Pharmacy Informatics Education: Then, Now, and Embed into any Rotation How?
Heidi S. Daniels, PharmD
Pharmacist Informaticist
NEFSHP Fall Meeting: Pharmacy Practice Updates 2015
Daniels.Heidi@mayo.edu
Mayo Clinic Florida Campus
Jacksonville, Florida

Objectives
- Answer the question: What is pharmacy informatics?
- Review the history of pharmacy informatics education
- Detail the current pharmacy informatics education requirements
- Describe opportunities for advanced pharmacy informatics education
- Discuss ways to incorporate pharmacy informatics into non–informatics Intermediate Pharmacy Practice Experience (IPPE) or Advanced Pharmacy Practice Experience (APPE) rotations

What is Pharmacy Informatics?
- National Library of Medicine definition of medical informatics:
  "...field of information science concerned with the analysis, use and dissemination of medical data and information through the application of computers to various aspects of health care and medicine."

Medical informatics/ Health informatics
- Bioinformatics
- Public Health informatics
- Imaging informatics
- Clinical informatics
- Nursing informatics
- Dental informatics
- Physician informatics
- Pharmacy informatics

Disclosure Statement
I have nothing to disclose concerning possible financial or personal relationships with commercial entities (or their competitors) that may be referenced in this presentation.


What Does an Informaticist do?

- Maintain databases of medication management systems
  - Using a clinical eye
- Liaison between information technology (IT) and pharmacy
  - Understanding system capabilities and limitations
- Identify solutions to and resolve system problems


What Does an Informaticist do?

- Assess systems for safety to prevent and reduce medication errors
  - Testing new versions/upgrades
- Develop clinical decision-support systems
  - Best practice guidelines and system rules
- Mine, aggregate, analyze, and interpret data
  - Research, inventory, financial, diversion, safety, optimization data, etc.


What Does an Informaticist do?

- Work with interdisciplinary teams to implement new technology
  - Barcode Medication Administration (BCMA)
- Leadership
  - Involvement in committees and professional organizations
- Education

Informatics Education Opportunities, Current Requirements, and History


Informatics Education Opportunities

- Pharmacists
  - Pharmacy school Accreditation Council for Pharmacy Education (ACPE) required competencies
  - IPPE exposure
  - APPE pharmacy informatics rotations
  - Post Graduate Year 1 (PGY1) rotation
  - Post Graduate Year 2 (PGY2) specialty
  - Fellowships
  - On the job training
- Technicians
  - On the job training


ACPE Required Competencies

- Developed from Institute of Medicine (IOM) report outlining the five competencies that all healthcare professionals should attain during their education:
  - Provide patient–centered care
  - Work in interprofessional teams
  - Employ evidence–based practice
  - Apply quality improvement
  - Utilize informatics
    - Communicate, manage knowledge, mitigate error, and support decision making using information technology

Table 3-1. Rules and the Core Competencies

<table>
<thead>
<tr>
<th>Rules for the 21st Century Health System</th>
<th>Provide Patient Centered Care</th>
<th>Employ Patient- Centered Care</th>
<th>Apply Quality Improvement</th>
<th>Work in Interdisciplinary Teams</th>
<th>Utilize Informatics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Care is based on evidence-based guidelines</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2. Care is based on evidence-based guidelines</td>
<td>XX</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3. The patient is a full partner in care</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4. Knowledge is shared and understood among providers</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5. Decisions are made in evidence-based manner</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6. Safety is a systems property</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>7. Transparency is necessary</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>8. Work is continuously improved</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**New ACPE Standard**

- Effective July 1, 2016
- New terminology describes Health Informatics requirements:
  - "Effective and secure design and use of electronic and other technology-based systems, including electronic health records, to capture, store, retrieve, and analyze data for use in patient care, and confidentially/legally share health information in accordance with federal policies."

**ACPE Required Competencies**

- Effective February 24, 2011
- "Demonstrate expertise in informatics"
  - Basic terminology (data, information, knowledge, hardware, software, networks, information systems, and information systems management)
  - Reasons for systematic processing of data, information and knowledge in health care
  - Use of data in continuous quality improvement initiatives
  - The benefits and current constraints in using information and communication technology in health care

**IPPE Exposure and APPE Rotations**

- Intermediate Pharmacy Practice Experience (IPPE)
  - Definition
  - Opportunity to introduce informatics
- Advanced Pharmacy Practice Experience (APPE)
  - Definition
  - Informatics specialty rotations available
  - Opportunity in non-informatics rotations to introduce pharmacy informatics

**Partners in e**

- Curriculum to teach pharmacy informatics
  - Online pre-recorded web courses
  - Slide deck that can be modified and taught live
  - Testing modules
- Originally developed by University of California, San Francisco School of Pharmacy with grant funds
- Free of charge for educational use
- Utilized by 65+ US colleges of pharmacy

**Post Graduate Informatics Training**

- PGY1 informatics rotations
  - Many residencies have required or optional informatics rotations
- PGY2 informatics specialties and fellowships
  - [http://www.ashp.org/DocLibrary/MemberCenter/SOPIT/InformaticsSpecialtyProgramMatrix.aspx](http://www.ashp.org/DocLibrary/MemberCenter/SOPIT/InformaticsSpecialtyProgramMatrix.aspx)
Technician Informaticists

- 2013 ASHP Statement on the Pharmacy Technician’s Role in Pharmacy Informatics
  - Pharmacy Technician Informaticist (PTI)

"...the PTI will be a health care professional, working under the supervision of a registered pharmacist, who uses his or her knowledge to influence and adapt IT systems to improve the effectiveness and efficiency of the health system."


Why Incorporate Informatics into a Non-Informatics Rotation?

- General lack of knowledge about informatics as a pharmacy specialty
- Pharmacy informatics plays a role in every aspect of pharmacy practice
- No need to be an informaticist to bring attention to informatics in action

Informatics Embedded into IPPE or APPE

- Goal is to introduce education which allows the student to participate in the medication use process within an informatics context
  - Utilize Partners in e program
  - Hands on learning activities/skills lab
  - Topic discussions

Partners in e Web Curriculum

- Introduction to HIT and HIE
- Strategies to Promote the Adoption of EHRs and HIE
- Introduction to Pharmacy Informatics
- Introduction to EMRs and EHRs and PHRs
- Interoperability
- E-Prescribing Basics
- Computerized Provider Order Entry

IPPE and APPE Learning Activities

- Broken down into medication use activities
  - Prescribing
  - Pharmacist prescription review
  - Compounding and dispensing
  - Medication administration
  - Monitoring of ongoing medication therapies
  - Overall

Prescribing Activities

- Review components and fields of prescriptions
- Discuss legibility issues of written, verbal, and electronic prescriptions (e-Prescribing)
- Discuss the rationale for structured data for e-Prescribing and computerized prescriber order entry (CPOE)
- Review clinical decision support options for prescribers

Pharmacist Prescription Review Activities

- Discuss the stepwise process to determine prescription appropriateness
- Review relationship between product availability and product selection in received prescriptions
- Discuss options for and document interventions related to prescriptions (electronically and/or on paper)
- Experiment with clinical decision support options for pharmacists
- Search electronic resources for evidence based medicine, clinical tools, and drug information

Compounding and Dispensing Activities

- Discuss the role, limitations, and benefits of dispensing automation for safe medication storage, preparation, and dispensing
- Watch a video describing IV robotics and automated IV workflow systems on how the technology prepares drug products while increasing safety
- Print and scan barcodes; note challenges of scanning due to label size/shape of dosage form
- Observe process of loading automated dispensing machines (ADMs)

Medication Administration Activities

- Review operational reports and metrics; identify methods to improve drug preparation/dispensing workflow
- Observe differences in nurse ADM workflow
- Use and discuss process of using barcode technology during inventory, drug preparation, and dispensing
- Observe automated medication tracking systems from receiving through patient medication administration
- Review telepharmacy workflow to check a drug preparation remotely
- Compare and contrast the benefits/limitations of paper and electronic medication administration records
- Observe role of smart infusion pumps in patient safety and the development of drug libraries
- Collaborate with nursing to review the 5 Rights of medication administration using automated systems
- Discuss/observe the role of auto-ID patient identification tools in ensuring the 5 Rights
- Review workflow allowing for IV interoperability communication between EHR and smart infusion pumps
Monitoring Medication Therapy Activities

- Discuss clinical documentation within the larger context of electronic health records
- Write clinical surveillance rules to identify potential adverse drug reactions and adverse drug events
- Observe the use of electronic clinical monitoring tools within community pharmacy software systems
- Discuss the various remote and mobile technologies to retrieve clinical information and medication database for us while on patient care rounds


Other Activities

- Discuss positive and negative workflow implications of health information technology
- Describe human factors engineering to design and optimize safety and efficiency of technology
- Describe technology implementation project management principles for the assessment, build, implementation, maintenance, and optimization stages


References