

UNIVERSITY OF MICHIGAN – DEPARTMENT OF PHARMACY SERVICES

ANNUAL REPORT FY2006

WELCOME FROM THE DEPARTMENT OF PHARMACY SERVICES



James G. Stevenson, PharmD, FASHP
Director of Pharmacy Services
Professor and Associate Dean for
Clinical Sciences, College of Pharmacy

Welcome to the Department of Pharmacy Services Annual Report for Fiscal Year 2006. This was a year in which we continued to improve the quality of our services and expand our clinical pharmacy services. Specifically, several major capital projects were being planned or implemented. These included the implementation of Omnicell Pharmacy Central – a bar-code assisted inventory management system that incorporates the use of vertical storage carousels. It is anticipated that this system will provide enhanced inventory control, tracking, and safety using bar code technology and light-assisted product picking.

Two other large capital projects being planned include the construction of a USP 797-compliant Class 10,000 cleanroom for the preparation of parenteral products, and the renovation of our Investigational Drug Service area. We have also worked toward the opening of a new operating room pharmacy in Mott Children's Hospital and a new outpatient infusion pharmacy at the Canton Health Center. In addition to these departmental projects, we have worked with others in the University of Michigan Hospitals and Health Centers on other major projects including the opening of the Cardiovascular Center (scheduled for late spring 2007) and a replacement Children's and Women's Hospital (scheduled for opening in 2011). The Cardiovascular Center will include a pharmacy that will provide operating room and acute care pharmacy services. Multiple pharmacies are planned for the new Children's and Women's Hospital.

Significant work also occurred in preparation for our computerized provider order entry (CPOE) system implementation, scheduled for October 2006. UM CareLink will utilize software from Eclipsys to allow computer order entry with an interface to the WORx Pharmacy Information System.

We have continued to add outstanding staff and expand services to our constituents. The following report highlights many of the activities and accomplishments in the various areas of our department during FY2006.

The department works to support the mission, vision, values and goals of the University of Michigan Health System and the UM College of Pharmacy. Our mission and goals are listed below:

Mission

The University of Michigan, Department of Pharmacy Services strives to attain the highest level of services in patient care, education, and research. It is our intention to utilize available resources in an efficient manner to achieve the following goals:

- *Patient Care:* To provide rational, progressive pharmacotherapy in a safe, efficient, and compassionate manner to enhance the quality of life for all patients we serve.
- *Research:* To provide a leadership role in the evolution of knowledge through the development and support of investigations to benefit the advancement of health care.
- *Education:* To provide current and innovative pharmaceutical information and instruction to health professionals, healthcare students and the general public.

Department of Pharmacy Services Specific Goals

To meet the University of Michigan Health Systems mission, vision, values, and goals.

To assure that pharmaceutical care is of the highest quality, meeting or exceeding community and national standards.

To identify pharmaceutical care issues, trends, and opportunities for improvement related to the systems that support that care.

To assure that pharmaceutical care, practice and professional performance are regularly, validly, and reliably evaluated.

To assure that procedures, methods, and systems are cost effective and demonstrate effective impact.

To conduct research and create new knowledge related to medications and pharmacy services in patients.

To participate in the education of pharmacy students, post-graduate pharmacists (residents and fellows), as well as other health professionals.

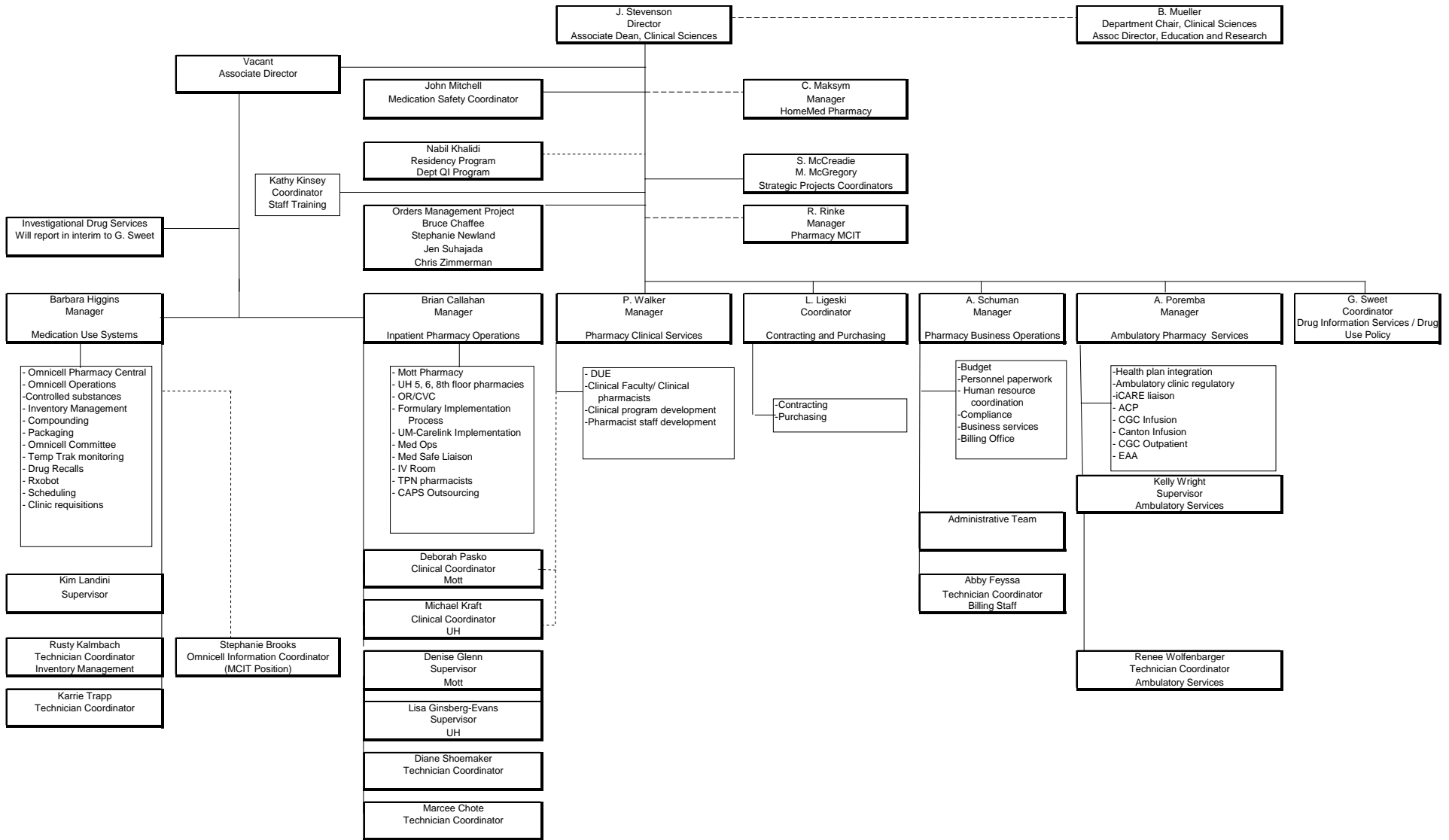
Collectively, by embodying these values and goals we help make the Michigan Difference <http://www.med.umich.edu/michigandifference/mdiff/index.htm>.

In order to achieve these goals we rely on excellence among our staff. In order to learn more about the department and joining our staff, please go to <http://www.med.umich.edu/careers/careers/pharmacy/index.html> for more information.

To see our current openings, please go to <http://websvcs.itcs.umich.edu/jobnet/search.php?searchBox=pharmacy&searchwhat=current>.

An organizational chart of the department is displayed below:

Department of Pharmacy Services
Organizational Structure
 Jul-06



INPATIENT DRUG DISTRIBUTION SERVICES

The Inpatient Pharmacy Services, consistent with the values of the University of Michigan Hospitals and Health Centers, places a priority on patients and family, teamwork and never-ending improvement.

The Department is responsible for dispensing medications daily for an average inpatient population of 800 patients between the University and Mott Hospitals combined. Additional services are provided to support the outpatient and clinic settings. The Department consists of pharmacists as well as technical and support personnel, who work together to assure patients receive the highest quality pharmaceutical care possible.

The Inpatient Pharmacy performs a wide range of duties 24 hours per day, 7 days per week. These include but are not limited to: prescription order entry, IV dosage and filling, chemotherapy admixtures, sterile lab and bulk drug compounding and packaging, filling of unit based medication cabinets, provide drug information to Physicians and Nurses and participation on the Cardiac Arrest Team.



Brian Callahan, Pharm.D.
Manager, Inpatient Operations

Inpatient Operations Management Team

- Nabil Khalidi, Assistant Director
- Brian Callahan, Manager, Inpatient Operations
- Denise Glenn, Manager, Mott Pharmacy
- Barb Higgins, Manager, OR Pharmacies and 5UH
- Kim Landini, Manager, UH Satellites
- Mike Kraft, UH Clinical Coordinator
- Deb Pasko, Mott Clinical Coordinator
- Marcee Chote, Technical Coordinator
- Diane Shoemaker, Technical Coordinator
- Karrie Trapp, Technical Coordinator

Key Accomplishments/ Improvement Initiatives

- Preparation for UM-CareLink physician order entry system
- Completed design of Main and OR Pharmacies for new Mott Hospital
- Extended UH OR satellite hours of operation to provide evening coverage
- Recruited and hired UH Clinical Coordinator
- Expanded Patient Focused Care clinical program to Mott Hospital
- Extended off shift Management presence with Afternoon Technical Coordinator
- Established a workgroup to improve reduce and improve response to “missing medications”

Inpatient Pharmacy Statistics

- **3.1 million** prescription orders processed per year
- **21,000** doses of oral medications dispensed per day
- **5,200** doses of intravenous medications dispensed per day
- **1.4 million** doses of medications packaged per year
- **25,600** chemotherapy products prepared annually

- Expanded Omnicell unit based cabinets from 77 to 98 machines
- Completed installation of Safety Stock barcode technology for stocking Omnicell drug dispensing machines
- Constructed Mott Children's Hospital OR pharmacy satellite
- Planning and design for a new Cardiovascular Center Pharmacy
- Expansion of Pharmacy services to include support of East Ann Arbor Surgery Center
- Implemented Phaseal® - a closed compounding and delivery system for Chemotherapeutic agents
- Implemented new post-op and transfer order processing system to improve accuracy and reduce dispensing delays
- Revised IV policies and standards to improve compliance with USP 797 Guidelines
- Modified the Medication Administration Record to include new sections for Respiratory Therapy and Chemotherapeutic agents
- Installed Omnicell Pharmacy Central carousel inventory system
- Constructed new break room for Mott Pharmacy
- Implemented Neonatal Starter TPN process
- Provided representation for Disaster Drill and Emergency Preparedness
- Updated labels for PCA syringes to support new barcode enabled Smart Pumps
- Implemented Label Safe- new barcode enabled label making program to improve packaging accuracy
- Converted OB epidural syringes to cassette delivery system

CLINICAL PHARMACY SERVICES

The Department of Pharmacy Services provides pharmaceutical care to both inpatients and outpatients. Clinical pharmacists function as integral members of health care teams at University Hospital, Women's Hospital and C.S. Mott Children's Hospital, working with physicians to achieve desired therapeutic outcomes, prevent or minimize drug-related problems, and improve medication use. Currently, 30 clinical pharmacists, including 5 new positions added in FY2006 (in the areas of Ambulatory Care, Antimicrobial Management/Infectious Diseases, Hematology/Oncology, Pediatric Cardiothoracic Surgery, and Transplantation), practice full time providing direct patient care services. In addition, a clinical practice model for staff pharmacists was implemented at Mott in 2006. Similar to the model implemented at University Hospital in 2005, this model expands the role of the staff pharmacist beyond pharmacy operations, enabling them to participate in direct patient care activities.



Paul C. Walker, Pharm.D.
Clinical Pharmacy Manager

Pharmacists actively participate in the development, implementation and enforcement of drug use guidelines, policies and procedures, help to ensure appropriate use of high-risk medications, and serve on quality improvement committees throughout the institution. Specific departmental programs help assure cost-effective and appropriate use of high-risk or high-cost medications:

- *The High Impact Drug Monitoring Service.* The High Impact Drug Monitoring Service, implemented in 2005, continues to help manage the use of targeted biotech and high-cost drugs that significantly impact the costs of care and the institution's margin. Drugs managed by the service include: Recombinant Factor VIIa; Darbopoetin; Drotrecogin; Fenoldopam; Filgrastim; and Intravenous Immune Globulin.
- *The Antimicrobial Restriction Program (ARP).* This program, implemented in 1997 to help manage rising antimicrobial expenses and escalating microbial resistance rates, evaluates the use of targeted antimicrobials on a case-by-case basis. Four clinical pharmacists specifically monitor the use of restricted antimicrobial agents to ensure appropriate use and make interventions as necessary. The ARP continues to help maintain pharmaceutical costs and attenuate or reduce microbial resistance rates at

Clinical Pharmacists led or participated in development, revision and implementation of numerous drug use guidelines, including:

- Antifungal Guidelines
- Antimicrobial Use Guidelines (revised existing guidelines)
- Criteria for Use for IV Nafcillin
- Febrile Neutropenia Treatment Guidelines (revised existing guidelines)
- Guidelines for Factor VII Use in Adults
- Guidelines for Factor VII Use in Pediatric Patients
- Guidelines for Inhaled Ribavirin
- Guidelines for Octreotide Use in the Management of Bleeding Varices Admitted to Hepatology Service
- Guidelines for Use of 3% Saline for Mott
- IV Amiodarone Guidelines (revised existing guidelines)
- IVIG Guidelines (revised existing guidelines)
- Surgical Prophylaxis Guidelines

Other clinical initiatives, policies and procedures, and quality improvement projects undertaken by clinical pharmacists this year include the following:

- Piloted an order form for DVT prophylaxis on the general medicine units to improve DVT prophylaxis
- Collaborated with Phlebotomy to optimize blood draw time frames to improve work flow to allow for better laboratory information for clinical decision making
- Implemented the sepsis bundle in MICU to improve patient care with respect to laboratory ordering and antimicrobial prescribing.
- Helped develop and implement the hyperglycemia management protocol in the TICU. Currently evaluating the impact of the protocol in TICU.
- Participated in the Diabetes Mellitus Quality Improvement Initiative
- Implemented a Pill Splitting Program that has resulted in significant financial savings to the institution
- Establishing billing for pharmacist-provided clinical services in the ambulatory environment
- Developed and implemented a Diabetes Medication Algorithm for use at East Ann Arbor
- Developed and implemented a Hypertension Medication Algorithm for use at East Ann Arbor
- Developed and implemented a Hypertension Management Protocol.
- Developing an Insulin Titration Protocol for clinical pharmacists at the other health centers
- Developed and implemented of a protocol for adding cysteine in neonatal TPN's
- Developed protocol for using ethanol locks in patients with occluded central venous catheters (CVCs), and a protocol to measure the length of CVCs.
- Developed and implemented a process for the safe administration of inhaled ribavirin
- Participated in practice drills pertaining to pandemic influenza
- Assisted with formulary management of HIV-related medications
- Conducted a systematic review of the Antimicrobial Management Program
- Helped to develop and review OMP order sets
- Investigated/recommended process changes to address errors associated with obtaining of aminoglycoside and vancomycin levels
- Worked with the microbiology lab to select an automated antimicrobial susceptibility system (Vitek II).
- Developed and implemented a nicotine replacement therapy order form
- Standardized an alcohol withdrawal treatment protocol
- Developed a protocol for daily interruption of sedative infusions in the TBICU
- Updated the maximum dose list for continuous IV infusions in the adult ICU
- Implemented and assessed the impact of an insulin infusion protocol for patients undergoing cardiac surgery
- Reviewed and revised the CMV prophylaxis protocol for kidney transplant patients
- Assisted with review and revision of lung transplant protocols
- Assisted with review and revision of lung transplant patient education materials, staff education, and new transplant patient education
- Revised standardized drip charts and created new chart for the Holden NICU to facilitate elimination of Rule-of-Six
- Implemented standardized concentrations in the Holden NICU to eliminate the Rule-of-Six

Pharmacists as integral members of health care teams, actively participate in the development, implementation and enforcement of drug use guidelines, policies and procedures, help to ensure appropriate use of high-risk medications, and serve on quality improvement committees throughout the institution.

- Revised the pediatric electrolyte protocol
- Developed a CIN protocol
- Built and implemented of drug libraries for new smart pump syringe pumps
- Built and implemented new PCA/epidural pediatric pain libraries for new PCA smart pumps
- Converted OB anesthesia to a commercial labor epidural solution
- Implemented new epidural pumps in OB anesthesia
- Trained staff on use of new epidural pumps
- Standardized infusions in the Mott OR for consistency with the Holden NICU and Pediatric ICU
- Developed and implemented a radio contrast media policy for OR areas
- Developed an intrathecal drug administration policy for OR areas
- Standardized emergency drug supplies for the ICU's
- Developed a process to transfer topical hemostatic agents from the pharmacy inventory to Materials and Central Supply
- Developed new pediatric and adult postoperative nausea and vomiting algorithms
- Implemented pre-hospital care pain management protocols
- Developed nursing information sheets for intrathecal baclofen pumps
- Updated OR anesthesia drug trays
- Converted anesthesia to generic propofol and cisatracurium
- Implemented pharmacist documentation in the electronic medical record (Careweb)
- Developed a health-system Medication Administration Policy that governs who is authorized to administer medications
- Implemented a pilot project to evaluate the impact of a pharmacist in the discharge process
- Implemented an on-call clinical pharmacist process to support staff pharmacists
- Implemented an on-call clinical pharmacist to support the new palliative care teams

DUE Projects Completed In the Last Year

The following DUE projects were undertaken in FY 2006:

- Evaluation of Factor VII Use in Adults
- Evaluation of IVIG Use
- Outcome of a Multidisciplinary Intervention Aimed at Preventing the Concomitant Oral Administration of Fluoroquinolone or Tetracycline Antibiotics with Supplements Containing Polyvalent Cations
- Post-Operative Vancomycin Prophylaxis in Patients Undergoing Cardiothoracic Surgery
- Use of Antifungal Agents in Transplant Patients

Committee Participation

Clinical pharmacists served on the following hospital committees, work groups and task forces:

- Accreditation and Regulatory Readiness Council
- Anesthesia Quality Assurance Committee
- Anesthesia Technical Support Committee
- Antimicrobial Subcommittee (Secretary)
- Body Substance Exposure Task Force
- Cancer Pharmacy Committee
- Chemotherapy Content and Knowledge Subgroup (for Orders Management Project)
- Chemotherapy Content and Knowledge Subgroup Committee
- Committee of Pain and Sedation
- Contrast Media Reaction Committee

- CPR committee
- Critical Care Steering Committee
- Drug Diversion Committee
- DVT Risk Assessment and Prophylaxis Workgroup
- Emergency Medicine Bio-terrorism/Disaster Committee
- Falls Committee
- Geriatrics Center Clinical Advisory Committee
- Hematology Standard of Care group
- Heparin Orders Management Project
- Immunization Committee
- Inpatient Cardiology Quality Assurance Committee
- Inpatient Diabetes and Insulin Workgroup Committee
- Joint Practice for Critical Care
- Joint Practice for Critical Care/Surgery
- Kidney/Pancreas Transplant Operations Committee
- Lipid Therapy Guideline Committee
- Liver Transplant Policy Committee
- Medical ICU Multidisciplinary Committee
- Medication Administration Policy Development Committee (Chair)
- Medication Reconciliation Committee
- Medication Reconciliation Committee (Co-Chair)
- Medication Safety Committee
- Pain and Analgesia Sedation Committee
- Pediatric Anesthesiology Research Committee
- Pediatric Anesthesiology Technical Support Committee
- Pediatric Medication Safety Committee (Interim Co-Chair)
- Pediatric Nurse Network
- Pharmacy and Therapeutics Committee
- Pharmacy Intervention Team, Medication Reconciliation Project
- Product and Vendor Selection Committee
- Smoking Cessation Policy Committee
- Surgical ICU Multidisciplinary Clinical and Administrative Team
- Timed Blood Draws Lean Team
- Vincristine Sentinel Alert #37 Response Committee (Chair)
- Pharmacy also participated in the planning committee for the new pediatric hospital.

AMBULATORY PHARMACY SERVICES

Ambulatory Pharmacy Services encompass three separate outpatient pharmacies as well as two infusion pharmacies. The infusion pharmacies are located in the Cancer Center and the Canton Health Center. In addition to dispensing functions, the pharmacy staff supports many pharmaceutical care activities for the University of Michigan Hospitals and Health Services (UMHHS) ambulatory areas. All pharmacies provide the following services:

- Clinical review of prescription
- Physician consultation and drug information provision
- Patient consultation
- Reimbursement assistance



Art Poremba, RPh, MS
Ambulatory Pharmacy Services Manager

Outpatient Pharmacies

The Ambulatory Care Pharmacy and the Cancer Center Pharmacy are located on the main campus, adjacent to the University Hospital. A third pharmacy services our East Ann Arbor Health Center. The population served by these pharmacies include those patients receiving care from UMHHS, patients discharged from the hospital and/or our emergency department and employees. A customer satisfaction survey of employees, dependents and retirees was conducted by the University Staff Benefits Office for those individuals who utilized the Employee Prescription Plan. This survey reflected our dedication to patient services with the University of Michigan pharmacies ranked highest in terms of customer satisfaction.

Ambulatory staff provide consultative services to approximately 115 ambulatory sites related to compliance with medication management standards. Sites frequently contact pharmacy staff for assistance with new drug availability, reimbursement support and individual patient drug related support. Additional services include the training of site staff to complete self-review for accrediting agencies, annual on-site consultation visits, and tracking of compliance with monthly self inspections. The process of self-evaluation, with appropriate validation, has increased monthly site inspection compliance rates from 45% to 98%.

Ambulatory pharmacy representatives participate on several committees including:

- Ambulatory Formulary Committee
- Cancer Center Pharmacy Committee
- Cancer Center Clinical Operations Committee
- Cancer Center Operations Committee
- University of Michigan Pharmacy Benefits Committee
- Ambulatory Services JCAHO Readiness Committee

In addition to these activities, ambulatory pharmacy staff are involved in iCARE – the University of Michigan’s academic detailing program, as well as initiatives to improve the cost and quality of pharmacy services provided to university employees, dependents, and retirees with a prescription drug benefit carve-out.

Pharmacy Demographics and Services

Ambulatory Care Pharmacy	<ul style="list-style-type: none"> • Prescription volume = 280 / day • Utilizes ScriptPro automation • Discharge prescriptions account for 20% of volume • Compounding services provided-generally about 5 compounds per day • Generic dispense rate equals 60% which exceeds standards
Cancer Center Pharmacy	<ul style="list-style-type: none"> • Prescription volume = 110 / day • Supports a high volume of investigational drug protocols • Generic dispense rate equals 60% which exceeds standards
East Ann Arbor Pharmacy	<ul style="list-style-type: none"> • Prescription volume = 85 / day • Supports U of M speciality pharmacy program • Generic dispense rate equals 65% which exceeds standards
Cancer Center Infusion Pharmacy	<ul style="list-style-type: none"> • Supports 50 patient chairs/beds, representing 130-180 patients per day • Approximately 35,000 infusion procedures annually • Significant support provided for investigational drug protocols • Utilizes Phaseal technology to safeguard employees from chemotherapy exposure • Emphasis on patient safety by tracking compliance with independent pharmacist double checks of new orders entered. Results indicate 98-100% compliance • Pharmacists monitor patient laboratory results and recommend dose adjustments when appropriate • Provide nursing education for new medication
Canton Health Center Infusion Pharmacy	<ul style="list-style-type: none"> • Opened in June 2006 • Primary support is for oncology patients; however other infusion needs are also supported • Initial capacity is 6 chairs with expansion up to 10 chairs • On-site infusion pharmacy services

MEDICATION SAFETY

The Institute of Medicine's Report, *To Err is Human*, followed by the 2006 report, *Preventing Medication Errors*, highlights the advantages for having a dedicated individual who reviews each medication incident and helps to maintain the integrity of the database that is used to analyze and focus attention on important areas for improvement. The Medication Safety Coordinator for the department focuses his attention on a variety of activities. Working in close collaboration with the Risk Management Department, the coordinator reviewed nearly 2,400 reported medication incidents in the past fiscal year. Though most reports originate from the hospitals, medication incidents are reported from throughout medical system, including offsite locations such as our Brighton and East Ann Arbor locations. Pharmacy-related errors (approximately 15% of the total reports) precipitate a more exhaustive review. Whenever possible, the coordinator notifies those staff members involved with the incident and seeks their input as to system and personal changes that can be made to minimize the potential of a similar event in the future. This type of collaborative, non-punitive interchange of ideas has stimulated many changes, some of which include:



John Mitchell, Pharm.D.
Coordinator

- Implementation of PCA "smart pump" technology
- Revision and revision, as needed, of the hospital's intrathecal policy
- Numerous additions to our computerized dose-checking program
- Inclusion of standard indications for use on the MAR for those drugs which have a single use indication

Throughout the year, the Medication Safety Committee has worked closely with the hospital's computer team, which is charged with implementing computerized prescriber (CPOE) order entry before the end of 2006. Literature suggesting that CPOE potentially could inject new errors into the healthcare process made this collaborative effort a high priority to reduce that potential.

Medication Safety Committee (MedSafe)

The Medication Safety Committee is a multi-disciplinary group of clinicians who are dedicated toward improving the safe use of medications throughout our healthcare environment. The committee is represented by medical, pharmacy, and nursing staffs as well as members from Risk Management, Quality Improvement, and HomeMed (see membership list below). The committee, which meets monthly, is advisory in nature and reports directly to the hospital's Pharmacy and Therapeutics Committee. MedSafe engaged in a wide range of activities during the past fiscal year. Some of these include:



- Selectively reviewed a number of the 2391 medication safety incident reports submitted in the past 12 months.
- In compliance with JCAHO revisions, UMHS changed its list of unapproved abbreviations eliminating AU, AS, and AD.
- Conducted a thorough analysis of Ultravist contrast media reactions; advised P&T to allow continued use of Ultravist when it appeared that the number of serious adverse reactions trended downward with less Emergency Department visit requirements.

- Added a key member of the UM CareLink team to the committee to help coordinate medication safety efforts with those being considered for computerized order entry.
- Supported efforts during Pain Awareness Month by providing pens to staff imprinted with the statement “Medication Safety: 1 mg Dilaudid = 10 mg morphine”.
- Proposed several changes to the Patient Care Orders Policy as a result of an event that may have been precipitated by the use of homeopathic medication.
- Approved a list of standard PRN medications with single indications and requested Pharmacy to add those indications to the instruction line of the MAR.
- In response to a JCAHO sentinel event review, changed the process for dispensing vincristine from a syringe to a 25-mL IVPB (except in pediatric patients with fragile veins or who cannot cooperate during the slow IVPB infusion).

Primary Goals of the Medication Safety Committee

1. Reduce error rates for error-prone processes
2. Review and Analyze Adverse Drug Reactions
3. Review and Analyze Medication Errors
4. Conduct External Data Reviews
5. Promote and Conduct Staff Education
6. Enhance Medication Error Reporting
7. Cultivate a Non-punitive Environment

Interdepartmental Activities

Medication Safety belongs to every member of the healthcare team who comes into contact with our patients. Risk Management plays a large role in providing a content-rich database for all reported patient safety incidents, including medication safety reports. The medication safety coordinator meets with members of the risk management team and nursing on a regular basis to discuss both individual significant events and cumulative data that suggest trends requiring the attention of MedSafe. Patient Safety Rounds are conducted bi-weekly and headed by the Office of Clinical Affairs (OCA). These rounds provide an avenue for staff members to voice issues and concerns regarding systems that may subject a patient to errors. The medication safety coordinator is a permanent member of this rounding team.

Serious adverse events and sentinel events result in the activation of multi-disciplinary teams that investigate the facts surrounding the event, determine the root cause(s) of the event, and develop an action plan to minimize the likelihood of the event reoccurring. This team is launched after a review by OCA and usually includes physicians, pharmacists, nursing, risk management, and quality improvement. Other disciplines may be included as the event warrants.

Quarterly reports are developed for the Continuous Quality Improvement Program Lead Team in consultation with quality improvement, risk management, pharmacy, and nursing.

DRUG INFORMATION AND INVESTIGATION DRUG SERVICES

Drug Information Service

The Drug Information Service provides pharmaceutical, pharmacological, and therapeutic information to the University of Michigan Hospitals and Health System and to health practitioners in the local area. In FY06, the Service handled approximately 2500 questions for health care providers. In addition to providing drug information for patient care, the Service manages all drug shortages that require conversion to an alternative therapy or allocation of existing stock. Other responsibilities of the Drug Information Service include handling of product defects, drug recalls, review and approval of requests for preprinted orders, and participation in the development of clinical guidelines as requested. In FY06 the Service was active with the development of order forms to improve patient safety and prescribing of several agents (enoxaparin, IVIG, heparin).



Gundy Sweet, Pharm.D.
Coordinator, Drug Information
and Investigational Drug Services

The staff of the Drug Information Service support the functions of the UMHC Pharmacy and Therapeutics (P&T) Committee and several of its subcommittees. In this capacity, they are responsible for conducting a

thorough review of all published information related to safety and efficacy of new drugs, and to recommend the addition or deletion of products from the formulary, to recommend and implement therapeutic conversion programs, and to approve policies related to drug use. The P&T Committee is supported through several subcommittees including the Ambulatory Formulary Committee, Antimicrobial Subcommittee, Cancer Pharmacy Committee, Drug Use Evaluation Committee, Medication Safety Committee, and the Product and Vendor Selection Committee. Some of the key accomplishments of the Committee in FY06, either directly or through the subcommittees, include:

- Reviewed 20 new pharmaceutical agents and over 120 medication line item extensions
- Implemented and/or modified restriction criteria for several agents due to safety concerns, including new criteria for factor VII use in adult and pediatric patients
- Updated membership on the P&T Committee to increase nursing representation, including representatives from Mott and UH inpatient units
- Proposed and approved the Glycemic Management Subcommittee as an official subcommittee of P&T
- Approved nursing driven policies including the vaccination program and the nicotine replacement protocol
- Approved the Medication Administration Policy, a document that identifies who is authorized to administer medications
- Approved guidelines for appropriate use of antifungal agents
- Developed and/or revised several order forms to enhance patient safety and improve prescribing for restricted agents
- Worked with the Orders Management Project for clinical and policy-related decisions in the development of CPOE
- Implemented therapeutic interchange programs for generic Vicodin, tiotropium/ipratropium, and albuterol/levalbuterol.
- Developed and posted preprinted order sets for several chemotherapy and investigational drug protocols to improve medication safety
- Revised antiemetic guidelines based on new NCCN recommendations

The Ambulatory Formulary Committee is a multidisciplinary group with representation from several physician leaders, pharmacy services, M-CARE (the University's managed care branch), and the pharmacy benefits program. The goal of this committee is to determine an educational drug list for preferred agents that provide good clinical care at reasonable costs. Academic detailing of pharmacy specific information is used to help direct ambulatory prescribing to the preferred agents. Accomplishments of this group in FY06 include:

- Approval of funding to increase support (1 FTE of pharmacist) for Academic Detailing and predicted switch programs over the next 12-24 months
- Approved a proposal for eight specialty drug categories in rheumatology and neurology to only be available through a limited pharmacy network, providing savings to patients, payers and the institution
- Switched the University's PBM to Catalyst RX
- Distributed 15 targeted email communications (FGP-Grams) to medical staff about timely drug-related topics

Drug Information

- Handled 2,500 calls in the past year
- Reviewed 20 new pharmaceutical agents and over 120 medication line item extensions

Investigation Drug Service

- Handled over 275 active drug protocols
- Renovated the dispensing area to incorporate carousel technology

Health care staff are kept informed of Pharmacy and Therapeutics Committee decisions and new information regarding medications by means of the monthly, web-based [Pharmacy ForUM Newsletter](#).

Investigational Drug Service

The Investigational Drug Service (IDS) is a medical-school-mandated service for research protocols involving human subjects that involve the use of medications not yet approved by the FDA. In addition, the Service handles multiple other protocols involving commercially available drug. The goal of the IDS is to ensure that investigational drug studies and other drug-related research at the UMHC are conducted in compliance with the requirements of the FDA, study sponsors, Michigan State Board of Pharmacy Regulations, and JCAHO. The IDS handled over 275 active drug protocols in FY06, with approximately 45% being done in oncology, and the balance in non-oncology studies. IDS staff work with investigators to improve study design and ensure feasibility of the study, establish randomization procedures, and monitor progress of the study through completion.

Major accomplishments for FY06 include further implementation of the new IDS computer system, WebIDS, for billing of satellite dispensings. A workload and budget analysis revealed a significant increase in activity in studies conducted in the Cancer Center. Additional FTEs (1 FTE technician and 0.6 FTE pharmacist) were approved to support this growth. The physical space of the IDS is currently being renovated to better accommodate its growth and to improve efficiencies.

Committees

Committee	Responsibilities
Ambulatory Formulary Committee	Charged with developing an ambulatory formulary and impacting physician prescribing in the ambulatory environment to reduce ambulatory pharmaceutical expenditures while maintaining optimal clinical care
Antimicrobial Subcommittee	Advises P&T Committee on issues related to antimicrobials
Cancer Pharmacy Committee	Advises P&T on issues related to cancer therapy

Drug Use Evaluation Committee	Reviews drug use within the institution in order to ensure compliance with criteria, and improve medication safety and fiscal accountability
Glycemic Management Subcommittee	Advise the P&T Committee on issues related to glycemic control for inpatients, including standardization of product selection, standardization of protocols, and transition of patients across environments.
MedSafe Committee	Reviews the medication use process to improve medication safety
Pharmacy and Therapeutics Committee	Charged with ensuring safe and effective drug use within the institution. Its activities are supported by several subcommittees
Product and Vendor Selection Committee	Reviews market changes in formulary products (new formulations, generics or pricing) to continually enhance formulary effectiveness

RESEARCH AND EDUCATION

Part of the mission of the Department of Pharmacy Sciences is to share knowledge with our peers and one way that this is accomplished is by conducting research and publishing these results in peer reviewed journals. We maintain our reputation of excellence by showing leadership in scholarly activity.



Bruce Mueller, Pharm.D.
Professor and Department Chair
College of Pharmacy

Research

The Department's research covers a wide range of inpatient and outpatient drug and disease state management, pharmacokinetics, and pharmacogenomics. In addition to conducting research itself, we mentor future researchers through our work with residents, pharmacy students and fellows.

Pharmacy Residency Class 2005-2006	
Specialty	Pharmacy Practice
Greg Eschenauer (Infectious Diseases) Aline Saad (Heme/Onc) Rima Mohammad (Critical Care) Regine Caruthers (Pediatrics) Seth Kuiper (Informatics and Technology)	Dina Mohammad Ian Hollis Yaman Kaakeh
Pharmacy Residency Class 2006-2007	
Specialty	Pharmacy Practice
Dorothy Surowiec (Infectious Diseases) Peter Schlickman (Heme/Onc) P. Neil L. Edillo (Informatics and Technology) Dina Mohammad (Critical Care)	Jennifer L. Ludwig: James T. Miller Kristen T. Reaume Valerie A. Sanluis Shawna L. Van De Koppel

Additionally, there were approximately 120 student investigations projects last year within the College of Pharmacy.

Grants

The Department of Clinical Sciences' Faculty have contributed a total of \$568,892 through their grantsmanship efforts in fiscal year 2006.

Funded Fiscal Year, 2006

INVESTIGATOR	PI	SPONSOR	TITLE	DIRECT	INDIRECT	TOTAL AWARD	CURRENT PERIOD END
Alaniz	Alaniz	Amgen	A Multicenter, Retrospective, Observational Study to Evaluate Erythropoietic Stimulating Protein (ESP) Use and Clinical Outcomes in Hospitalized Patients (ASSESS)	\$23,965	\$5,991	\$29,956	8/23/2008
Bleske	Bleske	NIH	Mechanisms of Hawthorn's Action in Heart Failure	\$125,000	\$52,728	\$177,728	7/31/2006
DePestel	DePestel	WESTAT	CUBICIN Outcomes Registry and Experience (CORE) for the Treatment of Serious Gram-Positive Infections	\$10,811	\$1,189	\$12,000	12/31/2005
DePestel	DePestel	Cubist	CUBICIN Outcomes Registry and Experience (COREsm) Sub-study for Patients Reported with Osteomyelitis	\$1,622	\$178	\$1,800	10/31/2006
DePestel	Mueller	Merck	Invanz™ Clearance in Continuous Renal Replacement Therapy (CRRT) An In-Vitro Investigation	\$43,666	\$8,733	\$52,399	10/31/2006
Mueller	Mueller	Theravance	Pharmacokinetics of Telavancin During Continuous Renal Replacement Therapy (CRRT): An In-vitro Investigation	\$35,132	\$20,377	\$55,509	6/30/2006
Mueller	Mueller	Merck	Invanz™ Clearance in Continuous Renal Replacement Therapy (CRRT) An In-Vitro Investigation	\$43,666	\$8,733	\$52,399	10/31/2006

Mueller	Mueller	Amgen	Pharmacotherapy and Renal Disease	\$4,505	\$495	\$5,000	8/31/2006
Mueller	Mueller	Cubist	Pharmacotherapy and Renal Disease	\$4,505	\$495	\$5,000	8/31/2006
Streetman, Dan	Streetman, Dan	NIH	P-glycoprotein and Steroid-Resistant Nephrotic Syndrome	\$150,000	\$79,500	\$229,500	8/31/2006
Welage	Med School	NIH	K30 Drug Development Grant	\$0	\$0	\$0	5/31/2007
Welage	Streetman, Dan	NIH	P-glycoprotein and Steroid-Resistant Nephrotic Syndrome	\$150,000	\$79,500	\$229,500	8/31/2006
TOTAL				\$399,206	\$169,686	\$568,892	

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Awards and Highlights

ACCP member **Dr. Rosemary L. Berardi, Pharm.D., FCCP, FASHP** was selected by the College's Awards Committee to receive the association's prestigious 2005 Education Award. The award was presented in San Francisco on Sunday, October 23, during the Opening General Session of the College's Annual Meeting.

Dr. Imad Btaiche has become a member of the Editorial Board of "Nutrition in Clinical Practice", a scientific publication of the American Society for Parenteral and Enteral Nutrition.

Dr. Regine Caruthers was hired by the UM Pharmacy Department as a clinical pharmacist

Dr. Hae Mi Choe is the recipient of the College of Pharmacy's 2006 Teaching Excellence Award.

Dr. Daryl DePestel is the American College of Clinical Pharmacy's new Chair Elect of the ID-PRN for 2005-2006.

Dr. Vicki Ellingrod joins the UM College of Pharmacy Department of Clinical Sciences from the University of Iowa. She is joining the College's Clinical Pharmacogenomics Laboratory.

Dr. Cary Johnson has been named as a Fellow of the American Society of Health-System Pharmacists.

The Executive Committee and Board of Regents endorsed the promotion of **Dr. Ujjaini Khanderia** to Clinical Associate Professor without tenure effective September 1, 2006.

Dr. Jace Nielsen has successfully completed a two-year fellowship in critical care under the mentorship of Dr. Lynda Welage.

Dr. Nadine Shehab left the institution on August 2006 to accept a Fellowship with the Centers for Disease Control in Atlanta, Georgia.

Dr. Aline Saad was hired by the UM Pharmacy Department as a clinical pharmacist (oncology)

Dr. Petrea Cober was hired by the UM Pharmacy Department as a clinical pharmacist (pediatrics)

Dr. Michael Dorsch was hired by the UM Pharmacy Department as a clinical pharmacist (cardiology)

Dr. Linda Stuckey was hired by the UM Pharmacy Department as a clinical pharmacist (transplant)

Dr. Denise Markstrom was hired by the UM Pharmacy Department as a clinical pharmacist (hematology oncology)

Dr. Jerod Nagel was hired by the UM Pharmacy Department as a clinical pharmacist (infectious disease)

Dr. Melissa Pleva was hired by the UM Pharmacy Department as a clinical pharmacist (critical care)

Dr. Helen Tamer has been appointed as a regular member of and Vice-Chair to Board CI as an affiliated non-physician scientist for IRBMED for the term of April 15, 2006 through March 31, 2009. Congratulations Helen!

Dr. Mei Tang accepted a critical care fellowship under the mentorship of Dr. Lynda Welage.

Dr. Trisha Wells accepted a Clinical Assistant Professor position with the College of Pharmacy. Her area of clinical practice is at the Brighton Health Clinic.

Department of Clinical Sciences' Faculty were invited to present this past year a total of **34** international or national research presentations, a total of **77** invited international or national presentations, a total of **35** invited state presentations and a total of **41** invited local presentations.

HOMEMED

HomeMed operates as a business unit where commodity procurement, receiving, insurance verification, claims processing and cash application operation activities are all completed within the pharmacy located at 2850 S. Industrial Hwy., which is approximately 2 miles south of the main medical campus. A positive net margin is consistently generated in the area and this contributes to the health system margin target and support of non-revenue generating activities. Clinically, patient care, quality and process improvement programs are integrated into the health systems institutional plan and contribute to maintaining the institution's tradition of leadership in healthcare



Christopher Maksym, Pharm.D.
Director, HCS

Service Description and Background

HomeMed is a licensed pharmacy and home infusion provider responsible for providing a wide range of products and services to safely and effectively facilitate care to UMHS patients in the convenience and comfort of their home. Since 1989, HomeMed has been providing infusion medications, nutritional therapy, specialty drugs, high-tech infusion nursing and care management services throughout Michigan and Northern Ohio. An interdisciplinary team consisting of pharmacists, nurses and dietitians along with technical, administrative and support staff totaling 101 FTEs provide pharmacy compounding, equipment management, dispensing, delivery and care management services to ensure that patient home regimens are safe and effective throughout the course of therapy. Staff have direct access to up-to-date and complete medical and patient drug information which facilitates effective and efficient collaboration with physicians and other caregivers within the health system. In order to ensure a smooth transition to home care, HomeMed has a hospital-based training and education team; this team consists of nurses and dietitians who work with patients and the referring health care team to ensure that home care needs are identified prior to hospital discharge and infusion nurses who provide care for the patient in the home.

Although HomeMed resides within the Home Care Service division in the Hospital and Health Centers corporate structure an administrative relationship exists between HomeMed and the Department of Pharmacy Services. Thus many administrative, pharmacy practice and educational activities are collaborative and integrated. There is HomeMed representation on several Department of Pharmacy and Health System committees. Additionally, most HomeMed clinicians and leaders hold academic appointments within the University reflecting the commitment to teaching, experiential training and research.

2006 Year in Review

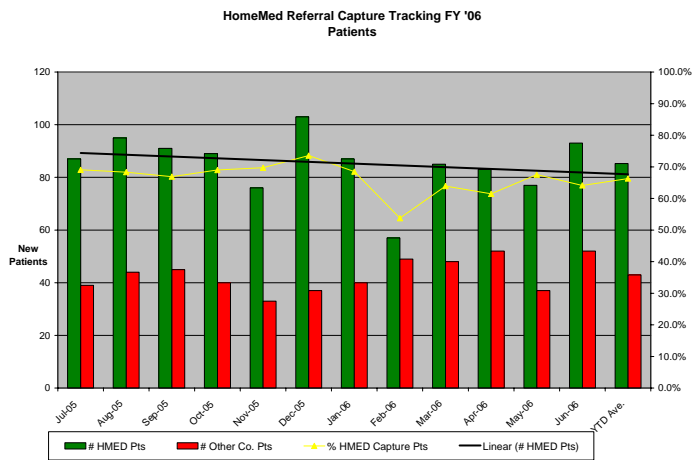
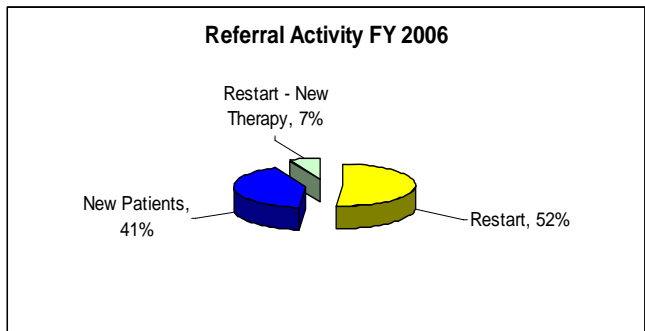
Referral Activity

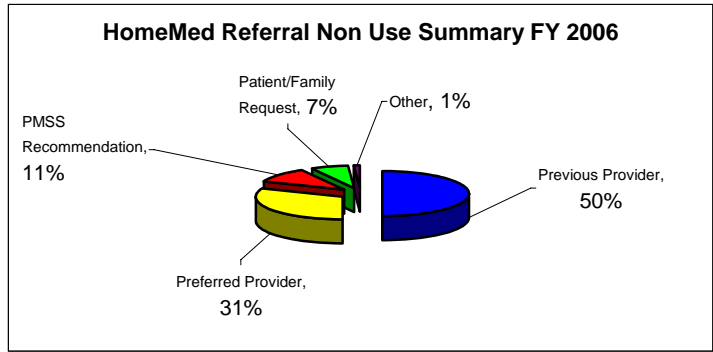
An average census of 1,171 patients was maintained by processing 1,983 (41%) new patient therapy referrals and 2,984 (59%) existing patient therapy or existing patient new therapy referrals.

HomeMed referrals are obtained exclusively from UMHS where on average 66.3% of patient referrals (an average 65.3% of therapies) processed by Discharge Planning were referred to HomeMed opposed to other home infusion providers.

The majority (63%) of home infusion therapy referrals originate from inpatient hospital discharges. Thirty-three percent of HomeMed referrals come from ambulatory care areas with the Cancer Center being the predominant origin of referrals in this category. The remaining four percent of referrals originate in either the emergency department, primary care sites or in the home where typically a previous patient is restarted on a therapy previously administered in the home.

Of patients not referred to HomeMed, the majority (81%) were not serviced by HomeMed due to previous provider relationship and preferred provider payor agreements as assessed by the discharge planning clinician. Additionally, the benefit change to Medicare Part D necessitated transfer of many existing “dual-eligible” Medicaid/Medicare patients from HomeMed to another participating provider.





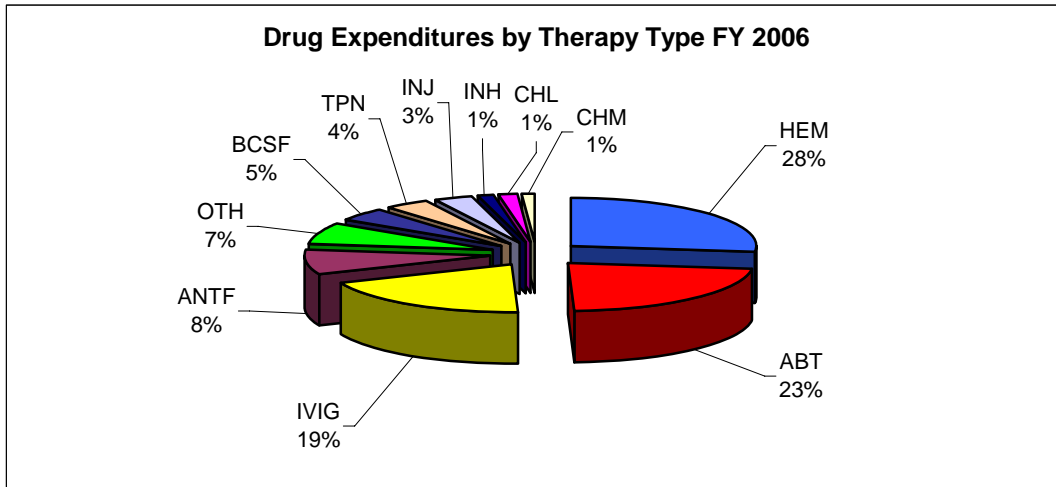
Pharmacy Operation Activity

Selected metrics are presented in the table below and illustrates a decrease in activity and this correlates with the decrease in revenue realized.

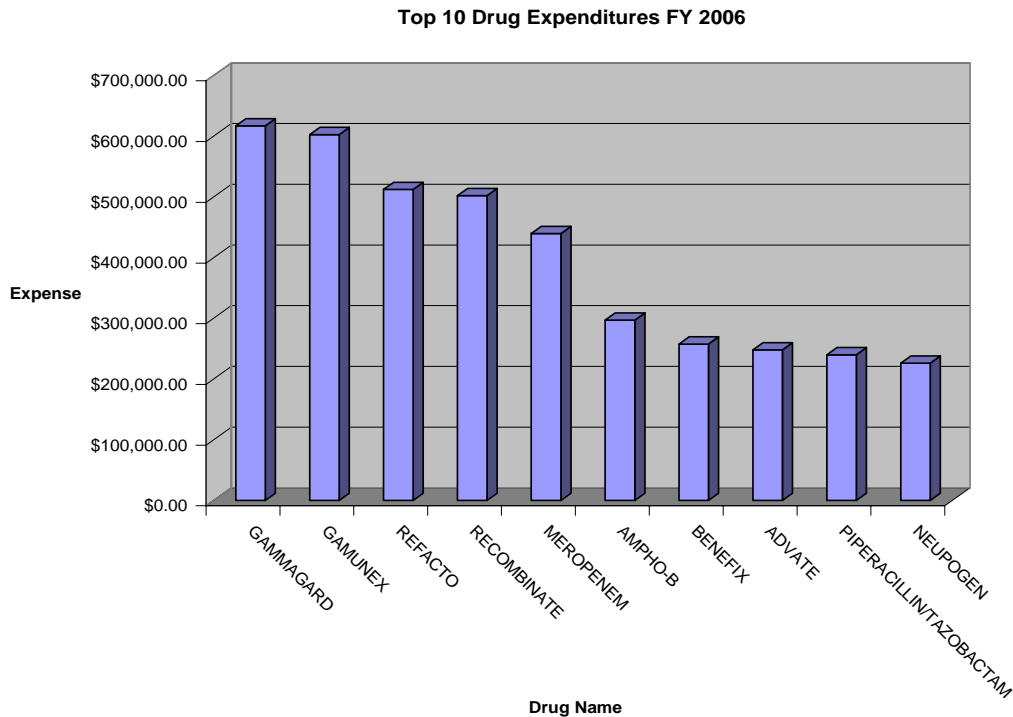
	FY '06 Total	Monthly Average FY '06	FY '06 % Change - Vs- FY '05
Total Orders Processed	26,904	2242	-2.8%
Total Prescriptions Filled	43,703	3642	1.7%
Total Units Admixed by Therapy	89,143	7,429	-19.17%
New Therapy Starts	4,281	357	-4.1
Total Infusion Days	315,733	26,311	-5.3%
HomeMed Deliveries	13,858	1,155	-4.3%
Sub Contracted-HomeMed Deliveries	10,141	845	2%
Total Deliveries	24,004	2000	-1.7%
Percent HomeMed Deliveries	57.73		

Drug Spend and Inventory Management

The HomeMed drugs spend was \$6.4 million and this represented approximately 35.41% of the total operating expense. Five therapies (i.e., anti-hemophilia factor, antibiotics, intravenous immunoglobulin, anti-fungal agents and blood component stimulating factors) comprise 83% of the annual drug expense as illustrated below.



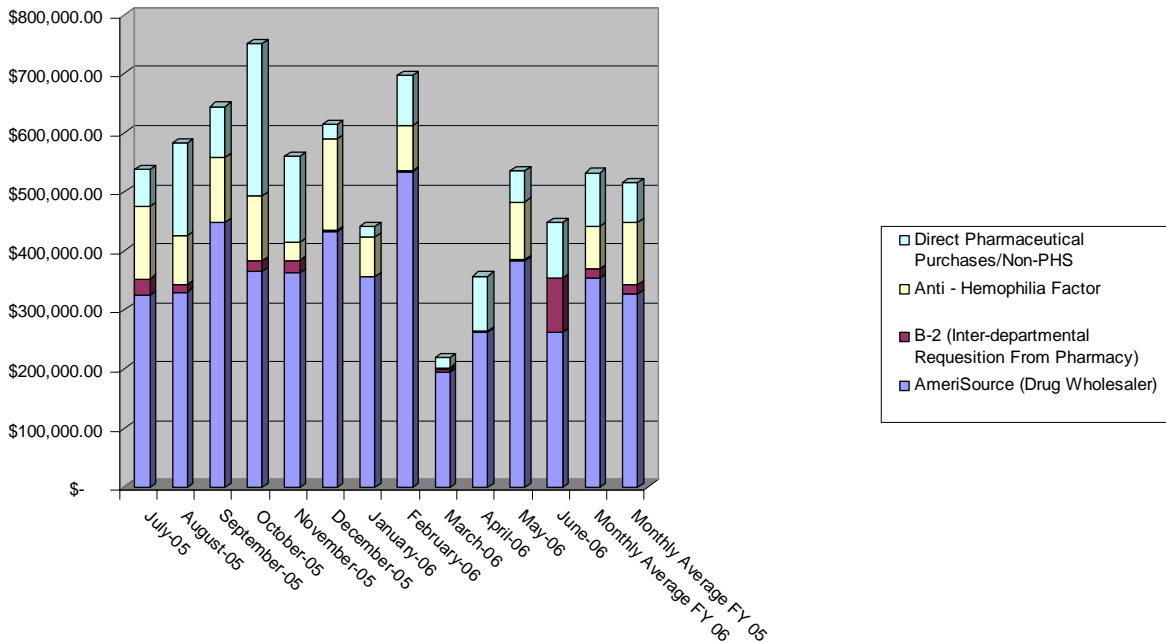
Ten pharmaceuticals comprise 36% of the total drug spend as illustrated graphically.



HomeMed purchases the majority (66.6%) of its pharmaceuticals from the institution's primary drug wholesale company, AmerisourceBergen. A very small amount (2.9%) is procured from the

department of pharmacy with the remaining drugs obtained directly from the manufacturer or secondary wholesaler (primarily biologics on backorder).

FY 06 Monthly Pharmaceutical Purchases



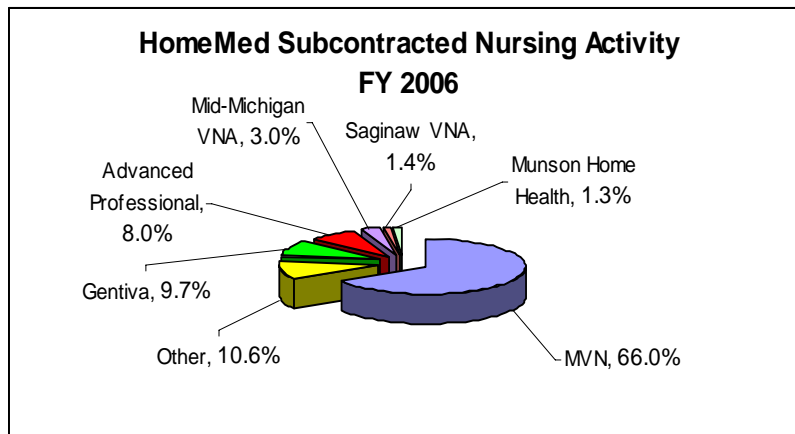
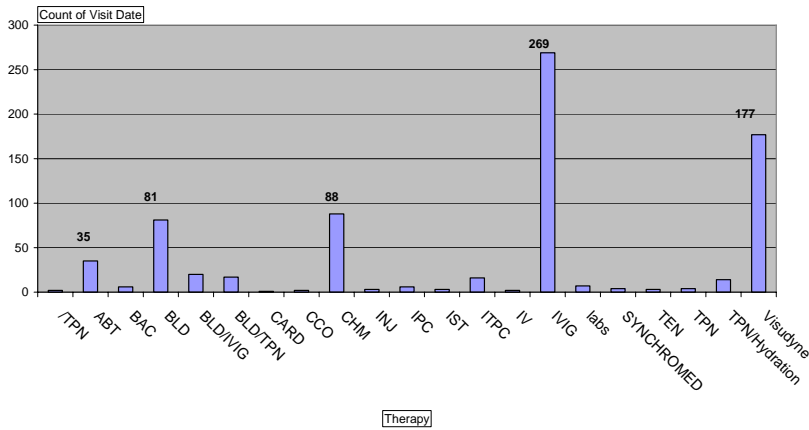
The annual physical inventory was completed on June 10, 2006 and revealed an inventory value of \$725,205. This computes to an annual inventory turn rate of 12.17 turns which is very favorable considering the ongoing problems with product outages and back orders at the both the wholesaler and manufacturer levels.

Home Infusion Nursing Activity

A total of 5,599 in-home infusion nursing visits were made by HomeMed infusion nurses (13.6% or 760) and subcontracted nursing agencies (86.4% or 4,839) to fulfill payor-contract requirements. HomeMed infusion nursing activity is typically associated with more complex visits (e.g., IVIG administration, Synchroned Pump refills, and chemotherapy) and visits where other agencies do not have available nurses to provide services at the time needed.

Note that these totals do not include other agency visits which were not sub-contracted wherein the home health agency billed the payor directly. Michigan Visiting Nurses (Michigan Health Corporation) is the predominant provider of in home nursing services to HomeMed patients as illustrated in the following chart.

**HomeMed Home Infusion Nursing Activity FY 2006
(Visits by Therapy Type)**



Selected Accomplishments

- Development and implementation of the 340B Purchasing Program for pharmaceuticals exclusive of anti-hemophilia products
- TIE (**T**ransmission of **I**nformation **E**lectronically) Steering Committee formalized with staff and structure to contain and coordinate e-projects within and among the 3 service lines for HCS.
- Launch of web-based referral system for ambulatory clinics (HCS Transitions web page) to initiate referrals to HomeMed
- Development and implementation of delivery signature capture process with a 98.5% capture rate
- Implementation of vehicle tracking system for all HomeMed vehicles
- Development and implementation of new pump tracking process pathways with demonstrated increase in compliance

- Development of a First Dose (in the home) for IVIG Therapy
- Development of a Peripheral Nerve Pain Therapy Program

Academic and Professional Activities

HomeMed continues to contribute to the education of Health Science students. There were 14 student placements at HomeMed (i.e., 6 Pharmacy, 8 Dietetics) in FY '06 and 2 staff members presented one or more lectures in the College of Pharmacy and School of Nursing. Two pharmacy interns were employed at the pharmacy and there were four active Doctor of Pharmacy student research projects precepted by HomeMed staff.

Professional staff made presentations at the local, regional and national level. Two staff members serve as professional association board of directors at the national level and four staff members serve on various national professional association committees.

HomeMed Leadership

Mangers

Michelle Barnett – Reimbursement
Debbie Kovacevich – Infusion Nursing
Tricia Sirois – Infusion Pharmacy

Supervisors

Terrilyn Cook – Medical Records, Office, Facilities
Lisa Klein – Pharmacy Technicians
Eric Korte – Inventory, Warehouse & Shipping
Mary Mancinelli – Billing & Collections

Goals for Fiscal Year 2007

- ❖ Achieve Budget Margin Target of \$2,442,111 (12.0%)
- ❖ Update Process Mapping of primary operations pathways
- ❖ Identify CHIP Replacement Software & Initiate Conversion Plan
- ❖ Negotiate Favorable BCBSM HIT Contract
- ❖ Achieve JCAHO Unannounced Survey Readiness
- ❖ Implement New Business Model inclusive of Medicare Part D participation
- ❖ Realize benefits of TIE, HCS Web Page and IT initiatives

COMPUTERIZATION AND AUTOMATION

The Department of Pharmacy utilizes and supports computer and automated systems in a number of areas. The Medical Center Information Technology (MCIT) Pharmacy team is responsible for supporting a number of these systems. The department has also utilized its own technical expertise in developing and supporting systems such as PharmDoc, WebIDS and the Pharmacy external and internal web pages.

MCIT Pharmacy team

The MCIT Pharmacy team is a group within MCIT assigned solely to the support of technology in Pharmacy. This includes support of major pharmacy applications, Pharmacy automated dispensing systems, and other technical responsibilities such as ad hoc report production and desktop support. The team is located in the B2 Pharmacy administrative office area. The group provides Pharmacy systems support 24 hours per day, 7 days per week, 365 days per year. The team responds to an average of 90 MCIT help desk calls per month.



In addition to implementation and support activities, the MCIT Pharmacy team is actively involved in the education of pharmacy informatics professionals through the PGY2 Pharmacy Informatics program and precepting students on rotation from the College of Pharmacy.

Major Pharmacy systems

- WORx – Inpatient Pharmacy system used to support Pharmacy dispensing, clinical and billing activities.
- QS/1 – Outpatient Pharmacy System used to support pharmacy dispensing, clinical and billing activities in the East Ann Arbor, Ambulatory Care and CGC outpatient pharmacies.
- QS/1 – Outpatient Pharmacy Point of Sale system used in all outpatient pharmacies
- Ateb IVR phone refill system used in the Ambulatory Care Pharmacy
- Omnicell – Approximately 100 automated dispensing cabinets utilized throughout the Medical Center inpatient and outpatient locations.
- SecureMed – Narcotic Vault management system
- ECHO – Amerisource/Bergen purchasing system
- PharmDoc.Net – Clinical pharmacy management system
- WebIDS – Investigational Drug Service management system

Pharmacy automated dispensing systems

- **Omnicell** – dispensing system used to secure and manage medication inventory



- **McKesson RxOBOT**
 - UH inpatients only
 - Fills on average 450 drawers/day
 - 4000 - 4500 pics/day
 - 798 line items



- **ScriptPro**
 - Used in Ambulatory Care Pharmacy (ACP)
 - Fills approximately 40-45% of ACP prescriptions
 - Contains 178 Line items



Fiscal Year 2006 Activities

There was a great deal of activity in computerization and automation in the Department over the past year. This work included the following projects:

- **WORx in patient Pharmacy system**
 - Performed WORx 2.8 application upgrade in November 2005
 - Supported implementation of a new CareWeb/WORx allergy interface including following up problem resolution
 -
- **QS/1, outpatient pharmacy system**
 - Performed QS/1 Version 18.1.12 Upgrade (Medicare Prescription Drug Program)
 - Performed Outpatient Pharmacies Workflow Implementation Project
 - Performed QS/1 Version 18.1.14 Upgrade Implementation
 - Performed QS/1 Version 18.1.16 Upgrade Implementation
- **Omnicell Pharmacy Central (OPC) Inventory system**

Supported system implementation in May of 2006

- **MedexPharmguard**

Supported the install and deployment of the syringe pump project.

- **Hospira MedNet Wireless PCA pump project**

Supported the install and deployment of the Hospira MedNet system.

- **Workload system development**

- Completed development of this system including additional time standard metric tables in Informix, workload analysis reports and graphs.
- Presented a poster presentation on the Workload system at the annual Mediware Pharmacy User Group meeting in April 2006.
-

- **Omnicell:**

- Deployed 26 new cabinets
- Upgraded server and all cabinets to Omnicell 10000 version of software.
- Installed a new PPC – OmniGate server.
- Installed Safety Stock hardware on all cabinets.
- Assisted in the implementation of RxAuditor
- Moved XPC and OmniGate server to TC Machine room
- Beta site for Omnicell 10.0 and 10.1 Beta program

Key Automation projects planned for 2007

Computerization and automation efforts in the Department of Pharmacy continue this year with the following active major projects:

- IDS Pharmacy inventory management system
- OMP (Orders Management Project)
- WORx, inpatient Pharmacy system, upgrade
- Omnicell system Beta partner

CONTINUOUS QUALITY IMPROVEMENT

Quality Improvement and Regulatory Compliance Committee

The Department of Pharmacy Services Continuous Quality Improvement Program revolves around the departmental mission for, excellence in patient care, education, and research. The committee's specific intent is to ensure the continuous competency of all staff as they render their respective assigned duties, and a full departmental compliance of practices and processes with all the safety and regulatory rules and regulations set by the respective agencies and professional organizations. It is composed of the two co-chairs, for staff competency assessment, and for regulatory compliance, in addition to the medication safety coordinator, and the manager of ambulatory care. It is supported by a full time staff coordinator and led by a senior pharmacy manager.



Nabil Khalidi, Pharm.D.
Associate Director

Primary Activities of the Quality Improvement and Regulatory Compliance Committee

Staff Competency

- Conducted an annual educational blitz in March. Compliance with this competency testing this past year has been at 100%.
- Utilized M- Learning, the computerized administration, correction, collation, and reporting this data to respective staff members, and provided aggregate data to both the department and the institution.
- Replaced the bacterial surveillance program for intravenous product with the media fill testing for all designated staff as required by USP 797 on Pharmaceutical Compounding – Sterile Preparations.

Regulatory Activities

- Extensive planning took place to meet JCR recommendations for compliance with the medication management standards and the medication-related National Patient Safety Goals (for 2006 and 2007).
- Accreditation applications were submitted to ASHP for our specialty residencies in Infectious Diseases, Oncology, Informatics, Critical Care, and Pediatrics. Applications were accepted, and the accreditation site visit will be scheduled sometime next fiscal year.
- Centers for Medicare and Medicaid Services (CMS) made a visit to follow-up with concerns raised during a JCAHO validation survey conducted in February 2006. A corrective action plan was submitted and awaits final approval by CMS. Four other CMS visits in FY 2006 were related to unsubstantiated patient complaints. Issues raised with the pharmacy were related to dating of multi-dose medication vials, and corrective action has taken place, including revision of our multi-dose product and vial policy.
- Site visits by MIOSHA related to employee safety complaints in various hospital areas have had all citations resolved.
- Conducted surveys of all new employees of their training/orientation experience. 35 surveys were returned in 2006, with an improved rating over 2005 noted for helpfulness of staff (4.23 vs. 3.75), pharmacist on-the-job training (3.77 vs. 3.33) and technician on-the-job training (3.94 vs. 3.73). The 2005 survey consisted of five questions, and three more questions were added in 2006, which will be benchmarked next year.

Additional Tasks:

- Departmental QI plan updated (annually)
- Planning and implementation of the patient reconciliation process compliant with the patient safety goals continues
- Participation in hospital-wide surveys and audits of medication storage areas
- Conduction of Periodic inpatient and outpatient pharmacies surveys and audits
- E-mail communications to staff and management on compliance issues
- Preparation and dissemination of reports as requested
- Policy and procedures review and coordination – three policies and procedures were revised: Multi-Dose Vials and Products (PP 158.00), Non-Formulary Drug Use (PP 121.12) and Medications at the Bedside (PP 135.00). New policies drafted and implemented include:
 - Medication Administration Policy implemented (UMHHC 62-02-003)
 - Compounding Sterile Intravenous Admixtures Policy (PP 150.00) – implemented procedures in pharmacy IV preparation areas that are compliant with USP 797, until the clean room is constructed in the B2 pharmacy
 - Use of Pharmacy Facilities After Hours Policy (PP 119.02)
 - 340B Purchasing Program Policy (PP 203.00)
 - Medication Error Review Policy (PP 327.10)
 - A Disaster and Emergency Preparedness Policy section in the pharmacy policy website was created, which includes addition of atropine injection preparation procedure and disease management protocols for anthrax, botulism, plague, smallpox, and tularemia.
- The structure of the QI and regulatory committee was revised to add two new operational managers/decision makers, and planning to assess outcome in the following areas:
- Omnicell System:
 - Rate and reasons for overrides
 - Controlled substances discrepancies within pharmacy
 - Expired medication removal: implementation of the expiration date function in Omnicell. This pilot is to be implemented in August 2006, and will be evaluated in Omnicells scheduled for survey later this year.
- Employee turn over and reasons
- Medication errors trending and clinical alerts and follow-up as documented in PharmDoc
- Enforcement of inventory control measures – to reduce inventory on hand and increase turn over
- Chemotherapy double checks and accuracy will continue to be measured and remains stable
- Inspection rate of medication storage areas in Omnicells and outpatient clinics will continue to be measured
- Ambulatory pharmacy measures including waiting time.

PURCHASING, INVENTORY MANAGEMENT, AND DISTRIBUTION

The Department of Pharmacy Services provides oversight and direction of the pharmaceutical purchasing process for the Health System as well management of the drug inventory and clinic drug requisition distribution program.

Pharmaceutical Purchasing

In FY06, the Department of Pharmacy Services experienced a 25% increase in total pharmaceutical purchases compared to FY 2005. Pharmaceutical purchases for the year totalled \$92,000,000.

\$51,000,000 spanning approximately 2400 line items was purchased by the hospitals and affiliated clinics and \$41,000,000 of product was procured to support our ambulatory pharmacy and infusion operations. These purchases were made utilizing University and Federal Public Health Service (PHS) contracts that are administered by a contracted pharmaceutical prime vendor supplier.



Larry Ligeski, RPh
Coordinator

The Department of Pharmacy Services purchased \$92,000,000 of pharmaceutical products to support the needs of the Health System.

Some of the purchasing challenges that were experienced in FY 2006 include:

- Brand product price increases in excess of CPI
- Negotiation of specialty distribution contracts for new products
- IV immune serum globulin and albumin product supply allocations.
- Ongoing IV antibiotic product extended backorders and product shortages

Significant cost saving initiatives implemented in FY 2006:

- Continued conversion to various generic products due to patent expirations
- New pharmaceutical bid awards realized lower pricing on multi – source injectable products.
- Continued success in the negotiation of “inpatient PHS pricing” from various pharmaceutical manufacturers for product used in the inpatient areas.

Inventory Management

The Department of Pharmacy Services continued to focus on controlling pharmacy inventory costs in FY 2006 as well as improving work processes that would minimize errors in shelving and pulling product. Brand pharmaceutical product price increases, continued product shortages and the ongoing introduction of new pharmaceutical products contributed to a 15% increase in the value of the inpatient inventory. Brand pharmaceutical cost increases, the introduction of new oncology products as well as the expansion of ambulatory infusion services resulted in a 32% increase in the value of the ambulatory pharmacy inventory at the end of FY 2006. Annual Department inventory turns calculated for activity



Staff members supporting the purchasing, inventory and distribution services

in all areas remained at 13.

Inventory cost reductions initiatives implemented in FY 2006 include:

- Installation of the Omnicell Pharmacy Central inventory management and product distribution system. This automated system combines vertical carousel technology along with customized bar coded inventory management software that will further increase inventory turns as well as decrease the rate of picking and stocking errors.

Pharmaceutical Distribution

The Department of Pharmacy Services experienced a 20% increase in pharmaceutical requisition activity in FY 2006 and supplied 795,332 pharmaceutical products to 445 clinic and research accounts totaling \$16,000,000 in FY 2006.

BUSINESS OPERATIONS

Budget performance

Pharmacy services had total gross revenue of \$270 million in FY06, and \$95 million in expenses.

- The inpatient and OR areas combined had \$50 million expenses, up 6% over the prior year. This growth was driven by increased hospital volume and drug costs.
- UMH qualified in January 2004 as a Disproportionate Share Hospital for 340b discounts, which reduce outpatient drugs costs by up to 30%.
- The Retail Pharmacy area, experienced a slight increase in the number of prescriptions filled, but also had a change to more expensive prescriptions on average.
- The Infusion area continued its trend of significant volume increases, for a 28% increase in revenue



Alice Schuman
Administrative Manager

UMH Pharmacy Services FY06 Revenue and Expenses

	Inpatient & OR	Retail	Infusion	Total
FY06, July 2005 - June 2006 (in 000s)				
Revenue	161,884	21,292	87,214	270,390
Salary/Benefits	13,999	1,901	1,595	17,494
Supplies/other	<u>36,433</u>	<u>13,593</u>	<u>27,225</u>	<u>77,250</u>
Total exp	50,431	15,494	28,819	94,744
<i>Gross margin %</i>	69%	27%	67%	65%
Percent Change from Previous Year				
Revenue	9%	10%	28%	14%
Salary/Benefits	11%	3%	41%	12%
Supplies/other	<u>4%</u>	<u>26%</u>	<u>30%</u>	<u>16%</u>
Total exp	6%	23%	30%	15%

Statistical Information

The Department of Pharmacy monitors several key performance ratios.

- Inpatient drug costs per discharge and per patient day held steady of most of the past five years.
- Inpatient personnel costs have risen by an average of 7%/year per discharge over the past five years to address additional medication complexity and patient safety issues
- Retail area personnel costs have risen by an average of 6%/year over the past five years, driven by an increase in the ratio of new-to-refill prescriptions and more time spent processing discharge prescriptions.
- Infusion area personnel costs per infusion have held steady over the past five years.

UMH Pharmacy Services Performance Ratios, One Year and Five Year Average Trend

	FY01	FY02	FY03	FY04	FY05	FY06	1 year change	Avg Yrly Change
Inpatient Drug Cost/Discharge	580	602	632	632	743	754	1.5%	6%
Inpatient Drug Cost/Patient Day	105	109	115	110	130	132	1.3%	5%
Retail Drug Cost/Prescription	87	93	99	98	90	110	22.6%	5%
CGC Infusion Drug Cost/Infusion	481	610	621	581	547	733	34.1%	10%
Inpatient Personnel Cost/Discharge	135	142	145	151	169	180	6.4%	7%
Inpatient Personnel Cost/Patient Day	24	26	27	26	30	31	6.2%	6%
Retail Personnel Cost/Prescription	9	9	9	10	11	11	0.0%	6%
CGC Infusion Personnel Cost/Infusion	23	24	23	21	23	34	48.6%	9%

Staffing Levels

Department of Pharmacy staffing levels have been increased over the past two years to address issues of increased volume and complexity and to better address patient safety issues. The growth over the past five years has been mostly in pharmacists, both staff and clinical. This segment of the staff has grown 5%/year over five years, compared to the pharmacy technician growth of 3%/year over that same time period.

UMH Pharmacy Services Staffing Levels, One Year and Five Year Average Trend

	FY01	FY02	FY03	FY04	FY05	FY06	1 year change	Avg Yrly Change
Pharmacists	71	69	69	70	84	88	5%	5%
Technicians	92	91	90	92	100	107	6%	3%
Residents	5	5	8	8	7	8	14%	12%
Management	13	13	14	13	14	15	11%	4%
Office	17	14	12	11	10	10	0%	-8%
Total	198	191	193	192	215	228	6%	3%

*** END OF UMHS DEPARTMENT OF PHARMACY SERVICES ANNUAL REPORT FY2006 ***