Survey of Pharmacy Informatics

http://courses.washington.edu/pharm304/schedule.html

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Just what IS ‘Pharmacy Informatics’?

Pharmacoinformatics encompasses the intersection of technology and information with all aspects of the medication system including prescribing, dispensing, administration, monitoring, clinical decision support and education regarding medication use.

--Jennifer Brown, Pharm.D. a student at Nova Southeastern University College of Pharmacy, Fort Lauderdale-Davie, Florida includes on her website:

http://www.pharmacyinformatics.org/index.htm

a definition put forward by the American Medical Informatics Association (AMIA)  http://www.amia.org that is probably one of the better definitions:

"...informatics has to do with all aspects of understanding and promoting the effective organization, analysis, management, and use of information".

Jennifer included a definition of ‘Informatics’ as that discipline that assists in the translation of raw data into actionable knowledge, i.e., something that could be used, and the dissemination of that knowledge to other individuals including health care professionals and consumers. She further defined ‘Pharmacy Informatics’ as that subspecialty of informatics which is applied directly to pharmaceutical care.

By her definition emphasis is on the USE of information and not the tools themselves.
Memory was something you lost with age
An application was for employment
A program was a TV show
A cursor used profanity

A keyboard was a piano
A web was a spider's home
A virus was the flu
A CD was a bank account
Informatics is as much a part of pharmacy today as any of the other disciplines. NO pharmacist can escape it and many embrace it. Some degree of information technology competence IS a growing requirement of pharmacy practice today.

I find it interesting that yesterday the Seattle PI carried an article: "Testing students for 'technology literacy'". Along with successfully passing the Washington Assessment of Student Learning (WASL) as a high school graduation requirement, the author speculated that students may one day be required to pass an exam demonstrating technological competence.

**What is the history of Pharmacy Informatics?**
Pharmacy and Laboratory Departments were some of the first areas in Health Systems (hospitals) to bring in 'stand-alone' systems. These systems fulfilled a departmental need to maintain records, print labels, produce reports and patient bills. In large part they were not really integrated. Today many health systems including our own are aiming for full systems integration. The goals are:

- Improve patient safety
- Improved Patient Care
- Reduce costs

Outpatient (retail) pharmacy systems have been automated for some time. Automation of this area was driven primarily by the need for billing. With the explosion of health care payors and a more mobile demographic it was essential to develop systems that supported electronic reimbursement.

What is an example in this Medical Center of the scope of a Pharmacy Informatics project?

**Medication Reconciliation Project**

What is it?

Why is it important to invest resources?

Seemingly simple until the process is analyzed:

1. Outpatient Clinic meds/Allergy records - System 1
2. Inpatient stay medications and allergy/intolerance - System 2
3. Discharge medications and allergy/intolerance - System 3
4. Paper chart & notes - System 4

The challenge ... how to bring it all together?
If you are interested in the topic of Pharmacy Informatics  there are opportunities to be a ‘fly-on-the-wall’ and listen in on the areas of concern to those of us involved in the area.

**Discussion email lists:**

The Pharmacy_Informatics_Grp Issues discussion group is a service provided by ASHP. The listserver is intended for enrollees to communicate about practice-related issues.

Send a message to the list to activate it.

Pharmacy_Informatics_grp@list.ashp.org

If you have any questions contact Toby Clark, Director at:

owner-pharmacy_informatics_grp@list.ashp.org@ashp.org

**Vendor-specific lists:**

Some discussion lists may be hosted BY specific vendors in which case they may be 'moderated' or not. Moderated means someone 'approves' postings. The function of 'moderator' when effective is NOT to 'filter' unfavorable content, but instead to filter actual 'spam' or 'off-topic' content.

Other lists can be found on Yahoo.Com, for instance that are specific to a single vendor or interest.

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**THE 'article' that has stimulated great discussion in the informatics community:**

Unexpected Increased Mortality After Implementation of a Commercially Sold Computerized Physician Order Entry System

PEDIATRICS Vol. 116 No. 6 December 2005, pp. 1506-1512

Pharmacist comments on the article:

“Reviewing this article should underscore the importance of proper planning and preparation for major change (including good forecasting of issues that may develop) and the necessity of having a well-designed method of evaluating the outcomes of a process change.”

--Kevin Purcell, MD, Pharm.D., Leadership Coach & Clinical Investigator
“The most important key to success is how you implement, not who you implement (can't always blame the vendor). If it takes 10 clicks to enter one medication order, you are impeding care. Clinician efficiency should never be taken lightly. Many systems (including the one studied) are not ready to support pediatrics (weight-based dosing) (for example). This needs to be taken into account when implementing for special patient populations.”
--Anne Bobb, RPh; Patient Safety Research Pharmacist

“When implementing such systems, great care should be given to reevaluating ALL operational activities -- start to finish – to determine the possible impact of this new technology. It is a fundamental change that will ultimately affect (in one way or another) nearly every activity in your institution.”
--Douglas Smith MS RPh; Senior Consultant

Perhaps of as much interest as the reasoned comments above would be the 'titles' of the commentators. We see some of what we might have expected:

- Pharm.D. - Clinical Investigator
- RPh - Patient Safety Research Pharmacist
- RPh - Consultant

Resource organizations:

Institute for Safe Medication Practices (ISMP)
http://www.ismp.org/
Devoted to medication error prevention and safe medication use. The organization is respected as a resource for medication safety information.

Healthcare Information and Management Systems Society (HIMSS)
http://www.himss.org
The healthcare industry's membership organization focused on providing leadership for the optimal use of healthcare information technology and management systems for the betterment of human health.

HIMSS Annual Conference & Exhibition - February 12-16,2006 in San Diego
http://conference.himss.org/education/index.asp

Sample Topic to be presented next week:
Pharmacy Informatics: How Connected Do You Want to Be?
Bill Felkey, Professor of Pharmacy Care Systems, Auburn University
"We live in a world that is rapidly becoming an integrated digital environment but healthcare is struggling and years behind other industries. While we are waiting for the perfect systems to be created there are so many technologies and methods we can adopt to make us more safe, efficient, and effective."

Take Bar-coding, for example. You can go into a grocery store and make ANY purchase and get it all scanned at the check-out counter INCLUDING 'odd' items such as produce AND Bulk bulgur wheat. In most of today's hospitals we can't tell you WHERE a $6000 dose of a drug is at all times. The pharmacy says we manufactured it. The delivery technician says it was delivered to the refrigerator. The patient needs it now.

Another example ... the company founded here in Seattle, United Parcel Service (UPS), can tell you where the $10 package you're expecting is at all times from the moment it leaves the shipping department of a company or in some cases WHILE it is being assembled on the floor of a manufacturing plant until it is delivered to your hands AND they have captured your electronic signature.

"The World is Flat" by Thomas L Friedman in his section:
  What the Guys in Funny Brown Shorts Are Really Doing

Why not Pharmaceuticals?

Microsoft Healthcare Users Group (MS-HUG)
http://www.mshug.org/ASP/about.asp

Unified with the Healthcare Information and Management Systems Society (HIMSS) as part of the HIMSS Users Group Alliance Program through a shared vision to provide leadership and healthcare information technology solutions that improve the delivery of patient care.

The mission of the Microsoft Healthcare User’s Group (MS-HUG) is to be the healthcare industry forum for exchanging ideas, promoting learning, and sharing solutions for information systems using Microsoft technologies. MS-HUG is primarily focused on information technology professionals and developers from healthcare providers.

Leapfrog Group --
http://www.leapfroggroup.org/

The Leapfrog Group is made up of companies and organizations that buy health care. Leapfrog and its members work to:
• Reduce preventable medical mistakes and improve the quality and affordability of health care.

• Encourage public reporting of health care quality and outcomes so that consumers and purchasing organizations can make more informed health care choices.

I mention this group because it is intensely data driven.

The Leapfrog Group identified four hospital quality and safety practices:

1. **Computer Physician Order Entry (CPOE):**
   With CPOE systems, hospital staff enter medication orders via computer linked to prescribing error prevention software. CPOE has been shown to reduce serious prescribing errors in hospitals by more than 50%.

2. **Evidence-Based Hospital Referral (EHR):**
   Consumers and health care purchasers should choose hospitals with extensive experience and the best results with certain high-risk surgeries. Based on scientifically valid criteria — such as the number of times a hospital performs these procedures each year or other process or outcomes data — research indicates that a patient’s risk of dying could be reduced by 40%.

3. **ICU Physician Staffing (IPS):**
   Staffing ICUs with doctors who have special training in critical care medicine has been shown to reduce the risk of patients dying in the ICU by 40%.

4. **The Leapfrog Safe Practices Score:**
   The National Quality Forum-endorsed 30 Safe Practices that, if utilized, would reduce the risk of harm in certain processes, systems or environments of care.

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**Literature Resources on Informatics/Medication Systems**

Three new related publications have become available for pharmacists and others interested in informatics and medication systems:

1) Health Care Informatics by Felkey, Fox and Thrower
2) Institutional Pharmacy Practice 4th Edition
   Chapter 23 Pharmacy Information Systems by Rowell Daniels
   Chapter 24 Automation in Practice by Steve Rough, Jack Temple
   Chapter 25 Informatics by James G Stevenson, Scott R. McCreadie, Bruce W. Chaffee
   Chapter 26 Electronic Data Management:
      Electronic Health-Record Systems and Computerized Provider Order-Entry Systems
      by James R. Knight, Stephen K. Huffines, S. Trent Rosenbloom
Educational Programs –
You’ve done some research – you want to pursue further study in the field.

Where can you obtain credentials to specialize in the field?
This information appears to be quite rapidly changing. If you have a strong interest, check with the school or institution directly.

Allen Flynn, Pharm.D. examined the public internet web sites of the 88 colleges of pharmacy for evidence of curriculum offerings in the field.


He reported that ONLY 24 had ANY apparent coursework in Pharmacy Informatics.

PharmacyInformatics.com http://www.pharmacyinformatics.com/
a collaborative effort of five Pharmacy Informaticists that have shared experience and training in informatics and information technology identify the following Informatics Programs and Residencies:
Ohio Northern University Pharmacy Pharmacy Informatics Residency
Auburn University PCS
James A. Haley VAMC Medical Informatics
Creighton University Drug Informatics
UCSF/First Data Bank Pharmaceutical Informatics

A quick search of the web turns up at least two other currently available residencies:

The Johns Hopkins Hospital - The Pharmacy Informatics Residency offers advanced training in emerging technologies and information handling at The Johns Hopkins Hospital along with the opportunity to work with technology projects at the American Society of Health-System Pharmacists in Bethesda MD.
This Specialized Residency in Pharmacy Informatics is a 1-year residency designed to foster knowledge and appreciation for the potentials and limitations of tools used to gather and disseminate information in the practice of pharmacy in the institutional experience.

**Vanderbilt University Medical Center** has established a one year specialty pharmacy informatics residency position beginning in July 2006 at Vanderbilt University Medical Center. The program is a partnership with McKesson Provider and pays a generous stipend of $48,000.

For those with a strong interest, when the time is right, fortunately you won’t have to travel far:

**Bellevue Community College:**
Medical Informatics Certificate Program  
30-credit program offered both as instructor-led and an online format.

**University of Washington:**  
Graduate Program in Biomedical and Health Informatics.  
Department of Medical Education and Biomedical Informatics  
Detailed course offerings  
[http://www.washington.edu/students/crs.cat/mebi.html](http://www.washington.edu/students/crs.cat/mebi.html)

Typical coursework on the more technical IT side:  
MEBI 531 "Computing Concepts for Medical Informatics"  
Introduction to computing concepts underlying the solution of problems in medical information management, medical problem solving and medical informatics research. Algorithms, data structures, programming languages, object-oriented programming. Prerequisite: some prior experience with computer programming and application computers in medical care.  
[http://www.washington.edu/students/icd/S/mebi/531ikalet.html](http://www.washington.edu/students/icd/S/mebi/531ikalet.html)

Typical coursework on the more clinical side:  
MEBI 552 “Clinical Decision Support”  
Doctor Provides foundation in clinical decision making and support (including decision analysis, Bayesian analysis, belief networks, artificial intelligence, neural networks) presented in the context of local and national decision support systems and the movement to decrease errors in healthcare.

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What is HIPAA?

The Health Insurance Portability and Accountability Act of 1996 (HIPAA), was the result of efforts by congressional healthcare reform proponents. The goals and objectives of this legislation are to streamline industry inefficiencies and reduce paperwork.

Title I of the Act improves the portability and continuity of health insurance. Title II provides for administrative simplification that requires the development of standards for the electronic exchange of health care information. Administrative simplification also requires rules to protect the privacy of personal health information and the establishment of security requirements to protect that information and the development of standard identifiers.

What does Administrative Simplification Mean?
A reduction of health care costs through the development of standards for the electronic exchange of health care information.

The Privacy Rule
The overall goal of HIPAA was to improve the efficiency and effectiveness of the health care system, which included adopting national standards for electronic health care transactions. Congress recognized that advances in electronic technology could erode the privacy of health information. Congress incorporated into HIPAA provisions that mandated the adoption of Federal privacy protections for individually identifiable health information.

The HIPAA Security Regulation compliance deadline was April 21, 2004. Of interest with this section is the requirement to have documented:

- Data backup plan
- Disaster recovery plan
- Emergency mode operation plan
- Testing and revision procedures

Yes, it DOES affect you as students:

- Data Confidentiality (non disclosure)
  This applies to YOU during your clinical rotations. It applies whenever you store patient data on a PDA, on removable media such as floppy, jump drive, flash cards, etc.

- Data Security
  You must maintain records for who MAY review Protected Health Information (PHI) (care relationships) AND who HAS viewed PHI for a particular patient.

- Databases MUST be routinely backed-up, to secure off-site storage.
  This is commonly referred to as the ‘business continuity’ requirement.
New technology

What new technologies should we be embracing?

Where should we be introducing these new technologies?

How soon can they be incorporated into WIDESPREAD daily practice?