Introduction to Health Informatics
HINF1100
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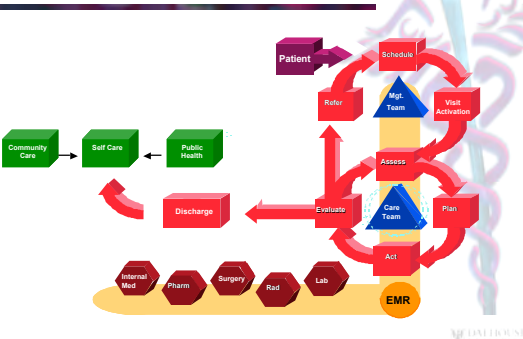**Halifax, Canada**

Objectives

❖ **Understanding Health Informatics**
  ❖ Objectives
  ❖ Practices

Healthcare Lifecycle

Information Flow in a Clinical Environment

Ms Smith is a 58 year old florist with a 15 year history of renal impairment caused by childhood pyelonephritis who is experiencing tiredness and muscle cramps. She has sought medical attention for similar problems in the past, and is considering doing so again
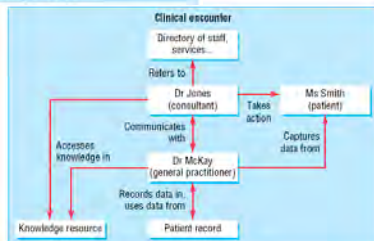
Information flows in a clinical environment

Health Informatics as a Discipline

❖ **Health Informatics is concerned with all aspects of understanding and promoting the effective organization, analysis, management, and use of information in healthcare.**

❖ **What is information in healthcare?**
  ❖ Information about the patient's health
    ❖ Medical record, lab results, medical images, disease diagnostics
  ❖ Information about the treatment of the patient
    ❖ Investigation requisitions, prescriptions, referral letters, discharge summaries
  ❖ Information about the healthcare resources available within a healthcare environment
    ❖ Physicians/nurses on duty, number of beds available, drug formulary, imaging devices, operation theatres
  ❖ Information about medical procedures to support clinical decisions
    ❖ Clinical protocols, clinical practice guidelines, best evidence, healthcare delivery policies
  ❖ Information about public health and patient education
    ❖ Risk assessment, lifestyle modification, health improvement, health alerts
  ❖ Information for making healthcare policies
    ❖ Resource usage and cost, disease outbreaks, societal concerns (privacy of health information)

Health Informatics: Definitions

❖ **"Medical informatics is the rapidly developing scientific field that deals with the storage, retrieval, and optimal use of biomedical information, data, and knowledge for problem solving and decision making." (Blois and Shortliffe, 1990)**

❖ **"Medical informatics is a developing body of knowledge and a set of techniques concerning the organizational management of information in support of medical research, education, and patient care.... Medical informatics combines medical science with several technologies and disciplines in the information and computer sciences and provides methodologies by which these can contribute to better use of the medical knowledge base and ultimately to better medical care." (Association of American Medical Colleges, 1986)**

❖ **"Medical informatics is the application of computers, communications and information technology and systems to all fields of medicine - medical care, medical education and medical research." (Collen, 1980)**

❖ **"Medical informatics attempts to provide the theoretical and scientific basis for the application of computer and automated information systems to biomedicine and health affairs . . . medical informatics studies biomedical information, data, and knowledge - their storage, retrieval, and optimal use for problem-solving and decision-making." (Lindberg, 1987)**

❖ **"...the understanding, skills, and tools that enable the sharing and use of information to deliver healthcare and promote health" (British Medical Informatics Society)**

Health Informatics Fields

- **Informatics = People + Information + Technology**

- **Health Informatics = Health + Healthcare + People + Information + Technology**
- **Health Informatics = Healthcare + (People = Practitioners+Patients+Administrators) + Information + Technology**

- **Health Informatics is a heterogeneous field--an intersection between various fields**
  - Health, IT, Psychology, Epidemiology, Education, Engineering, Management and CS

- **Health Informatics Specializations**
  - Nursing Informatics
  - Public Health Informatics
 - Consumer Health Informatics
  - *Medical Informatics*

Health Informatics as a Discipline

- **Health Informatics is not about computers and technology--instead it is about health, healthcare practice and delivery**

- **Health informatics emphasizes technology *only* as a tool to help organize, analyze, manage, and use information to improve healthcare delivery.**

Health Informatics Environment

Health Informatics Environment

| Practitioner | With | Technology Support | Better Than | Practitioner without Support |
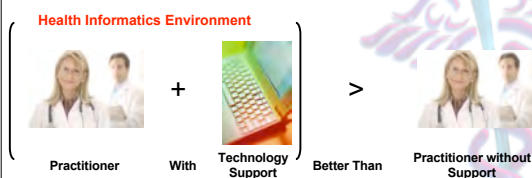
Creating an environment of "supported practice" such that an intelligent person (or practitioner) working in combination with information resources/technology is "better" than a person without such support

Charles Friedman, National Library of Medicine

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Role of Health Informatics

❖ **Health informatics aims to help practitioners by**
  ❖ Providing them efficient ways to capture, share and use patient information
  ❖ Helping them to make better and informed decisions and actions
  ❖ Improving outcomes

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Clinical Information: What a healthcare practitioner can do with it?

Medical record keeping
- What records to keep?
- In what format?
- What data to enter, and how?
- How to store records, and for how long?
- With whom to share the record?

How to use the information records contain
- To manage my patients?
- To audit and improve my service?
- To support my research?
- To feed another information system?

How to communicate with my colleagues and patients
- Face to face?
- On paper?
- Using the internet?

Clinical knowledge sources
- What knowledge sources are out there, and how to select them?
- How to use these sources to answer my own, and my team's clinical questions?
- How to keep knowledge and skills up to date?
- How to use knowledge to improve my own, and my team's clinical practice?

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Why Health Informatics?

❖ **Health informatics is the**
  ❖ Study of the way we think about patients, and the way that treatments are defined, selected and evolved.

  ❖ Study of how clinical knowledge is created, shaped, shared and applied

  ❖ Study of how we organize ourselves to create and run healthcare organizations

❖ *Health informatics is the logic of healthcare*

(Coiera, 2003)

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Why Health Informatics?

❖ **Health informatics allows**
  ❖ Capturing all information about a patient's health status (over the lifetime)
  ❖ Sharing all information about a patient amongst all potential care-providers
  ❖ Providing patients easy and timely access to healthcare services
  ❖ Ensuring that care-providers are informed about the best possible care methods
  ❖ Reducing medical errors due to the lack of information and knowledge
  ❖ Optimizing the healthcare resources to reduce healthcare costs and to provide efficient services
  ❖ Training better practitioners and educating patients
  ❖ Making informed healthcare policies

What does health informatics offer?

❖ **Health informatics offers**
  ❖ Health information systems
  ❖ Standards for recording health information
  ❖ Clinical support systems
  ❖ Communication systems (Internet based)
    ❖ Practitioner to practitioner
    ❖ Practitioner to patient
  ❖ Healthcare knowledge management
    ❖ Clinical practice guidelines, best evidence, terminologies
  ❖ Medical imaging systems
  ❖ Clinical data analysis systems
  ❖ Healthcare information retrieval systems
  ❖ Patient education programs (web-based)

Health Informatics Functional Objectives

❖ **Treating the right patient**

❖ **Treating the right patient right**

❖ **Treating the right patient right at the right time**

❖ *Treating the right patient right at the right time and in the right way*