



# HEAL ITALIA Innovation on the road Next steps 2024-2026

11 dicembre, Roma  
09.00-13.00



SAPIENZA  
UNIVERSITÀ DI ROMA

Azienda ospedaliero-universitaria Policlinico Umberto I  
Università Sapienza di Roma  
Aula Cassano, Dip. Medicina Traslazionale e di Precisione II  
Viale del Policlinico, 155, 00161 Roma RM

Esperienze e proposte da un **Centro Pilota di Medicina di Precisione** per la sperimentazione di un nuovo modello di Sanità innovativa e accessibile



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**Medical Genetics Unit -**  
Department of Medical  
Sciences and Public Health

**Oncology and Molecular  
Pathology Unit -** Department of  
Biomedical Sciences

## PRECISION MEDICINE



Is an innovative approach to the prevention, diagnosis, and treatment of diseases.

**It considers each patient's characteristics, including genetic background, environment, and lifestyle.**

**It uses DNA sequencing technologies, gene expression analysis, advanced imaging, and tools for Big Data analysis.**



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# Benefits of Precision Medicine

**Improvement of Treatment Efficiency:** administering ineffective or potentially harmful drugs for the patient can be avoided, thus optimizing healthcare resources and reducing costs.

**Reduction of Medical Errors:** the risk of drug dosage errors, adverse reactions and incorrect diagnoses are significantly reduced, ensuring a significant improvement in healthcare safety and overall effectiveness.

Medical errors will become increasingly rare, and patient health will be central to every clinical decision



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# Current Challenge in the Medical Sector

Despite the benefits and progress made so far, widespread adoption of precision medicine is hampered by several factors: :

- **Data Complexity and Integration**
- **Cost and Accessibility**
- **Training of Health Professionals**
- **Ethical and Social Issues**
- **Regulatory Barriers**
- **Disparities in Access to Care**

Could enhancing artificial intelligence (AI) help overcome current limitations and realize the full potential of precision medicine?



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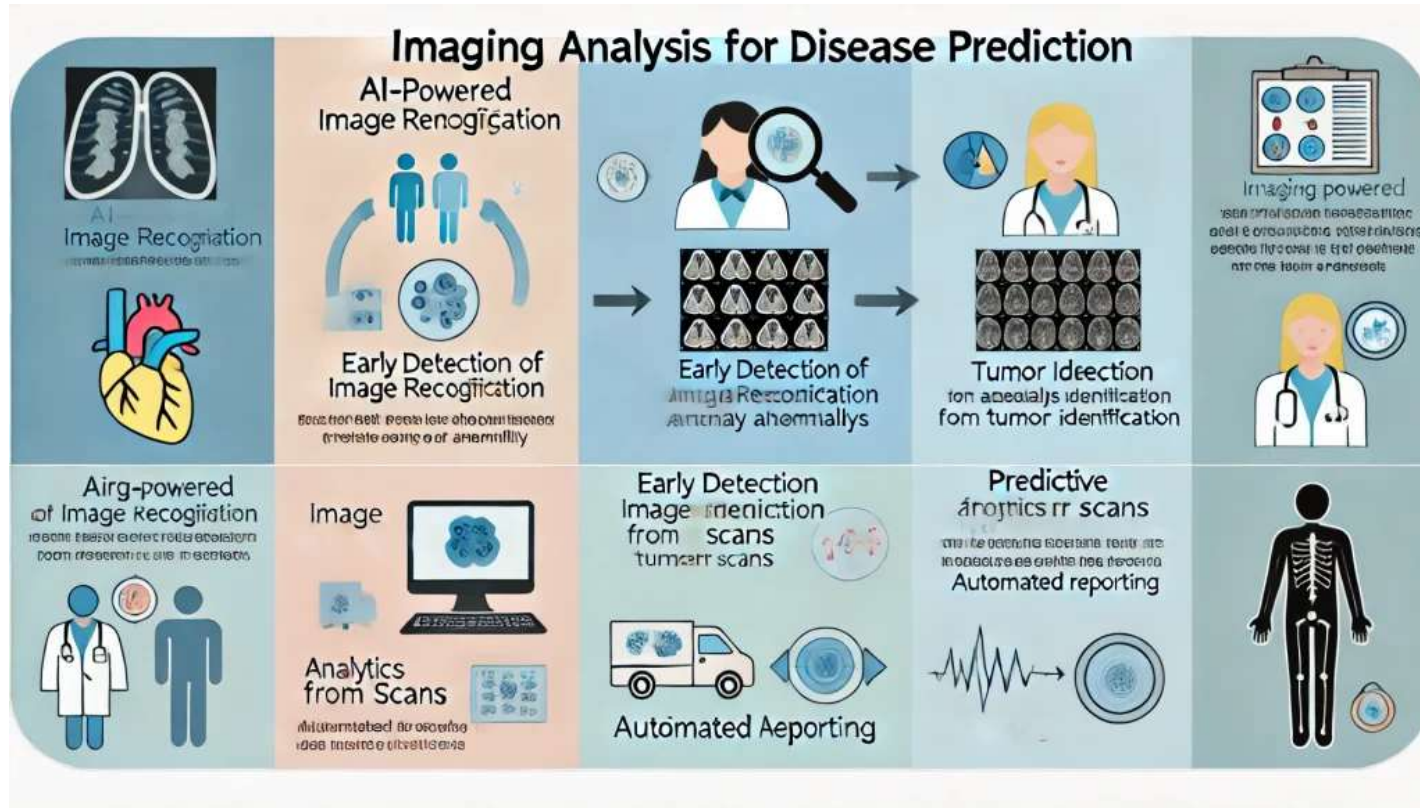
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# GENOMICS and Improvement in Disease Prevention



## • AI to

- ✓ Analyse genetic and clinical data to identify individual risk factors
- ✓ Allow early diagnosis through the analysis of complex predictive models
- ✓ Promote the development of personalized screening programs based on the patient's genetic profile



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# The Pilot Center for Precision Medicine in Cagliari

**Mission:** Implementing Precision Medicine for Equitable and Accessible Healthcare

**Vision:** Innovation and Accessibility as Guiding Principles

Our current work

- \*We have developed an integrated platform for clinical and omics data
- \*We have started translational research projects
- \*We have started collaborations with national and international institutions



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#### ALE

- Advances genomic
- Legal data protection
- Ethical AI implementation

Developed within the e.INS

*Ecosystem of Innovation for Next Generation Sardinia Project*

**ALE** is an innovative system that integrates clinical data with omics data, particularly genomic and transcriptomic, making the results **immediately applicable in clinical practice**.

Using advanced analytics and data protection technologies **ALE**:

- ✓ Allows **personalization of care** based on the individual's *omic* profile
- ✓ Ensures **advanced security**, preventing unauthorized use of sensitive information



# Organizational Structure at CeSAR

Clinical consultations and genetic tests are performed to identify disease predispositions and guide targeted therapeutic choices

**Medical Genetics Service**

Supports the daily operations of the centre, managing human, financial and logistical resources

**Administrative and Management Service**

Applies mathematical models and simulations to understand complex biological processes and support the development of personalized therapies

**Computational Physics**

Studies, together with clinical geneticists (and also specialists in the field), the interactions between drugs and individual genetic variants, optimizing the efficacy and safety of therapies

**Pharmacogenomics Expert**

Analyses and interprets large amounts of biological and clinical data, supporting the personalization of treatments

**Bioinformatics Unit**

Collects and stores biological samples, such as tissues and body fluids, for diagnostic and research purposes

**Biobank**

They facilitate the transfer of scientific discoveries from basic research to clinical practice, promoting therapeutic innovation

**Translational Research Laboratories**

Subdivided by therapeutic areas (e.g., oncology, cardiology, neurology), which provide personalized medical care based on patient's genetic and molecular data. Many clinical geneticists and trainees actively participate in specialist visits, and often, both specialists communicate the reports

**Specialized Clinical Units**

**CeSAR**





## Proposals and Perspectives

Medicina  
di precisione



- Creation of a digital ecosystem for data integration: *ALE to process health big data through specialized algorithms*
- Training for health workers and raising awareness among the population
- Public-private partnerships for economic sustainability
- Expansion of the model on a regional and national scale



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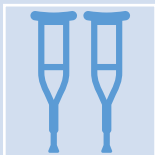
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## Measurement and Evaluation



**Clinical KPIs:** Diagnosis times, efficacy of therapies, patient outcomes.



**Economic KPIs:** Cost sustainability and reduction of general healthcare costs.



**Research KPIs:** Number of published studies, innovative results.



KPI: Key Performance Indicator



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*Grazie a tutti !*



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