

# **INFORMATION MANAGEMENT PLAN**

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## **Introduction**

In early 1980, Louisiana State University Medical Center, Shreveport installed Siemens Medical Systems application. The system was designed as a front end to a billing application rather than a fully functional clinical information system. Applications included patient registration, order entry, outpatient scheduling and patient accounting.

LSUHSC purchased the Siemens Medical Systems INVISION software for patient management, patient accounting and order and charge entry. The installation occurred in July 1997. Lifetime Clinical Results, a clinical data repository system, was installed in August 1998. Web-based access to Lifetime Clinical Results and other patient registration information was made available in 2001.

An information management needs assessment (**Appendix A**) is distributed electronically to all levels of personnel within the organization. The assessment results are utilized in strategic planning and in improvement in the performance of the current information management functions. Staff may also submit a written request to address system improvements for clinical data entry, storage and retrieval of information.

## **Overview of the Organization**

Louisiana State University Health Sciences Center, Shreveport is licensed for 436 beds (in addition to 35 neonatal intensive care beds and 25 newborn nursery and bassinets). There are approximately 22,000 patient admissions to the hospital each year and more than 440,000 outpatient clinic visits annually. Care of the patient is administered as services for outpatients and inpatients and sophisticated tertiary care programs. The tertiary care programs are directed by faculty in the School of Medicine's academic clinical departments: Anesthesiology, Family Medicine and Comprehensive Care, Internal Medicine, Neurology, Neurosurgery, Obstetrics and Gynecology, Ophthalmology, Orthopedic Surgery, Otolaryngology/Head and Neck Surgery, Pathology, Pediatrics, Psychiatry, Radiology, Surgery and Urology and their subspecialty sections.

The LSUHSC Hospital provides a Level I Trauma Center as a community and area resource as well as a Burn Center, Pediatric Intensive Care, Neonatal Intensive Care, Medical Intensive Care, Surgical Intensive Care and a 51-bed Inpatient Psychiatric Unit. Other subspecialty programs provide the basis for regional tertiary care programs which include cardiology, endocrinology, hematology/oncology, oral surgery, infectious disease, nephrology, neurology sleep disorders, rheumatology, genetics and bone marrow transplantation.

## Vision

LSUHSC's Information Management vision is the creation of an information architecture which transforms the delivery of health care from a process which generates data to a process which utilizes information to achieve better clinical and organizational performance outcomes. The driving force behind LSUHSC hospital's vision is the provision of patient care, education and research utilizing an electronic (paperless) medical record that will serve as the primary source of information from which LSUHSC functions revolve.

To achieve this vision, LSUHSC is developing, planning and improving a number of organizational-wide information management processes to meet both internal and external needs. This involves:

- Ensuring timely and easy access to appropriate information throughout the hospital
- Improving data accuracy
- Balancing requirements of security and ease of access
- Using aggregate and comparative data to pursue opportunities for improvement
- Redesigning information-related processes to improve efficiency
- Increasing collaboration and information sharing to enhance patient care

Our long-term goal is to be able to obtain, manage and utilize information to improve not only patient outcomes, but individual, departmental, hospital and system performance in patient care, management, research, education and support processes.

To assist in attaining these goals, the following processes are reviewed once each year to ensure they meet LSUHSC's needs:

- Identifying information needs
- Designing the structure of the information management system
- Defining and capturing data and information
- Analyzing data and transforming it into information
- Transmitting and reporting data and information
- Integrating and utilizing information

## **Mission**

The mission of the Louisiana State Health Sciences Center, Shreveport is to serve the State of Louisiana as well as the Ark-La-Tex region by providing:

- quality patient care services
- a teaching environment for training future medical and allied health care professionals and
- support for medical and scientific research

Quality patient care is the first priority of the organization. Empowered employees will maximize quality patient care by balancing patient expectations, patient needs and available resources.

Our goal is to improve access to health care, reduce the costs by sharing expensive resources and by improving the way people with information technology and computers, communicate with each other.

LSUHSC's information management's mission is to provide services which both support the delivery of quality health care and improve the decision making process for effective and efficient management of LSUHSC's resources.

## **Purpose of the Information Management Plan**

The purpose of the Information Management Plan (IMP) is to describe the processes utilized to obtain, manage and use information to enhance and improve individual and organizational performance in patient care, governance, management and support processes. The needs assessment was completed to evaluate and improve the current information management processes. The assessment considered the following:

- The organization's type, structure, size and complexity.
- The individuals/groups whom the function is serving or will serve.
- The support needed for planning purposes.
- The support needed for education services and any research activity; any national and state guidelines for data set parity and connectivity in interfacing information systems.
- The requirements for internal and external transmission of data/information.
- Longitudinal data/information reporting needs.
- The requirements for internally and externally generated data/information to support continuous improvements in performance.

- The requirements for comparing the organization's performance with internal past performance, with that of other organizations, and with information from the literature.
- The appropriateness of various technologies.
- The costs of various technologies.
- The need to support customer and supplier relationships.
- The analysis of resource use for patients with particular clinical problems to enhance the cost-effectiveness of care.

### **Objectives of the Information Management Plan**

- Improve the decision-making capabilities of clinicians, managers, professional staff, the patients and their families.
- Enable timely and efficient access and information sharing between distributed systems, such as laboratory, pharmacy, physicians billing, radiology, etc.
- Provide better patient care tools for physicians and nurses, such as improved ability to track patients and their records.
- Improve the accuracy and integrity of the data.
- Delineate the method of achieving the balance of proper levels of security and ease of access.
- Describe the use of aggregate data, along with external knowledge-based and comparative data, to pursue opportunities for improvement.
- Delineate important information-related processes to improve efficiency.
- Enhance collaboration and information sharing to improve patient care and patient satisfaction through the use of tools such as automated scheduling.
- Develop the integration of financial and clinical data to improve the management, efficiency and quality of patient care.
- Facilitate the achievement of the organization's vision and strategic initiatives through timely and effective access of data for improved decision making.
- Provide timely data for effective negotiation in addressing fiscal issues associated with patient care.

### **Objectives of Computer Services**

Computer Services plays a vital role in achieving an organizational wide approach to Information Management. The Computer Services process must provide information which is available, timely, accurate, effective, coordinated, integrated and provided in an efficient manner.

The goal of the Computer Services Department is to provide the tools that healthcare professional's need to contribute to high quality patient care; that

educators need to train these professionals; and that researchers need to analyze past performance. These tools would include exceptional software to assist the healthcare delivery team by providing more accessible and more accurate patient data. The software would also provide input into patient care decisions and would enable the professional to spend more time focusing on direct patient care. Complete, computerized patient records would enable clinical researchers to conduct more accurate studies.

Computer Services goal is also to become proficient in supporting the systems necessary for the facility to attain the goal of excellence in healthcare computer systems. Provisions are available for users to request system changes to facilitate this goal through the use of the System Change Request (**Appendix B**).

## **Scope of Information Management Systems**

**Siemens Medical Systems INVISION Patient Management System** - offers on-line, interactive admissions, discharges and transfers (ADT), registration, re-registration, bed reservation/control, pre-admission planning, care provider census inquiry and reporting for both inpatients and outpatients. Patient Management links and supports the facility's departments to enhance productivity, speeds communication and eliminates redundant recording of data. Departments share standard patient information that has been collected by registration personnel. All on-line entry is fully edited and immediately processed. The consistency, integrity and legibility of information are uniformly improved. Those applications included in Patient Management are:

- 
- Registration/ADT
- O/P Visit Processing
- Master Patient Index
- Room/Bed Management
- Daily Census/Reporting
- Patient Status Transfer
- Case Mix Management
- On-line Architecture System for Customer Controlled Screen, Data Capture, and Pathway Changes
- SoftMed Chart Location, Deficiency Tracking, Electronic Signature (ESA), SoftMed Transcription, Abstracting w/Interface to Lifetime Clinical Record
- User Defined Reporting (Ad Hoc)

**Siemens Medical Systems INVISION Financial Data System** - utilizes interactive data entry and inquiry systems to support the needs of Patient Accounting. Essential components include access to all account detail via

inquiry, detailed service pricing, pricing formulas; complete insurance prorating and reimbursement processing, wide array of statement and collection letter options, automatic worklist capabilities and Bad Debt management. All federally-mandated standard bill forms are supported. The Patient Accounting Application includes the following:

- Information Capture
- Billing
- On-line Account Management
- Bad Debt
- Reimbursement/Allowance Calculation
- Archive Data Base Reporting
- User Defined Reporting (Ad Hoc)

**Siemens Medical Systems Radiology Management System** - the Radiology Management System is tightly interfaced with INVISION. This system supports all of the following applications. It provides for systematic control of all the detail involved in the flow of orders, charges and results in the Radiology Department. It incorporates Patient Management, Orders, Clinical Observations and Results, Generalized Indexing, Cost Accounting and Materials Management. Bar code technology assists with film management.

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- Word Processing
- Automatic Fax
- Mammography
- Medical Image Management System
- Radiologist Workstation
- GE PACs - Picture Archive Communication System - The PACS provides contemporary radiology department's optimal storage of patient data and radiographic images. PACS enables the acquisition, storage, output and display of digital images and reports throughout the facility to many users, simultaneously. PACS consists of five major subsystems:
  - Image Acquisition
  - Patient / Exam Data Entry
  - Image Output and Display
  - Image Database Management and Storage
  - Network and Communications

**Siemens Medical Systems Lifetime Clinical Record (LCR)** - provides an integrated lifetime view of a patient's significant clinical data from throughout the health care enterprise. The LCR is built upon IBM standard technology and employs a relational data base to meet the operational, educational and reporting requirements of the organization. LCR offers flexible, selective, on-line storage capabilities to meet the data management and clinical objectives of the facility.

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- Store Current and Lifelong Clinical Information
- HL7 Interface for uploading from existing Lab, Radiology, Pharmacy, Departmental databases
- Simultaneous On-line Access to All Caregivers
- Flowsheets & Clinical Visits Reports Available On-line/Print
- Analyses Across Selected Patient Population
- Healthcare Term Dictionary (HTD)
- Web-based Access

**Siemens Medical Systems Enterprise Access Directory (EAD)** - provides a single point of entry into the demographic and key clinical information maintained in the enterprise. EAD tracks patients throughout the facility, along with the services associated with healthcare delivery.

- Reporting Functionality
- HL7 Compliant for Inbound/Outbound transactions
  - Single point of access to Enterprise-wide Patient Data, regardless of multiple medical record schemes
  - Tracks a Patient's services throughout the healthcare enterprise
  - Integrated with data management systems
  - On-line communication between all systems

**OPENLink Interface Engine** - This product provides an interface engine that will handle all interfaces and is manageable from in-house. The sending system will send a record to the interface engine. The interface engine handles the communications protocols between systems and re-formats the record into the format that each receiving system requires. This decreases interface cost and allows interfaces into more departmental systems. Features of the OpenLink include:

- Open platform to connect independent systems
- User control & flexibility
- Standard communication network connectivity solutions

**Siemens Medical Systems Intellect** - a natural language query system. Saves time in generating ad hoc reports by on-line inquiries from multiple systems to access statistical, financial, patient information, etc.

**Siemens Medical Systems Net Access** – Net Access provides physicians with fast, user-friendly, remote access to *selected clinical data* via a Web browser. Physicians can view selected INVISION data in an intuitive graphical user interface (GUI) format. This information is available for display only – Patient Management, Resource Scheduling, Orders and LCR.

**Siemens Medical Systems Pharmacy System** – PCW (Pharmacy Clinical Workstation) is a Windows-based PC application that lets users perform functions (enter allergies, orders, interventions, etc.) on the Pharmacy system using a Graphical User Interface. Siemens Pharmacy system is integrated with Med Select, Invision Patient Management and Invision Orders.

#### **Other Automated Information Systems**

- 3M Encoder
- People Soft TPS
- Accounts Payable
- Sunquest Lab
- Dictaphone Physician Dictation System
- MicroMedix (Pharmacy)
- People Soft Materials Management
- C/Net (Cancer Registry)
- InterQual (Quality Improvement)
- Peritronics O/B Clinical Information System
- Med Select

#### **Other Network Systems**

- Sunrise (Hematology Information System)
- Approved Anti-Virus Software
- Dr's Choice (Emergency Medicine Patient Medical Record Documentation System)
- ESA (Electronic Signature)
- WITT (Cardiac Cath Lab)
- Cirius (Patient Accounting Claims Scrubber)

#### **Non-Network Applications**

- Microsoft Office Products
- Word Perfect
- Dbase
- Approved Anti-Virus Software
- PC Anywhere
- Print Shop
- Visio
- Fox Pro

### **Customers of Information**

There are multiple users of information produced by LSUHSC. Based on the assessment, surveys and committee findings, listed below are some of customers of information provided:

- Attorneys
- Civic Organizations
- Collection Agencies
- Community
- Dialysis Centers
- Employees
- Governing Board
- Insurance Companies
- Insurers of LSUHSC
- Libraries
- Library System
- Managed Care Organizations
- Medical/Surgical hospitals
- Nursing Homes
- Nursing Schools
- Other Businesses
- Other Healthcare providers
- Patients
- Patient family members
- Physicians
- Physicians' office staff
- Professional Organizations
- Rehabilitation facilities
- School Districts
- Universities
- Vendors
- Visitors
- Volunteer Services

### **Information Reporting**

#### A. Voluntary Reporting

- American Hospital Association Information Request
- National Library of Medicine
- EMS Data to appropriate hospital

#### B. Regulatory Reporting

- Environmental Protection Agency
- Joint Commission on Accreditation of Healthcare Organizations
- OSHA
- American College of Pathologists

- State Board Review
  - Nursing
  - Pharmacy
  - Physicians
  - Physician's Assistants
  - Clinical Laboratory Medical Technologists
  - Radiology Technicians
  - Respiratory Practitioners
  - Occupational Therapists
  - Physical Therapists
- Louisiana Department of Public Health
- Louisiana Department of Health & Hospitals/Medicaid
- Louisiana Hospital Association
- Federal Government
- Internal Revenue Service (IRS)
- CMS (Center For Medicare Medicaid Services)
- Social Security Administrations
- Centers for Disease Control (CDC)
- State Tumor Registry
- American College of Surgeons
- National Physician Data Bank
- University Healthcare Consortium (UHC)

## **Confidentiality, Security and Integrity of Data**

Confidentiality of patient information is managed in accordance with Medical Staff Bylaws, Rules and Regulations, Hospital and Departmental policies and procedures (see Hospital Policy Information Management Policies - Confidentiality and HIPAA, **Appendix C**) and HIPAA Policy and Procedures. The Medical Staff Bylaws, Rules and Regulations and Hospital Policy dictate that medical records may be removed from the hospital's jurisdiction and safekeeping only in accordance with a court order, subpoena, or statute. All staff are required to sign a confidentiality agreement according to hospital policy (**Appendix D**).

All staff shall be oriented in the principles of maintaining confidentiality with importance stressed on the need to maintain the patient's right to privacy at the time of initial employment. Education shall include the responsibility of each individual and consequences of failing to adhere to the hospital standards. HIPAA training is required for all employees. Policies and procedures related to this subject are provided on an ongoing basis as needs dictate.

Computer access to the various software applications shall be designated by Department Director or designee and is based upon job responsibilities. All employees, medical staff members, volunteers, students, and other designated

staff shall be granted access to the information needed to perform their jobs. The maximum levels of access to the data shall be defined and approved by the Department Director or designee. All employees shall receive orientation and or training on the principles of confidentiality, release of medical information and personal protected information.

A unique sign-on and password will be assigned to all system users. Penalties may be invoked for sharing access methods to anyone without the permission of appropriate LSUHSC authorities. Security violations will be investigated by management for disposition. Security violations are defined in the hospital policy manual.

Physical access to the Health Information Management Department is restricted. The department's main entrance is locked at 6:00 p.m. daily and unlocked at 6:00 am. On weekends and holidays, the door is locked on Friday and unlocked at the 6:00 am the next business day. Patient records requiring additional security are maintained in a secure file within the Health Information Management Department. Locations of records checked out of the department are tracked utilizing an automated chart location system. Patient records are maintained in secure locations (not accessible by the public, visitors, etc.) in the Health Information Management Department, on the nursing units, in the outpatient clinic areas, and in requesting department areas.

Routine backup procedures are defined in conjunction with Computer Services, applicable departments and responsible vendors. Storage media shall be labeled as confidential and stored in an area restricted to authorized personnel. Audit trails of all accesses shall be periodically reviewed for compliance with the hospital's policy.

Each clinical and or ancillary department head or designee shall assess each staff member's security access to information systems and shall educate those users regarding their access and the importance of maintaining confidentiality, security and integrity of information. The assessment shall include consideration of the following elements:

- who has access to the information
- information to which an individual has access
- obligation of the individual who has access to information to keep it confidential
- release of information and/or removal of the medical record
- mechanisms designed to secure information against unauthorized intrusion, corruption and damage.

LSUHSC has assessed how data/information can be retrieved on a timely basis without compromising the data/information's security and confidentiality and has developed hospital policies addressing the following:

- A written organizational and Medical Staff policy requires the medical records may be removed from the organization's jurisdiction and safekeeping only in accordance with a court order, subpoena or state statute.
- LSUHSC has mechanism designed to preserve the confidentiality of data/information identified as sensitive or requiring extraordinary means to protect patient privacy.

LSUHSC has a functioning mechanism designed to safeguard records/information against loss, destruction, tampering and unauthorized access or use.

## **Education Strategy**

LSUHSC individuals, who generate, collect, analyze data/information are educated and trained in the principles of information management. Training in the use of departmental software programs is provided to new department staff in order to meet the essential functions of their job descriptions. Additional training will be provided as necessary. These individuals are educated and trained to enable them to:

- Understand security and confidentiality of data/information.
- Assist in use of data/information in decision making.
- Assist in interpreting data.
- Collect unbiased data.
- Educate and support the participation of patients and family in care processes.
- Assess and improve patient care processes over time through the use of indicators.
- Search the literature (knowledge-based information), to assess the value of collected information and procure that needed to interpret data, assist in decision making and provide educational resources.

In addition to the training programs at LSUHSC, the following tools are resources that are utilized for educating individuals about information management principles:

### Employee

- Hospital Policy & Procedure Manual
- Administrative Directive
- Department Policy and Procedure Manuals
- Equipment Operation Manuals
- Quality Management Training
- Quality Improvement findings
- Hospital Education Council
- Departmental Inservice Programs
- Job Descriptions

- Medical Library
- Material Safety Data Sheets
- Patient Care Support Newsletter
- Clinical Information System Training provided by Computer Services
- Patient Registration Training provided by Patient Processing
- Project Care Education, including basic PC Training
- Computer Services Newsletter
- Infection Control Manual
- Video programs for continuing education
- Attendance at outside professional workshops/seminars
- Payroll Employee and Supervisory Manual
- Human Resource Employee Manual

#### Patient

- Notice of Privacy Practices
- Consent Forms
- Discharge Instruction Forms
- Support Groups
- Patient Rights/Responsibilities
- Preoperative Instructional Information
- Information on Food-Drug Interactions
- Information on Safe Use of Medications
- Information of Safe Use of Medical Equipment
- Information Regarding Community Resources
- Patient Education Programs, i.e., television, pamphlets, etc..

#### Medical Staff

- Medical Staff Meetings
- Weekly Cancer Conferences
- Quality Performance and Improvement findings
- Medical Library
- Departmental meetings
- Special meetings/conferences
- Attendance at outside workshops/seminars
- Medical Staff Bylaws Rules and Regulations

#### Community

- Health Fairs
- Support Groups
- Physician Referral Program
- Patient education programs
- Medical Library

## **Transmission of Internal and External Data/Information**

The format and methods for disseminating data/information are standardized to facilitate transmission of data/information in a timely and accurate manner, whenever possible.

LSUHSC provides, but is not limited to, the mechanisms for the transmission of data listed below:

### Internal

#### Voice

- Beepers
- Physician Dictation Equipment
- Telephone
- Two Way radios
- Hospital Voice Paging System
- Nurse Call System
- Cell Phones

#### Data/Information

- Fax
- Personal Computer/LAN System
- Paper (memoranda, reports, etc.)
- Distributed Systems Equipment/LAN System

#### Alert Devices

- Fire Alarm
- Panic Buttons
- Code 1 Personal Protection Devices
- Distributed Systems Equipment/LAN System

### External

- Fax
- Telephone
- Paper (records, reports, etc.)

## **Data Definitions**

LSUHSC strives to ensure that data is collected in a timely, economical and efficient manner and with the degree of accuracy and completeness necessary. Coordination between Health Information Management and Computer Services serves to ensure that consistent ICD-9-CM, CPT-4 and HCPCS coding is used between automated and non-automated information systems.

Information is collected in accordance with the Uniform Hospital Discharge Data set (UHDDS), 1992 Uniform Billing (UB-92 requirements), the CMS 1500 billing form, ORYX reporting and other minimum data sets. Standardized coding and classification systems include, but are not limited to, ICD-9-CM, ICD-O, or CPT-4. Edit checks are a part of the coding software applications to ensure the validity and accuracy of the code, based on the patient's gender and diagnosis.

Coding of clinical data for billing and inclusion in the facility's clinical database is the responsibility of the Compliance Department. ICD-9-CM is used to classify diagnoses and procedures. Coders adhere to all applicable coding conventions and AHA Coding guidelines. CPT-4 and HCPCS codes are used for procedure coding when required for billing. The accuracy of coded data and related abstract data is monitored through the various policies and procedures of the department and through monitoring of identified types of cases. Admitting diagnoses and procedures are entered for all patients. A random sample of inpatient record coding and outpatient record coding is conducted and reviewed with appropriate staff.

Periodically, third parties (i.e. insurance companies, CMS, PRO) may perform a review of previously coded records to identify opportunities for education and improvement of accuracy or consistency. Completeness, accuracy and timely completion of medical records are monitored on an ongoing basis according to the policies and procedures of the Health Information Management Department and the medical staff.

LSUHSC has implemented quality control measures to minimize bias in the data collection and to assess the data's reliability, validity and accuracy on an ongoing basis.

In addition Siemens Medical Systems provides a term dictionary. Siemens Medical Systems Healthcare Term Dictionary (HTD) is a single source of information about the terms and concepts that comprise the medical vocabulary of an Integrated Health Network (IHN). It provides a single integrated view of medical terminology instead of a multitude of unrelated master files. It enables consistent definition of terms and concepts, it also provides a single source for editing rules and displays options. The Healthcare Term Dictionary serves as an Enterprise data model linking clinical nomenclatures across disparate systems and entities. Among the items defined within the Term Dictionary are:

- Results to be accepted from feeder systems as coded values
- Observations for which to collect results
- Logical groupings of observations
- User defined parameters for clinicians to facilitate order entry defaults, allowable values, suggested values, etc.
- Industry standard coding systems: ICD-9-CM diagnosis/procedures, CPT codes, SNOMED codes, etc.

- Relationships (links) between term and external coding systems (synonyms the information is known by in feeder systems)
- Defined protocols

The HTD addresses how the institution defines itself and has three major objectives:

- To have an enterprise-wide clinical system that can be reasonable installed, maintained and migrated to future technology
- To drive widespread clinical usage
- To facilitate meaningful outcomes analysis in the future.

## **Planning Methodology**

For leadership to achieve its goal of providing appropriately managed information, the leadership must begin by planning for services. LSUHSC leadership team developed a Strategic Plan that describes the long-range, strategic and operational plans for the facility. In addition, the leadership develops a capital and operating budget that describe resource allocations annually.

Computer Services must provide leadership with a minimum of the following to facilitate the budgeting process:

- Applicable information from the organization's strategic planning process that indicates any needs to further refine the fiscal resources allocated for providing patient care.
- Ongoing review of the organization's plan for staffing for services.
- Other sources that address the adequacy of fiscal and other resources for providing patient care.
- The process used for measuring Department/Service performance relative to the approved budget, including the methods for measuring and acting on identified and defined variances.
- Performance improvement activities

## **Knowledge-based Information**

### **A. The Medical Library**

The LSU Health Sciences Library in Shreveport serves as a principal information resource for the School of Medicine, the University Hospital, the School of Graduate Studies, and the School of Allied Health Professions. The library occupies 39,000 square feet over three floors, with seating for 269 users at tables, carrels, and in study rooms. The library also houses five small-group teaching rooms, five photocopiers, a scanner, and a fax machine. The library has two state-of-the-art computer

labs. One has twenty-eight Windows XP computers, four Windows 98 computers, two network printers, and a projection system for teaching. The newest computer teaching lab has twelve workstations with Windows XP, a projection system for teaching, and teleconferencing capability. Wireless access to the campus network using the 802.11b protocol is also available throughout the library's three floors.

The library provides a variety of information services including answering basic reference questions, providing assistance in online searching, mediated searching of online databases, e-mail and web-based reference service, interlibrary loan, and user education. Networked access is available to over thirty databases. The library's collection includes over 185,000 print volumes (books and bound journal volumes). The Library also provides access to 200 electronic books. The Library currently receives/accesses over 2000 print and/or electronic journals. This total includes journals in print-only format, journals in electronic-only format (full-text), and journals in both print and online formats. The Library also has an extensive audiovisual collection that includes audiotapes, videotapes, slides, and X-rays.

Journals that are not in the collection may be obtained through interlibrary loan. Requests for interlibrary loans are routed preferentially through regional libraries and whenever possible are transmitted electronically. This process allows for a rapid response to interlibrary loan requests. As technology continues to develop, electronic service will allow even more rapid access to crucial journals and books.

The Library is open 99 hours per week: 8 a.m. to 11 p.m. Monday through Saturday and 2 p.m. to 11 p.m. on Sunday. However, remote access to the online catalog, databases, and electronic resources is available 24 hours a day, 7 days a week. Reference questions may also be submitted after hours via e-mail, and the reference staff will provide a reply by the end of the next business day.

In summary, the LSU Health Sciences Library in Shreveport provides LSUHSC-Shreveport students and faculty with ready access to critically important information required for research, patient care, and teaching.

#### B. Poison Control

The pharmacy, medical and nursing staff have access to poison-control information by the following mechanisms:

- The poison control phone number (1/800/256-9822) is available at each nurse station, and throughout the outpatient clinic areas and emergency areas.

- Poisindex is available on the hospital's computer system and may be accessed from nursing units, pharmacy and computers accessing the mainframe.
- Applicable MSDS sheets located in each Department for Hazardous Materials used in the area. Complete sets are located in the Safety Office.
- Reference materials maintained in the Pharmacy Department and the Library.

C. Formulary

A Formulary is reviewed annually and provided to all physicians through the LSUHSC Web Site.

### **Aggregate Data**

Monthly, calendar year and fiscal year end statistical reports are posted to the e-mail bulletin board for access by internal departments on a monthly basis.

- Monthly Analysis by Hospital Service
- Monthly Analysis by Nurse Station
- Fiscal Year Analysis by Hospital Service
- Comparative Report of Professional Performance
- Comparative Report of Outpatient Services

The statistics include information by hospital service and by selected nurse stations as it relates to the number of active/staffed beds, admissions, patient days, average daily census, percent of occupancy, discharges, deaths and length of stay, outpatient clinic visits, operative procedures, deliveries, cesarean sections, etc.

Ad hoc or customized reports may be obtained from Computer Services, Health Information Management and/or from the departmental systems administrator upon request, i.e., Physicians' Billing Information Coordinator, Clinical Laboratory Systems Administrator, etc. Information can be obtained on defined fields within the database.

### **Comparative Data**

The hospital uses external data and information to identify areas in which its own performance deviates from expected patterns. In addition, the hospital contributes its own information to external reference databases. As a part of its information management activities, the hospital exchanges clinical and knowledge-based data and information with other health care organizations. These activities help the hospital develop its future capabilities and goals. Security and confidentiality of

data is maintained through resources such as hospital policies and procedures, contract agreements, applicable laws. Information is exchanged with the following agencies/institutions:

University Hospital Consortium (Benchmarking studies with other university teaching hospitals and other comparisons, such as complications, mortality, LOS, Average Cost/Charge, etc. )

Louisiana Health Care Review (Cooperative studies with the Louisiana Peer Review Organization (PRO) and Core Measure Data reported to the JCAHO))

InterQual Criteria (SIM-A for invasive procedures)

MedPar Analysis

MECON

Center for Disease Control (CDC)

CMS (Center For Medicare Medicaid Services)

Louisiana Department of Health and Hospitals

National Association of Children's Hospital's and Related Institution (NACHRI)

## **Performance Improvement**

As health care evolves in response to technological development, the flow and dissemination of information becomes increasingly important in guiding the future of health care. Performance improvement is defined by the following:

- Customer satisfaction
- Commitment and dedication to continuous improvement
- Reduction of costs and services
- Timeliness of products and services

Performance Improvement is supported based on the collection and analysis of data. Examples of projects supported by Health Information Management and Computer Services are:

- Analysis of resource utilization by case DRG or ICD-9-CM code
- Analysis of trends in cost, quality and volumes of services
- Re-engineering and re-design of department and function workflow

### Internally Generated Data/Information to Support PI (includes but not limited to)

- 
- Needs Assessment
- Monitoring and Evaluation Summary
- Quality Indicators
- Standard and ad hoc reports from Health Information Management

- Performance Improvement Evaluations
- Adverse Drug Report Forms
- Variance Reports
- UHC Clinical Data Base (for comparative reports)
- Patient Satisfaction
- Focus Studies

Externally Generated Data/Information to support PI (includes but not limited to)

- University Hospital Consortium (Benchmarking studies with other university teaching hospitals)
- CMS (Center for Medicare Medicaid Services)
- Louisiana Health Care Review (Cooperative studies with the Louisiana Peer Review Organization (PRO))
- InterQual Criteria (SIM-A for invasive procedures)
- MedPar Analysis
- MECON
- Other National Registries as specific to the indicator being monitored
- National Association of Children's Hospital's and Related Institution (NACHRI)

### **Opportunities for Improvements**

The needs assessment revealed a number of opportunities for improvement in our current application. These opportunities for improvements and additional informational needs are as follows:

Improvements Identified:

- 
- Windows interface and user friendly Invision interface
- Improve speed of current hardware
- More hardware available to access and print from the clinical system
- Link all patient-related systems together and provide education on one system
- One password to access all systems
- Paperless record retrieval
- Improve coding and entry of data as it relates to patient management and reporting
- Improve pathways for keying orders and looking up orderable tests
- Improve research capabilities within Invision
- Receive input from all users
- Improve remote access
- Offer educational opportunities for ICD-9, CPT coding, medical terminology, computer skills workshops

## Records Retention

The clinical information system, Invision, retains forty months of patient aggregate information, including diagnoses and procedure coding. Lifetime Clinical Record (LCR) serves as a data repository for clinical results and reports transmitted from reporting systems to Open Link (August 1998 to present). Louisiana law requires that medical records be retained for a minimum of 10 years following the last discharge. However, due to the continued need for patient care, research, education, records are retained for an indefinite period of time.

Each department is responsible for retaining documents that relate to employees:

<b>Record</b>	<b>Retention Period</b>
Acknowledgment of TACs Policies/Procedures Form	Duration of employment, plus 1 year
Competency Assessment Documentation	Duration of employment, plus 1 year
Confidentiality Statement	Duration of employment, plus 1 year
In-service Education/Training Records	Duration of employment, plus 1 year
Leave Reports	One fiscal year, plus six months
New Employee Orientation Checklist	Duration of employment, plus 1 year
Pay reports	One fiscal year, plus six months
Performance Planning/Evaluation Reviews	Duration of employment, plus 1 year
Payroll adjustment forms/leave approval forms	3 fiscal years, plus six months

The following represent minimum retention guidelines for other documents and/or records maintained for patient care activities:

<b>Record</b>	<b>Suggested Minimum Period of Retention</b>	<b>Responsible Department</b>
ABO and RH types	5 years	Laboratory
Annual Reports	Permanently	Responsible Departments
Audit reports	Permanently	Internal Auditor
Birth Registry	Permanently	Labor & Delivery
Blueprints	Permanently	Physical Plant
Clippings (historical)	Permanently	Informational Services
Construction projects	Permanently	Physical Plant
Controlled substance inventory	5 years	Pharmacy
Daily Census Reports	5 years	Health Info Mgt.
Death Registry	Permanently	Admitting Office
Delivery Room Log	Permanently	Labor & Delivery
Disease Index	10 years	Health Info Mgt.
Electrocardiogram tracings	3 years post last date of treatment	Cardiology Department
Electroencephalogram tracings	3 years post last date of treatment	EEG Department
Endowments, trusts, etc.	Permanently	Informational Services
ER reports	Permanently ( as a part of the medical record)	Health Information Mgt.
Fetal heart monitoring strips	3 years post last date of treatment	Dept. of O/B-GYN Health Info Mgt.
Final disposition of blood and components	5 years	Laboratory
Food Costs	5 years	Nutritional Services
Garnishments records	6 years	Payroll
Hospital claims	5 years	Hospital Billing
Job classifications	Permanently	Human Resources
Meal counts	5 years	Nutritional Services
Medical Records	10 years post last date of service	Health Information Mgt. (Medical Records)
Minutes of medical staff meetings	Permanently	Medical Staff Office Responsible Department
Nursing applications (non-employees RNs & LPNs)	2 years	Nurse Recruiter

<b>Record</b>	<b>Suggested Minimum Period of Retention</b>	<b>Responsible Department</b>
OR Log	Permanently	Operating Room
Patient Index	Permanently	Health Information Mgt.
Personnel Records	6 years	Human Resources
Operative/Procedure Index	10 years	Health Information Mgt.
Photographs (institutional)	Permanently	Informational Services
Physician charges	5 years	Physicians' Billing
Prescriptions	5 years	Pharmacy
Procedure Index	10 years	Health Information Mgt.
Property records	Permanently	Physical Plant
Purchase Orders	6 years	Accounting
Receiving Reports	6 years	Accounting
Records of reactions to transfusions	5 years	Laboratory
Refrigerator Inspections	5 years	Responsible Department
Requisitions	6 years	Purchasing
Statistical Reports	Permanently	Health Information Mgt.
Transfusion request records	5 years	Laboratory
Tumor Registry Files	Permanently	Tumor Registry
Variance Reports	Permanently	Performance Improvement
Volunteer service records	Duration of service, plus 1 year	Patient Relations
Withholding tax exemption forms W2	6 years	Payroll
Withholding tax exemption forms W4	6 years	Payroll
Work Orders	6 years	Physical Plant
X-ray film	3 years post last date of treatment	Radiology File Room

## Summary

Louisiana State University Health Sciences Center (LSUHSC), Shreveport, is committed to improving the quality of the facility's information management processes and reducing cost. Information management encompasses the management of information, the management of application systems and the management of information and communication technology, whether computer supported or not. Information management is the key component in providing quality patient care, education and research in a constantly changing environment. The quality of information management is an important factor for hospitals to gain the competitive advantage.

Processes are currently in place at LSUHSC that will allow the end user to make recommendations to enhance and improve current software applications.

The Information Technology Strategic Plan for 2004-2007, is driven by the following internal and external forces:

- HIPAA
- Patient Safety and JCAHO Compliance
- Improving Operating Room Efficiency
- Enhancing the efficiency in Computer Services
- Enhancing the Usefulness of available clinical and financial data
- Electronic Radiography and Imaging
- Enhancing user training
- Updating clinical systems that are or soon will be unsupported
- Reducing costs in Computer Services Budget
- Improving physician and healthcare provider access to data
- Enhancing Research and Educational capabilities
- Space

The results of the 2003 Information Management Needs Assessment Survey showed a common need among current users for the following enhancements:

- Additional training on system software applications and on HIPAA Confidentiality and Security compliance.
- Password synchronization
- Electronic medical record
- Use of PDAs
- Use of Bar codes (forms, arm bands, etc.)
- Additional hardware to increase access to applications

Recent upgrades to the current systems included:

- Cirius - Hospital Billing Claims Editing Software
- Sunquest Modifications
- Anatomical Pathology (Co-Path)

- Pharmacy System (Replacement of Pharmakon mainframe system with Siemens Pharmacy)
- Report Automation System (RAS)

Plans are currently underway for the implementation of the following:

- Siemens Medication Administration Check (MAK) – point of care application that offers automated medication administration tracking and quality assurance. MAK utilizes the Siemens Pharmacy patient profiles and provides the clinician methods to verify the correct patient, correct drug, correct route, and correct dose and correct time through use of barcode technology and electronic applications.
- Siemens Clinician View - incorporation of OAS/Gold graphical forms and objects into INVISION pathways to enable a browser-based graphical user interface.
- Physician Order Entry – allows clinical real-time access/entry of orders that provides access to process specific or service specific order processing, decision support tools, clinical results and Med/IV records.
- Rules Engine - NOVIUS Rules Engine integration provides clinical alerts and reminders for care providers and supports decision making processes by using an industry-standard language for the creation of rules.

Users' needs are assessed on an ongoing basis. Users may request system modifications at any time. The request is summarized, evaluated by leadership and acted upon accordingly. Please refer to **Appendix E** for Information Technology Strategic Plan and Budget Justification Summary for 2004-2007. Information Management and Technology continues to strive to keep pace with the continued growth of the institution.

## **APPENDIX**

### **Appendix A – Information Management Needs Assessment**

See document at <http://www.education.sh.lsuhs.edu/jcaho/survey.htm>

### **Appendix B – System Change Request Form**

See document <http://www.sh.lsuhs.edu/infotech/ocs/userservices/Invision/homeinv.html>

### **Appendix C - Security, Confidentiality and Integrity of Information**

See Information Management Policies

[http://www.sh.lsumc.edu/policies/POLICY\\_MANUALS\\_VIA\\_MS\\_WORD/hospital\\_policy\\_number\\_index.htm](http://www.sh.lsumc.edu/policies/POLICY_MANUALS_VIA_MS_WORD/hospital_policy_number_index.htm)

### **Appendix D - LSUHSC Confidentiality Agreement**

See Information Management Policies

[http://www.sh.lsumc.edu/policies/POLICY\\_MANUALS\\_VIA\\_MS\\_WORD/hospital\\_policy\\_number\\_index.htm](http://www.sh.lsumc.edu/policies/POLICY_MANUALS_VIA_MS_WORD/hospital_policy_number_index.htm)

## Appendix E – LSUHSC Information Technology Strategic Plan

### Information Technology Strategic Plan

#### HIPAA

HIPAA is a federal law involving confidentiality of patient records and standards for the transfer of electronic patient information. We must be compliant with HIPAA regulations within the next 18 months. Most of the industry agrees that the costs of HIPAA compliance will exceed the costs incurred by Y2K upgrades by 150-200%. The following systems and personnel will be needed:

- 1) Firewall: A hardware system that protects the campus network and patient records from Internet hackers and other intruders. **Done.**
- 2) Secure Wireless Authentication: The 802.11b wireless standard requires additional encryption services to be HIPAA compliant. **Done.**
- 3) Password Sync (synchronization): Sharing of passwords and accounts in clinical areas is presently a common practice because most users have 3-5 accounts and passwords that are constantly changing. A password synchronization system would provide a single account and password for each user.
- 4) Authentication/Application Switching System for all Clinical Workstations: Because many people use the same clinical workstation, a system must be implemented that authenticates users and enables rapid switching between users and their applications. For example, when one doctor walks away from a computer, the screen should go blank and allow other users to be authenticated and access their applications quickly; when that same doctor returns, the system should quickly authenticate who the doctor is and rapidly return to the application that was originally being used. Other doctors and nurses may use the computer in the interim, but the computer remembers the last application used before the person walks away so that if the user returns, there is little delay in authentication or workflow.
- 5) VPN (Virtual Private Network): This network encryption system enables physicians to access clinical information from home and other locations outside the building. **Done.**
- 6) Switches in Hospital: Four additional network switches are needed in the hospital to support new security systems. **Done.**
- 7) SQL Server for Clinical Research: We will propose that no clinical research be conducted using personal computers, but rather, such research must be conducted centrally so that all access to patient information can be tracked and audit reports can be created. A central SQL server will be provided for clinical research, and a client-server database manager FTE will be needed.
- 8) Storage area network (All systems, including all imaging)
- 9) Off-site Backup (Disaster Preparedness): To ensure that patient data is not lost and to maintain disaster preparedness, off-site backup of clinical data will be enhanced. Presently, such data is backed up on tape, but restoration of such tapes would require 2-3 days effort. Instantaneous access to such data is needed in a “hot-site” backup system.
- 10) Medical Records System Upgrade: The Medical Records system is not HIPAA compliant and must be upgraded. **Done.**
- 11) Replace of all Network Hubs with Switches: Although four switches must be upgraded at a very minimum, we recommend that the remaining 10-year-old network hubs be replaced with switches to fully implement the security system (firewalls, password sync, wireless authentication, etc.)

- 12) Network Device Authentication System: When wireless computers and other handheld computing devices are used in a clinical environment, we must be able to authenticate valid users and devices.
- 13) Invision Clinical Workstations: The computers used to access Invision and all other clinical systems are four and five years old and must be replaced with computers capable of running Windows 2000 or Windows XP. These new operating systems are necessary to support password synchronization and authentication/application switching required by HIPAA.
- 14) Microsoft Site License: The Microsoft Software Management System (SMS) software will be needed to manage all the new security systems on Invision workstations. This software is a part of the Microsoft site license. **Done.**
- 15) Desktop Management (SMS server): Hardware will be required to run the Software Management System software.
- 16) Client-Server Database Manager FTE: One person must be hired to manage the SQL server that houses all clinical research data.
- 17) Systems Programmer: A mainframe systems programmer will be required to update and maintain mainframe security systems.
- 18) Security Manager: A security manager will run the client-server security systems (password synchronization, authentication/application switching, network device authentication system).
- 19) Desktop Management: One person will be needed to run the software management system (SMS) desktop management.
- 20) RACF Mainframe Security software: At present, mainframe security is managed in by LSUHSC-New Orleans. We must install this security on the Shreveport mainframe computer to implement the password synchronization system.

## Patient Safety and JCAHO Compliance

The recent JCAHO accreditation visit, together with an increased awareness of patient safety outlined by the Institute of Medicine, has led us to develop new systems to manage the prescribing, ordering, authorizing, and administration of medications. A grant from the Louisiana Technology Innovations Fund will finance a portion of this project. Furthermore, there are considerable long-term costs savings associated with improved management and monitoring of the prescribing and the procurement processes.

- 1) Pharmacy System: The present pharmacy system is 10 years old, is not Health Level 7 (HL7) compliant, and must be upgraded to communication with other electronic systems. **Done.**
- 2) Barcode/PDA Web Interface: The system we propose will enable a nurse to barcode the patient's ID bracelet, the prescribed medication, and their own employee ID badge to ensure that there are no errors in administration.
- 3) Wireless LAN in Hospital: Nurses will use a wireless personal digital assistant with barcode scanning capabilities. **Done.**
- 4) New Interfaces: The new systems that will be implemented must be interfaced to existing systems, and several new interface programs must be written by the vendors.
- 5) Electronic MAR: The web interface to the medication administration report (MAR) identifies to the nurse the medications that are to be administered to each patient. A web server must run this system.
- 6) Physician Order Entry: Although we presently own the hardware and software so that physicians can order directly from the clinical information system, there will be considerable implementation costs to install the software, customize it for the physicians, and train all physicians.
- 7) Client-Server Manager FTE: A person will be needed to manage the hardware for the new pharmacy system, the electronic MAR, and the web interface.

- 8) Clinical Director FTE: A staff physician will be hired half-time to provide consulting and management expertise for physician order entry and other clinical systems.
- 9) Physician Order Entry FTE: A programmer must be hired to customize and maintain the mainframe-based physician order entry system.
- 10) Pharmacy/Surgery Applications Programmer FTE: A programmer will be needed to manage the Pharmacy and Surgery applications. **Done.**

## Enhance Efficiency in Computer Services

Several new systems and new personnel are needed to improve the level of services within Operational Computing.

- 1) Problem Tracking (Help Desk): All problems reported to User Services are logged in the software package that was developed in-house. This software runs on the mainframe computer in New Orleans, and the maintenance cost is \$100,000 per year. A new system should be purchased and implemented so that recurring costs can be significantly reduced and software capabilities can be improved.
- 2) Open Link (Interface Engine Upgrade): The interface engine provides an electronic connection between all clinical and billing computer systems. We will lose support for the present system within the next 12 months. The new system will provide significant improvements in redundancy and fail-safe capabilities. **Done.**
- 3) SoftMed Coding Upgrade: The underlying database behind the compliance system is antiquated and should be upgraded. It is difficult to manage and requires an unnecessary amount of personnel support time. **Done.**
- 4) Education and Training: Computer Services staff needs ongoing education and training not only to maintain competency, but also to improve recruitment and retention.
- 5) OMEGAMON (mainframe monitoring software): New mainframe software is needed to monitor the status of all mainframe systems. This monitoring software provides tools to troubleshoot problems, to identify slowdowns, and to anticipate future problems.
- 6) Desktop Computer Upgrades for Computer Services Staff: Many staff computers are old and must be upgraded. Furthermore, up-to-date desktop computers provide a tool for recruitment and retention. **Done.**
- 7) Interface Programmer: Because new clinical and billing systems are constantly being added, and new interfaces are required, an additional interface programmer is needed. **Done.**
- 8) Business Manager: The combined budgets of Operational Computing, Academic Computing, and Video and TeleHealth Services are almost \$10,000,000, yet there is no business manager. Within this budget, almost \$1,600,000 is grant funding. **Done.**
- 9) DB2 Mainframe Database Manger: The clinical information system, Invision, uses the DB2 database software, but we have no DB2 programmer. This programmer would ensure efficient operation of Invision as well as the various systems that depend on Invision. This programmer would also provide new capabilities for report generation.
- 10) Project Manager FTE: This long-range plan is an aggressive effort to develop state-of-the-art systems to improve patient safety, to improve efficiency, to address compliance issues, and to save money. A project manager will be needed to manage implementation of such a broad range of systems.
- 11) Clinical User Services FTE: This new range of clinical systems and enhancements will require additional user support within Clinical User Services.

## Enhance Usefulness of Available Clinical and Financial Data

There is considerable clinical and financial data stored in various computer systems throughout the enterprise, but this data is not being used optimally for research and for financial analysis and forecasting. If all this data were accumulated in a single location, that is, a data warehouse, significant new capabilities

would be available: the costs report could be generated at any interval, such as weekly or monthly, instead of once per year; outcomes research could be conducted to determine the cost-effectiveness of clinical pathways; epidemiology research could be conducted to identify patterns of diseases.

- 1) Data Warehouse: The ability to consolidate patient, billing, and cost data in a single database will provide important new tools for research and financial management.
- 2) Data Warehouse Manager: A person should be hired to manage the data warehouse system.
- 3) Mainframe Clinical Reporting Software. New tools are needed to create reports directly from the Invision clinical system. These tools would also enable new capabilities to support outcomes research.

## Electronic Radiography and Imaging

The Picture Archival and Communication System (PACS) provides filmless radiology services, not only to the Radiology Department, but also to all physicians throughout the campus. However, this system has not been completely implemented throughout the campus. Furthermore, the system components (consisting of the PACS, the Radiology Information System, and the dictation system) are poorly integrated. Enhanced integration of these systems would improve efficiencies so that radiologists could read more film in the same amount of time.

- 1) PACS Upgrade: The PACS should be completely implemented throughout the facility, so that film will almost be completely eliminated. **Done.**
- 2) Radiology Information System (RIS): Although we already own RIS software, the hardware must be upgraded before the software can be updated to the most recent version. This most recent version will provide significant enhancements in efficiency.
- 3) Integrated Radiology Dictation System: Improvements to the way that radiologists transcribe their findings could also greatly increase efficiency. Improvements to the integration of the dictation system and to template notes would improve the consistency and accuracy of dictations.

## Enhance User Training

User training for clinical, administrative, and productivity applications occurs continuously within the Medical Center. The primary clinical application is Invision, the primary administrative application is People Soft, and the primary productivity application is the Windows Office Suite. There are two training labs, one in the Library, and one managed by Operational Computing.

- 1) Training Lab (Library): The lab in the library is four years old and will need an upgrade of 25 workstations within the next two years.
- 2) Training Lab (Clinical Systems): The training lab managed by Operational Computing is five years old and will need 16 workstations.

## Update Clinical Systems that are or soon will be unsupported

There are four primary clinical systems that are presently unsupported or will be unsupported within the next 12 months. Furthermore, as additional clinical users

are added and as the patient data repository (Lifetime Clinical Record) becomes larger, mainframe hardware and software upgrades will be necessary.

- 1) Peritronics: Peritronics is the name of the fetal heart monitor system. This system has been unsupported for years and is presently managed by Operational Computing. Hardware repairs are virtually impossible.
- 2) Cardiology System Upgrade: The cardiology-based systems (Marquette) that support EKG monitoring are presently unsupported, based on Windows 3.11 operating system technology. **Done.**
- 3) SunQuest: The clinical laboratory system, SunQuest, is written in an outdated programming language (MUMPS) and will be unsupported within 18 months. The new system uses standards-based SQL technology.
- 4) Mainframe hardware/software upgrades: The mainframe will need upgraded processor capability, upgraded memory, upgraded file storage capabilities, as well as standard upgrades to the software. **Done.**
- 5) Programmer for Clinical Systems: An additional person will be needed to manage these upgraded systems. At present, management of these systems was accepted by Operational Computing, but there was no additional personnel support provided.
- 6) CoPath Plus: The anatomic pathology system is presently unsupported, but a new system is being implemented this fiscal year. **Done.**

### Reduce Costs in Computer Services Budget

There are several opportunities to reduce immediate and long-term expenditures within Operational Computing. A primary method will be to reduce the budget for postage by reducing the number of bills sent to patients. The long-range goal is to send one unified physician and hospital bill to each family each month. At present, a bill is sent to each person in the family for each episode of care.

- 1) Family Bill: The first step will be to send one hospital bill each month to each patient. Only programming changes will be required. **Done.**
- 2) Unified Patient Bill: The next step will be to send a single bill from hospital and physician billing. Because two systems are involved, this system will be more complex.
- 3) Deinstall mainframe printer: By decreasing the volume of billing statements, and by decreasing the volume of administrative printing (as a result of People Soft), we can “deinstall” an expensive old mainframe printer. **Done.**
- 4) Cirrus: The Cirrus system is presently being installed to improve management efficiencies within Hospital Billing. Cirrus may also be helpful in creating a unified bill. **Done.**

### Improve Physician and Healthcare Provider Access to Data

At present, we do not have an automated nursing documentation system. Nursing notes are recorded in the chart, but are not available electronically. Several systems need nursing documentation to make important decisions, such as pharmacy (patient weight, patient temperature).

- 1) Invision Printers: Lab results are printed from Invision and placed in patient files. Invision printers are four and five years old and will soon need replacing.
- 2) Nursing Clinical System: Automation of nursing notes will be an important step in providing electronic access to all patient information.
- 3) Printers for KidMed: The KidMed program has recently moved to the Women's and Children's Building and will need Invision printers. **Done.**

## Enhance Research and Educational Capabilities

Operational Computing provides almost no support for the research community, except for e-mail services. Academic Computing does provide educational support, but additional systems are needed.

- 1) Internet 2 Router: All staff and faculty need access to Internet 2, and this network device will provide a part of the needed system. **Done.**
- 2) Network Management Software: To provide Internet 2 access, enhanced network management software will be needed.
- 3) Core Lab Management: The Core Lab is rapidly expanding as is the need for bioinformatics support. At present, only a student worker is provided to support the technical systems in the Core Lab. These systems are highly complex, and two FTE's will be needed over the next several years to manage these sophisticated systems on a daily basis.
- 4) Blackboard Educational Software: Testing and evaluation software is needed, as is software to support web-based instructional materials. Blackboard is a software package in use in the School of Allied Health Professions and may be expanded for use in the rest of the Health Science Center.
- 5) Academic Computing Support: To support these systems, an additional person should be hired in Academic Computing.

## Space

There are 19.5 additional personnel needed to implement and manage the proposed system, and office space and furniture will be needed.

- 1) Space: For each person, 100 square feet of office space will be needed. If this space is created in the existing Operation Computing offices in the Linwood location, \$20 per square foot should be allocated for renovations.
- 2) Furniture: "Co-Struck" cubicle walls, office furniture, and desktop computers will cost about \$4670 per person.

## Physicians' Billing System

Upgrades are needed on several sub-systems, and some devices are outdated and must be replaced.

- 1) Upgrade IDX to version 9.0 the present version of the software will not be supported within the year. Furthermore, the new version will enhance capabilities, especially the ability to monitor managed care contracts.

- 2) HIPAA Upgrades: The inbound interface for electronic payments must be modified to convert HIPAA format to the existing format.
- 3) Add OCR to Imaging System: To address compliance issues and to improve efficiency, an imaging system is used to convert all paper to an electronic image. To further improve efficiency by providing textual search capabilities, Optical Character Recognition (OCR) should be added in a system upgrade.
- 3) MEIS Upgrade: The Management for Electronic Information System (MEIS) is used to warehouse and billing data and to provide sophisticated reporting tools. The existing version is no longer supported by the vendor.
- 4) Desktop Computer Upgrades: There are still a number of Windows 95 and Windows 98 computers that are difficult to use and manage.

## E-Mail

The present e-mail system (Microsoft Outlook) was designed to support 2000 users, and is presently being used to support over 4200 users.

- 1) Upgrade existing server. The existing server is over 3 years old and should be upgraded.
- 2) New Server: A new server must be added to support the two-fold increase in users.