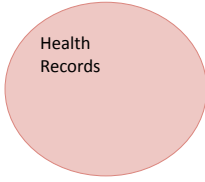# Health Informatics

Professor Kay Connelly

Health Informatics

Health Records

Electronic Health Records
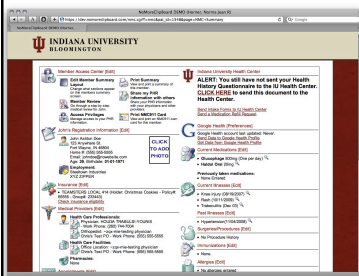
Health Records

- Increased efficiency
  - Within an institution
  - Between facilities
- Better care
  - For individuals
  - For populations

Personal Health Records

Health Records

- Patient control
  - Review EHR info
  - Upload own info

- Issues
  - Usability
  - Trustworthiness of data
  - Security

Personal Health Records
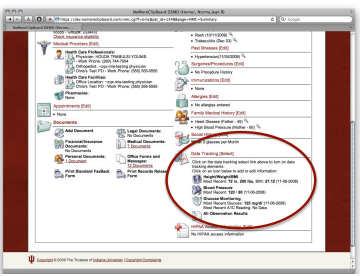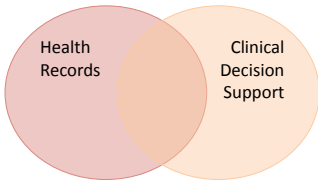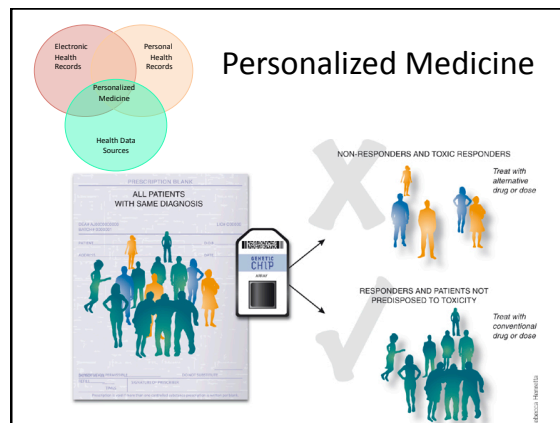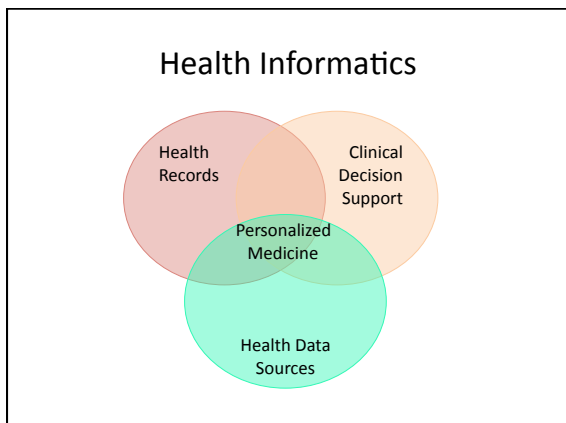
Health Records

- Patient control
  - Review EHR info
  - Upload own info

- Issues
  - Usability
  - Trustworthiness of data
  - Security

Health Informatics

Health Records

Clinical Decision Support

Clinical Decision Support

Algorithm for Acute Asthma Severity Decision Support System

- Combines **health observations** with **health knowledge** to influence **health choices**
  - Assists in decision-making process
  - Often embedded in EHR
- Technologies:
  - Knowledge base
  - Artificial intelligence

Health Informatics

Health Records

Clinical Decision Support

Health Data Sources

Health Data Sources

- Medical
  - Blood tests
  - Heart monitoring
  - Biomedical imaging (e.g. MRI, X-ray, CAT scan)
  - Physician notes
  - …

Health Data Sources

- Medical
  - Lab tests
- Biology
  - Genome

Health Data Sources

- Medical
  - Lab tests
- Biology
  - Genome
- Environment
  - Heavy metals (e.g. in fish)
  - PCBs
  - Pesticides
  - Mold
  - …

Health Data Sources

- Medical
  - Lab tests
- Biology
  - Genome
- Environment
  - Toxins
- Continuous Monitoring
  - Exercise
  - Nutrition
  - Heart rate, glucose, etc…

http://www.youtube.com/watch?v=jt8JqVdaTqI&feature=related

Health Informatics

Personalized Medicine

Informatics Areas

- Bio & Chem Informatics
  - Molecules/proteins
  - Genes
  - Pharmaceuticals
  → lots of data

➢ I371: Chemical Info
➢ I372: Molecular Modeling

Informatics Areas

- Bio & Chem Informatics
- Data Mining
  - Databases
  - Search
  - Learning and Artificial Intelligence

➢ I308: Information Representation
➢ I421: Applications in Data Mining
➢ I427: Search Info

Informatics Areas

- Bio & Chem Informatics
- Data Mining
- Security and Privacy
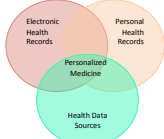
➢ I130: Intro to cybersecurity
➢ I230/231: Foundations of security
➢ I330: Legal/Social Info of security

Informatics Areas

- Bio & Chem Informatics
- Data Mining
- Security and Privacy
- Pervasive and Mobile Computing

➢ B355: Autonomous Robots
➢ B490: Topics – Mobile Computing
➢ P535: Pervasive Computing

Informatics Areas

- Bio & Chem Informatics
- Data Mining
- Security and Privacy
- Pervasive and Mobile Computing
- HCI/d
  - ➢ I300: HCI/d and programming
  - ➢ A346: User interface programming
  - ➢ I411: HCI/d I

Activity

- With a partner
- Think of one health-related thing that you would like to monitor
  - Physical activity, stress, water intake, smoking, etc…
- Design a system that can make it easy to monitor
  - Use an existing, common technology if you can!