New Bulgarian University

INTENSIVE PROGRAMME: SPECIAL ABILITIES AND TALENTS - PATTERNS OF COGNITIVE PROCESSES IN PEOPLE WITH DISABILITIES
The role of telemedicine in assessment and therapy in developmental disorder

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Telemedicine

“A journey of a thousand miles begins with one step”
Definition

- Telemedicine is composed of the Greek word τελε (tele) meaning 'far', and medicine. Telemedicine usually means transmission of information followed immediately by medical care. Image acquisition, storage, display, processing, and transfer represent the basis of telemedicine.
- Telemedicine is defined by the Telemedicine Information Exchange (1997) as "the use of electronic signals to transfer medical data from one site to another via the Internet, Intranets, PCs, satellites, or videoconferencing telephone equipment in order to improve access to health care".
- In 1996 Jim Reid defined telemedicine in his book "A Telemedicine Primer: Understanding the Issues" as "the use of advanced telecommunication technologies to health information exchange and health services delivery across geographical, time, social and cultural boundaries".
- According to the Telemedicine Report to Congress (1997), "telemedicine can mean access to health care where little had been available before. In emergency cases, this access can mean the difference between life and death. In particular, in those cases where fast medical response time and specialty care are needed, telemedicine availability can be critical. For example, a specialist at a North Carolina University Hospital was able to diagnose a rural patient's hairline spinal fracture at a distance, using telemedicine video imaging. The patient's life was saved because treatment was done on-site without physically transporting the patient to the specialist who was located a great distance away".
- The report added, "Telemedicine also has the potential to improve the delivery of health care in America by bringing a wider range of services such as radiology, mental health services, and dermatology to underserved communities and individuals in both urban and rural areas".
- In the near future telemedicine might thoroughly change the execution of medicine and how health care is organised. The government should on one hand change the rules so that new technologies can be usefully used, and even encouraged. On the other hand it must make sure that the changes would benefit the people and take measures to protect the population against possible problems.
What is Telemedicine

Telemedicine is the use of advanced technology to exchange health information (audio, visual, text) and provide health care services (diagnosis, consultation, treatment, education) across geographic, time, social and cultural barriers.
What is the aim of Telemedicine

A Telemedicine project is successful, when it achieves to:

- Save time
- Save money
- Improve the quality of healthcare
HOW TELEMEDICINE WORKS

1. Webcam
   A webcam and microphone connected to the computer allows your doctor to see you on the other side. Your session works just like a normal doctor visit.

2. Internet
   A high-speed internet connection allows the video session to occur in real-time from your computer.

3. Features
   Telemedicine gives you the ability to securely upload a picture of your problem area to your online patient file. Once uploaded, the doctor can view the image from a computer.

4. EMR
   A secure third-party electronic medical records system stores your information and all relevant data collected from your telemedicine session. All appointment scheduling, patient files and billing are controlled here.

5. Prescriptions
   After the doctor has evaluated you and provided treatment recommendations, a prescription can be electronically submitted to the pharmacy for any necessary medication.
Timeline - since 1844

- Primitive forms of telemedicine have already been used hundreds of years ago. One example is the use of clocks by lepers, to warn others to stay away from them. In the Middle Ages information about the bubonic plague was sent throughout Europe by bonfires. During those days some wealthy families even sent urine samples to their doctor for a diagnosis.

- First message sent in 1844 using the electric telegraph invented by Samuel Morse (1791-1872).

For details – see the paper Version of the Lecture “The role of telemedicine in assessment and therapy in developmental disorder”
Model of Point to point System

Patient end
- 12 Lead ECG
- A3 Scanner
- Video Conferencing Camera
- Digital Camera
- TV Monitor

Doctor end
- SkyIp or FlexiDama Terminal
- Video Conferencing Camera
- TV Monitor
- Doctor-End Station

Switch

District Client Station
Point-to-Multipoint System Configuration

Super Specialty Hospital

Server

Doctor-End

Doctor-End

Doctor-End

Rural/District Hospital

Patient-End
Continuing Medical Education (CME) Configuration

- TV Monitor
- LCD Projector
- Video Camera
- Microphone
- Document Camera
- Mixer/Switcher
- Antenna & ODU
- DVB-RCS In-Door Unit
- Hub/Switch
- Scanner
- Work Station(s)
- Server(s)
Telemedicine and children`s health

• Telemedicine is used to screen, diagnose, treat, and monitor a wide range of pediatric health conditions from common childhood illnesses, such as strep throat and asthma, to conditions requiring specialty care in such fields as dermatology, endocrinology, emergency and critical care, neurology, gastroenterology, obesity, radiology, pathology, oral health, and psychiatry.

• Telemedicine and telehealth applications help providers and patients manage the patient’s health, reducing the need for more complex and costly hospital visits and health treatments later.
• For example, UC Davis Children’s Hospital in Sacramento, California has used telemedicine to facilitate the availability of emergency and critical care consultations to a rural hospital in Northern California 24 hours a day, 7 days a week by installing telemedicine equipment at UC Davis’ pediatric intensive care unit and in the homes of its pediatric critical care physicians.
Mother finds a problem with her child

She visits a specialists for a consultation

The diagnosis

Telemedical solution for children with disorders
Personal assistant contacts remote site and requires consult

Local physician’s assistant schedules time & date for consult

Inform consultant site about new patient
Consultant reviews patient record

Consultant notifies mother and assists child

Videoconferencing
  Introduction with patient
  • Clarifies details of record with physician
Consultation ends

Consultant gives orders immediately

Consultant reviews patient’s electronic record and sends orders later

Diagnosis & Treatment plan
a. Home monitoring

3 times daily: exercises

Once a day: fill in form with difficulties and complaints

If necessary: Type in questions or request teleconference with consultant

Send data through the internet

Consultant’s assistant reviews new data on a daily basis
Urgent: Notify Consultant immediately
Not certain: Notify consultant the same day
Normal: Consultant reviews data once a week

Consultant reviews new data
**Pathological**

- Notify local physician
- Notify patient
- Call patient, give order for hospitalization
- Send instructions over internet
- Physician’s assistant schedules appointment with patient and notifies consultant’s assistant
- Assistant sends email once a week for reassurance

**Normal**

- Answers patient’s questions, if asked for, schedules teleconference appointment
- Adjustments needed
- Urgent
c. Visit to Local practice

Patient arrives at remote site
- Every 3 weeks
- On Consultant’s request

Physician
- Reviews patient record
- Examines patient
- Enters new data into record

Assistant
- Notifies consultant site
- Turns on videoconferencing equipment
- Sets up linkage

When ready, assistant notifies consultant site
Other applications

- Emergency and Critical Care.
- Oral Health
- Children and Youth with Special Health Care Needs
- Vision Screening
- Mental Health
- Telepharmacy
- Children with Special Health Care Needs
- Home Health Care
- Child Abuse Evaluations
- Educating Families
- Supporting Families
- Disease Management
- Language Translation
- Supporting Rural Providers and Providing Medical Education
- Caring for Children Where They Are Located
Kern Regional Center uses telemedicine to connect children with developmental disabilities in Kern, Inyo and Mono Counties—very remote areas in California—to pediatric psychiatrists, neurologists, and other sub specialists at major medical centers throughout the state. Through approximately 2,000 telemedicine consults a year, Kern Regional Center has helped children get the care they need while reducing their absences from school and their parents’ absences from work. Kern Regional Center has also used telemedicine to coordinate children’s care by simultaneously connecting the members of a child’s care management team, such as the pediatrician, teacher, sub specialist, and the regional center staff.
One basic telehealth system
The benefits of telemedicine

- Improved access to healthcare, e.g., obtaining second opinions;
- Improved continuity of care;
- Improved patient education, and timely treatment;
- Continuous monitoring of chronically ill patients;
- Reduced travel time for physicians, other healthcare providers, and patients;
- Better access for patients in underserved areas;
- Improved access to medical records and information,
- Promoting self-help by increasing the online availability of medical information;
- Knowledge-based self-diagnosis programs;
- Distance learning programs; and medical research data/information;
- Improved continuing medical education.
Telemedical potential risks

- collected and transmitted information may not be sufficient to allow appropriate medical decision making by the physician and consultant(s);
- medical, technical or other limitations in obtaining, processing, presenting and/or understanding patient data may result in inappropriate decisions);
- delayed evaluation of patient’s condition due to failures or deficiencies of equipment may influence the quality of telemedical service;
- prearranged consultants’ time schedules and availability may influence time-to-response and decision making;
- patient’s condition may vary in time necessary for teleconsultation and relevant (tele)medical procedures;
- in rare instances, telemedical practice algorithms, security protocols and integrity of medical data could be affected or damaged by changes in services,
- in rare cases, lack of access to complete medical records.
<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
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<tbody>
<tr>
<td>Transfer to the hospital</td>
<td>Instant consultation</td>
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<tr>
<td>Only one expert</td>
<td>More experts</td>
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<tr>
<td>Paper archive</td>
<td>Digital Data base+ Paper archive</td>
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<tr>
<td>Lost in transferring papers</td>
<td>Digital record at 2 places</td>
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<td>More expenses for patients/relatives</td>
<td>Least expenses for patients/relatives</td>
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<td>Multitude visits</td>
<td>Reduction of visits</td>
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<td>Experts time expenses</td>
<td>Only when necessary</td>
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<td>Healthcare in hospital</td>
<td>Healthcare at home</td>
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<tr>
<td>Isolation of experts</td>
<td>Improvement of relationships in professional sphere</td>
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<td>Expenses of the hospital for:</td>
<td>Only when necessary</td>
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<td>- specialists</td>
<td>Only when necessary</td>
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<td>- transfers and ambulances</td>
<td>Only when necessary</td>
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<td>- time</td>
<td>Only when necessary</td>
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<td>- technology</td>
<td>Single but with permanent reimbursement</td>
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<tr>
<td>Lost of time for the patients</td>
<td>Only when necessary</td>
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<td>Limited disease prevention</td>
<td>Unlimited</td>
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<td>Patients access to specialists to the local place</td>
<td>Patients access to specialists to a national level</td>
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<td>Need for personal direct contact with a specialist from national level</td>
<td>Immediate distant consultation</td>
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<td>Limited free time for experts</td>
<td>Augmentation of creative work</td>
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<td>Standard medical practice</td>
<td>Pros</td>
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<td>Traditions of medical work - it changes with years and it is the main component of work methodics</td>
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<td>Tested through its development fixed and routine</td>
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<td>The paper doesn’t require technologies</td>
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<td>Face-to-face contact</td>
<td>Financial and time expenses for patients family</td>
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<td>Subjective mistakes</td>
<td>Transfer of various data and examination results</td>
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<td>Legislation and law have the evidence power and validates the doctor in front of every administrative and accounting issue</td>
<td>Speculation with information</td>
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<td>Personal written responsibility - official documentation</td>
<td>Time delay</td>
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<td>Ancient rituals in communication with patient</td>
<td>Old archives</td>
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<td>Long life and home education</td>
<td>Interaction human-PC</td>
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<td>Objective opinions</td>
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<td>Reduce professional isolation</td>
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<td>Reduction of permanent travelling and increase of professional satisfaction</td>
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<td>Ensuring the best specialists</td>
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<td>New standards of work - faster, precise and cheaper</td>
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<td>Team work principles</td>
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Thank You for attention!

Q & A

Everyone's Unique &
Th-Th-That's Good Folks!