

Machine Learning-Based Prediction of Cardiac Arrest Outcome Using a Large Multi-Center Database

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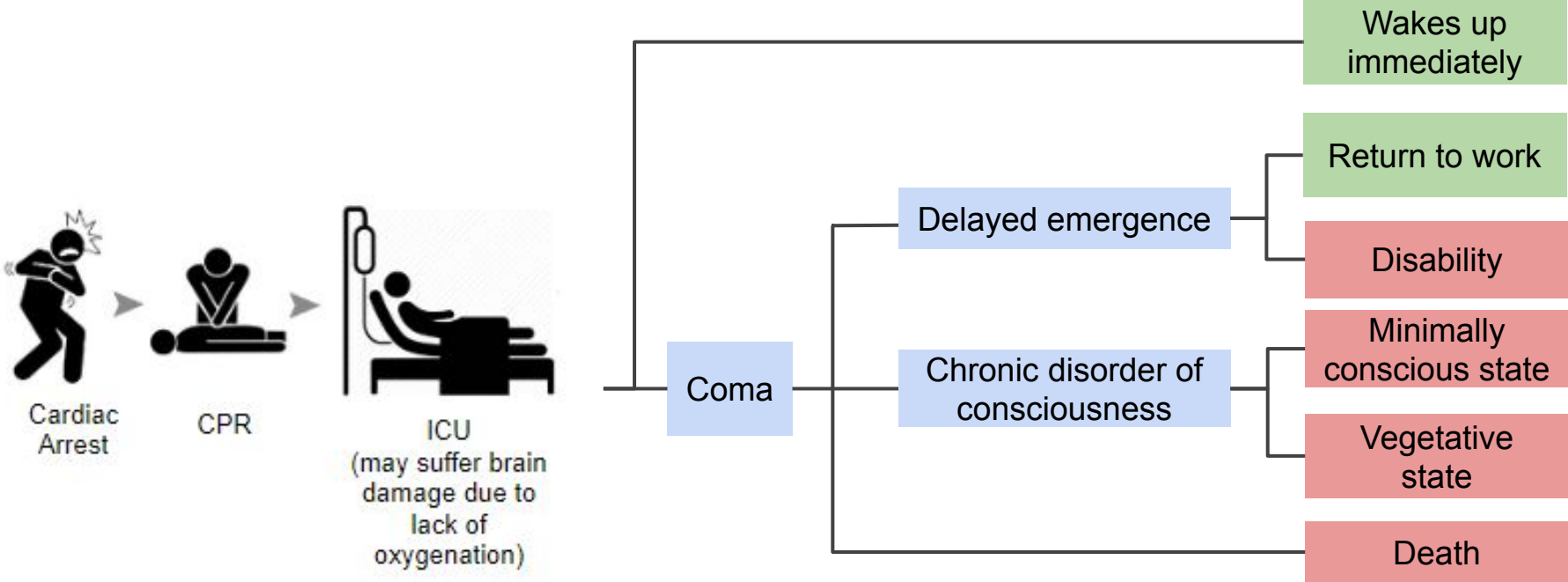
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Problem Introduction



Significance and Innovation

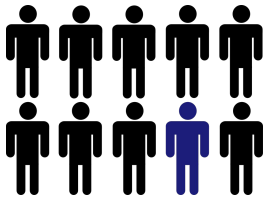


\$140,000 cost incurred



per QALY for continuing aggressive treatment in high-risk patients

Fewer than 10%



leave hospital without neurological damage

Large Unmet Need



for accurate and reliable methods to predict post-CA prognostication

We bring to the table...



Integration of physiological time series



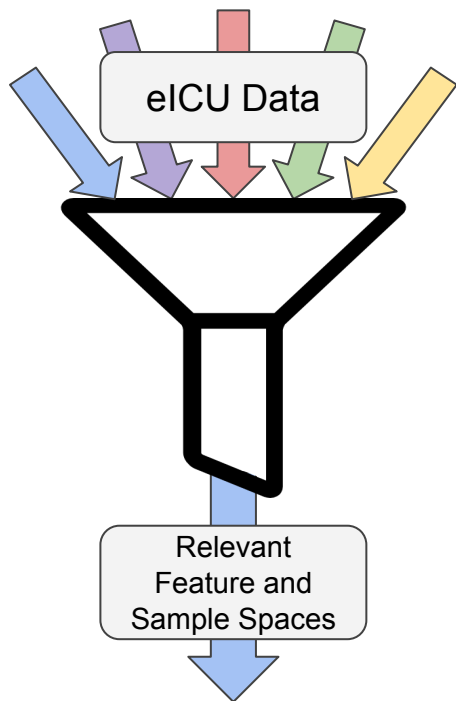
Large database from 200+ hospitals



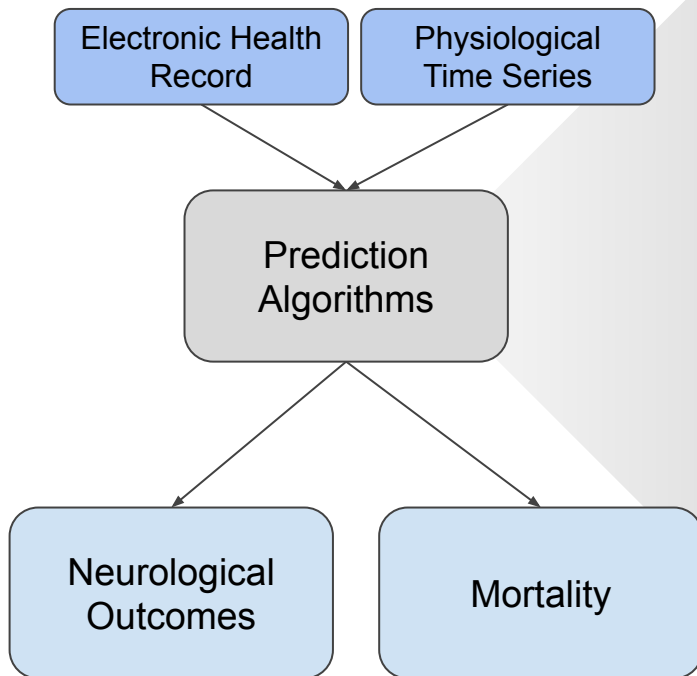
Clinical and engineering expertise

Approach

Aim 1: Data preprocessing and data exploration



Aim 2: Prediction of cardiac arrest outcomes



Machine Learning Algorithms:

GLM: LASSO & Elastic Net

Random Forest

Gradient Boosting

XGboost

Neural Networks (LSTM, GRU)

Transfer Learning

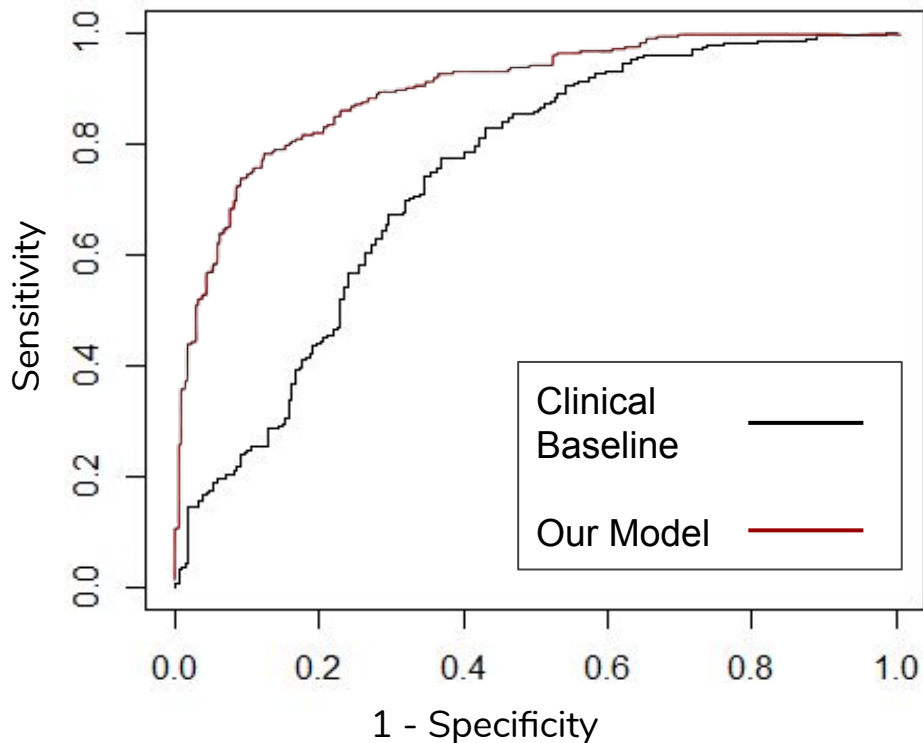
Model Refinement:

Optimization Techniques

Combination of Models (stacking)

Results

Clinical Baseline Vs. Our Model ROC



	Clinical Baseline	Our Model
Area Under the ROC Curve	74%	86%
Sensitivity	77%	78%
Specificity	63%	88%

With further validation, our model could:

- aid physicians in clinical decision making to allocate appropriate treatment regimens
- help identify previously overlooked predictive features which merit further investigation

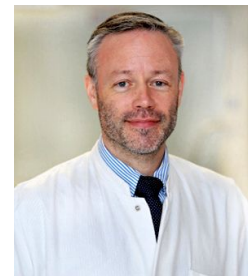
Acknowledgements



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