

# Consumer Health Informatics (CHI)

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Essential of Health Informatics Certificate



# What is Consumer Health Informatics?

A branch of health informatics that focus on the following:

- **Analyzes** information **needs** of consumers
- Studies and **implements** methods of making health information and services accessible to consumers
- Integrates consumer preferences into health care information systems

Eysenbach, G. (2000). Consumer health informatics. *BMJ*, 320, 1713-1716



# Consumer Health Informatics

- In this view, consumer health informatics **analyzes consumers'** needs for information; studies and **implements methods** for making **information and services accessible** to consumers; and models and integrates consumers' **preferences** into health information systems.
- Consumer informatics stands at a crossroad of several other disciplines, such as **nursing informatics, public health, health promotion, health education, library science, and communication science.**



# Consumer Health Informatics

Subsidiary of health informatics which focuses on and **addresses:**

- Patient-Focused Informatics
- Consumer Education
- Health Literacy
- Consumer and patient views
- Self care and self action
- Consumer empowerment and patients enable
- Consumer-friendly language



# Consumer Health Informatics

- Could be defined as:
- The integration of consumer health information and information technology in an environment of **shared** healthcare decision-making that supports effective **self-health** action.

Lewis, D. & Friedman, C. (2002). Consumer health informatics. In M.J. Ball, K.J. Hannah, S.K. Newbold, & J.V. Douglas (Eds.). *Nursing informatics: Where caring and technology meet (3<sup>rd</sup> ed.)*. New York; Springer-Verlag.

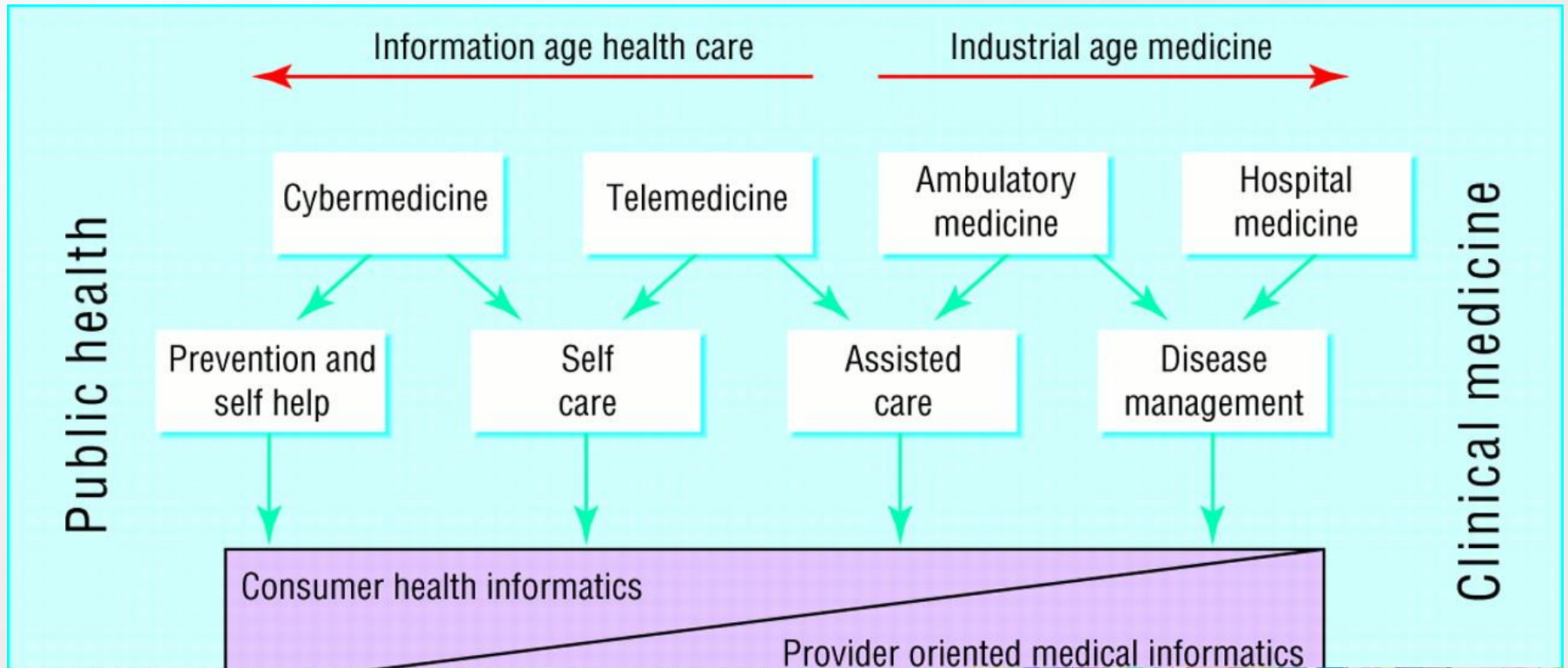


# Consumers

- Broader than “patient “ it may include the well, healthy and caregivers
- It is a very diverse group
- Consumers includes:
  - Patients
  - Population
  - Professionals



The focus of health care with consumer health informatics is shifting from health professionals to be consumers centered



# Empowered Consumers

- Consumer Empowerment: Granting of power to a dependent group or enhancing an individual's **ability** for **self** determination. Could be defined as:

“a **social** process of recognizing, promoting and enhancing people’ abilities to meet their own **needs**, to **solve** their own problems, and **mobilize** the necessary resources in order to feel in control of their lives” (Gibson, 1991)

Brennan&Safran.Chapter 2 Empowered consumers.

In: Lewis, Eysenbach, Kukafka, Stavri, Jimison. Consumer Health Informatics

Springer, 2005





# Empowering Consumers

- Consumers Health Informatics applications support the empowered consumers concept (a power balance in the patient-health professional relationship) by e.g.:
  - ✓ Providing Informing about health concerns
  - ✓ Assisting in finding others with similar concerns
  - ✓ Assisting in navigating the health care system and services and access to clinical records and personal care management tools.
  - ✓ Assess in finding and navigating for information and services

Brennan&Safran.Chapter 2 Empowered consumers.

In: Lewis, Eysenbach, Kukafka, Stavri, Jimison. Consumer Health Informatics

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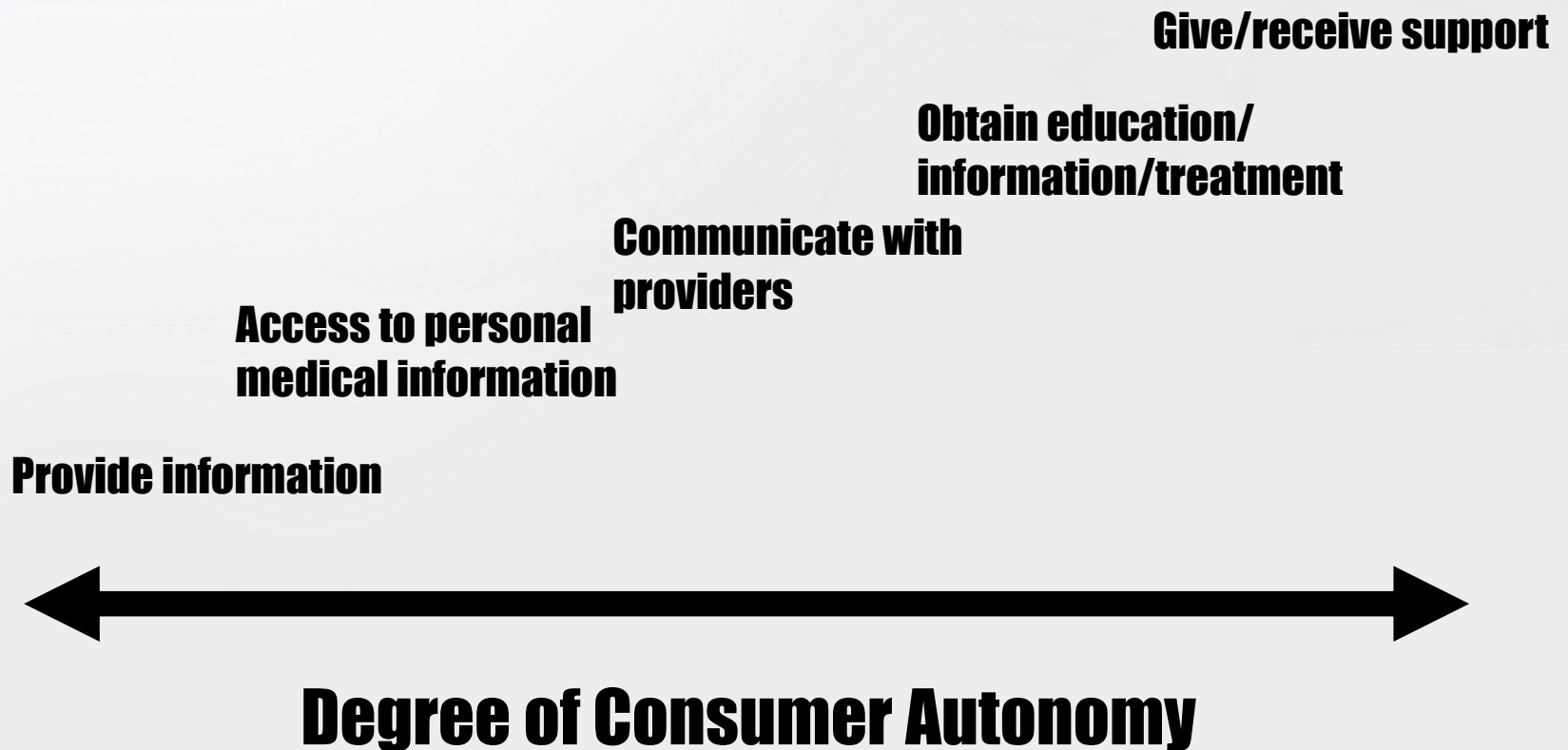
# History of CHI

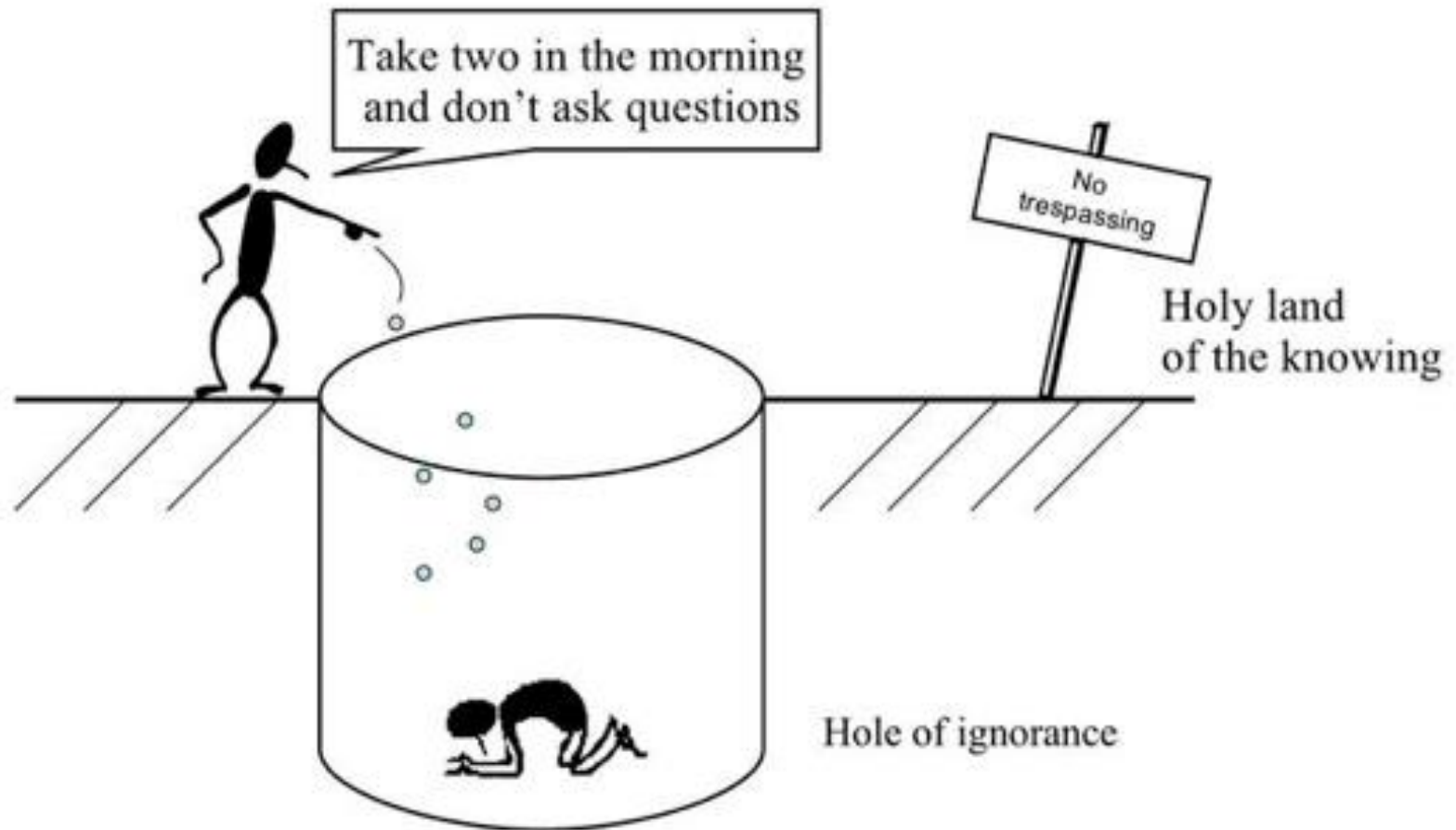
- Consumer movement 1970s
  - Increased demand for information
  - Greater participation in “medical” decision making
- Prominence of “self-help” phenomenon 1980s
  - Huge increase in health information for lay audience and consumers
- Widespread use of the Internet 1990s
  - Increased dramatically throughout 1990- later

[Consumer Health Informatics: Past, Present, and Future of a Rapidly Evolving Domain G Demiris](#) - IMIA Yearbook, 2016

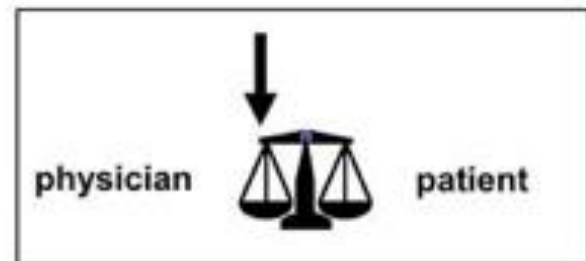


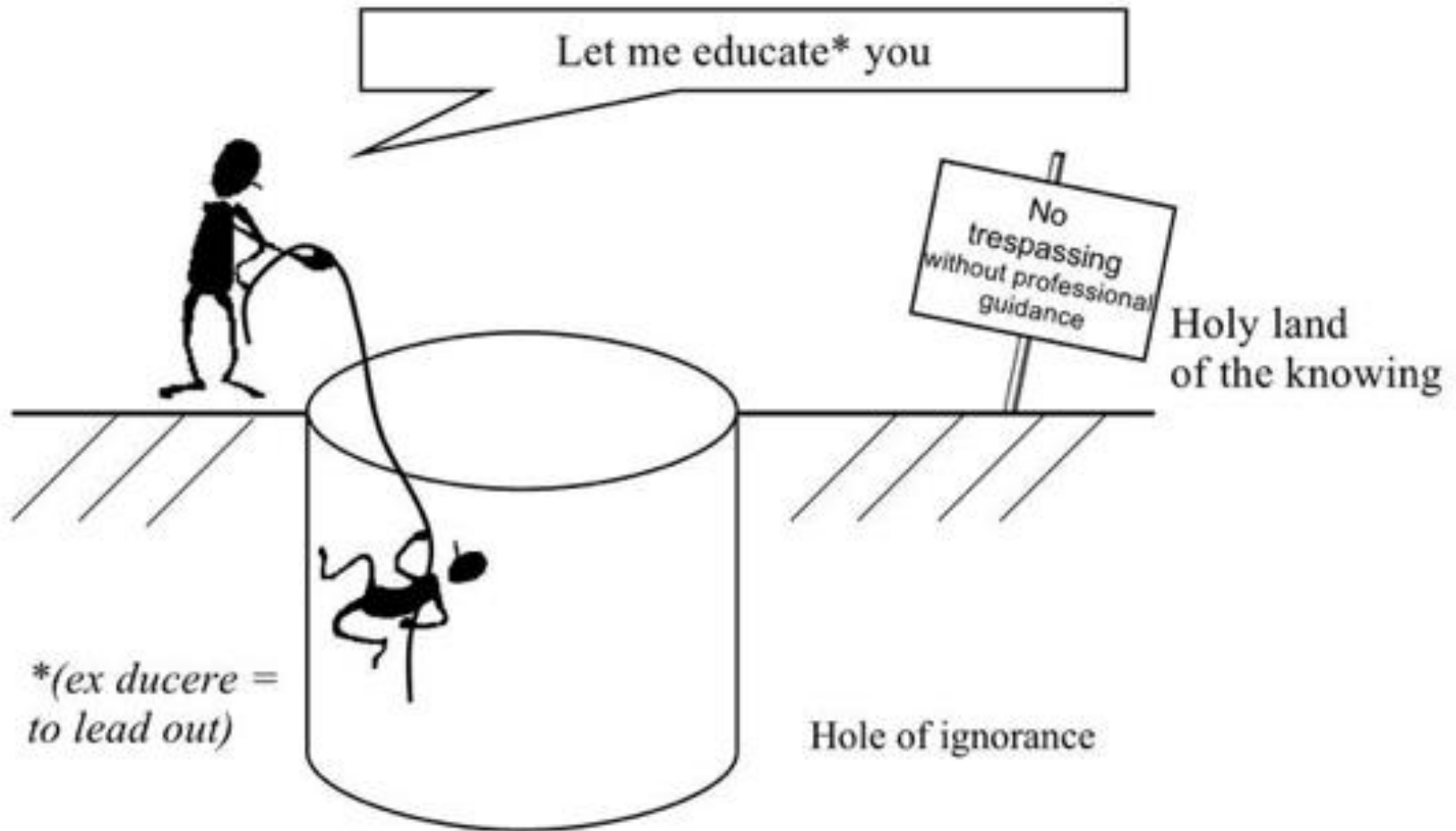
# CHI Continuum



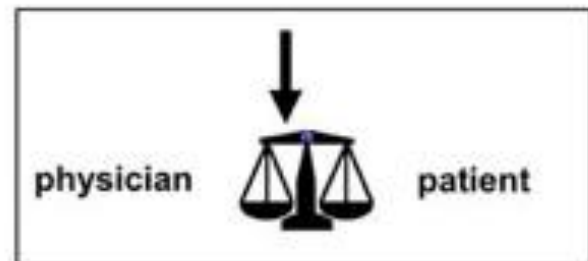


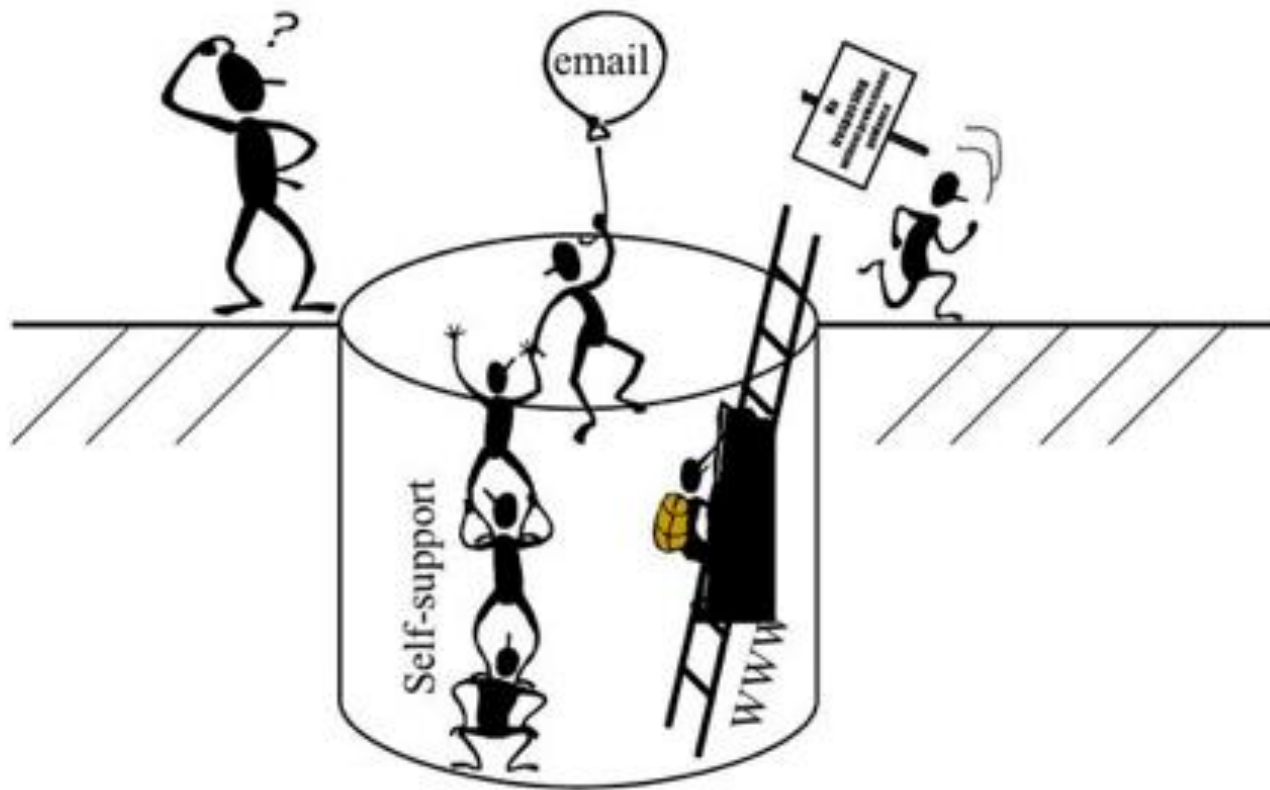
Eysenbach G, Jadad AR.  
Consumer health informatics in the internet age.  
<URL: <http://www.jmir.org/2001/2/e19/>>



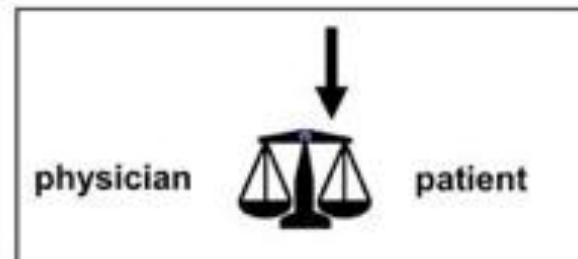


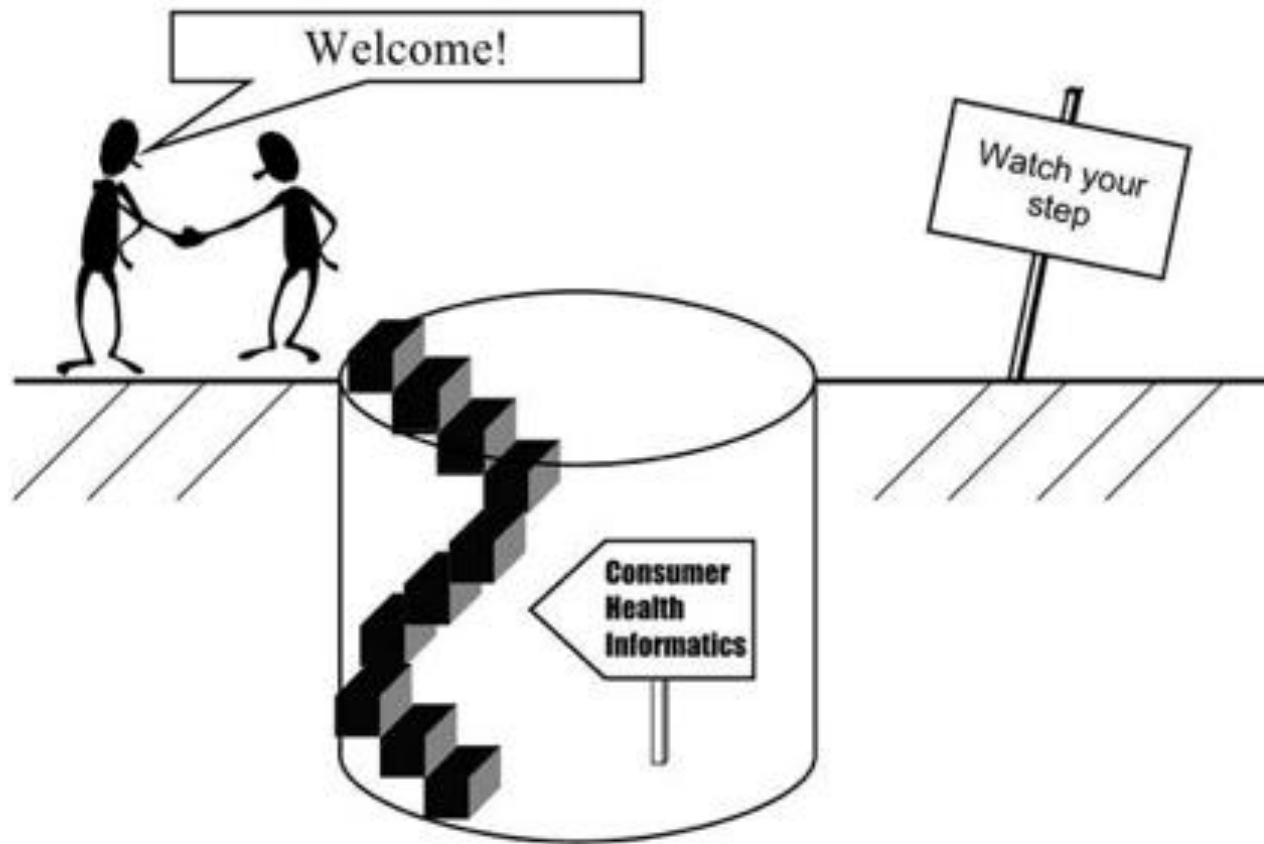
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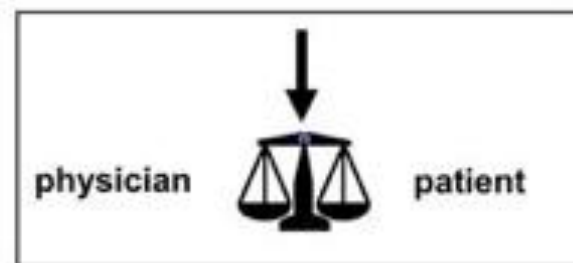


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# Consumer Health Informatics

A diverse and at a crossroad of several specialties, include the applications of the following:

- Mobile health (mHealth)
- Telehealth
- Patient education
- Personal health records
- Patients' portals
- Health literacy and health promotion and games for health
- Internet-based strategies and resources.



# Saudi Arabia: Internet Growth and Population Statistics

YEAR	Users	Population	% Pop.	Usage Source
2000	200,000	21,624,422	0.9 %	ITU
2002	1,500,000	24,774,600	6.0 %	ITU
2003				C+I+A
2004				ITU
2005				ITU
2010	9,800,000	25,731,776	38.1 %	ITU

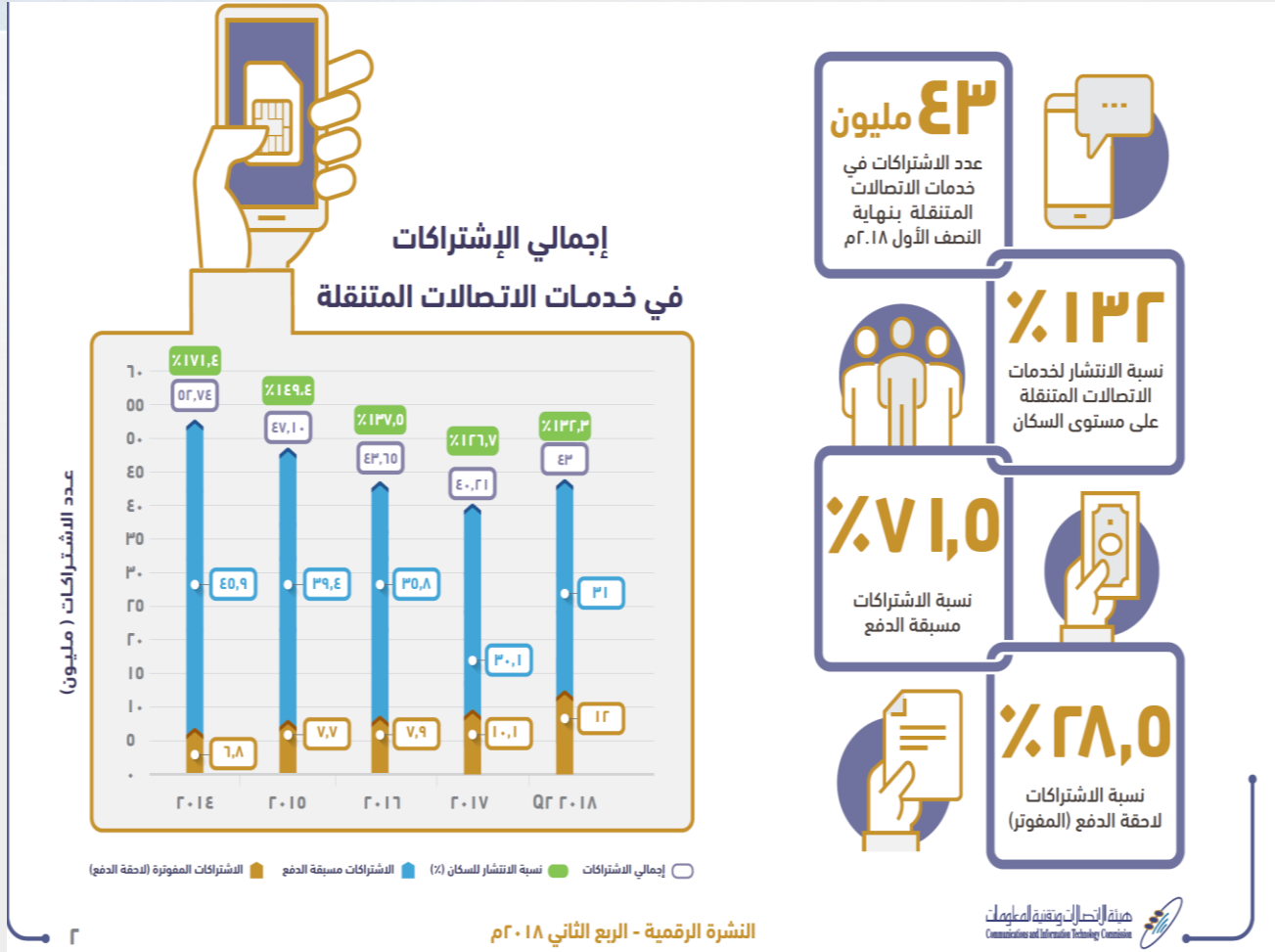
**2015 USERS -> 21,500,000**



# Consumer Health Informatics

- **Mobile and internet subscriptions:**
  - In 2014 mobile services subscriptions 43 m (171%)
  - In 2014 mobile data subscriptions 31.5 m (100%)
  - In 2018 mobile services subscriptions 52.7 m (132%)
  - In 2018 mobile data subscriptions 29.1 m (89.3%)





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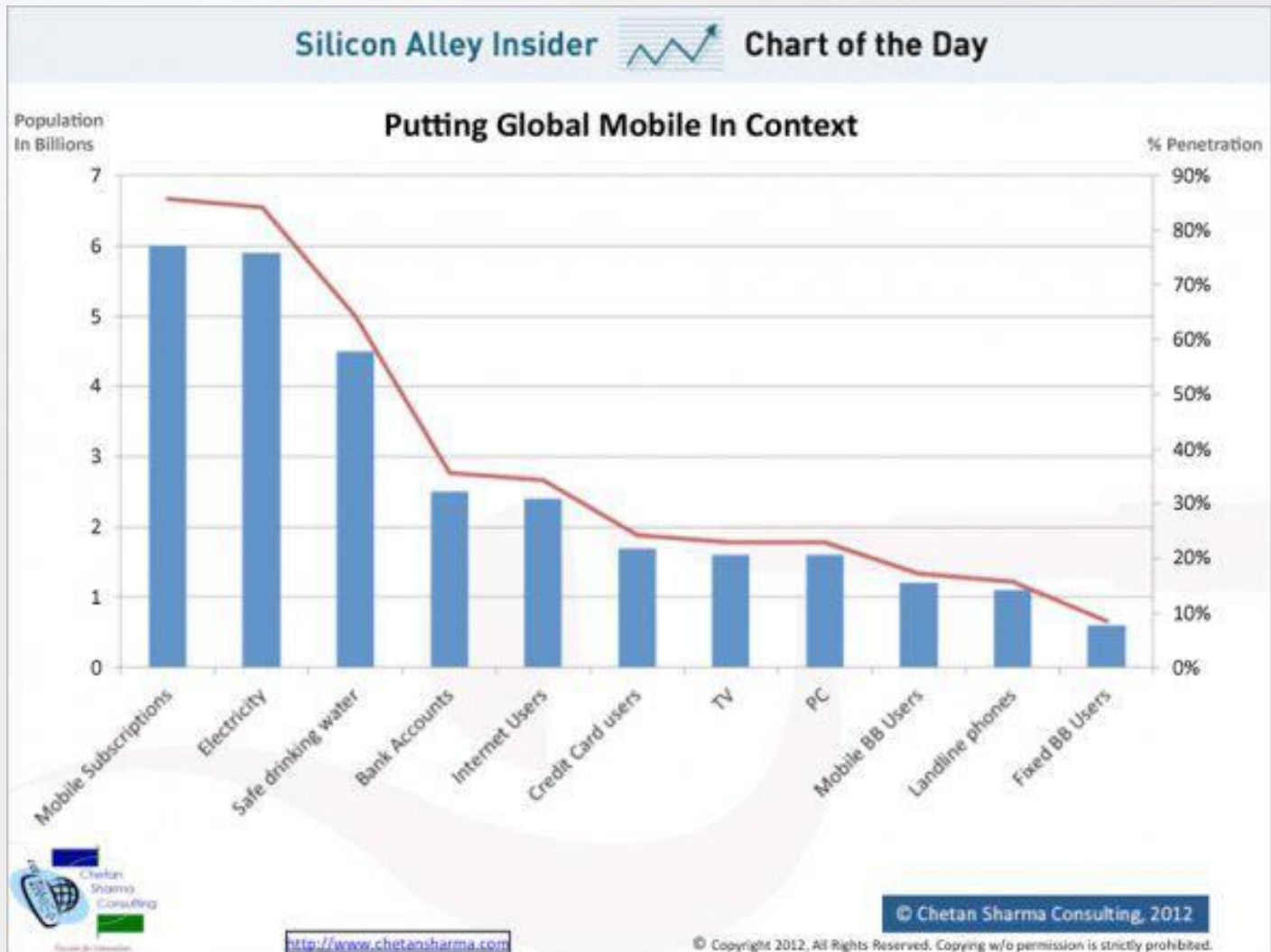
# Mobile health

- M-health or Mobile health is a term used for the practice of medicine and public health, supported by mobile devices and applications. The term is mainly used in reference to using mobile communication devices, such as [mobile phones](#), [tablets](#) and [PDAs](#), for [health services](#) and information. The mobile Health is a sub-segment of [eHealth](#),
- The mHealth market earned estimated revenues of \$230 million in 2010 and estimated to reach **\$392** million in 2015 in USA, according to a new report from research firm Frost & Sullivan.



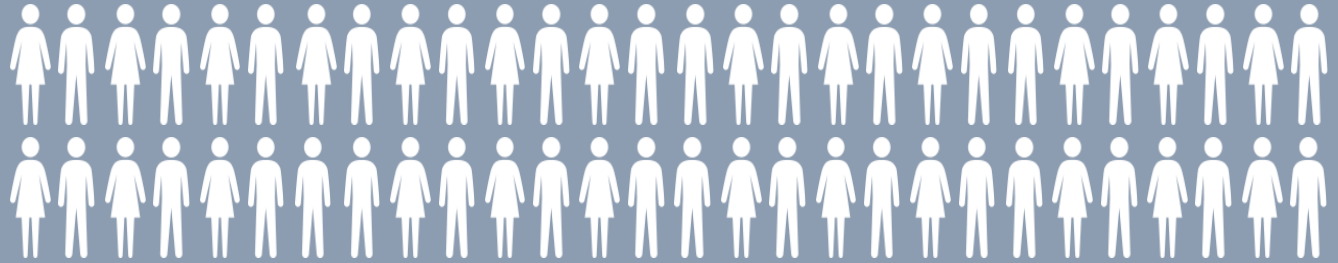
# mHealth

Mobile is the most Pervasive technology ever invented

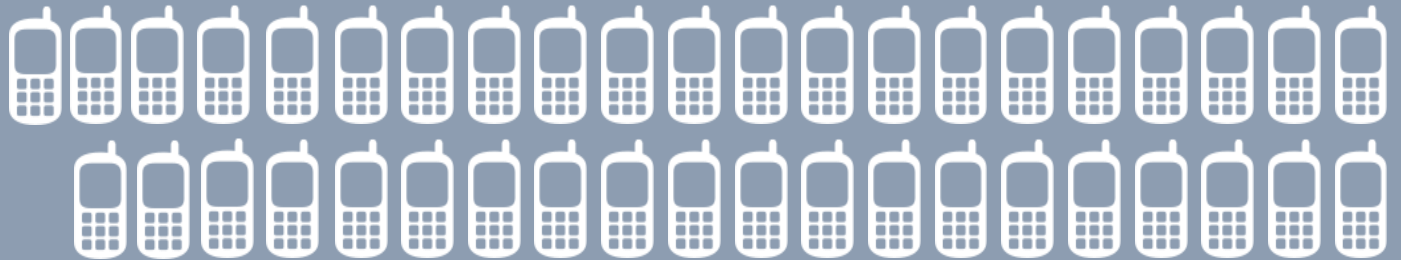


# The mHealth Opportunity

7 Billion  
People



By 2014  
More mobile  
phones than  
people



Expanding the coverage and reach of  
critical health information and services  
and moving towards citizen-centered  
health and well-being





# Where clinical health and hospital IS and Consumer health informatics meet

- Patient Portals: Patient interface to clinical information systems
- Personal Health Record: Internet based- set of tools that allows people to access and coordinate their life-long health information and make appropriate parts of it available to those who need it

<http://www.webcitation.org>



### Important Notes

Please phone the office at 360-875-2286 for urgent medical problems or dial 911 for medical emergencies.

Your physician will respond to your message Monday through Friday during office hours. If you do not receive a timely response, please phone the office. During evenings and weekends, please

## Contact My Doctor/Provider

Please complete the following information:

To:

Subject:

Message:

Dr Jones, the sample medication you gave me at my last visit does not seem to be working. Should I continue to use this or should we change to something else?

Thanks,

Steve



### Important Notes

Please phone the office at 800-875-3000 for urgent medical problems or dial 911 for medical emergencies.

## Request an Appointment

Our appointment scheduling staff will handle your request, and will reply with date and time options for you to confirm.

### Please complete the following information:

Type of Appointment	<input type="text" value="Complete Physical Exam"/>
Reason for Appointment (Optional)	<input type="text" value="I need my yearly physical exam"/>
Special Requests, Comments, etc.	<input type="text"/>

[Calendar](#)

Date Requested:

Time  Morning  Afternoon  No Preference

[Send Appointment Request](#)



### Important Notes

Please report any medication side effects or allergies.

All patients must be seen at regular intervals to evaluate your medical problems and medications.

Some insurance plans will only permit enough medication for one month at a time.

We will forward your

## Refill/Renew My Medications

Please complete the following information regarding your medication refills.

(Check only those medications you need refilled or renewed at this time. You must select at least one checkbox. If you do not see your medication listed below, please [Click here](#) to update your medication list. Once you have updated your medication list, you can return to this page and request a refill.)

Add/Edit Meds

Check to Refill	Medication Name	Dosage (mg, ml)	Dosage Frequency	Quantity
<input type="checkbox"/>	Lantus	14 units	Once Daily	1 Days
<input type="checkbox"/>	Regular insulin	as needed	Three Times	1 Days
<input checked="" type="checkbox"/>	Lasix	20 mg	Once Daily	1 Days
<input type="checkbox"/>	Lovastatin	20 mg	Once Daily	1 Days
<input type="checkbox"/>	Lisinopril	10 mg	Once Daily	1 Days




### Important Notes

This form will be reviewed by your doctor for approval. You will be notified about approval, the need to visit your primary care doctor, etc.

## Request a Referral

**To receive a referral to a specialist, please complete the following:**

Specialist Type	Allergist 
Specific Doctor	Dr Green
Medical or Surgical Problem (Describe)	Allergies
Have you seen this specialist before?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Have you consulted your primary care physician for this problem?	<input checked="" type="radio"/> Yes <input type="radio"/> No
Comments	




### Important Notes

Please phone the office 303-871-2205 for urgent medical problems or dial 911 for medical emergencies.

## View EKG

Click on the title to view a document.

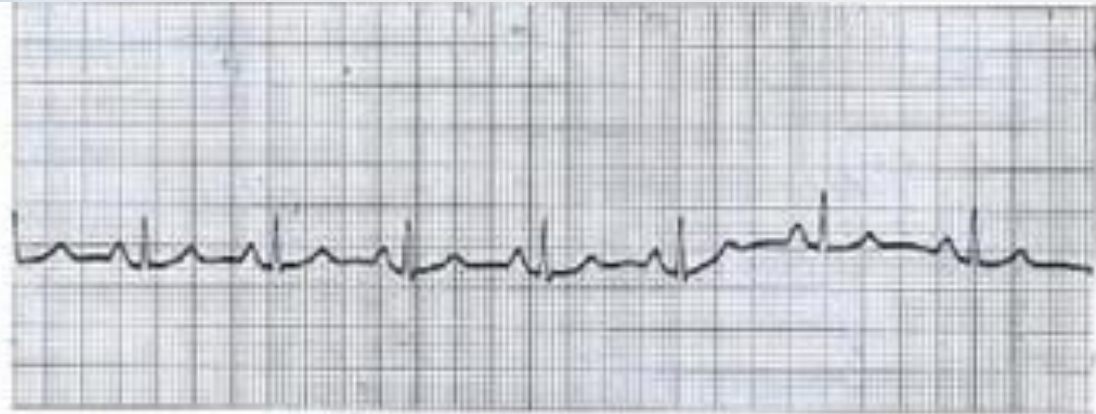
Results for **Steve Johnson**:

Title	Description	Print
<a href="#"><u>3-30-2003</u></a>	Normal	





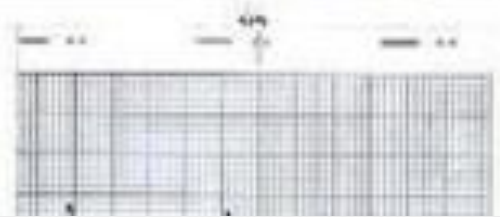
GRAPHICS



GRAPHICS



GRAPHICS



# Consumer Health Informatics Systems

- Consumer health informatics can be organized into three general systems that:
  - *provide* health information to the user (one-way communication)
  - *tailor* specific information to the user's unique situation (customized communication)
  - allow the user to *communicate* and *interact* with health care providers or other users (two-way communication)





# Consumer Health Informatics Systems

- **One-way communication:** CD-ROMs, on-line health articles
- **Tailor:** automated systems that obtain information from the consumer about his or her general health or other health-related factors (such as family disease histories and smoking habits) and, on the basis of this information, suggest a need for preventive health procedures (such as mammograms), or identify actions to curb high-risk behaviors.
- **Two-way communication:** electronic mail, electronic bulletin boards, on-line discussion groups.





Research Chair for Health Informatics and  
Health Promotion



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## Barriers and Challenges

- **Privacy** and security concerns specially in PHR where patients are uploading and accessing private health information. Such data and information are vulnerable to [cyber](#) risks and hacking, e.g. identity theft.
- **Usability** and **User-friendly** users reported PHR as too complicated while clinicians have concerns about the over-simplified view presented to the uses of in these systems. A collection of mobile and online health applications are complicated than they should be.
- **Access to computer or internet** Digital divide where different population segments having different access to internet/computers.
- **Physical disabilities** Elderly users may not be able to access to PHR, internet and mobile applications without assistance.

Kumar Laxman et al 2015, [www.hsj.gr/archive](http://www.hsj.gr/archive)



## Barriers and Challenges

- **Access to PHR systems** as benefits and business case for the adoption of PHR are limited and technology which support the evolution of PHR is still progressing. So acceptance and use of PHR in large scale will not happen until tangible values to users and associated costs are justified.
- **Cognitive disabilities and functions and low literacy** in computer or computer literacy and anxiety is a concern among consumers, mainly for many consumers especially elderly people.
- **Low health literacy Consumers** with low health literacy may not be able to access and identify the improvements without education. They may be able to maintain some of their health records and services independently after having a proper training.

Kumar Laxman et al 2015, [www.hsj.gr/archive](http://www.hsj.gr/archive)



## Barriers and Challenges

- **Terminology** specific terms or “medical jargon” used in a PHR or health application could be too complex and confusing for users without medical training.
- **Familiarity** consumers are most likely to use applications if they are comfortable with an interface or know intuitively how it works based on their familiarity with other systems.
- **Ensuring accurate data** consumers are naturally concerned with ensuring accurate data, meaning both complete and without error.
- **Legal Barriers** prevent doctors from practicing telehealth in different countries. Two main reported obstacles facing telehealth: legislative, to remove trade barriers and technical, to improve data security.

Kumar Laxman et al 2015, [www.hsj.gr/archive](http://www.hsj.gr/archive)



## Barriers and Challenges

- **Speed and connectivity** network quality and interruption especially for “life-sized” or high-definition videoconferencing used for consultation and diagnosis.
- **Cost** Implementing the technology to support Consumer Health Informatics and [telehealth](#) services and managing operations and training. It is important for providers to select solutions tailored to needs and budget and works with the lowest internet speed as possible
- **Resistance to change** Patient acceptance of mobile and telehealth is also a key factor, and challenge

Kumar Laxman et al 2015, [www.hsj.gr/archive](http://www.hsj.gr/archive)



## Barriers and Challenges

- ***Lack of physician support***
- ***Lack of existing technology*** was cited as the biggest barrier
- ***Lack of support***
- ***Reliability of the technology*** most of elderly people are not able to trust and adapt these technologies
- ***Low availability***
- ***Lack of search precision*** i.e. an elderly heart patient might read and follow advice only appropriate for younger patients, and a patient reading a warning about a medication on a discussion board might stop using it



## Barriers and Challenges

- **Extensive [health information](#)** Require high level of reading ability and literacy.
- **Language and centered on the Western society** English is the universal language, there is a huge population of consumers that do not understand English.
- **Lack of patient motivation**
- **Fast developing field, new system** and adaptability, unwillingness to change to use new applications among skilled professionals and patients is one of the barriers which make them unable to leverage these technologies.





## Roles of Health Professionals in CHI

The main roles for health professionals:

- Professionals serve as sources of content.
- Professionals provide important guidance in moderating public electronic.
- discussion groups and responding to patients' electronic messages.
- Clinicians become information brokers and interpreters for patients.



## Quality control of health information on the internet

- The quality control of health information on the internet rests on **four pillars**:
  - educating the consumer to identify and find good quality information.
  - health information providers to self-regulation and self-labeling.
  - having independent and external third parties to evaluate the information.
  - enforcement legislation, in the case of fraudulent or harmful information and in cases of dissemination of fraudulent or harmful information.

Eysenbach et al 2000 Journal of Medical Internet Research



## Credibility Criteria

The FA<sub>4</sub>CT Algorithm: A New Model and Tool for Consumers to Assess and Filter Health Information on the Internet

### **CREDIBLE Criterion:**

- Current and frequently updated
- Reference cited
- Explicit purpose
- Disclosure of sponsors
- Interest disclosed and no conflicts found (e.g financial)
- Balanced
- Level of Evidence

Eysenbach G, Thomson M. The FA<sub>4</sub>CT Algorithm: A New Model and Tool for Consumers to Assess and Filter Health Information on the Internet. In: Kuhn K (ed.) Medinfo 2007 Proceedings (in press)



## Patient / People Engagement

WHO defines People Centered Care as:

*“Care that is focused & organized around the health **needs & expectations** of people & communities rather than on disease”*



## Patient Centric Healthcare

***" care that is respectful of, and responsive to, individual patient preferences, needs, and values"  
and that ensures  
"that patient values guide all clinical decisions."***

This definition highlights the importance of clinicians and patients working together to produce the best outcomes possible.

**Crossing the Quality Chasm, IOM**



## Characteristics of Patient Centered Care

- **Respect** for patients values, preferences & needs
- **Coordinated and integrated** care
- **Information, Communication & Education**
- **Physical Comfort**
- **Emotional Support**
- **Involvement** of family & friends
- **Continuity** of care
- **Access** to care

Picker Institute-Multiyear Research Project  
*"Through the Patient's Eyes: Understanding and Promoting Patient-Centered Care"*



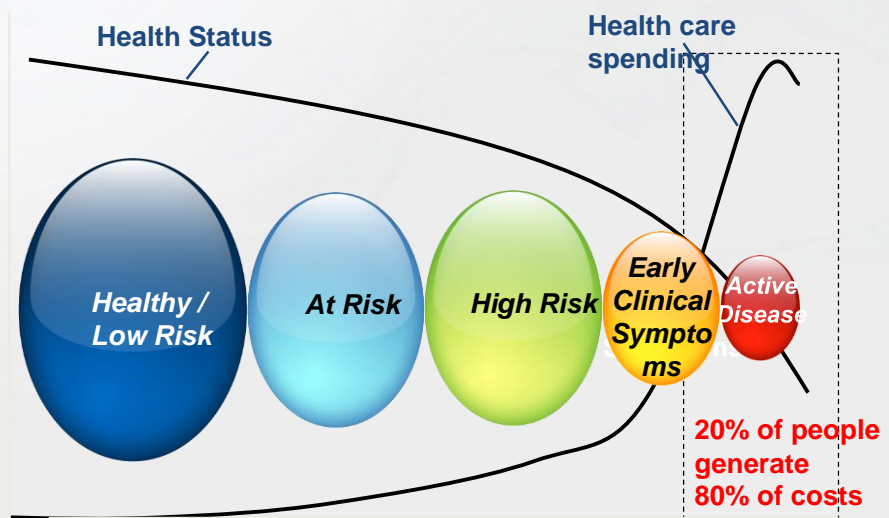
## It's a Different Ball game

In an eHealth environment, **Information Moves** rather than the Physician or the Patient

eHealth  
**ePhysician - eConsumer**  
!



## Is "At the Point of Care" Too Late?



- Early detection of at-risk patients
- Provide personalized evidence to enable pro-active decisions





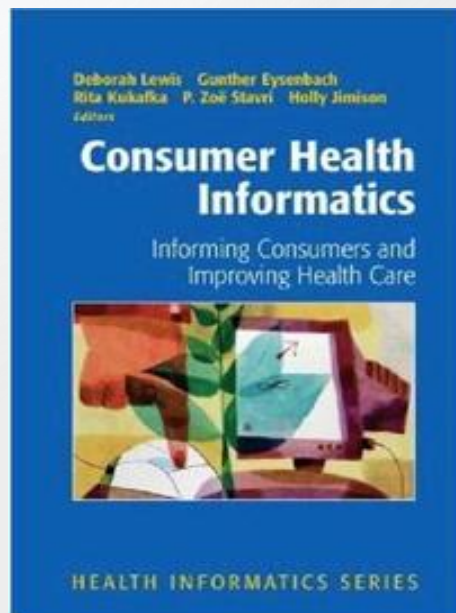
## Actions

- Consumer Health Informatics and technology victories for health care and chronic disease in particular
- E-Health should take a prominent role in the delivery and management of healthcare
- Work on barriers and challenges
- To aggregate rather than segregate healthcare system
- Consumer health education and empowerment
- Preventive medicine takes precedence over treating the sick
- Focus on vulnerable members of society

The European study for future of health



## Further Reading



## The Future: Trends

- Is for Consumer Health Informatics

**Thank you**  
With my best wishes

