Enhancing the Electronic Health Record: Clinical Decision Support via Risk Stratification at the Emergency Department Point of Care

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BACKGROUND
• Emergency departments (EDs) are a prime setting for technical innovation to improve evidence-based clinical decision making.
• Prediction rules are useful for risk stratifying patients to appropriate care pathways.
• A web-based application embedded within the electronic health record (EHR) offers a convenient opportunity to bring clinical decision support (CDS) to emergency physicians at the point of care.

OBJECTIVES
• To develop methods and best practices for bringing innovation to emergency medical care through a fast and user-friendly CDS embedded in the EHR.

METHODS
• Developed RISTRA (Risk STRAtification), a web application embedded in an Epic-based EHR.
• A validated evidence-based risk calculator—the Pulmonary Embolism (PE) Severity Index—used as a proof of concept.
• The application extracted patient information from the EHR to predict the risk of 30-day all-cause mortality in patients with PE.
• Web services were used to import patient-specific data into RISTRA to provide real-time guidance to the treating physician.

RESULTS
• RISTRA loaded in less than 3 seconds and calculated a patient-specific risk score in a few steps, taking less than a minute.
• RISTRA successfully identified patients at low risk for PE-related complications for outpatient treatment.
• ED physicians were satisfied with the design and ease of use of the application.

DISCUSSION
• RISTRA has since been rolled out to 21 Kaiser Permanente Northern California EDs.
• In the fast-paced ED environment, it was imperative that the CDS application be fast and simple.
• Engaging stakeholders across the organization was essential.

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