Case Study on Expanded Pharmacy Practice Model

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Objectives

• Describe impact & logistics involved with increasing integration of pharmacist clinical & distributive activities
• Identify driving forces & essential components related to implementing 24-hour clinical pharmacy services
• Explain benefits of incorporation of student/resident training into the 24-hour integrated clinical service model

Disclosure Statement

• Dr. Mason has no financial or other conflicts of interest to disclose at this time.

Where are we?

University of Tennessee Medical Center
Knoxville, TN

Hospital Services

• 52 specialty/subspecialty services
• Centers of Excellence
  – Emergency and Trauma Services
  – Heart Lung Vascular Institute
  – Cancer Institute
  – Center for Women and Children’s Health
  – Brain Spine Institute

Case Study

• University Health System, Inc.
  – University of Tennessee Medical Center
    • 581-bed Academic Medical Center
      – Level I Trauma Center
      – Regional Referral Center
      – Regional Perinatal Center
      – Level III Neonatal Nursery

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Hospital Statistics
• 83 ICU beds
• 25,000 admissions / year
• 60,000 ED visits / year
• Average length of stay 5.1 days
• 3,250,000 billed med. doses / year

Department of Pharmacy
• 54 pharmacists
  – 26 clinical staff
  – 14 specialists
  – 3 administrative
  – 11 residents
• 48 technicians
• 4 administrative support staff
• 1 RN specialist, medication safety
• 1 RD, metabolic support
• 1 computer data specialist
• 1 technology specialist

Pharmacy

Clinical Specialists
• Transplant
• Medication Safety
• Critical Care Trauma
• Internal Medicine
• Clinical Drug Policy
• Clinical IS/CPOE
• Critical Care Medicine
• Nightshift Medicine
• Pulmonary Medicine
• Women’s & Children’s
• Emergency Medicine
• Oncology
• Drug Policy
• Communications
• Infectious Diseases
• Ambulatory Care*
• Family Medicine*

*UT College of Pharmacy Faculty

Question for you…
• Any ideas what the average % of added qualifications on a hospital’s pharmacy staff is for those participating in recent ASHP survey?
  – PGY1
  – PGY2
  – BCPS

Pharmacist Added Qualifications

2008 national survey by the American Society of Health System Pharmacists
Pharmacy Services
- 12 decentral dayshift pharmacist/tech teams
- 5 decentral evening teams (ED included)
- 1 decentral night team
- OR satellite pharmacy
- Oncology satellite pharmacy
- Metabolic support service (RD, MD)
- Medication safety office (RN, PharmD)
- Automated distribution systems

Technology/Automation
- eMAR medication instructions/BCMA
- Bar-code verified pharmacy dispensing & inventory management via carousels in main pharmacy
- Smart pump drug libraries
- Automated medication cart filling system
  - over 90% of medications distributed via ADCs
  - ADCs with patient-specific bins on each floor
- Order sheet scanning technology
- CPOE planned for implementation April 2011

Technical Staff
- Pharmacy technician certification = 95%
- Decentral techs provide order entry & medication distribution to the floors
- Techs in parenterals production in IV Room/Chemo/OR Satellite Pharmacies
- Optimizing skill mix as much as possible

Average Drug Orders per Month

Average Pharmacy Consults per Month

Orders Reviewed in 60 Minutes or Less
UTMC Service Enhancements

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>Unit-based pharmacists</td>
</tr>
<tr>
<td>1985</td>
<td>Split model (centralized staff pharmacists with specialists in select areas)</td>
</tr>
<tr>
<td>1989</td>
<td>Redeployed staff pharmacists to floors</td>
</tr>
<tr>
<td>2000</td>
<td>Added residency requirements: (PGY1) for pharmacist hires / (PGY2) for specialist hires</td>
</tr>
<tr>
<td>2002</td>
<td>Integrated clinical specialists into decentralized team structure on day shift (including weekends)</td>
</tr>
<tr>
<td>2003</td>
<td>Established medication safety office</td>
</tr>
<tr>
<td>2005</td>
<td>Expanded specialist coverage to evening shift</td>
</tr>
<tr>
<td>2007</td>
<td>Expanded specialist coverage to night shift</td>
</tr>
<tr>
<td>2010</td>
<td>Expanded specialist coverage to ED shift (4p – 2a)</td>
</tr>
</tbody>
</table>

What about when night falls…?

24-hour Clinical Pharmacy

- Prior to 2007
  - Decentralized, clinical services 7am-11pm
  - 1 nightshift pharmacist
- Increasing patient census, growing requests during nightshift for formal and informal consults, emergency code presence
- Request by college of pharmacy to expand training experiences

24-hour Clinical Pharmacy

- 2006-2007
  - Residency trained pharmacist added to nightshift every other week
  - Voluntary “extra service” 4 hr nightshifts
- Summer 2007
  - 2 residency trained nightshift specialists (IM and CC) began 7 on / 7 off schedule
  - Decentral, integrated practice model

Night Clinical Responsibilities

- Prospective participation in the plan of care & initiation of monitoring plans for overnight admission
- Prospective review of medication orders
- Response to formal consults
  - Pharmacokinetics, dosing, review for ADE
- Informal consults (attending/hospitalist, resident, RN)
- Emergency Code & trauma alert response
- Precept P3/P4 students, PGY1s, PGY2s

So in the first year…

- Over 400 documented prevented prescribing errors
- Over 500 formal consults (initial & f/u)
- 43 ADE reported to P&T Committee
- 131 pharmacist-initiated protocols
Percent TAT for Pharmacist Order Review

Program Sustainability

- Two initial residency-trained pharmacists
  - One became Assistant Director at UTMC
  - One moved out of state for family reasons
- Two residents who had this nightshift rotation were hired for nightshift positions
  - One of these took ED position Summer 2010
    - Recruited replacement pharmacist from a different residency program

What about those coming after us…?

Case Study

- Teaching Affiliations
  - Medicine
    - Grand Rounds for Departments of Surgery/Internal Medicine/Family Medicine
    - Physician group meetings
    - Noon conference presentations for FM/IM
    - Course lectures for medical residents/fellows
  - Nursing
    - Nursing in-services and new nurse orientation
  - Allied Health
    - Dental resident lectures
  - Pharmacy
    - Pharmacy Journal Clubs
    - On site accredited Pharmacist/Technician CE

Educating Pharmacy Students

- Large and small group didactic coursework/lectures
- Teach 130 student month rotations/year

- Cardiology
- Critical Care Medicine
- Critical Care Trauma
- Ambulatory Care
- Nephrology
- **Nightshift Medicine**
- Advanced Institutional Pharmacy Practice
- Family Medicine
- Internal Medicine
- Women & Children’s
- Transplantation
- Oncology
- Pulmonary

UTMC Pharmacy Residency

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991</td>
<td>Establish PGY1 program – 2 residents</td>
</tr>
<tr>
<td>1993</td>
<td>Expand to 4 residents</td>
</tr>
<tr>
<td>1995</td>
<td>Expand to 6 residents</td>
</tr>
<tr>
<td>1996</td>
<td>Establish PGY2 Critical Care residency</td>
</tr>
<tr>
<td>1997</td>
<td>Beta site – Model of Residency Training Demonstration Project (RLS)</td>
</tr>
<tr>
<td>1999</td>
<td>Expand to 8 residents</td>
</tr>
<tr>
<td>2000</td>
<td>Establish chief resident position</td>
</tr>
<tr>
<td>2008</td>
<td>Establish PGY2 Pharmacotherapy residency</td>
</tr>
<tr>
<td>2010</td>
<td>Expand to 11 residents (7 PGY1, 4 PGY2)</td>
</tr>
<tr>
<td>2010</td>
<td>Convert Pharmacotherapy residency to 24-month PGY1/PGY2</td>
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</table>
Residency Impact
- 131 graduates since inception of program
  - from nearly every state; two international
  - hired 30 residents onto UTMC staff
- Improved recruiting
  - Larger applicant pool
  - Expanded credentials
  - Enhanced “fit”
- Decreased (eliminated turnover)
  - 0.25% vs 5.7% in 2009 ASHP survey

Residency Outcomes
- Faster clinical service expansion to all areas/all shifts
  - Decreased training time
  - Improved productivity
  - Relationships developed
  - Change agents
- Enhanced professional development (BPS)
- Leadership development/succession planning
  - RPD → Assistant Director
  - Chief Resident → Director
  - Pharmacy Residents (multiple) → RPDs
- Enhanced visibility within and outside the organization

Nightshift Educational Impact
- Student clerkships
  - 7 students on Nightshift Medicine in 1st year
  - 20 students as of October 2010
- All 2010 PGY1s elected to do Nightshift rotation
- Dayshift rounds & medical residents
  - Pre-Nightshift Clinical Services
    - Retrospective post-call pharmacy input
    - “Why was this decision made?”
  - Post-Nightshift Clinical Services
    - Prospective & concurrent consultation during overnight admissions

In Summary…
- Successful implementation & continuation of 24/7 integrated model depends upon
  - Well-developed decentral clinical staff
  - Broad capabilities of clinical specialists
  - Resources for 2nd night pharmacist
  - Meaningful clinical activities on nightshift
  - Investment in student/resident training
  - All-around commitment!!!
  - 1 patient deserves 1 pharmacist aware of all issues
Post-Test

• True or False
  – Beginning night clinical services is best done by decentralizing current central Rx staff

• True or False
  – Students and residents will not be interested in working 7 on / 7 off night schedules

• True or False
  – 1 staff pharmacist + 1 pharmacist specialist + 1 pharmacy resident + 1 faculty pharmacist = silos of care for patient in bed 718

Questions?
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