Informatics & Technology in Healthcare

Technology allows people to have easier, quicker access to information they need

INFORMATION MUST BE:

- ✓ **The Right Information**
- ✓ *from* **the Right Person**
- ✓ *at* **the Right Time**
- ✓ *in* **the Right Place**
- ✓ *and in* **the Right Amount** --
- ✓ *and also be* **Accurate**,
- ✓ *easily* **Accessible**
- ✓ *and* **Understandable**
- ✓ *to do* **the Right Job.**

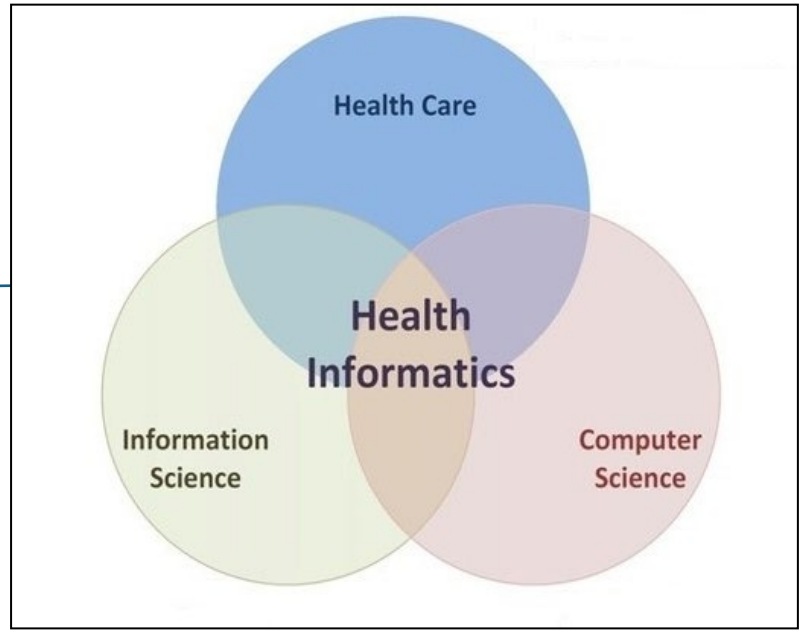
Information Technology

Any technology which processes and communicates data.

- **Includes:**
  - Computers
  - Voice Recognition Software
  - Data & Image Sensing Programs
  - Communications Devices
  - Graphics Devices
  - Multi-media storage

Informatics & Technology in Healthcare

Healthcare Informatics is the integration of health-care sciences, computer science, information science, and cognitive science to assist in the management of healthcare information



Goal

- To utilize technology to organize, analyze, manage, and use information to improve the health of populations, communities, families, and individuals by optimizing information management & communication.

The Benefits of Healthcare Informatics

- **Improves** the safety & efficiency of patient/resident care.
- **Increases time** with the patient/resident and family by freeing the healthcare provider of non-value added activities.
- **Communicates & coordinates** care with ALL other clinical disciplines.
- **Coordinates** transition of care.
- **Manages** ALL information related to the patient/resident care.
- **Brings** evidence for decision making at the point of care.
- **Creates** a better work environment for the healthcare providers.
- **Enhances** workflow while being supported by the hospital's IT infrastructure.
- **Facilitates** analysis of clinical data.

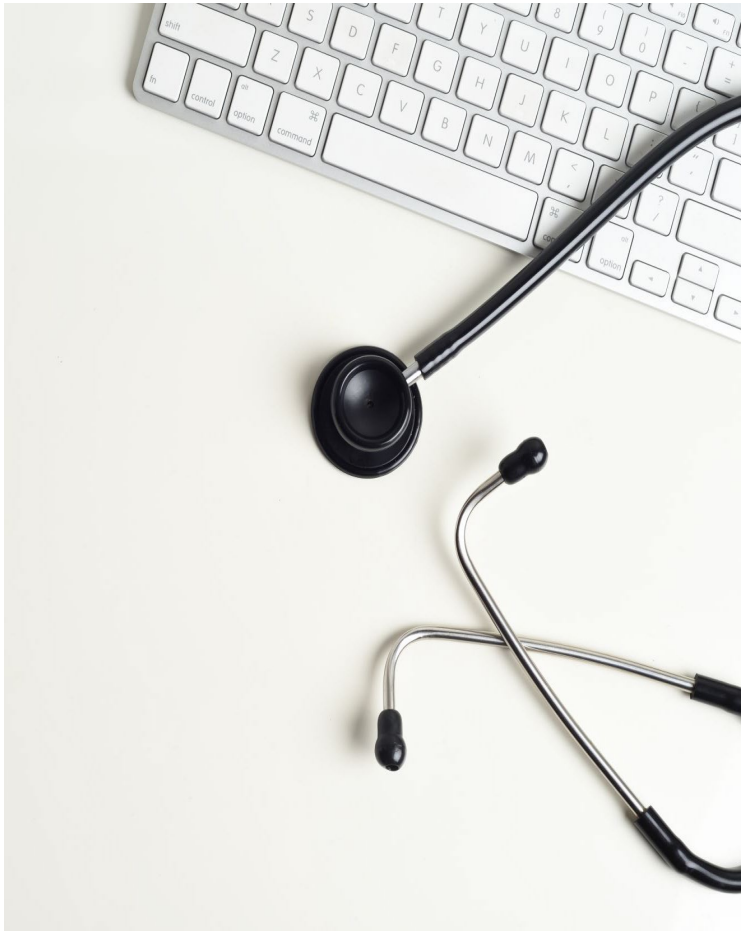
Application of Healthcare Information Technology

Healthcare Information Technology can be applied to all areas in healthcare:

- Clinical Practice
- Education
- Research
- Administration

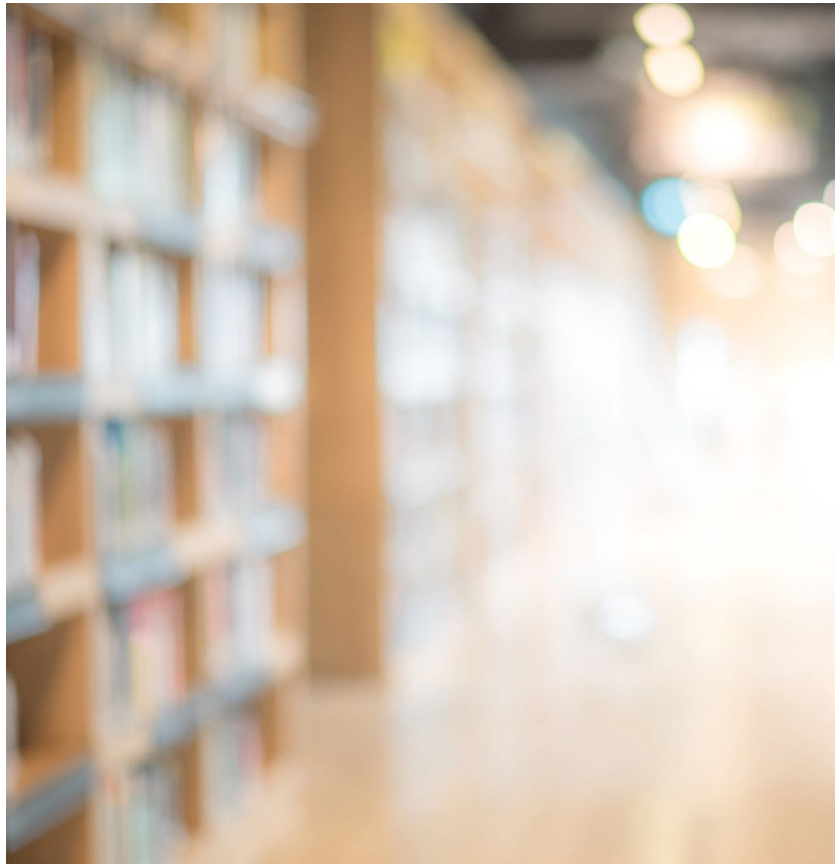
Current Information Technologies: In Practice

- **Wireless Devices**: hand-held computers & smartphones for ubiquitous connectivity.
- **Delivery Robots**: Used for meal, lab, and pharmacy deliveries, improving efficiency.
- **Workflow Management Systems**: Automated census boards optimize resource allocation.
- **Wireless Patient Monitoring Systems**: Prevent falls through continuous patient monitoring.
- **Electronic Medication Administration**: Barcoding enhances medication safety & tracking.
- **Electronic Clinical Documentation**: Supports clinicians with decision-making tools.
- **Patient Engagement Systems**: Portals empower patients to manage their healthcare.
- **Telemedicine**: Provides remote healthcare services, improving accessibility.
- **Robotic Surgery/Minimal Invasive Procedures**: Enhance precision & control for surgeons.
- **Bioprinting for Tissue Engineering**: Creates replacement tissues / organs using patient cells.
- **3D Printing for Prosthetics & Surgical Guides**: Customized solutions for patient needs.



Current Information Technologies: In Education

- **Virtual Classrooms and Learning Management Systems (LMS)**: Enable remote learning.
- **Adaptive Learning Platforms**: Customize educational content and pace to individual student needs.
- **Gamification and Interactive Learning**: fostering active learning.
- **Augmented Reality (AR) and Virtual Reality (VR)**: immersive learning experiences, allowing students to explore concepts in simulated environments.
- **Task Trainers**, Human Patient Simulation; i.e., Simman, Simbaby
- **Artificial Intelligence (AI) in Education**: Personalize learning experiences, offer feedback, and aid in content creation and grading.
- **Flipped Classroom Model**: Shift lecture content delivery outside the classroom, allowing interactive activities and discussions during class time.
- **Digital Assessment and Feedback Systems**: Streamline grading, offer immediate feedback, and track student progress efficiently.
- **Remote Proctoring Solutions**: Ensure integrity in online assessments through secure monitoring and authentication methods.



Current Information Technologies in Reasearch and Administration

Research:

- **Computerized literature searching-**Utilizing databases such CINAHL, HINARI, Medline and Web sources to access vast repositories of academic literature, enhancing research efficiency and breadth
- **Standardized Medical Terminology Adoption:** related to medical terms to ensure consistency and accuracy in communication, facilitating interoperability and data exchange in healthcare research.
- **Trend Analysis in Aggregate Data:** Leveraging statistical software to analyze aggregate data from large population groups, enabling researchers to identify trends, patterns, and correlations, thus informing evidence-based decision-making and policy formulation.

Administration:

- **Automated staff scheduling:** Implementation of software solutions to automate and optimize staff scheduling
- **E-mail for improve communication:** Utilizing email platforms to enhance communication
- **Cost Analysis and Budget Trends:** Utilizing IT tools for cost analysis and trend identification to inform budget planning and resource allocation.
- **Quality Assurance and Outcomes Analysis:** Leveraging information technology for outcomes analysis, to monitor and improve the quality of care delivery

Automation of Documentation

Automated documentation provides:

- Up-to-date and accurate information on each step of patient / resident care and is the ***Power*** behind safe, high-quality patient-centered care.

E.H.R. Core Components
Identified by the 2003 IOM Report

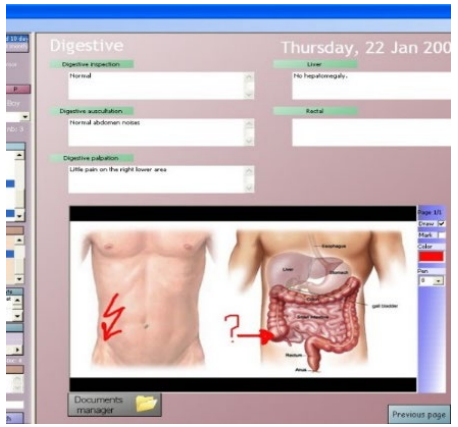
- **Health Information & Data**: Electronic chart hold everything that is included within a paper chart.
- **Result Management**: Ability to manage all test results (labs, X-ray reports).
- **Order Management**: Prescriptions are written electronically to reduce medical errors. Orders are automatically generated.
- **Decision Support**: Warnings/reminders to enhance clinical performance.
- **Electronic Communications & Connectivity**: An interoperable system that is able to connect with multiple providers, the patient, labs, & hospitals in a secure manner.
- **Patient Support**: Provide patients with educational material as well as the ability to enter data through home monitoring devices.
- **Administrative Processes**: Improves the efficiency in scheduling appointments.
- **Reporting:** Standardized system to produce reports that are demanded by state, federal, and local levels.

E.H.R. Advanced Features & Functions

- **Ancillary Systems:** Information can be shared with multiple providers, the patient, labs, and hospitals in a secure manner.
- **Clinical Data Repository:** Full charting capabilities for healthcare providers.
- **Physician Documentation:** Computerized physician order entry allows physicians to enter orders for medications, laboratory tests, procedures, and imaging studies.
- **Bar-Coded Medications Administration (BCMA):** use wrist bands with bar codes to identify patients and to check the medication to be administered against the information in pharmacy records.
- **Continuity of Care Document Transactions:** Information can be shared across health care settings.
- **Decision Support:**
    - Basic decision support: alerts and reminders such as drug interactions or warnings for order duplications (e.g., ordering a chest x-ray when a current one is extant).
    - Advanced decision support: protocols, advanced drug-related alerts, and aid in drug selection.

Electronic Health Record

With more complete patient information, healthcare providers improve their ability to make well-informed treatment decisions quickly and safely.



Ethical considerations in Information Technology

- Potential breaches in confidentiality via phone, fax and emails
- HIPAA violations can be substantial depending on severity of violation
- Patient education materials from credible websites; i.e., MedlinePlus; WebMD; MayoClinic, etc.

Conclusion

- Technology will play a leading role in the future of healthcare
- National healthcare organizations support the need for healthcare providers to become computer literate and well-versed in the dynamics of informatics.
- To thrive in the digital era, healthcare providers must engage in the rapidly advancing technology revolution.
- EHR supports, drives, and sustains Evidenced-based Practice (EBP) within the care delivery area.

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