CardioTwin

An **AI-driven virtual platform** for the management of **multi-morbidities associated with cardiometabolic diseases**

- Diagnostic codes
- Clinical lab results
- Care and medication history
- Demographics and socio-economics

Graph-driven & RAG/LLM-driven framework

- Physician decision support
- Patient stratification
- Patient care pathways

STRIREG Study

Lp(a) Stockholm Study

~2M index patients

01 **Data ingestion**

02 **RAG-LLM classification**

03 **Hierarchical logic/ knowledge graphs**

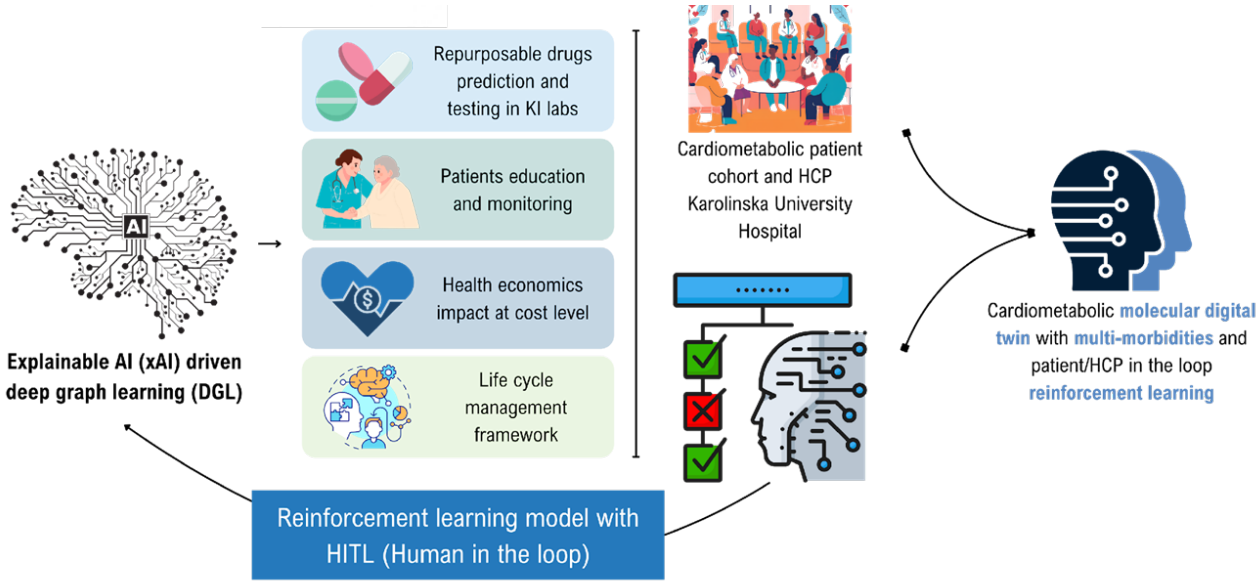
04 **Transition ML/DL models**

05 **Expert validation**

06 **Functional Twin**

CardioTwin

Framework & timeline



Today

DPA, ethics clearance and data quality and protection

2026

Model implementation, data homogenization and early use cases

2027

Virtual digital twin CardioTwin v1.0

2028

Envisioned deployment at KUH, Sweden

CardioTwin

Engagement potential

For clinical/ medical/ R&D expertise

1. **Hypothesis testing and simulation**
   Simulate disease trajectories and treatment outcomes across patients
2. **Data enrichment and model training**
   Using XAI to enrich the Lp(a) Stockholm Study dataset and STRIREG cohort (2.3M+ individuals)
3. **Discovery of biomarkers and pathways**
   Hidden associations between routine biomarkers and multi-morbidity patterns
4. **Advancing medical education**
   Explore patient-specific multi-morbidity scenarios,and test treatment combinations/observe outcomes in real time

For end users

Co-design with healthcare providers and patients

Human-in-the-loop mechanisms for model fine-tuning

Iterative validation in clinical settings

Define clinical subgroups of patients based on shared features, comorbidities, and outcomes