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HEALTHCHAIN

HEALTHCHAIN STORIES

CARDIOLOGY AI: **BRINGING PREDICTIVE PRECISION TO CARDIAC PRIORITISATION**

THE NEED

There is currently a substantial waiting list for aortic valve interventions, with international studies reporting an average waiting time of approximately six months and an associated mortality of around 3%. In Portugal, the situation is particularly severe, with mortality reaching 6% for patients waiting up to 426 days. These findings highlight the urgent need for clinically grounded, fair, and evidence-based prioritization strategies.

Continuous assessment of the person and the process is imperative, before, during and after the intervention. The challenge addressed at this project is the management of waiting lists: with an AI-powered solution we are able to reorganize these lists according to the surgery's urgency, while clearly informed by the predicted survival outcomes.

THE HEALTHCHAIN SUPPORT

HealthChain supported Healthcare Organisations in identifying their innovation challenges and selecting companies to address them. They worked closely as an interregional team to co-create, test, and validate a solution aligned with real clinical workflows, patient needs, and organisational constraints. The project provided financial and business support to boost the solution's market-readiness and commercialisation.

Centro, Portugal

THE **SOLUTION**

CARDIOLOGY AI is an AI-driven predictive analytics solution which facilitates informed decision-making for professionals ensuring the surgery waiting list is arranged according to the best patients' survival outcomes.

The solution combines secure data interoperability with clinically validated AI to generate actionable insights directly from real-world clinical systems. By embedding clinical expertise throughout data access, validation, and model development, the solution ensures trust, relevance, and scalability.

IMPACT

- Established a secure interoperability framework enabling streamlined access, extraction, harmonization, and analysis of cardiology data directly from hospital systems.
- Structured clinician evaluation confirmed the usefulness of the model outputs for patient prioritization and follow-up decision-making.
- Enabled reprioritization of surgical waiting lists for aortic valve interventions based on predicted survival outcomes, promoting more equitable and objective clinical decisions.
- Strengthened collaboration with ULSC's Cardiology Team, increasing clinical ownership, confidence, and alignment with real-world workflows.

OUTCOMES

The pilot successfully validated the clinical, technical, and operational performance, demonstrating strong predictive capability, data robustness, and practical clinical relevance.

- The survival model achieved a Concordance Index (C-index) ≥ 0.75 on an independent test set, confirming good discrimination in ranking patient survival risk.
- Automated variable extraction demonstrated a very low proportion of failed extractions or excluded records.
- Logical inconsistencies led to exclusion rates of ≤ 1%, confirming high data integrity.
- The automated extraction pipeline significantly decreased the clinician time previously required for manual chart review.

SUSTAINABILITY

The AI-driven solution is built on a robust digital infrastructure scalable to other regions and medical specialties. In addition, by leveraging data directly from existing informatic systems, the solution reduces reliance on paper-based processes and supports clinicians in adopting digital, technically enabled approaches to data access and innovative project implementation.

TESTIMONIALS

"The Cardiology AI solution provided valuable insights into how predictive models can support clinical decision-making in cardiovascular care. The project demonstrated the potential of AI to improve risk stratification and early detection, while remaining aligned with clinical workflows and regulatory requirements. The collaborative approach between clinicians and the technical team was essential to ensure the solution addressed real-world needs and could be realistically integrated into hospital practice."

- PROMPTLY, Developer