Dr. Jason Adelman

ABSTRACT
The 2011 Institute of Medicine (IOM) report, *Health IT and Patient Safety,* raised awareness of new patient safety risks introduced by Health IT systems. However, the report also noted a lack of evidence quantifying the magnitude of these risks due to inadequate systems for capturing Health IT safety events, and called for the Agency for Healthcare Research and Quality (AHRQ) to fund the development of "new measures for reliably assessing the current state of Health IT safety and monitoring for improvements." This proposal meets this need by developing and validating new automated Health IT Safety measures that will identify important electronic medication ordering errors.

The PI of this proposal submitted the first Health IT Safety measure to be reviewed by the National Quality Forum (NQF) called the "Wrong-Patient Retract-and-Reorder (Wrong-Patient RAR) Measure", a reliable, validated and automated method for measuring wrong-patient electronic orders. The Wrong-Patient RAR measure identifies orders placed on a patient, retracted within10 minutes, and then placed by the same clinician on a different patient within the next 10 minutes. This measure identified over 5,000 wrong-patient electronic orders at one hospital in one year, which is more than 500 times as many errors than had previously been identified by voluntary reporting. In this grant application, we will use the Retract-and-Reorder automated detection method to develop and validate additional Health IT safety measures needed for identifying violations of the "Five Rights of Medication Safety": right patient, right dose, right medication, right route and right frequency. For example, the "Wrong-Dose Retract-and-Reorder Measure" will identify an order placed on a patient that is retracted within10 minutes, and then placed by the same clinician on the same patient, but with a different dose within the next 10 minutes.

We will pursue the following specific aims: **Aim 1:** Develop and pilot effective and valid measures (positive predictive value > 75%) for detecting wrong-dose, wrong-medication, wrong-route, and wrong frequency electronic orders in an acute care setting, by extending the wrong-patient Retract-and-Reorder automated detection method. **Aim 2:** Implement the automated measures developed in Aim 1 at a second hospital, using a different Electronic Health Record (EHR), to evaluate the reliability (external validity) of the measures. **Aim 3**: Conduct a multi-site observational study describing the overall frequency of wrong-patient, wrong-dose, wrong-medication, wrong-route, and wrong-frequency electronic orders, and describe the frequency in subgroups characterized by provider, patient, and system factors.

The grant application is directly responsive to the special emphasis notice that states AHRQ is seeking proposals that evaluate methods, "to carefully monitor the systems' use and performance post-implementation; and to understand how to address causes of errors."