Importance of Computers in Medicine

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Importance of Computers in Medicine

Computers play a key role in almost every sphere of life. Because of

❖ They facilitate storage of huge amounts of data.

❖ They enable speedy processing of information and they possess an inbuilt intelligence.

❖ Capabilities, computers function on levels close to that of a human brain.

Importance of Computers in Medicine

❖ **Advantages of use computer in medical**

- Data Storage
- Surgical Procedures
- Diagnostic Tests
- Knowledge Sharing

❖ **Disadvantages of use computer in medical**

1. **Cost**
   - ✓ **Computers cost money.**
   - ✓ **Creating a network to transfer medical records**

2. **Security**

# The three <u>main uses</u> of computer in medical field are

- **Patient Monitoring**

Different electronic scanning devices are used in hospitals. They are connected with computers. These devices are used to monitor the patient continuously

- **Maintaining Patient History & Other Records**

The complete bio-data as well as medical history of a patient is recorded into the computer. The medical history is delivered to the related doctor for the check up of the patient. In this way, much of the **doctor's time is saved**.
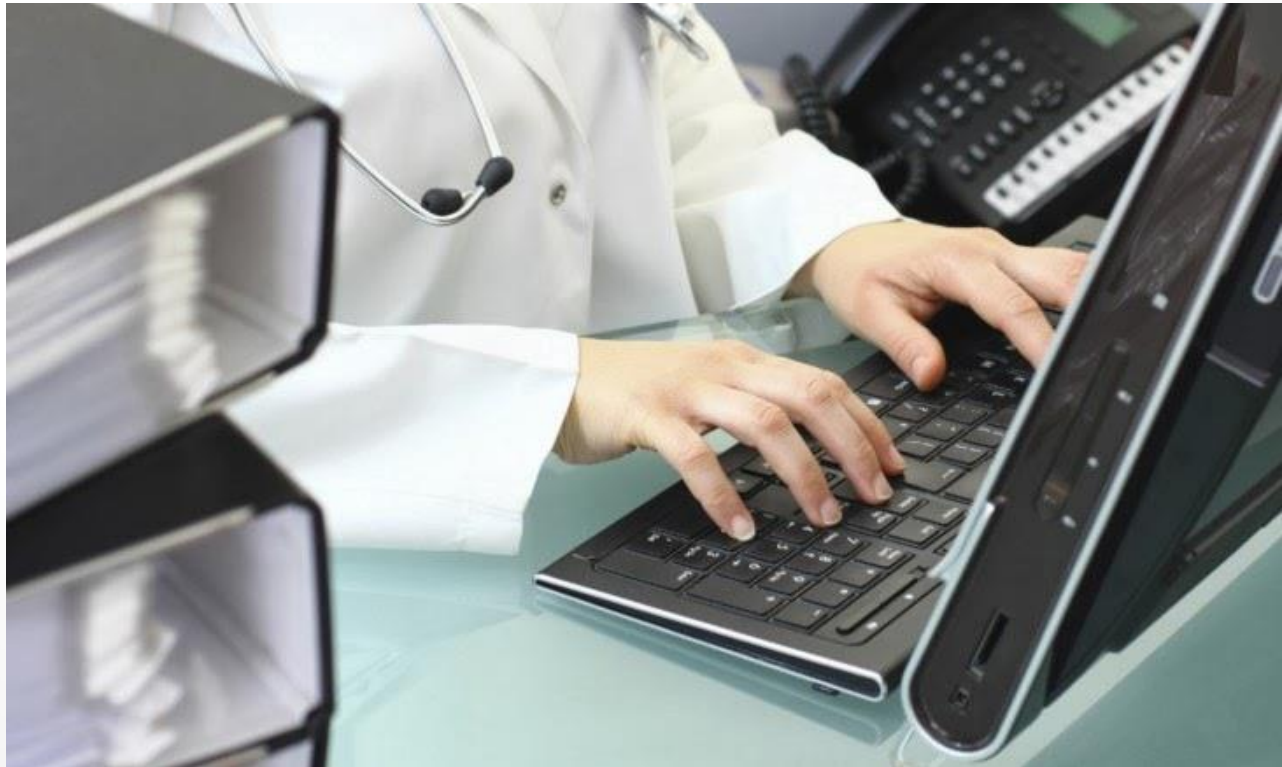
• **Diagnosis**

Computer is also used in hospitals for diagnosing diseases. Different medical tests depend upon the computerized devices such as laboratory test of blood and scan the body of patient .

It displays an image of bone and tissue structure of patient on a computer screen. This image is printed on the printer. It is also store in computer for late use.

Digital Radiography in the SIAST Dental Clinic Using Wireless Compu

Applications of Computers in Medicine

- Medical images.
    - ❖ Digital x-ray images.
    - ❖ Digital microscope image
- Electronic medical records.
- Clinical decision support systems.
- Hospital administration.
- Video games to hone laparoscopic surgeons'.

APPLICATIONS OF COMPUTERS IN MEDICINE

1. **Medical images**

2. **Electronic medical records.**

3. **Clinical decision support systems.**

4. **Hospital administration.**

5. **Video games to hone laparoscopic surgeons'**

Electronic medical records(EMRs)

(EMRs) is **electronic** medical records, contain **general information** such as **treatment** and **medical history** about a patient as it is **collected by the individual medical practice**

The objectives of EMRs

❖ **Improve Quality, Safety, Efficiency**

❖ **Engage Patients & Families**

❖ **Improve Care Coordination**

❖ **Improve Public and Population Health**

❖ **Ensure Privacy and Security for Personal Health Information**

Electronic medical records(EMRs)

EHRs help providers **better managed care** for patients and provide better health care;

1. Providing accurate, **up-to-date**, and complete **information** about patients
2. Enabling **quick access** to patient records
3. Securely **sharing** electronic **information**
4. Helping **providers more effectively diagnose** patients, **reduce medical errors,** and **provide safer care**.

5. Improving patient and **provider interaction and communication**.

6. Enabling **safer,** more **reliable prescribing.**

7. Reducing **costs** through **decreased paperwork**

Electronic medical records(EMRs)

Benefits of Electronic Health Records (EHRs)

- **Improved patient care**

- **Improved care coordination.**

- **Increase patient participation (مشاركة)**

- **Improved diagnostics and patient outcomes.**

  - **94%** of providers report **readily available** at point of care.

  - **88%** produces clinical benefits for the practice.

  - **75% of** allows them to deliver better patient care.

Clinical Decision Support Systems(CDSSs)

- (CDSSs) are **computer programs** that are **designed** to provide expert **support** for health professionals making **clinical decisions**

- The **goal** of these systems is to **help health professionals analyse patient data and make decisions** regarding diagnosis

The benefits of CDSSs, including:

A. **Increased quality** of care and **enhanced health outcomes**

B. **Avoidance of errors and adverse events**

C. **Improved efficiency**, **cost-benefit**, and **provider patient satisfaction**

Computer use in Hospitals

The use of information and communication technologies has become widespread in the health care sector to allowed nurses and doctors to work more efficiently with patients and each other.

1. Administration

2. Research

3. Community setting

4. Clinical implications

Research

- Preparation of a research document

- Data gathering

- Computer assisted instruction

- Simulation

- Tutorials

Community setting

In community settings, we use **computers for:**

- Gathering **Statistics**
- **Patient-appointments**
- Identification Systems
- Home Care Management
- And Automated Remote Patient Monitoring.

Clinical Implications

In clinical implication, computers are used for:

- Assessment
- Patient Monitoring
- Documentation
- Telemedicine
- Electronic Medical Records (EMR)

Video Games

Video games is a **practical teaching tool** to help **train surgeons or dentist**

Dental video games have been around since the first flourishing of the art in the early **1980**s

- Training
- Experience
- Reduce Errors
- Reduce the Cost
- Dental Plans Will Make it Affordable

Dental Imaging Examples

- ▶ Intraoral devices
- ▶ Panoramic dental systems
- ▶ Head imaging
- ▶ Cone Beam CT
- ▶ Visible Light applications

Digital x-ray images

Digital x-ray images are the most common of computer application in medical.

X-ray allow dentists to look at what is happening beneath the surface of your teeth and gums.

Digital X-ray in dentistry provides the clinician with the ability to store their images on a computer. This provides advantages as;

➢ Enhanced
➢ Zoomed
➢ Aiding diagnostics
➢ Providing easier patient communication
➢ Allowing dental offices to communicate images electronically

The Benefit of Digital X-Ray

- Safer
- Healthier
- Faster
- Better
- Easier
- Environmentally Friendly
- Higher Quality Images
- Image Analysis
- Image Enhancement
- Shorter Dental Appointments
- Allows For Quantitative Evaluation

Digital Imaging in Dentistry Applications

❖ A picture is worth a thousand words

❖ Knowledge is valuable

❖ Don't waste it

Digital Dental X-ray Methods Techniques

- The direct method

- Indirect method

- Semi-indirect method

Digital Dental X-ray Categories

Extra-oral dental X-RAY
Is taken outside of the mouth. Where
the film or sensor is placed outside the
mouth aiming to visualize the entire oral
maxillofacial

INTRAORAL DENTAL X-RAY
Is an X-ray that is taken inside the mouth.
Where the film or sensor is placed in the
mouth, the purpose being to focus on a small
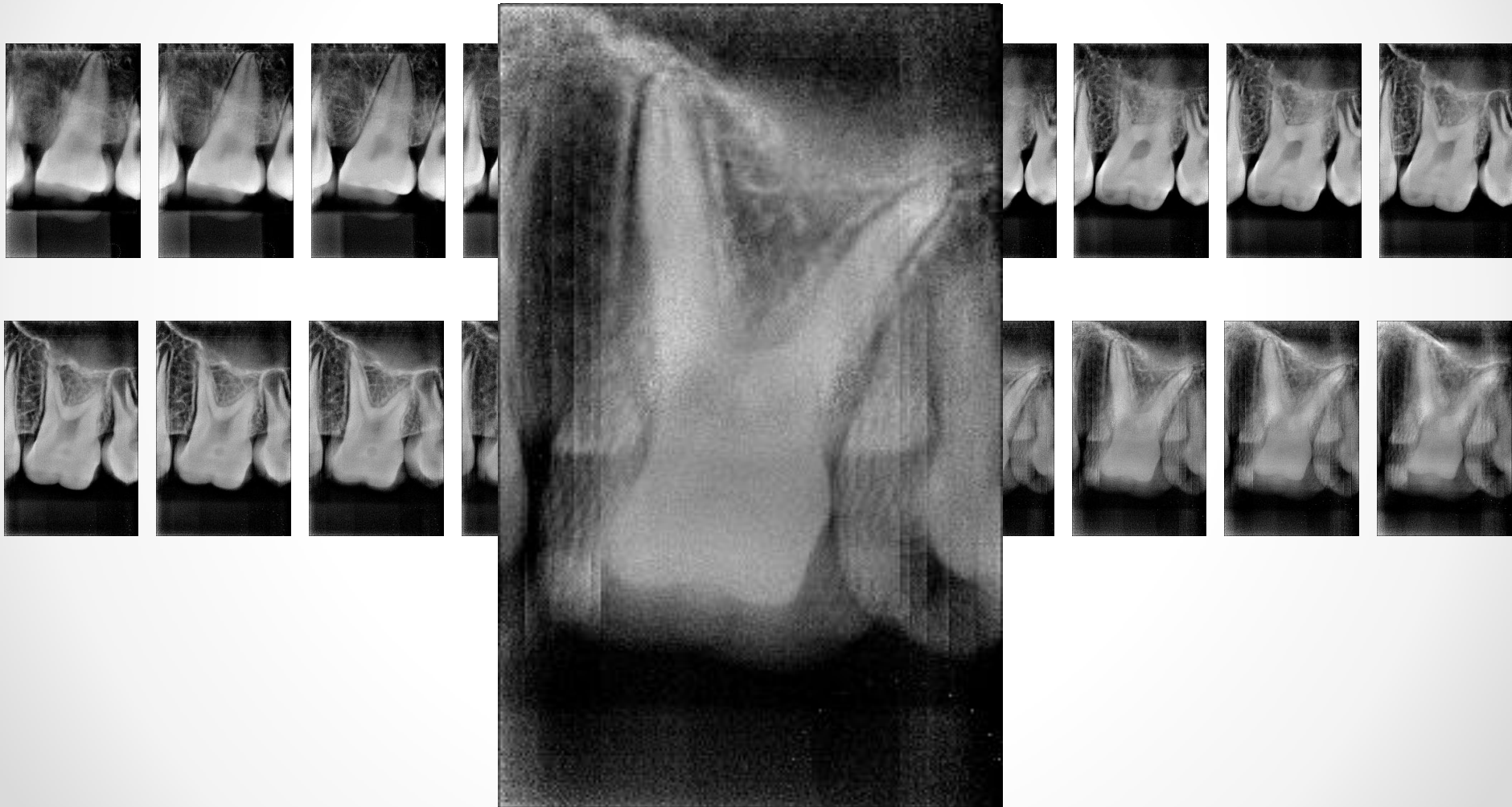region of the oral-maxillofacial region

Advantages of Digital X-ray

- ➢ No Darkroom
- ➢ No Chemical Processing
- ➢ Lower Cost Per Image
- ➢ Instant Viewing of Images
- ➢ Less Radiation to Patient
- ➢ Image Processing and Analysis
- ➢ Transmission of Images for Consultation

Disadvantages of Digital X-ray

- Disadvantages of the digital dental X-ray include the;

    - Initial cost of the system

        - Some difficulty in placing the sensor with the holder in the third molar region

Digital System Components