**In Vitro to In Vivo Translation of AI for Clinical Use: Screening for Acute Coronary Syndrome to Identify STEMI**

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**Background**
- Patients presenting to the Emergency Department (ED) who are at risk of Acute Coronary Syndrome (ACS) should receive an ECG within 10 minutes of arrival.
- We have built a logistic model to estimate patients’ ACS risk.
- Based on the model’s performance, we believe it can reduce the time to ECG if implemented in clinical care.
- Before using AI in live care, testing is required to ensure patient safety. Standards for such testing are needed.
- We present our method and results from a prospective silent pilot of our model programmed as Clinical Decision Support (CDS) in the electronic health record (EHR).

**Methods**
- Prospective silent pilot with iterative cycles
- Predictive model
- Program into CDS
- Two analyses of technical performance
- Run silently for a short period
- Pull “live care data” for that period

**Results**

**A. Technical Component Analysis**
1. **Population Capture**
   - Ineligible patients were initially included, such as those in the Clinical Decision Uni or under 18.
2. **Risk Prediction Score Calculation**
   - The 4th decimal place of the decision threshold was missing.
3. **Decision Threshold**
   - The symbol ≥ had been inputted as >.
4. **Data Capture for Monitoring and Transparency**
   - Initially, the report of CDS data included only the “yes” screening decisions.
5. **CDS Decision Alignment with Risk Calculation**
   - In 21 encounters, the CDS screening decision did not align with the calculated risk score.

**B. Technical Fidelity Analysis**
- Agreement between CDS and model: Raw agreement 96%, Kappa 88%
- Impact of data missingness: Impact of calculation method
  - Impact of calculation method: 98%

**Conclusions**
- This methodology evaluated the technical translation of a predictive model into CDS.
- With each iteration, issues were discovered and successfully corrected.
- The CDS screening decisions substantially agreed with the original model’s decisions, and disagreements were due to both missing data and calculation differences.
- We look forward to evaluating the impact of this CDS on STEMI screening when it becomes available for use in live care.

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