Development and Implementation of a Patient-Centered Integrated Practice Model in a Community Teaching Hospital

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Learning Objectives

- Describe the steps necessary for developing and implementing a patient-centered pharmacy practice model.
- Describe the role of pharmacy personnel in developing and implementing a pharmacy practice model.
- Describe resources that can support a patient-centered practice model.

Self-Assessment Questions

True or False:
1. Factors that should be considered prior to designing and implementing a pharmacy practice model include pharmacy workflow, workload and staffing.
2. The director of pharmacy, clinical manager and pharmacists are the only pharmacy personnel needed to design and implement a patient-centered integrated pharmacy practice model.

Pharmacy Practice Model Initiative (PPMI) – Goal

To significantly advance the health and well being of patients in hospitals and health systems by developing and disseminating optimal pharmacy practice model that are based on the effective use of pharmacists as direct patient care providers.

Disclosure

The presenters for this continuing pharmacy education activity report no relevant financial relationships.

Maryland General Hospital

- 240 bed community hospital
- Affiliated with University of Maryland Medical System (UMMS)
- 110, 000 patients annually

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Maryland General Hospital

- Comprehensive specialty inpatient care in > 20 Sub-specialties including:
  - OB/GYN
  - Behavioral health
  - Medical Services
  - Surgical care
  - Renal dialysis
  - Stroke Center
  - Geriatric care
  - Rehab (until July '11)\

"to improve the health of our community through superior, compassionate care and medical education in partnership with our physicians and employees.

MGH Patient Care Services

- 18 bed ICU
- 12 bed ACE-Unit
- 6 Medical/Surgical Units
  - 4 Med/Surg (1 with telemetry)
  - 1 Peds Surgical
  - 1 Psychiatry
  - Emergency Dept.
  - Psychiatry ED
  - Ambulatory Family Health Center
  - HIV/AIDS clinic
  - Diabetic center
  - Pediatric clinic

Pharmacy Practice Model: 2004

- Drug processing and Dispensing model with centralized pharmacy operations
- Order entry and verification
- Medication distribution
- Preparation of sterile products including TPNs

Clinical Services – Limited

- Clinical coordinator
- Clinical Support pharmacist
  - Vancomycin and Aminoglycoside dosing on consult
  - Therapeutic Interchanges
  - Drug Information

Phase One

Comprehensive evaluation of pharmacy workload and workflow

Identification of desired clinical services

Phase One: Comprehensive evaluation of pharmacy workload and workflow

- All pharmacy-related activities (intra- extra-department)
- All pharmacist and technicians (both part-time and full time)
- Detailed Tasks and timelines
- Hourly workload reports
  - # of orders processed per hour per shift
  - Weekends and weekdays

Phase One: Identification of desired clinical Services

- IV to PO
- Pharmacokinetics Dosing and monitoring
  - Vancomycin, Aminoglycosides, Phenytoin, Digoxin
- Renal dosage adjustments
- Targeted list of 15-20 drugs
- Therapeutic Interchanges
  - HMG-CoA Inhibitors
  - PPIs
  - H2 Antagonist
  - Quinolones

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Findings

- Technicians
  - Lack of clarity in delineation of duties
  - Unequal distribution of tasks
  - Workstations
  - Frequent schedule changes and call-outs
  - Skills and knowledge-base deficits – calculations; hospital processes and procedures
  - Unequal distribution of tasks
  - Dissatisfaction with practice
  - Lack of confidence to take on expanded clinical activities
- Pharmacist
- Workstations
- Frequent schedule changes and call-outs
- Skills and knowledge-base deficits – calculations; hospital processes and procedures

Other
- Excessive phone calls
- Missing Doses
- Waste

Staffing Distribution

- 8.75 FTE pharmacist
  - 4.75 Post Baccalaureate Pharm.D.
  - 3 B.Sc.
- 8 FTE Technicians
- Work Shifts
  - 7:00 am – 3:30 pm: 3 FTE pharmacist; 4 Technicians
    - 1 IV room pharmacist
    - 2 order entry pharmacist/cart check pharmacist
  - 1:30 pm – 9:30 pm: 1 FTE pharmacist; 2 Technicians
    - 60% of orders are processed between 4:00 pm and 9:00 pm
  - 9:30 pm - 7:30 am: 1 FTE pharmacist

Workload Assessment:
No. of Doses Dispensed per FTE technician/ Pharmacist

- 4,100 doses daily
- 1.5 million doses annually

Failure to Launch

- Redesign of workflow
- Improved efficiency
- Clarity of job functions, duties and responsibilities
- Initiated Education and Skills development
  - Technicians – calculation; peer skills development, cross training
  - Pharmacists – targeted lectures, assigned reading, skills enhancement:
    - Drug therapy assessment; Pharmacokinetics, Renal dosing IV to PO dosing etc.
- Clinical Activities
  - Limited participation by staff pharmacist
  - Volume of orders processed
  - Excessive phone calls

Phase Two

Justification of Clinical Services Expansion
Need for Additional Pharmacist and Technicians
Benchmarking

- 3 area hospitals with similar size and mission
- Number of doses dispensed daily, annually
- Number of Pharmacist FTE
- Number of Technician FTE
- Calculated daily doses dispensed per Pharmacist and Technician FTE

Comparative Hospitals based on Bed Size

Clinical Services at MGH

- Pharmacokinetic Dosing and monitoring
  - > 500 pts vancomycin & aminoglycosides
  - >100 pts – phenytoin and digoxin
- Renal Dosing Program
- $10,000 cost savings
- Therapeutic Interchange Program (IV to PO Conversion)
  - $54,000 cost savings
  - Automatic Substitution Programs
- Participation in Interdisciplinary rounds (ICU only)
  - $19,068 (projected annual); $1,589 cost saving – 4 wks pilot
- Physician Education
  - Monthly physician in-services & noon conferences

Expanded Clinical Service Proposal for the CEO

- Published cost effectiveness of clinical services provided by pharmacist and
- Documented cost effectiveness of clinical services provided by pharmacist at MGH
Impact of Clinical Pharmacy Services: Literature Review

- Bond, CAB and Raehl CL. AJHP 2005 62: 1596-1605
  - Hospitals without pharmacist-managed kinetic services: 12.3% higher LOS; 6.3% Medicare charges; higher rates of hearing loss (46.4%) and renal impairment (43%) deaths (10.2%)
- Nesbit TW et al. AJHP 2001 58 (9):784-90
  - 12 months: 4,959 Interventions; $92,076 direct cost savings; $488,426 cost avoidance
- Bond et al. Pharmacotherapy 2001 21 (2) 129-41
  - increase clinical pharmacist staffing levels from 0.34/100 occupied beds
dec in hospital deaths; 30-45% decr. LOS; cost of care
  - Mutnick AH et al. AJHP 1997; 54:392-6
  - Clinical interventions = $487,833 net cost savings
- Schumock GT et al. AJHP 1999; 56:1945-9
  - Additional 2 FTE Clinical pharmacist = $217,551 net savings annually
- Baldinger et al. AJHP 1997; 54:2811-4
  - ICU rounds; 6 wks pilot; $5,084 cost savings; $25,140 (projected annual)

On to the CEO

- Understaffing at MGH compared to area hospitals
- Pharmacist Impact
  - Improved order entry and medication reconciliation process
  - Cost Savings
  - Improved patient outcomes
- Requested
  - 2 FTE pharmacist
  - 2 FTE Technicians

Proposed Clinical Pharmacy Expansion

- Decentralized pharmacist order-entry
- Pharmacist participation in interdisciplinary rounds ICU and medical rounds
- Pharmacokinetic Dosing and monitoring – automatic
- Expansion of the IV to PO drug list
- Implementation of a robust therapeutic interchange program – PPIs; H2 antagonist; Quinolones
- Initiation of a targeted drug program for high risk and high cost medication
- Expansion & Enforcement of the Restricted Antibiotics list

Phase Three

Implementation of our Patient-Centered Integrated Practice Model

Generalist Practitioner Decentralized Model

- Workload and Workflow Redesign
  - Five pharmacist in the day shift
  - 1 Pharmacist - IV room
  - 1 Pharmacist - cart check and ED
  - 3 pharmacist clinical/order entry
  - 3 pharmacist area
- Pharmacist Responsibilities
  - Wireless computer on wheels
  - Participation in interdisciplinary rounds
  - Order Entry
  - Targeted Clinical Activities - using a computer generated list of target drugs

Example – Day in the life

Generalist Practitioner Decentralized Practice model

- Pros
  - Improved pharmacist involvement in patient care
- Cons
  - Logistics Problems – “docking stations”
  - “Dead zones” and other network problems
  - Multiple interdisciplinary rounds
  - STAT orders
  - Prioritizing – order entry vs. clinical activities
  - Delayed order entry due to rounds
  - Therapy assessments delayed due in favor of STAT or first dose
  - Intervention documentation

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Automation and Technology

- E-MAR-BMV
- OmnilinkRX system
- 22 Omnicell automated dispensing machines
- Profiling capabilities
- Mini-bag Plus system IV Medications
- Glove box
- TPN outsourcing
- Bar-Coding technology - BMV
- Quantifi (Pharmacy One-source) – web-based intervention documentation
- SafetySurveillor (Premier) – Infection control and management

Modified Practice Model

- 5 Pharmacist in day shift
- 2 Pharmacist in central pharmacy
- IV compounding
- Order entry, distributive functions
- Therapeutic interchanges
- Initial Anticoagulation Assessment
- 3 Pharmacist with expanded clinical duties
  - Pharmacokinetics
  - Anticoagulation dosing and monitoring
  - IV to PO, Renal Dosing
  - Antimicrobial stewardship activities
- Expanded Technician Duties
  - Missing doses
  - Telephones

No. of Doses Dispensed Per FTE Pharmacist/year

No. of Interventions per FTE Pharmacists per Year

Cost Savings/Avoidance Per FTE Pharmacist per Year

Cost Avoidance/Savings per pharmacist
2006-08 12.75 Pharmacist FTE; 2009-2010 11.75 Pharmacist FTE
% of pharmacist time based on Type of Intervention

Pharmacist Education
- Determine Skills Sets
- Design education plan
  - Didactic
    - Reading, Discussions, Lectures
    - Local Pharmacy Association Meeting
    - Medical Grand Rounds, noon conferences
  - Webinars/On-line/On-demand
    - ASHP website (ASHP advantage) CE Programs
  - Experiential
    - Demonstration of skills
  - Pharmacy Rounds
    - Mini case presentations
  - Dissemination of case findings via e-mail
- Continuous/Feedback
- Quality Assessment and Feedback

Summary
- Start with what you have
- Review all pharmacy process and workflow
- Involve EVERYONE
  - Technicians, Secretary, pharmacist etc.
- Strategic planning
  - "build it and they will come"
  - Technology and automation
  - Pharmacist Education
- Prescriber and Nursing Support
- Review the Literature – demonstration projects,
- Write proposals to hospital administration
- Safety Agencies
- Be VISIBLE in patient care areas

Questions?