

Cardio●Card

The cardiology file in the patient's hands



Legon Informatik

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Contents

CardioCard: The system	2
The idea	3
The implementation	3
Centralized data, locally accessible	5
Administrative routines in CardioCard	5
Openness to the outside	7
CardioCard	7
CardioCard System: Module	8
Reports	10
Distribution	10
Report types	12
Administration	14
Data protection	15
Structured and yet flexible	15

CardioCard: The System

Digital patient files have become the visiting cards for hospitals and clinics geared up to leading-wave technology.

Now CardioCard shows that software solutions can be more than electronic archiving aids: they can become an integral part of a new concept in diagnosis and treatment.

The idea

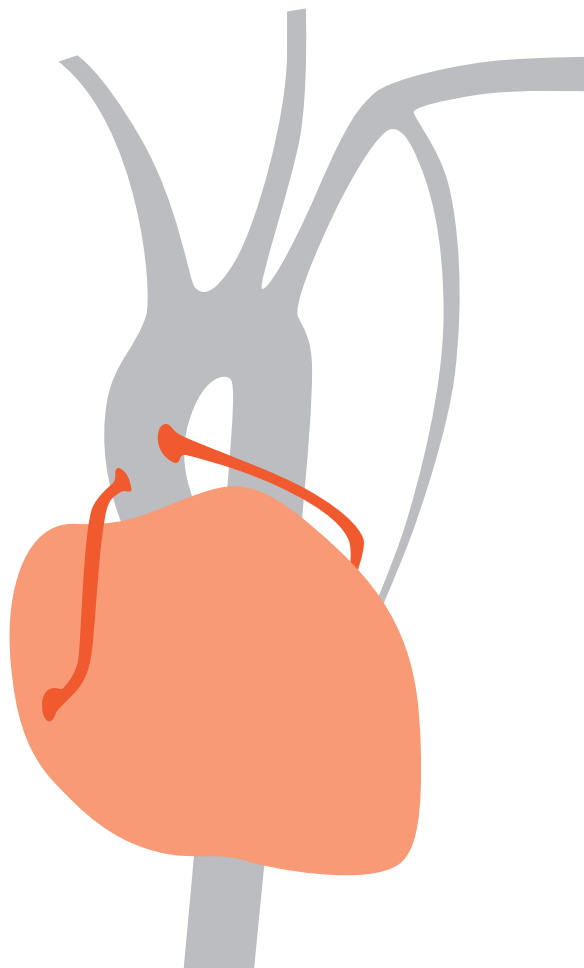
Everything stems from the initial idea: because a mass of digital data already flows into various diagnostic tools in cardiology departments, everything from ultrasound to ECG records can be networked and pooled in a single file. But the heart specialists of Basle's University Hospital wanted to go a step further: cardiology involves significantly more standardized data than other medical disciplines, so a standardized template for treatment techniques can be more easily defined.

The experience gained by cardiologists over decades has now flowed into the new CardioCard software. Three years of close cooperation with developers from Legon have led to the creation of clearly defined data-entry masks. "Instead of vague statements hedged about with qualifications, clear entry paths now lead to unequivocal interpretations," explains senior physician Prof. Dr. Stefan Osswald as he highlights the benefits of the new software.

The implementation

The program has been running on PCs in the various sections of Basle's Cardiology Department since the spring of 2000. Each week, medical supervisors and senior physicians assess and discuss dozens of patient files which are projected onto the walls of the meeting room. But CardioCard not only allows the individual patient histories to be displayed, it also subjects the individual data to a statistical comparison. That's why the CardioCard system offers medical staff an important tool for checking and

assuring the quality of the techniques they apply. In addition to this benefit, they can dispense with a great deal of paperwork, as the CardioCard program automatically records the medical histories of individual patients and prepares ready-to-dispatch letters to their GPs and specialists. The experience gained so far by the Basle cardiologists shows that the daily paperwork for each doctor has now been reduced by at least half an hour.



Centralized data, locally accessible

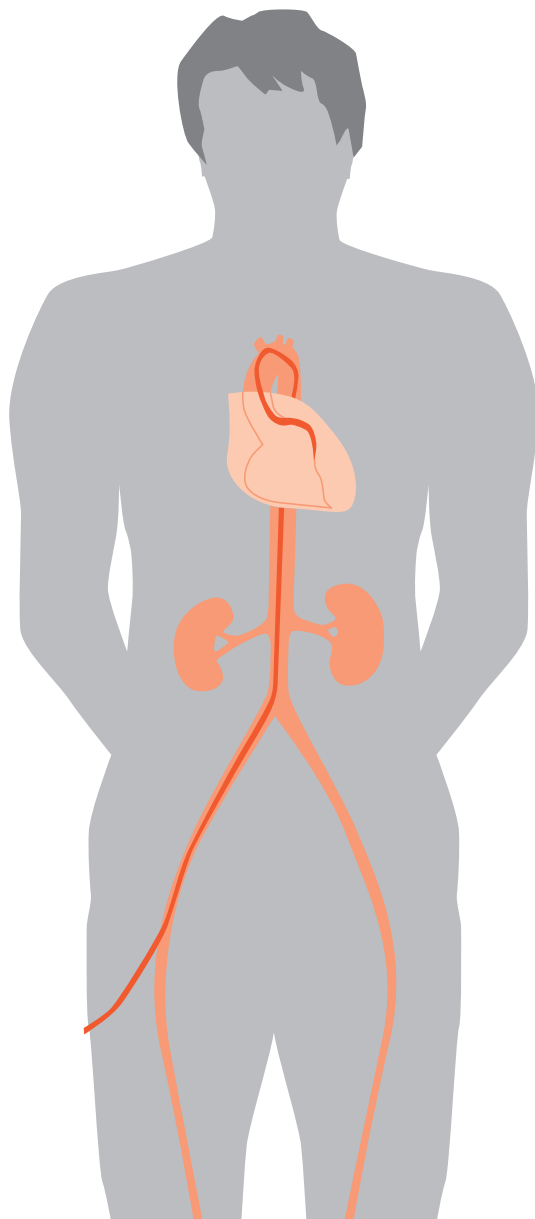
Right from the very start, the leading idea in the development of CardioCard was to create a user-friendly and low-maintenance product. The network architecture developed by Legon is consequently based on a browser which allows data to be accessed from a central server.

The exclusive choice of intranet/internet technology minimizes the training requirement and largely obviates the expensive installation and maintenance of proprietary programs.

Administrative routines in CardioCard

Although CardioCard centers on the establishment of a new diagnosis and treatment concept, the software also facilitates the administrative routines of the cardiology department.

Thus the planning tool can be used to control the scheduling of examinations and operations. But it also integrates the laboratories to which patients are allocated depending on their available resources. Its statistical components not only allow scientific verification of the efficiency of the selected forms of treatment, but also evaluate the performance of individual teams. In addition, the program integrates the user rights which control its access options.



Open to the outside

The browser solution from CardioCard is also open to partners outside the University Hospital. Thus an external private clinic in Zurich already has access to the cardiology files of the patients assigned to it. In future, digital links will also be set up to the private practices of GPs and specialists.

CardioCard

The patient is also involved in the digital revolution of Basle's Cardiology Department. Some 1000 patients already carry their own medical history in credit-card format on the CardioCard, which files their overall assessment by the Basle heart specialists together with extracts of their ECG, ultrasound and other records. Unwieldy paper files hung in registers used to be typical for patients with a long medical history: they will soon be a thing of the past. The cardiology data is collected from all

relevant sectors. Because the CardioCard can be read-in from any CD drive, there is another positive effect: heart patients can present their medical history effectively and with minimum fuss to any other hospital in Switzerland or abroad. In short, the CardioCard is open to various partners and saves the patient repeated explanations and unnecessary trips.

CardioCard-System: Modules

8 | 9

Examinations

ECHOCARDIOGRAPHY

The structure of the heart and the blood flow through it are recorded by means of **ultrasound**. Diseases of the cardiac muscle (coronary, myocardial insufficiency) or of the heart valves (narrowing, inflammations) can then be diagnosed.

ECG

The **electric potentials of the heart are recorded** in order to detect disturbances of cardiac rhythm and other diseases.

NUCLEAR MEDICAL HEART EXAMINATIONS

RADIONUCLIDE VENTRICULOGRAPHY

The movements of the **cardiac ventricles** are displayed with radioactively marked blood corpuscles. This allows the function and wall movement of the heart to be examined.



MYOCARDIAL PERFUSION SCINTIGRAPHY

The blood flowing through the heart muscles is displayed with the aid of a **radioactive contrast medium**. The extent of insufficient blood supply or scarring following a coronary can then be determined.

LEFT VENTRICULAR CATHETER

Long catheters are used to inject **X-ray contrast medium** into the coronary vessels, making them visible on X-ray plates.

PTCA

Narrowed coronary vessels can be widened by the same catheter with the aid of a balloon and/or a stent.

ADMISSION EXAMINATION

The patient's clinical history (anamnesis) and physical examination (status) provide important information about diseases, even in an era of sophisticated technical tests.

CARDIAC PACEMAKER IMPLANT

An artificial pacemaker can be implanted in the event of disturbance of the cardiac rhythm or blockage of the heart's conduction pathways.

MONITORING

Like any technical instrument, a cardiac pacemaker must be regularly checked for correct operation. This is done externally with the aid of a monitoring computer.

INTRACARDIAC DEFIBRILLATOR (ICD)

Like a cardiac pacemaker, the ICD is an instrument designed to treat disturbances of cardiac rhythm. Unlike the standard pacemaker, however, it is also used to treat rapid arrhythmias (tachycardia, ventricular fibrillation). Because both detection and treatment are more difficult in this case, the ICD is equipped with a series of supplementary functions.

ELECTROPHYSIOLOGICAL STUDIES (EPS)

Electrical stimulation and recording of the electric potentials from the cardiac ventricles can be used to determine the electrical operation of the heart with precision.

Reports

Distribution

These examinations supply a large volume of specific data which is summarized in reports for display in an appropriate form.

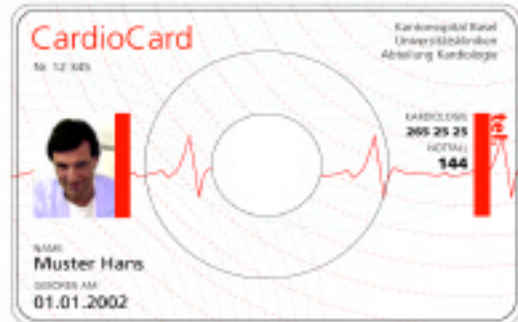
CARDIOCARD

The data is written onto a CD-ROM in credit-card format which is handed to the patient.

STANDARD BROWSER

The reports may be accessed from the database via conventional Internet technology.

The CardioCard



The user interface



Report types

12 | 13

Cardiac catheter report
Right and left ventricular catheter report
PTCA report
Mitral valvuloplasty
ASD occlusion
Right ventricular catheter report
Heart muscle biopsy

Stress echocardiography
Trans-thoracic echocardiography
Trans-esophageal echocardiography

Myocardial perfusion scintigraphy
Radionuclide ventriculography
Cardiac MRI

Electrical reversion
Electrical reversion hyperstimulation
PM implant
PM monitoring

PM check
ICD implant
ICD monitoring
ICD check
Electrophysiological examination
Radio-frequency ablation
Tilting-table examination

ECG

Admission examination
Conference
Doctors' letter
Discussion report

Rhythm consultation
Cardiac insufficiency consultation
Post-operative consultation
Vitiium consultation
Clarification consultation

Administration

SCHEDULE PLANNING

Every examination can be planned in advance: this allows a patient examination program to be produced and permits the laboratories to plan their resources.

STATISTICS

Any data may be accessed in suitable combinations both for internal checks and for scientific purposes.

USER AND RIGHTS ADMINISTRATION

Access to the data is controlled in various authorization hierarchies, so that bona-fide access is permitted while abuse can be prevented.

Data protection

The central question for all medical software is: how can data protection be assured for sensitive patient files? Firstly, as the bearer of the CardioCard, the patient is the guardian of his/her own digital file. Secondly, clear authorization hierarchies control access to the data on the hospital server. External partners, doctors and hospitals can view only reports pertaining to the patients referred by them. During the data transfer itself, cryptographic programs prevent eavesdropping on sensitive patient data.

Structured and yet flexible

The physicians see a clearly structured entry path thanks to various masks. But CardioCard also offers the option of integrating special remarks and comments into the overall assessment. However, only entries in selected pre-specified categories are statistically evaluated.

The user may add any of his own documents to the patient file via an easy-to-use browser interface. If required, these documents may be converted to PDF format to appear as an integrated component of the patient report.

Alternatively, such external documents may merely be stored by the CardioCard system for later access by the treating physician.



Please do not hesitate to contact us should you have any further questions. Simply call us or visit our website at:
www.legon.ch/cardiocard



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