The Virtual Hospital as Tool for Ubiquitous Health

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National Discussion Forum
Electronic Cards, Patient Record and Electronic Prescriptions – Key Factors for Successful Implementation of Electronic Healthcare
7th of February. 2007, Sofia, Bulgaria

What is Charité?

- Largest university hospital in Europe:
  - 3,500 beds in 115 clinics and institutes
  - ~125,000 inpatients, ~390,000 outpatients yearly
- 12,400 employees, including 3,232 scientists
- 8,900 students
- State-of-the-art business enterprise:
  - 810 million € annual budget, including
  - 253 million € for research and education

The European eHealth Area

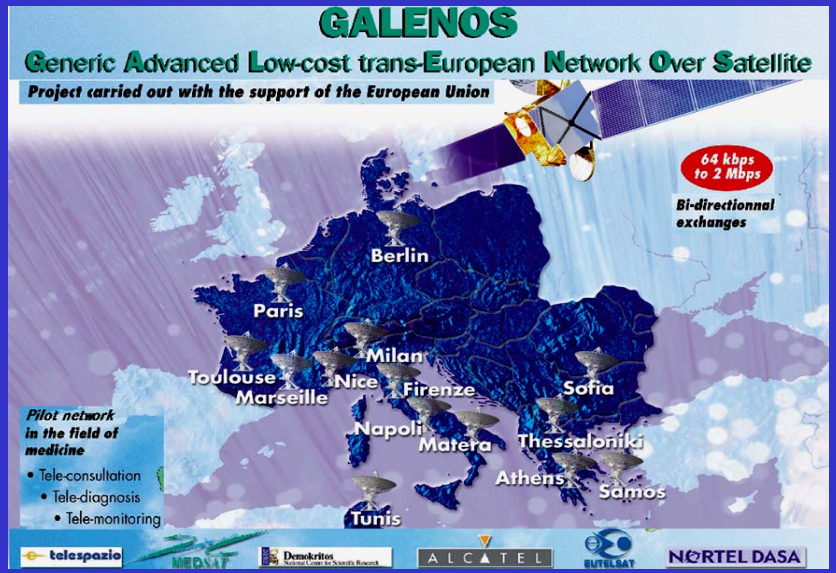
- electronic health cards
- health information networks
- online health services
- standardised European provision for e health services in clinical and administrative settings

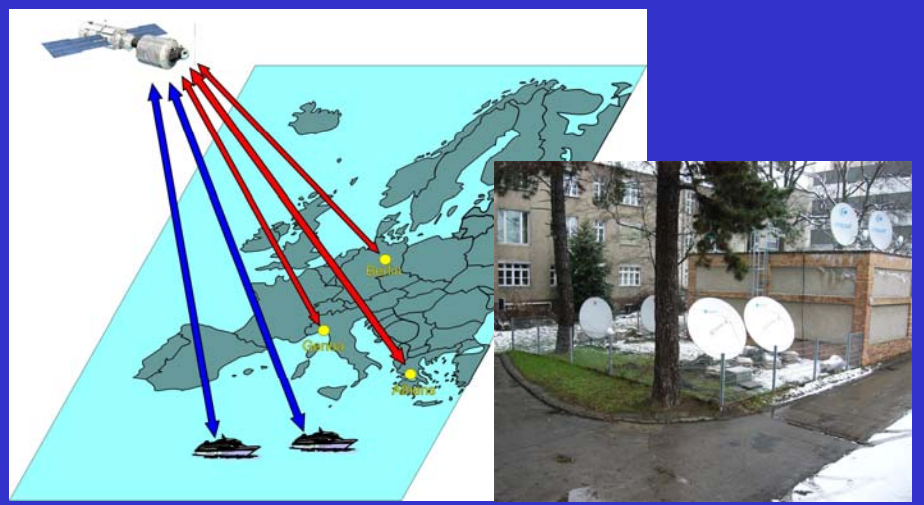
VH - Learning Objectives

- To understand the roles of ICT (Information and Communication Technologies) in digital medicine (e-Health) and its drawback of digital divides
- To see that global access for all, anytime, anywhere to the best medical practice: Ubiquitous Health (u-Health) is required
- To understand the importance of progression from Telemedicine to Telepresence
- To recognize the VH - Virtual Hospital as an integrated concept of services and platforms for telemedicine
- To understand how to get evidence into medical practice
- To recognize sharing expertise in multicultural settings

Networks for interactive medical Teleapplications

VH for Bridging the Digital Divide





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Background of VH - e.g. Virtual Euro Mediterranean Hospital

- Telemedicine aims at equal access to medical resources for everyone at any time and anywhere
  (ubiquitous healt: uHealth)

- Digital divide: ICT amplifies disparity in quality of life

⇒ Need for real integration
of ICT platforms and telemedical services

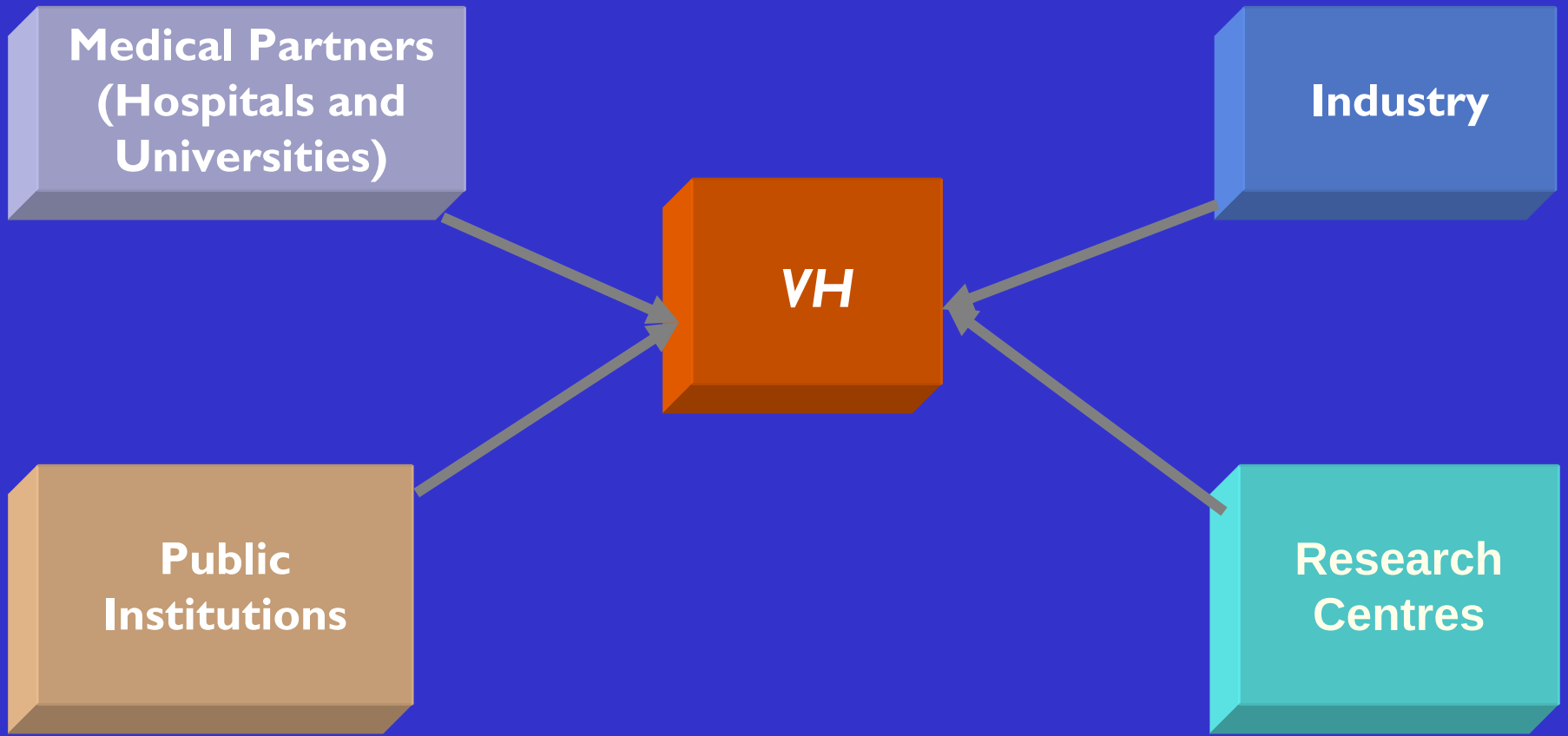
Virtual Hospital (VH) for Digital Medicine

Services:

- Virtual Medical University (education)
- Real-time Telemedicine (patient care)
- Medical Assistance / Continuity of Care (prevention & curative tourism)
- Implementation of Evidence-based medicine (distributed knowledge)
- Fellowship Programmes for young professionals (teleeducation)
- Intelligent homecare (smart home)
- Distributed Units in the Network for diagnosis and therapy (export of patient data/import of best medical expertise)

Methodologies:

- Medical-needs-driven instead of technology-driven!!!
- New management tools for virtual medical communities
- Management of clinical outcomes
- Modular architecture
  - improved implementation of evidence-based medicine
- Integration of different telemedical solutions in one platform
- Data Security & Patient's Privacy
- Distributed Units for diagnosis and therapy



The VH Consortium constitutes an original partnership between Health care professionals and industries for the delivery of medical teleservices for global health care.

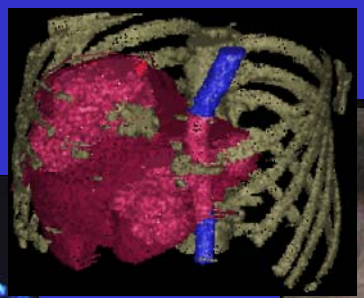
VH - Getting evidence into medical practice

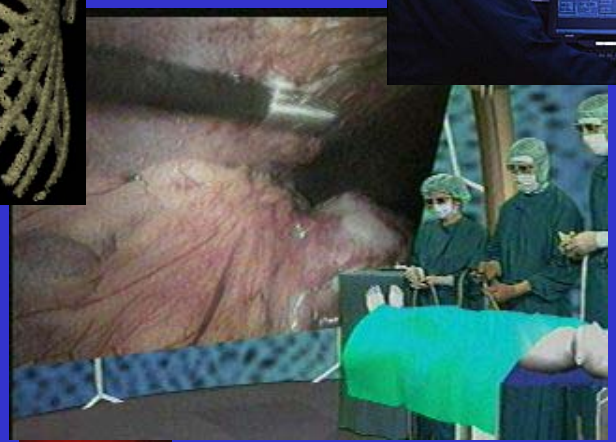
- Innovative methods for disseminating evidence into practice
- Translation of evidence into knowledge for practising physicians

VH and Global Health

Simultaneous and synchronized access from local and remote

- **collaborative access of patient data**
- **collaborative manipulation**
- **collaborative control**





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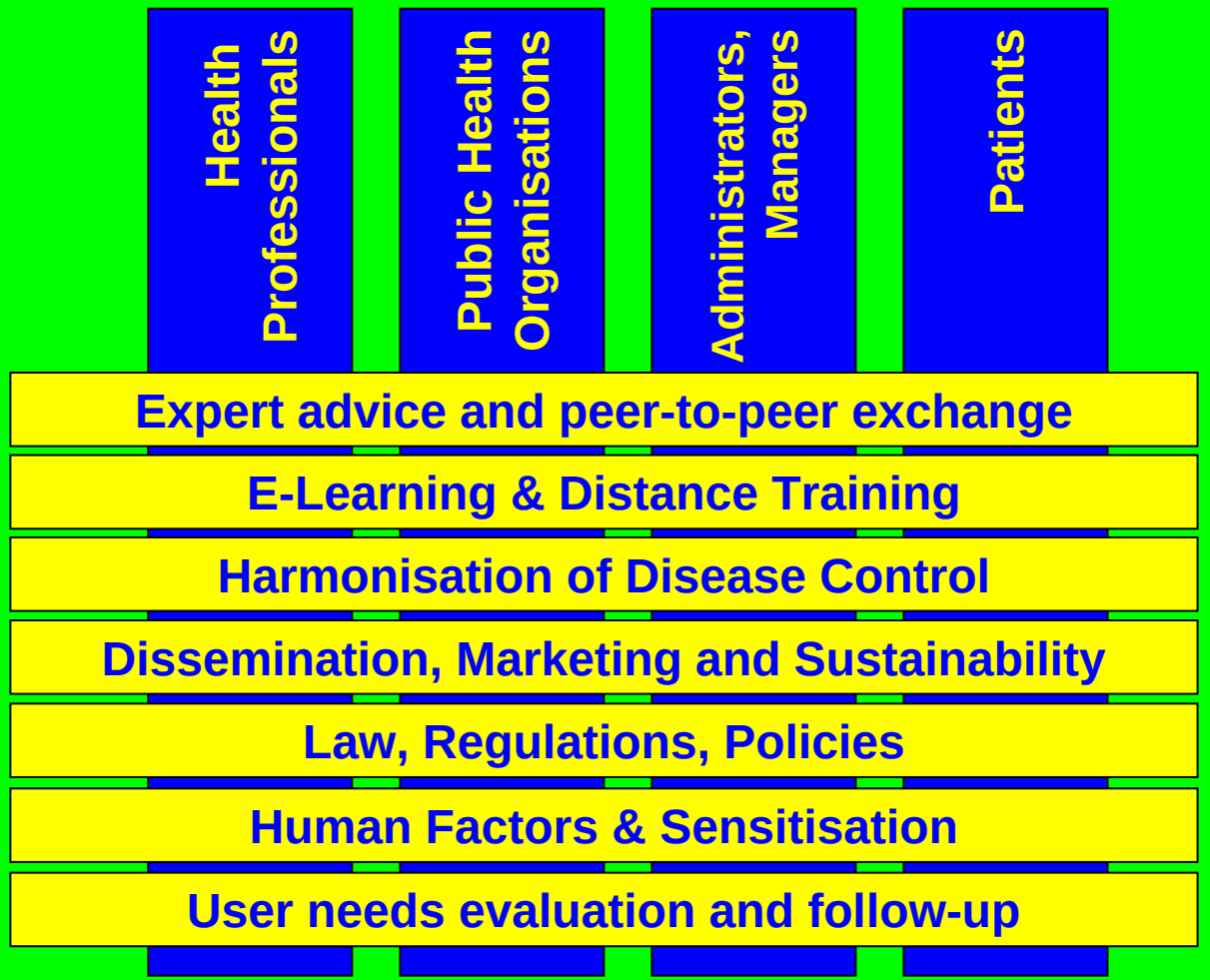
VH-Platform



Technologies:

- Satellite Links
- Terrestrial Links
- Grid Technologies
- Electronic Patient Record
- Data mining
- Decision Support
- Security Services and Privacy

VH – The need for Homecare

- ‘Aging society’ and social changes demand for new ways of care delivery
- Healthcare at home through ICT promises
  - Benefits to citizens and patients (esp. disabled and those with chronic diseases)
  - Huge economic potential because it relieves the strained health care system
- Homecare services should enable patients to stay at home and to participate in their usual community for as long as possible

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Components for Homecare

- Networks: ISDN, DSL, ATM, GSM, UMTS, bluetooth, etc.
- Telecare systems should be:
  intelligent, user - friendly, reliable, fault - tolerant and secure
- Components for health care at home comprise
  - intelligent houses
  - personal assistants
  - emergency services
  - positioning devices
  - monitoring services
  - body area networks
- Personal health monitoring system: sensors & actuators
- Central data monitoring, knowledge-based decision and generation of alerts

Scenarios for Homecare

- Televisite
- Telenursing
- Telecare by GP

VH and the Future of the Medicine

Computerisation - Miniaturisation- Molecularisation - Nanomedicine ?

classic

diagnosis and treatment of disease symptoms

future

preventive and personalized medicine:

- **molecular diagnosis**
- **molecular imaging**
- **molecular therapy**