ELECTRONIC HEALTH RECORD

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Color index:
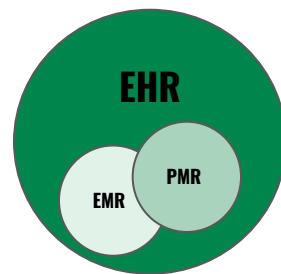- **Important**
- ☀️ Golden notes
- Doctors notes

Introduction

- There is no topic in health informatics as important, yet controversial, as the electronic health record (EHR).
- In spite of fledgling EHRs being around for the past 35-40 years they are still controversial in the eyes of many
- In 1991, IOM recommended EHR as a solution for many problems. The Computer-Based Patient Record: An Essential Technology for Health Care.
- The features of EHR as mentioned in that report:
  - Evidence based decision and support
  - Result management
  - Computer management
  - Patient support
  - Reporting support

1- Electronic Health Record (EHR)

- An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed and consulted by authorized clinicians and staff **across more than one healthcare organization**.

Electronic Medical Record	Personal Health Record
"An electronic record of health-related information on an individual that can be created, gathered, managed and consulted by authorized clinicians and staff **within one healthcare organization**." The difference between this & EHR is that this is for one health organization	"An electronic record of health-related information on an individual that conforms to **nationally recognized interoperability standards** and that can be drawn from **multiple sources** while being managed, shared and controlled **by the individual**."

- There is no a universal accepted definition of EHR
- EHR will handle information of both patients and healthy people
- EHR is NOT a digital copy of a paper record
- PHR will be controlled by the individual instead of hospitals or healthcare organizations

Electronic health records

2- Advantages

1   **Paper records are severely limited[1]**

2   **Need for aggregated data[2]**

3   **Need for improved efficiency and productivity [3]**

4   **EHR as a transformational tool**

5   **Quality of care and patient safety**
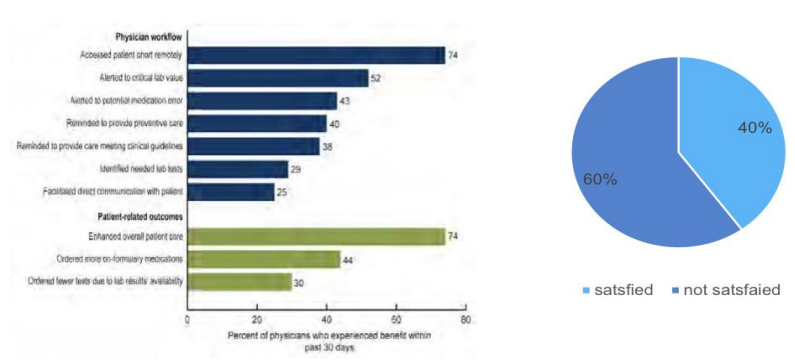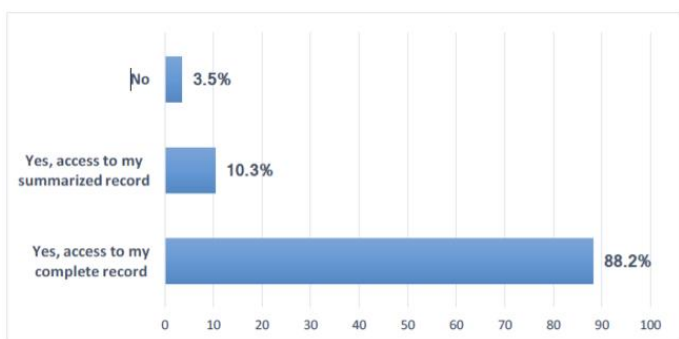
6   **Need for coordinated care**

7   **Public expectations**

8   **Technological advances**

9   **Financial savings[4]**

1- handwriting, no analysis, expensive to copy and transport, easy to destroy, hard to track, easy navigation, might not be uasly used in research.

2- cannot be done with paper, paper cannot integrated, we also need aggregated data because we can analyse it.

3- decrease in duplication, paperwork, it also adds the feature of decision support system

Electronic health records

3- Key components

Clinical decision support (Guidelines, reminders and alerts)	**Results retrieval**	**Access via mobile technology**	**Integration with physician and patient education**
Secure messaging between health care provider and patient	**Prior encounter retrieval**	**Remote access from home**	**Public health reporting**
Computerized physician order entry (CPOE)	**Patient reminders**	**Electronic prescribing**	**Problem summary lists**
Practice management software such as scheduling	**Electronic encounter notes**	**Integration with images**	**Ability to scan in data** An example of software that convert different type of documents into searchable and editable documents is OCR
Referral management	**Multiple input methods**	**Robust backup systems**	**Ability to graph and track results**
Ability to create patient lists	**Ability to create registries**	**Privacy/security compliance**	**Support for client server or application service provider (ASP) modes**

Electronic health records

4- Computerized Physician Order Entry (CPOE)

- **CPOE** is an EHR feature that processes orders for medications, lab tests, imaging, consults and other diagnostic tests.
- CPOE has many potential benefits:
  - Reduce Medication Errors
    - We will not be using handwriting so everyone can read it clearly and also this makes it easier to share in the CDSS.
  - Reduce costs
  - Reduce Variation of Care
    - Specific guidelines that you follow to deliver standardized care.
- Unintended adverse consequences

5- Clinical Decision Support Systems (CDSSs)

- **Clinical Decision Support** is any electronic or non-electronic system designed to aid directly in clinical decision making, in which characteristics of individual patients are used to generate patient-specific assessments or recommendations that are then presented to clinicians for consideration.

| Knowledge support	- UpToDate, diagnostic (ICD-10) codes, and infobuttons.
Calculators	- Appropriate antibiotic dosing.
Flow charts and graphs	- To look at lab or vital sign trends over time.
Medication order support	- To detect any allergies or drug-drug interaction and also proper dosing.
Reminders	- Remind clinician or patient about pending tests.
Order sets	- Inpatient clinical practice guidelines for specific scenarios.
Differential diagnosis	- Software exists that helps clinicians analyze symptoms and signs, to arrive at a diagnosis.
Lab and Imaging decision support	- For example: which criteria i should follow to decide ordering CT scan or MRI.
Public health alerts	- Primarily infectious disease alerts for new outbreaks, e.g. MERS virus

EHR Registries

Definition	An organized system that uses observational study methods to collect uniform data (clinical and other) to evaluate specified outcomes for a population defined by a particular disease, condition, or exposure, and that serves one or more predetermined scientific, clinical, or policy purposes

Types	• Chronic disease management registries • Research registries • Safety registries: Reporting system • Public health registries: for immunization and cancer • Quality registries: Performance

- **Geographic information system (GIS) maps demonstrating the diabetic patient distribution for:**
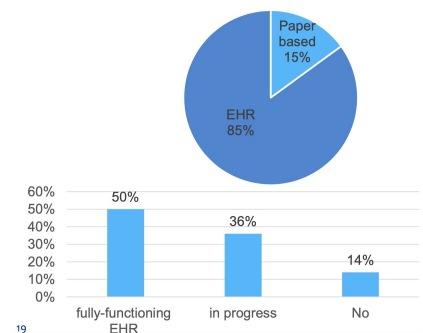   - (a) type 1 diabetes
    - (b) type 2 diabetes at the country level
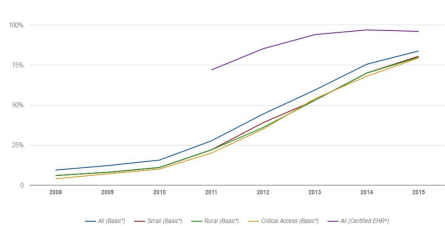   - (c) the distribution of different age groups in all health sectors.
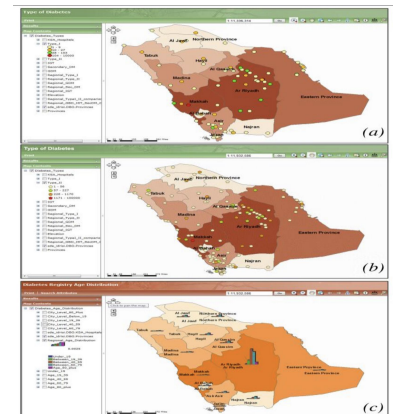
EHR Adoption

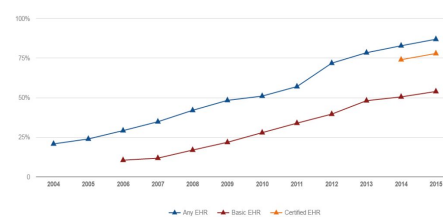- **EHR Adoption in Saudi Arabia :**
    - Eastern Province study (Bah, Alharthi, El Mhalli, 2011): Only 3 of 19 hospitals adopted EHR. They implemented the same EHR system which includes three main modules; laboratory, radiology, and pharmacy.

Inpatients EHR Adoption

Outpatients EHR Adoption

Steps:

1- Pre-implementation:
- Decision of purchasing EHR.
- Workflow mapping

2- Implementation: (From signing contract to go live)
- Team: clinical champion (can be nurse or any clinical employee not necessarily a physician), project manager, a senior administrative sponsor.
- Tactics
- Technology

3- Post- implementation (maintenance)

EHR Challenges

Financial Brarries	• Most common one, small healthcare organizations may face some problems.
Physician Resistance	• Because everything done by physician will be changed.
Loss of Productivity	• Caused by physician resistance. • A good method to deal with this challenge is what we call (Champion Physician) who helps to increase morals and positive attitudes.
Workflow Changes	• We have to use workflow analysis.
Reduced Physician-Patient Interaction	• No eye contact, so you can use tablet instead of PC and also you have to balance between physician-patient interaction and using PC.
Usability issues	• Effectiveness, efficiency and satisfaction with which specific users can achieve a specific set of tasks in a particular environment. • Effectiveness is the ability to do things, Efficiency doing things with minimal resource waste. • Commercial EHRs might be different that healthcare environment.
Integration and interoperability issues	• Data standards such as HL7.
Privacy concerns	• Hacking into EHRs could result in loss of privacy for thousands, rather than a single paper chart. • An important solution of security concern is using database or transmission encryption.
Legal	• It is not known if EHRs will increase or decrease malpractice over the long haul. • **E-iatrogenesis.** • **Clinical documentation.** • **Clinical decision support.**
Inadequate proof of benefit	• In spite on many published studies, there is not adequate proof that EHRs improve quality of care.
Patient safety and unintended consequences	• Not only are studies suggesting improved patient safety mixed, there is evidence that new medical errors may occur (at least in the short term) with EHR use. • **E-iatrogenesis:** medical errors due to technology (Over Dependent on technology can be challenging especially if we had system shutdown) • **Reliability issues:** You should have a backup plan when the system is shut down; paper based records for example.

Quiz

Q1:An electronic record of health-related information on an individual that can be created, gathered, managed and consulted by authorized clinicians and staff within one healthcare organization.?

A-personal health Record.
B-E health.
C-Electronic Medical Record.
D-Electronic health record .

Q2:An electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed and consulted by authorized clinicians and staff across more than one healthcare organization"?

A-Electronic health record.
B-Electronic medical record.
C-Ehealth.
D-personal health record.

Q3:Electronic medical record (EMR) is the main application of which of the following health informatics area?

A-Administration.
B-Clinical.
C-Research.
D-Education.

Q4:Why do we need export system in CDSS?

A-preservation of knowledge.
B-sharing of knowledge between clinicians. C-Aid decision making.
D-Range checks.

Q5:It provides the right information to the right person in the right format through the right channel at the right point in workflow to improve health care decision and outcome " which one of the following describe the above statement?

A-CDSS.
B-PACS.
C-ICD10.
D-RIS.

Q6:Improving patient safety,quality and efficiency and reduce operating cost"are benefit of which of the following?

A-Big data.
B-CPOE.
C-Barcode technology.
D-Patient portal

1:C
2:A
3:B.
4:C.
5:A
6:B

8

Good Luck!

TEAM LEADER
JUDE ALOTAIBI

TEAM LEADER
KHALID ALKHANI

DONE BY OUR AMAZING MEMBER:
Lama Alzamil

NOTE TAKEN BY OUR SHARP MEMBER:
Khalid (nothing rhymes with his name)