication Reconciliation</td>
</tr>
<tr>
<td>Discharge Medication Reconciliation</td>
</tr>
<tr>
<td>Discharge Medication Coordination</td>
</tr>
<tr>
<td>Discharge Patient Education</td>
</tr>
<tr>
<td>Documentation of Clinical Services</td>
</tr>
</tbody>
</table>

*Pinelli NR. Personal correspondence.*
# Hematology / Oncology Pilot Outcomes

<table>
<thead>
<tr>
<th>Function</th>
<th>n</th>
<th>Practitioner Only</th>
<th>Layered Learning Pharmacy Team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission Medication Reconciliation</td>
<td>152</td>
<td>5.3%</td>
<td>29.6%</td>
</tr>
<tr>
<td>Discharge MRPs Identified</td>
<td>120</td>
<td>Not recorded</td>
<td>1.8 / patient</td>
</tr>
<tr>
<td>Discharge Education</td>
<td>112</td>
<td>15.2%</td>
<td>54.5%</td>
</tr>
<tr>
<td>Pharmacy Benefits Investigation</td>
<td>137</td>
<td>0%</td>
<td>36.5%</td>
</tr>
</tbody>
</table>

Pinelli NR. *Personal correspondence.*
Pharmacy Forecast: Strategic Recommendation

Plan to use pharmacy students, both employed and rotational, in clinical activities such as:

- Obtaining medication histories
- Medication reconciliation
- Patient care activities that can be completed with pharmacist supervision
Leveraging Pharmacy Technicians

- Empowers the pharmacy team to ensure that technicians perform all traditional preparation and distribution activities
- Urges technicians to handle non-traditional and advanced responsibilities and activities to allow pharmacists to take greater responsibility for direct patient care

Pharmacist Credentialing & Training

- Elevates the reputation of the pharmacy team
- Ensures pharmacists, residents, and **students** have the training and credentials for activities performed within their scope of practice now and in the future
PAI Consensus Regarding Students

- “Develop a plan to allocate pharmacy student time to drug therapy management services”
  - Consensus statement B24c

- “Pharmacy education must prepare pharmacists for an expanded role...”
  - Training to include roles of safety and quality in the medication-use process and transitions of care
  - Consensus statements B26, B27, E4m, E4n

Hospital Self-Assessment

**B24c:** “a plan has been developed to allocate student time to drug therapy management...”

**B24c:** “employed student interns’ duties differ from traditional technicians...”

**E4m:** “students are trained on the roles of safety and quality in medication-use processes...”

**E4n:** “while on rotation, students are trained on transitions of care...”
RECOMMENDATION B24c

If you employ pharmacy student interns, are their duties different from traditional pharmacy technician duties?
Expansion of a Pharmacy Internship Program at a Tertiary Academic Medical Center
Medication Reconciliation

- Performed by nursing and physicians
- Medication history not considered “practice of pharmacy”

- Senior leadership requesting to expand pharmacy provision of medication history / reconciliation
- 2016 Pharmacy Department Goals
  - Increase medication history & reconciliations to 200 per week
  - Expand counseling and med rec services on second shift and weekends
- Lack of sufficient resources
Cleveland Clinic Pharmacy Intern Program

- Year-round internship
  - Summer intensive
    - Six weeks clinical shadowing
    - Six weeks centralized staffing
      - Operations
      - Sterile Compounding
    - Clinical topic presentation(s)
    - Operational project and presentation
  - Academic staffing
    - Central operations staffing one weekend every eight weeks
# Maximizing Student Participation

<table>
<thead>
<tr>
<th>Current State</th>
<th>Proposed State</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 interns: 2.5 FTEs</td>
<td>17 interns: 4.1 FTEs</td>
</tr>
<tr>
<td>5 PRNs x 0.1 FTE</td>
<td>5 PRNs x 0.1 FTE</td>
</tr>
<tr>
<td>• P4 Students</td>
<td>• P4 Students</td>
</tr>
<tr>
<td>8 Interns x 0.25 FTE</td>
<td>12 Interns x 0.30 FTE</td>
</tr>
<tr>
<td>• P2/P3 Students</td>
<td>• P2/P3 Students</td>
</tr>
<tr>
<td>One intern per weekend in centralized staffing</td>
<td>Four or five interns per weekend in various roles</td>
</tr>
</tbody>
</table>
Proposed Intern Weekend Staffing Roles

- Change weekend staffing to one of every four weekends
- No changes to other program requirements

<table>
<thead>
<tr>
<th>Intern</th>
<th>Year</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1</td>
<td>P2</td>
<td>Centralized Role (Technician)</td>
</tr>
<tr>
<td>S2</td>
<td>P2/P3</td>
<td>Internal Medicine – Medication Histories</td>
</tr>
<tr>
<td>S3</td>
<td>P3</td>
<td>Internal Medicine – Medication Histories</td>
</tr>
<tr>
<td>S4</td>
<td>P3/P4</td>
<td>Emergency Medicine – Medication Histories</td>
</tr>
<tr>
<td>S5</td>
<td>P3/P4</td>
<td>Split: IM and ED – Medication Histories</td>
</tr>
</tbody>
</table>

Expansion was net neutral in regards to departmental FTEs
Outcomes to be Measured

- Clinical / Operational Metrics
  - Number and percentage of medication histories completed
  - Number of identified discrepancies per medication history
  - Number and percentage of discharge counseling completed

- Financial Metrics
  - Technician overtime during academic year
Considerations

- Operational Considerations
  - Patient populations served
  - Patient prioritization
  - Competency / training

- Limitations
  - Nearest pharmacy school is >1 hour away

- Additional Benefits
  - Additional resources for research projects
  - Development of future residents and pharmacists
  - Service expansion with APPE students and advanced technicians
  - Telehealth counseling opportunities
RECOMMENDATION B24c

If you take pharmacy students on rotation, has a plan been developed to allocate pharmacy student time to drug therapy management services?
Longitudinal Advanced Pharmacy Practice Experience: Expanding Clinical Practice for Both the Students and Preceptor
Froedtert & the Medical College of Wisconsin: Froedtert Hospital

- 500-bed academic medical center
  - Level I trauma center
  - Certified stroke center

- Pharmacy education
  - Hosts over 200 students on rotation each year
    - Inpatient, ambulatory, community, and specialty
  - 44 unique advanced pharmacy practice experiences (APPEs)
  - Concordia University Wisconsin School of Pharmacy faculty onsite
  - Student precepting is required job standard for clinical pharmacists
Longitudinal APPE Program

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Student rotation months</td>
<td>98</td>
<td>197</td>
</tr>
<tr>
<td>Longitudinal APPE students</td>
<td>3</td>
<td>16</td>
</tr>
</tbody>
</table>

- **Recruitment Process**
  - Application
    - Letter of intent, letter of recommendation, curriculum vitae
  - Interview

- **Students complete majority of their rotations at institution**
  - Acute care, required
  - Community/ambulatory care, required
  - 2 - 3 electives
  - Leadership elective, optional
Longitudinal APPE Program Goals

- Prepare students for residency training so they can be a stand-out candidate
- Minimize transitions between rotations thereby minimizing orientation time
- Off-set pharmacist time to expand clinical practice
- Complete priority projects for the institution
Experiences for Student Extenders

- Active participation in the clinical pharmacist role
- Longitudinal research project
  - Presented at a local and/or national meeting
- Longitudinal health-system experience
  - Half day per week for 6 – 12 weeks
    - Investigational drugs
    - Drug policy
    - Specialty pharmacy
- Networking
  - Mentor (PGY1 or PGY2)
  - Project advisor
Experiences for Student Extenders

- Medication histories
- Medication reconciliation
- Multidisciplinary patient care rounds
- Medication dosing per policy or collaborative practice agreements
  - Aminoglycosides
  - Anticoagulants
  - Renal dose adjustments
  - Vancomycin
- Discharge counseling
Barriers

- Scheduling student experiences
- Collaboration with schools of pharmacy
- Project determination and management
  - Students
  - Project advisors
- Communication
- Ability to assess longitudinal performance
Departmental Successes

- Student orientation time
  - 320 hours saved in 2014 – 2015
  - Administration time gained
  - Direct patient care

- Longitudinal projects
  - Assistance with Utilization Review Accreditation Commission for specialty pharmacy
  - Process improvement projects

- Expanding clinical pharmacist practice
  - Antifungal therapeutic drug monitoring
  - Integration into the blood culture notification process
Successes: WIN – WIN – WIN!

- **Students**
  - ↑ motivation
  - Advantages in applying for internal or external residencies

- **Institution**
  - ↑ job satisfaction: pharmacist preceptors
  - ↑ allocation of time for clinical activities
  - Students’ goals align with the institution

- **School or college of pharmacy**
  - Streamlined communication between institution and SOP
  - Strengthened student programming and development
Successes – Student Skill Assessment

![Bar chart showing skill assessments before and after LAPPE rotations.](chart.png)
Successes – Preceptor Skill Assessment
## Successes – Residency Match

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>No. Entering Match&lt;sup&gt;a&lt;/sup&gt;</th>
<th>No. Successful Match&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Match Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>Froedtert Hospital</td>
<td>13</td>
<td>11</td>
<td>84.6%</td>
</tr>
<tr>
<td></td>
<td>ASHP National Data&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4,358</td>
<td>2,811</td>
<td>64.5%</td>
</tr>
<tr>
<td>2014</td>
<td>Froedtert Hospital</td>
<td>2</td>
<td>2</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>ASHP National Data&lt;sup&gt;c&lt;/sup&gt;</td>
<td>4,142</td>
<td>2,640</td>
<td>63.7%</td>
</tr>
</tbody>
</table>

<sup>a</sup> Excludes participants that withdrew from the Match for any reason

<sup>b</sup> Match Day results only; does not account for positions unfilled or obtained in post-match scramble

<sup>c</sup> Data obtained from: https://www.natmatch.com/ashprmp/stats/
Successes – Expanding Clinical Practice

- Clinical pharmacists replaced the primary provider in the blood culture notification process.
- Pharmacists were contacted directly by the microbiology lab with positive results.
## Blood Culture Outcomes

<table>
<thead>
<tr>
<th>Measure</th>
<th>Pre-RPh Integration (n=133)</th>
<th>Post-RPh Integration (n=95)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time to optimal therapy, median (hours)</td>
<td>61.7 (n=122)</td>
<td>41.1 (n=92)</td>
<td>0.002</td>
</tr>
<tr>
<td>Never reached optimal, n (%)</td>
<td>11 (8.3)</td>
<td>3 (3.2)</td>
<td>0.162</td>
</tr>
<tr>
<td>Time to effective therapy, median (hours)</td>
<td>5.4 (n=117)</td>
<td>4.7 (n=80)</td>
<td>0.084</td>
</tr>
<tr>
<td>Length of stay, median (days)</td>
<td>8.8</td>
<td>7.1</td>
<td>0.393</td>
</tr>
<tr>
<td>Readmission, n (%)</td>
<td>5 (3.8)</td>
<td>4 (4.2)</td>
<td>&gt; 0.99</td>
</tr>
<tr>
<td>Mortality, n (%)</td>
<td>13 (10)</td>
<td>10 (10.5)</td>
<td>0.820</td>
</tr>
</tbody>
</table>
Value of Utilizing Student Pharmacists in a General Pediatric Outpatient Clinic
Univ. of Alabama at Birmingham: Huntsville Regional Medical Center Pediatric Clinic

- 50 patients daily
- Interdisciplinary staff
  - Pediatricians
  - Nurses
  - Social workers
  - Medical residents
  - Medical students
  - Pharmacist
  - Pharmacy students

Eiland LS. PPMI Case Study.
Students Involvement

- Eleven APPE student rotations
  - 5 week rotations = 55 student weeks
- Pharmacotherapy knowledge
  - Chart review
  - Medication assessment
  - Counseling

Eiland LS. PPMI Case Study.
Workflow

- Prior to appointment
  - Chart review
  - Medication assessment

- Appointment
  - Interview patient and/or caregivers
    - Medications
    - Allergies
  - Counseling

- Post-Appointment
  - Documentation
## Interventions: RPh

<table>
<thead>
<tr>
<th>Category</th>
<th>Pharmacist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergy info clarified</td>
<td>5</td>
</tr>
<tr>
<td>Drug information</td>
<td>7</td>
</tr>
<tr>
<td>Drug therapy (consult, initiation, adjustment)</td>
<td>13</td>
</tr>
<tr>
<td>Medication reconciliation</td>
<td>26</td>
</tr>
<tr>
<td>Patient and caregiver counseling</td>
<td>6</td>
</tr>
<tr>
<td>Past medical history</td>
<td>26</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>83</strong></td>
</tr>
<tr>
<td>Cost Avoidance</td>
<td><strong>$6,793</strong></td>
</tr>
</tbody>
</table>

Eiland LS. *Personal correspondence.*
Outcomes: Students

- 1,433 interventions
  - 869 chart reviews
  - 281 medication histories
  - 115 counseling sessions
- Cost avoidance: $69,776
  - Seven month period

- On average, conducted 18 medication assessments
- Physician feedback / evaluations all positive

Eiland LS. PPMI Case Study.
Intangible Benefits

- Enhanced work flow and clinical practice
- Instilled self-confidence in decision-making in unique population
- Realization of tangible progress noted for students
- Opportunity for preceptor to coach and motivate
- Allowed students to see initiation of a new practice site early
- Showed value of pharmacists and students in clinic
CONCLUSION
Key Takeaways

- Pharmacy practice is becoming more reliant on pharmacy students and residents for the provision of essential patient care services.
- Implementation is not finite; advancement will continue well into our careers.
- This is a marathon, not a sprint.
- Not every recommendation works for every institution or practice-setting.
A Necessity for Students

- Build a strong foundation of knowledge
  - Therapeutics
  - Guidelines
  - Landmark trials
  - Pathophysiology and diagnosis

- Hone vital skills
  - Drug-related problem identification
  - Therapeutic plan development
  - Clinical documentation
  - Counseling skills
  - Evidence-based medicine
Conclusion

- Pharmacy departments are continually tasked with expanding patient care and services
  - Without concomitant expansion in resources

- Departments must create pioneering solutions to continue to drive practice forward

- Students as pharmacist extenders is one of the best ways to advance clinical pharmacy practice
  - Readily available resource for most health systems
Practices in Action:
Your Student is Doing What?!?

Thomas S. Achey, PharmD
Health-System Pharmacy Administration Resident
Cleveland Clinic