Value of modern computer technology in the practice of a family doctor

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Medical information systems

- A **Hospital information system** is a comprehensive, integrated information system designed to manage the all aspects of a hospital operation, such as
  - medical,
  - administrative,
  - financial,
  - legal and
  - the corresponding service processing.
- Traditional approaches encompass paper-based information processing as well as resident work position and mobile data acquisition and presentation.

Hospital Information Systems

can be defined as massive, integrated systems that support the comprehensive information requirements of hospitals, including patient, clinical, ancillary and financial management.

- Hospitals are complex institutions with large sets of departments and units coordinate care for patients.
- Hospitals are becoming more reliant on the ability of hospital information system (HIS) to assist in the diagnosis, management and education for better and improved services and practices.
- Implementation of HIS inevitable due to many mediating and dominating factors such as organization, people and technology.

Medical information systems

- improves the quality of medical services,
- optimizes the management of various structural health departments and
- provides a base level of access to the world of health care.

Medical information systems

Expert system is a computer program that can partially replace the specialist expert in the resolution of the problem situation. Artificial Intelligence researchers have started to develop ES in the 1970s.

The most important areas of application for expert systems:

1. Diagnosis of urgent and emergency conditions under time pressure.
2. The limited capacity of examination
3. Scanty clinical symptoms
4. The aggressive clinical behavior

" Electronic health record " is :

- an evolving concept defined as a systematic collection of electronic health information about individual patients or populations.
- It is a record in digital format that is theoretically capable of being shared across different health care settings.
- In some cases this sharing can occur by way of network-connected, enterprise-wide information systems and other information networks or exchanges.

" Electronic health record “

- EHRs may include a range of data, including
- demographics,
- medical history,
- medication and
- allergies,
- immunization status,
- laboratory test results,
- radiology images,
- vital signs,
- personal statistics like age and weight, and
- billing information.

" Electronic health record " :

- is designed to capture and re-present data that accurately capture the state of the patient at all times.
- It allows for an entire patient history to be viewed without the need to track down the patient's previous medical record volume and assists in ensuring data is accurate, appropriate and legible.

" Electronic health record "

- It reduces the chances of data replication as there is only one modifiable file, which means the file is constantly up to date when viewed at a later date and eliminates the issue of lost forms or paperwork.
- Due to all the information being in a single file, it makes it much more effective when extracting medical data for the examination of possible trends and long term changes in the patient

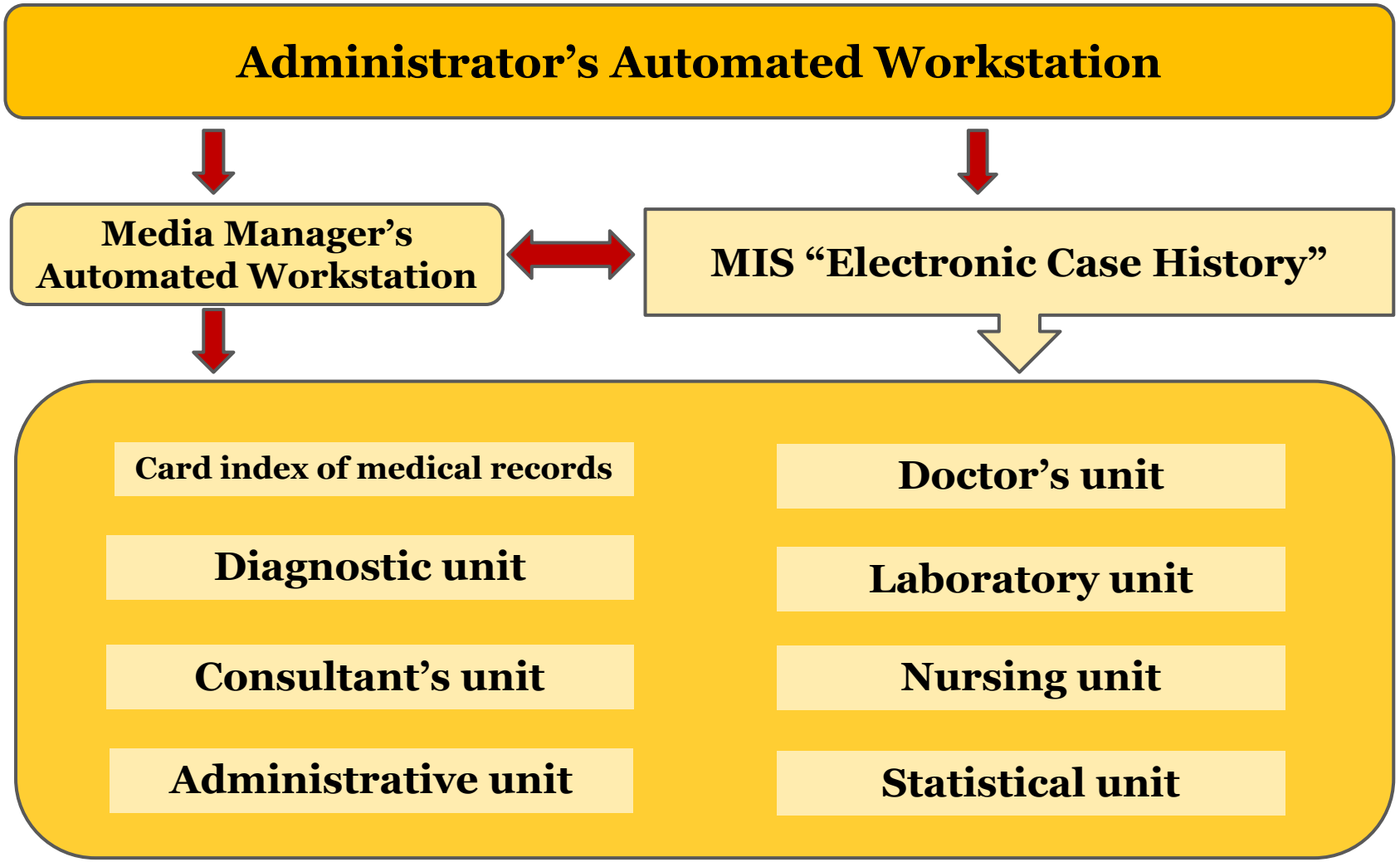
Comparison with paper-based records (PBR)

- PBR require a significant amount of storage space compared to digital records.
- The costs of storage media, such as paper and film, per unit of information differ dramatically from that of electronic storage media.
- When PBR are stored in different locations, collating them to a single location for review by a health care provider is time consuming and complicated, whereas the process can be simplified with electronic records.
- When PBR are required in multiple locations, copying, faxing, and transporting costs are significant compared to duplication and transfer of digital records.

The program complex “Media Manager’s Automated Workstation” is designed to:

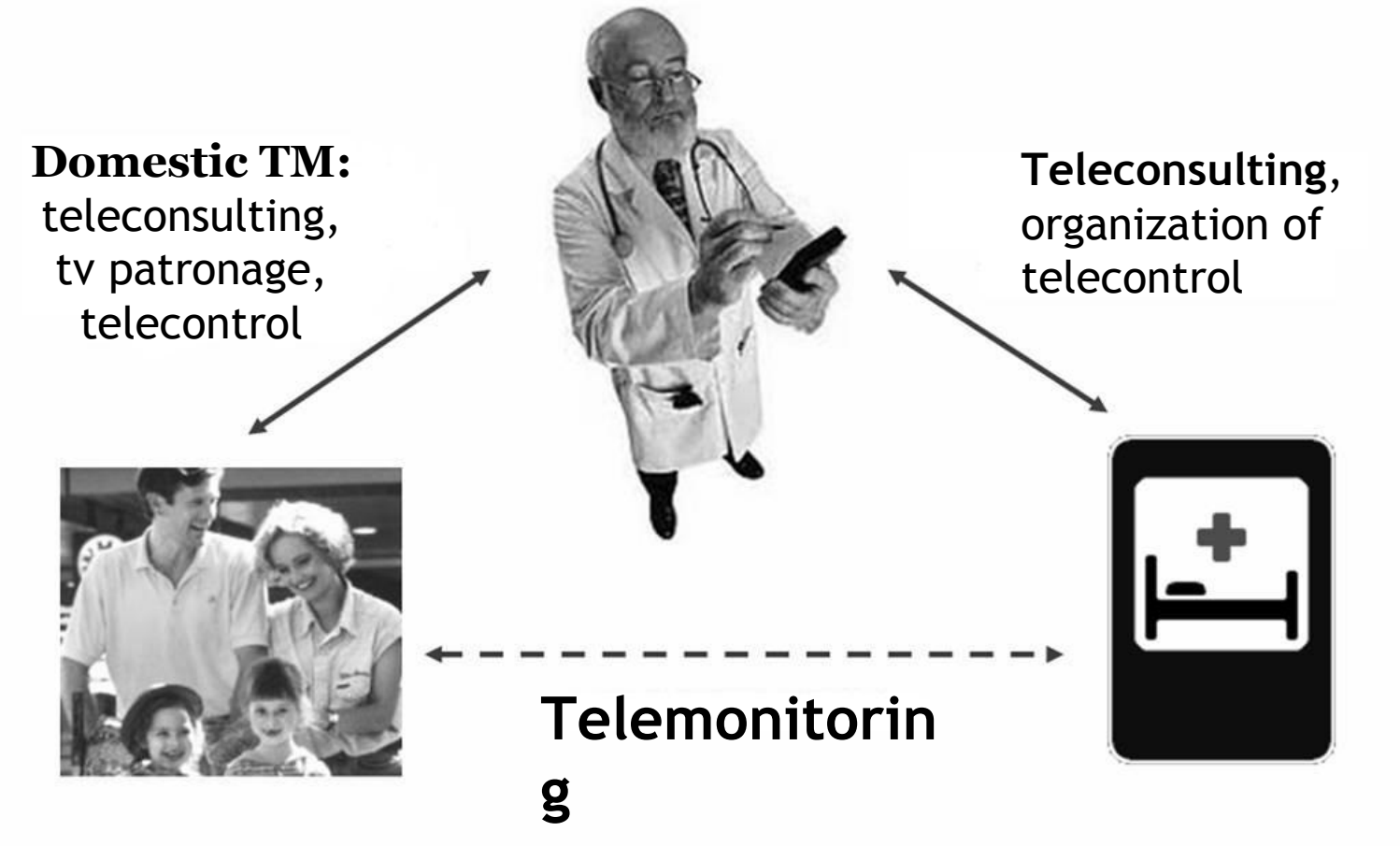
- quick and easy selection of the treating individual procedures (services), medical consultation;
- receiving treatment schedule (full time) for each patient;
- receiving spreadsheet with paid admission procedures;
- automatically receiving invitations for doctor’s consult;
- printing a list of the schedule admission procedures for each patient for each procedure room;
- receiving various reports.

Interrelation of medical complexes

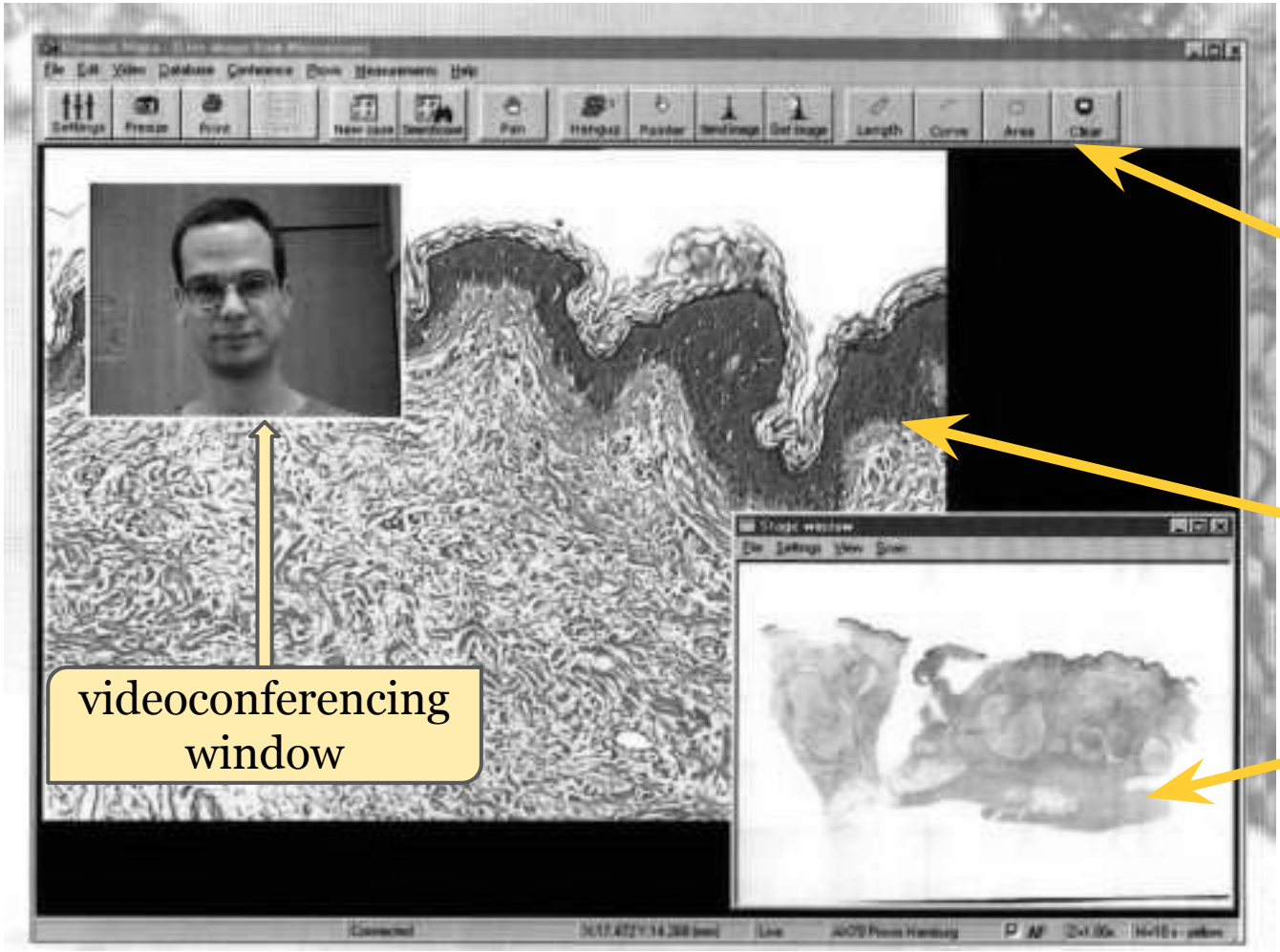


- **Telemedicine** (Greek tele - distance, lat. Meder - cure) is the branch of medicine that uses telecommunications and electronic information (computer) technology to provide health care at a distance.
- **The purpose of telemedicine:** providing quality health care to anyone, regardless of location or social status.
- **The subject of telemedicine:** transmission via telecommunications and computer technologies of all types of medical information between remote locations (medical institutions, patients and doctors, health officials, etc.).

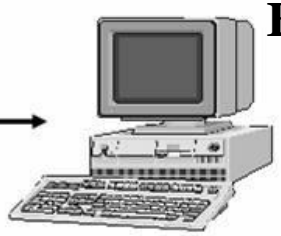
Telemedicine in practice of a family doctor



Remote manipulation - video microscopy



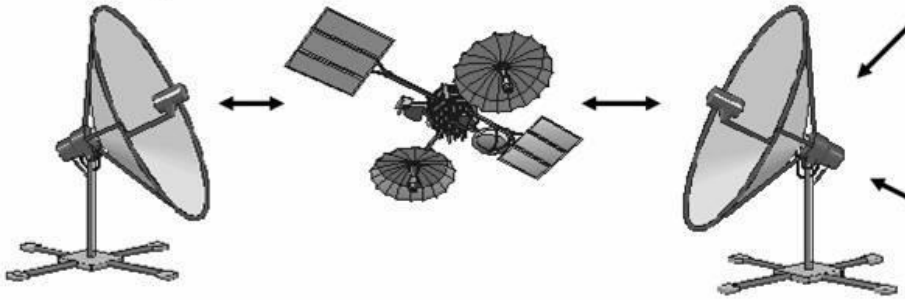
General (basic) scheme of remote consulting



Basic workstation of telemedicine

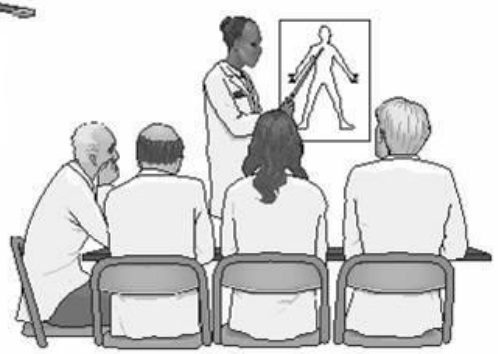
Subscriber

Coordinator



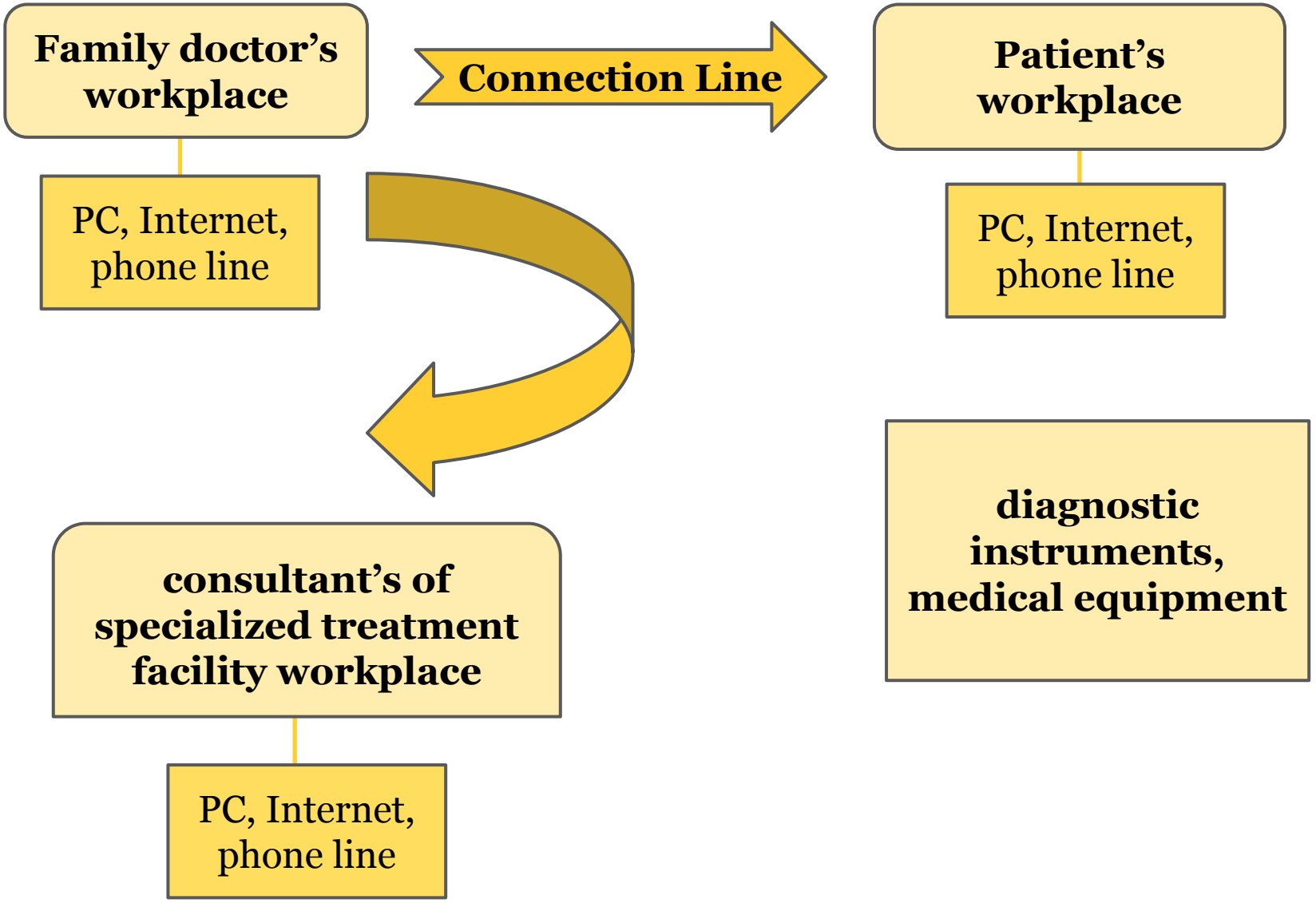
personal computer

Line: a computer network, the Internet, satellite, phone line etc.

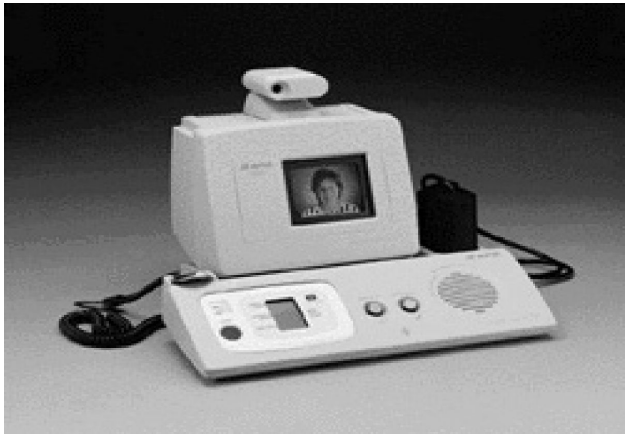


Consultant
PC or PDA

The general scheme of the home teleconsultation



Conducting "home" video conferencing. Home videophone system for teleconsultation and patronage



Scheme of telemonitoring using mobile phone

glucometer

tonometer

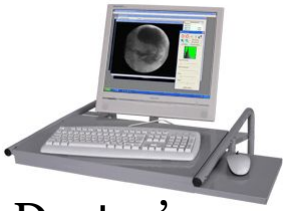
cardiograph

Patient's phone

heart rate sensor

pulsoximeter

Hospital's servers



Doctor's workplace

PDA

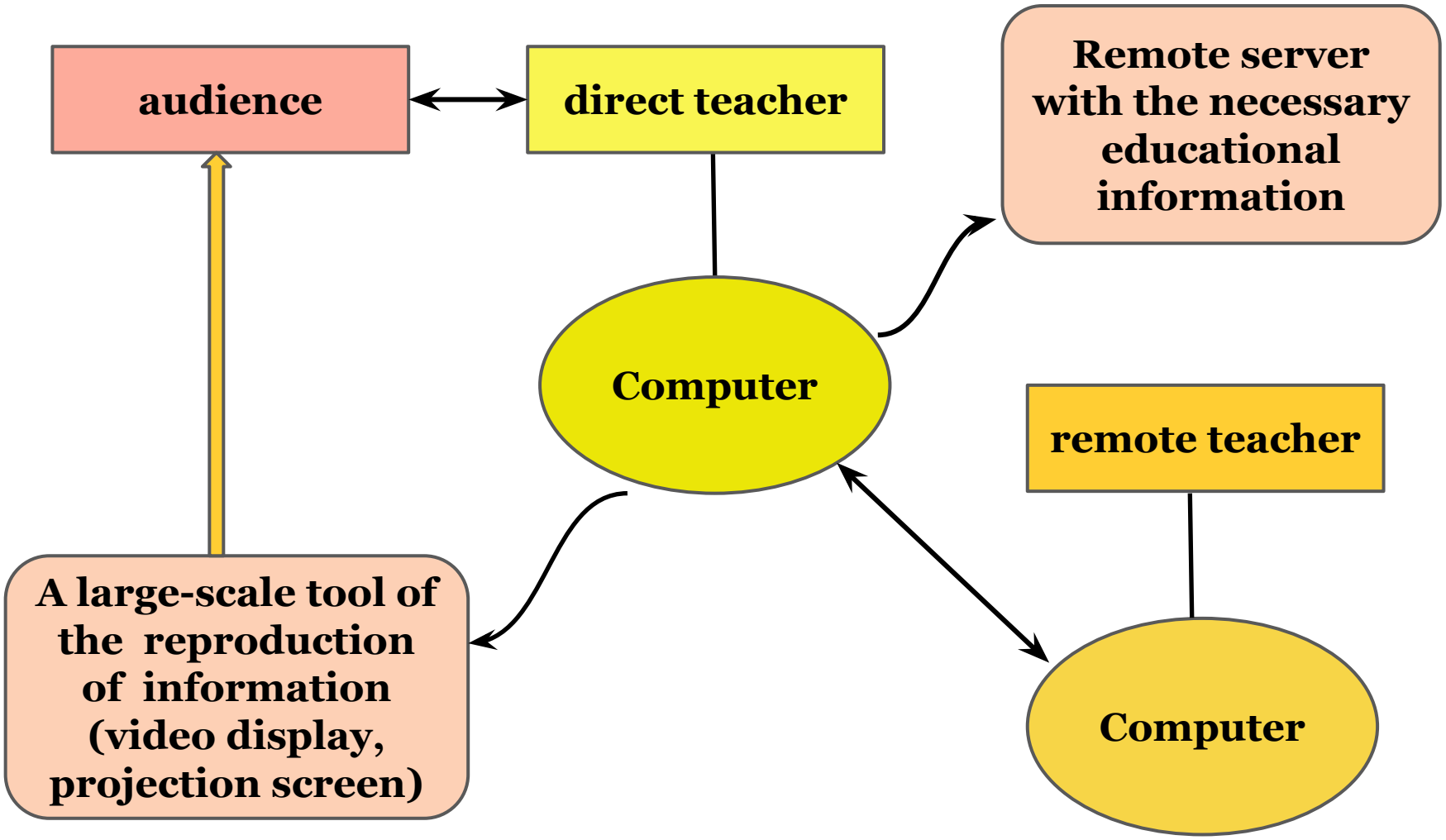
cellular networks

Doctor

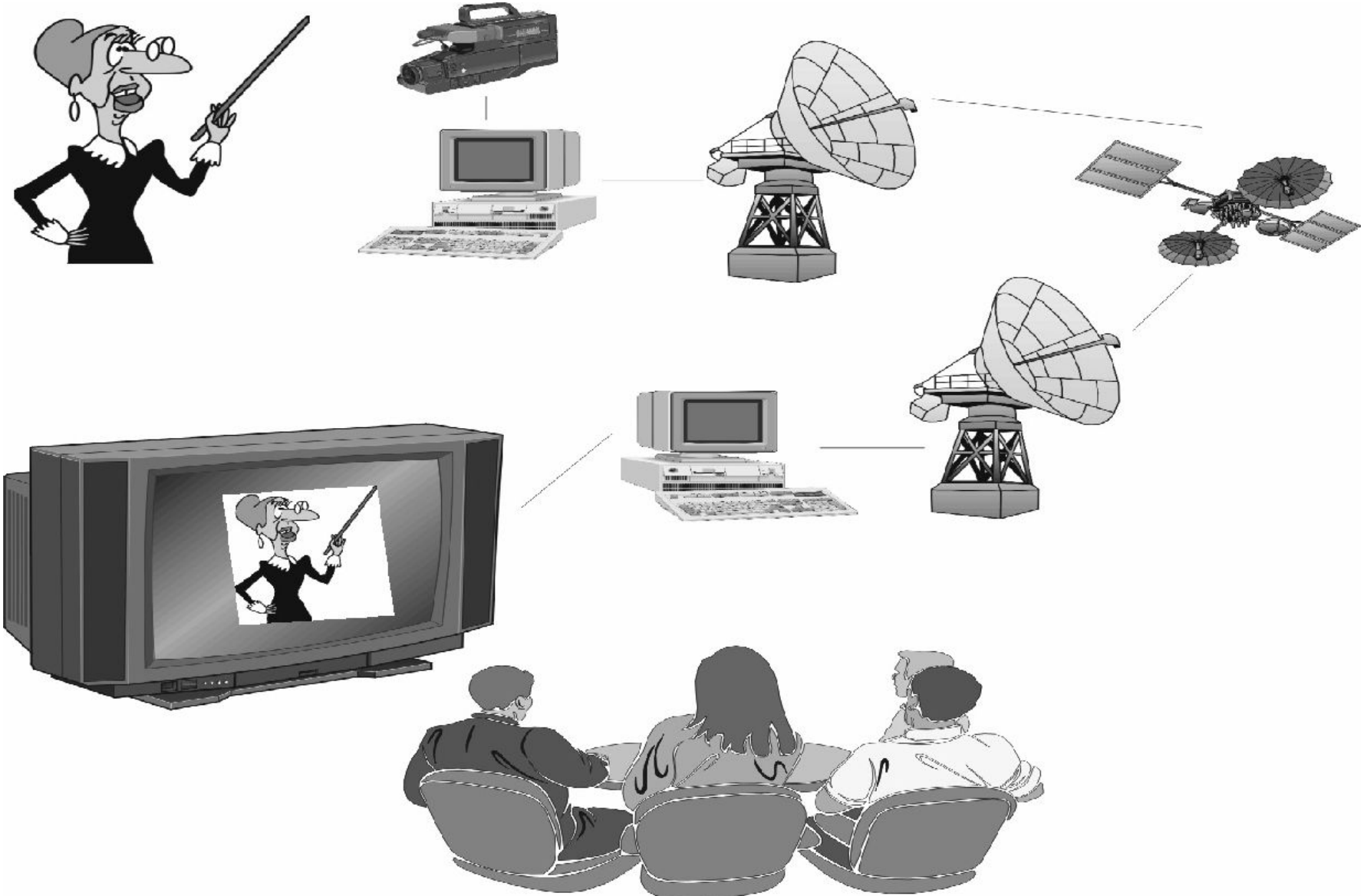
Telemonitoring - Self-diagnosis with digital spirograph, Pocket PC and wireless Internet

Combination of telemonitoring and domestic teleconsultation

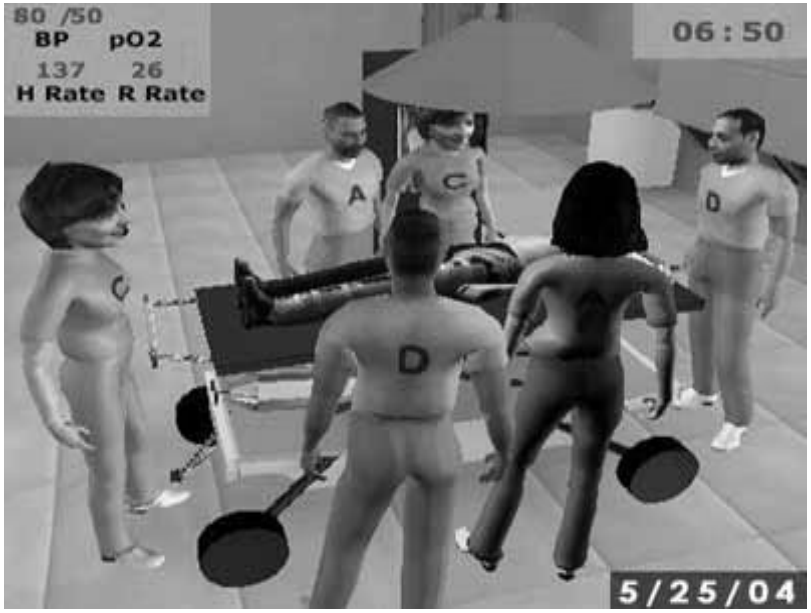
Distance Learning



Scheme of an educational telecomplex



- Multimedia teaching-controlling system (media teacher) is a software and hardware system, which contains a random set of illustrated educational information with the ability to control its study. For the technical implementation is used as a specially developed software and widely available Internet technology.



Example of Multimedia teaching-controlling system of intensive medicine, virtual 3D simulator at Stanford University

Information technology and telemedicine are necessary assistants of family doctor’s, which improve and facilitate medical care at home and in the hospital.


Thank you !