

# Examples of practical application



## Interactive audio-video medical solutions

for remote medical education & global medical exchange

### DEVELOPED FOR

MEDICAL UNIVERSITY

HOSPITAL

SCHOOL OF SURGERY

EMERGENCY DEPARTMENT

MEDICAL ASSOCIATION

MEDICAL CONFERENCE



### USERS

DOCTORS

STUDENTS

PATIENTS

MEDICAL SCIENTISTS  
(PROFESSORS)

YOUNG DOCTORS

## medVC SOLUTIONS – MAIN ELEMENTS



### Medical cart

Mobile medical cart specially designed for operating theatres, equipped with:

- video inputs for connecting audio-video devices in the operating theatre (endoscopes, microscopes, Da Vinci robots etc)
- overall FullHD PTZ camera
- medical touch-screen monitor
- integrated audio-video devices
- wireless headset microphone & loudspeaker

Designed and developed by medVC - fully personalizable to your specific needs.



### Terminal

Audio-video system for lecture theatres and doctors' offices, equipped with:

- 24" touch-screen monitor
- FullHD USB camera
- SDI/HDMI video input for additional source (laptop, PC)
- DVI/HDMI video output for additional display
- audio interface, loudspeaker & wireless handheld microphone

Designed and developed by medVC - fully personalizable to your specific needs.



### Mobile device with medVC WebRTC solution

- use your own mobile device (smartphone, tablet, laptop) to connect to the operating theatre from your browser
- you can connect from anywhere
- no need to install any application or software - connection from any browser



### Recorder

The medVC Recorder is a response to the growing need of hospitals and healthcare centres concerning secure recording and storing of medical videos.

Elements and functionality:

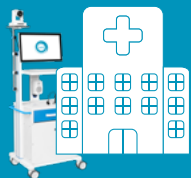
- main unit (6 video inputs) - recording up to 6 inputs in parallel in full quality
- medical touch screen monitor
- automatic upload to portal or server (as required)



### medVC Video Portal

- Internet portal allowing to perform live streaming of surgical procedures as well as to publish recorded sessions
- the solution is integrated with medVC terminals and the medVC Recorder, so live broadcasts and recordings are initiated with a single click on the medVC interface

## LOCATIONS WHERE medVC OPERATES AND ELEMENTS WHICH medVC CONNECTS



Hospital



Lecture/  
conference  
room



Doctor's office



Doctors/  
students  
- active  
recipients



Medical  
conference  
centre



TV studio  
with doctor  
moderators

## TRANSMISSION MODES

### KEY DISTINCTIONS:

THE MOST IMPORTANT FROM  
A MEDICAL POINT OF VIEW:

HIGH QUALITY AND TIMING



### INTERACTIVE DIALOG MODE

- real-time two way audio-video connection
- immediate response - minimum delay time, practically unnoticeable to the recipient
- allows live remote collaboration of doctors, especially during difficult operations/procedures
- transmission provided to a limited number of involved participants

VS



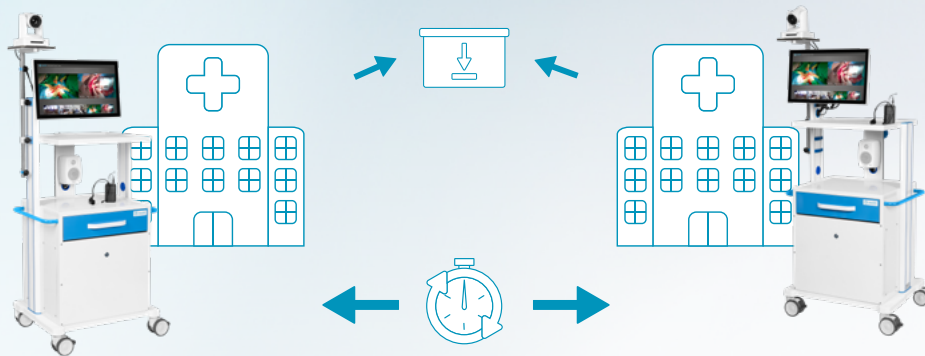
### STREAMING

- participants receive the audio-video stream with a delay of a few to several seconds
- lack of opportunity for live collaboration between doctors/participants - more passive role of participants
- limited capacity to transmit fully encrypted and secure data
- but**
- practically unlimited number of participants - transmissions to a mass audience

### COOPERATION BETWEEN HOSPITALS

#### Example: Poland and Germany

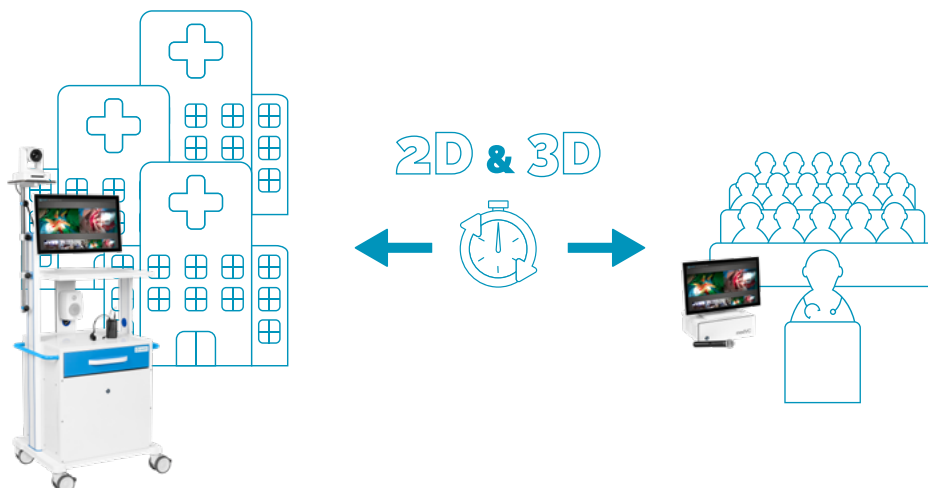
- interactive transmissions of operations with live commentary between two friendly hospitals in Berlin (DE) and Gorzow (PL)
- recording of operations by both hospitals to a common database
- after about 3 years of cooperation, more than 300 operations are registered on a dedicated video portal



### COOPERATION BETWEEN HOSPITALS AND SCHOOL OF SURGERY & MEDICAL UNIVERSITY

#### Example: cooperation of French surgeons

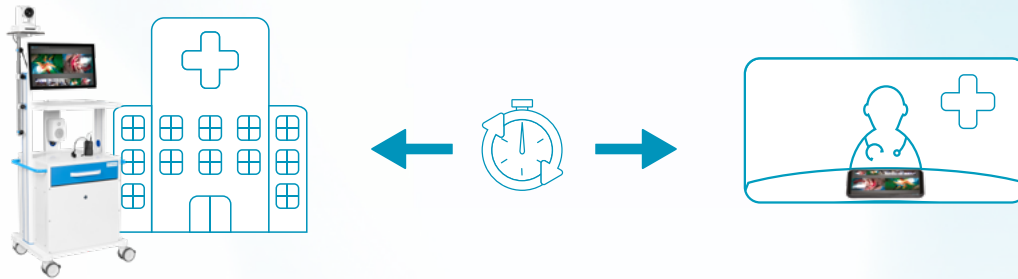
- interactive live transmission of operations from hospitals in Nancy, Marseille and Paris to the Nancy School of Surgery
- 2D and 3D surgeries at the surgical school for students & young doctors with live commentary from experienced specialists
- students have the opportunity to listen to live commentary from professors and experts, they can also ask questions during the live surgery



### INTERACTIVE REMOTE COOPERATION OF DOCTORS

#### Improving patient safety through second opinions & consultations

- possibility for the doctor to connect via a mobile device (smartphone, laptop) to the operating theatre at any time and place for support or verification - the specialist does not always have to be on site at the hospital
- live interactive collaboration to fulfill the need for assistance or urgent remote consultation
- possibility of providing support to smaller, remote hospitals that are far away from the main medical centre

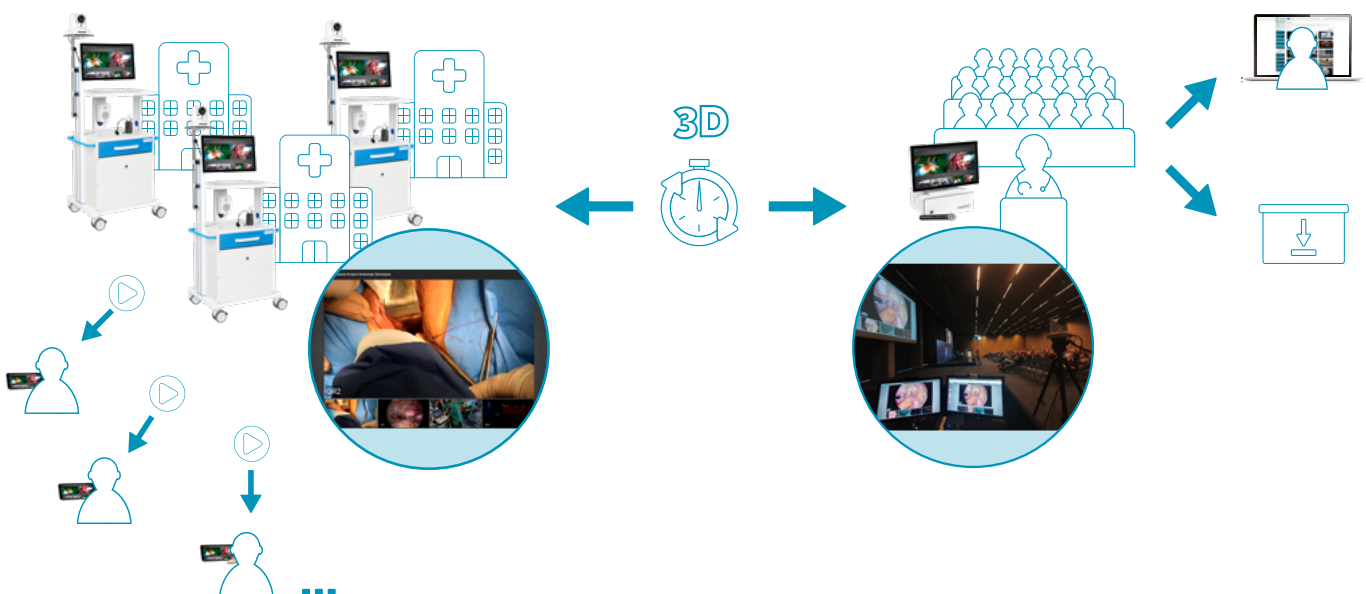


### MEDICAL SCIENTIFIC CONFERENCES

#### + WITH LIVE SURGERY SESSIONS

Example: International Congress of Operative Gynaecology – transmission from 3 operating theatres to the International Congress Centre in Katowice, Poland

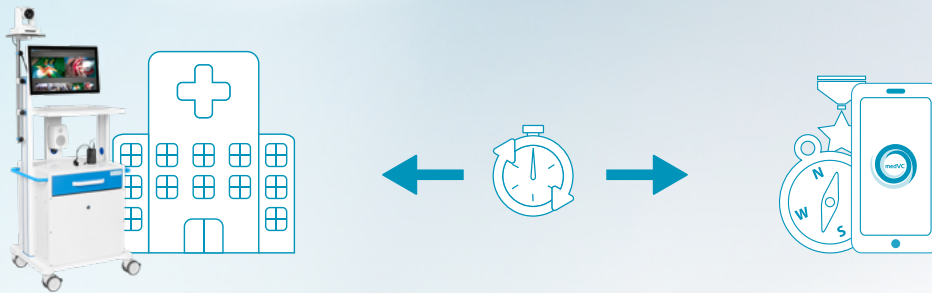
- interactive transmission of operations from the different operating theatres to the scientific conference room
- special shows and workshops in 3D
- in the conference room, the moderator comments on the operation, dynamically selects the most interesting fragments from different operations and switches between operating theatres
- the audience in the hall has the opportunity to participate in many operations at the same time, watch the most interesting parts of the operations and ask the operators questions in real time
- the entire conference, including the Q&A session, is recorded and made available after the conference on a personalised conference portal





### medVC ON THE BATTLEFIELD

- encryption, security, and quality of the connection under difficult combat conditions
- adaptation of the medVC system to high military requirements - compatible with NATO standards for multinational missions
- connecting frontline field hospitals with specialists in the home country



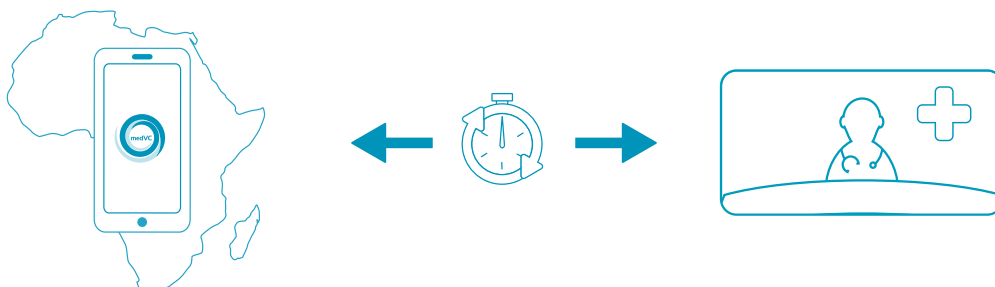
### INTERACTIVE ACADEMIC MEDICAL TEXTBOOKS

- full cross-section of recorded operations with expert commentary for students
- the first such textbook was developed under the ERASMUS program by 3 European ENT clinics from Barcelona, Essen and Poznan
- over 300 explanatory surgical videos - a set of basic and advanced surgeries every ENT surgeon has to master



### SUPPORTING AFRICA

- experienced surgeon remotely supervises surgeries performed by young doctors in some African countries
- the project is conceived as a model system solution for delivering medical expertise to remote corners of the African continent



# Examples of practical application of medVC



## A GLOBAL MEDICAL EVENT

Global medical exchange & remote medical education

Example: ELS - European Laryngological Live Surgery Broadcast

**15**  
**LIVE SURGERY BROADCASTS**

+

**10**  
**DIFFERENT HOSPITALS  
IN EUROPE**

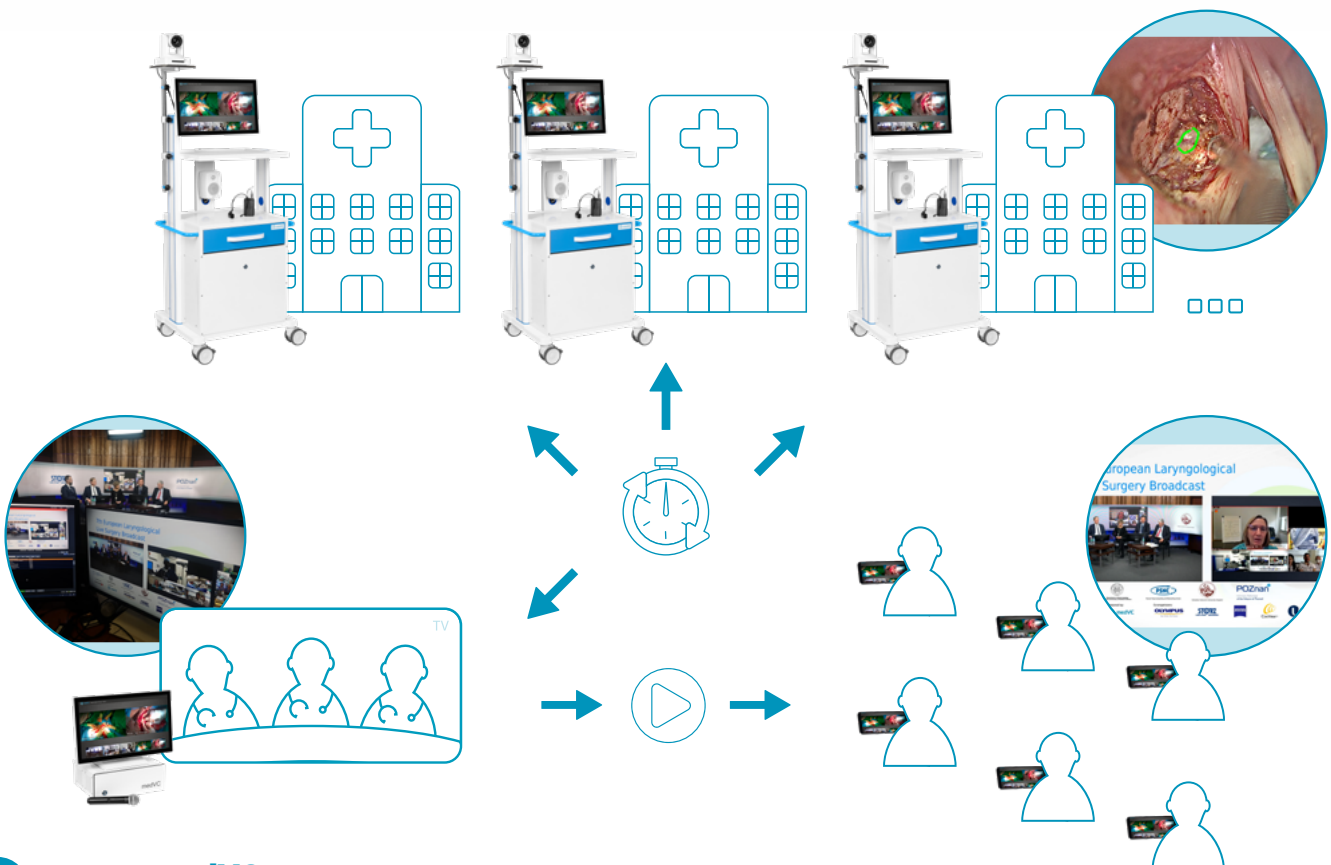
BARCELONA  
ESSEN  
GENOVA  
HAMBURG  
LEIDEN

LONDON  
LUXEMBURG  
MADRID  
MARSEILLE  
POZNAN



**IN 1 DAY & 5 MODERATORS IN STUDIO**

- ✓ each year a special educational live surgery event is organised by several outstanding European ENT clinics
- ✓ a pan-European session of ENT surgery broadcasts available to doctors around the world
- ✓ interactive mode with live commentary and discussions with experts in the TV studio
- ✓ the ELS association's annual broadcasts are streamed worldwide and gather a huge audience of more than 30,000 viewers from over 80 countries
- ✓ experts in the studio make extensive use of the graphical interface during discussions with surgeons in the operating theatres
- ✓ the clinics participating in the broadcasts have increased their worldwide recognition
- ✓ the event attracts many sponsors who are willing to finance outstanding live surgery sessions



### NATIONAL VIRTUAL MEDICAL UNIVERSITY

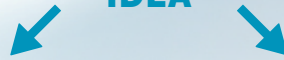
#### Live surgery sessions online

Example: a pilot project in Poland for the integration of medical universities under the auspices of the Ministry of Education and Science.

The National Advisor to the Minister of Health supervises the content and organisation of the courses.



IDEA



INTEGRATION



EXCHANGE OF  
KNOWLEDGE AND  
EXPERTISE

### BETWEEN DIFFERENT MEDICAL UNIVERSITIES

- ✓ each university presents its flagship treatments and operations
- ✓ unique chance for students to interactively participate in various surgical procedures (not only during COVID-19 pandemic)
- ✓ live-session classes are systematic
- ✓ each group has a mentor – moderator who leads the discussion
- ✓ several groups from different medical universities take part in the courses at the same time
- ✓ there are 3 leading universities - Krakow, Lublin and Poznan - other universities are invited individually
- ✓ the courses are held in Polish and English - invitation for foreign students

5



#### ACTIVE MEDICAL UNIVERSITIES

##### Schedule of each session:

- presentation of the case
- discussion of applicable medical procedures
- selection of procedure by the operator in charge
- discussion between moderators
- questions from the students
- survey of the students & evaluation of the course

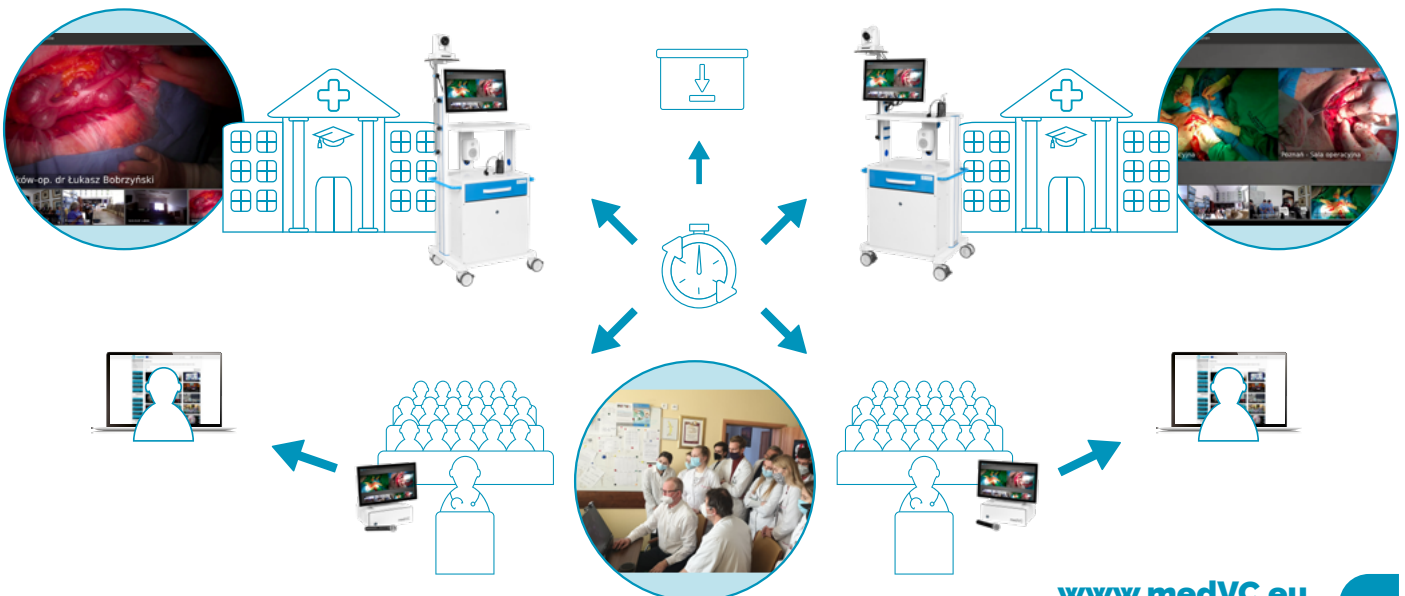
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#### BENEFITING STUDENTS

##### Students appreciate:

- highest quality of the images
- high didactic quality of the lessons
- live commentary from professors

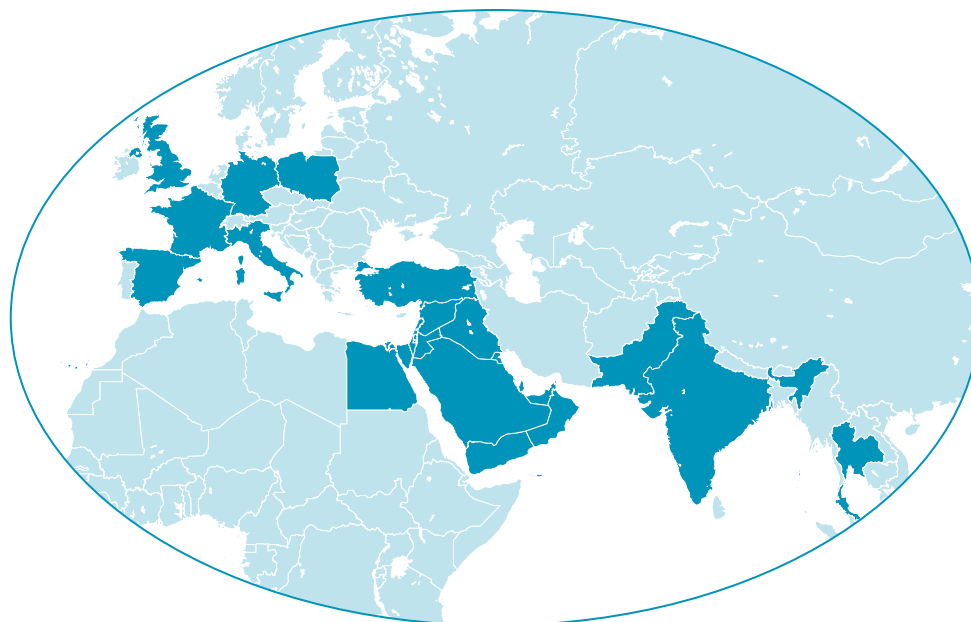
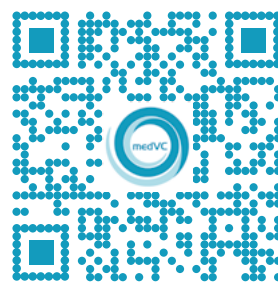




advanced telemedicine solutions

Try it yourself, join our demo room:  
<https://demo.or.medvc.eu/or1>

Examples of practical application - videos:  
<https://medvc.eu/#in-action>



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