

Unit One - Terms and Tech

Information Technology Applications - Lecture Notes

Introduction

Computers have become essential in almost every aspect of health care.

- Computers are processors of information.
 - Process large amounts of information at incredible speeds, accurately, and consistently.
 - Their processing speed is their major advantage over humans.
- All health care services have gained a greater ability to treat, diagnose, and care for patients thanks to computers.

Examples

- What are some of the many computer interactions you have had today?
 - Car
 - Microwave
 - VCR/DVD
 - Oven
 - Camera
 - ATM
 - Credit Card
 - Cash register
 - Telephone, cell phone
 - Store scanner
 - etc.

Computer Literacy

- Whether you want to be a physician, nurse, lab technician, nurse's aide, radiology technician, dietician, pharmacist, physical therapist, or any other type of health care professional, you must have a working knowledge of computers.
- Computer literacy:
 - A basic understanding of how a computer works and of the applications used in your profession.
 - Feeling comfortable using a computer for your job needs.

Four Areas Computers Are Used

1. Hospital Information Systems (HIS) or Medical Information Systems (MIS)
 - Managing budgets, inventories, lab reports, ordering, personnel scheduling, and general records.
 - Maintain and retrieve vital patient information including demographics, insurance, etc.
 - Patient medical records.
 - Drug interaction alerts.
 - Patient scheduling.
 - Clinical Pathways/Care Maps – standardization of care
2. Diagnostic Testing
 - Computerized Tomography (CT Scan), Magnetic Resonance Imaging (MRI), Positron Emission Tomography (PET), Stress Testing, Electrocardiograph, and Ultrasonography.
 - Development of these types of computer applications have contributed to more accurate and less invasive methods of diagnosis and treatment.
3. Educational Tools
 - Computer-assisted Instruction, Interactive Video.
 - Research has shown that computer-based learning decreases time on the task, and increases achievement and retention of knowledge.
4. Basic & Applied Research
 - Statistical analysis of data.
 - Internet, databases.
 - Computer controlled research testing.

History of the Computer

- First computers were installed in hospitals in the late 1950's and early 1960's.
 - They often overheated and became inoperable for many hours.
- 1970's - Invention of the silicon chip.
 - Computers are now much smaller, more powerful, and less expensive.

Computer Predictions

- **1949** – “Computers in the future will weigh no less than 1.5 tons” (Popular Mechanics).
- **1943** – “I think there is a world market for maybe 5 computers” (Thomas Watson, Chairman IBM).
- **1977** – “There is no reason anyone would want a computer in their home” (K. Olson, founder of Digital Equipment Corp).
- **1981** – “640K ought to be enough for anybody” (Bill Gates).

Computers Can Be Frustrating

- Not always user-friendly, don't know how to use them.
- Steep learning curve; always changing.
- Down time – when they aren't working it seems impossible to get our work done.
- Put information in and can't get it back out.
- Expense, upkeep, and maintenance.

Contingency Plans

- Whenever humans depend on machines, contingency plans need to be made just in case the machine stops functioning.
- Computer downtime may be scheduled or unexpected.
- Medical facilities must have manual methods available to accomplish all of the tasks a computer does.
 - Examples: patient admissions, bed assignments, medical records, ordering, **scheduling, etc.**

Computers Can Be Our Friends

- They can make our jobs simpler. Examples:
 - Data analysis
 - Presentation of information
 - Internet
 - Databases
 - Appointment scheduling (coordinate multiple appts, auto reminders)
 - Patient monitoring
 - Medical claims
 - Paperless records (pharmacy, lab results, radiology)
 - Information at our fingertips (electronic medical records)
 - Email systems
 - Off site/telemedicine
 - Payroll, employee info
 - Communication
 - Create documents (word processing, spreadsheets)

Ethics and Confidentiality

- The health care worker must remember the importance of ethics and confidentiality when using a computer.
- Computers contain privileged information that must be protected.
- Keep your identifications codes and passwords confidential to protect you and the patient.

Communication

- Email (Electronic Mail)
 - A means of creating and sending messages from one computer to another using a system of networks.
 - Now a standard professional communication tool.
 - Can attach documents and files.
 - It is essential that email messages be clear and accurate.
 - Keep messages brief and to the point.
 - No personal email correspondence - employers have the right to read and monitor any messages sent through their computers.

Fax Machines

- Actually invented in 1843, Alexander Bain.
- Connects to a normal phone line and allows you to transmit pieces of paper to someone else instantly.
- Image sensors look for black or white in a single line of the document, translates those into “bits” which travel through the phone line and arrive at a receiving fax machine. Bits are decoded and reassembled into the scanned lines of the original document.

Telemedicine

- Medicine is practiced over telephone lines.
- Images, such as x-rays can be transmitted.
- Benefits:
 - Allows patient access to specialists located far away.
 - Communicate vital signs from home to a facility.
 - Perform physical exams from a distance.
 - Link physicians to emergency medical workers in the field.
- Problem: Most state licensing laws do not allow physicians to give medical advice via telephone to patients in other states.
 - Technology is advancing more quickly than society.

Telepharmacies

- Allow dispensing of drugs at sites other than pharmacies.
- Instructions for prescriptions are sent to a computerized dispensing unit over telephone lines.
- The dispensing unit prepares and releases the exact dosage.
- Safety features are built into the system to prevent incorrect types and amounts of drugs from being dispensed.

Virtual Communities

- Individuals who use the Internet to communicate and share information.
- Discussion groups and methods for exchanging information can be very valuable.
- Health care workers and patients can share information and experiences about specific health conditions.
- Examples:
 - Chat rooms – correspond in real time.
 - Listserves – receiving a newsletter/info on specific topics.

Internet

- Began as a method for government authorities to communicate in case of a nuclear attack.
- Has rapidly grown to become a principal means of communicating, conducting business, shopping, learning, and securing needed information.
- Medical uses for the Internet:
 - Organ transplant databases.
 - Research and information.
 - **Patient education.**

Summary

- Computers are an essential part of health care and also a necessity.
- All health care services have gained a greater ability to treat, diagnose, and care for patients through computerization.
- Every health care worker should have basic computer literacy.
- Bottom line – computers DO enhance the quality of patient care!!!