

## 5- Research Focus in Medical Informatics in Saudi Arabia

- **Done by:** Jawaher Abanumy , Shahd Alsowaidan , Ebtisam Almutairi
- **Team leader:** Allulu Alsulayhim
- **Revised by:** Maha AlGhamdi
- **References:** 436 Doctor's Slides and notes

### Objectives

1. Definition
2. Knowledge management
3. Why Knowledge management in Healthcare
4. Examples of research in medical informatics (Evidence based medicine, Medical records, Tele-health, Students, Public health)
5. What is next?
6. Facts and conclusions

### Color index

- **Doctor's notes**
- Extra information and further explanation
- **Important**
- **Main titles**
- **Subtitles**



This slide from doctor's slides



This slide from the book



- "Medical informatics is a 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."
- "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."

## Knowledge

- Data, information and knowledge are often used interchangeably, however, they are not the same .
- Data, in itself is not knowledge, nor is information. Data is without a meaningful relation to anything else".  
(Bellinger, 2004)
- "Knowledge is the full utilization of information and data, with the potential of people's skills, competencies,...."  
(Grey, 2009\*7)
- Knowledge Involves interpreting information received, adding relevance and context to clarify the insights the information contains" (Audit Commission, 2007)
- **Knowledge**: is the understanding and interpretation of information and its settings within a meaningful context
- There are numerous theories existence regarding not only the creation of knowledge, but also the different types of knowledge that exist.
- Cook and Brown (1999) define four types of knowledge: individual/explicit; individual/tacit; group/explicit; group/tacit.

# Data?



- **Data:** “data are numbers, words or images that have yet to be organised or analysed to answer a specific question” (Audit Commission, 2007).
- What makes numbers, words and images all data? rawness. No exact meaning or context.
- **Information:** Information is the result of processing, manipulating and/or organising data or combinations of data to answer question.

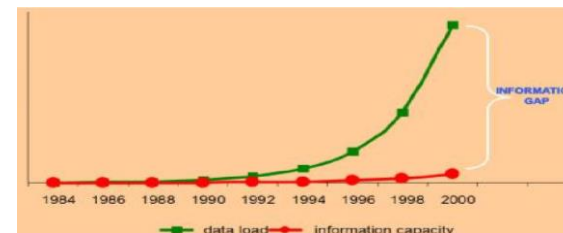
## ❖ Environment public health KM

	Data	Information	Knowledge
Asthma	Number of hospital visits due to asthma	Asthma case data organized by geographic location, population, etc.	Understanding of the times and places to alert asthma patients due to risks posed by air quality
Air Quality	Ambient air quality monitoring data	Air quality measurements organized by geographic location and time.	

## Why knowledge in health care? **Very important Q**

### ❖ Flood **فيضان** of Information

Huge gap in data acquisition and information → knowledge capacity

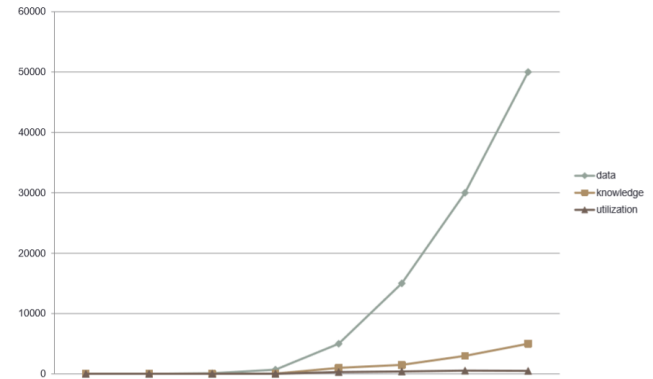


# Why knowledge in health care?



## ❖ Data – knowledge – utilization

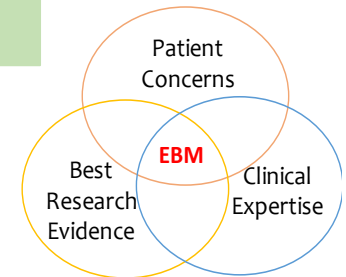
- Institute of Medicine (IOM) estimated that around **98,000** patients die each year as a consequence of preventable errors. Likewise, a study of two UK hospitals found that 11% of admitted patients experienced adverse events of which 48% of these events were most likely preventable if the right knowledge was applied.
- The **under-utilization** of healthcare knowledge contributes to improper clinical decisions, medical errors, under-utilization of resources and raise in healthcare delivery costs



## Examples Research in Medical Informatics

### ❖ Evidence based medicine (EBM)

- **Definition:** Evidence based medicine (EBM) is the integration of best research evidence with clinical expertise and patient values.
- **History of EBM**
- The name of EBM appeared in 1992 by group led by Gordon Guyatt at McMaster University in Canada.
- Since then the number of articles about evidence based practice has grown exponentially from one publication in 1992 to about 1000 in 1998 and international interest has led to the development of six evidence based journals that summarize the most relevant studies in clinical practice and have a combined worldwide circulation of over 175000.



Clinical Expertises represents taking Hx & PE & lab analysis. Then having patient values & concerns

# Literature Searching



- **Main benefits:** Can improve the treatment of medical inpatients, even those already receiving evidence-based treatment.
- **Example (from a study)**
  1. Random sample of 146 inpatients cared for by 33 internal medicine attending physicians.
  2. After physicians committed to a specific diagnosis and treatment plan, investigators performed standardized literature searches and provided the search results to the attending physicians.
  3. Attending physicians changed treatment for 23 (18%) of the 130 eligible patients as a result of the literature searches.
- **Another example:** medical records

# Veterans Health

- Veterans Health, which runs the largest and one of the most cost-effective healthcare systems in the United States.
- The VA has been employing tele-health tools for more than 11 years. “The VA is absolutely a pioneer in the use of telehealth,”
- They published a study linking telehealth and 17,000 VA patients with chronic disease that showed a tremendous impact – nearly a 20 % reduction in hospital admissions.”

# The Accenture study



- **Objective:** The Accenture survey asked physicians about the extent to which they used 12 different “functions” of EMR and HIS such as electronic entry of patient notes, electronic referrals, electronic ordering and prescribing and communicating with other physicians or patients via secure email.
- **Methodology:** By Jim Burke, Managing Director, Accenture UK Health Industry Published Friday, 3 February 2012 –. Research among more than 3,700 doctors in eight countries reveals ripe opportunities to accelerate broad healthcare IT initiatives, according to a new survey from Accenture

- **Findings:**

1. The findings clearly show that the broadest, fastest path to integrated, effective health practices requires outreach, education and changing mindsets.
2. Results showed that physicians who are routine users of a wider range of healthcare IT functions have a more positive attitude towards these technologies. On average across all the countries, as physicians start to use more “functions” the more positive they are about the benefits
3. Majority of doctors surveyed believe that healthcare IT does provide some common top benefits, including:
  - a) better access, quality data for clinical research (70.9%). *Quality of handwriting description.*
  - b) improved coordination of care (69.1%) *by sharing your knowledge/opinion/data with others.*
  - c) reduction in medical errors (66 %).
  - d) average score of 61 %
4. In England, physicians perceived other healthcare IT benefits to include: increased speed of access to health services to patients (55.3 %), reduced number of unnecessary interventions and procedures (52 %).

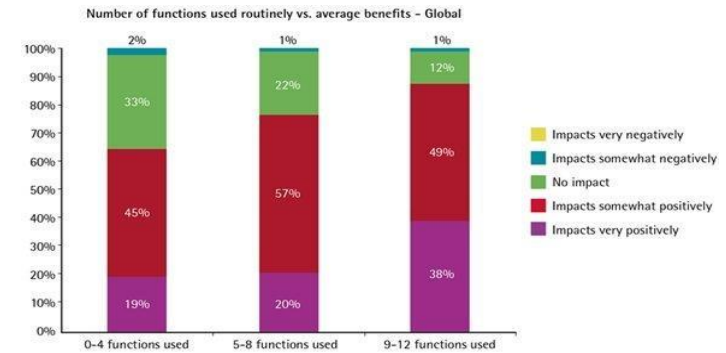


Figure 1 Average Benefits of Functions Used Routinely -- The Accenture eight-country physician survey found, as the number of routinely used healthcare IT functions increases, doctors' overall perception of the benefits grows more positive

Using functions in medical informatics like using your phone for scanning & texting & taking pictures, etc.

So the findings here are very important, It shows you, the more you're using the system the more positive attitude you will have.

# Examples of Literature Searching (from students)



## ❖ Wireless in Healthcare:

- Mobility is addicting, once you use it you can't live without it



## ▪ Conclusion:

1. Healthcare professionals acceptance seems to be one of the key to success for this new industry
2. We may dream of delivering healthcare without being forced to use network cables or tipping over computer wires

## ❖ Towered Electronic Health Record

### ▪ Barriers and issues:

1. **Many players and many approaches:** while the expansion of health care providers and services has been a factor behind the call for EHRs and improved sharing of health information, it also means that their implementation requires support from many stakeholders. An individual may now receive care from several physicians and other providers at once. Policies to govern the implementation and use of EHRs will therefore require the support of many different provider groups
2. **Lack of a health network architecture, privacy issue:**
  - What information should be included in EHRs
  - Who should have access to the EHR? Which information in the EHR and under what circumstances should the EHR be shared with other health providers? How will a patient be able to access his/her own EHR?
  - In what instances can the information in an EHR be used for secondary purposes (e.g. research, administration)? When is consent from the patient required



# Examples of Literature Searching (from students)

## ❖ Information Technology in Medical and Patient Education



**Information Technology in Medical and Patient Education**  
Ahmed AlBarrak PhD Medical Informatics  
Assistant Professor, Family & Community Med. College of Medicine, Director, Computer and Informatics, K University, Riyadh, KSA

Hanan AlGhammas  
Health Educator Specialist, Health Education Department, KFHR&C, Riyadh, KSA

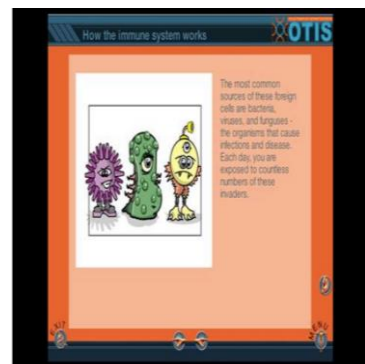
Submitted for publication: 18 February 2009

**Background:** Patient education is an important role in the quality and effectiveness of health care outcome. Information technology has a significant role in delivering and improving health care performance on individual, society, and organization. However, medical staff has an important role in conducting and applying information technology in the health care organizations.

**Aim:** The aim of this study is to assess medical staff

**Methods:** The PE in the unit while (10) staff to take computer training to develop their knowledge in using information technology. 80% rated themselves as "Good" or above hospital information system (HIS), while rated the same level for general computer skill time and language were among the biggest conducting patient education.

**Conclusion:** In conclusion medical staff



Pictures from the research from KFSH. Since the patients need to go under heavy education after operation.

### ■ Methods:

1. A total of 60 medical staff from different specialty (physician = 21, nurses = 25, health educator = 8, others = 6, female = 33, male = 27) responded to the study questionnaire in KFHR&C.
2. The questionnaire was designed in six sections

### ■ Results (barriers of conducting patient education in %):

Barriers	%
Language barriers	18.3
Lack of time	23.3
Lack of plans for education activities	8.3
Lack of financial resources	8.3
Uncooperative patient	11.7
All of the above	28.3
Other	1.7

### ■ Conclusion:

- In conclusion medical staff had a very positive attitude towards applying patient education information system. However, the language barriers and lack of time were considered as the biggest barriers for conducting patient education. Accordingly the results showed that there is a significant need for computer training



# Examples of Literature Searching (from students)



## ❖ Software selection

- Remember that the end GOAL is not just to buy hardware and software. Rather, it is to buy successful, well-installed system that effectively meets the needs of the organization

Saudi Pharmaceutical Journal (2013) xxx, xxx-xxx

King Saud University  
Saudi Pharmaceutical Journal  
www.ksu.edu.sa  
www.sciencedirect.com

ORIGINAL ARTICLE

### Evaluating factors affecting the implementation of evidence based medicine in primary healthcare centers in Dubai

Ahmed I. Albarrak <sup>a,\*</sup>, Suhair Aqil Ali Abdullrahim <sup>b</sup>, Rafiuddin Mohammed <sup>c</sup>

<sup>a</sup> Health Informatics, College of Medicine, King Saud University, Riyadh, Saudi Arabia  
<sup>b</sup> e-School of Health and Environment Studies, Hamdan Bin Mohammed e-University, Dubai, United Arab Emirates  
<sup>c</sup> College of Medicine, King Saud University, Riyadh, Saudi Arabia

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**KEYWORDS**  
Evidence based medicine

**Abstract** *Objectives:* To assess the current evidence based medicine (EBM) knowledge, attitude and perceptions of physicians at Dubai Primary Health Care Sector (PHCS). Further to evaluate

Compliance Level	% of committed
Non Committed	5
Poorly Committed	30
Committed	65

Figure 1: Patients' point of view in compliance to treatment plan

Response	% of compliance
No	5
Maybe	15
Yes	75

Figure 2: Patients' self-reported compliance if the physician explains to them the proper treatment plan

age, gender, duration of disease, The results of the current elderly heart failure patients is due to

# Examples of Literature Searching (from students)



## Assessment of skills and attitude of dental students and interns toward e-learning in KSU

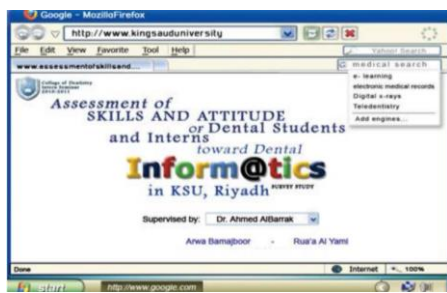
### Assessment of Skills and Attitude of Dental Students and Interns toward e-learning in KSU

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Ahmed Al Barrak  
Associate Professor, Head of Medical Informatics and e-learning Unit  
College of Medicine, King Saud University, Riyadh, KSA.

Rua'a Al Yami  
Dental intern in the academic year 2010-2011  
College of Dentistry, King Saud University, Riyadh, Saudi Arabia.

Arwa Bamaajoor  
Dental intern in the academic year 2010-2011



## Incidence of prescribing errors among handwritten prescription and electronic prescription system

### and Electronic Prescription System Prescribing Errors

#### Researchers:

Eman Abdurahman Al-Rashidi  
Rwaa Kamel Fatani  
Shoog Ibrahim Al-Ageel

#### Group:



#### ORIGINAL ARTICLE

### Assessment of legibility and completeness of handwritten and electronic prescriptions

Ahmed I Albarak\*, Eman Abdurahman Al Rashidi, Rwa Kamil Fatani, Shoog Ibrahim Al Ageel, Rafiuddin Mohammed

College of Medicine, King Saud University, Riyadh, Saudi Arabia

Received 6 February 2014; accepted 28 February 2014

**KEYWORDS:** Abstract Objectives: To assess the legibility and completeness of handwritten prescriptions and



### Incidence of Prescribing Errors Among Handwritten Prescriptions and Electronic Prescription System

**Students:**  
Eman Abdurahman Al-Rashidi  
Rwaa Kamel Fatani  
Shoog Ibrahim Al-Ageel  
**Supervisor:**  
Dr. Ahmed Ismail Al-Barrak.

## Academic satisfaction among traditional and problem based learning medical students

### Academic satisfaction among traditional and problem based learning medical students

#### A comparative study

Ahmed I. Albarak, PhD, Rafiuddin Mohammed, MSc, Mohammed F. Alshaban, MBS, Nasser K. Almutairi, MBS.

#### ABSTRACT

الأهداف: تقييم الرضا الأكاديمي والأهمية الأكاديمية عند طلاب التعليم الطبي التقليدي والتعليم الطبي القائم على حل المشكلات وتقييم مزايا الأقسام في التعليم الطبي من وجهة نظر الطلاب.

Methods: A cross sectional study was conducted at the College of Medicine, King Saud University, Riyadh Kingdom of Saudi Arabia from May to June 2012. The survey questionnaires were self-administered and consisted of mainly 6 sections: teaching, learning, supervision, course organization, information technology (IT) facilities, and development of skills.

#### CLINICAL RESEARCH AND METHODS

### Relationship between Patients' Understanding of Treatment Plan and Medication Compliance

Ahmed I Albarak (1)  
Jawaher Almulhem (2)  
Saad H. Alfraikh (2)  
Mohammed Alotabi (2)  
Rafuddin Mohammed (3)

(1) Associate Professor of Health Informatics, College of Medicine, King Saud University, Riyadh, Saudi Arabia  
(2) Medical Interns, College of Medicine, King Saud University, Riyadh, Saudi Arabia  
(3) Researcher, College of Medicine, King Saud University, Riyadh, Saudi Arabia

**Correspondence:**  
Dr. Ahmed Albarak  
Associate Professor of Health Informatics,  
Chairman, Medical Informatics and E-learning  
College of Medicine, King Saud University  
P. O. Box 43079 Riyadh 11526.

# Questions



1. “The understanding and interpretation of information and its settings within a meaningful context” is the definition of:

- A. Data                                      B. Information                                      C. Knowledge                                      D. Research

2. Medical informatics is the application of computers, communications and information technology and systems to all fields of medicine:

- A. medical care, medical education and medical research                                      B. Knowledge, data, and information  
C. surgery, medicine, and nursing                                      D. Radiology, laboratory and pharmacy

3. Why is knowledge important in health care?

- A. Over-utilization of health care knowledge                                      B. Huge gap in data acquisition and information  
C. Knowledge should not be applied in health care                                      D. EHRs are hard to use

4. What is the main benefit of literature searching?

- A. Can improve the treatment of medical inpatients                                      B. Prevent duplication of data  
C. Copying the previous physicians notes                                      D. Less time consuming

5. “The integration of best research evidence with clinical expertise and patient values” is the definition of:

- A. Literature searching                                      B. Veterans Health                                      C. Evidence Based Medicine                                      D. Knowledge

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

