Informatics Team Notes

The following slides are the original lectures. Only notes were added and they're mostly additional information.
431 team notes are in purple color and this year's notes are in green color.

For any mistakes contact informatics team leader
Dana Aldubaib
dsd.993@gmail.com

Notes provided by: Danah Aldubaib

From the note space below

eHealth is also written "e-health"
"is defined as the use of emerging interactive technologies (e.g., Internet, CD-ROMs, personal digital assistants, interactive television and voice response systems, computer kiosks, and mobile computing) to enable health improvement and health care services"

Telehealth

Offered by

Suliman Alomran, RHIA

Objectives

- Define Telehealth and Telemedicine
- History of Telehealth
- Identify Driving Forces of Telehealth
- List the Advantages of Telehealth
- Identify equipment and technology to sustain telehealth
- Identify several telehealth applications

It is Already There!

- Telehealth is projected to reach 1.8 million patients worldwide by 2017
- In 2012, 308,000 patients remotely monitored for
  - Congestive heart failure (CHF),
  - Chronic obstructive pulmonary disease (COPD),
  - Diabetes
  - hypertension and mental health conditions worldwide

http://www.healthcareitnews.com/news/telehealth-growth-mode-worldwide

Define Telehealth and Telemedicine

- **Telehealth defined:**

"The delivery of health-related services and information via telecommunications technologies"

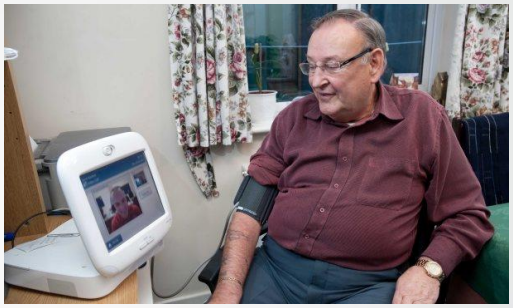
- Could be: (nonclinical services)
  - Two healthcare professionals discussing a case over the phone for example, a dr. at KKUH can talk with another dr. -same specialty- in another hospital or another city (it is not between patient and dr.)
  - Using videoconferencing between providers at facilities in two countries

From the note space below

Telehealth Provision of information to healthcare providers and consumers and the delivery of services to clients at remote sites through the use of telecommunication and computer technology.
Telehealth Generic term used for designation of fields including telemedicine, telerehabilitation.

Telenursing Practice Guidelines https://www.crnns.ca/documents/Telenursing2014.pdf

Define Telehealth and Telemedicine



- **Telehealth can promote:**
  - Patient-provider communication
  - Patient self-management with provider feedback example: Patient at home -like the picture- connected to BP measuring device. It will evaluate any abnormality and give feedback to the dr responsible so he could then communicate with the patient using telehealth.
  - Health literacy Search for diagnosis and educate patients
  - Provider-provider consultants

Telenuring Practice Guidelines https://www.crnns.ca/documents/Telenursing2014.pdf

Telehealth System Overview

- Transmits data (Vital Sign) from home to a healthcare professional by use of ICT.

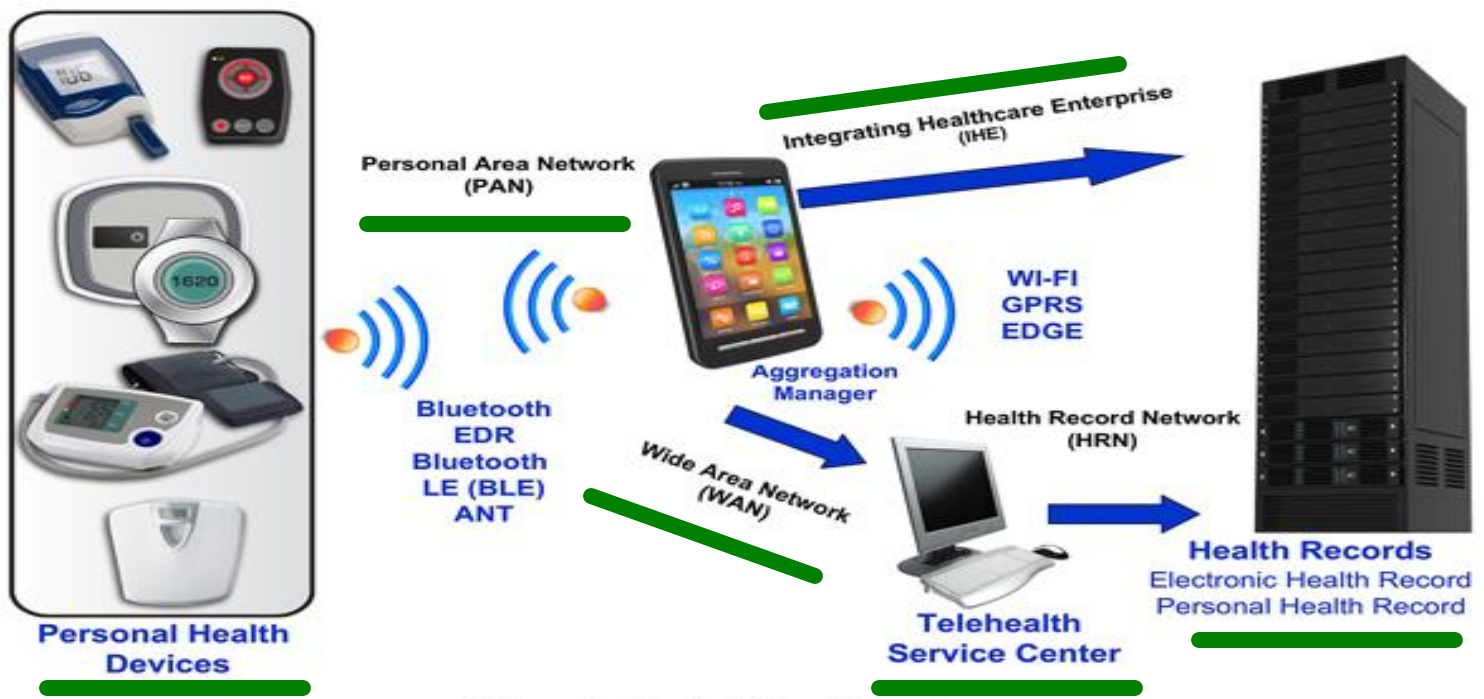
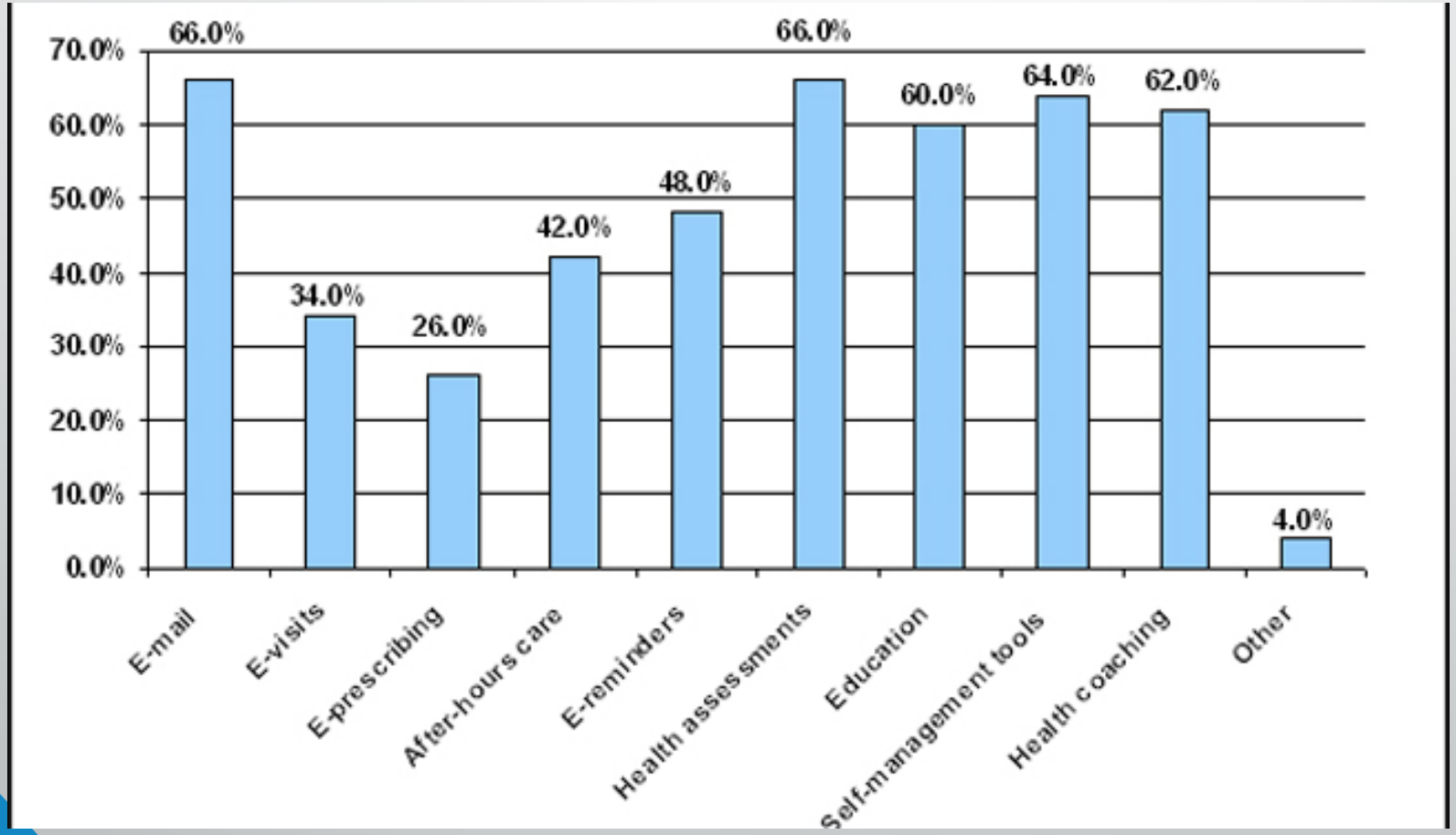


Figure 1. Basic telehealth system.

http://www.ecnmag.com/articles/2011/03/wireless-technologies-build-momentum-telehealth-systems

Top Telehealth Tools for Patients

Top telehealth tool: email.



http://www.hin.com/chartoftheweek/patient_telehealth_tools_printable.html

Define Telehealth and Telemedicine

From the note space below

Telemedicine is an older and a narrower term, connoting communication between two persons. Telemedicine is often associated with video-conferencing between patients and providers.

- **Telemedicine defined:** between patient and provider

"the use of electronic information and communication technologies to **provide** and support health care when distance separates the participants "

- **Combination of:**
  - Telecommunications Technology
  - Medicine (clinical services)

Telehelath does not directly include patient

Telenuring Practice Guidelines https://www.crnns.ca/documents/Telenursing2014.pdf

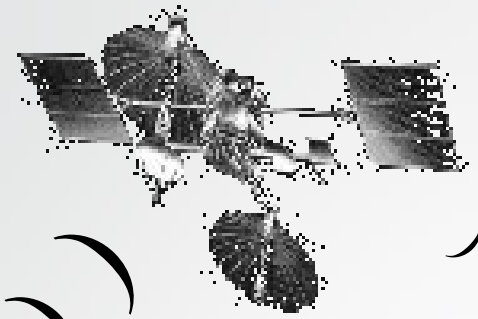
Types of telemedicine interaction

- Real-time (for Emergency use) eg: stroke , trauma
  - Parties communicate simultaneously via a telecommunication network, also called synchronous or interactive
- Store and forward (Non- Emergency use)
  - Involves non-interactive transmission of information from on site to another.
  - Sometimes referred to as asynchronous or pre-recorded and involves information being captured and then transmitted to the other party for advice, opinion or specialist consultation
- Hybrid Method

Categories of Telemedicine

- Patient Monitoring (Home care)
  - Blood pressure monitors
- Interactive Applications
  - Teleconsulting, Videoconferencing
- Store and forward applications
  - Medical images, lab results

Telehealth: videoconference can be between dr. and dr. for education or counseling –not always related to a patient-

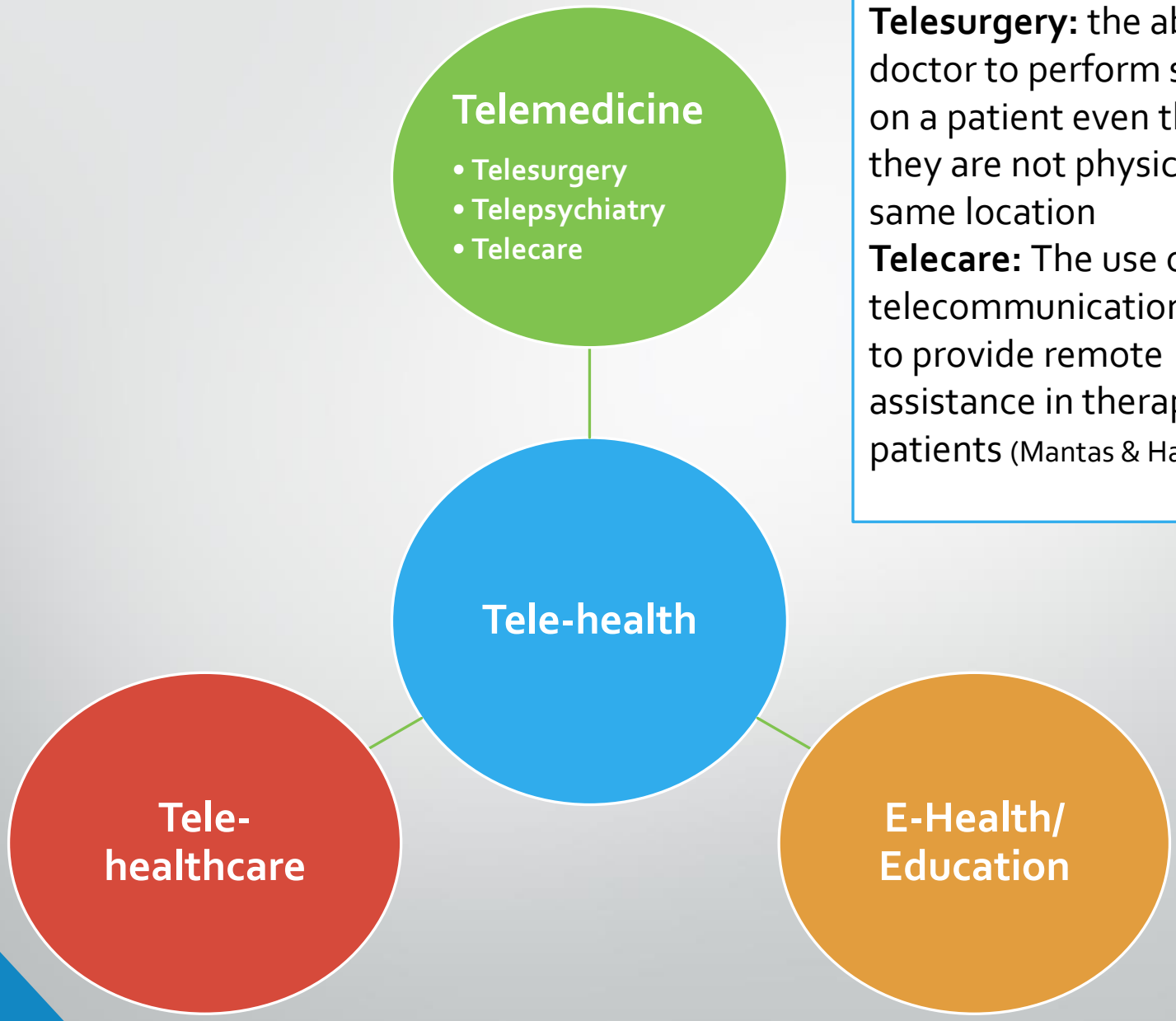


Hub Site

Remote Site

communication

T-1



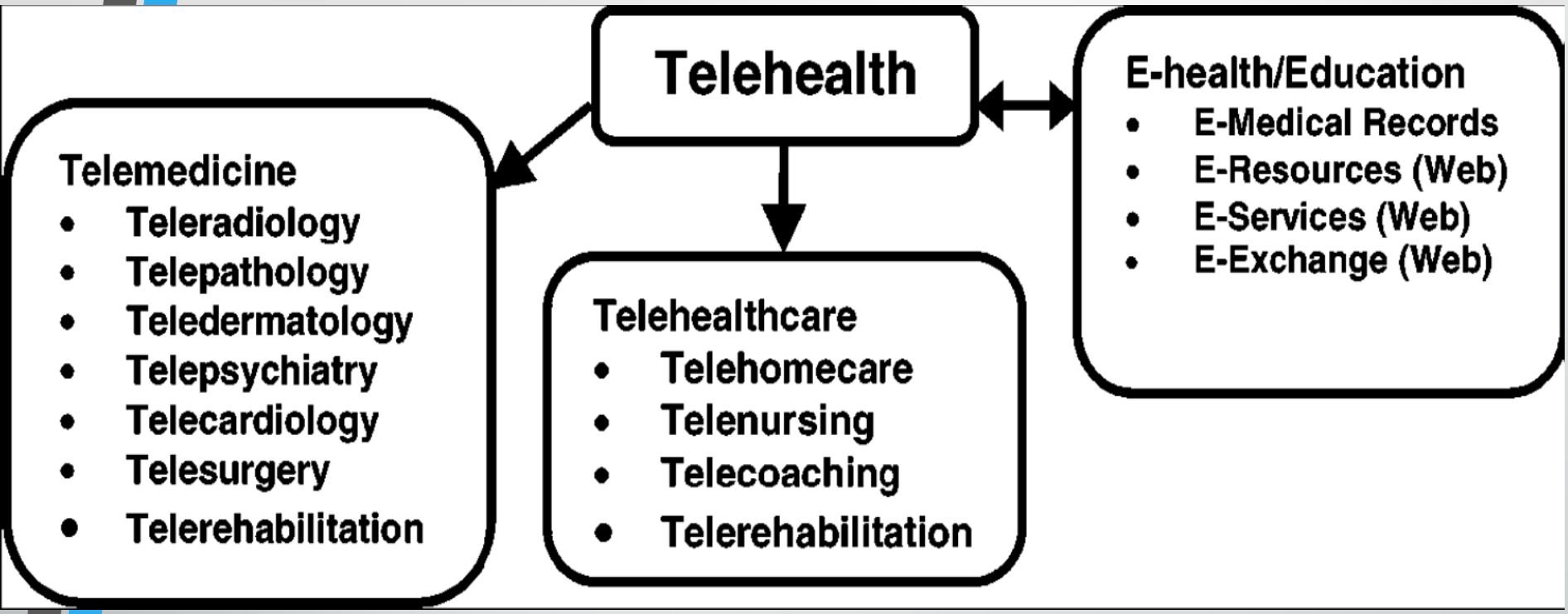
(Winters, 2002)

From the note space below

Telesurgery: the ability for a doctor to perform surgery on a patient even though they are not physically in the same location

Telecare: The use of telecommunication systems to provide remote assistance in therapy to patients (Mantas & Hasman, 2002)

Telehealth vs. Telemedicine



From the note space below

Telehealth is different from telemedicine because it refers to a *broader scope of remote healthcare services* than telemedicine. **While telemedicine** refers specifically to remote clinical services, telehealth can refer to remote non-clinical services, such as provider training, administrative meetings, and continuing medical education, in addition to clinical services.

History of Telehealth

(Wittson, Affleck, and Johnson)

Not important

Period	Telegraph	Telephone application
1835	Telegraph	Used in the American Civil War to deliver casualty lists and order supplies. Later used to transmit x-ray images.
1876	Telephone	Initially used for voice communicaion. About 30 years later, used to transmit ECGs and EEGs.
1895	Radio	Used to supply medical advice to seafarer. In 1920 the Seaman's Church Institute of New York provided medical care using radio. The CIRM in Rome has been using radio to provide
Late 1960s	Video/ television	A two-way closed circuit television link was set up between the Nebraska Psychiatric Institute in Omaha and the state mental hospital in Norfolk for educational purposes.
1990s	Videoconfer encing	Videoconferencing for health purposes became more common
Mid-1990s	Internet	Use of the internet for health purpose

Participants in the telehealth interaction

- The nature of the communication in health can be
  - Patient with practitioner ➔ telemedicine
  - Practitioner with Practitioner (Teleradiology)
  - Patient with patient (that is, mutual support) ➔ telehealth with no doctors involved
  - Practitioner or patient accessing educational material (that is, source of health information)) ➔ telehealth

Participants in the telehealth interaction

- The nature of the communication in health can be
  - **Patient with practitioner ➔ telemedicine example**
    - Telepsychiatry is a common telehealth application usually performed by videoconferencing
    - An evaluation of Telepsychiatry services in Alberta, Canada, showed that it was acceptable to users and there were significant cost savings from avoided travel by psychiatrists and patients

Chapter 19 Telehealth and Communication
http://www.powershow.com/view/12d046NWMxM/Chapter_19_Telehealth_and_Communication_powerpoint_ppt_presentation

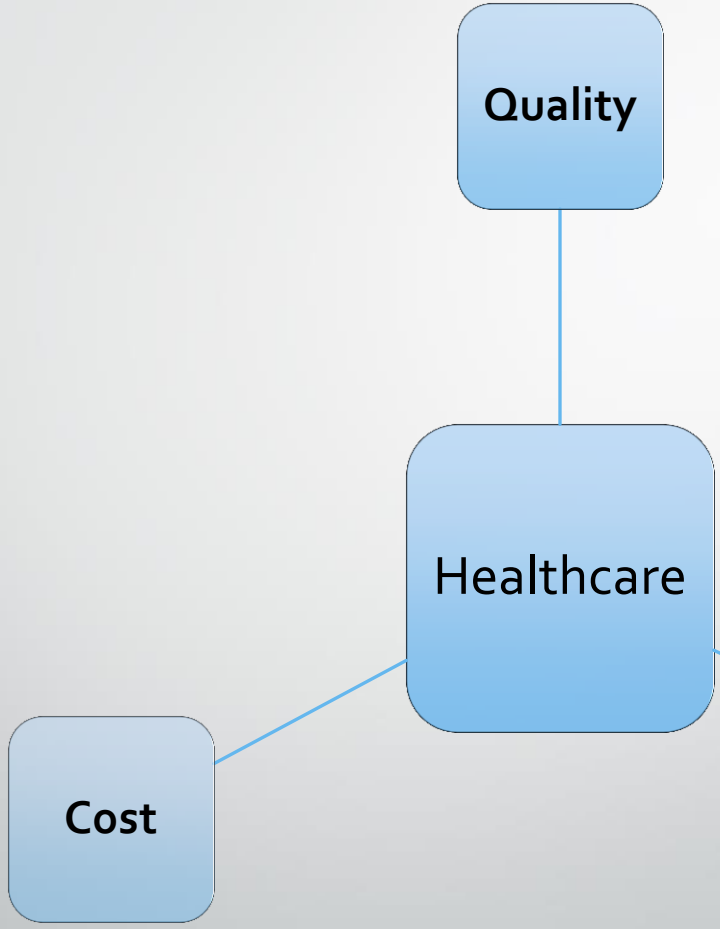
Participants in the telehealth interaction

- The nature of the communication in health can be

➔ telehealth example

  - Patient with patient (that is, mutual support)
    - Support groups : communication between people who have similar conditions,
    - A study of the use of audio conferencing by breast cancer patients in rural Newfoundland showed that it provided valuable mutual support, despite the distances.

Driving Forces of Telehealth

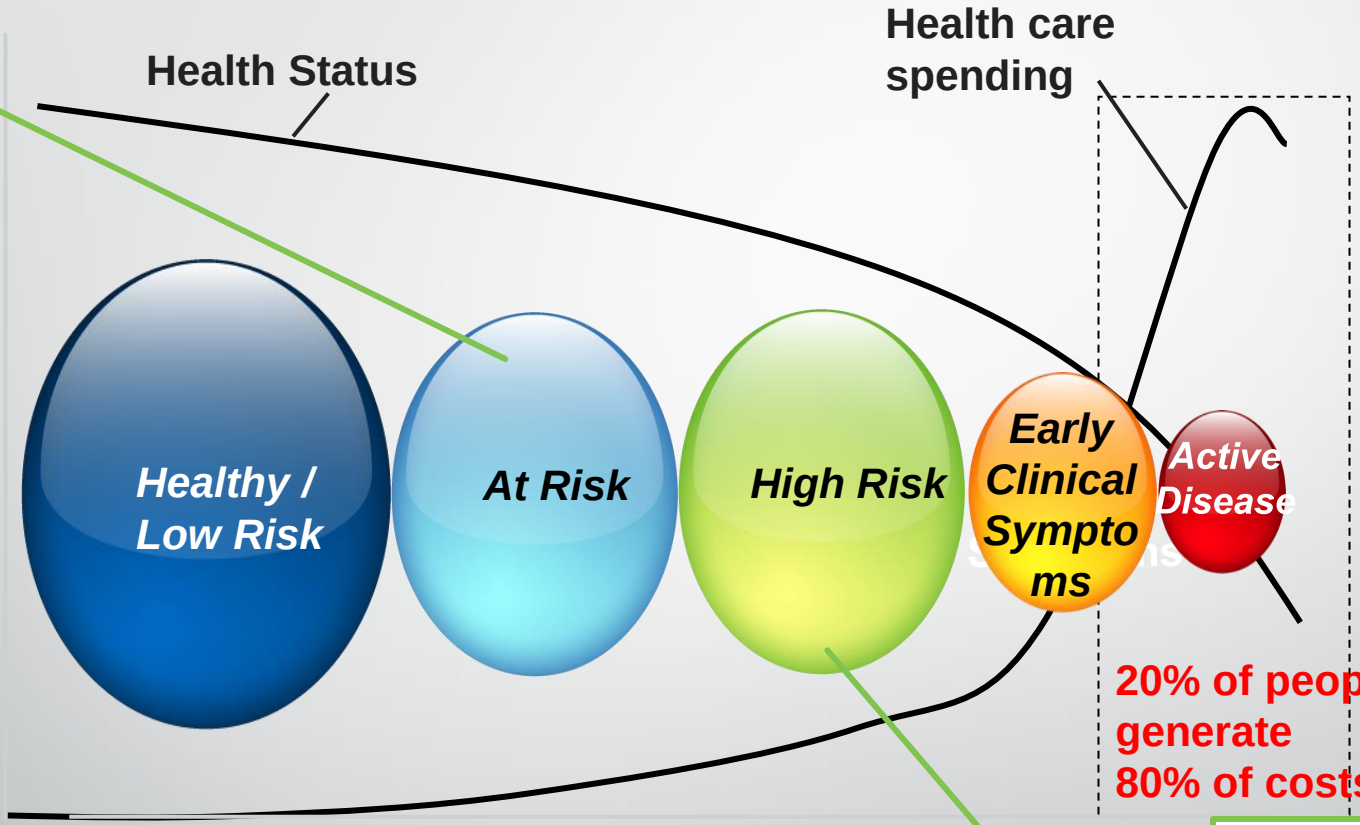


Driving forces

Big city better access smaller ar ea don't have better access

Low risk patients will be recognized by telehealth ➔ better prognosis

Is "At the Point of Care" Too Late?



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

Application will prevent them from reaching symptoms phase: social media like, twitter for low risk and high risk patients

Driving Forces of Telehealth

- Quality of Care
  - Provide diagnostics. If we apply telehealth in schools, we can observe students' conditions and monitor the kids, intervene and diagnose early.
  - New mode of treatment
  - Improve patient satisfaction

(early treatment, higher frequency of encounter. Telemedicine reduces frequency of patient coming to the hospital in Riyadh. For example, if the patient is living outside of Riyadh (like in Tabouk) , doctor can provide him/her with BP machine. Feedback will come from Riyadh after monitoring (like if he/she got higher than 140 mmHg ➔ alert will be sent by a nurse in Tabouk.)

From the note space below

Key factors to measure:

- Diagnostic accuracy
- Delay/Time reduction in providing treatment
- Prevented conditions
- Adherence to medication
- Change in mortality/morbidity
- Improved quality of life

Driving Forces of Telehealth

- Access to Care
  - Access for people with situational limitations (physical disabilities, elderly, etc). Also, females can't drive ➔ so, telehealth will increase their access to health care.
  - Minimize distance of travel for people in hard to reach/isolated locations
  - Not limited by time/place

From the note space below

Key factors to measure:
Patients satisfaction
Timely disease detection

Driving Forces of Telehealth

- Cost of Care
  - Prevent/early treatment of disease = lower cost of care (both to provider and society)
  - Lower cost from travel

From the note space below

Key factors to measure:

What does the service cost?
Does the service save money?
What is the balance between costs and effects?
Which perspective to measure cost: patient, provider, or society?

Why Telemedicine/Telehealth?

- Access: Time, Travel, Expense, Information → No need for travel.
- Health Provider Collaboration. → prevent patients from becoming advanced cases and acquiring more cost.
- Enhanced Communications
- TV & Computer Applications common and non-threatening
- Minimize referrals

From the note space below

Access

Provide primary healthcare that would not be available otherwise
Specialty care consultations for isolated specialists, practitioners, and other health care professionals
Eliminate expensive travel and isolation
Reduce need to move patient
CME for isolated health care providers

Why do Telemedicine/Telehealth?

- Communication/Collaboration with specialists
- ER 'front-line' support. ➔ Small hospital will alert a big hospital if it couldn't handle a patient ➔ so, it consults for or transports this patient.
- Improved professional education
- Saves time, travel to outreach clinics

List the Challenges of Telehealth

- Infrastructure
- Liability
- Privacy Privacy psychiatry patient will be hesitate of using it.

- End-user lack of knowledge about the benefits, services available in other settings
- Compromised relationship between health professional and patient
- Lack of time to adopt telemedicine

From the note space below

Equipment costs , Connectivity costs ,Reimbursement , A lack of appropriate ,training and educational facilities , The legal and ethical issues including licencing, privacy and confidentiality

Identify equipment and technology to sustain telehealth

- Equipment to capture the information at each site
- Communication equipment to transmit this information between the sites
- Equipment to display the information at the relevant sites
- Four types of information transfer common in telehealth
  - Audio, text, still images, video

Chapter 19 Telehealth and Communication
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Telemedicine Settings

- Rural area
- Schools
- Clinics
- Hospitals
- Prisons can't go to hospital
- Assisted living. elderly homes

From the note space below

School-based Care
- Dialysis
- Support groups
- Speech therapy
- Remote ultrasounds
- Pre-commitment assessments
- Sign Language interpretation
- Dietary counseling
- Rehab services
- Supervision

Emerging Telemedicine applications

- Telestroke
- Teledermatology
- Teleconsults
- Telewound care
- TeleICU
- Teleophthalmology
- Telecardiology
- Pre and post-surgical care
- Telepsychiatry
- Telepathology
- Teleradiology
- TeleEndocrine
- TeleTrauma
- TelePediatrics
- eVisits

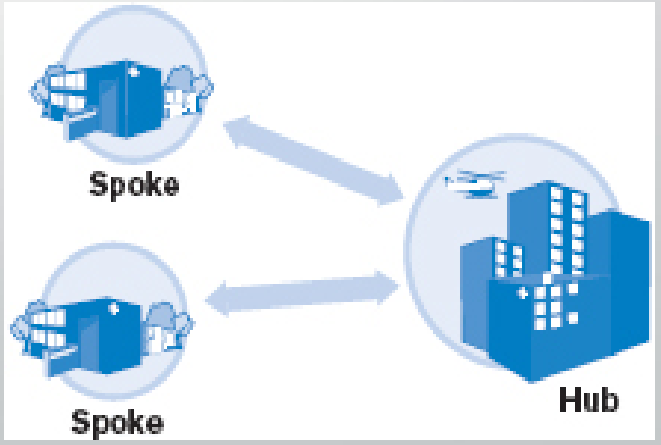
Emerging Telemedicine applications

- Telehealth Post-discharge
  - Reduce hospital readmissions
  - Improve clinical outcomes, compliance
  - Improve patient quality of life
  - Improve patient education and self-care

Emerging Telemedicine applications

- For Stroke Patients:

"To be effective, clot-dissolving therapies must be given within three to four and a half hours after you experience stroke symptoms."



http://www.mayoclinic.org/tests-procedures/stroke-telemedicine/basics/definition/prc-20021080

From the note space below

Case Study:

In a stroke telemedicine consultation, an emergency medicine doctor at your regional hospital (the spoke) will examine you. If your doctor suspects an acute stroke, he or she will activate the stroke telemedicine hotline at the hub hospital, which has a dedicated hotline and group paging system and vascular neurologists on call 24 hours a day, 365 days a year. The hub's on-call vascular neurologist usually responds within five minutes.After you have a CT scan at the spoke hospital, the vascular neurologist at the hub performs a live, real-time audiovisual consultation. The vascular neurologist may discuss your medical history and review your test results. The vascular neurologist evaluates you, works with your doctor to determine the most appropriate treatment and sends the treatment recommendation electronically to the spoke hospital.Having a prompt evaluation increases the possibility that clot-dissolving therapies (thrombolytics) can be delivered in time to reduce stroke-related disability. To be effective, clot-dissolving therapies must be given within three to four and a half hours after you experience stroke symptoms.

Link

http://www.mayoclinic.org/tests-procedures/stroke-telemedicine/basics/definition/prc-20021080

Emerging Telemedicine applications

- Telestroke
  - ER Consultant do a CT Scan;
  - Trained neurologist performs a live, real-time audiovisual consultation
  - make diagnosis and appropriate treatment recommendations;
  - Send documentation electronically

http://www.mayoclinic.org/tests-procedures/stroke-telemedicine/basics/definition/prc-20021080

Emerging Telemedicine applications

- Teledermatology
  - Inpatient and emergency consults for hospitals without dermatology coverage.
  - Timely transmission of images and clinical information.
  - Educational opportunities for residents and fellows.

Emerging Telemedicine applications

- Emergency Care and Trauma
  - Timely trauma evaluations for patients in remote or rural areas.
  - Assistance with triage and transfer decisions.
  - Learning opportunities for community providers.

Emerging Telemedicine applications

- Tele Wound Care
  - Remote consults for patients with poorly healing wounds.
  - Real-time transmission and review of images.
  - Reduced patient transfer rates.

Emerging Telemedicine applications

- **Telesurgery:** the ability for a doctor to perform surgery on a patient even though they are not physically in the same location. Communicate by robotics.
- **Teleradiology:** the transmission of radiological patient images, such as x-rays, CTs, and MRIs, from one location to another for the purposes of interpretation and/or consultation

Identify several telehealth applications

- **Telecare:** The use of telecommunication systems to provide remote assistance in therapy to patients
- Teledentistry
- Health Education
  - Geographically isolated health care workers
- TeleICU. when the on call doctor leaves.

From the note space below

Systematic and regular updating of skills and knowledge ae essential elements in effective healthcare provision and Internet supports this development

Telemedicine in Saudi Arabia

Successes and Challenges in the Implementation and Application of Telemedicine in the Eastern Province of Saudi Arabia

by Azza Ali El-Mahalli, MD, PhD; Sahar Hafez El-khafif, PhD; and Mona Faisal Al-Qahtani, PhD

http://perspectives.ahima.org/successes-and-challenges-in-the-implementation-and-application-of-telemedicine-in-the-eastern-province-of-saudi-arabia/#.VHw2EJOUd9k

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