

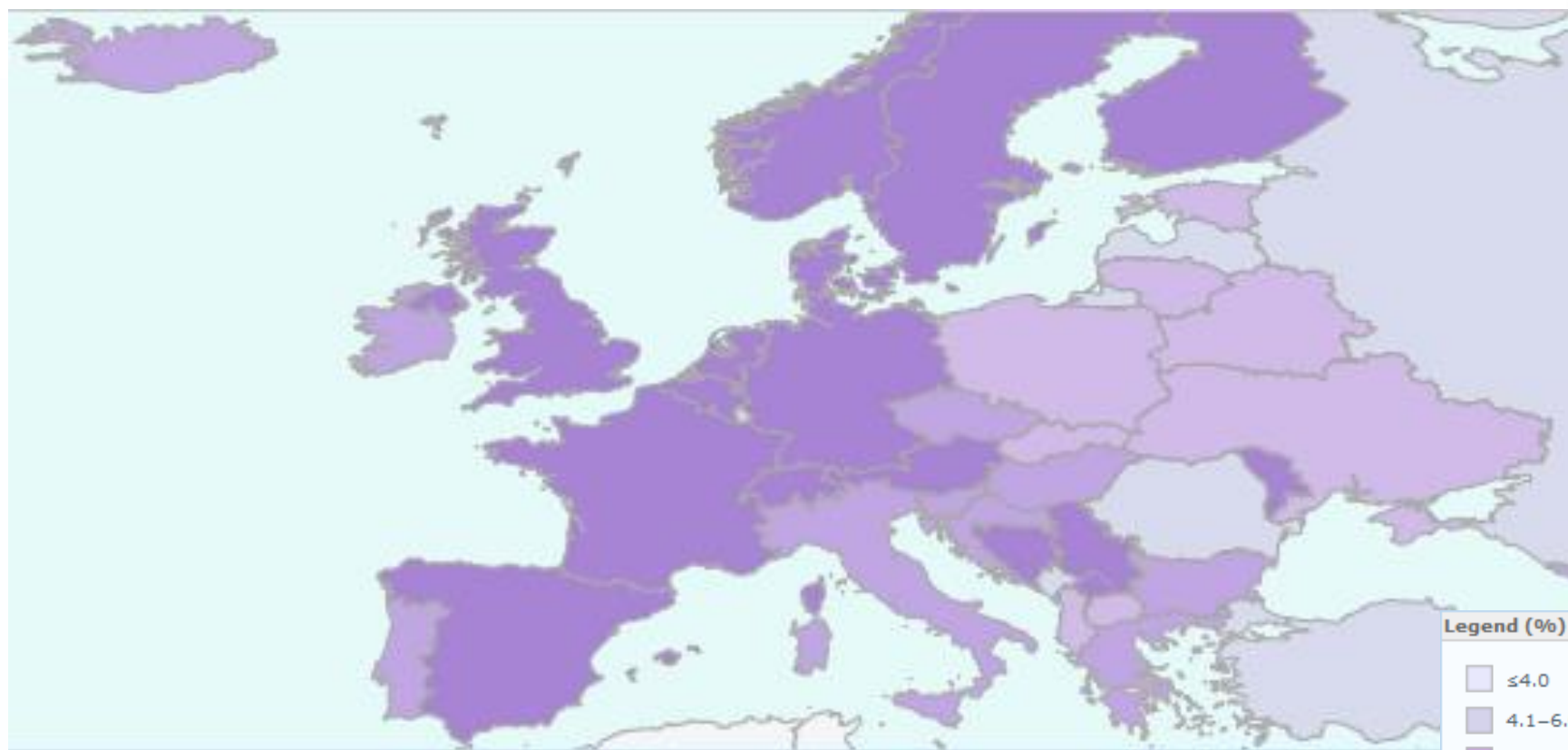
# Opportunities for telemedicine in Southern Poland

Dr. Szymon Majda

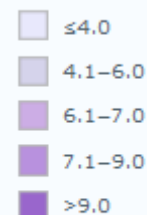
J. Dietl Specialist Hospital in Kraków

# Current health expenditure

as a percentage of gross domestic product (GDP)



Legend (%)

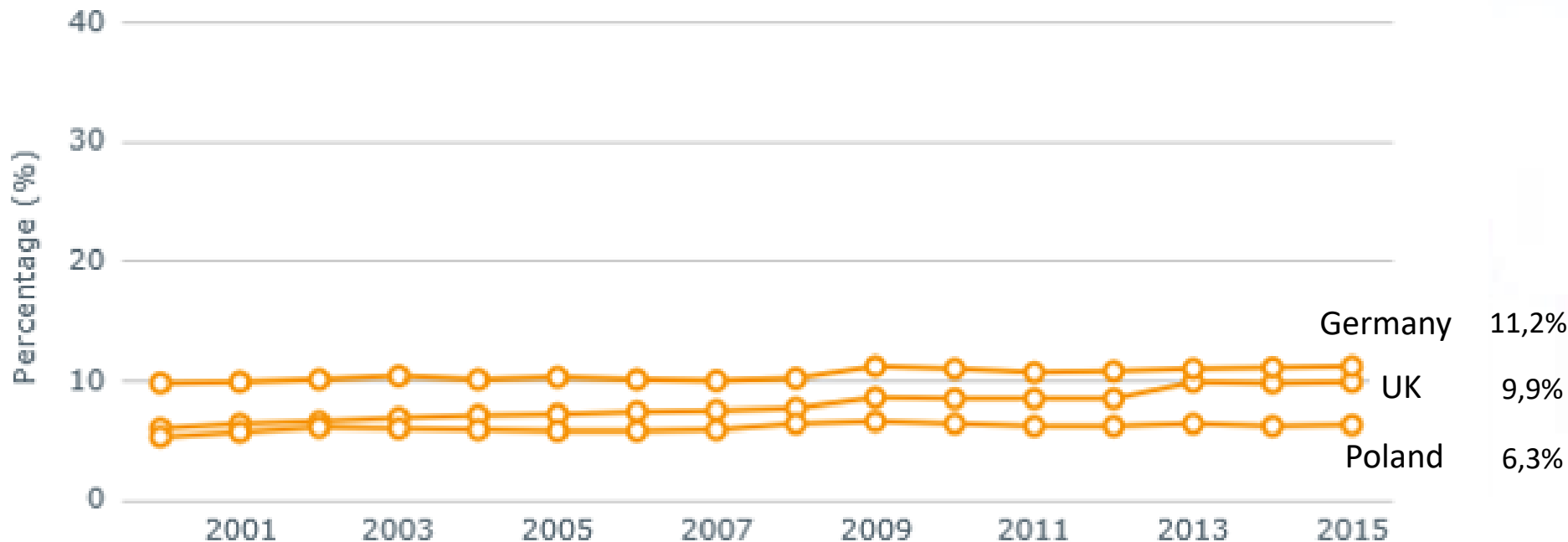


Not applicable

No data

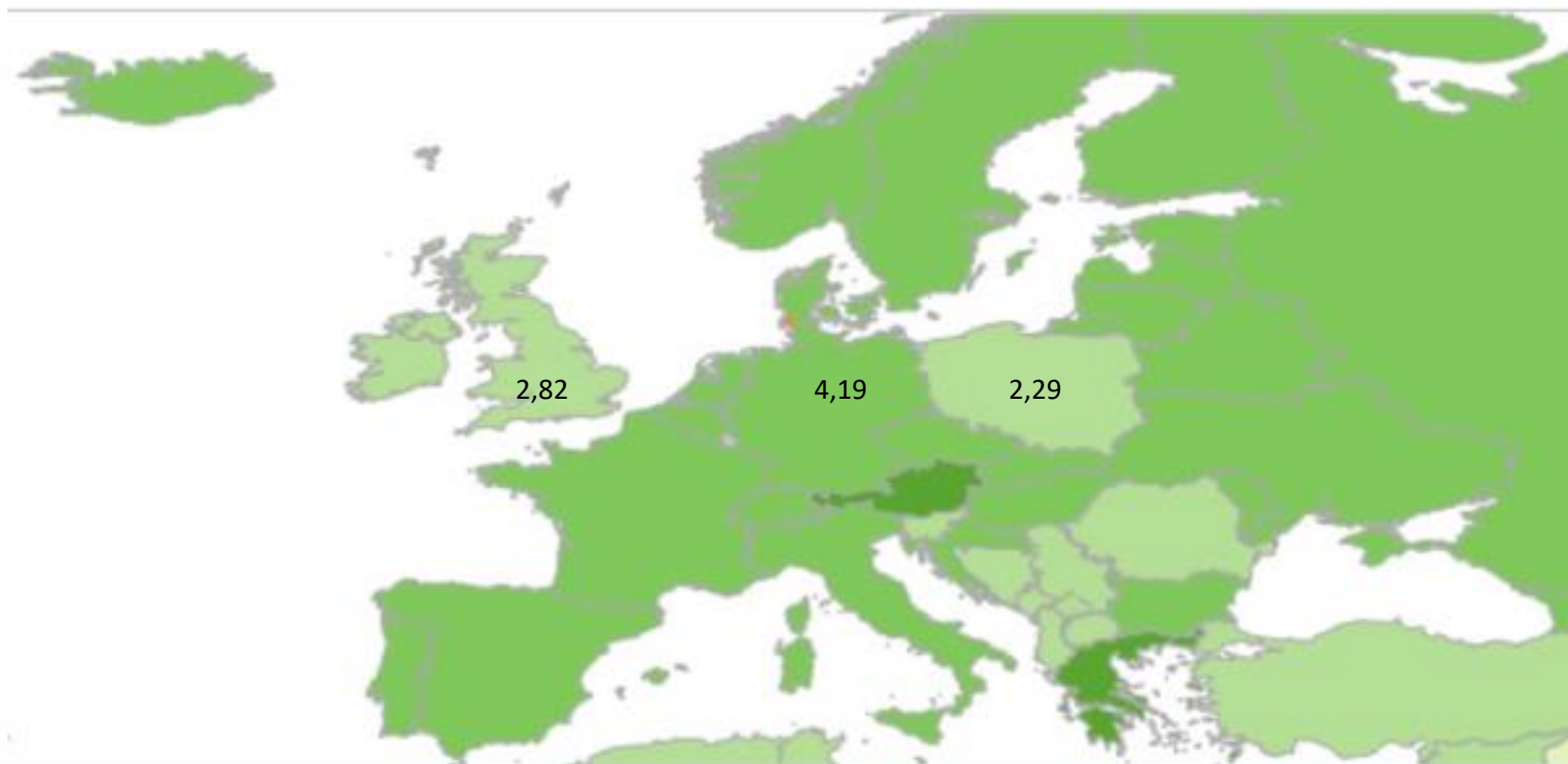
# Current health expenditure

as a percentage of gross domestic product (GDP)  
(total of public and private)



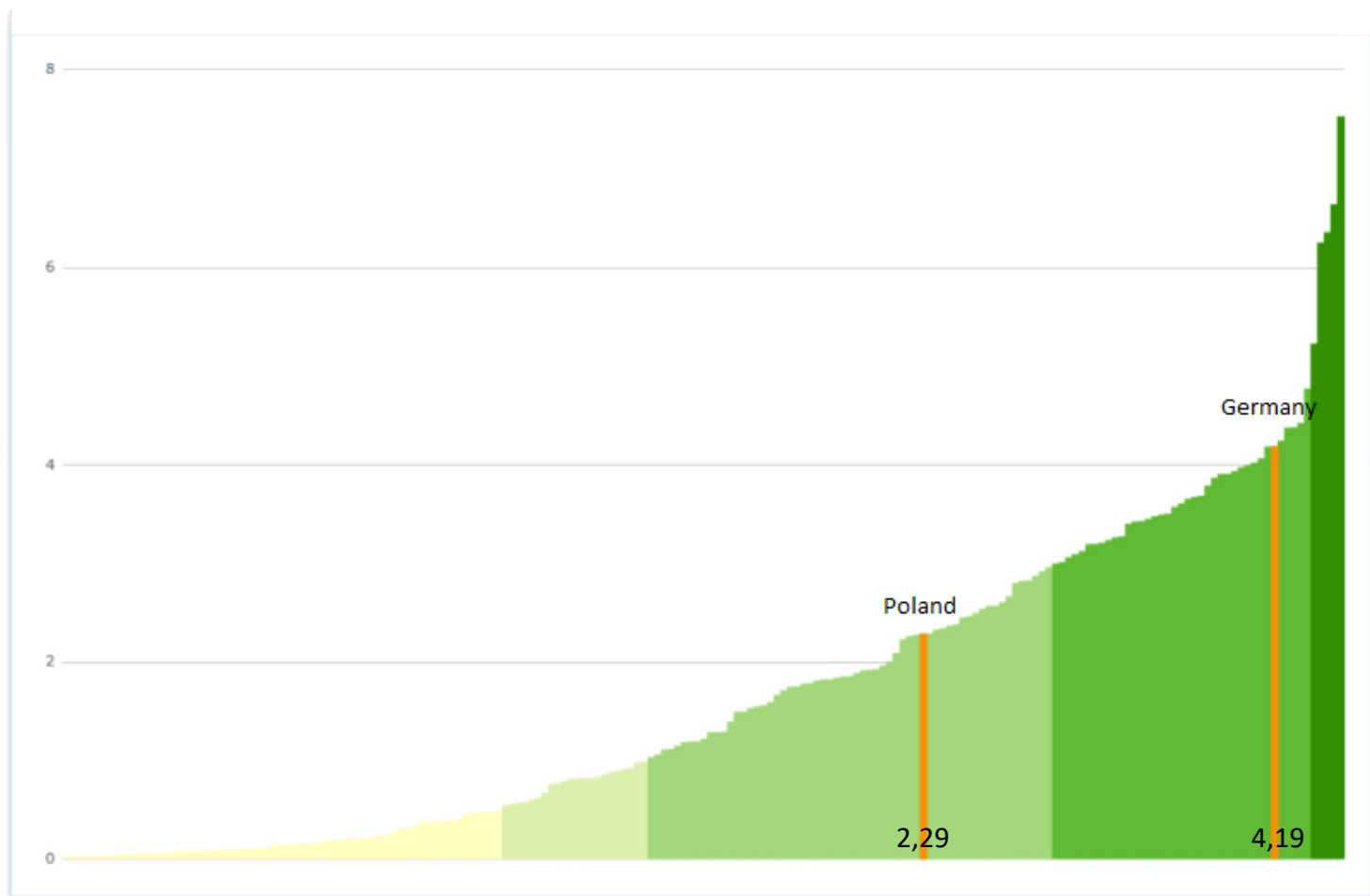
# Density of physicians

(total number per 1000 population)



# Density of physicians

(total number per 1000 population)



# Demographic time-bomb

	2013		2050
Median of age	37,3 years	+13,5	50,8 years
Percentage of population 65+	14,7%	x2,0	30,2%
Percentage of population 80+	3,7%	x2,8	10,4%
Number of people 65+	5,6 mln	x1,8	10,2mln
Number of people 80+	1,5mln	x2,3	3,5mln



# Polish telemedicine projects

## Public spending:

- NOMED AF
- LIFENET
- Teleangels care
- AMULET
- COMODITY12

## Private sector:

- COMARCH
- InfoScan
- Braster
- Nestmedic
- Medicalgorythms
- MedGo
- Telemedicine Poland

# NOMED AF

## Estimates:

- 18% of Polish 65+ population might have AF
- 600 000 patients
- Only 30% of them know about disease
- About 30% of strokes of unknown origin is caused by AF

## Goal:

- find an effective tool for screening atrial fibrillation
- prevention of strokes among population of 65+



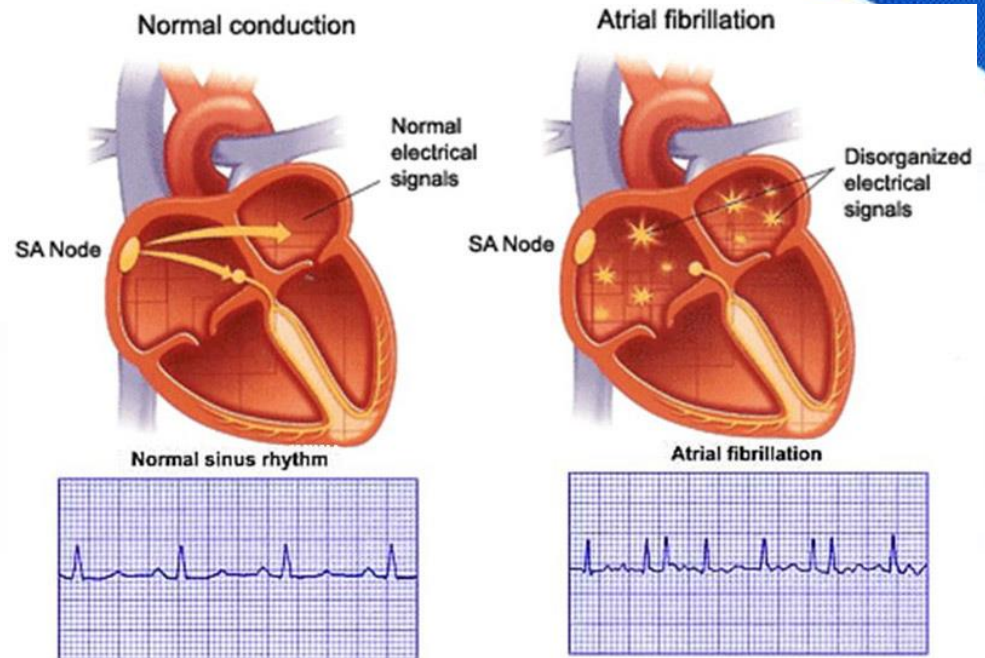
# Stroke



Spot a stroke **F.A.S.T.**

- Third most common cause of death (1.CV 2. Injuries 3. Strokes)
- High risk of permanent complications
- Main reason of disability among people 40+
- 130 mln € + 159 € spent annually

# Atrial Fibrillation



- Cause of up to 20% of strokes
- 15 000 strokes annually
- Bad predictor for disability and death when combined with stroke

# NOMED AF

- One of the leading telemedical research in Poland
- 3000 participants >65y.o.
- 30 days of constant ECG monitoring
- + HR, PPG and selective symptoms
- Visual and vibroacoustic signalisation of incidents of arrhythmia
- Results send to and monitored by the Kardiomed Silesia Center
- Under patronage of MoH and KEP



# NOMED AF



Kamizelka  
NoMED



Stacja dokująca  
NoMED



Rejestrator EKG  
NoMED

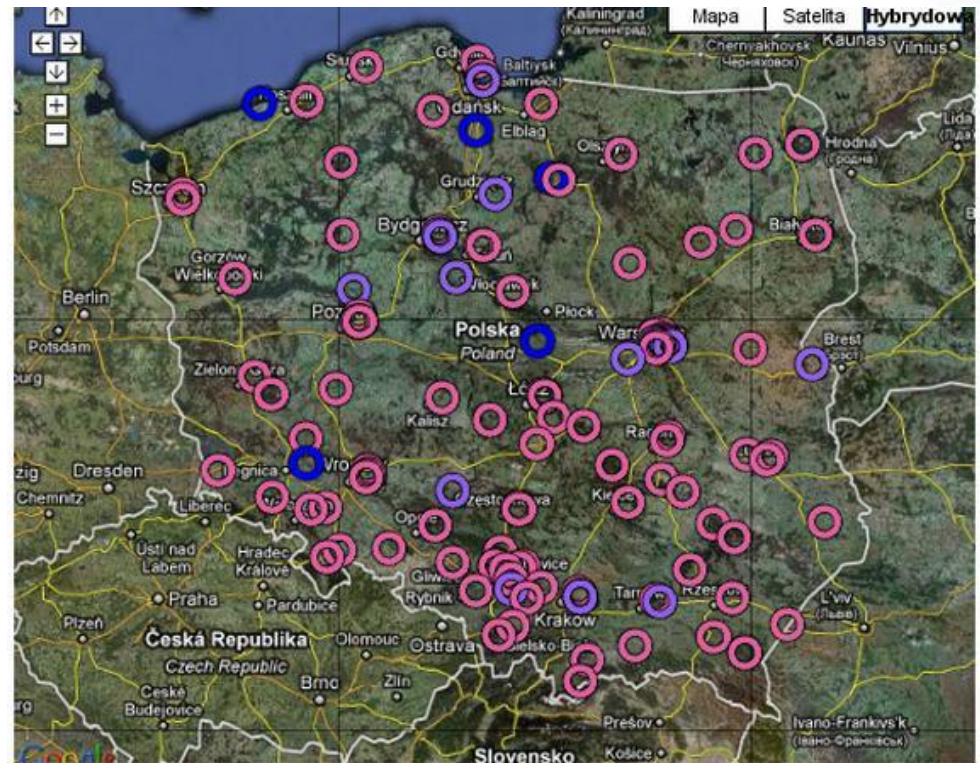


Rejestrator  
nadgarstkowy

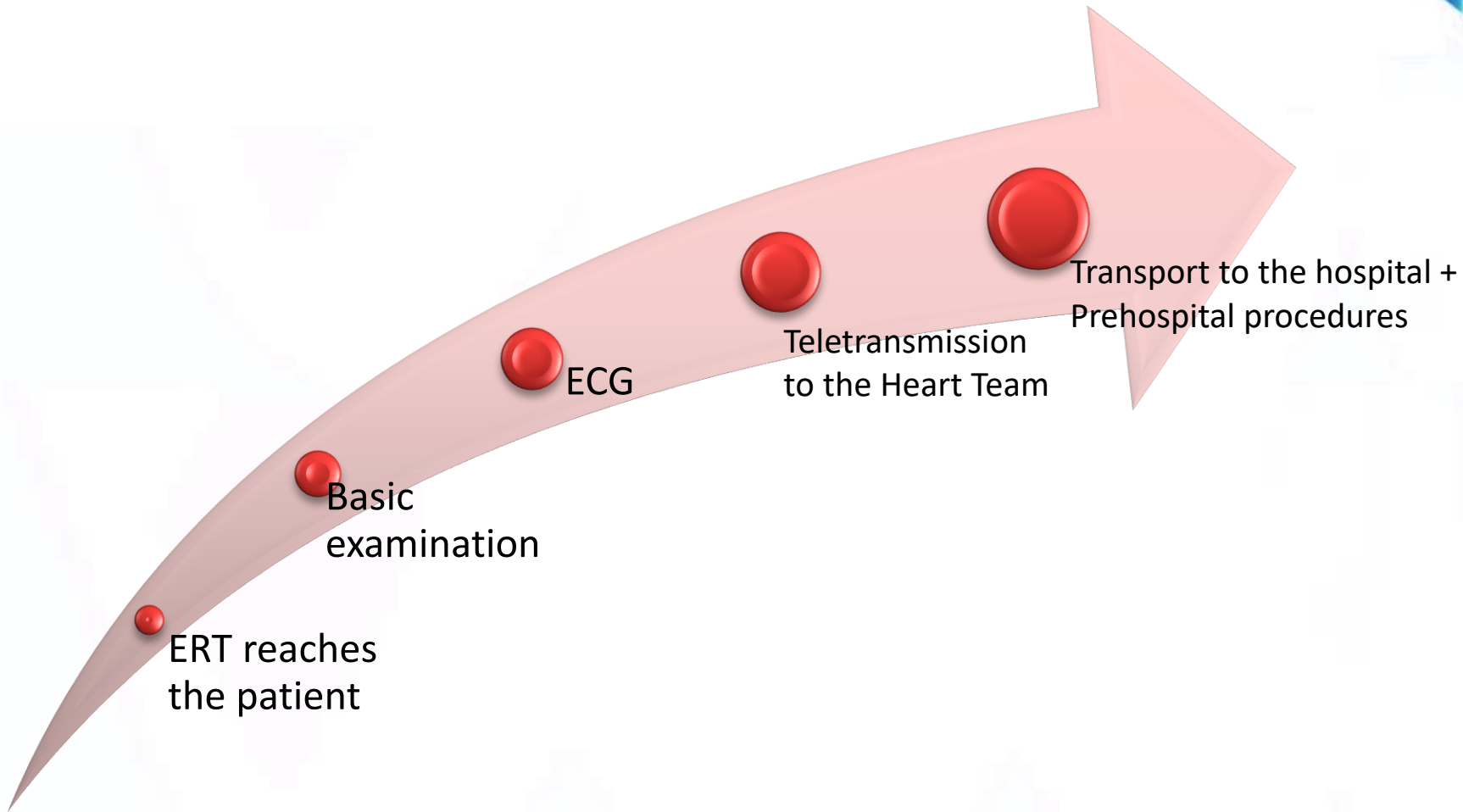


# LIFENET

- Cardiovascular diseases are the leading cause of death in Poland
- Poland has excellent net of more than 100 hemodynamic wards
- The main challenge is transportation time



# LIFENET



# LIFENET

## Goals:

1. Golden Hour
  1. Minimalizing the time between onset of symptoms to reperfusion among STEMI patients
  2. Paramedics can carry out ECG and contact with Heart Team – MD is not required in ambulance
  3. The ERT may perform non-standard, advanced procedures guided by the cardiologist
2. Cost efficiency
3. Prehospital advanced care



# Teleangels

- Provincial Małopolska program started in February 2018 (9mln €)
- Problems with daily activities due to age, disability or mental illness.
- 65+ population in Małopolska Region:
  - 2015: 0,515 mln
  - 2050: 1 mln



# Teleangels

- The 24/7/356 Center of Telecare
- 10 000 participants
- Band with SOS button and SIM card
- 3 200 people will be granted professional or neighbour care services
- Mean time of care for one participant is 20h per month



# AMULET

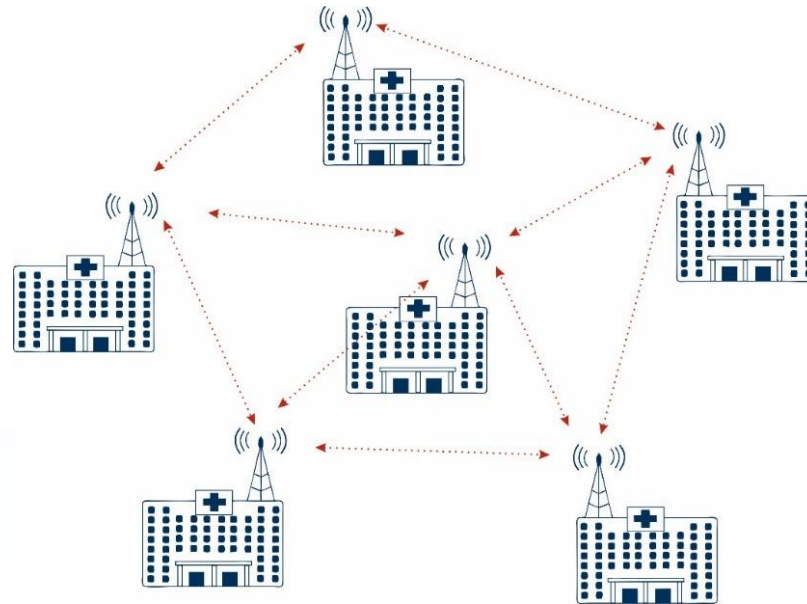
- Goal: establish more cost efficient long term management of patients with cardiac insufficiency
- Cardiac insufficiency: 1 mln patients, 60 000 of them dies annually
- Leading cause of hospitalization in Poland among 65+ population
- 15 times more expensive hospitalizations
- 11% of all hospitalizations
- Mean waiting time to see a cardiologist: MONTHS



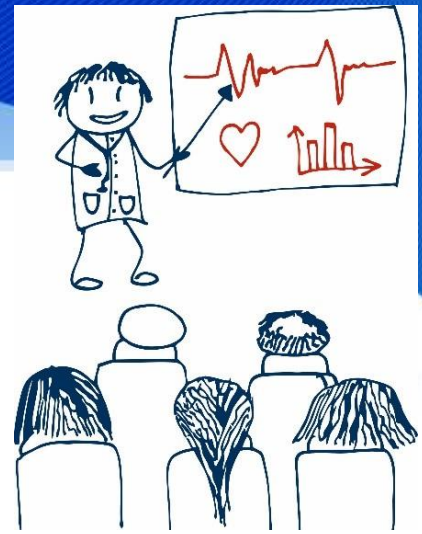
# AMULET

Participants:

- LVEF  $\leq 49\%$ ;
- NYHA I-II with at least one hospitalization due to cardiac insufficiency in the last 6 months
- No major CV incidents in the last 40 days



# AMULET



- Platform for communication, gathering and analyzing medical data
- Monitoring with use of modern technological techniques and telemedicine
- Prospective, retrospective and randomized research
- Creating optimal models of care and monitoring patients with CI

GP office  Patient home



# COMODITY12

Future of mHealth solutions for Diabetes?

## Methods

- 60 patients with drug dependent DM2 for >6months prior
- 6 weeks long follow up
- a Bluetooth-enabled glucometer, blood pressure reader and scale
- a Bluetooth-enabled sensor of ECG, heart rhythm, and respiratory movements

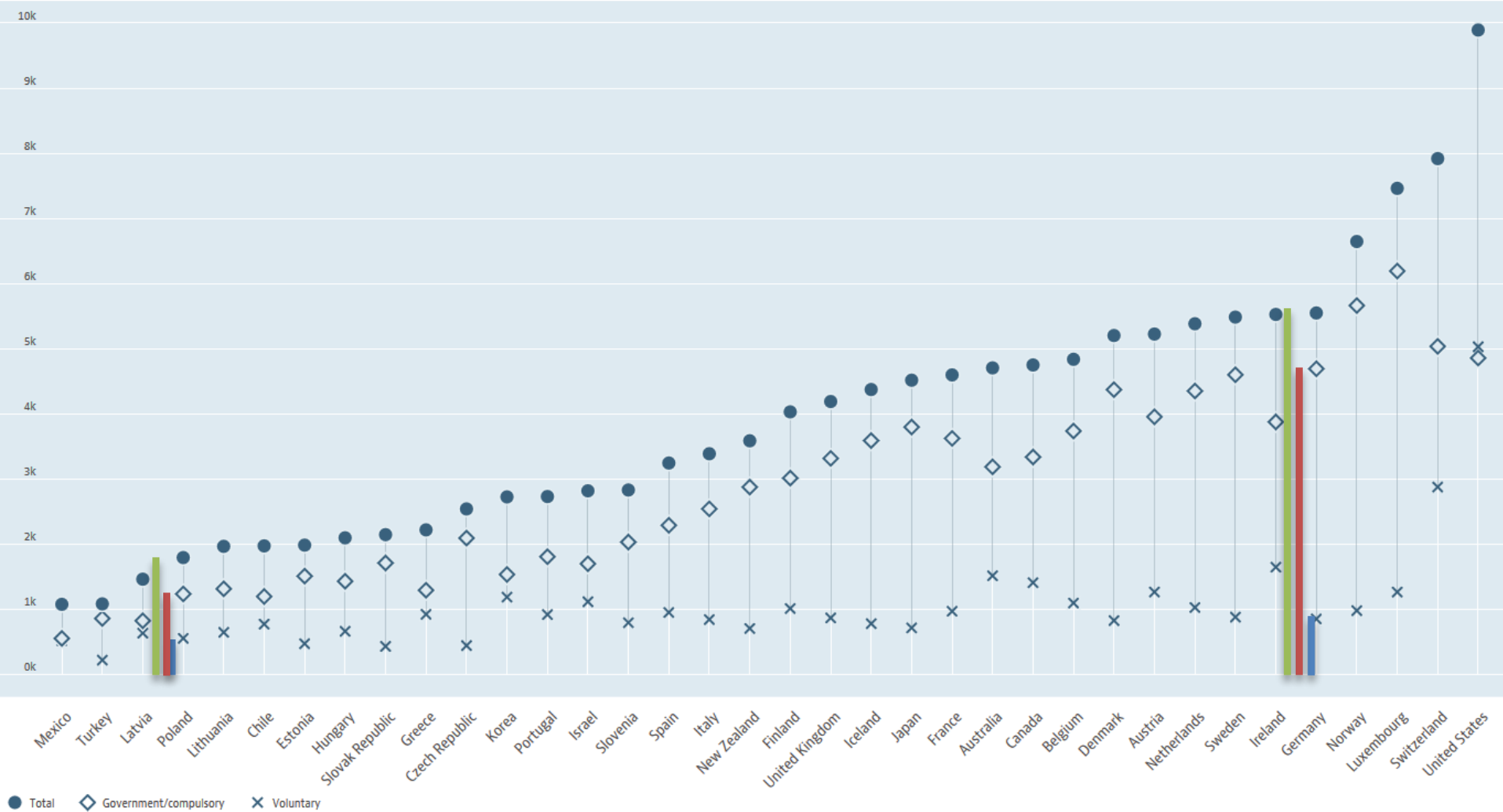
## Outcome measures

- Technical functionality
- Glycaemic control parameters (HbA1c, plasma glucose levels) arterial blood pressure
- Patient adherence to medication
- Health-related quality of life



# Health spending

Health spending Total / Government/compulsory / Voluntary, US dollars/capita, 2016



## ■ Top products



Hospital Information S



Medical Care

## ■ Innovation



Remote Cardiac Care



ology

## ■ Electronic Heal



for hospitals



for doctors



for patients



# COMARCH Healthcare

Leading Polish IT and tech company founded in Kraków

- Electronic Health Record
- Hospital InformationSystem
- eHealth
- eCare
- iMed24



# COMARCH Healthcare

Leading Polish IT and tech company founded in Kraków

- Teleradiology - teleDICOM
- Telecardiology - remote ECG monitoring
- Telegynecology - remote CTG
- Telegeriatics - remote care for seniors
- Life bracelet
- HTA device
- CardioVest
- Electronic Life Card
- Tech and IT provider for many public programs ieg:
  - NOMED-AF
  - Teleangels



# InfoScan

## Obstructive Sleep Apnoea

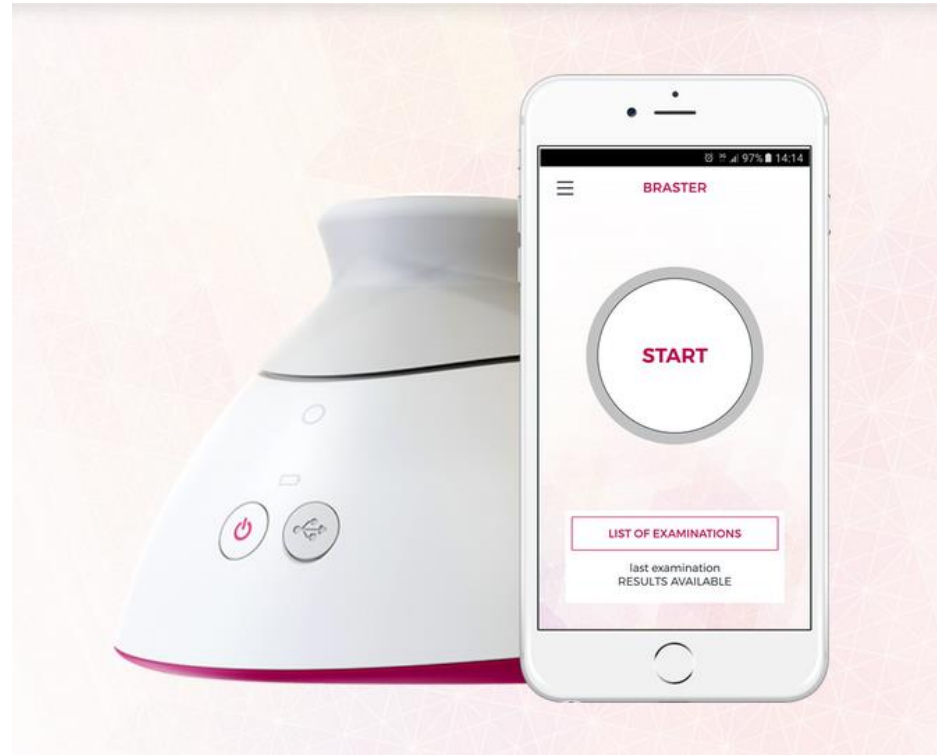
- SaO2
- PPG, HR
- Chest wall movement
- Nasal and oral airflow
- Snoring sounds
- Body positioning
- Analysis by the specialist in 24h
- Cost – 35 €



# Braster

Breast self-exam tool

- Prophylaxis of breast cancer
- Uses thermography to map potentially malignant neoplastic lesions in breasts
- Examination last for about 15min
- Then it is sent to the Telemedical Center
- The results are sent back withing 48h



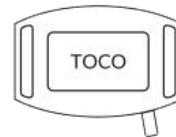


# Nestmedic

## Home CTG

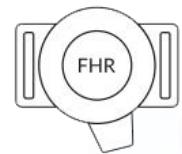
- Fetal heart rate
- Contractions of the uterus
- Fetal movement
- Mothers heart rate

automatyczny pomiar tętna matki  
OPASKA POMIARU TĘTNA

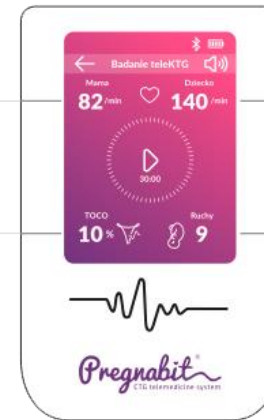


SONDA TOCO  
automatyczny pomiar skurczów mięśnia macicy

automatyczny pomiar akcji serca płodu  
SONDA FHR

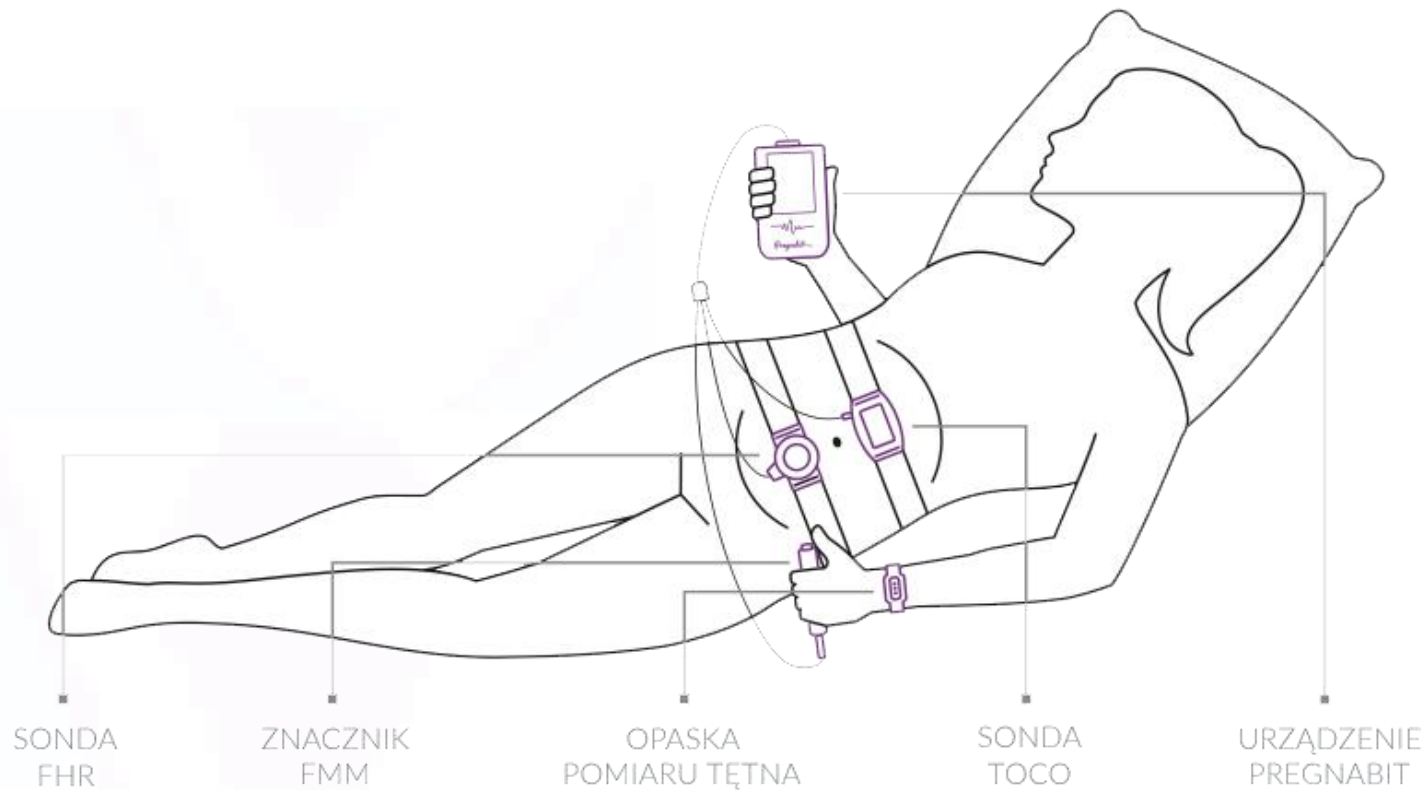


ZNACZNIK FMM  
ręczne oznaczanie ruchów płodu



# Nestmedic

## Home CTG



# Medicalgorithms

## ECG monitoring

- Unlimited time of monitoring
- Detection of arrhythmia by advanced algorithms
- Life data transmission
- Subjective symptoms
- Telemonitoring and telerehabilitation



# MedGo

Cardiac monitoring

- Unlimited time of monitoring
- IT platform for patients and physicians
- Cloud data storage
- Telemonitoring and telerehabilitation





# Conclusions



# J. Dietl Specialist Hospital in Kraków

- 400 beds
- 800 employees
- 30 000 hospitalizations annually
- 50 000 ambulatory patients

- **Internal diseases:** allergology, diabetology, endocrinology, gastroenterology, hematology, **Cardiology** and clinical pharmacology
- **Neurology**
- **Rheumatology**
- **Rehabilitation**

Broad diagnostic panel:

The Institute of Diagnostic Imaging (i.e. CT, MRI), Gastrointestinal Endoscopy, the EEG Laboratory, the Laboratory of Cardiovascular Organ Function Tests and Hemodynamic, the Laboratory of Spirometry

Educational cooperation for physicians (students trainings, graduate internships, specialization trainings in the field of internal medicine), medical students and students at Kraków medical faculties including nursing, dietetics, physiotherapy and massage.





*Thank you for your attention*