Authorial initiatives in telemedicine and eHealth

Polish Telemedicine Society and Center of Excellence „TeleOrto„ perspectives

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Telehealth/Telemedicine/eHealth

- “medical care delivery and medical information exchange on remote”
- Move information instead of patient or physician
- Telehealth, telemedicine, telecare is not:
  - A panacea
    - Able to solve all medical problems
    - Able to replace medical professionals

“Introduction to Telemedicine”, Wootton (1999)
Applications for telemedicine

Telemedicine

- IT in medicine
- Evidence Based Medicine (EBM)
- Applicable in every medical specialty
Telemedicine Approach

- Interdisciplinary

- Team (many specialists – team work necessary)

physician + informatician + telekcom specialist = TM

- Specialists take part while solving real clinical problems
Attributes:

- Telecommunication as fast as possible (economically justified)
- Move the information, not the patient
- Shorten way to highest class specialists
Features of Telemedicine:

- Medical service – served by physician

- **Beneficiary - PATIENT**

- Direct or Indirect

- **Responsibility and Liability**

- Medical Ethics
eHealth - telemedicine

Telemedicine
Telemedycyna
eHealth
eZdrowie
telenursing
Tele pielęgniarstwo
eCare/telecare
eOpieka zdrowotna
Activities in telemedicine and eHealth

Teleeducation – eEducation in Medicine
Telediagnostics - eDiagnostics
Teleconsultations - eConsultations
Telepresence in surgery (telepresence, telementoring)
Telesurgery (robotics)
Telerehabilitation

Clinical decision support on remote
How polish population understand telemedicine (TNS-OBOP & PTS Survey)

- Treatment / medicine / medical consultation via telephone
  - Most often: 21%

- Treatment / medicine / medical consultations via TV
  - Young person, age 15-29: 9%

- Medical TV programs / TV program
  - Middle and higher educated person: 5%

- Esoteric "medicine" / telepathic therapy / parapsychology
  - Person in moderate or good financial status in self evaluation: 5%

- Difficult to say
  - Most often: 42%

(N=1005)
Polish attitudes toward telemedicine

- Term „telemedicine” brings no association in 42% population (42%) or makes total misunderstanding (telepathy/parapsychology – 5%; TV program – 5%).

- 44% respondents aged 15 or above have heard about telemedicine

- 24% of population think, that no telemedicine service is available in Poland, 35% have no idea about telemedicine.

- Most often reason for no interest in telemedicine service use (independent on service type) is persuasion that direct contact with physician is necessary, and lack of trust to such service.
Society teleinformatic preparedness

- Almost 90% of population aged 60 and above cannot operate the computer. The same number cannot use the Internet. A little of that population have good will to learn to operate those devices (4–3%).

- The most promising devices are phones and mobile phones as devices for telemedicine.

- 42% of respondents would like to use telemedicine service utilizing phones.

- Almost 60% of population owns Mobile phone, in that group 21% is aged 60 or older.
Available for physicians

Teleeducation
-internet, Medline, web pages, e-manuals
-journals on-line
-e-learning
-Internet
Medline
Videoconferences
Webinars
Teleeducation - example
Anatomy Department

Manuals

Academic teachers

Radiologic Anatomy

selfeducation

multimedia

ANATOMICAL web page

Preparation toward telemedicine begins here !!!!
Egzamininy praktyczne

Zdjęcia preparatów z egzaminów praktycznych Naszego Zakładu.

Practical exams

Pictures from practical exams.
Katedra i Klinika Ortopedii i Traumatologii Narządu Ruchu
Akademii Medycznej w Warszawie

CENTRUM DOSKONAŁOŚCI

Telediagnostyki i Leczenia Chorób i Obrażeń Narządu Ruchu

Koordinator: Prof. dr hab. med. Andrzej Góręcki

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© Dr n. med. Wojciech Glinkowski
Teleeducation in medicine

Telemedicine

- example – CME - Orthopedics & Traumatology
VideoConferencing Systems in telemedicine

- Videoconferences
- Telecare
- E-learning
- Security
- Remote tutoring
- Tele consultations
Profesjonal Systems – restrictions

Up to 4 connections at once

Price

**ISDN** – high expenses locally, usually too high for hospitals in Poland

**IP connections require** – info highways
Videoconferences
TeleOrto – University Regensburg
Teleeducation in medicine

Telemedicine

- Modern techniques – high tech equipment
- Demonstrations by experienced surgeon while teaching required
- **Live surgery on-line** – useful tool in teleeducation.
- Usually utilized locally
- Rarely via Internet
- Our experiences – orthopedic and telemedicine
  - Webinars – password protected access
Webinars – national and international medical conferences transmitted via Internet on topics related to orthopedics and orthopedic trauma.

Connections: One to one, one to many, few to many

Chat available – online questions
Telemedicine

Conferences & Webinars

I Conference
„Telemedicine and modern IT application in medicine“

II Conference
„Telemedicine and modern IT application in medicine“

The IASTED International Conference on Telehealth 2006
April 5 -7, 2006, Luxexpo, Luxembourg

11th Congress of the International Society for Telemedicine
26 - 29 November 2006, Cape Town, International Convention Centre, Cape Town, South Africa
TeleOrto WEBINARS

Feb. 17, 2006 Conference „Columbus knee prosthesis”

March 27, 2006 (Monday) „Unicompartmental knee prosthesis Oxford”

Webinarium off line - see here

June 5, 2006 „THR Corail”

Webinars webcasted in cooperation with Polish Telemedicine Society
Telemedicine

Webinar_User side

"TeleOrto" webinarium on-line

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Hitaj konrad@entropy.pl!

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admin
konrad@entropy.pl
Telemedicine

Webinar - Conference – Teleasystesided surgery utilizing Computerized Navigation System – available on site, on PC, and pocket PC
Patients attitudes toward telerehabilitation

- Higher interest noted among younger, active patients
- Depends on level of education and active work
- Older patients expect some help from third person to attend telerehabilitation (family member/ nurse)
Telemedicine

Telerehab – telementoring
Telemedicine

Telerehab – telementoring

Via www, mms, videocall, movie transmission – online or “store and forward”
TeleECG support for musculoskeletal telerhabilitation project

TELE – EKG, TeleRR, „On demand” while exercising under telerehab supervision
TELEDERMATOLOGY – Authorial tool on the www/MDA/GPRS/EDGE/WiFi
Telemedicine

TELERADIOLOGY via Internet/GPRS/EDGE/WiFi

Zoom
Teleradiologic System developed in Wolski Hospital in Warsaw

Lab test orders

Register

Reports

Lab

Diagnostic room|CAD

Wyniki badan

Analizy

System/Data Base

Rejestracja

Pacjent

Other facility (Clinic, research center)

indexing, searching

Reference Base

Experts|CAD

Results

Discharge charts

Medical Center

Network links

Wi-Fi

Mobile Client

Client (specialist)

CAD

Interactive codec, intelligent transmission protocol

Lab test orders

Register

Reports

Lab

Diagnostic room|CAD

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CAD

Interactive codec, intelligent transmission protocol
Consulting and computer simulations

Medical recognition and advanced examinations

Treatment optimization – computer telesimulation biomechanical prediction

Acquired locally data

Consulting and computer simulations
Preoperative planning on remote service for distant hospital
Virtual surgery and 3D surgery planning international study

Lublana, Slovenia – Warsaw, Poland
Quantitative fracture healing assessment

Fracture healing prediction telemonitoring
Quantitative fracture healing assessment

Telediagnostic consultations and remote analysis for treatment enhancement
Quantitative fracture healing assessment

Telediagnostics

„Move the information not the patient”
Decision Support System components

• Input Systems
• Metabase (data warehouse, info. repository)
• Analytic apparatus
• Results visualization and distribution
Osteoporosis Telediagnostics

- DXR, DXA
PDA phone teleconsultation
TeleConsultations in orthopedics

Radiogram digital or digitalized

Wireless data transmission
GPRS

Consultant
Radiologist

Teleconsultation Center

Plus GSM

BTS
BSC
SGSN
GGSN
FireWall
Intranet
Internet
Charging Gateway

HSCSD/GPRS

Consultant
Radiologist
TeleConsultations in Trauma

Wireless data transmission

GPRS

HSCSD/GPRS

Charging Gateway

Plus GSM

Teleconsultation Center

Consultant

„acute duty“

- PDA phone
- Digital camera
- Digital X-ray

Wireless data transmission
TeleConsultations in Neurotrauma cases

- Digital input

RIS/PACS, with mms/sms notification
Most common teleconsultation scenario for heterotopic ossification patients qualified for radiotherapy

Department of Orthopedics and Traumatology of the Locomotor System
Medical University

Department of Radiotherapy
Institute Of Oncology

The distance - approximately 10 km.
Simple e-mail of anonymized patient’s image transfer
Preliminary reviewing of digitized x-rays has been shown as useful for radiotherapeutic treatment planning in the study.
Progressive codec (tele-tool)

- Teleconsultations, image transmission
- Multiplatform, independent architecture
- Progression mode for user selection
- Interactive protocol, effective coding
Compression Tele-tool: JPER2000

A. Przelaskowski
TeleCAD

Subjective quality: 1bpp
ROC_Detection: 0.1bpp
CAD: 0.2bpp

TP/(TP+FP+1)

mammograms

12bpp
0.3bpp

0.05bpp
Medical University in Wrocław
main directions of eHealth and telemedicine
activities

- **Telemedicine and eHealth – applications in Primary Health Care and Family Medicine:**
  - System of telemedicine services dedicated to Family Medicine Practitioners (grant KBN, 2000-2002)
  - Teleconsultations: Project ‘Consilium’ (AM W-w, 2003-)
  - BP Tele-monitoring by family medicine practitioners and telecare (own research AM, 2003-)
  - Tele-diabetology (own research AM, 2003-)

- **E-learning:** Project *European MedSkills*

- **eHealth:** Projekt *WHO/European eHealth consumer trends survey*
  (Program UE ‘Public Health’, 2005-2008)

A.Staniszewski
Telescreening of posture and spinal deformations – measurement System

A – patient, B – detektor CCD, C – Digital Projector, D – Stand, E – Computer PC

R. Sitnik
Early results and analysis

417 261 dots (x,y,z) system
Telemedical System Concept

Telediagnostic Center

Internet

GSM

Mobile System 1 (measurement)
Telescreening – epidemiology oriented cohort study of posture and spinal deformations

- Age independent
- No – X-ray
- Safe and repeatable measurement
- The first in the world for this purpose
Telehomecare

Tele-video-monitoring

- Monitoring and diagnostics after hospital discharge
- Telecare

- Lower cost of hospitalization
- Patient oriented and friendly environment
- Better quality of life
- Constant contact patient-physician

Tele-Comfort

- Monitoring without diagnozing
- Help to older and/or disabled
Mobile applications for sports medicine

Endurance tests mobile guide
as mobile phone application
For sports medicine physicians
Unique solution for middle class sportsmen

I. Wojtkowski
Telecare solutions
**Wireless telemedicine**

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Difficulties in telemedicine

- Certification
- Diplomas
- Law
- Safety
- Financing
- Liability and responsibility
- Technology (equipment, software, etc.)
- Supporting Institutions
- Medical community Acceptance
- „Passive resistance”
Telemedicine

Conclusions

- Selected cases only approximate effort of telemedicine enthusiasts in Poland
- Telemedicine is not the futuristic dream
- It becomes real in medical practice
- Searching for economically justified solutions remain important in telemedicine practical research
Summary

Telemedicine is able to:

• transform health care
• improve its quality
• reduce waiting lists and consultation time
• widespread access to specialists

There are some requirements to support telemedicine abilities, namely:
• allocation of funds for its development
• education, promotion
• interdisciplinary teams
• support for enthusiasts and overcome the barriers.
Polish
International
initiatives
Dziękujemy z uwagą

Thank you

Danke sehr