TELECARDIOLOGY FOR PUBLIC HEALTH CARE OF CARDIOVASCULAR DISEASES
PUGLIA’S EXPERIENCE
HISTORY
HISTORY
TELECARDIOLOGY FOR PUBLIC HEALTH CARE OF CARDIOVASCULAR DISEASES

3rd Momentum Workshop
Thursday, 15 May 2014, 9:00-15:00, Athens, Greece

Claudio LOPRIORE
GENERAL DIRECTOR
TELECARDIOLOGY FOR PUBLIC HEALTH
CARE OF CARDIOVASCULAR DISEASES

PARTNERS

SERVICE COVERAGE AREA

REGIONE PUGLIA
ARes PUGLIA
118 Puglia

UPDATE APRIL 2014
294 Clients in Apulia

185 Ambulances 118
41 First Aid Points
35 Summer First Aid Points
21 Medicas
7 First Territorial Aid Points
2 Hydroambulances
2 Inflated boat
1 Water Scooter

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**SCOPE OF SERVICE**

The service allows you to perform electrocardiogram checks electronically through the combined use of:

1. A transtelephonic electrocardiograph to 12 derivations standard mod. CardioVox P12 and CardioLink, supplied to users of the services.

2. A landline or mobile phone.

3. A Central Telecardiology, manned by a team of Cardiology Specialists Operating 24 hours on 24, 365 days for year, ready at all times to receive and report in real-time 12-lead ECG standard.

4. The operator, through CardioVox P12 or CardioLink record the ECG of the patient in 50 seconds.

5. The operator, in 50 seconds, trasmit by Telephone, an ECG at Central Telecardiology Cardio On Line Europe.

6. The specialist receive, analyze, and report, in real-time, the ECG just received; he provides a specialist referral telephone at the doctor or ambulance 118.

7. Reported electrocardiogram with a legal medical validity, is sent through fax (maximum within 3 minutes) to the operational Centre of 118, then it is made available in internet through the access to HRS - NET on www.cardionlineeurope.com.

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**TELECARDIOLOGY FOR PUBLIC HEALTH CARE OF CARDIOVASCULAR DISEASES**

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Electrocardiogram

Retto sinusale con frequenza di 68 bpm. ECG nei limiti della norma.
Activity to 11th October 2004 - 30th April 2014

MONTH BY MONTH

YEAR BY YEAR

BREAKDOWN FOR SEX

BREAKDOWN BY RANGE HOURLY

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DIVISION BY FINAL REPORT ON 674,569 ECG

- **Not Pathological**: 421,844; 62.54%
- **Pathological**: 252,725; 37.46%

252,725 ECG Pathological Distribution Disorders

Activity to 11th October 2004 - 30th April 2014
Activity to 11th October 2004 - 30th April 2014

DIVISION BY FINAL REPORT ON 674,569 ECG

WITHOUT SHELTER

MINORS DISEASES 176,776; 26.21%
NORMAL 421,844; 62.54%
SERIOUS DISEASES 75,949; 11.25%

URGENT HOSPITALIZATION

CALL/AGE REPORT

AGE DECADE

CALL NUMBER

16.018
37.639
67.777
81.160
149.005
22.09%
22.36%
14.70%
10.05%
99.687
5.58%
6.71%
4.03%
2.37%
2.19%

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GENERAL DIRECTOR
Cardio On Line Europe
Telemedicine Center
Critical Success Factors

Giuseppe DI GIUSEPPE - ICT Area Director
CULTURAL READINESS TOWARDS TELEMEDICINE

• CARDIO ON LINE EUROPE IS A TELEMEDICINE CENTER THAT IS CONSTANTLY CHAIRED BY AN OPERATOR, TECHNICIANS AND CARDIOLOGISTS 24 HOURS A DAY FOR 365 DAYS A YEAR. IT RECEIVES ALL ELECTROCARDIOGRAMS FROM ANY STATION (AMBULANCES, FIRST AID, OTHER) OF THE REGIONAL 118 EMERGENCY SYSTEM.

• CARDIO ON LINE EUROPE ALSO RECEIVES HOLTER CARDIAC OR ABPM FROM SOME SOCIO-HEALTH DISTRICTS LOCATED ACROSS THE REGION AND RECORDED ON CHRONIC PATIENTS WHO NEED A PERIODICAL CHECK-UP OR FOR FOLLOW UP.

• PATIENTS AND 118 ARE BEEN HAPPY TO USE THIS TELECARDIOLOGY SYSTEM, BECAUSE THE READY RESPONSE OF CARDIOLOGY IS A VALID SUPPORT FOR THEM AND THEIR MEDICAL DECISIONS. IN THE FIRST MONTH OF ACTIVITY, FROM 11th OCTOBER 2004, 601 ELECTROCARDIOGRAM (ECGS) WERE RECORDED.

• TODAY, CARDIO ON LINE EUROPE RECEIVES MORE THAN 10,000 ECG PER MONTH. THIS DETERMINES HOW THE TELEMEDICINE IS VIEWED POSITIVELY AND IS EMBRACED BY ALL.
• APULIA WAS THE FIRST REGION IN ITALY TO APPLY TELECARDIOLOGY SYSTEM IN THE REGIONAL EMERGENCY SYSTEM. THE PATHOLOGIES SUBDIVISION IS VERY IMPORTANT TO SEND PATIENTS TO AN APPROPRIATE HOSPITAL. TO SEND A PATIENT WITH A CHEST PAIN TO AN ORTHOPEDICAL CENTRE IS NOT A GOOD IDEA. WITH TELECARDIOLOGY SUPPORT, THE SAME PATIENT WILL BE SENT TO THE CARDIOLOGY DEPARTMENT.

• IN THE REGION OF APULIA, THE STEMI PROTOCOL HAS BEEN SET UP. WHAT IS THIS? ALL PATIENTS WITH STEMI, WILL BE SEND, IMMEDIATELY, TO THE HUB OR SPOKE UNIT THAT - IN SOME MINUTES - STARTS THE PTCA PROCEDURE.

• FOR SOME YEARS, MORTALITY FOR IMA IN PUGLIA HAS BEEN REDUCED BY 50% THANKS TO THE SYSTEM, COMPOSED BY CARDIO ON LINE EUROPE, THE APULIA REGION, HEMODYNAMIC, AND THE 118 EMERGENCY SYSTEM.

• IN THIS CASE, IN AN EMERGENCY, TELEMEDICINE SUPPORT CAN SUPPLY A FIRST SOLUTION.

THE SYMPTOMS AND CARDIOVASCULAR RISKS OF PATIENTS ARE VERY IMPORTANT: WITH THIS, TELECARDIOLOGY CENTER CARDIOLOGISTS ARE MORE SURE OF THEIR ECG INTERPRETATION.

THE EMERGENCY MEDIC IS AN INNOVATION FIGURE THAT WILL BE DECISIVE IN THE FUTURE.
PATIENT IS AT THE CENTRE OF SERVICE

• IT IS VERY IMPORTANT IS THAT THE PATIENT IS EVER THE CENTRE OF ATTENTION OF HEALTHCARE. IN FACT, WITH THE TELECARDIOLOGY SYSTEM, THE PATIENT DOESN'T GO TO FIRST AID FOR A CHEST PAIN! HE CALLS 118 ON HIS PHONE. IN A MAXIMUM OF 15 MINUTES, THE AMBULANCE CAN COME TO HIS HOME.

• THIS PERMITS EQUITY OF ACCESS FOR ALL PEOPLE IN THE REGION, THE SAME MEDICAL TREATMENT IN EVERY PLACE IN THE REGION, WHETHER IN A CITY OR IN A VERY FAR SITE THAT IS GEOGRAPHICALLY INCONVENIENT. THINK OF DISTANCES TO A HOSPITAL IN THE CITY OR IN THE COUNTRYSIDE.

• IN THIS MANNER, THERE AREN'T CULTURAL DIFFERENCES IN AGE OR SOCIAL LEVEL.

• THE PATIENT IS THE MOST IMPORTANT FIGURE IN THE HEALTHCARE SYSTEM.
TELEMEDICINE LEGALITY POLICIES

• CARDIO ON LINE EUROPE USES DEVICES AND SOFTWARE CERTIFIED BY THE FDA AND THE ITALIAN HEALTH MINISTRY.

• SOFTWARE AND DEVICES ARE DEVELOPED AND MANUFACTURED IN ISRAEL, AND THEY ALL HAVE LICENSES AND AUTHORIZATIONS FOR USE AND SALE.

• IN OUR SYSTEM, THE ECG REPORT IS SIGNED BY A SPECIALIST CARDIOLOGIST. SO, WE ARE SURE THAT TELEMEDICINE SYSTEM IS NOT INHIBITED BY LAW AND WE ARE CERTAIN THAT OUR TELECARDIOLOGY SYSTEM IS NOT CONSIDERED TO BE IN CONFLICT WITH THE REQUIREMENTS FOR BEST PRACTICE IN MEDICINE.

• THIS IS VERY IMPORTANT FOR US, BECAUSE OUR DOCTORS ARE HAPPY TO WORK SAFELY.
LEGAL, ETHICAL, PRIVACY AND SECURITY EXPERTS

• This is a considerable success factor for Cardio On Line Europe. In fact, this society is the only one in Italy that has an integrated certification for “Information Security Management System” in telemedicine.

• Cardio On Line Europe is certified, in both its quality and security system, for “Design and providing telemedicine services applied to telecardiology for electrocardiographic reporting and “On line” consulting; reading and analysis of cardiac/pressure Holter reported by cardiologists”.

Giuseppe DI GIUSEPPE
ICT AREA DIRECTOR

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CARDIO ON LINE EUROPE: IT AND E-HEALTH INFRASTRUCTURE

• THE TELECARDIOLOGY SYSTEM OF CARDIO ON LINE EUROPE HAS THE MOST RECENT HARDWARE TECHNOLOGY, WHILE THE SOFTWARE USED, FOR THE HEARTLINE RECEIVING SYSTEM (HRS) WORKS ON AN ORACLE DATABASE. LAST YEAR, ORACLE DEVELOPED A NEW HARDWARE PRODUCT THAT ALL THE BEST FEATURES FOR THE SCOPE OF THIS TASK. THE ORACLE DATABASE APPLIANCE, ON A SCALE OF VALUES, OCCUPIES ONE OF THE TOP PLACES IN TERMS OF PERFORMANCE. THIS IS ANOTHER SUCCESS FACTOR, BECAUSE THE ICT INFRASTRUCTURE MUST ALWAYS BE FUNCTIONAL.

• CARDIO ON LINE EUROPE HAS THREE LEVEL OF NETWORKS WITH THE DATABASE SYNCHRONIZED. THE ELECTRICITY AND THE TELEPHONE DASHBOARDS ARE TESTED DAY BY DAY BY TECHNICAL STAFF.
CARDIO ON LINE EUROPE, ALSO HAS ANOTHER ROOM IN THE SAME OFFICE FOR A CENTRAL TELECARDIOLOGY BACKUP SYSTEM.

• THE OUTPUT FILE OF THE ECG REPORT CAN BE DOWNLOADED IN REAL TIME FROM THE INTERNET AS JPEG OR PDF.

• HRS DATA FILES AND ITS DATABASE ARE INTEROPERABLE WITH THE HEALTH INFORMATION SYSTEMS.
CARDIO ON LINE EUROPE: USER-FRIENDLY TECHNOLOGY

The electrocardiographs used (Aerotel Medical System Cardiovox P12) are extremely simple to use: with only one button the 118 doctor records and in a few minutes send a 12 leads standard electrocardiogram. The transmission is for acoustic coupling. The sound produced can be transmitted by every telephone system, from the ambulance’s telephone, from the doctor’s phone, from the patient’s home, or from any device capable of making a phone call. We know that other communication systems exist. But we also know that every signal transmitted by internet or any digital system, must be transmitted from start to end. If no, the trace cannot be recognized. For this reason, we have opted for an analog solution, because the sound produced by Cardiovox P12 can be transmitted in every mode. Finally, these electrocardiographs are easy to use and have a user-friendly design.
CARDIO ON LINE EUROPE: MONITOR THE SERVICE

• CARDIO ON LINE EUROPE HAS A DEDICATED SECTION THAT FOLLOW UNIQUELY CUSTOMER SATISFACTION LEVELS. WE HAVE TO MONITOR THE SERVICE AND THE ACTIVITIES CONTINUOUSLY 24 HOURS ON 24 HOURS FOR 365 DAYS A YEAR.

• WE HAVE A QUESTIONNAIRE REPORT TO CONSIDER THE NEEDS OF USERS, FROM ISSUES AROUND INSTRUCTIONS FOR USE TO TECHNICAL ASSISTANCE.

• WE ARE ABLE TO GUARANTEE THE REPLACEMENT OF DEVICES IN 24 HOURS FROM THE CALL. THE DEVICES ARE FREQUENTLY TESTED. EVERY 5 YEARS, THE EQUIPMENT ARE COLLECTED AND SENT TO REVISION CENTRES. THIS IS WHAT THE LAW STIPULATES.
WITH TELECARDIOLOGY SYSTEM SUPPORT WE HAVE:

- RAPID INTERVENTION TIME
  ( ... DIAGNOSIS NETWORK AND AT HOME)

- APPROPRIATENESS
  ( ... LESS HOSPITALIZATION)

- EQUITY
  ( ... WIDESPREAD EASY OPEN ACCESS, REGARDLESS OF SEX, AGE, TIME, SOCIO-ECONOMIC FACTORS)

- TRANSFERABILITY
  ( ... DEVICES, PHONE CONNECTIONS, NETWORKING, ORGANIZATIONAL MODEL)

- HIGH COST SAVINGS
  ( ... EACH SINGLE ECG COSTS LESS THAN 17 EUROS FOR THE PUBLIC ADMINISTRATION)
SUSTAINABILITY

INTERVENTION: PROVIDES EDUCATION AND SUPPORT

IMPROVES LIFESTYLES AND HEALTH BEHAVIOUR

IMPROVES CLINICAL OUTCOMES

REDUCES NUMBER OF ACUTE EVENTS

REDUCES HOSPITALIZATION AND HEALTHCARE COSTS

REDUCES INAPPROPRIATE HOSPITAL STAYS AND SAVINGS IN OPERATING COSTS

INTRODUCES TELEMEDICINE

PERFORMS SERVICES IN THE RIGHT SETTING

GUARANTEES WIDESPREAD AND MORE EFFECTIVE SERVICE

INCREASES POINT OF ACCESS TO HEALTHCARE

EQUITY IN HEALTH
Five months ago a study was published that showed the cost of a single electrocardiogram. The cost derives from the division of the amount paid to Cardio On Line Europe for the number of electrocardiograms performed in the year evaluated (2012). Each ECG, including cardiological consultation, costs the public administration only 16,7 euro! Of course, the more ECGs are performed, the lower the cost of each electrocardiogram.
Pre-hospital electrocardiogram triage with tele-cardiology support is associated with shorter time-to-balloon and higher rates of timely reperfusion even in rural areas: data from the Bari- Barletta/Andria/Trani public emergency medical service 118 registry on primary angioplasty in ST-elevation myocardial infarction.

We have collected all the times from the 118 operative centre. These times added to our times allow us to publish a work never made in cardiological literature.
DIFFERENCE TIME BETWEEN 118 CALL AND AMBULANCE ARRIVAL

DIFFERENCE MEDIANS TIME BETWEEN 118 EMERGENCY REGIONAL SYSTEM AND HEMODYNAMIC WHEN DIAGNOSIS IS IMA
CARDIO ON LINE EUROPE: “THINK GREAT, THINK BIG!”

• FOR SOME YEARS, THE SERVICE IS NOT DIRECTED ONLY TO THE EMERGENCY BUT ALSO THE SEVERITY OF THE CONDITION (“CHRONICITY”). MANY PATIENTS NEEDS CARE AND REGULAR CHECKS, SO THE PUGLIA REGION, HAS DECIDED TO MAKE THE SAME TECHNOLOGIES (ELECTROCARDIOGRAMS PLUS HOLTER) AVAILABLE TO THESE INDIVIDUALS EXPERIENCING AN EMERGENCY.

• THE AIM OF CARDIO ON LINE EUROPE IS NOT TO STOP AT ONLY ONE REGION, BUT TO EXTEND THE SAME SERVICE IN OTHER ITALIAN REGIONS, WHEN POLICY-MAKERS AND CARDIOLOGISTS AGREE - AS IT HAS BEEN THE CASE FOR THE PUGLIA REGION.

• TODAY, THE CARDIO ON LINE EUROPE AREA WORKPLACE, INCLUDING OFFICES AND OPERATIONS CENTRE, IS JUST 190 SQUARE FEET. IN THREE MONTHS’ TIME, WE WILL MOVE INTO A NEW OFFICE OF 630 SQUARE METERS, OF WHICH 120 WILL BE DEDICATED TO THE OPERATIONS CENTRE AND 80 TO THE HOLTER DIVISION. THERE WILL BE A TRAINING ROOM, A KITCHEN, A SECRETARY, A CONTROL ROOM, A SERVER ROOM - AS REGULATIONS REQUIRE, A RELAXATION AREA, AND AN ENTERTAINMENT AREA.

• IN THIS MANNER, ALL OUR EMPLOYEES ARE HAPPY TO WORK HERE … THIS MEANS THINKING BIG.
CARDIO ON LINE EUROPE: OTHER CUSTOMERS

- All PuGlia Regional Prisons
- Some Italian Air Force Planes
- A lot of General Practitioners
- A lot of Nursing Homes
- A lot of Italian Military Navy ships
- A lot of Italian Pharmacies
CARDIO ON LINE EUROPE: REAL SUCCESS FACTOR, USEFUL TO EXPORT IN OTHER SITUATIONS

• THE COMPLEXITY OF THE ORGANIZATION AND MANAGEMENT OF A TELECARDIOLOGY CENTRE, COMPUTERS AND THEIR HARDWARE, TELEPHONE CONNECTIONS, NETWORKS, REDUNDANT SERVERS, "ON SITE" CARE FOR BOTH HARDWARE AND SOFTWARE, MANAGEMENT OF DATA, AND - LAST BUT NOT LEAST - THE TRAINING AND RELIABILITY OF THE STAFF, ARE THE MAJOR FACTORS TO COORDINATE IN ORDER TO OBTAIN THESE HARMONIOUS RESULTS. THIS CAN ONLY BE ACHIEVED WITH ABSOLUTE DEDICATION OF HUMAN RESOURCES AND ABOVE ALL STEP-BY-STEP. COUNTLESS PUBLICATIONS, MANY SCIENTIFIC PAPERS AND A FEW PHOTOGRAPHS, ACCOMPANY AND COMPLEMENT THE TOTAL PICTURE. YOU CAN DO BETTER, HARDLY MORE PASSION!

• FOR FURTHER INFORMATIONS, PLEASE VISIT OUR SITE: WWW.CARDIOONLINEEUROPE.COM
TELECARDIOLOGY FOR PUBLIC HEALTH
CARE OF CARDIOVASCULAR DISEASES

THANK YOU FOR YOUR ATTENTION AND SEE YOU SOON IN ...

... PUGLIA !!!

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