

# HealthCare AI

How to Gain Value Today



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A male doctor in blue scrubs is the central figure, looking down at a tablet computer he holds in his right hand. A stethoscope is draped around his neck. In his left hand, he holds a small, dark, 3D-printed model of a human foot. To his right, a hand holds a white card with a colorful anatomical diagram of a foot. The background is a blurred hospital setting with other medical staff and a surgical light fixture.

# Embracing AI in Healthcare: A Personal Perspective

# Ensuring Data Quality and Trust



## Data Cleansing

Rigorous data cleaning protocols are essential to ensure the accuracy and reliability of AI-powered healthcare solutions. Standardized input methods and AI-powered tools can effectively detect inconsistencies in medical records, leading to more robust analysis.



## Interoperability

Adopting universal data standards across healthcare systems is crucial for interoperability. Seamless data exchange between different systems reduces errors in AI analysis and fosters a more efficient and collaborative healthcare environment.



## Transparency

Transparency is paramount for building trust in AI-driven healthcare. Developing explainable AI models, which provide clear insights into how AI reaches its conclusions, empowers healthcare professionals to understand and trust the technology.





# Ethical Considerations in HealthCare AI

## Patient Privacy

Implement robust data encryption and anonymization techniques.  
Ensure AI systems comply with HIPAA and other privacy regulations.

## Bias Mitigation

Regularly audit AI algorithms for bias. Use diverse training data to ensure fair outcomes across all patient demographics.

## Human Oversight

Maintain a "human in the loop" approach. Combine AI insights with clinical expertise for optimal patient care.

## Continuous Education

Provide ongoing AI literacy training for healthcare professionals.  
Foster a culture of responsible AI adoption and ethical use.



Artificial Intelligence

Machine Learning

Tablular  
ML



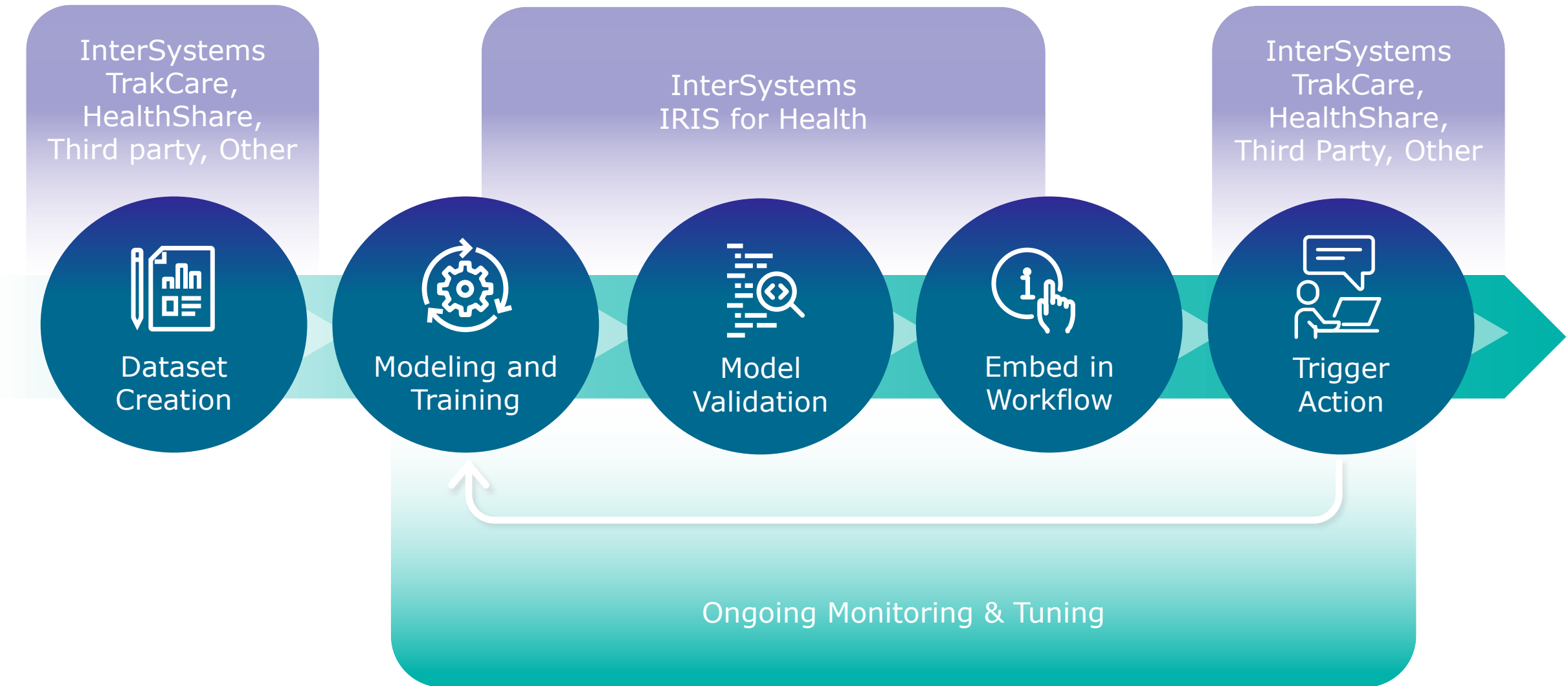
Predictive Modelling

Generative  
AI



e.g. Chat GPT

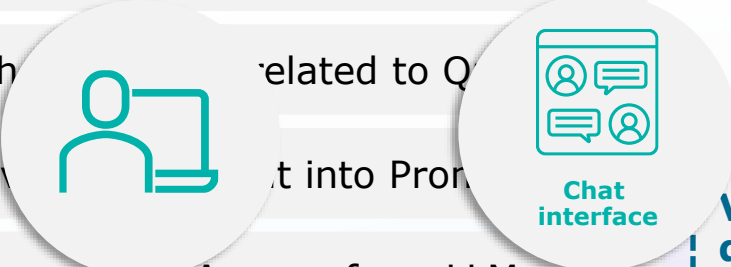
# ML Model Development Process



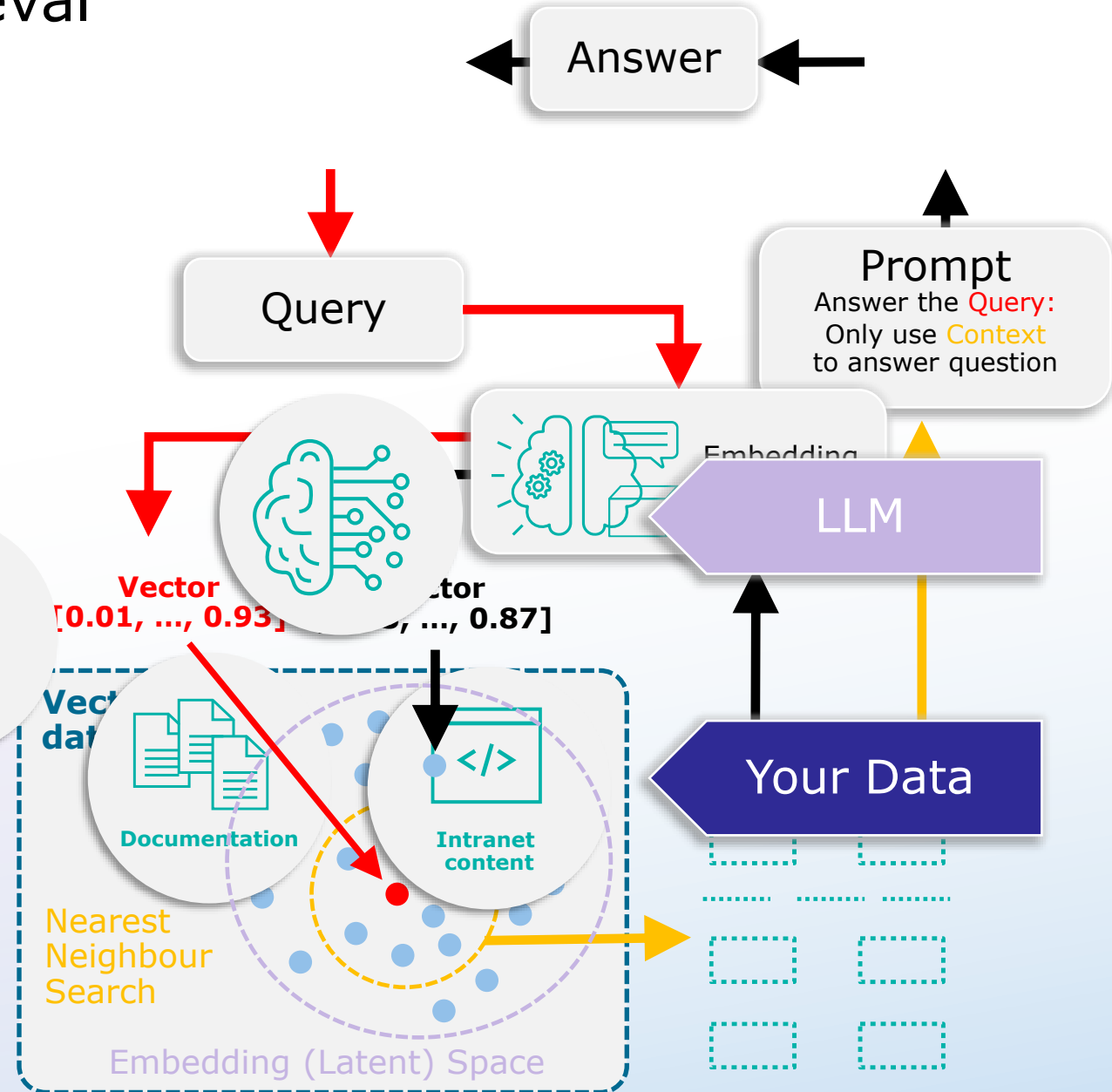
# Vector Database and Retrieval Augmented Generation



- 1 Build Knowledgebase, split into chunks
- 2 Vectorize with Embedding Model
- 3 Insert Vectors into Vector Database
- 4 Vectorize Query with Embedding Model
- 5 Search for related to Q
- 6 Retrieve relevant information into Prompt
- 7 Get "grounded" Answer from LLM



- Text Chunk
- Stored Vectors
- Embedded Query Context
- Retrieved Vectors







## Clinical



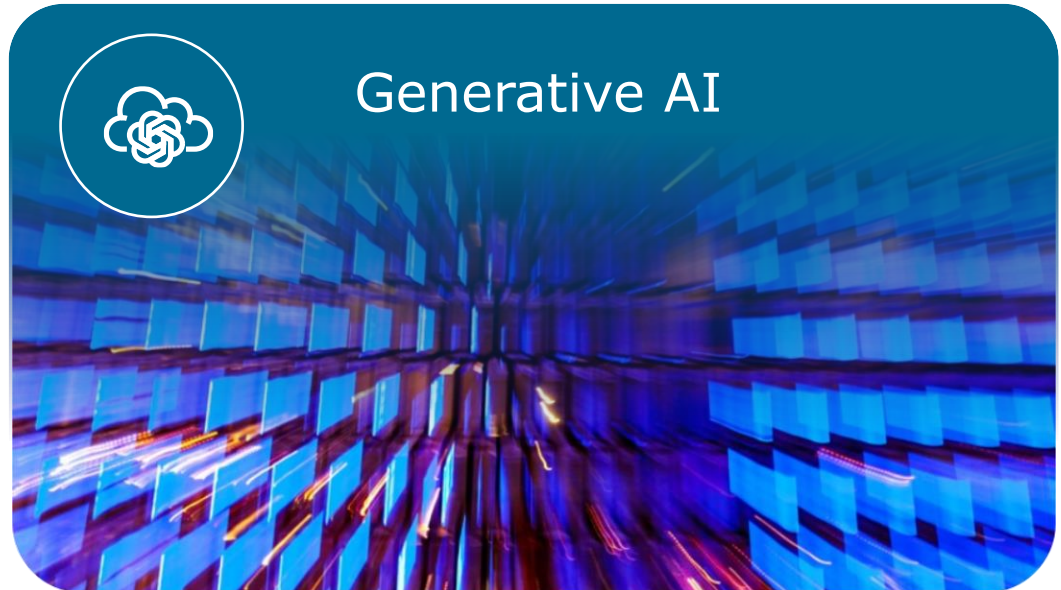
## Administrative



## Revenue Cycle Management



## Generative AI





# Claim Approvals and Denials



## GOAL

Analysis of claims approval/denial patterns by payer



# Emergency Room Waiting Time Prediction



## GOAL

Predicting wait time from emergency department admission to physician visit

ADMINISTRATIVE



# Sample Rejection Rate Reduction



## GOAL

Reduction in the number of discarded laboratory samples



# Surgery Duration Prediction



## GOAL

Predicting the duration of a surgical procedure in a specialized ophthalmology hospital





# Hospital Staff Allocation Optimization



## GOAL

Improving the deployment of staff in the various departments of a hospital with the help of a forecasting model

ADMINISTRATIVE



# Clinic No-Show Reduction



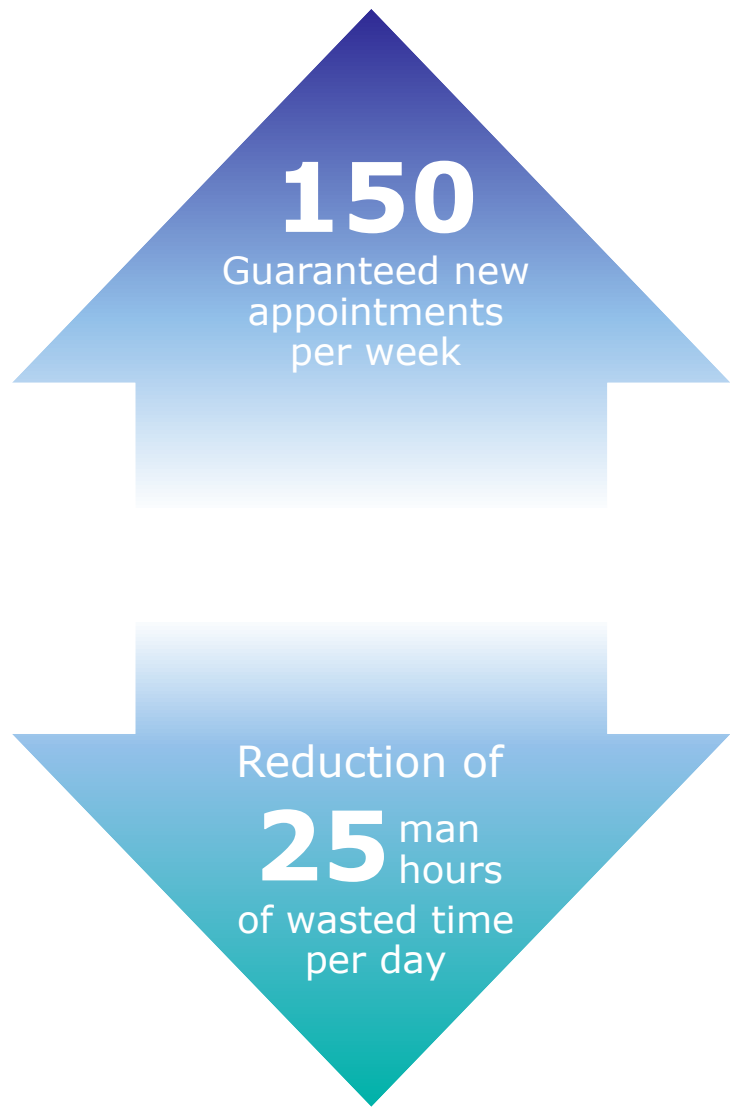
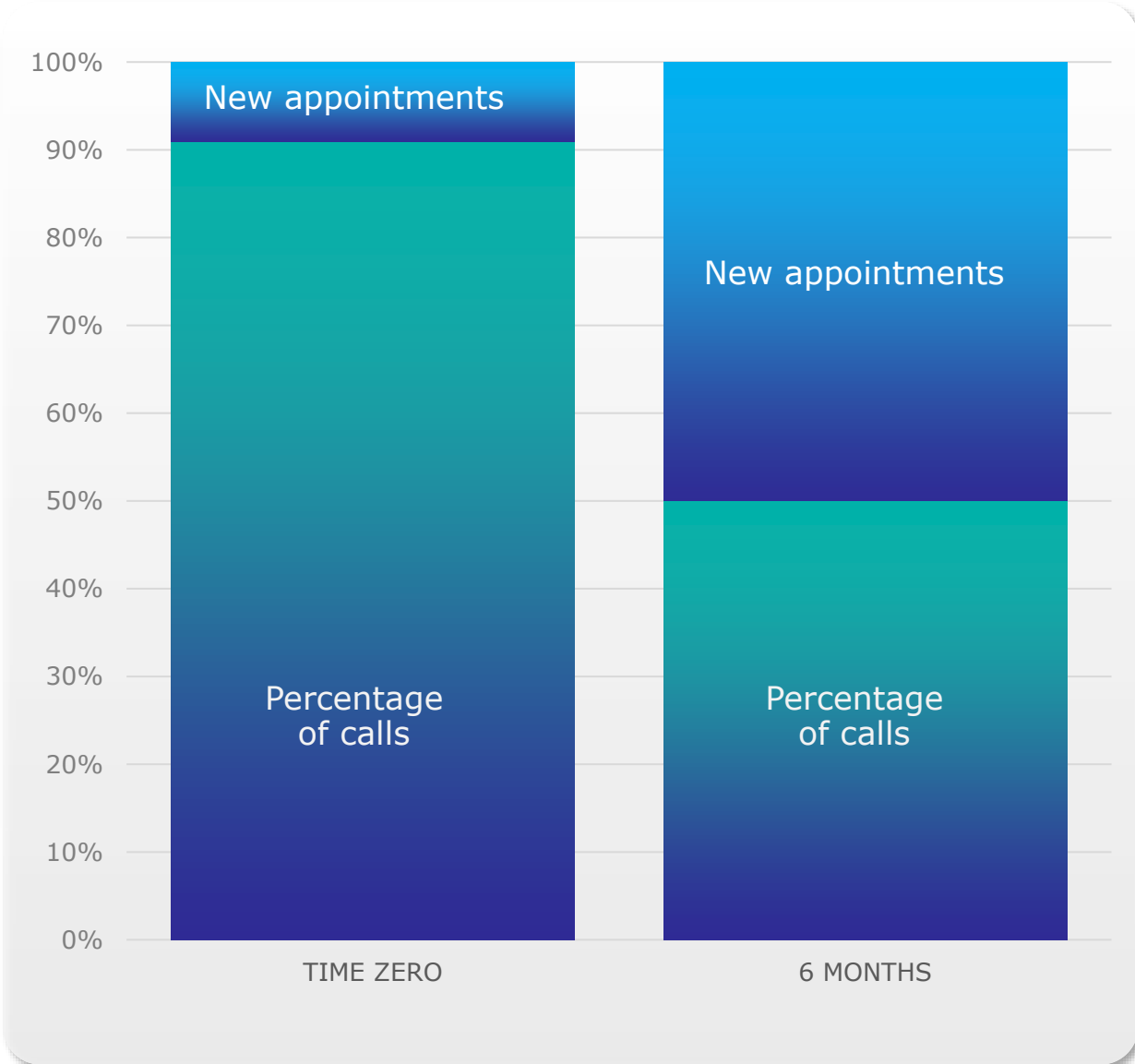
## GOAL

Improve quality of care and optimize allocation of time, clinical and financial resources

ADMINISTRATIVE



# Benefits Realized



# Readmission Rate Reduction



## GOAL

Reduce readmission rates to improve patient recovery outcomes and lower costs/revenue

ADMINISTRATIVE





# Readmission Rate Reduction: Testing the model



**4%**

inpatient cases  
could have avoided  
readmission

**8%**

readmissions avoided  
with proactive  
measure

## FACILITY IMPACT

Avoided

**400**

readmissions from

**5000**

inpatients in one year

## FINANCIAL IMPACT

At average cost  
per IP episode  
of **€6.2k**

**€1.4m**

annual saving  
per facility

ADMINISTRATIVE



# DRG Discrepancy Check



## TASK

Determine the potential loss of revenue due to incorrect DRG calculation



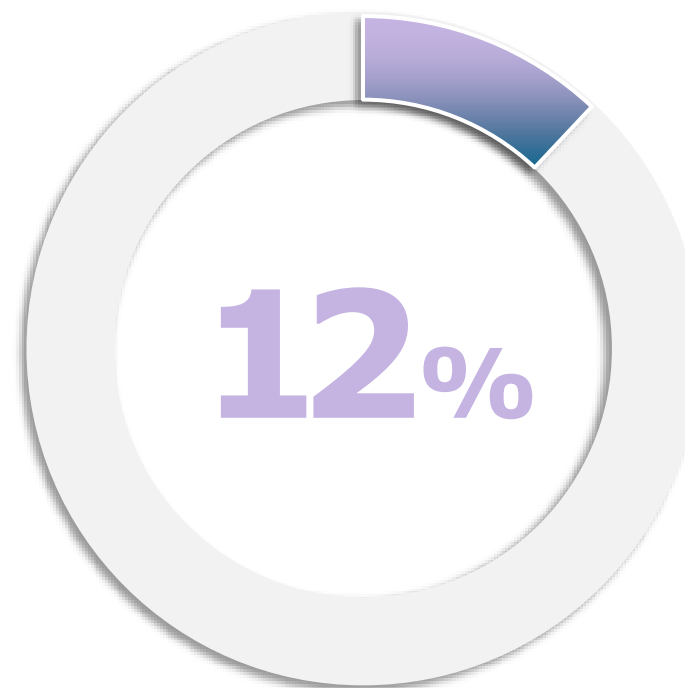
# DRG Discrepancy Check: Impact



DRG Cases Discrepancy



DRG Bills / Total Bills



Overall Financial Impact



# Diabetes Prediction



نابض  
NABIDH

هيئة الصحة بدبي  
DUBAI HEALTH AUTHORITY

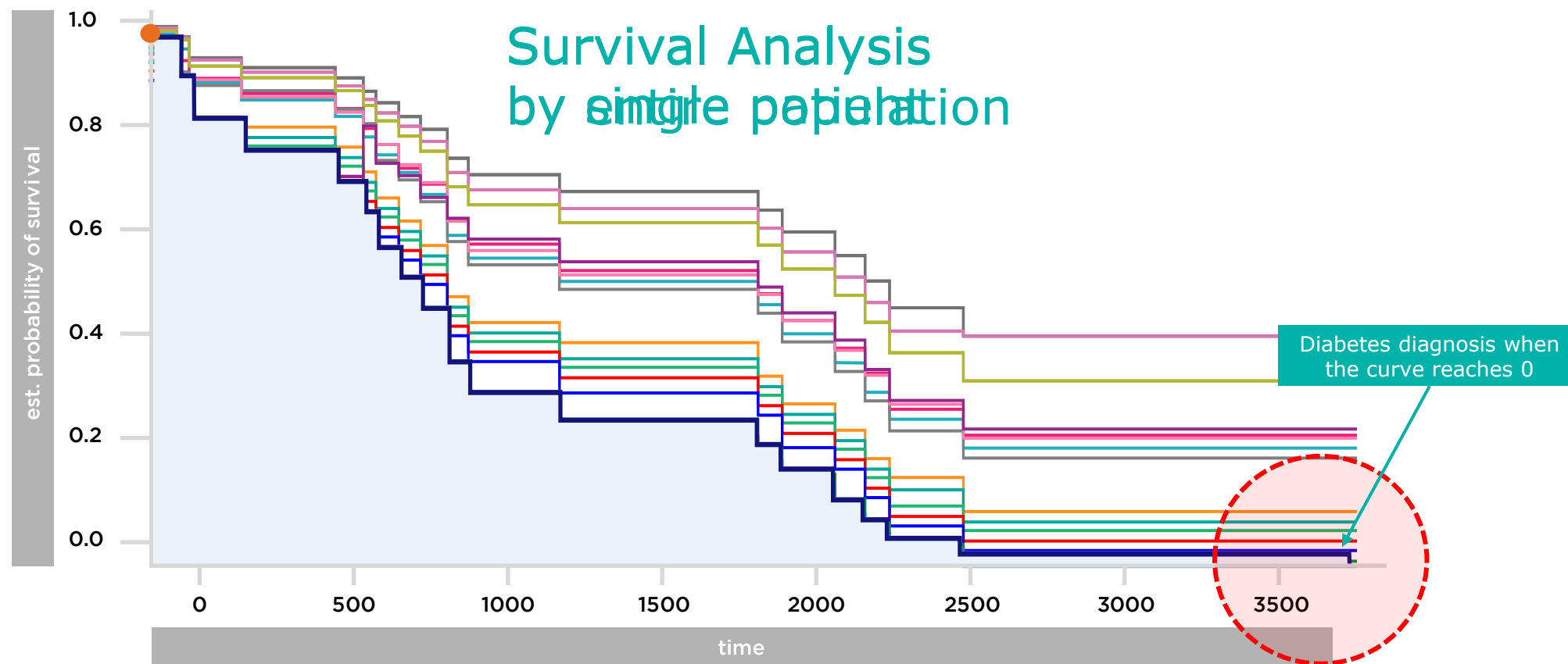


CLINICAL





# Diabetes Prediction: Results



# Diabetes Prediction: Results





# AI in Healthcare: Unlocking Potential Through Strategic Innovation

- 1** Harnessing AI is pivotal for healthcare innovation
- 2** Evident advantages for efficiency and patient care
- 3** Strategic AI integration is imperative for healthcare entities
- 4** Begin with targeted AI applications for impactful results





**Thank you**