Imagine 2029: Our data, our health, our care – 20th anniversary of EHTEL

EHTEL 2019 Symposium

Kindly hosted by TIC Salut Social
Technology, innovation and digital transformation.

11:15 – 12:30 [S8]

Aula 1
First Floor

InteropEHRate

Breakout **A: Meaningful Data Sharing and Advancing for Interoperable Health Records**

Inspired by "EHRxF" recommendation COM(2019)800: Exploring interoperability and meaningful data.

Session Chair: Janne Rasmussen, Medcom, Odense, Denmark

Towards an EHR Exchange Format: Joint Steps Member States and European Commission
Costica Dumbrava, DG CNECT - Unit H3, European Commission, Luxembourg

InteropEHRate - Supporting EHR Exchange through 'Data in People's Hands'
Francesco Torelli, Engineering, Rome, Italy

Smart4Health - Citizen-centred EU-EHR Exchange for Personalised Health
Afonso Duarte, Smart4Health Coordination Office, UNINOVA, Lisbon, Portugal

International Patient Summary (IPS) in Clinical Use - Lessons Learned in InteropEHRate
Stefano Dalmiani, FTGM "Gabriele Monasterio" Medical Research Foundation, Pisa, Italy

Q&A and Conclusions by the Session Chair

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Symposium Silver Sponsors DM+ Coach
T-Systems Let's power higher performance

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The Digital Transformation of Health and Care in the EU

Interoperability of EHR systems

EHTEL Symposium, Barcelona, 4 December 2019

Costica Dumbrava
Programme Officer

European Commission
DG CONNECT – Communications Networks, Content and Technology
Unit H3 – eHealth, Well-being & Ageing

The Digital Transformation of Health and Care in the EU

Priorities (EC Communication):

1. Provide better access to health data for citizens
2. Pool health data for research and personalised medicine
3. Empower citizens and foster human-centred health and care through digital tools and solutions

Recommendation on a Electronic Health Record exchange format

Aims

- Support Members States in their efforts to build **interoperable** EHR systems, ensuring adequate **protection and security** of health data
- Enable citizens to **access and share** their health data with healthcare professionals across borders in the EU
- Supports the digital transformation of health and care in the EU by facilitating the flow of **health data** across borders

Recommendation on a Electronic Health Record exchange format

A framework for the further development of a European EHR exchange format

- **Principles** governing the access to and exchange of EHRs across borders
- **Common technical specifications** for the cross-border exchange of data
- **Joint Coordination Process** for the development of the European EHR format

Recommendation on a Electronic Health Record exchange format

Guiding principles

- Citizen centric by design
- Comprehensiveness and machine readability
- Data protection and confidentiality
- Consent or other lawful basis
- Auditability
- Security
- Identification and authentication
- Continuity of service

Security and Data Protection

- GDPR
- NIS Directive
- Set up National Digital Health Networks

Recommendation on a Electronic Health Record exchange format

Common technical specifications (baseline)

- Initial set **of health information domains**: patient summaries, ePrescriptions, laboratory reports, medical images and reports, and hospital discharge reports
- Common list of **interoperability specifications** (existing standards and profiles)
- **Incremental and selective approach** for adopting, refining, and maintaining the specifications of the European EHR exchange format

Recommendation on a Electronic Health Record exchange format

Joint Coordination Process

- Drivers – EC & Members states
- Purpose - oversee, develop and adopt the European EHRxF
- Resources - existing expertise and projects, pilots
- Stakeholders - wider engagement (relevant national authorities, clinicians, patients, industry)
- Integrated policy approach - GDPR, cybersecurity, European health data space

European EHR interoperability
State of play

eHealth Digital Service Infrastructure (eHDSI)

- Enables the cross-border exchange of patient data in the EU (Patient Summary and ePrescription)
- Ongoing work to expand the scope of eHDSI
- eHN investment guidelines for MS – interoperability specifications – prerequisite for procurement of health services
- DEP funding for eHDSI (Deployment & interoperability)

European EHR interoperability State of play

Interoperability Roadmap

- Ongoing discussions with MS (eHealth Network)
- Take stock of existing projects; mobilise resources and expertise (e.g. TRILIUM II, INTEROPEHRATE)
- H2020 Coordination and Support Action (deadline for proposals 13 November 2019)- under evaluation

European EHR interoperability
State of play

Stakeholder consultations

- eHealth Stakeholder Group – new mandate
- HealthTech Roundtable
- Innovation community (EIP/AAL)
- Patients Workshop on Health Data

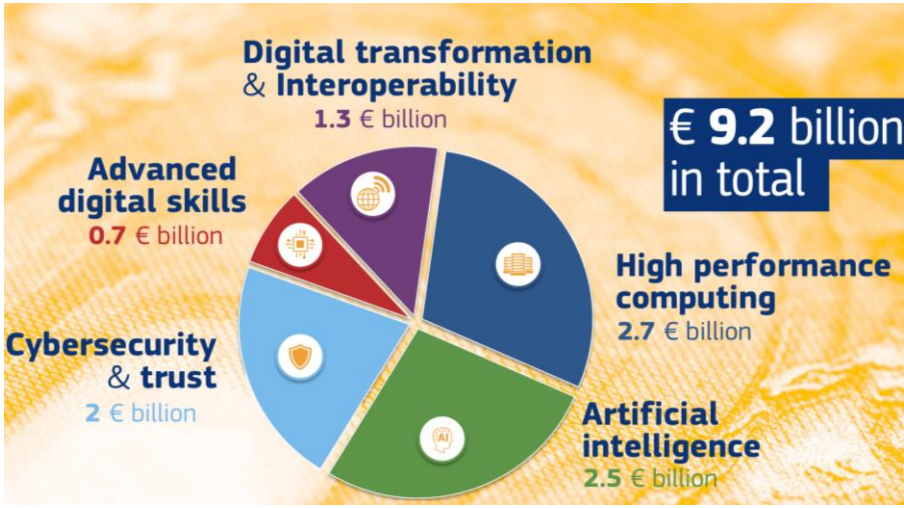
European EHR interoperability
State of play

Integrated approach on health data

- Data protection - GDPR
- Cybersecurity and trust: NIS Directive; Health eID
- European health data space – secure access to different kinds of health data for healthcare, research and innovation (Genomics declaration; AI & imaging)
- Funding (DEP, Horizon Europe)

Digital Europe Programme

- Health & Care: key societal sector & high impact deployment area
- 5 DEP Pillars: HPC; AI; Cybersecurity; Digital skills; Deployment and interoperability



Priorities on health (2021-2012)

- Connecting health data (eHDSI, Genomics, ERNs)
- Building trust and innovation for digital health and care
- Promoting digital skills in health and care sector

Funding opportunities digital health 2021-2027

Digital Europe Programme and Connecting Europe Facility

Horizon Europe

European Social Fund + and European Globalisation Adjustment Fund

European Regional Development Fund

InvestEU Programme

THANK YOU!

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www.interopehrate.eu

InteropEHRate

EHR in people's hands across Europe

EHR EXCHANGE FOR CITIZENS

EHTEL 2019 SYMPOSIUM – DECEMBER 4TH 2019, BARCELONA

FRANCESCO TORELLI
Engineering Ingegneria Informatica SpA - R&D Lab

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 826106

Who we are

Project Acronym: **InteropEHRate**

- Type: Research and Innovation action
- Grant Agreement Number: 826106
- Budget: €7,192,592.50

- 1st January 2019
- 30th June 2022
- 42 months

- Engineering - Ingegneria Informatica S.p.A. (Italy)
- A7 Software (Belgium)
- EHTEL - European Health Telematics Association (Belgium)
- DTCA Hygeia – Diagnostic and Therapeutic Centre of Athens (Greece)
- University of Trento (Italy)
- University of Vienna (Austria)
- EFN - European Federation of Nurses Associations (Belgium)
- FTGM - Toscana Gabriele Monasterio per la Ricerca Medica e di Sanità Pubblica (Italy)
- CHU de Liège - Centre Hospitalier Universitaire de Liège (Belgium)
- UBITECH Limited (Cyprus)
- UPRC - University of Piraeus Research Center (Greece)
- SCUBA - «Bagdasar-Arseni» Clinical Emergency Hospital of Bucharest (Romania)
- SIVECO Romania S.A. (Romania)
- Fraunhofer ISST - Institute for Software and Systems Engineering (Germany)
- ISA - Iatrikos Syllogos Athinon (Greece)
- Byte Computer S.A. (Greece)

InteropEHRate

cross-border exchange of health data

EHRxF Recommendation

*"**Citizens should be central** to the way in which systems are designed […]*

*(8) Member States should ensure that **citizens** are able to access and securely **share their electronic health data across borders**. […]*

*(9) Member States are encouraged to **give citizens the ability to choose to whom they provide access** to their electronic health data, and which health information details are shared. […]*

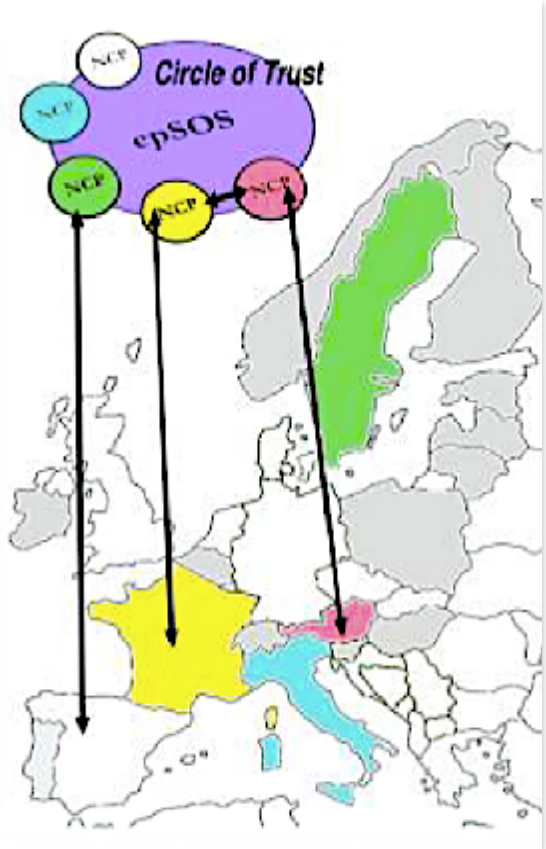
*(10) Member States should **ensure that the principles […] are observed when developing solutions** enabling access to, and exchange of electronic health data in the Union. […]*

*The refinement of the exchange format should **consider the possibility offered by resource driven information models** (such as Health Level Seven Fast Healthcare Interoperability Resources (**HL7 FHIR©**)).*

*[…] **Data protection and confidentiality** […] **Consent** […] **Auditability** […] **Security** […] **Identification and authentication** […] "*

CROSS-BORDER EHR EXCHANGE UNDER TESTING IN **EU**

System Architecture Specification v3.0.0, DG SANTE, CEF eHealth DSI, 2019



eHealth DSI* overall picture

A circle of trust is built between NCP**

in the "eHealth DSI abstract space",

the only way a country can exchange with another country.

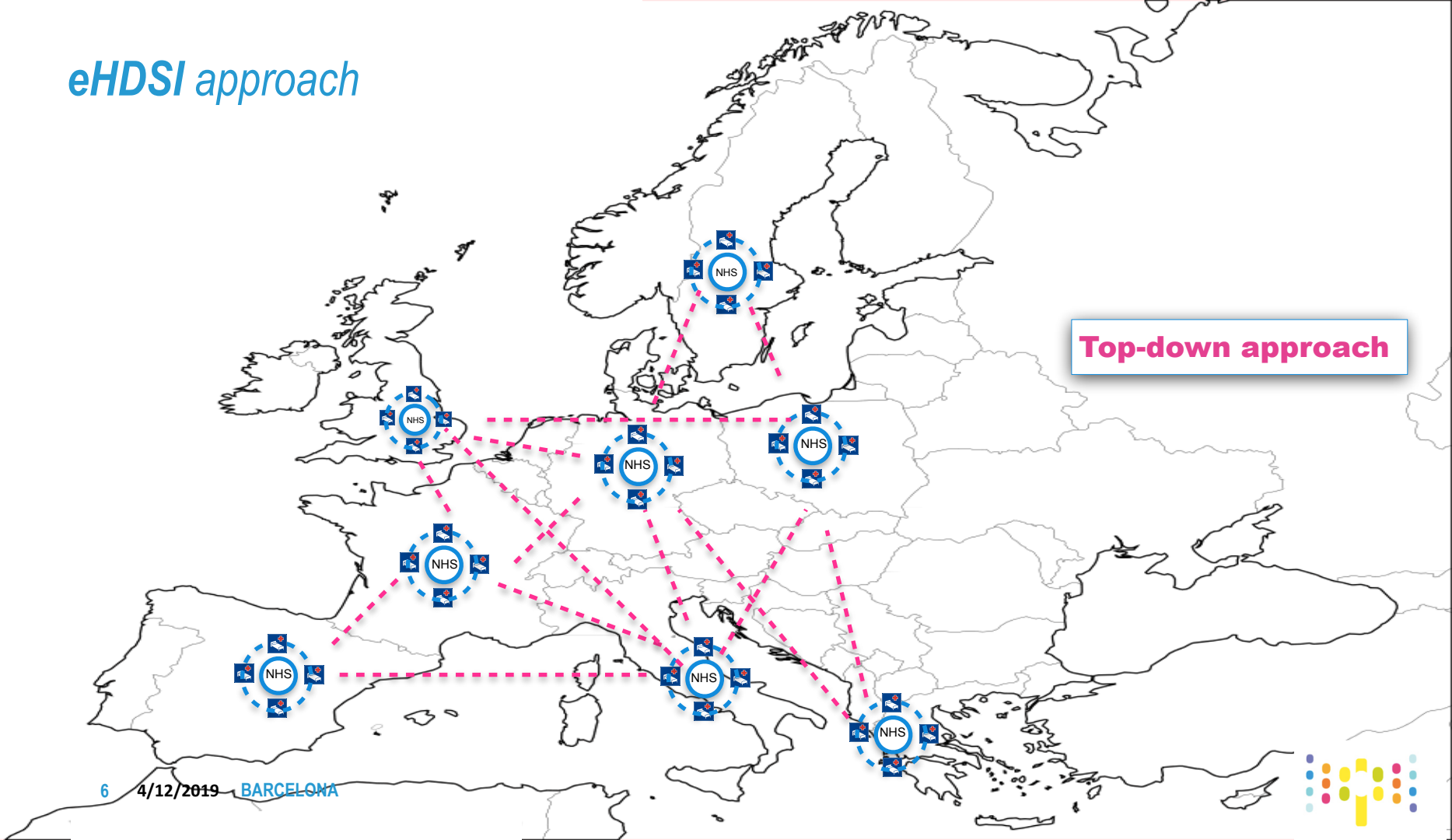
***eHDSI**: The eHealth Digital Service Infrastructure (eHDSI or eHealth DSI) is the initial deployment and operation of services for cross-border health data exchange under the Connecting Europe Facility (CEF)

****NCP**: National Contact Point as referred to in Article 6 of Directive 2011/24/EU

Organisations delegated by each participating Country, acting as a bidirectional way of interfacing between the existing different national functions provided by the national IT infrastructures and those provided by the common European infrastructure, created in eHDSI.

NCPeH: National Contact Point for eHealth, which may act as an organisational and technical gateway for the provision of eHealth Cross-Border Information Services.

eHDSI approach



Top-down approach

NEW CROSS-BORDER INTEROPERABILITY UNDER TESTING IN **EU**

With **eHDSI**

- Every EU country will expose **NCPeH** (National Contact Points for eHealth) to offer to other countries the cross border exchange of **ePrescriptions** and **Patient Summaries**

Limits

- **HCPs cannot access** to health data produced in foreign countries **without internet**
- **Citizens cannot access** to health data produced **in foreign countries**
- **Citizens** have **no control on** health data exchange
- There is **limited support for translation**
- Based on yet another API

InteropEHRate GOAL

*To extend **eHDSI Architecture***

*to support **cross-border exchange** of*

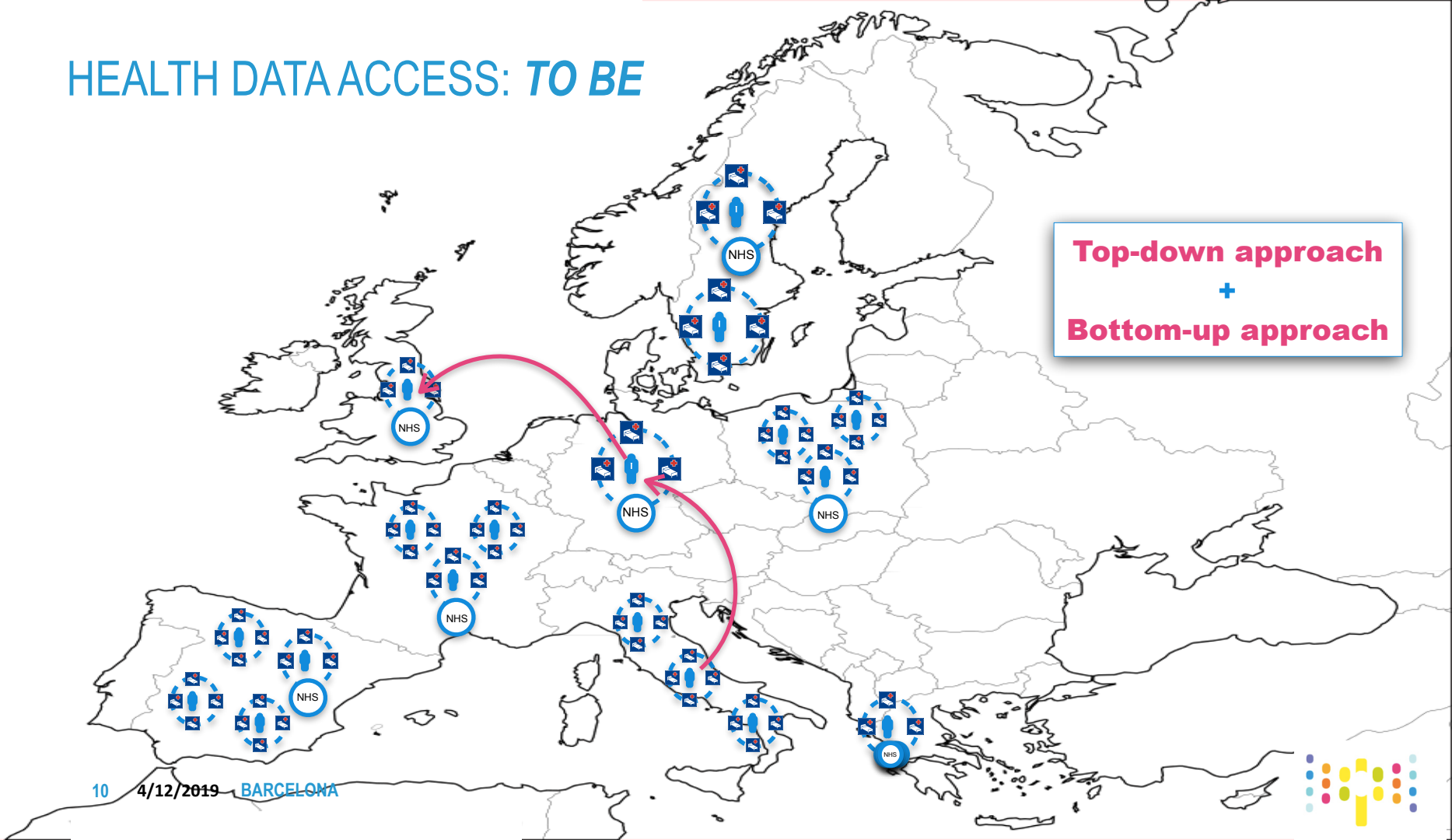
personal health data

between **Citizens** and **health organisations**

HOW

Define, validate and promote an **open specification** to securely store health data on personal mobile apps (**S-EHRs**) and exchange health data between Citizens and HCPs or Researchers of different countries using **InteropEHRate protocols**.

HEALTH DATA ACCESS: *TO BE*

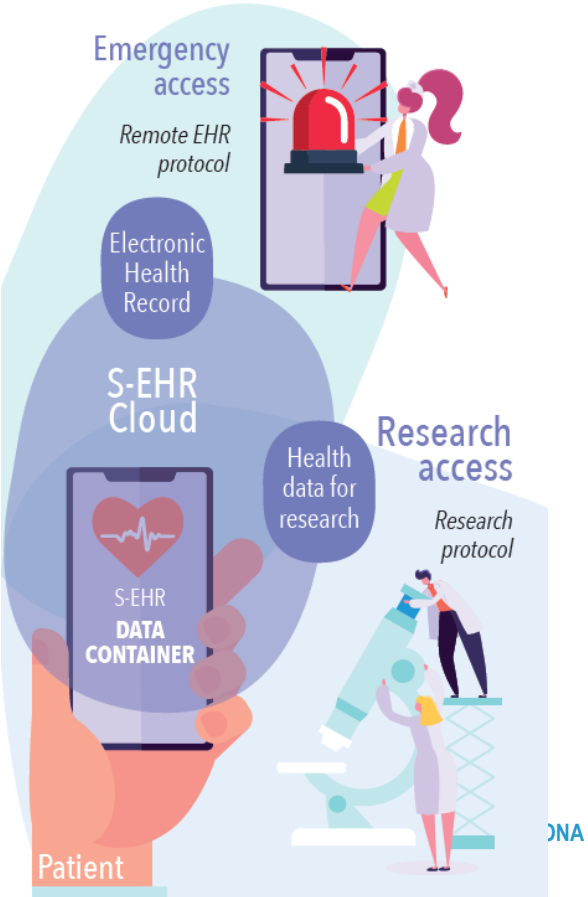


MAIN RESULTS OF InteropEHRate (IEHR)

1. **InteropEHRate open specification**
   Vendor independent technologies
   to become EU standard for
   Citizen Centred mobile interoperability.

2. **InteropEHRate Framework**
   The reference implementation of the
   InteropEHRate open specification.

IEHR Open specification



1. ***D2D protocol*** – *applied to* **Face to face medical visit**

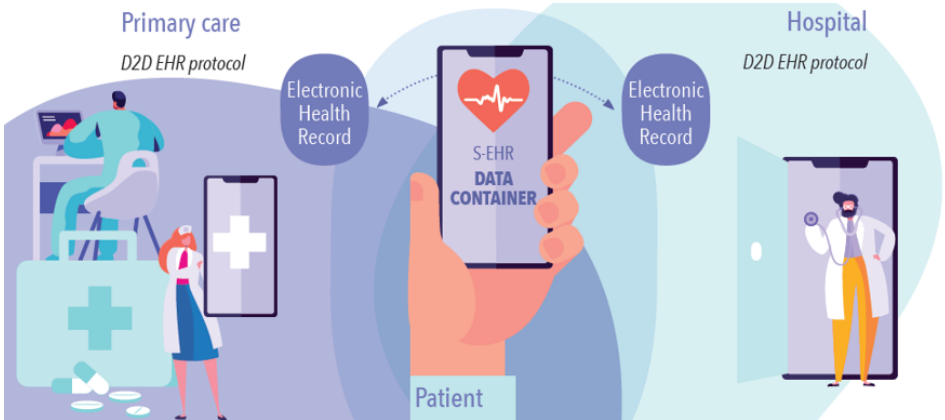
Exchange of health data without internet connection

2. **Remote protocol** – *applied also to* **Clinical emergency**

Access to data available on personal cloud and NCP node

3. ***Research protocol*** – *applied to* **Research study**

Sharing of health data for specific research studies



IEHR Open specification

1. **FHIR profiles for EHR interoperability**

Leverage
- *IHE*
- *HL7 FHIR*
- *CEN IPS*

2. **S-EHR conformance levels**
   constraints and guidelines that S-EHRs and cloud storage must fulfil.

Leverage
- *GDPR*
- *Security standards*

3. D2D protocol for healthcare
   exchange among two near devices, on encrypted short range channel (Bluetooth).

4. Remote protocol for healthcare
   health data exchange between S-EHR, NCP, S-EHR Cloud;

Leverage
- *eIDAS / CEF eID*
- *eHDSI*

5. Remote protocol for Research
   exchange of health data, on internet, between the S-EHR App and Research Organizations.

Improvement in data quality

- Health data provenance is certified;
- Data are structured using specific FHIR profiles that integrate existing standards;
- Data structured according to specified FHIR profiles can be reliably translated in different user languages.

Both Citizens and consumers of Citizens' health data are guaranteed by non-repudiation.

Improvement in interoperability & patient empowerment

- **Non proprietary protocols free** Citizens, HCPs and Researchers from specific vendors.
- Citizens are **in control** of health data exchange, give\retract **specific usage consents**.
- Citizens may use (EIDAS) **same credentials** for accessing every health data source.
- With **Remote protocol**
  - Citizens may **import** their health data at distance **into their preferred (S-EHR) mobile app**.
  - HCPs may access to health data stored in Citizen's S-EHR Cloud in **emergency**.
- With **D2D protocol** Citizens and HCPs can exchange health data without internet.
- With **Research protocol** Citizens can **share certified health data** to researchers **across Europe**.

INTEROPEHRATE FRAMEWORK

REFERENCE IMPLEMENTATION (PROTOCOLS IMPLEMENTATION & EXAMPLE APPS)

1. **S-EHR mobile app**: prototype of mobile app fulfilling the *S-EHR conformance levels*, able to import/share data from/with EHRs and with research centres.
2. **S-EHR cloud**: prototype of optional secure cloud service, fulfilling the *S-EHR conformance levels*, for personal cloud storage.
3. **HCP App**: prototype of secure app, used by the Health Care Professionals (HCPs) to securely exchange health data with any S-EHR or S-EHR Cloud.
4. **InteropEHRate Health Services (IHS)**: prototype of Healthcare Interoperability Services, implementing *D2D and remote protocols*.
5. **InteropEHRate Research Services** (**IRS**): prototype of a Research Interoperability Service, implementing *protocol for research*.

INTEROPEHRATE FRAMEWORK

INTEROPEHRATE HEALTH TOOLS (IHT)

Data schema conversion
Mapping local DB schemas to the InteropEHRate FHIR profile
Conversion of records according to the mapping

Semantic codes conversion
Mapping local terms to international codes
Conversion of codes according to the mapping

Information extraction
Extraction of codes and structured content from unformatted content (e.g. interpretation of equivalent expressions to represent the dosage of medicines)

Language translation
Presentation of coded and extracted information into the language of the user
Integration with external services for free text translation

IHT is integrated within IHS, but is also reusable independently.

PILOTS

Pilot site	Country	Medical Visit	Emergency	Research
FTGM (FONDAZIONE TOSCANA GABRIELE MONASTERIO PER LA RICERCA MEDICA E DI SANITA PUBBLICA)	Italy	X	X	X
CHU Liege (CENTRE HOSPITALIER UNIVERSITAIRE DE LIEGE)	Belgium	X	X	X
DTCA Hygeia (DIAGNOSTIKON KAI THERAPEFTIKON KENTRON ATHINON YGEIA ANONYMOS ETAIREIA)	Greece	X		X
SCUBA (SPITALUL CLINIC DE URGENTA BAGDASAR-ARSENI)	Romania		X	X

GOVERNANCE AND EVOLUTION MODEL

Cover the right requirements is not sufficient.

Managing the Human Factor and put the basis for the future is fundamental for acceptance, creation and survival of an eco-system

An agile model of governance defining:

- a standardisation process
- rules to enter the eco-system
- how to manage the evolution of protocols
- strategy of collaboration with policy and legislation makers

AN EU ROADMAP FOR EHR EXCHANGE MEDIATED BY CITIZENS

1. Open specifications;
    a. FHIR based APIs covering Citizens' requirements
    b. FHIR profiles integrating standards (also for digital consents)
2. Vendors and standardisation bodies engagement;
3. EU endorsement of open specifications;
4. EU Certification of SW products (mobile apps, services, systems);
5. EU Services (e.g. for official translation of standard terminologies);

ACHIEVEMENT: Reliable cross border exchange of health data.

THANK YOU

InteropEHRate

EHR in people's hands across Europe

www.interopehrate.eu

InteropEHRate project is co-funded by the European Union (EU) Horizon 2020 program under Grant number 826106

Smart4Health

Building today a healthier tomorrow

Citizen-centred EU-EHR exchange for personalised health

Smart4Health is funded by the European Commission under contract 826117

General objective

Smart4Health will develop, test and validate a platform for the Smart4Health citizen-centred health record with integrated abilities for aggregation of data, for data sharing and for data provision/donorship to the scientific community.

Smart4Health is funded by the European Commission under contract 826117

Call objectives

- *Topic: SC1 -DTH-08-2018 - Prototyping a European interoperable Electronic Health Record (EHR) exchange (April 2018)*

- *Objectives:*
  - **1) Citizens´ secure access to electronic health records and the possibility to share it across borders,**
  - **2) Supporting data infrastructure, to advance research, disease prevention and personalised health and care**
  - **3) Facilitating feedback and interaction between patients and healthcare providers, to support prevention and citizen empowerment as well as quality and patient-centred care.**

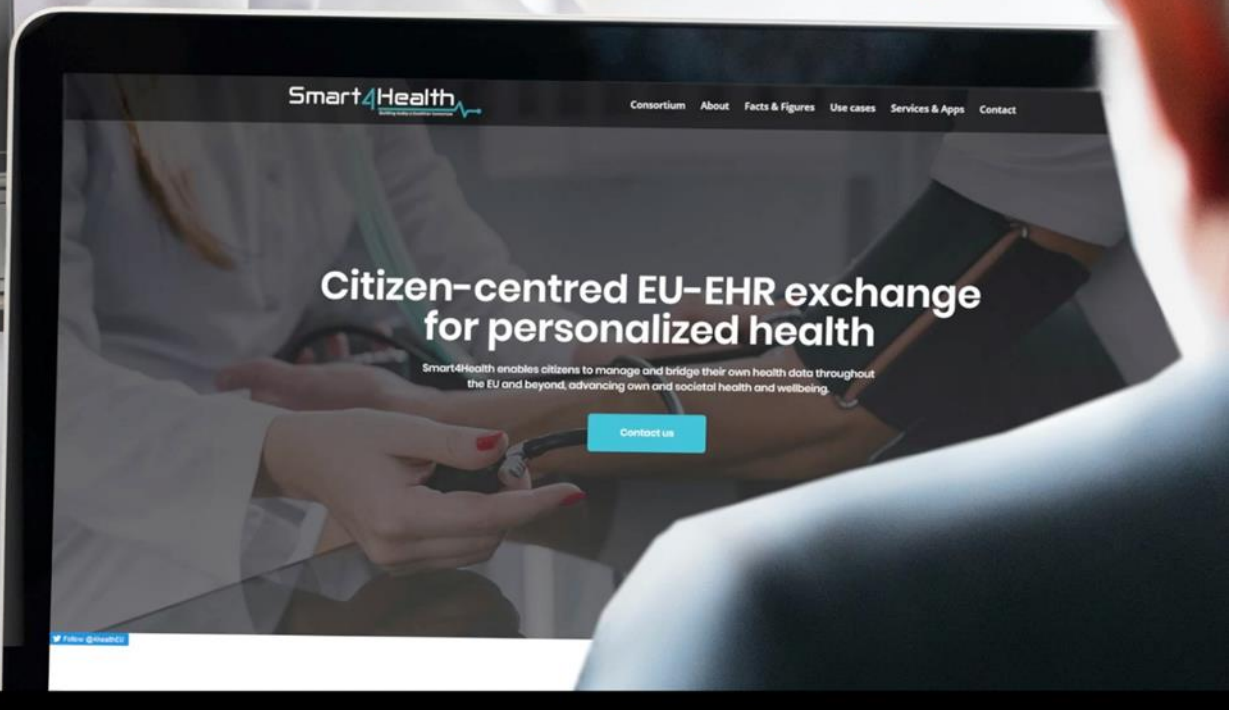
Smart4Health is funded by the European Commission under contract 826117

Smart4Health

This project has received funding form the European Union's Horizon 2020 research and innovation programme under the grant agreement No. 826117.

Smart4Health

Building today a healthier tomorrow



Project Officer:
Dr. Saila Rinne

Coordinator: UNINOVA

Scientific coordinator: HPI

Start: 1st January 2019

End: 28th February 2023

Duration: 50 months

Smart4Health Consortium

Building today a healthier tomorrow

Instituto de Desenvolvimento de Novas Tecnologias

Hasso Plattner Institute

Data4Life

HealthMetrix GmbH

University of Vienna

University Hospital Aachen

Maastricht University Hospital

Information Technology for Translational medicine

Knowledge Biz

Luxembourg Centre for Systems Biomedicine

Icahn School of Medicine at Mount Sinai

ZS-Unternehmen Gesundheit

Ospedale San Raffaele

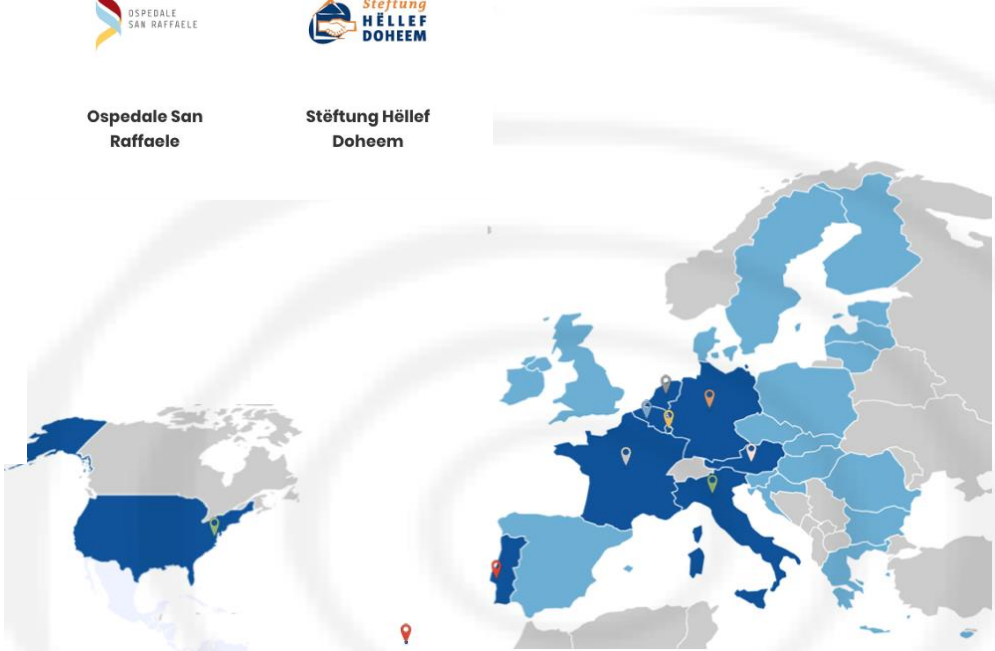
Stëftung Hëllef Doheem

EASPD

European Federation of Nurses

Região Autónoma da Madeira

Laboratoire Virtuel Européen



Smart4Health is funded by the European Commission under contract 826117

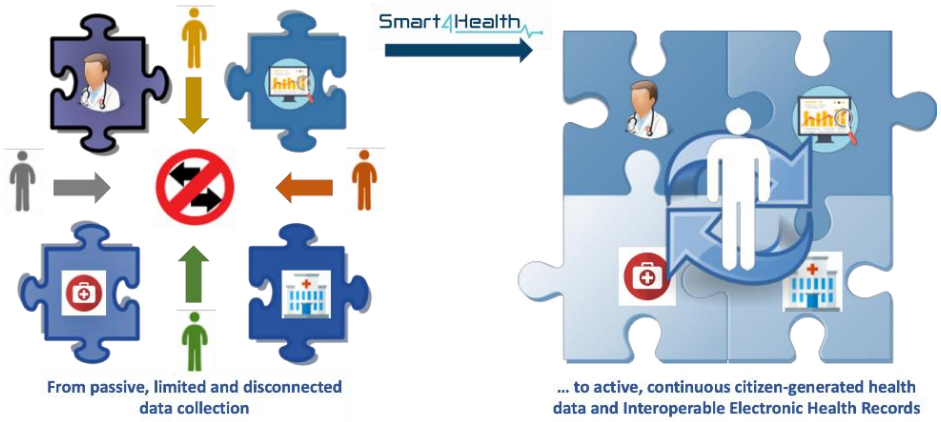
Smart4Health Concept

- *Centred around the citizen and its health-related environment.*

- *Citizen empowerment addressed by mirroring citizens' **needs**, **desires**, **preferences**, **norms** and **values** around two Leitmotifs:*

I am supported in managing my own health

I can help others by donating data



Smart4Health is funded by the European Commission under contract 826117

Specific objectives

- *Citizen empowerment*
  - **Management of own health data**
  - **Citizen decision on what/whom to share health data**

- *Interoperable and transnational infrastructure*
  - **All citizens throughout Europe**
  - **Citizen with secure access to own health information**

- *Data Donation for research and innovation*
  - **Infrastructure supporting Citizen to donate data for research and innovation**

Smart4Health is funded by the European Commission under contract 826117

Citizen empowerment

- *European citizens are in the center stage: conceptually and methodologically*
- *Co-creation and co-design framework*

Smart4Health is funded by the European Commission under contract 826117

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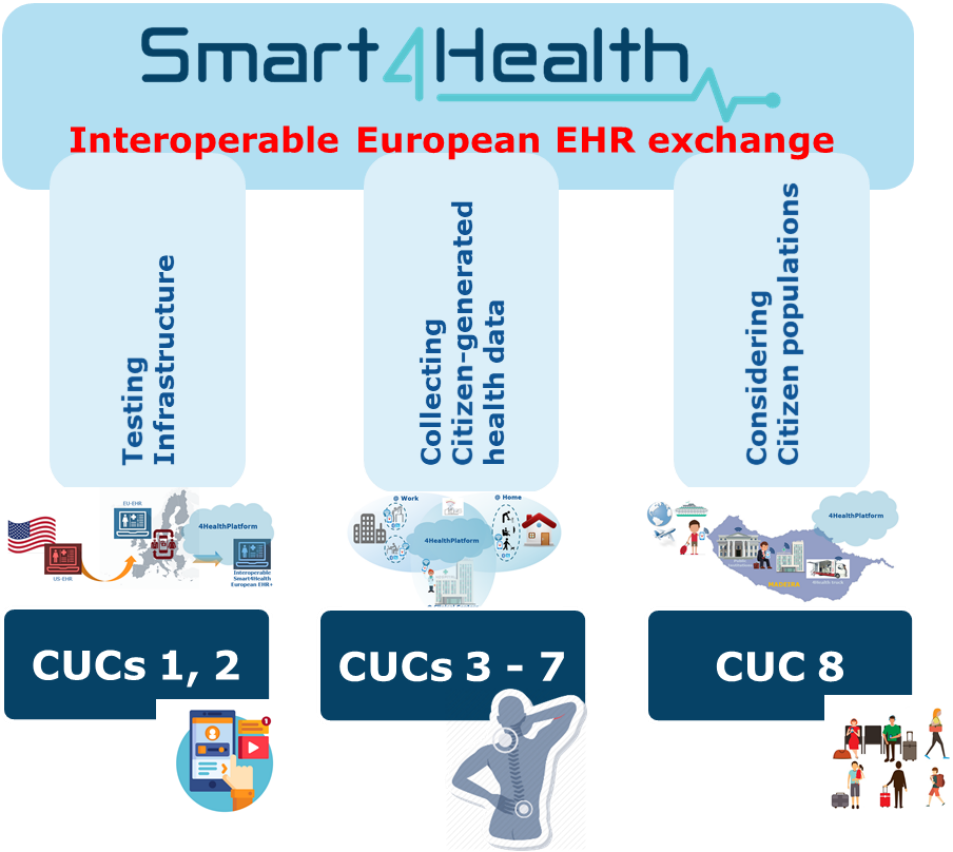
Citizen Use Cases and Use Design Cases



Smart4Health is funded by the European Commission under contract 826117

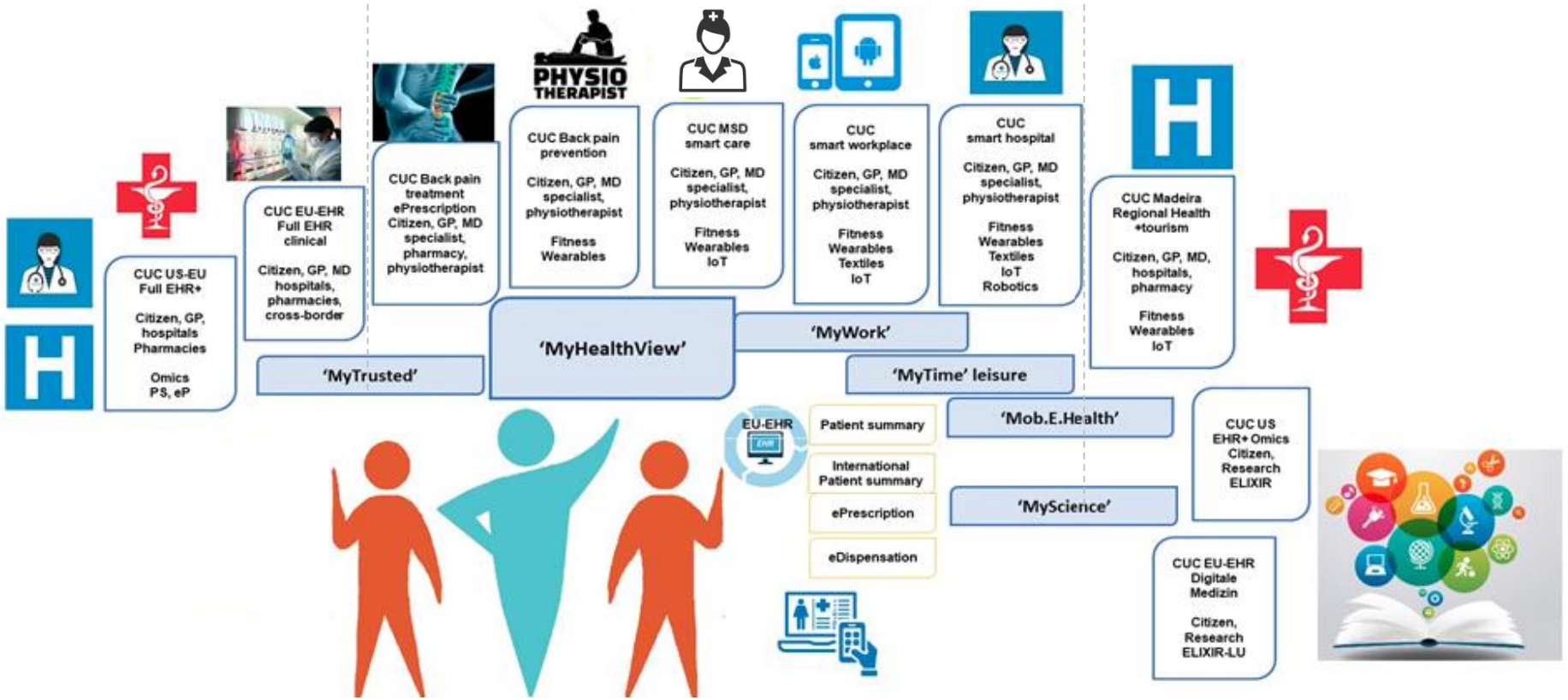
Citizen Use Cases and Use Design Cases

Testing Infrastructure	Collecting Citizen-generated health data	Considering Citizen populations

Smart4Health is funded by the European Commission under contract 826117

Smart4Health

Citizen Use Cases and Use Design Cases



Citizen Use Cases and Use Design Cases

- *Empower citizens' data access, portability, control, sharing and provision.*
- *Co-create the Social Science and Humanities Framework for citizen/user.*
- *Engage user groups throughout the project*
- *Ensure attention theft avoidance.*

Smart4Health is funded by the European Commission under contract 826117

Smart4Health

Interoperable and transnational

- *Support to the* Fast Healthcare Interoperability Resources *of the HL7*

HL7® FHIR®

SMART®

- *Using the European standards*
  - **Connecting Europe Facility (CEF) Building Blocks**
  - **IHE (Integrating the Healthcare Enterprise) profiles**

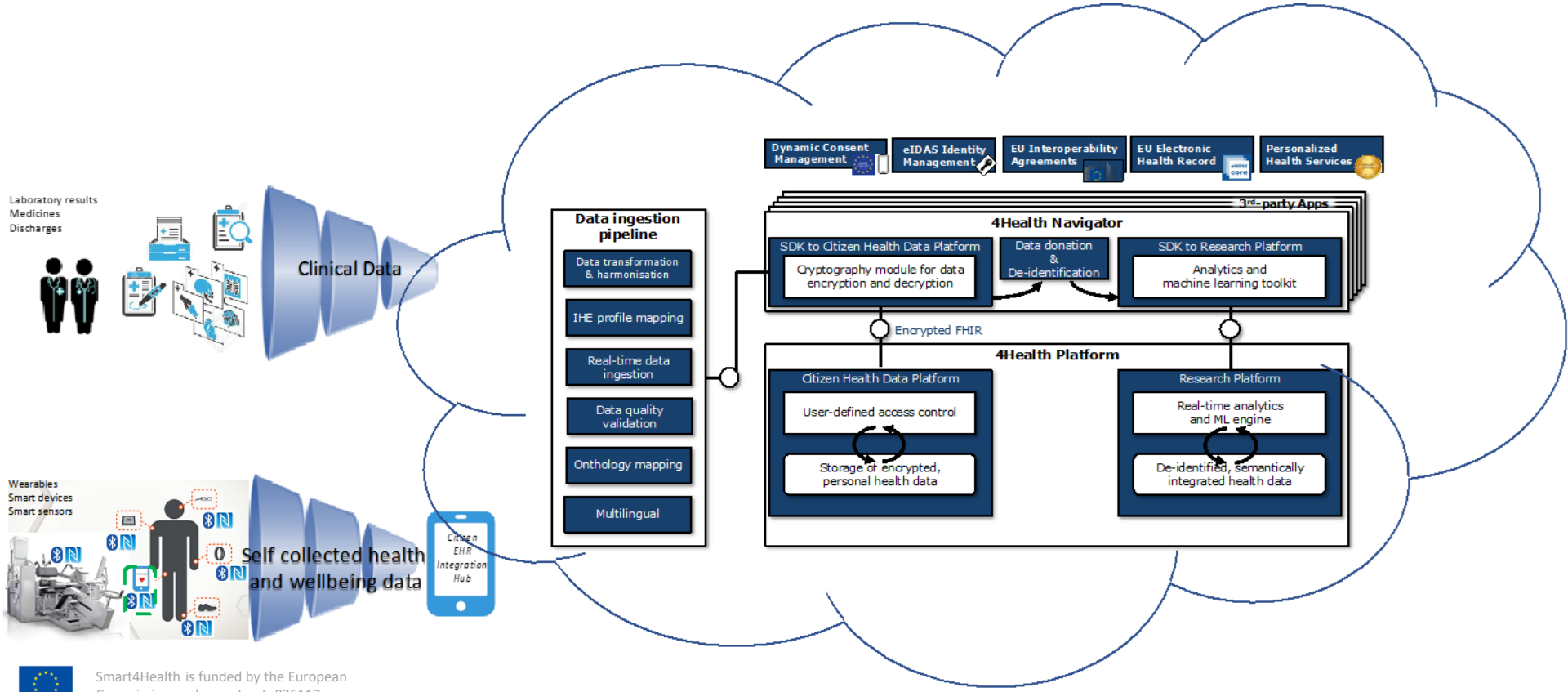
IHE EUROPE Integrating the Healthcare Enterprise

Smart4Health is funded by the European Commission under contract 826117

Smart4Health

Architecture

Data sources | **Data Collection** | **Data Ingestion** | **Services and Applications** | **Data donation**



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Smart4Health

Building today a healthier tomorrow

Smart4Health is coordinated by UNINOVA
Instituto de Desenvolvimento de Novas Tecnologias

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Smart4Health is funded by the European Commission under contract 826117

MEANINGFUL DATA SHARING AND ADVANCING FOR INTEROPERABLE HEALTH RECORDS

INTERNATIONAL PATIENT SUMMARY (IPS) IN CLINICAL USE - LESSONS LEARNED

InteropEHRate

EHR in people's hands across Europe

STEFANO DALMIANI – HEAD ICT DPT.

FTGM - "G. MONASTERIO" FOUNDATION RESEARCH HOSPITALS

EHTEL 20TH ANNIVERSARY, 3-4 DECEMBER 2019 - BARCELONA

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 826106

PISA Hospital

MASSA Hospital

REGIONE TOSCANA

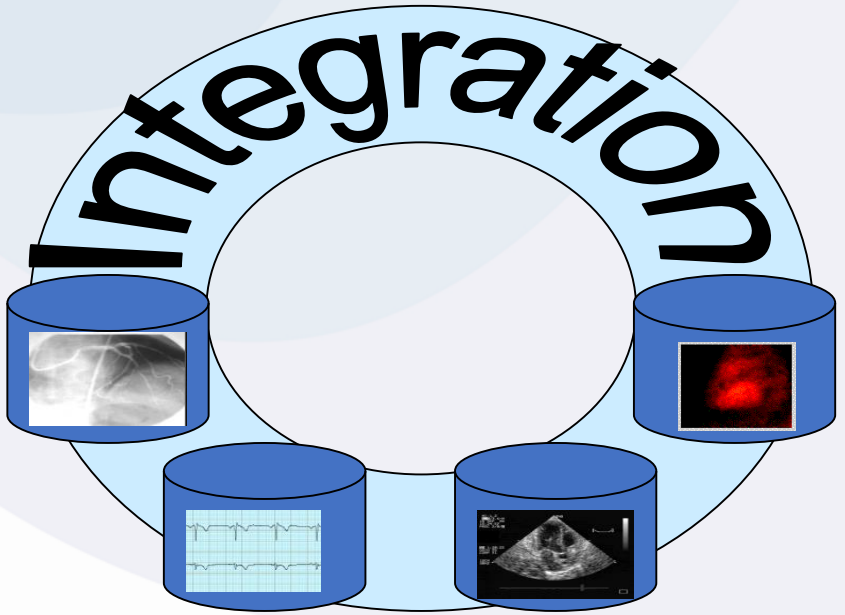
Fondazione Toscana Gabriele Monasterio
PER LA RICERCA MEDICA E DI SANITÀ PUBBLICA

- Cardiology
- Pediatric Cardiology
- Pulmonology
- Adult Cardiac Surgery + ICU
- Pediatric Cardiac Surgery + ICU
- Newborn ICU
- Advanced diagnostic and procedural Imaging
- Interventional Cardiology
  - (1st in Italy for PTCA volume)

- ICT Translational BioInformatics
- AI research units
- CFD Simulation and in-silico models
- Epidemiology, BioStatistics
- Clinical Research:
- Clinical Pathophysiology
- Experimental Surgery
- Info-bio-nano Technology

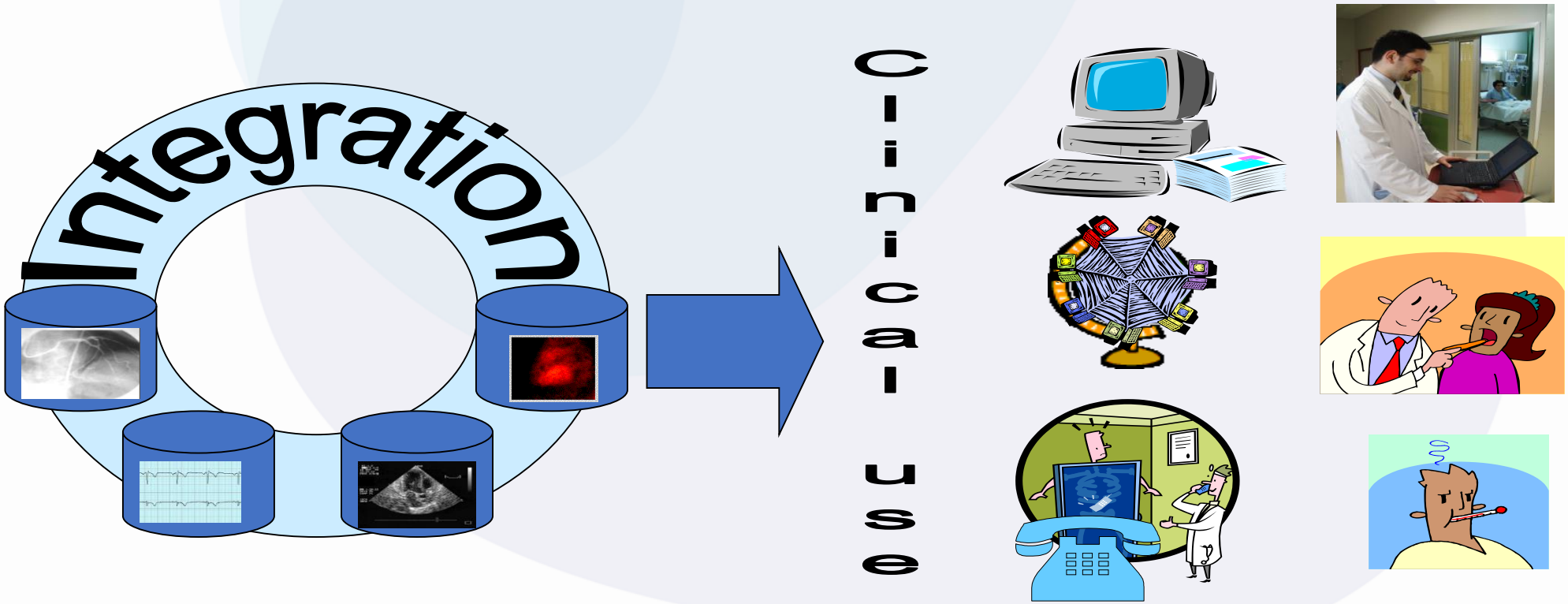
SYSTEMS INTEGRATION STRATEGIES

Since early 2000 we promoted in Italy, among healthcare software developers industries, use of communication bus as a middleware and the use on this of standard protocols (HL7, DICOM) to ensure the integration of managed information into the Hospital information system

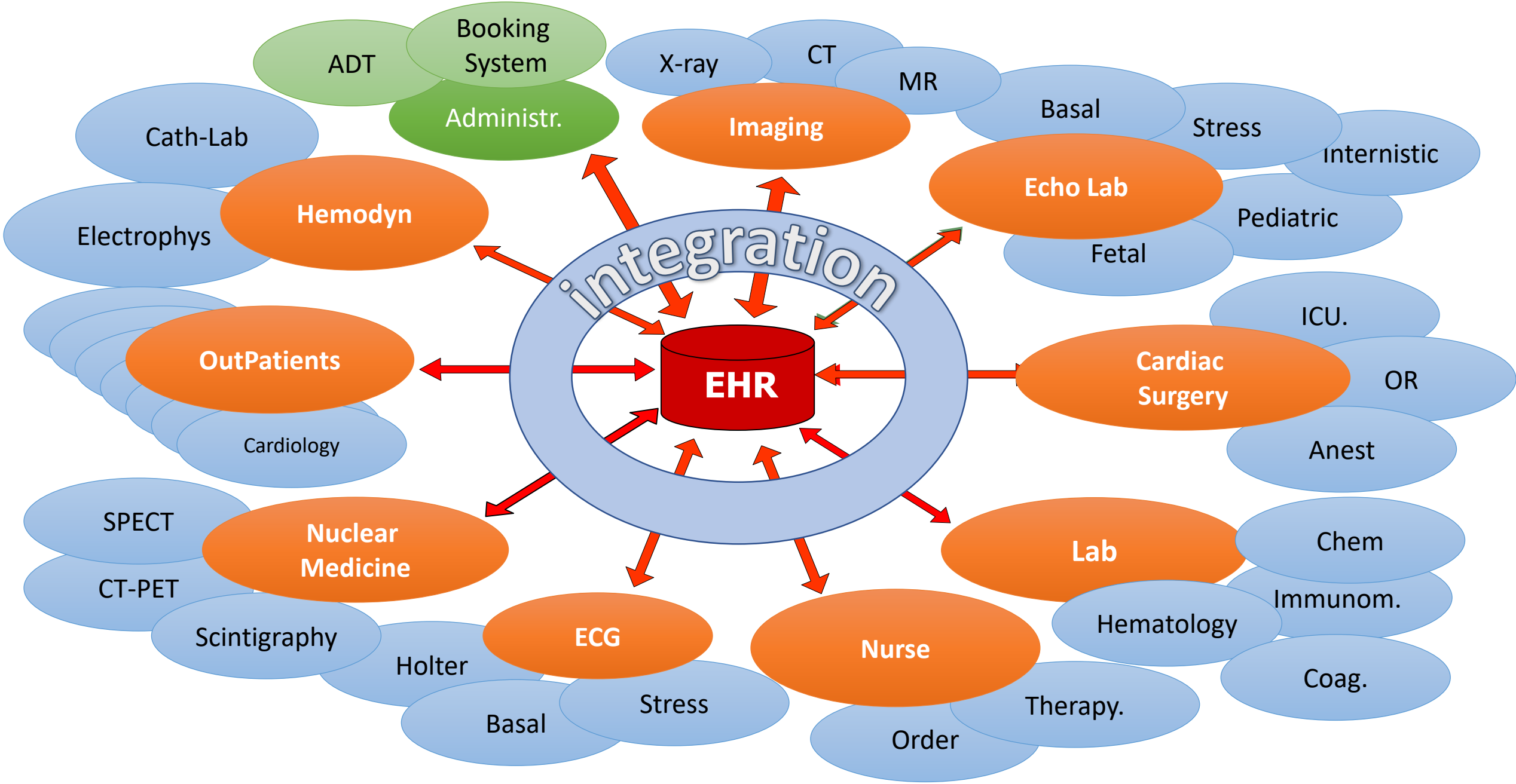


DATA MANAGEMENT

- **Integration and Display**, to collect and share data and documents, representing data in different settings and for different users roles



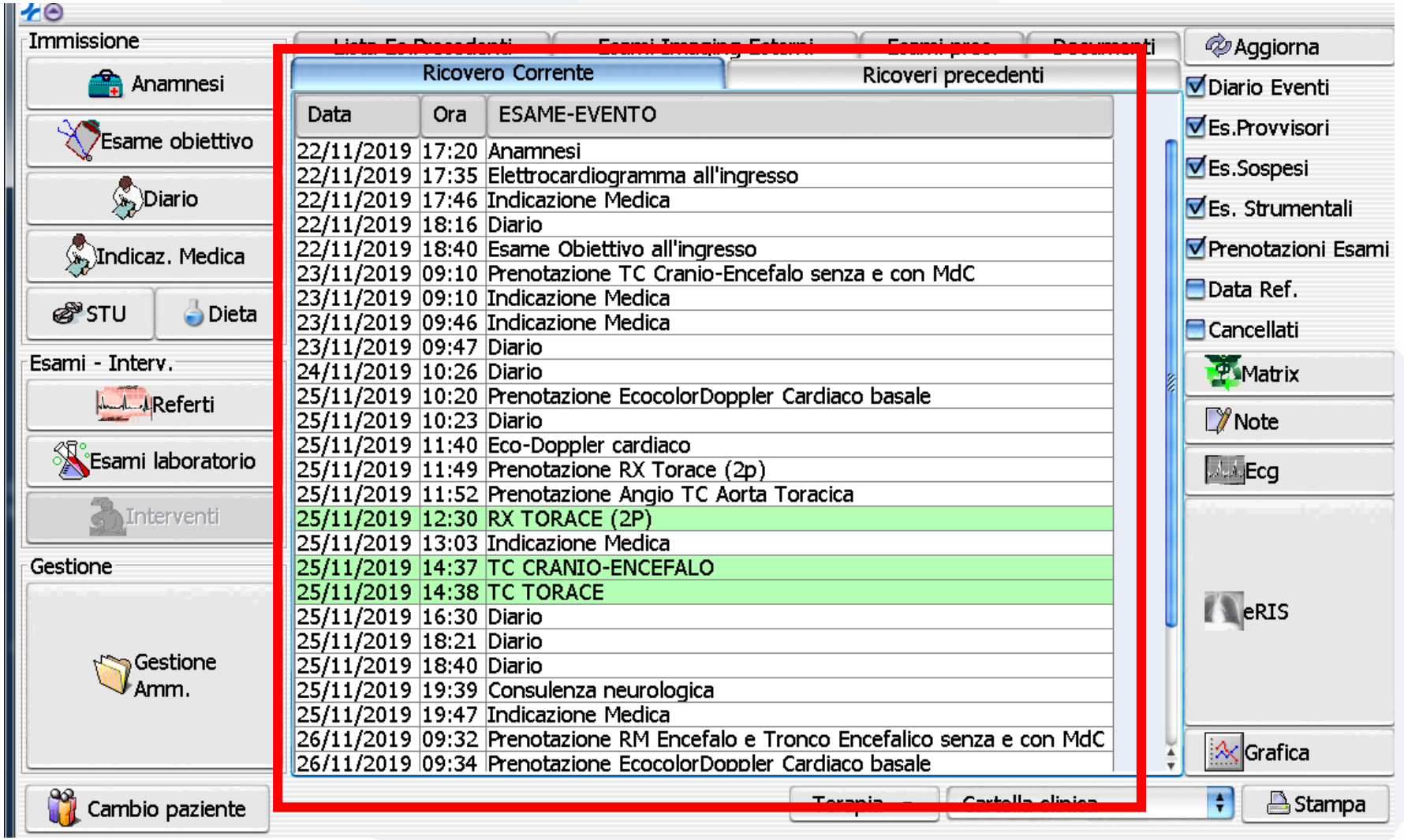
EHR as the source of IPS content



EHR REPOSITORY

- **Clinical content:**
  - *115,000 in-patients EMR*
  - *1,800,000 out-patients Encounters*
  - *5,895,000 Clinical Reports (Visits, Instrumental examinations, etc)*
  - *1,892,000 Clinical Events & Notes*
  - *390,000 in-patient ePrescription (since 2014)*
  - *1,358,000 eSubministration*
  - *14,100,000 Observations (structured data)*
  - *30,090,000 Lab results*
- **Used for healthcare and research**
- **Different levels of details, displayed when needed or requested**

DIFFERENT LEVEL OF REPRESENTATION – SUMMARY 1



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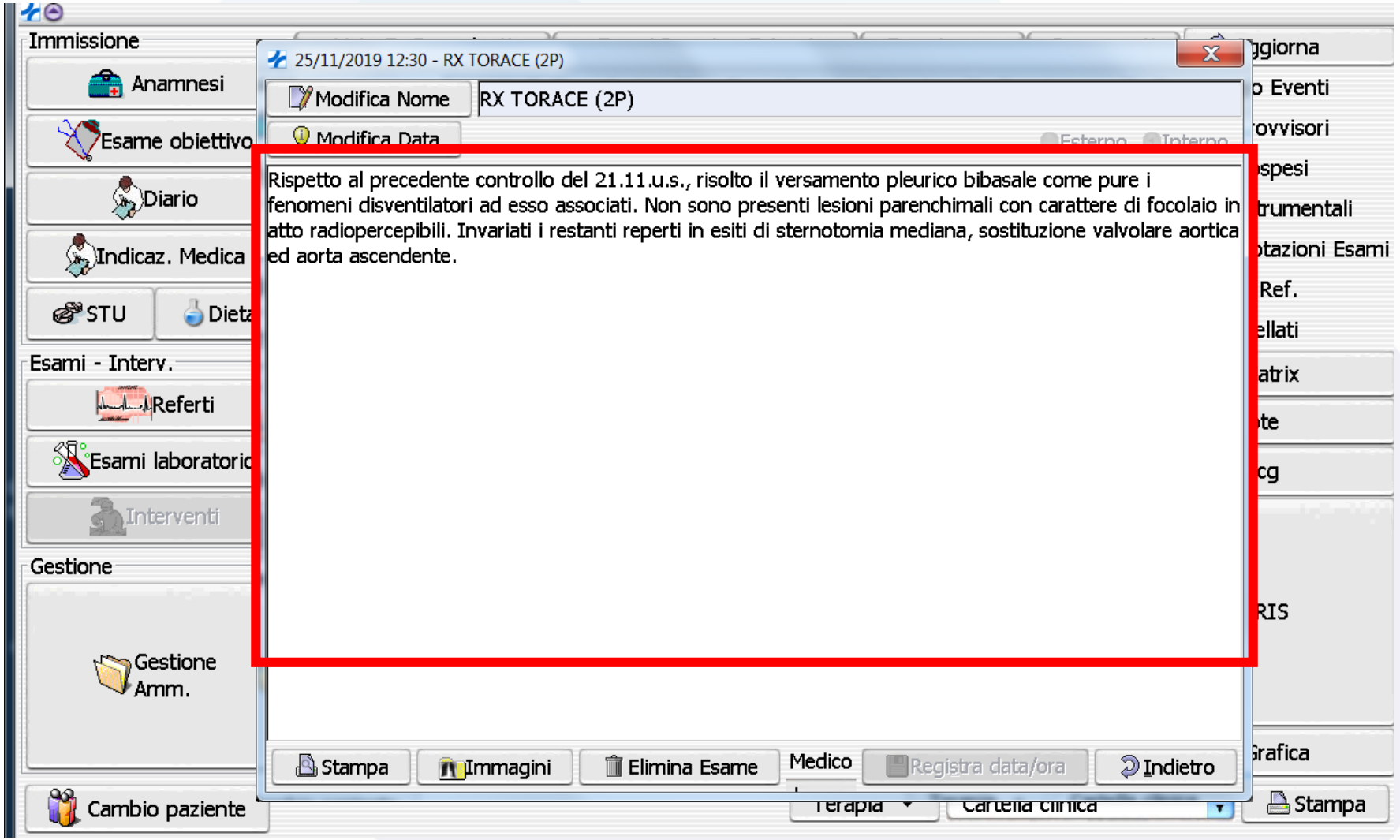

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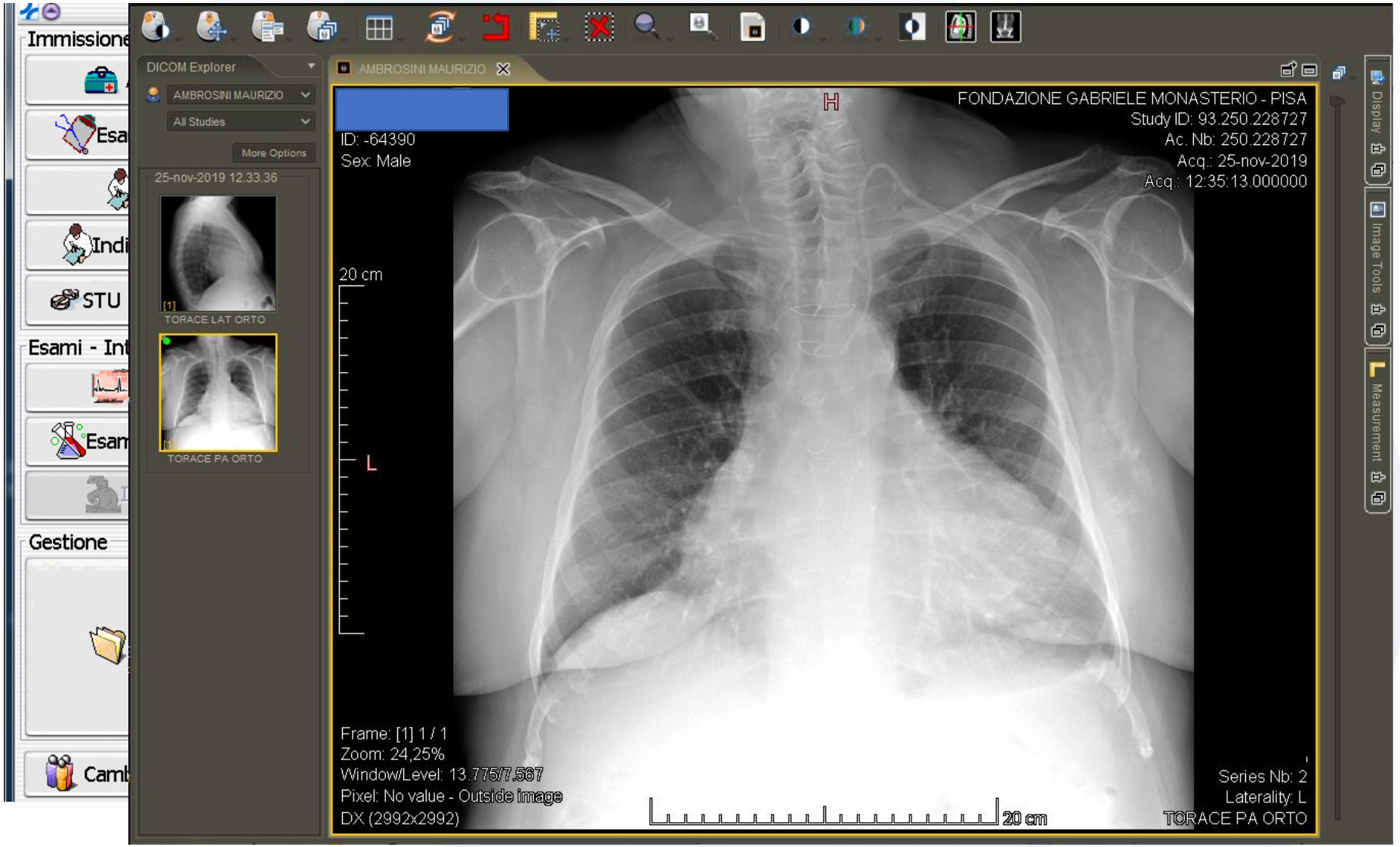

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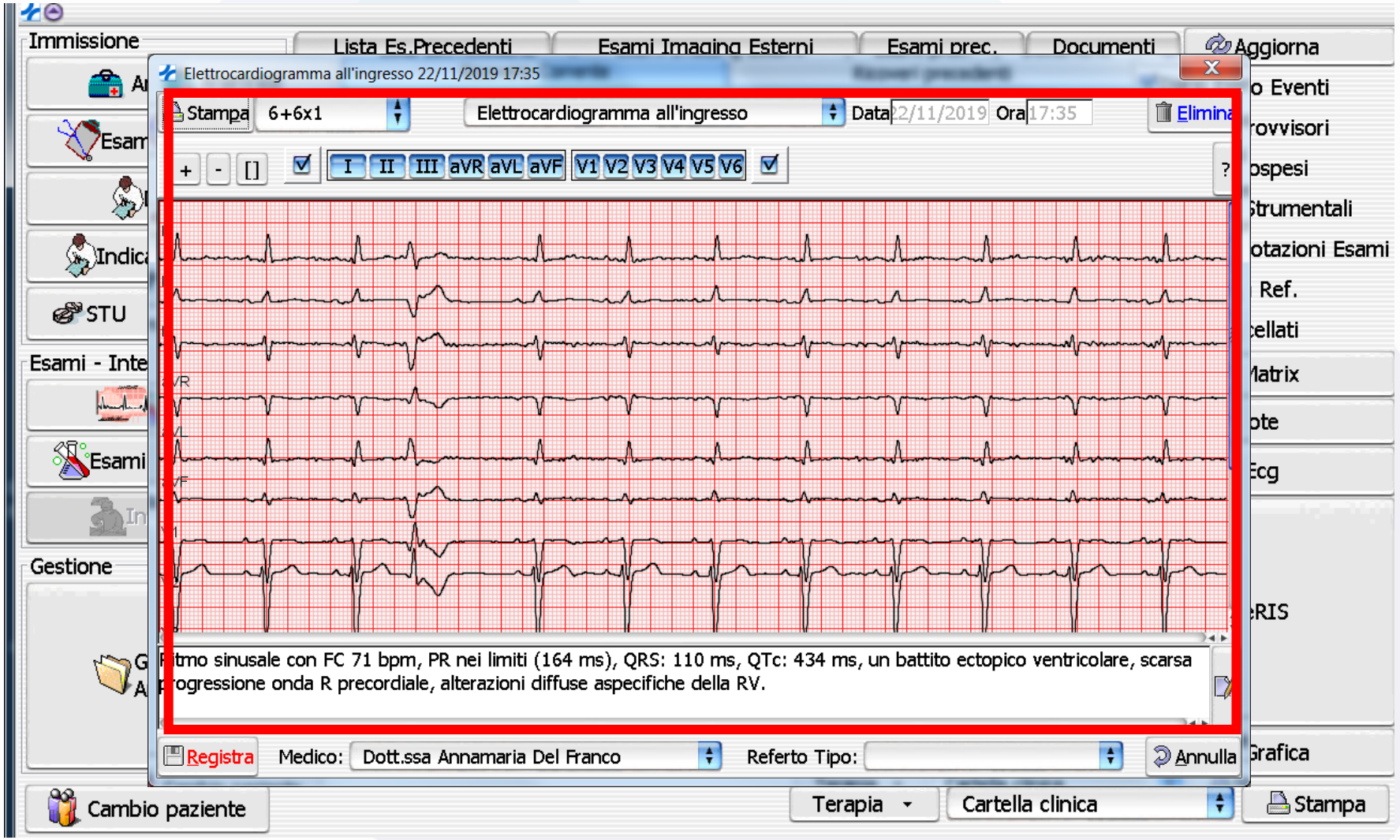
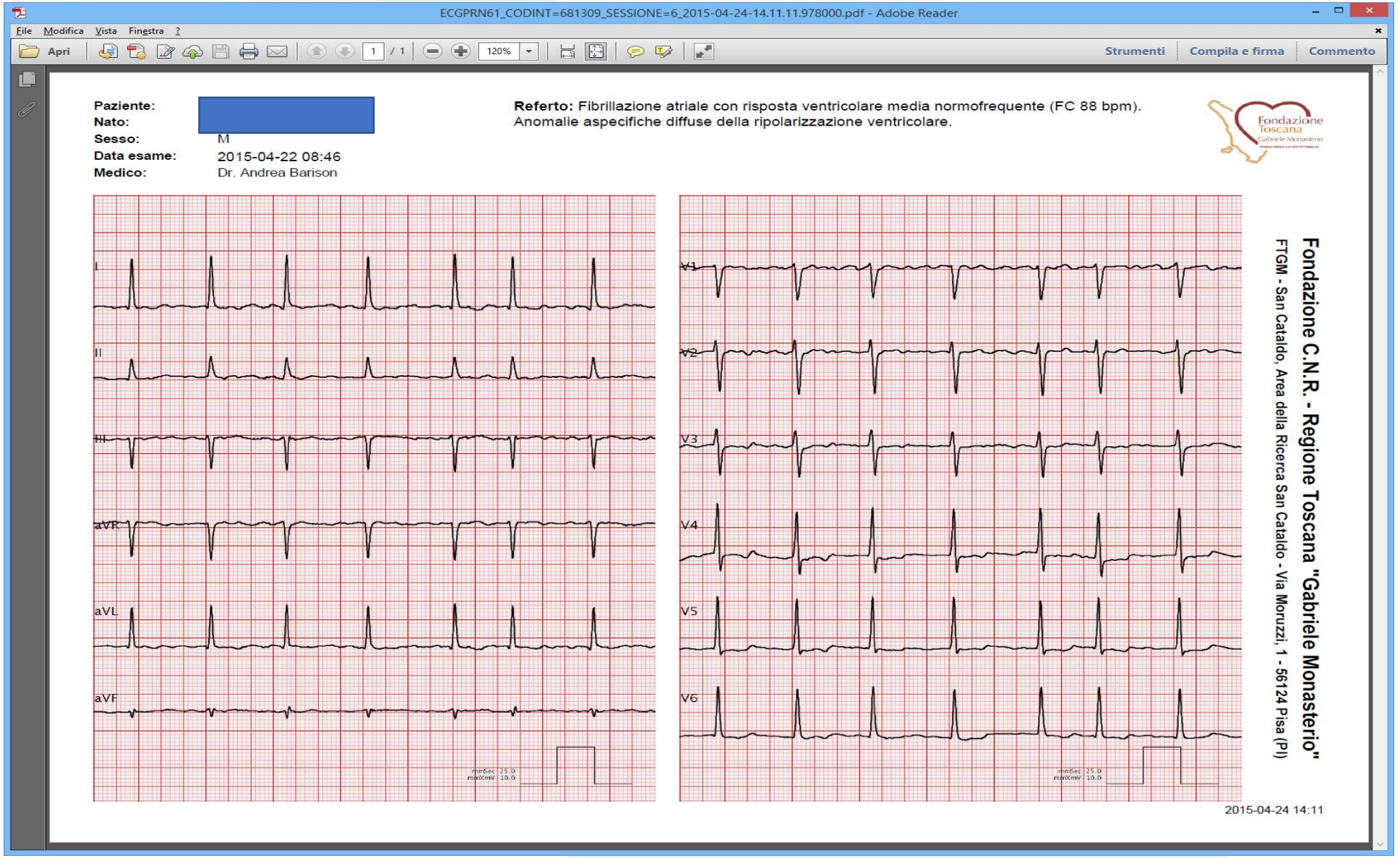


CLINICAL REPORTS – STATIC – DIGITALLY SIGNED



CLINICAL REPORTS – DYNAMIC – DIGITALLY SIGNED

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File Modifica Vista Finestra ?

Apri | 2 / 2 | 87,4% | Strumenti | Compila e firma | Commento

RINALDI / ALESSANDRA

Esame del 26.02.2015

Fondazione Toscana "G. Monasterio"

UOC Medicina Nucleare San Cataldo Pisa

Direttore: Dott. Paolo Marzullo
Resp. PET-TAC: Dott. Assuero Giorgetti
Resp. Imaging Cardiaco: Dott.ssa Alessia Gimelli

Sessantesimo anniversario
Medicina Nucleare 1953-2013

CNR - Regione Toscana

Paziente
Data nascita
Indirizzo Via Giuseppe Verdi, 11 Comune SAN MINIATO (PI) Tel. 3389593482 CAP 56028
Stato paziente Esterno Medico inv. DR SARTUCCI
Struttura inv. Reparto inv.

Esami
TOMOSCINTIGRAFIA CEREBRALE (SPECT)

QUESITO CLINICO
Valutazione integrità del sistema nigro-striatale

Peso (Kg) **52** Altezza (cm) **167** BMI (kg/m²) **18.65** Sup. Corporea **1.57** Glicemia (mg/dl)

R.Farmaco1 **I123-FP-CIT** *Dose1 (MBq)* **93,657** *Intervallo iniezione/acquisizione 1*

R.Farmaco2 *Dose2 (MBq)* *Intervallo iniezione/acquisizione 2*

Sistema **GE Millennium MG** *Tecnico* **Annette Kusch**

PROTOCOLLI ESEGUITI Rif. esame **115406** Refertato il **26.02.2015**
Immagini acquisite in scansione tomografica 3 ore dopo la somministrazione e.v. del radiofarmaco (123I-FP-cit).
Sezioni transassiali ottenute con correzione per l'attenuazione tissutale secondo Chang.

RISPOSTA
L'esame mette in evidenza una normale captazione del radiofarmaco a carico dei nuclei caudato e putamen bilateralmente.

CONCLUSIONI
Reperti scintigrafici nella norma e non compatibili con degenerazione nigro-striatale.

Il medico Dott. Dario Genovesi

L'appropriatezza dell'indicazione all'esecuzione dell'esame è stata accertata mediante valutazione preliminare del paziente, in accordo con il principio digiustificazione indicato nell'Art 3 del D.Lgs. 187/2000, modificato dall'Art 39 della Legge 39/2000
Il presente referto costituisce dichiarazione di somministrazione dell'sotopo radioattivo a scopo diagnostico nella quantità indicata in ottemperanza al principio diottimizzazione e tenendo conto dei limiti di dose di riferimento (LDR) riportati nell'Allegato II-ex Art 4 D.Lgs.

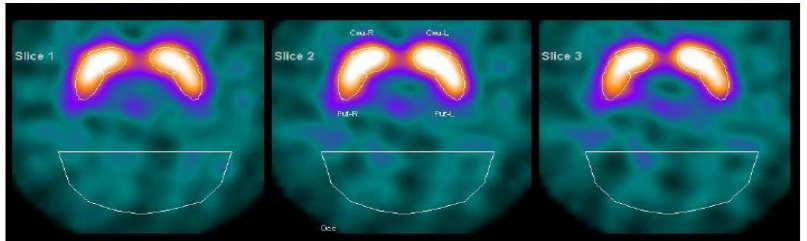
Area di ricerca del CNR - via G. Moruzzi 1, 56126 Pisa - Tel. 050/3152366 - 050/3152216 Fax. 050/3152368

Certificazioni Bureau Veritas ISO 9001 N. 60352882/2013 - AIMN 009/2012

Pagina 1 di 2

RINALDI / ALESSANDRA

Esame del 26.02.2015



Mean Counts	Cau-L	Cau-R	Put-L	Put-R	Occ
Slice 1	128.6	129.3	116.3	117.0	30.2
Slice 2	136.4	133.7	123.5	120.7	29.6
Slice 3	134.3	128.4	116.5	112.8	28.8
Average	132.4	130.5	118.7	116.8	29.5

Ratios

StriatL / Occ :	4.25
StriatR / Occ :	4.18
Caud-L / Occ :	4.48
Caud-R / Occ :	4.42
Put-L / Occ :	4.02
Put-R / Occ :	3.95
PutL/CaudL :	0.90
PutR/CaudR :	0.90

Acquisition / Recons Params

Dataset Name:	FBPAC_Transversal Obl
Acquisition Zoom:	1.33
Slice Thickness:	3.39 mm
Filter:	Butterworth 0.60 / 10.0
Attenuation corrected:	YES
Attenuation Corr Type:	CHANG
Attenuation Coeff:	0.11

Esami
TOMOSCINTIGRAFIA CEREBRALE (SPECT)

L'appropriatezza dell'indicazione all'esecuzione dell'esame è stata accertata mediante valutazione preliminare del paziente, in accordo con il principio digiustificazione indicato nell'Art 3 del D.Lgs. 187/2000, modificato dall'Art 39 della Legge 39/2000
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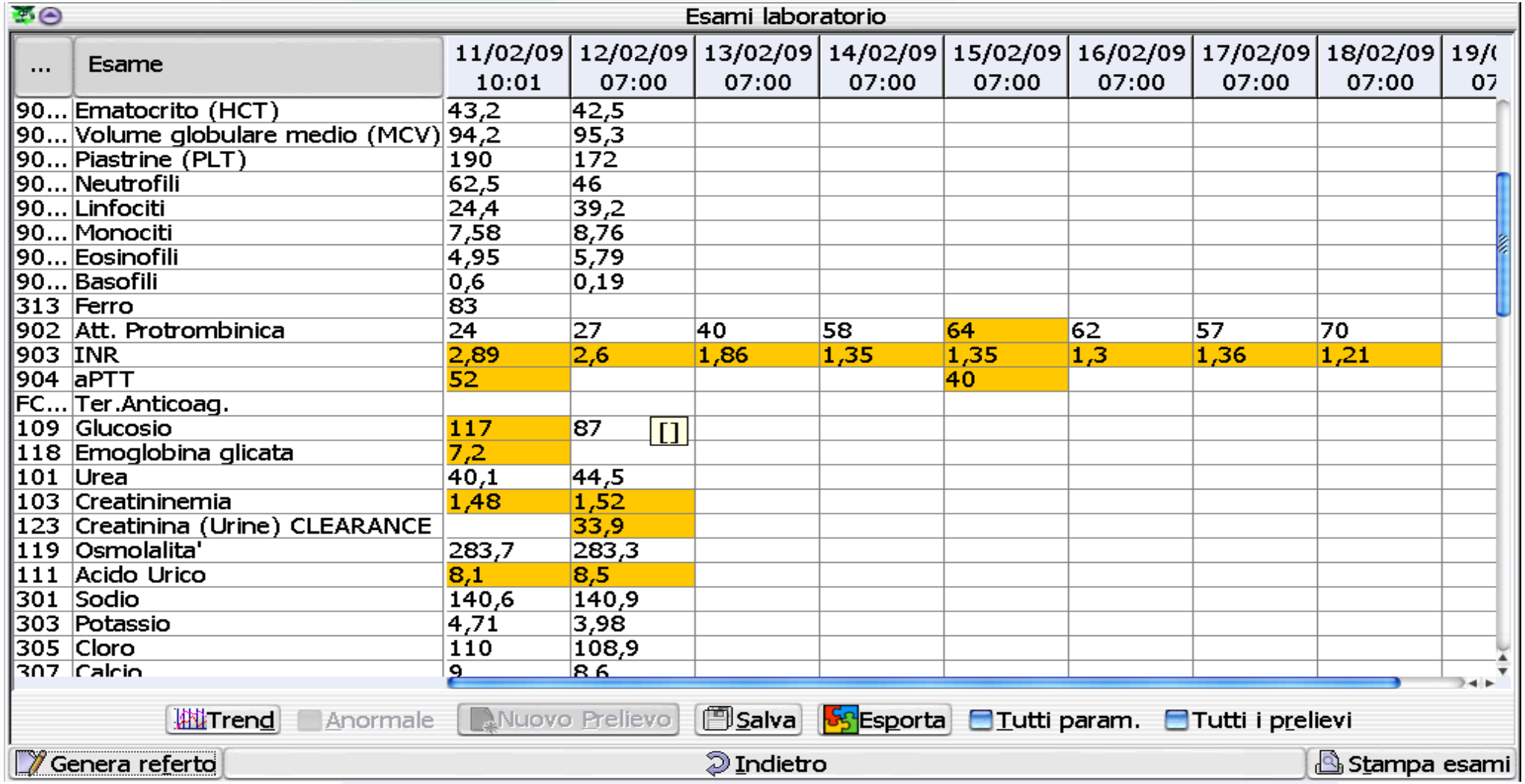
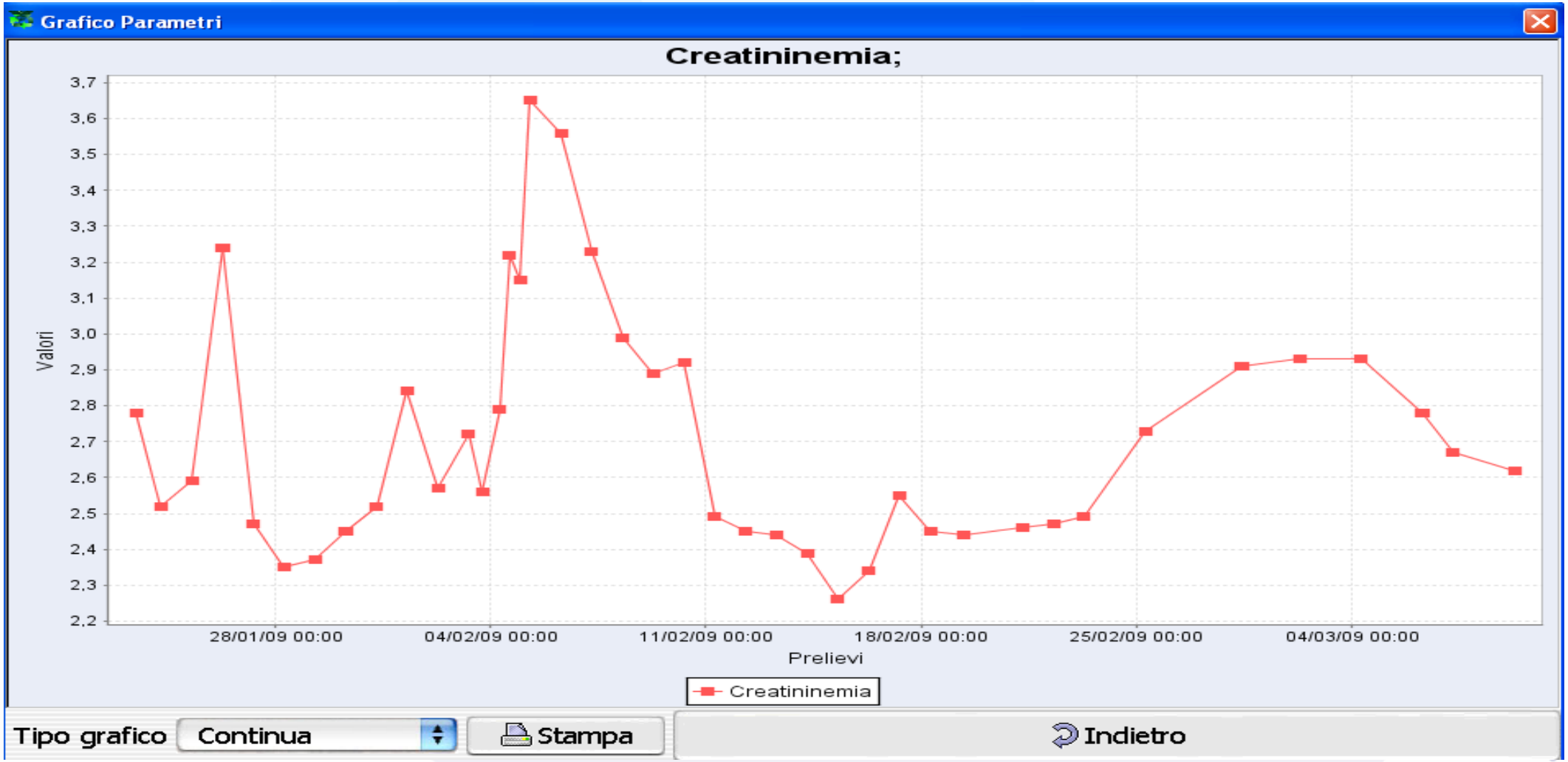
Certificazioni Bureau Veritas ISO 9001 N. 60352882/2013 - AIMN 009/2012

Pagina 2 di 2

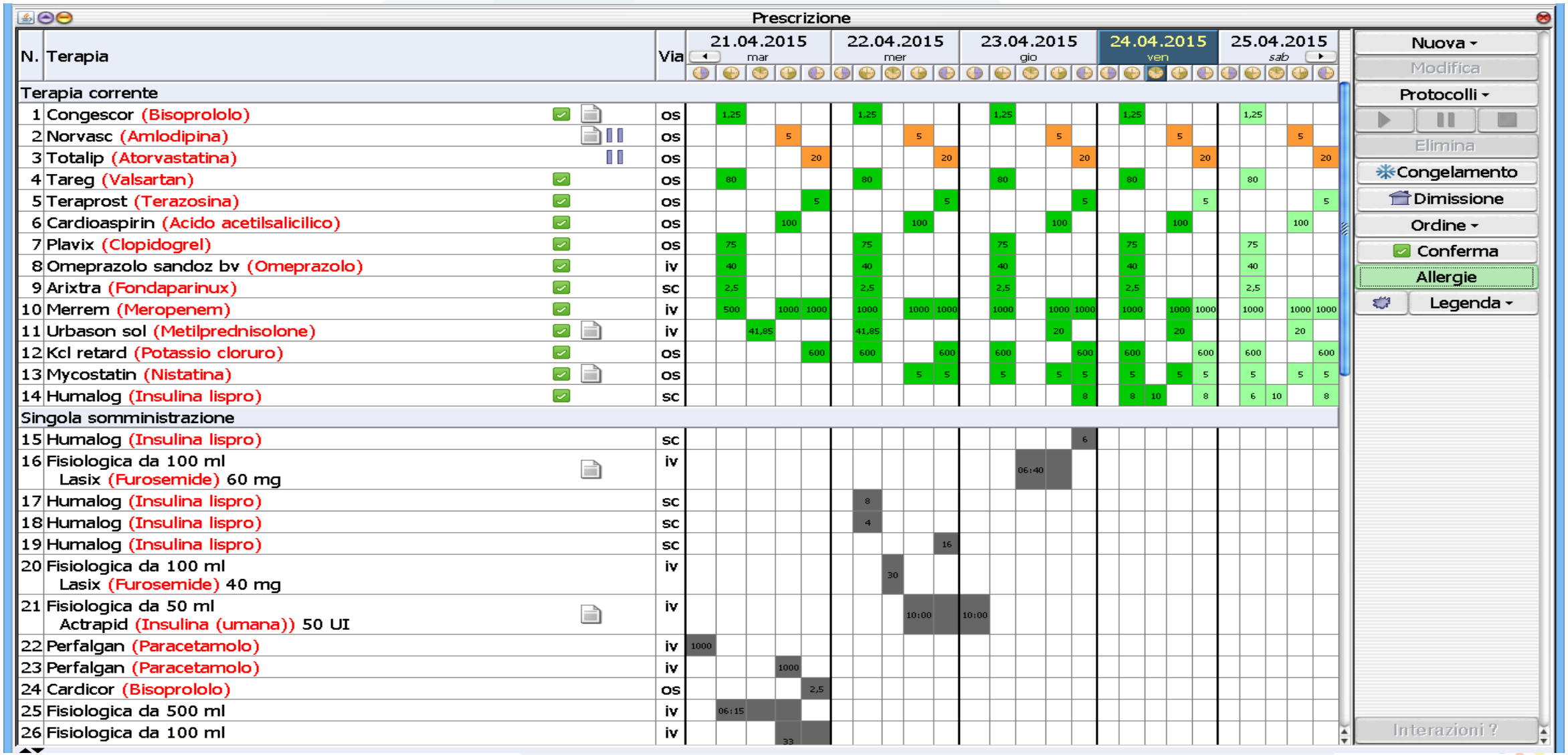
EMR LAB RESULTS REPRESENTATION



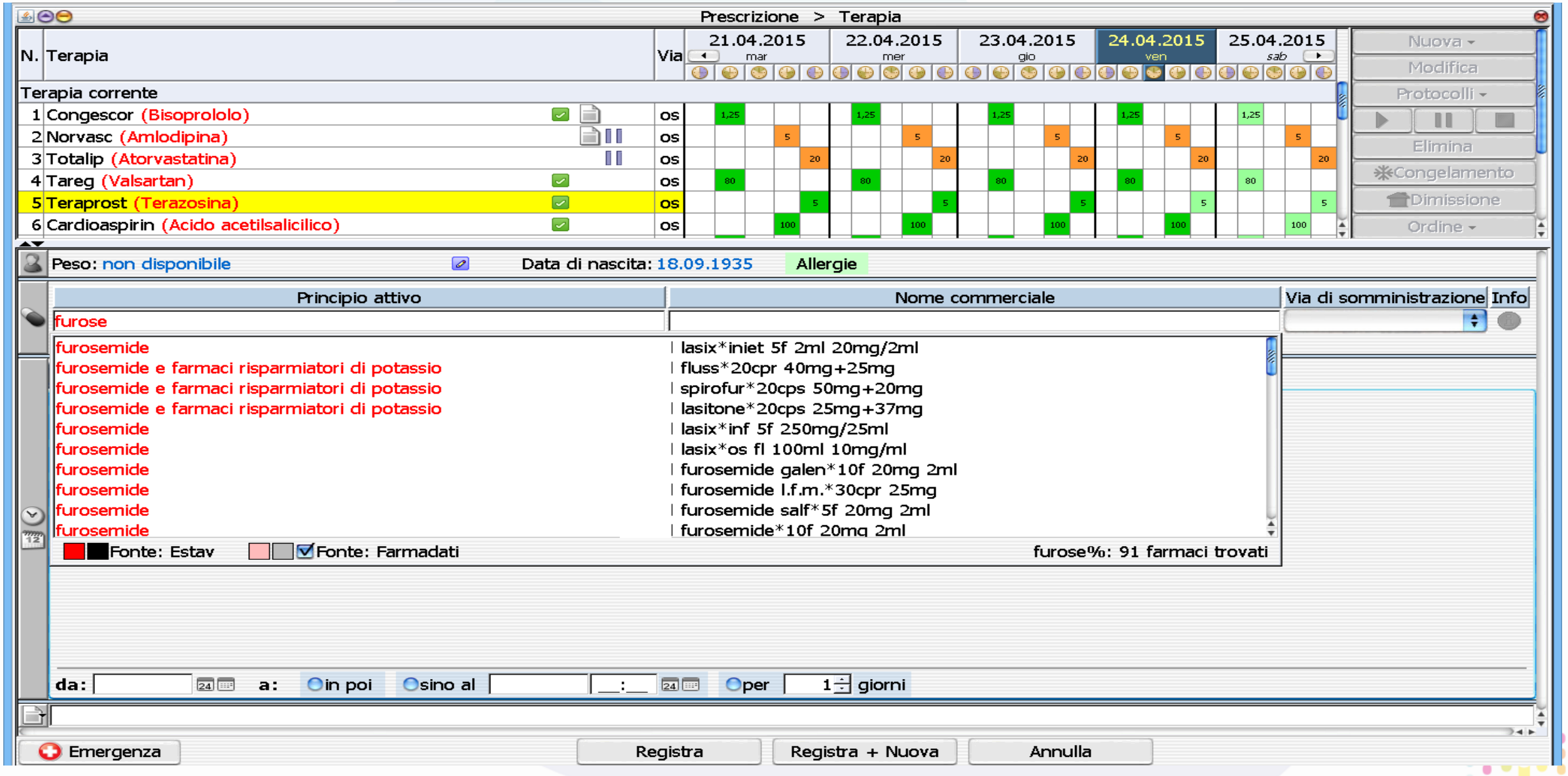
TREND CHARTS



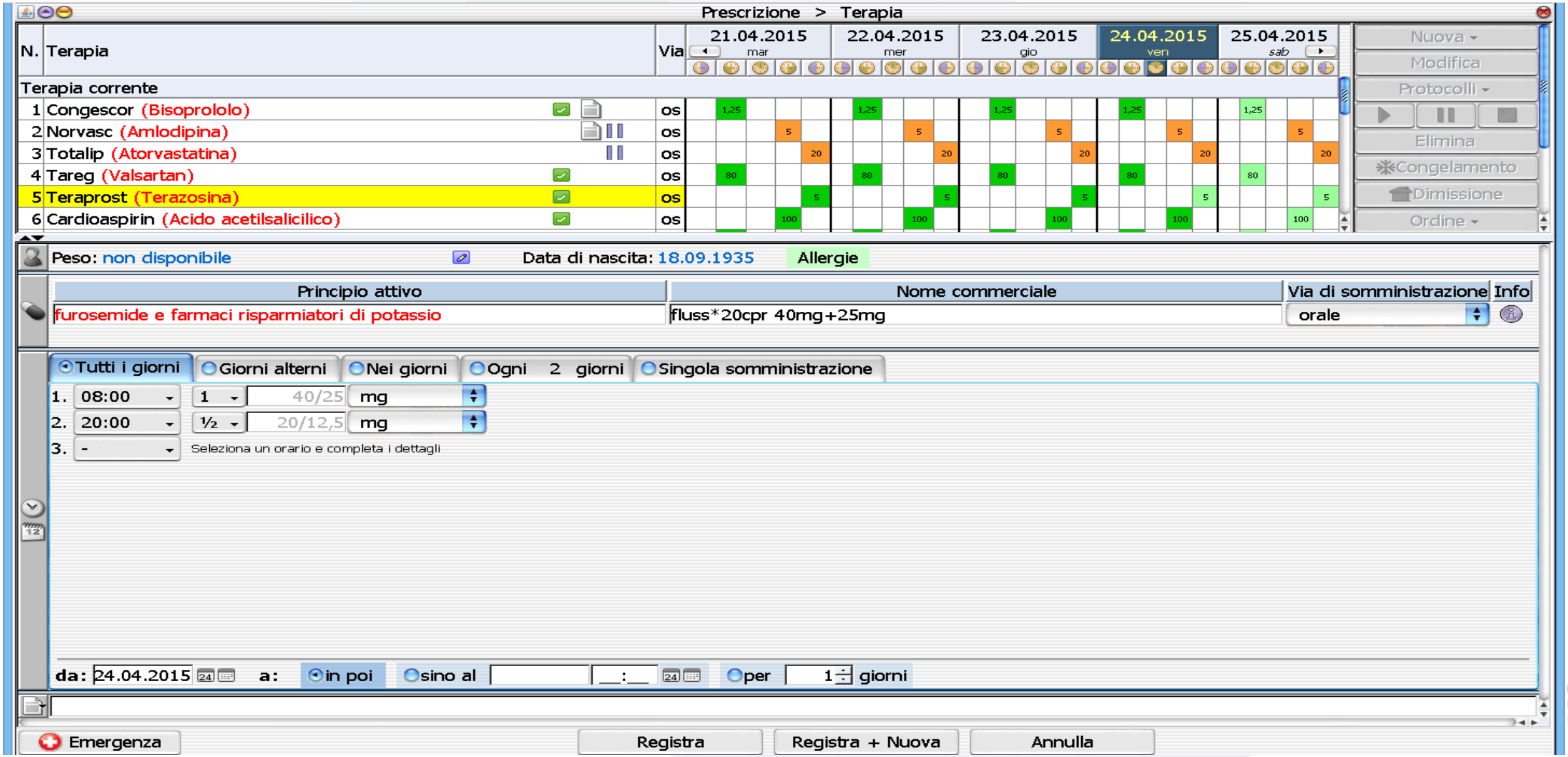
E-PRESCRIPTION



E-PRESCRIPTION – ATC CODE



E-PRESCRIPTION – DOSAGE WITH MULTIPLE MOLECULES



DSS - DRUGS RISK ANALYSIS + DRUGS INTERACTIONS

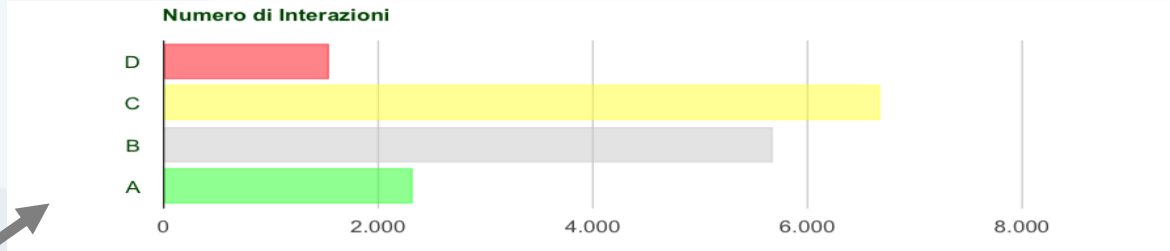
MEDIRISK

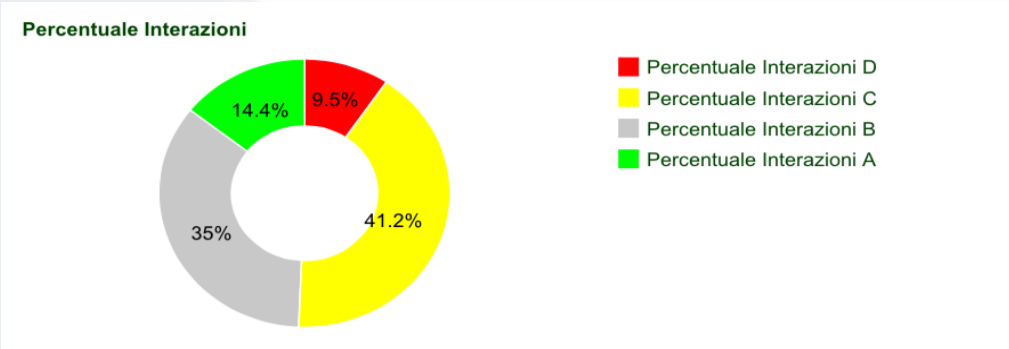
IPS - vMR

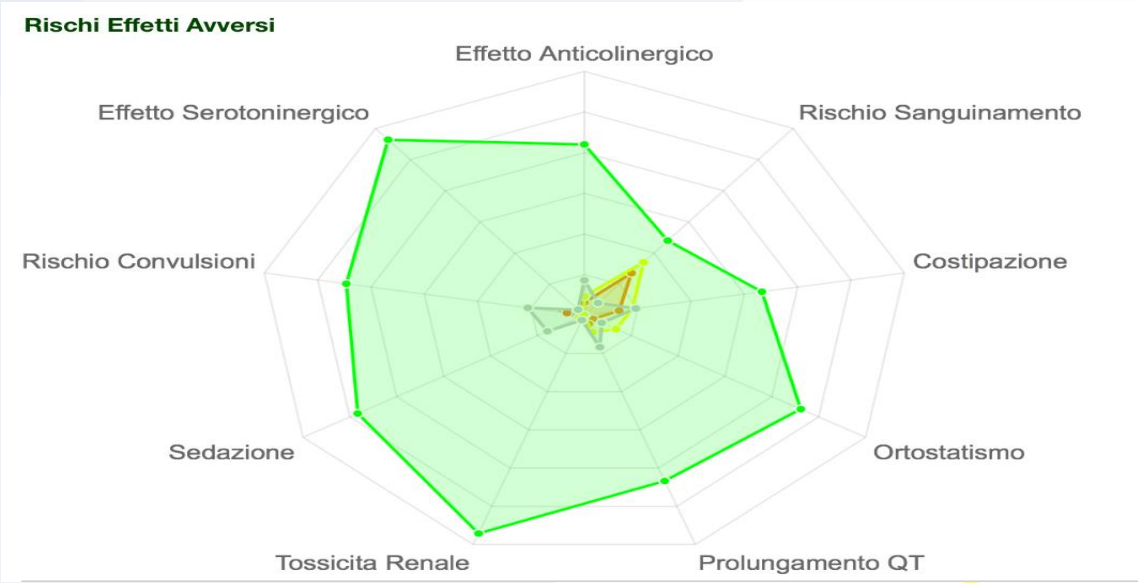
Prescriptions
Clinical status

INTERACTIONS

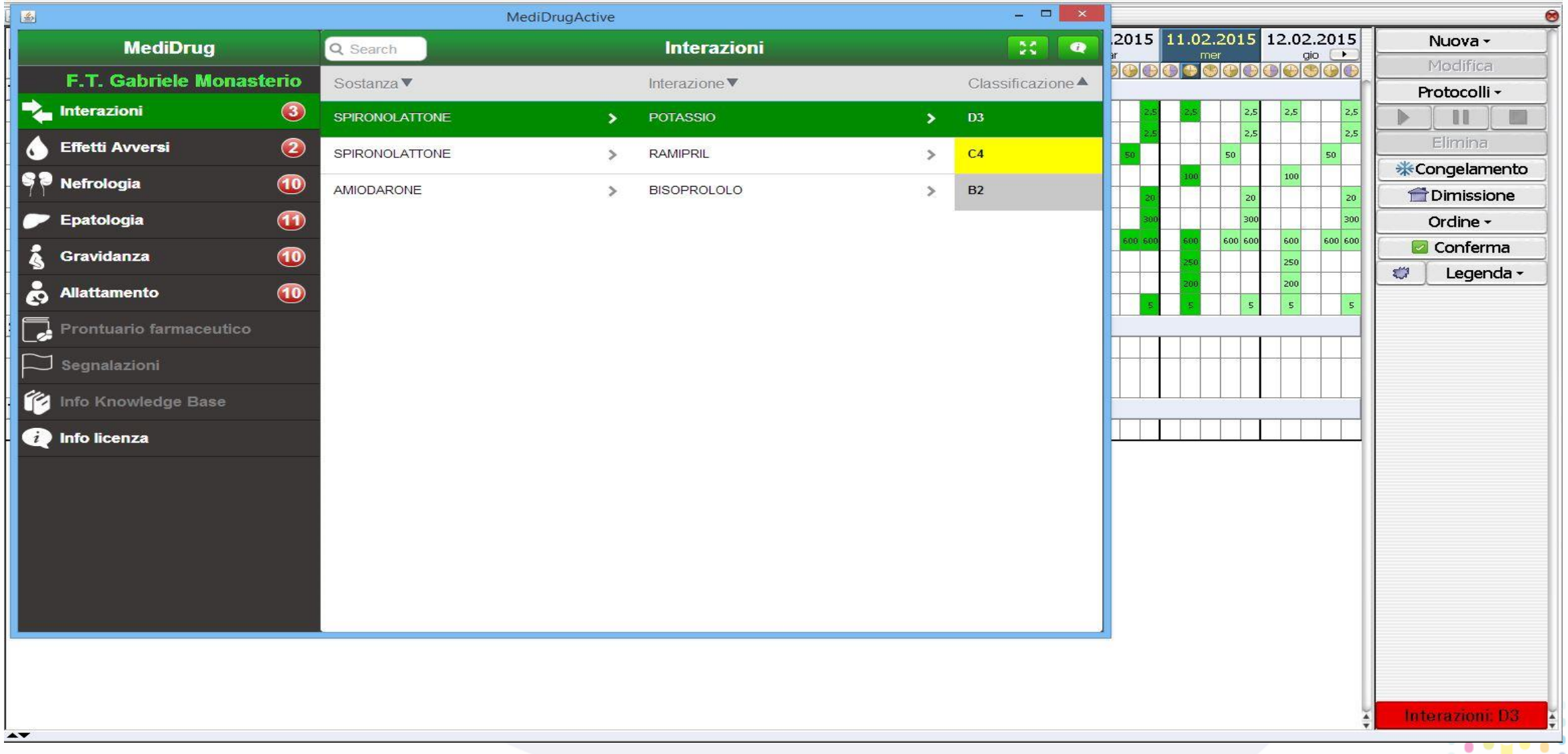
ADVERSE EFFECTS



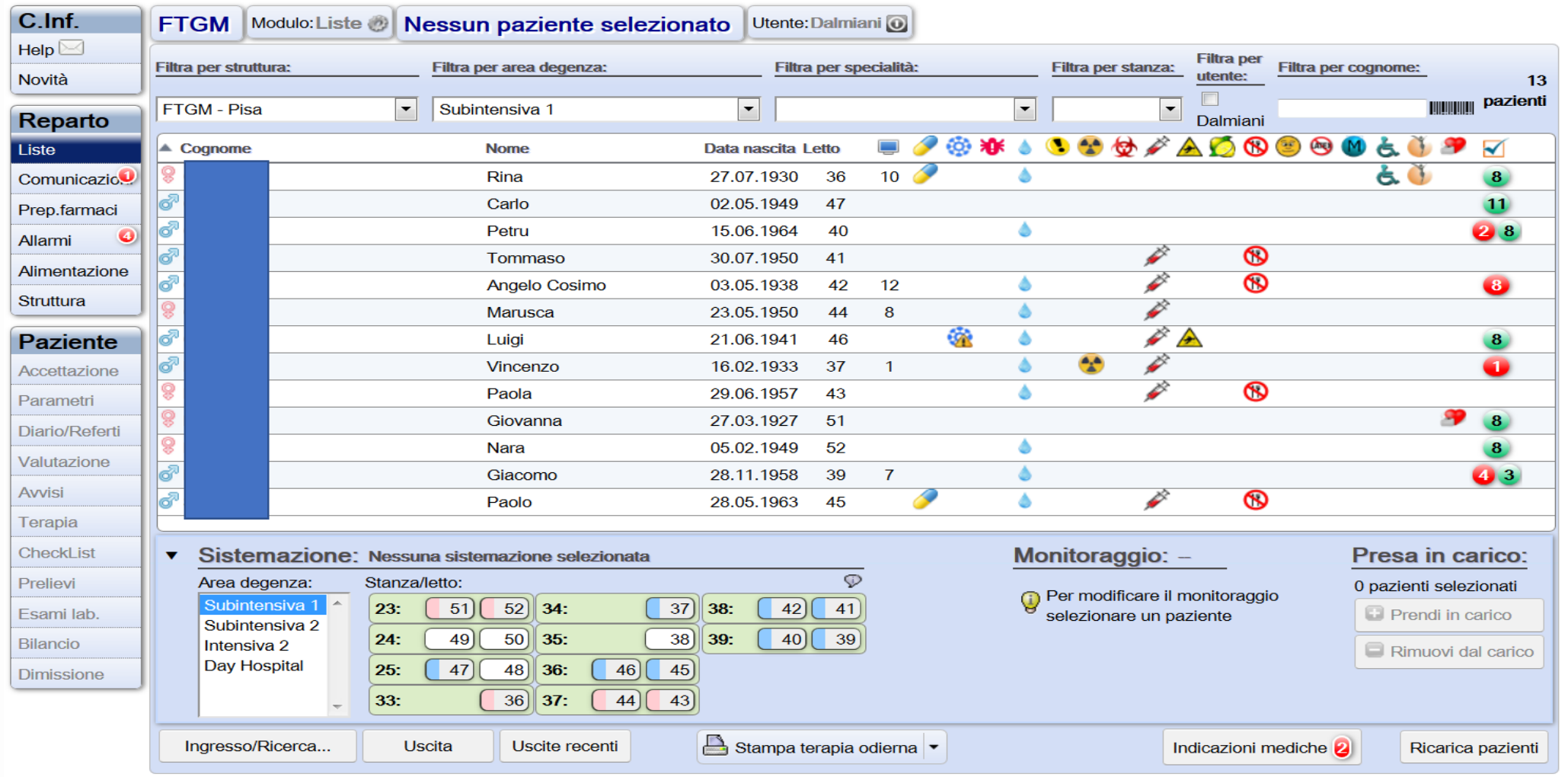




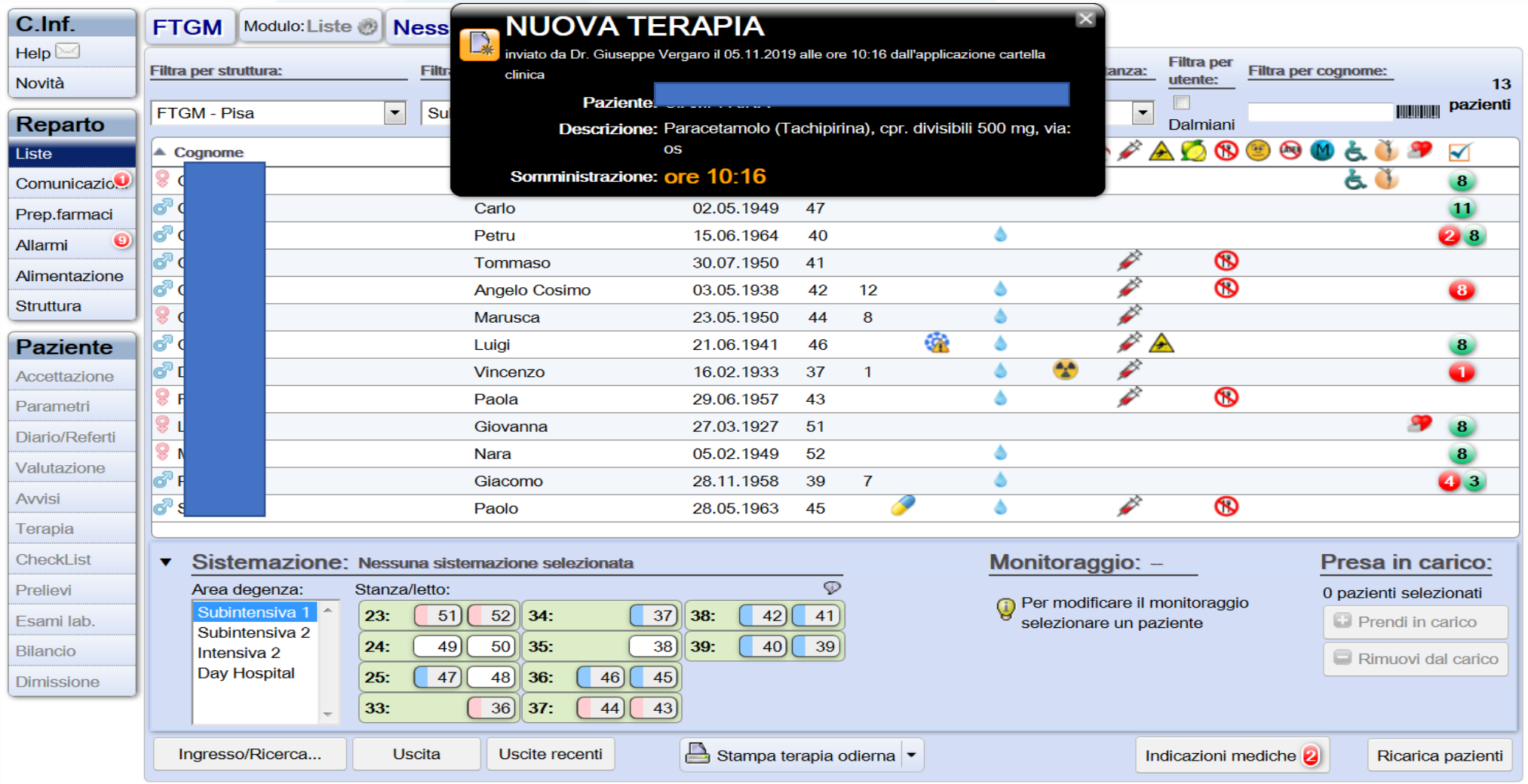
EMBEDDED IN EMR



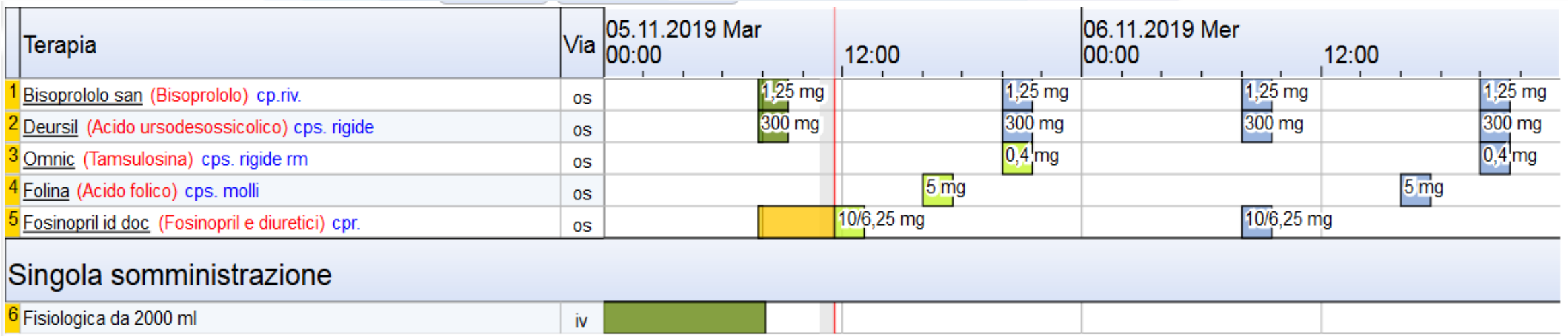
NURSE RECORD



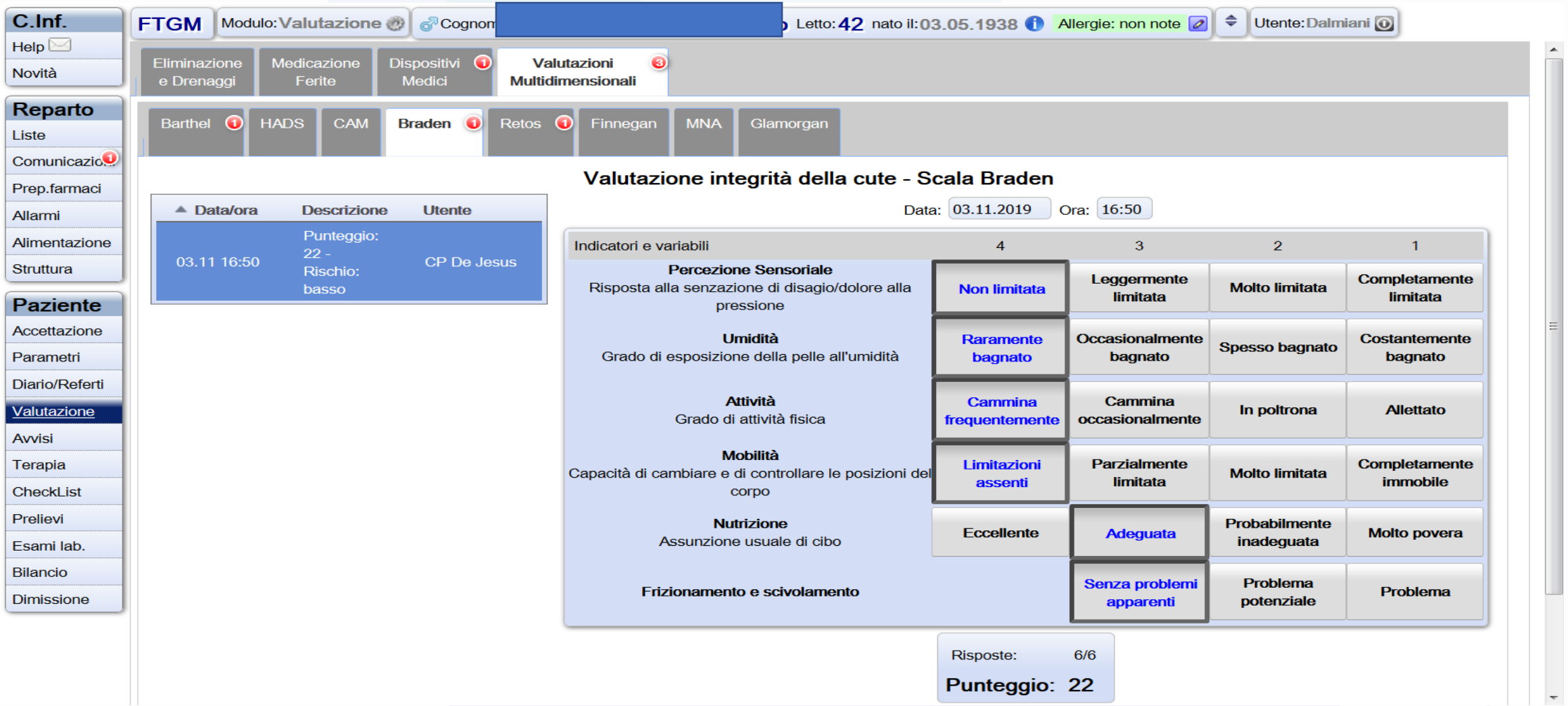
NURSE RECORD – PRESCRIPTIONS



NURSE RECORD E-SUBMINISTRATIONS

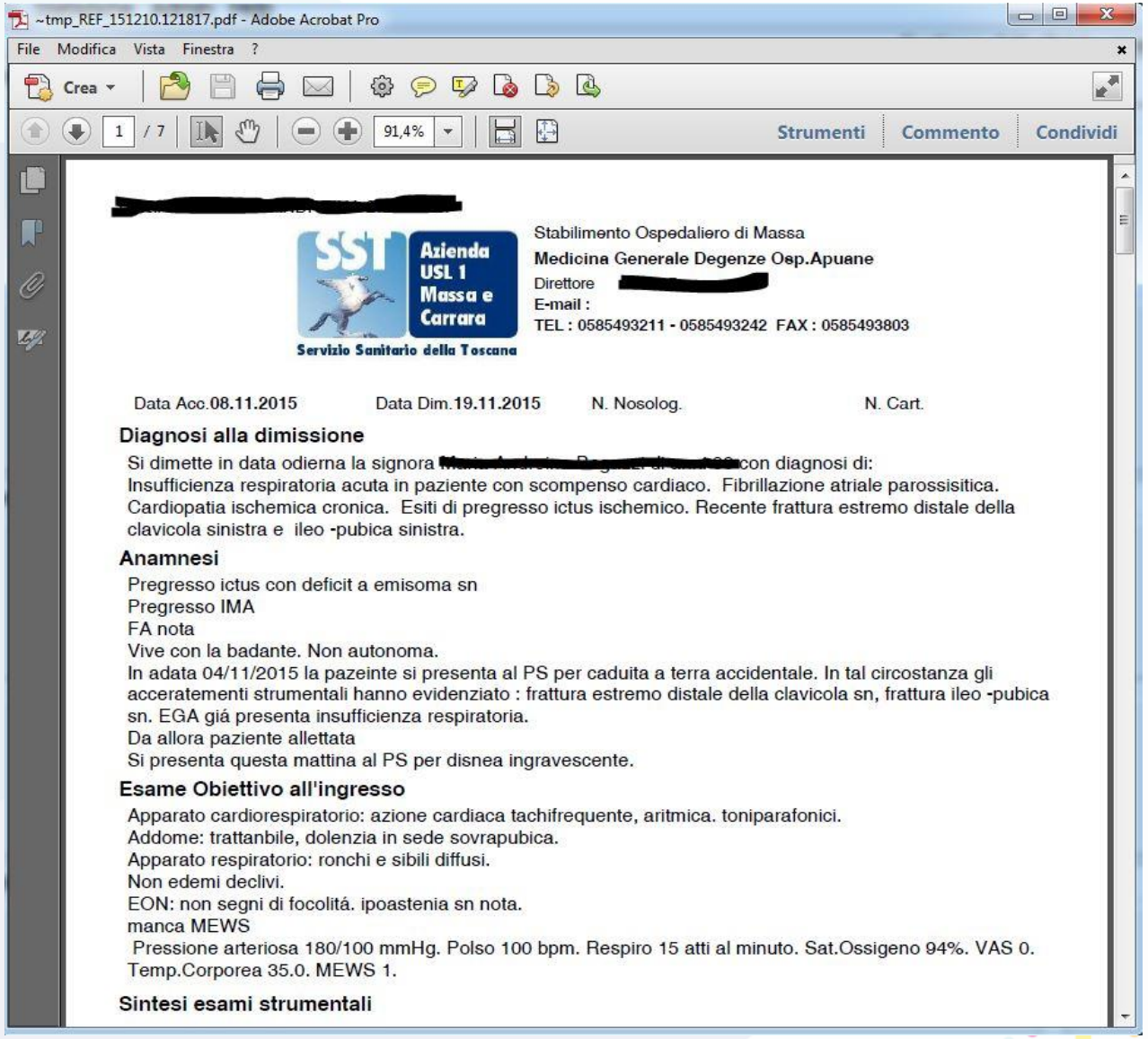


NURSE RECORD



CLINICAL REPORTS – DISCHARGE

- **HL7 CDA discharge summary**
  - *Contains final diagnosis, therapy, follow-ups, etc.*
  - *Sent to Patient EHR*
- **HL7 CDA – Patient Summary**
  - *Sent to DSS*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Crea

1 / 7 91,4% Strumenti Commento Condividi

[redacted]

SST Azienda USL 1 Massa e Carrara
Servizio Sanitario della Toscana

Stabilimento Ospedaliero di Massa
Medicina Generale Degenze Osp.Apuane
Direttore [redacted]
E-mail :
TEL : 0585493211 - 0585493242 FAX : 0585493803

Data Acc.08.11.2015 Data Dim.19.11.2015 N. Nosolog. N. Cart.

Diagnosi alla dimissione

Si dimette in data odierna la signora [redacted] con diagnosi di:
Insufficienza respiratoria acuta in paziente con scompenso cardiaco. Fibrillazione atriale parossisitica. Cardiopatia ischemica cronica. Esiti di pregresso ictus ischemico. Recente frattura estremo distale della clavicola sinistra e ileo -pubica sinistra.

Anamnesi

Pregresso ictus con deficit a emisoma sn
Pregresso IMA
FA nota
Vive con la badante. Non autonoma.
In adata 04/11/2015 la pazeinte si presenta al PS per caduita a terra accidentale. In tal circostanza gli acceratementi strumentali hanno evidenziato : frattura estremo distale della clavicola sn, frattura ileo -pubica sn. EGA giá presenta insufficienza respiratoria.
Da allora paziente allettata
Si presenta questa mattina al PS per disnea ingravescente.

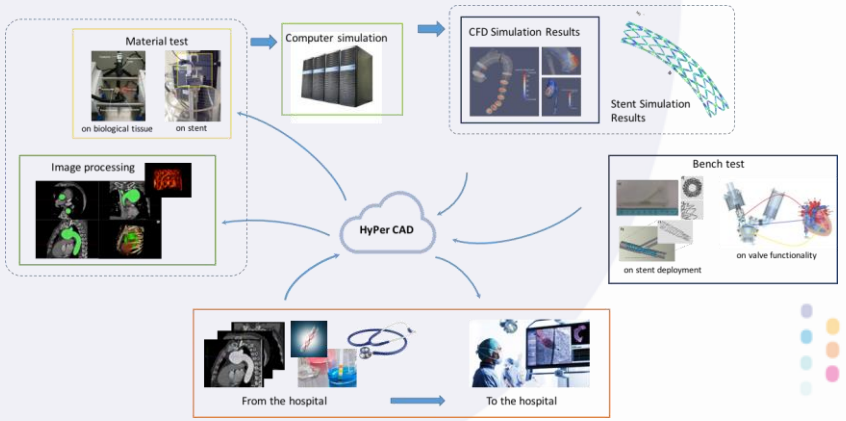
Esame Obiettivo all'ingresso

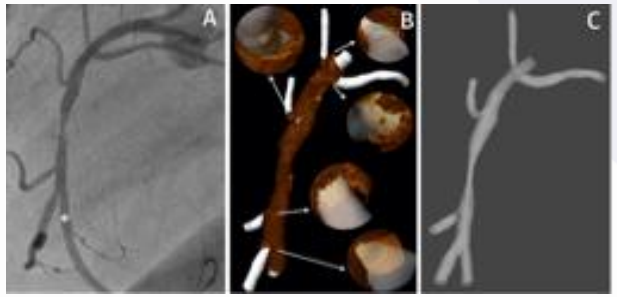
Apparato cardiorespiratorio: azione cardiaca tachifrequente, aritmica. toniparafonici.
Addome: trattanbile, dolenzia in sede sovrapubica.
Apparato respiratorio: ronchi e sibili diffusi.
Non edemi declivi.
EON: non segni di focolitá. ipoastenia sn nota.
manca MEWS
Pressione arteriosa 180/100 mmHg. Polso 100 bpm. Respiro 15 atti al minuto. Sat.Ossigeno 94%. VAS 0. Temp.Corporea 35.0. MEWS 1.

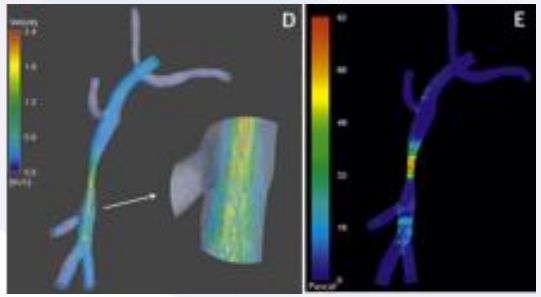
Sintesi esami strumentali

S-EHR CONTENT

- **in order to have a meaningful use S-EHR should be able to contain at least:**
  - ***Patient Summary*** *(Emergency Dataset)*
  - **ePrescriptions and eSubministrations**
  - **Laboratory results;**
  - *Clinical imaging and bio-signals:*
    - contains DICOM images and movies;
    - contains bio-signals (e.g. SCP and Dicom waveform);
  - *Reports and digitally signed documents; (patients consents)*
  - *Hospital discharge reports.*
  - *Personal notes of the patient (wellness and activity data)*

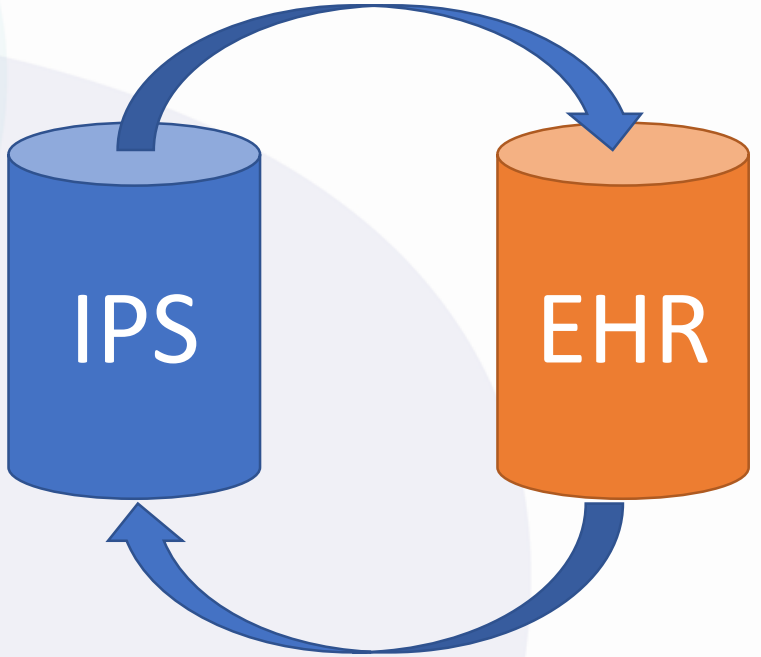






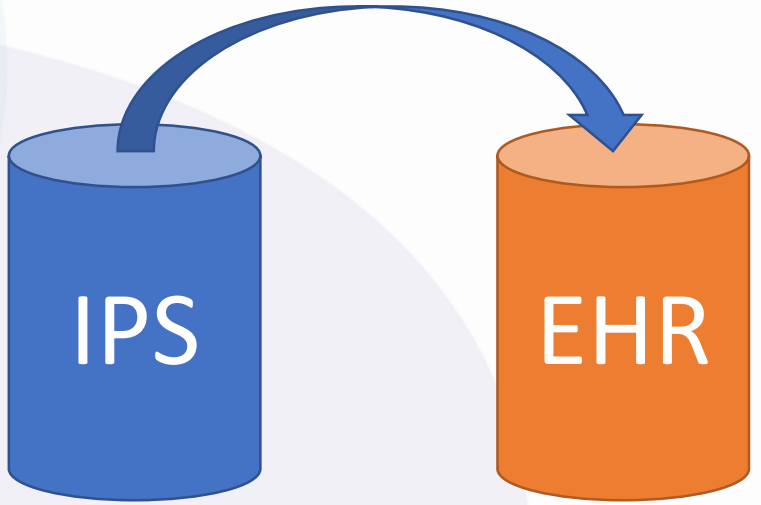
IPS AND EHR

- **Lesson 0: IPS is not an EHR**
- **Effective use of IPS involves:**
  - *the use of repository information cross-referenced to IPS content (data imported in EHR),*
  - *the update of IPS with new results coming from patient care (EHR use)*
  - *Use of IPS as health data container, not a document container*



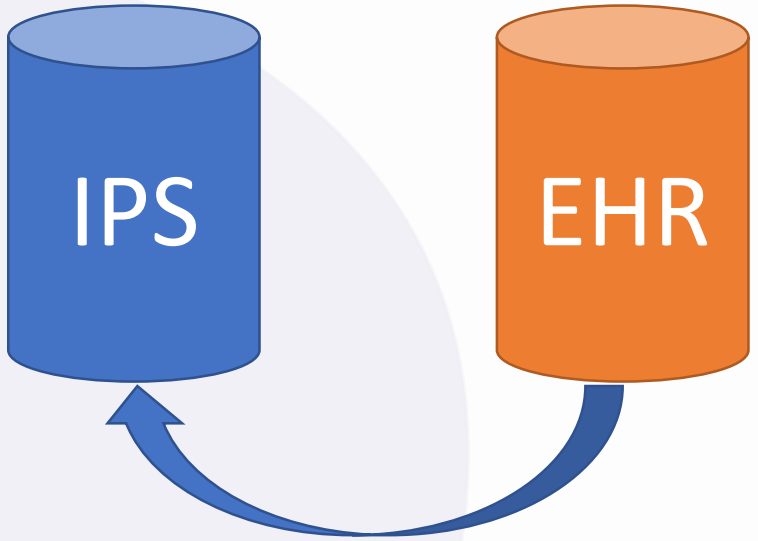
IPS AND EHR – LESSON LEARNED 1

- **Automatic import of information into EHR**
  - *Issue: Local dictionary mismatch with international dictionary used in IPS*
  - *Issue: Data processing on the border of Medical Device systems certification*
  - *Issue: Lack of necessary specialized or structured information (e.g. in cardiology)*
- **Information Assurance, for healthcare use, to be determined**
  - *Authorship of contained information*
  - *We cannot digitally sign sections of IPS*



IPS AND EHR – LESSON LEARNED 2

- **Who compile the IPS at the end of the encounter?**
  - *Automatic compiling seems to be the only way*
  - *supervised*
- **Local dictionary sometimes loses its attribute when information are converted into IPS (e.g. etiology of chronic heart failure).**
  - *Use of "free text" fields to represent the right information*
- **Lack of necessary specialized or structured information (e.g. in cardiology)**



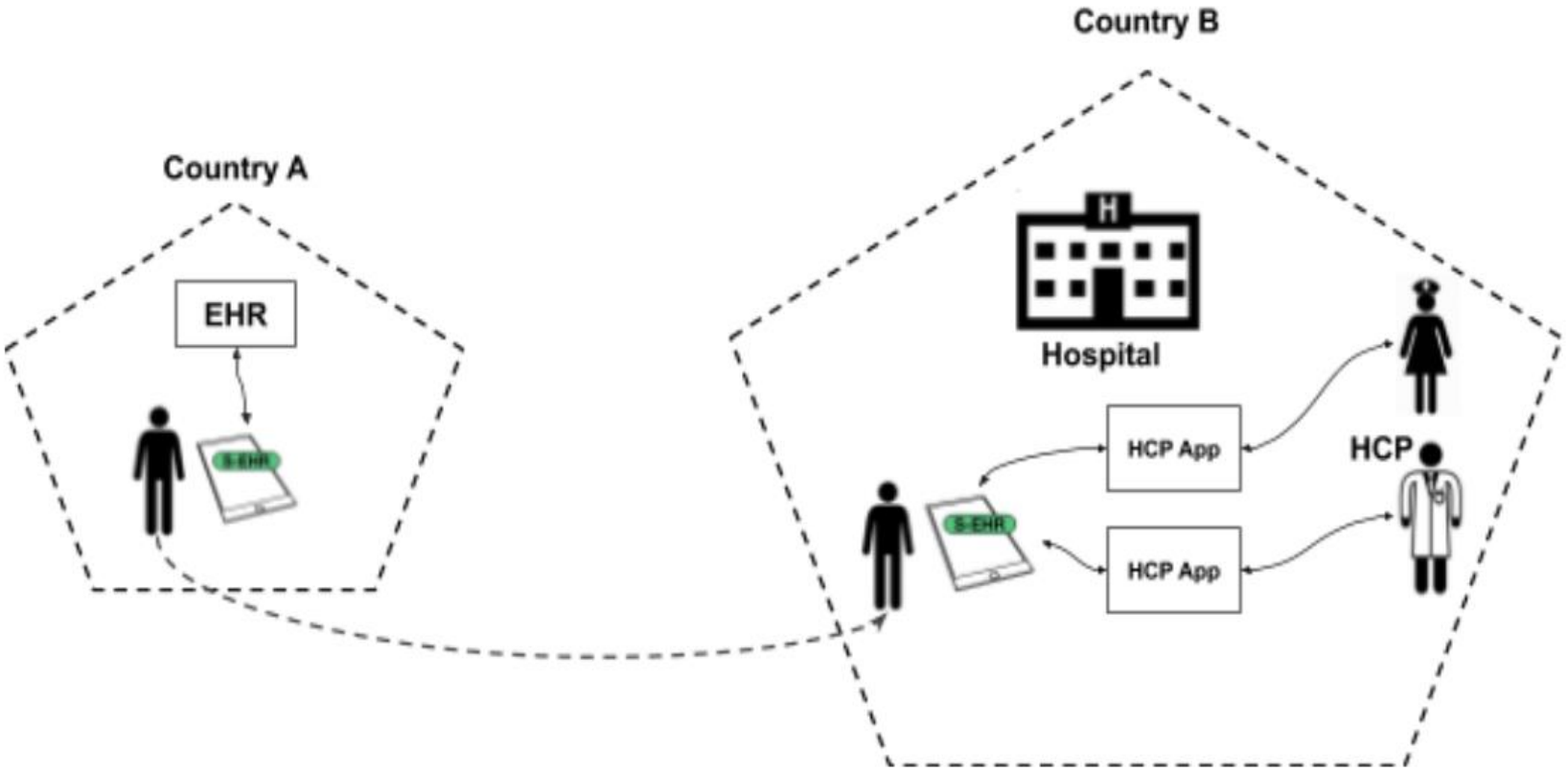
iEHR Users

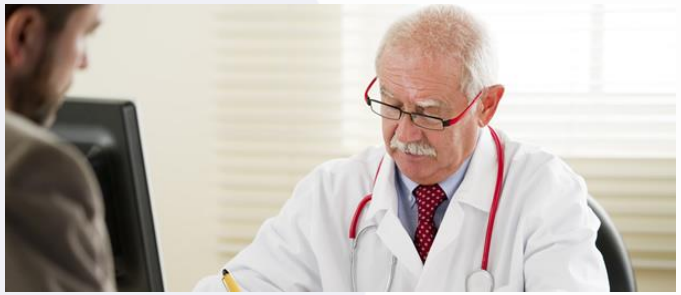
Users	Description
Patients	Persons who travel abroad and are affected by chronic disease
Healthcare Professionals	Employee of Healthcare service provider (Hospital, Outpatient facility, territorial service) and Stakeholder representatives
Researchers	Investigators interested in, or promoting a, research protocol in clinical or social field

USERS' PROBLEM

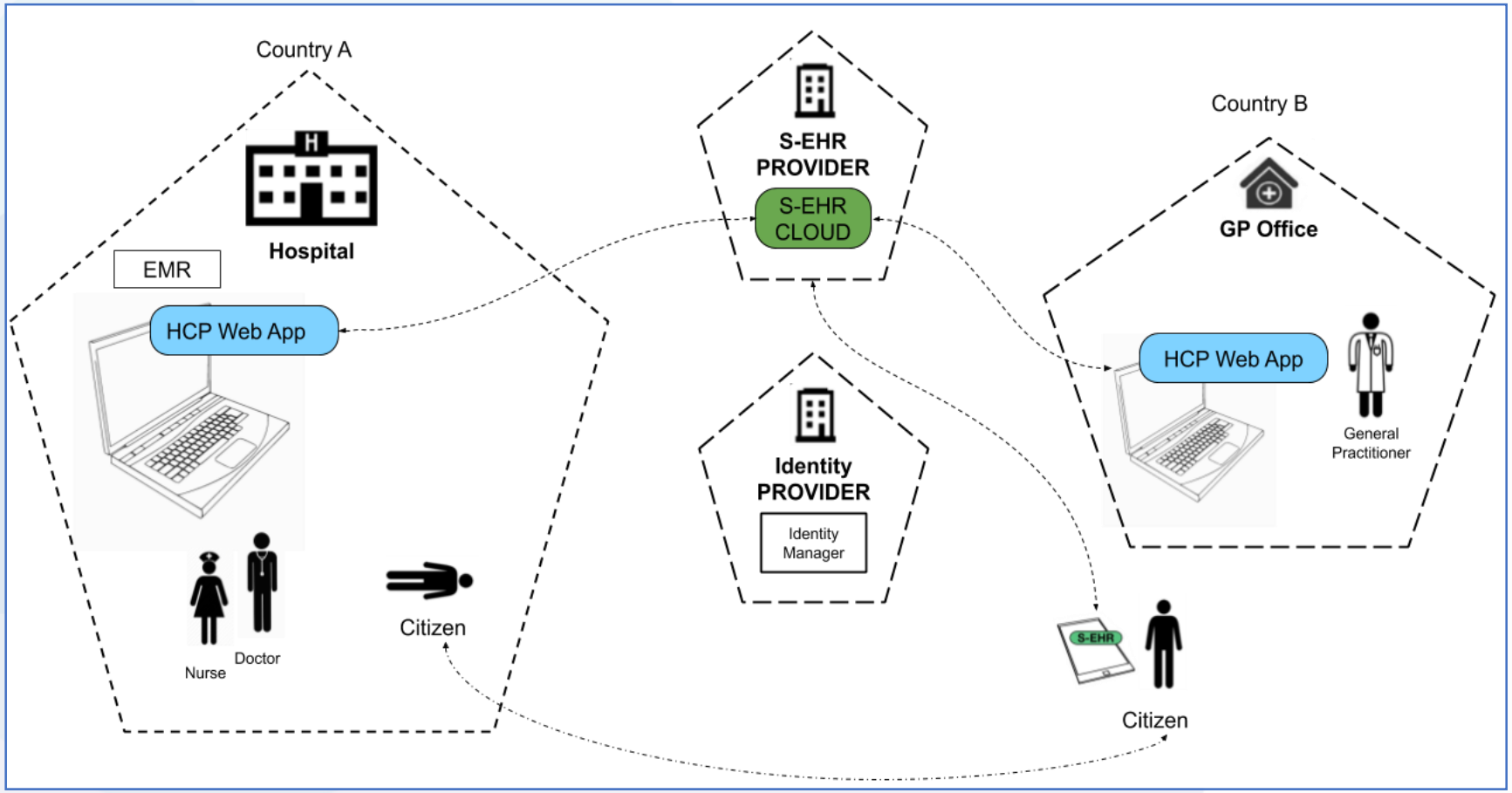
- **Different types of users, with different needs, knowledge, backgrounds, behavior, tools (apps)**
  - Somehow HCPs and patients needs are dependent and sometimes complementary
  - Many HCP use IT tools for (part of) their daily work
  - Some Patients use IT tools to manage their health (or wellness)
  - IT tools of HCP and Patients are often not connected nor able to communicate something
    - Use of communication standards may foster an effective communication, but some standards are “too flexible”. We are far from a “plug>&play” paradigm in general.

SCENARIO 1 - DEVICE TO DEVICE LOCAL HR EXCHANGE

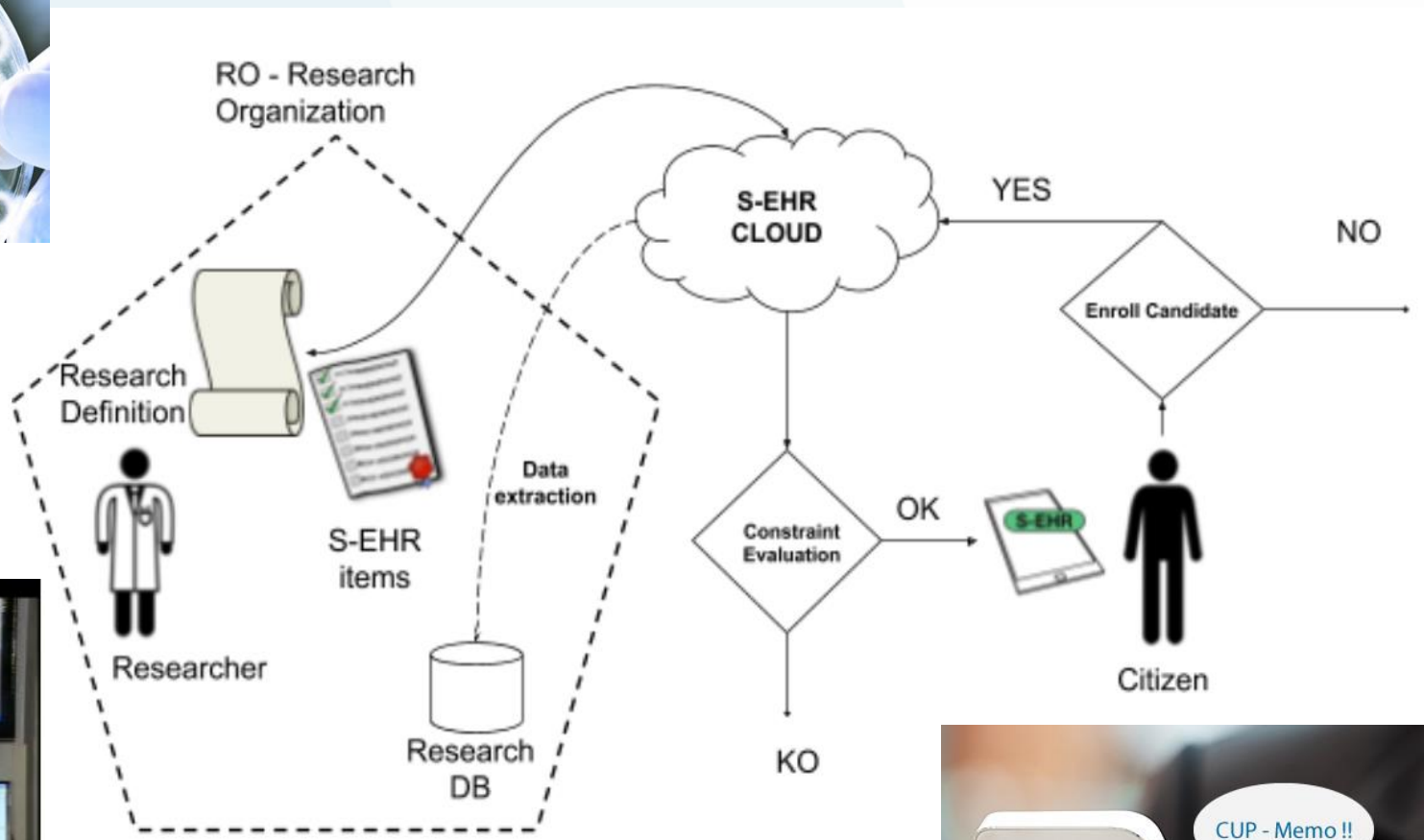




SCENARIO 2 – EMERGENCY ACCESS

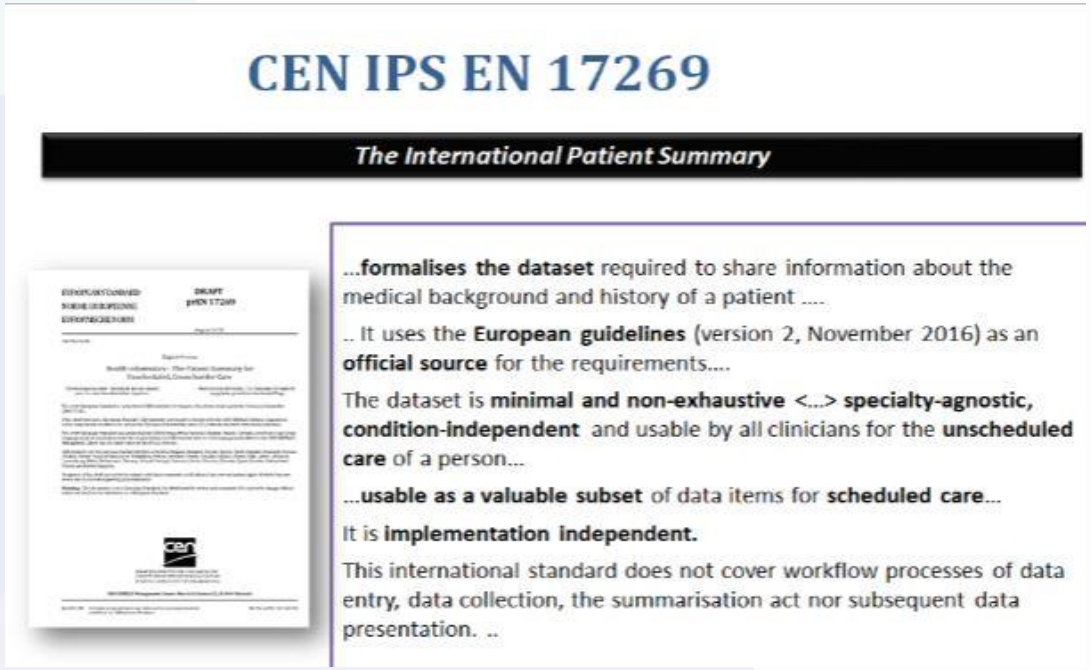


SCENARIO 3 - RESEARCH PROTOCOLS



CONCLUSIONS

- **Use of IPS in clinical practice is consistent for unscheduled care (in iEHR emergency encounter) but even on scheduled one**
- **IPS needs some extension for diagnostic imaging and signals**
  - *Out of IPS scope?*
- **IPS needs an official translation in FHIR r4**



Thank you!

Stefano Dalmiani
FTGM - “G. Monasterio” Foundation Research Hospitals

Q&A time.

InteropEHRate
EHR in people’s hands across Europe

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 826106